CLINICAL GUIDELINE **CG10058-8**

Extravasation

For use in (clinical areas):	Oncology/Haematology Unit (excluding Paediatrics)
For use by (staff groups):	Oncologists, Haematologists, Nursing Staff
For use for (patients):	Oncology/Haematology patients receiving chemotherapy
Document owner:	Cytotoxic User Group
Status:	Approved

Contents

1 Purpose

1.1 To minimize the risk of permanent tissue damage by the quick effective management of suspected extravasation of cytotoxic drugs.

2 Documentation

The following documentation should be completed. Please refer to section 3.9 for further details.

2.1 Nursing documentation

2.2 Medical notes

2.3 WSH NHS Trust Accident/Incident Book

2.4 Extravasation report green card (in extravasation pack)

2.5 WSH (NHS) Trust Extravasation Documentation Report

3 Description

3.1 General Principles

3.1.1 Speed of diagnosis and prompt initiation of treatment is imperative in the effective management of vesicant extravasation of cytotoxic agents.

3.1.2 Extravasation of a vesicant drug should be treated as a medical emergency and treatment should ideally be initiated within 1 hour of the incident.

3.1.3 All treatment interventions must be prescribed and administered by a Consultant or SpR. Under exceptional circumstances the prescribing can be delegated to another doctor and the administration to an agreed delegated person.

3.1.4 Treatment will be dependant on the classification of the cytotoxic drug (see section 3.3).

3.1.5 The patient's Consultant must be informed of any extravasation of vesicant drugs. Out of hours the relevant on-call consultant should be informed

3.1.6 All extravasations of vesicant drugs should be discussed with a plastic surgeon (see section 3.6 and 3.7)

3.1.7 If clinical judgment dictates alternative treatment to that described in this protocol full details of the rationale and the intervention should be documented in the patient's notes.

3.2 Diagnosis

3.2.1 Extravasation refers to the accidental infiltration of a drug that has been administered via the intravascular route into surrounding subcutaneous tissues. It can be associated with extensive tissue damage.

3.2.2 Extravasation should be suspected if a combination or all of the following symptoms occur:

- Increased resistance when administering IV drugs
- Lack of blood returned from the cannula/CVAD
- Change in infusion quality, i.e. reduce flow rate
- Any change in colour such as redness/blanching at the injection site
- Swelling or oedema around the cannula
- Pain or discomfort around the cannula site (stinging or burning)
- Inflammation, erythema or blistering around the infusion site

Note: Individually the above points are not diagnostic but in combination they may indicate extravasation.

3.2.3 The degree of damage caused by extravasation relates to the amount of drug extravasated and the speed with which it is recognized and treated. Therefore drugs which are normally regarded as non vesicant should be treated as a vesicant if they have extravasated in large volumes e.g. 5-10mls.

3.2.4 Delays in recognition and treatment can increase the risk of tissue necrosis.

3.3 Classification of Cytotoxic Drugs

Drugs are classified in this protocol according to whether they are **irritant, exfoliant, non-vesicant** or **vesicant**. Treatment of vesicant extravasation is further classified as anthracycline or non-anthracycline.

Vesicant: capable of causing pain, inflammation and blistering of the skin, underlying flesh and necrosis, leading to tissue death and necrosis.

Exfoliant: capable of causing inflammation and shedding of the skin but less likely to cause tissue death.

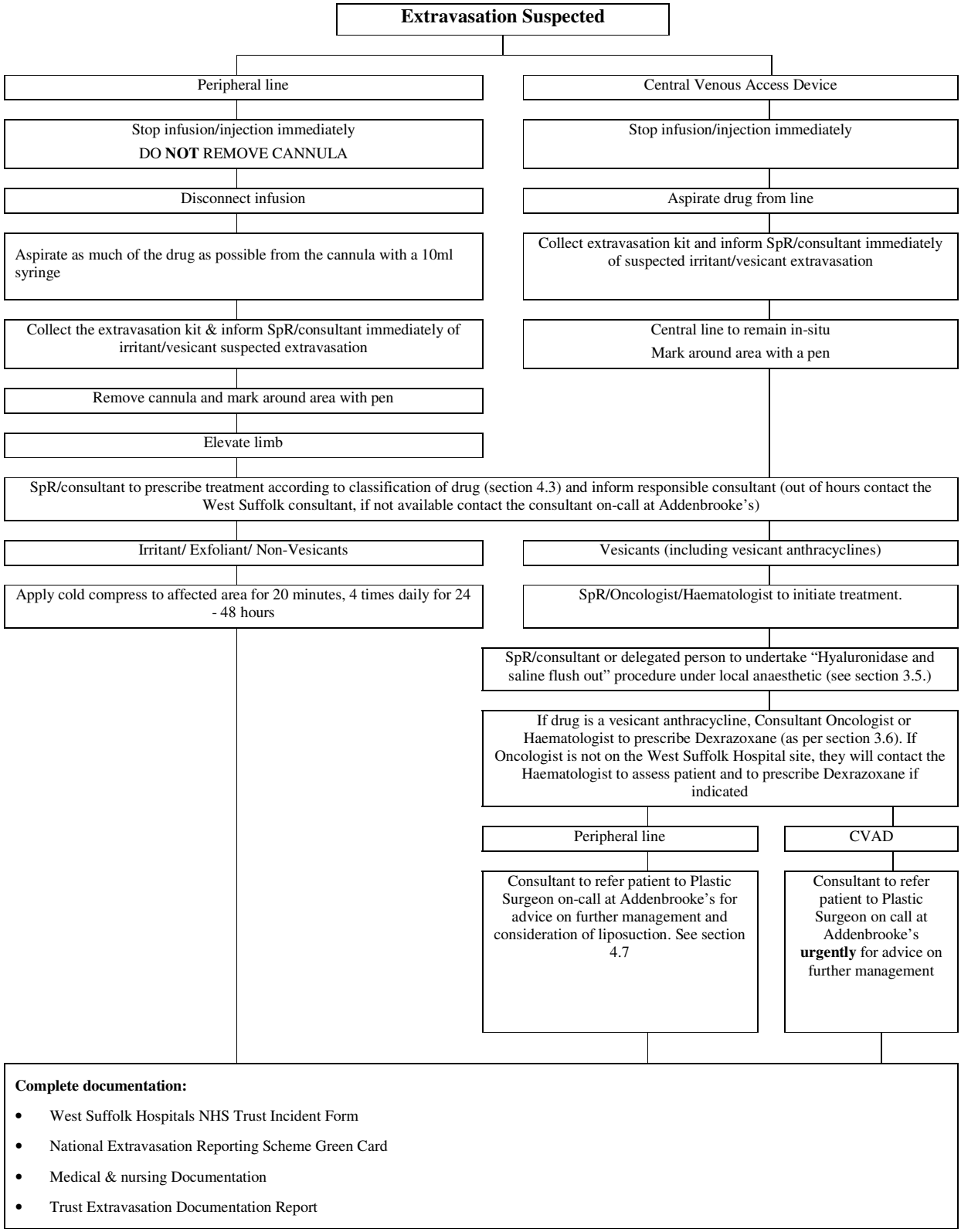
Irritants: capable of causing inflammation and irritation, rarely proceeding to breakdown of tissue.

Drug	Classification	Treatment
Aclarubicin	Irritant/Exfoliant/Non Vesicant	Cold compress
Actinomycin D (Dactinomycin)	**Vesicant**	Hyaluronidase and saline flush out
Alemtuzumab	Irritant/Exfoliant/Non Vesicant	Cold compress
Amsacrine	**Vesicant**	Hyaluronidase and saline flush out
Arsenic	Irritant/Exfoliant/Non Vesicant	Cold compress
Aspariginase	Irritant/Exfoliant/Non Vesicant	Cold compress
Azacytidine	Irritant/Exfoliant/Non Vesicant	Cold compress
Bevacizumab	Irritant/Exfoliant/Non Vesicant	Cold compress
Bleomycin	Irritant/Exfoliant/Non Vesicant	Cold compress
Bortezomib	Irritant/Exfoliant/Non Vesicant	Cold compress
Busulfan	**Vesicant**	Hyaluronidase and saline flush out
Carboplatin	Irritant/Exfoliant/Non Vesicant	Cold compress
Carmustine	**Vesicant**	Hyaluronidase and saline flush out
Cisplatin	Irritant/Exfoliant/Non Vesicant	Cold compress
Cladribine	Irritant/Exfoliant/Non Vesicant	Cold compress
Clofarabine	Irritant/Exfoliant/Non Vesicant	Cold compress
Cyclophosphamide	Irritant/Exfoliant/Non Vesicant	Cold compress
Cytarabine	Irritant/Exfoliant/Non Vesicant	Cold compress
Cetuximab	Irritant/Exfoliant/Non Vesicant	Cold compress
Dacarbazine	**Vesicant**	Hyaluronidase and saline flush out
Dactinomycin (Actinomycin D)	**Vesicant**	Hyaluronidase and saline flush out
Daunorubicin	**Vesicant anthracycline**	Hyaluronidase and saline flush out + dexrazoxane
Docetaxel	Irritant/Exfoliant/Non Vesicant	Cold compress
Doxorubicin	**Vesicant anthracycline**	Hyaluronidase and saline flush out + dexrazoxane
Epirubicin	**Vesicant anthracycline**	Hyaluronidase and saline flush out + dexrazoxane
Etoposide	Irritant/Exfoliant/Non Vesicant	Cold compress
Floxuridine	Irritant/Exfoliant/Non Vesicant	Cold compress

Fludarabine	Irritant/Exfoliant/Non Vesicant	Cold compress
Fluorouracil	Irritant/Exfoliant/Non Vesicant	Cold compress
Gemcitabine	Irritant/Exfoliant/Non Vesicant	Cold compress
Gemtuzumab Ozogamicin (Mylotarg)	Irritant/Exfoliant/Non Vesicant	Cold compress
Idarubicin	**Vesicant anthracycline**	Hyaluronidase and saline flush out + dexrazoxane
Ifosfamide	Irritant/Exfoliant/Non Vesicant	Cold compress
Interleukin – 2	Irritant/Exfoliant/Non Vesicant	Cold compress
Irinotecan	Irritant/Exfoliant/Non Vesicant	Cold compress
Liposomal Daunorubicin	Irritant/Exfoliant/Non Vesicant	Cold compress
Liposomal Doxorubicin (Adriamycin)	Irritant/Exfoliant/Non Vesicant	Cold compress
Melphalan	Irritant/Exfoliant/Non Vesicant	Cold compress
Methotrexate	Irritant/Exfoliant/Non Vesicant	Cold compress
Mitomycin C	**Vesicant**	Hyaluronidase and saline flush out
Mitoxantrone	Irritant/Exfoliant/Non Vesicant	Cold compress
Mylotarg (Gemtuzumab Ozogamicin)	Irritant/Exfoliant/Non Vesicant	Cold compress
Oxaliplatin	Irritant/Exfoliant/Non Vesicant	Cold compress
Paclitaxel	Irritant/Exfoliant/Non Vesicant	Cold compress
Panitumumab	Irritant/Exfoliant/Non Vesicant	Cold compress
Pegasparaginase	Irritant/Exfoliant/Non Vesicant	Cold compress
Pemetrexed	Irritant/Exfoliant/Non Vesicant	Cold compress
Raltitrexed	Irritant/Exfoliant/Non Vesicant	Cold compress
Rituximab	Irritant/Exfoliant/Non Vesicant	Cold compress
Streptozocin	**Vesicant**	Hyaluronidase and saline flush out
Teniposide	Irritant/Exfoliant/Non Vesicant	Cold compress
Thiotepa	Irritant/Exfoliant/Non Vesicant	Cold compress
Topotecan	Irritant/Exfoliant/Non Vesicant	Cold compress
Trastuzumab	Irritant/Exfoliant/Non Vesicant	Cold compress
Treosulfan	**Vesicant**	Hyaluronidase and saline flush out
Vinblastine	**Vesicant**	Hyaluronidase and saline flush out
Vincristine	**Vesicant**	Hyaluronidase and saline flush out
Vindesine	**Vesicant**	Hyaluronidase and saline flush out
Vinorelbine	**Vesicant**	Hyaluronidase and saline flush out

3.4 Treatment Intervention

3.4.1 Use Table in section 3.3 to assess classification of drug and treat according to classification of drug and type of venous access.



3.5 Hyaluronidase and Saline Flush out Technique

3.5.1 This should only be undertaken by a Consultant, SpR or agreed delegated person.

3.5.2 Hyaluronidase is most effective if administered within 2 hours of the injury occurring, but still has benefits for up to 12 hours.

3.5.3 Under aseptic conditions clean the site of injury and the immediate surrounding area.

3.5.4 Reconstitute one or two 1500 unit vials of Hyaluronidase in 5-10mls of Lignocaine 1%.

3.5.5 Infiltrate the subcutaneous layer of the area immediately under the site of extravasation.

3.5.6 Using a scalpel make at least 4 small "incisions" into the subcutaneous layer-evenly spaced around the area to be treated.

3.5.7 Insert the tip (without introducer) of a size 18/20g cannula, or 18g "drawing up needle" which is blunt, through one of the 4 incisions.

3.5.8 Using a syringe attached to a three-way tap flush up to 1000ml of 0,9% sodium chloride in turn through each of the 4 incisions, as quickly as possible. If necessary apply pressure to the bag to ensure quick flow of fluid.

3.5.9 If the area surrounding the extravasations becomes oedematous, gently massage the area towards the nearest incision site to allow excess fluid to be removed. If necessary use an 18g "drawing up needle" which is blunt to make puncture sites for the fluid to escape.

3.5.10 Once the procedure has been completed, dress the area with a layer of jelonet and gauze and elevate the limb for 24 hours.

3.5.10.1 Consider prescription of prophylactic antibiotics (refer to trust antibiotic policy)

3.5.10.2 The stab incisions should be allowed to close spontaneously and never be sutured.

3.6 Vesicant anthracycline extravasation and dexrazoxane

3.6.1 Vesicant anthracyclines are associated with considerable morbidity when involved in extravasation incidents.

3.6.2 In the event of vesicant anthracycline extravasation, the West Suffolk Plastic Surgeon to be contacted for advice. If he/she is not available then the on-call plastic surgeons at Addenbrooke's should be consulted as a matter of urgency and they should be specifically informed that the extravasation involves a vesicant anthracycline. Hyaluronidase and saline flush out technique should be performed as per section 3.5. If the flush out involves no significant delay it should be carried out prior to the Dexrazoxane, otherwise commence the Dexrazoxane without delay.

3.6.3 Ideally, the plastic surgeon will attend to make a baseline assessment. However, the administration of Dexrazoxane should not be delayed while waiting for their advice.

3.6.4 Dexrazoxane must be prescribed by the Consultant Oncologist or Haematologist.

3.6.5 Dexrazoxane is administered into the unaffected arm daily for 3 days so appointments should be made for days 2 and 3 for administration of dexrazoxane and for assessment by plastic surgery.

3.6.6 Following the 3 day administration of dexrazoxane, the plastic surgery team will advise on further management.

3.7 Plastic Surgeon Review

3.7.1 If the extravasation occurs via a peripheral line, contact the on-call plastic surgeon at Addenbrooke's for advice.

3.7.2 The patient should be referred urgently to the West Suffolk Plastic Surgeon if he/she is not available then the on call plastic surgeon at Addenbrooke's if:

- Drug extravasated via a CVAD
- The skin is compromised
- Extreme swelling
- Significant extravasation
- Skin necrosis

3.8 Follow up

3.8.1 The patient should be made aware that the site will remain sore for several days.

3.8.2 Extravasation sites should be observed for pain, erythema, induration and necrosis and the findings recorded in the medical/nursing documentation.

3.8.3 If the extravasation was caused by a vesicant drug appropriate arrangements should be made for follow up by the Oncologist/Haematologist or Plastic Surgeon.

3.8.4 If the extravasation was caused by a non-vesicant drug the patient should be asked to report immediately any increase discomfort or significant change, i.e., peeling or blistering of the skin, to the Oncology Unit and a follow up appointment made.

3.9 Documentation

3.9.1 The signs, symptoms, date and time of the injury should be recorded on a National Extravasation Reporting Scheme Green Card. In addition the following should be documented:

- Time of review by medical staff
- Referrals made
- Arrangements for follow up appointments
- Outcome of follow up assessments

3.9.1.1 The National extravasation Reporting Scheme Green Card should be photocopied and filed in the patient's notes as a permanent record of the assessment of the injury.

3.9.1.2 The follow up report for the National Extravasation Reporting Scheme should be completed within 1 month following the incident.

3.9.2 The following information should be documented in the medical records

- Time of review by medical staff
- Referrals made (who & time)
- Arrangements for subsequent follow up appointments required
- Outcome of follow up assessments

3.9.3 A West Suffolk Hospitals NHS Trust incident form should be completed.

3.9.4 A Trust Extravasation Document should be completed and used for subsequent assessments.

4. References

4.1 Dougherty L (1999) Safe handling and administration of intravenous cytotoxic drugs. In Dougherty L, Lamb J (1st ed) *Intravenous therapy in nursing practice.* Edinburgh: Churchill Livingstone. Chapter 16

4.2 Allwood M, Stanley A, Wright P (2002) *The Cytotoxics Handbook* 4th ed. Radcliffe Medical Press. ISBN 1857775 504

4.3 Gault D T (1993) Extravasation injuries. *British Journal of Plastic Surgery* March: 46 (2): 1991-1996.

4.4 Stanfors B L & Hardwicke F. *A Review of Clinical Experience with Paclitaxel Extravasations.* Support Care Cancer (2003) 11: 270-277

4.5 Mouridsen H.T. et al Ann Oncol doi:10.1093/annonc/mdl413

5. Cross - References

5.1 West Suffolk Hospital NHS Trust – Incident Reporting and Investigation Policy and Procedure

5.2 West Suffolk Hospital NHS Trust –Prescription and Administration of Cytotoxic Drugs Policy and Procedure

6. Development of the Guideline

6.1 Changes compared to previous document

This is an updated document, to reflect current knowledge and practice

6.2 Statement of clinical evidence

Refer to the reference list in the body of the document.

6.3 Contributors and peer review

This guideline was updated and then circulated to the members of the WSH Cytotoxic Users Group for comment. Necessary amendments were then made.

6.4 Distribution list/dissemination method

The Haematologist, Oncologist & nursing staff in the Oncology/Haematology Unit are to receive paper copies of the guidelines. Awareness of this guideline will be promoted via staff meetings. It will be included in the educational sessions for new members of the nursing team as part of their chemotherapy administration assessment.

6.5 Document configuration information

Author(s):	WSH Cytotoxic Users Group
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