Policy for the Care of the Patient Undergoing Intravenous Therapy
(Bolus, Continuous and Intermittent)

Issue Date:
v2.0: 23rd January 2017
v2.1: 14th September 2018
v2.2: 21st November 2018
v2.3: 25th April 2019

Disclaimer
- Overarching policy statements must be adhered to in practice.
- Clinical guidelines are for guidance only. The interpretation and application of them remains the responsibility of the individual clinician. If in doubt contact a senior colleague or expert.
- The Author of this clinical document has ultimate responsibility for the information within it.
- This clinical document is not controlled once printed. Please refer to the most up-to-date version on the intranet.
- Caution is advised when using clinical documents once the review date has passed.
1. INTRODUCTION

1.1 The purpose of this policy is to inform staff working at Sherwood Forest Hospitals NHS Foundation Trust (SFHT) of the correct procedures in relation to the care of all patients undergoing intravenous (IV) therapy and to give assurance that there is a safe consistent level of practice in the care of patients undergoing IV therapy.

“The complexities associated with prescribing, preparing and administering injectable medicines means that there are greater potential risks for patients than for other routes of administration. Weak operating systems increase the potential risk of harm and safe systems of work are needed to minimise these risks.” (NPSA, 2007)

1.2 As many as 80% of hospitalised patients will have an intravenous cannula in situ at some point during their hospital stay (Zingg and Pittet, 2009). A growing number of patients are receiving intravenous therapy in hospital as it becomes a routine aspect of care. Although a routine procedure, the potential harm, complication and risk to the patient should not be underestimated. For these reasons, it is vital that all health care professionals undertaking IV administration are competent and have a sound knowledge and skill base to minimise the risk and potential for harm for a patient undergoing IV therapy.
1.3 It is the duty of all who manage IV devices to understand the risks associated with their use, and take responsibility for updating their knowledge, and maintaining highest standards of practice.

“The administration of medicines……is not solely a mechanistic task… [but] requires thought and the exercise of professional judgement” (Nursing and Midwifery Council (NMC) Standards for Medicines Management, 2007)

1.4 No member of staff should activate or use an infusion device without accessing evidenced training and assessment as described in the Trust's Medical Equipment User Training Policy (current version).

1.5 All registered healthcare professionals as defined in this policy, can check IV medication in accordance with their professional registration, but they are prevented from administering this medication unless they have received the Trust’s IV medicines administration training relevant to their area of practice (RD04/RD04.4/RD05). Medical students receive core training (specified in section 7 of this policy).

This policy identifies which members of staff can administer IV therapies and further specifies the level of training that the practitioner must complete.

The policy content is intended to provide standards for the safe and effective administration of IV medicines and fluid therapy by registered healthcare professionals.

1.6 This policy is in place to ensure the highest standard of care delivery to patients. Failure to comply with this policy may be regarded as misconduct and dealt with in accordance with the Trust’s disciplinary procedures and potentially the practitioner’s regulatory body.

2. SCOPE OF DOCUMENT

This clinical document applies to:

Staff group(s)

- Registered nurses and midwives (Nursing and Midwifery Council) including bank and agency staff
- Medical staff (General Medical Council) including locum medical staff
- Radiography staff who undertake diagnostic procedures (Health and Care Professions Council Registered)
- Operating department practitioners (HCPC registered as above)

Clinical area(s)

- All in-patient wards – adults and paediatrics; operating theatres and recovery rooms; all outpatient areas; maternity areas; assessment areas; emergency departments and X-ray across Kings Mill Hospital, Mansfield Community Hospital and Newark Hospital.

Patient group(s)

- All patients undergoing delivery of IV therapy via, bolus, continuous or intermittent routes. This policy applies to paediatric, maternity and adult patient groups.
Regulatory standards

- NMC (2009) Record Keeping Guidance for Nurses and Midwives

Related Trust policies (all current versions available on the Trust intranet)

- Policy for Consent to Examination, Treatment and Care
- Medicines Policy
- Standard Operating Procedure Infection Prevention and Control ICP 1
- Hand Hygiene Policy ICP 17
- Policy for Use of Personal and Protective Equipment (PPE) ICP 9
- Nutrition and Hydration Policy
- Medical Equipment User Training Policy
- Medical Device Management Policy
- Escort Policy – selection and provision of an escort for intra / inter hospital patient transfer policy
- The Observations (and NEWS) Policy for Adult Patients
- Policy for the Administration of IV Morphine for Severe Pain by Nursing and Midwifery Staff
- Standard Policy for IV Morphine PCA in Adults
- Standard Policy for IV Fentanyl PCA
- Transfusion Policy, Procedures and Guidelines

Related guidelines and procedures

- Aseptic technique A1 (ANTT)
- Removal of peripheral cannula C26
- Procedure for changing an intravenous patient controlled analgesia (PCA) syringe/bag P9
- Procedure for administration of intravenous opioids (theatre recovery only) P12
- Flushing a central venous catheter C16
- Administration of IV drugs via a central venous catheter C15
- Multidisciplinary guideline for the administration of parenteral nutrition
- Management of a central venous line – neonates C5
- Changing the dressing of a central venous catheter line (adults) C14
- Protocol for Bionector® use (Bionectors® are referred to as needle free connection devices within this policy)
- Clinical guideline for the treatment of suspected sepsis

Related role development standards for practice

- Care and management of a child with a totally implantable venous access device (Port-a-cath)
- RD04 Administration of peripheral drugs (part A)
- RD04.4 Overview administration of drugs and intravenous fluids via a silastic long line
- RD05 Administration of drugs and Infusions via intravenous central lines (part B)
- RD06 Fluid management via intravenous peripheral infusion
- RD07 Administration of intravenous peripheral line flushes
- RD08 Administration of a saline flush to ensure a cannula is patent
Exclusions

This policy covers intravenous therapy only and does not apply to patients undergoing subcutaneous infusions/therapy. Please refer to the following policy:

- T34 Syringe Pump Policy and procedures for adult patient

This policy does not apply to administration of IV medicines or fluids in the Welcome Treatment Centre (refer to East Midlands Cancer Network policies and procedures).

This policy does not include the use of specialist infusion equipment used in anaesthesia delivery or radiology contrast mediums, in these areas the therapy and the device falls under the remit of the department’s own policy and protocols.

This policy does not apply to anaesthetic practice in the operating theatre department.

3. DEFINITIONS AND/OR ABBREVIATIONS

<table>
<thead>
<tr>
<th>Healthcare professional</th>
<th>A registered member of staff, including nurses, operating department practitioners, doctors, dentists and radiographers. This also includes individuals employed by a third party person to work within SFHT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare support workers</td>
<td>Non-registered staff employed as band 2 or 3. This group will include phlebotomists.</td>
</tr>
<tr>
<td>Competence</td>
<td>Is defined as demonstrating the knowledge and skills to perform the task to SFHT standards, consistently and without supervision.</td>
</tr>
<tr>
<td>IV trained practitioner</td>
<td>A practitioner who has satisfactorily completed the SFHT training for IV administration or has had their training and competency from another organisation verified, has undergone a competency check in their area of practice and has reviewed associated SFHT policies and procedures to align their practice.</td>
</tr>
<tr>
<td>Intravenous bolus</td>
<td>Introduction of a small volume of medicine solution into the cannula or the injection site of an administration set. A bolus injection should be administered slowly over 3-5 minutes unless otherwise specified.</td>
</tr>
<tr>
<td>Intermittent infusion</td>
<td>Administration of an infusion over a set time period, either as a one-off dose or repeated at specific time intervals. This will involve repeated use of a single cannula. This may be a central venous access device for example PICC lines/Port-a-cath devices/Hickmann lines.</td>
</tr>
<tr>
<td>Continuous infusion</td>
<td>Intravenous administration of a volume of fluid with or without medicines added over a number of hours to achieve a clinical end point. The infusion may be repeated over a period of days. Large volume i.e. 25-1000ml or small volume infusions may be delivered continuously.</td>
</tr>
<tr>
<td>2-person check procedure</td>
<td>This is a method of checking to ensure low risk error. The accepted standard is to have two registered health care professionals simultaneously check the medicine for administration (see checking and administration table below). Where a calculation is involved an independent 2-person check must take place. This is where two individuals will check a medicine separately and then share their individual calculation result to confirm accuracy. <strong>A single check of medicines for intravenous administration is not acceptable.</strong> The Trust Medicines Policy states that “ALL intravenous medicines must be checked by TWO registered practitioners, one of whom must be the administering Doctor or Registered Nurse/ Midwife”. This includes pre-filled syringes/syringe pumps and all infusions... The two nurse check should include all stages up until the bolus or infusion is commenced. <strong>Both registered healthcare professionals are required to sign the prescription chart in order to document that a robust 2-person check has been completed.</strong></td>
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<td>---</td>
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</tr>
<tr>
<td>Infiltration</td>
<td>The <strong>inadvertent and unintentional</strong> administration of non-vesicant solution/medication into surrounding tissue instead of into the intended vascular pathway. (Sometimes described as ‘tissued’)</td>
</tr>
<tr>
<td>Extravasation</td>
<td>The <strong>inadvertent and unintentional</strong> administration of vesicant medication or solution into the surrounding tissue instead of into the intended vascular pathway. (Royal College of Nursing, 2010)</td>
</tr>
<tr>
<td>ANTT</td>
<td>Aseptic Non Touch Technique</td>
</tr>
<tr>
<td>VIPS</td>
<td>Visual Infusion Phlebitis Score</td>
</tr>
<tr>
<td>The UCL Guide</td>
<td>The Trust uses UCL Hospitals Injectable Medicines Administration Guide (3rd ed, 2010) for detailed guidance on the NPSA risk rating, preparation, reconstitution and specific guidance on the administration of intravenous injections and infusions. UCL guides are available on every ward/unit (replacements can be obtained from pharmacy) and the <a href="#">Trust Medicines Policy</a> can be obtained via the intranet.</td>
</tr>
<tr>
<td>SFHT</td>
<td>Sherwood Forest Hospital Trust including Newark Hospital and Mansfield Community Hospital</td>
</tr>
<tr>
<td>TPN</td>
<td>Total Parenteral Nutrition</td>
</tr>
<tr>
<td>PICC</td>
<td>Peripherally Inserted Central Cannula</td>
</tr>
<tr>
<td>Preceptorship nurse</td>
<td>A newly qualified nurse who upon commencing post undergoes a 22 week programme of supported learning in their practice environment. Supported learning programmes are available for other newly appointed nurses to the Trust, where this is deemed essential to their role.</td>
</tr>
</tbody>
</table>
4. ROLES AND RESPONSIBILITIES

The Executive Director of Nursing and Quality and Executive Medical Director are responsible for the content and implementation of this policy.

Divisional nurses and heads of department are responsible for ensuring that necessary measures are in place to support the safe implementation and monitoring of the use of the policy in practice. They will need to take measures where practice has been deemed potentially unsafe.

Matrons, department managers and service line directors are responsible for ensuring that all staff accountable to them are aware of this policy and adhere to its statement. It is the manager’s responsibility to investigate and rectify any discrepancies identified.

Ward Sister/Charge Nurses/Departmental Leader will act as excellent role models and are responsible and accountable for the policy implementation among staff in practice, and the monitoring of standards and best practice associated with it. They will ensure that all staff in the sphere of their responsibility have access to training to develop the skills and competence. This includes the completion of the associated work books, medical equipment competency documents and study sessions in a timely manner.

All registered healthcare professionals have a duty of care to their patients. This is a legal and professional requirement of state registration that cannot be delegated. All registered healthcare professionals are personally responsible and professionally accountable in ensuring that they receive training in the safe use and observation of any medical device used in the delivery of intravenous therapy (MHRA, 2010). It is the responsibility of the healthcare professional to ensure that any IV access or IV therapy is appropriately prescribed for the patient and that the patient and therapy delivery are monitored accordingly according to associated policies and procedures.

Pharmacists are responsible for monitoring both the prescribing and overseeing the administration of medicinal therapies and alerting prescribers and other health care professionals to potential or actual problems.

All staff are required to prevent and manage healthcare acquired infection as part of The Health Act 2006: Code of Practice on the control of infections and related guidance (Department of Health, 2010). All staff are required to report incidents or near-misses relating to IV medicines using the Trust incident reporting system.

Band 3 Healthcare Assistants can flush a cannula after they have inserted it using a Posiflush to ensure the cannula is patent.

The health care assistant must not flush a cannula at any other time. Staff must ensure they have attended training and a completed competency has been signed and recorded by Professional Education and Training Team (PETT).
5. NARRATIVE

To assist with the application of this policy, please also refer as appropriate to the appendices:

- Appendix I – Procedure for aseptic non-touch technique
- Appendix II – Equipment for IV access
- Appendix III – Infusion Pumps
- Appendix IV – Procedural guidelines for practice (bolus / continuous & intermittent)
- Appendix V – Table of possible complications: IV administration
- Appendix VI – Guidelines for management of extravasation
- Appendix VII – Ports and Flushing of Venous Access Devices
- Appendix VIII – Administration of Intravenous Drugs and Fluids to Neonates

5.1 Assessment of need

The following must be considered when inserting or accessing an intravenous device:

- Is it necessary or is there an alternate route?
- Is the device suitable for intravenous use?
- Do I know how and am I trained and competent to use the device?
- Is it the correct device for the task? (cannula size and type)
- Is there product support and is the equipment licensed for the task?
- Is it intact and sterile and in date?
- Condition of insertion site (visual infusion phlebitis scores, VIPS)
- Compatibility with other equipment? (infusion lines/luer lock syringes/needle free connecters)
- What was the original intention for use of the device?
- Has the appropriate safety device been used where practicable?

5.2 Consent

Patients have the legal and ethical right to determine what happens to them. Valid consent to treatment is essential to all forms of healthcare and paramount when considering invasive techniques. Obtaining consent is also a matter of common courtesy between the healthcare provider and recipient.

Consent is the patient’s agreement for healthcare professionals to provide care (Department of Health, 2009) and consent may be given orally, in writing, implied (i.e. the patient offering an arm for cannulation) or any manner identified as consent by that patient.

When working with children it is important to gain consent from the parent/carer and the child where possible.

In order for consent to be valid the patient must:

- Be competent to take the decision
- Have received sufficient information in an appropriate format to make an informed decision
- Not be acting under duress

Acquiescence where the person does not know what the intervention entails is not “consent”.

Obtaining consent should not prevent urgent and necessary care.
The healthcare professional carrying out the procedure is ultimately responsible for ensuring that the patient consents to what is being done. It is that individual who will be held responsible in law if the intervention is later challenged.

Every effort must be made to explain the intervention and answer any questions the patient may have. Therefore staff must possess effective communication skills.

If after discussion a patient refuses intervention this must be clearly documented in the notes, informing the medical staff of this decision.

Treatments to which the patient has consented should continue and the patient made aware of the option to change their mind and consent to the treatment at a later time.

For patients who lack capacity, a mental capacity act 2-stage test should be completed and a best interest’s checklist should be added if the administration of IV therapy is necessary in the best interests of the patient.

5.3 Prescriptions

Prescriptions for IV medication, IV fluids, and for blood products must be written on a SFHT Medicine Prescription and Administration Record ("medicine" or “prescription” chart) or other authorised prescribing/administration documentation.

TPN must be ordered on an SFHT Total Parenteral Nutrition chart and be prescribed on the IV section of the medicine prescription chart.

For Radiology: consultant radiologists review and authorise specialised procedures. Those that require IV medication will have an associated patient group direction (PGD) in place as an integral part of the procedure. Before each procedure begins the radiographer will check the patient’s compatibility and suitability for the medication/contrast to be used. The information is recorded and scanned onto the patient’s record on the radiology information system.

Any individual undergoing an outpatient radiology procedure where an IV medication is given will receive a proforma advising them of the dosage of the medication that has been given.

Any inpatient who receives an IV medication as part of their procedure will have the medicine identified and signed on the front of the inpatient medicines prescription chart in the “once only and stat doses section”.

The prescription for each medicine must include the following: as per section 10.2 of the Trust Medicines Policy:

- Patient’s name, hospital/NHS number, date of birth, and address if available
- The allergy status of the patient
- The date and time of the medicine prescription
- The approved name of the injectable medication (in full, do not abbreviate)
- The date and time of administration
- The dose and frequency (ensuring, where necessary, that recent parameters have been used to calculate dose, for example, weight and laboratory test results)
- The date and time for re-assessment of the prescription
- The start and finish date/time or maximum number of doses
- The prescriber’s signature, name also printed for clarity and in the event of any query
5.4 Emergency cannulation: the need for delivery of life saving treatment

Where a cannula has been sited under an emergency situation and the expected best practice standards have been compromised, a fresh cannula must be re-sited aseptically as soon as possible and no later than 48 hours.

5.5 Medical devices

“An infusion system is a device, and any associated disposables, used to deliver fluids or drugs in solution to the patient. The common routes are: intravenous, subcutaneous, epidural or enteral” (Medicines and Healthcare Products Regulatory Agency (MHRA), 2010).

“Many thousands of infusion devices are now used in hospitals and the community and there is an identifiable mortality and morbidity associated with their use…. In most fatal incidents no fault has been found with the infusion device, suggesting that user error is the most significant contributing factor or that some form of tampering has taken place.”


All staff using medical devices, either directly in the diagnosis or treatment of patients, must have sufficient understanding of its use to do so in a safe and effective manner. Therefore all staff who intend to use infusion pumps must undergo the appropriate training and assessment process as described in the Medical Equipment User Training Policy (current version).

All intravenous fluids/medications (excluding bolus delivery) where practicable, must be infused using the appropriate infusion device.

Where there is a requirement to disconnect an infusion in use, a new infusion must be instigated and actioned as recommended by infection, prevention and control processes.

Infusion systems can be categorised into:

- gravity
- volumetric
- syringe
- ambulatory
- anaesthetic

(See Appendix II for further information)

Before using any infusion pump, please ensure that:

- The user is appropriately trained to use this particular make and model of infusion pump
- The pump’s MEMD asset number is recorded on the infusion chart
- The pump is clean and charged
- The pump displays an MEMD sticker indicating that it has been serviced within the last 12 month period
- The pump is held correctly on an infusion stand (5 footed) or specific holding device
- The pump is intact with no visible damage evident
- The correct administration set and/or syringe is used
- The administration line used for syringe pumps has anti-syphon valves and clamps to avoid syphonage
- Pre-use infusion consumables are sterile i.e. packet intact and not expired.
- Ensure protection of all key parts of consumables at set up and administration using ANTT
- There is access to guides/instructions for all infusion pumps if required
6. EVIDENCE BASE/REFERENCES


7. EDUCATION, MANDATORY TRAINING AND REGULATION

Prior to commencing intravenous administration, all staff must be able to demonstrate that they have read the Trust “Policy for the Care of the Patient Undergoing Intravenous Therapy (Bolus, Continuous and Intermittent)” (this document) and be able to evidence this as part of their training.

They will also need to be aware of the associated content of the following Trust policies:

- Medicines Policy
- Infection Prevention and Control Policies e.g. the policy for Personal protective equipment use and hand hygiene.
- Transfusion Policy, Procedures and Guidelines
- Disposal of Sharps Policy
- Medical Equipment User Training Policy
- Multidisciplinary guidelines for the administration of parenteral nutrition (if required)

All staff are required to have:

- Accessed training, complete and return self-assessment competency forms for the Trust infusion pumps relevant to role and practice to the medical equipment training facilitator.
- Completed a professional issues pack if not previously completed. The single completion of the pack covers all training.
Successfully completed the IV therapy medicines calculation test.
Completed the total parenteral nutrition training package (if this is appropriate to the individual’s area of practice).
Undertaken, following completion of the above, at least four supervised practice administrations and demonstrate competency in the administration of IV therapy by bolus, intermittent and continuous modes of administration.
Provided ward level documented evidence of all the above, using the correct assessment packs, and send the signed record to the Professional Educators and Training Team (PETT) in the Training, Education and Development Department. The return of this document will be recorded and inputted onto the Trust Oracle Learning Management training database.

**Nursing Staff**

“Nurses or midwives who are competent and fit to practise should: have the skills, experience and qualifications relevant to the part of the register they have joined. Demonstrate a commitment to keeping those skills up to date, and deliver a service that is capable, safe, knowledgeable, understanding and completely focused on the needs of the people in their care” (NMC, 2010).

Nursing staff undergoing preceptorship will be required to complete a formal induction and the Trust training package “RD04 Administration of Intravenous Peripheral Drugs / Infusions (Part A) “and during this period may undertake role developments RD06 and RD07 and participate in these procedures. They may also participate in the administration of IV medications and fluids as the second registered person only if they have successfully completed the IV medicines calculations test and answered the medication related questions in both their preceptorship pack and the RD04 training pack.

Training for role developments RD04/04.4/05 must be successfully completed (depending on relevance to their role) before administration of IV therapies can take place in practice.

Completion and practice of this role fulfils HWB7 of the Knowledge and Skills Framework - Interventions and Treatments.

Until completion of the aforementioned training packs and associated practice based medicine administration assessments and calculations tests are completed, no registered nurse may participate directly in any checking of medicines or fluids for intravenous administration.

Until staff have accessed the relevant training and have completed self-assessment competency forms, and returned the forms to the Training, Education and Development Department for relevant infusion pump use, newly qualified staff are unable to set up, activate or action any features of the infusion pump unless under the direct supervision of a competent user.

**Newly appointed staff not in preceptorship (nursing)**

Newly appointed staff who, have previously worked at other organisations will be required to supply evidence of their training course along with proof of supervised practice and verification of competence. The staff member will also need to provide evidence of recent continued practice and be able to clearly demonstrate knowledge relating to complications and the skills to take any action that is required. They will also be required to demonstrate the application of their practice relating to the NMC Standards for Medicines Management (2007).

A certificate of attendance for an appropriate IV administration study in other organisations without evidence of supervised practice and signature of competence will require the member of staff to complete the Trust’s intravenous fluids and medication infusion study day.
Agency nursing staff

Employing agencies are responsible for checking the competency and ongoing professional development of their registered nursing staff in the practice of intravenous administration. Agency staff should be able to provide robust evidence of Trust specific medical device user training when challenged.

Medical Staff

As medical students, trainee doctors are trained in core procedures and as part of this, specifically to put up a basic intravenous infusion and to administer an IV injection - this forms part of their core curriculum of practical skills and is signed off by clinical educators when competency is demonstrated. The core procedures are regulated by the foundation school (part of the local education training boards) and the United Kingdom Foundation Programme Office.

Foundation locum doctors coming into year 2 are also required to have been deemed competent in this procedure and are regulated in the same way.

As foundation year 1 doctors the safe prescribing and administration of IVIs and IV medicines is part of the individual’s core learning program - this can be signed off as a directly observed procedure by a competent observer and signed off for competency by their educational supervisor as complete in their e-portfolio.

Medical staff, including locums, should not action any infusion pump, unless specific evidenced training is completed and recorded in specialities such as anaesthetics, in accordance with the medical equipment user training policy.

Locum medical staff

Locum medical staff will have completed the training for IV prescribing and administration as per medical staff in their foundation year 1. If they are not deemed competent in the use of medical devices according to this policy, they must not attempt to use these devices and will need to seek the support of staff that are deemed competent to do so in accordance with the medical equipment user policy.

Radiology Staff

Radiographers must be qualified for one year before they are able to access the Trust IV training package “RD04 Administration of Intravenous Peripheral Drugs / Infusions (Part A)”. This training is delivered alongside specific departmental training with the focus in the department being on the use of specific mediums or IV medication being delivered as an essential part of the procedure.

Radiography staff are responsible for maintaining their own level of competency in practice; this is subject to peer review by a senior radiographer or radiologist.

Newly appointed radiology staff

Newly appointed radiology staff that have worked in other organisations need to provide evidence to the department manager to demonstrate prior completion of appropriate training. In addition to this they will need to undergo formal observation in practice under the scrutiny of a senior radiographer.
Medical device training and competency

All registered staff, unless they have evidenced training/competency, must not use or action any function on infusion pumps.
An attendance register of any training completed must be sent to the Oracle Learning Management Administration Officer:
Training, Education and Development Department, Kings Mill Hospital

All unregistered staff must not action any functions on infusion pumps except as specified in the Escort Policy.

8. MONITORING COMPLIANCE

Incident Reporting

If an incident or near miss occurs or is observed, there is a duty to take action to prevent any harm (or further harm) to the patient. Immediate actions need to be taken to ensure the affected patient receives the correct interventional treatment this will include contacting the doctor to inform them of the error and also the senior health care professional on duty. Out of hours this will be the duty nurse manager. All incidents and near misses are reportable via the SFHT incident reporting system as per the Trust policy on incident reporting.

Monitoring

This policy will be monitored via the following processes:

- Medicines Safety Group: bi-monthly reviews of themes and trends of DATIX incidents associated to medicine prescription and administration this policy. Any areas of concern should be addressed and escalated via the Clinical Quality and Governance Committee and Patient Safety Improvement Group. The Trust Medicines Safety Officer will produce a highlight report in support of this on a quarterly basis.
- Monthly Divisional Clinical Governance meetings: reviews of themes and trends of DATIX incidents associated to this policy where appropriate using the highlight report produced from the Drugs and Therapeutics and Medicines Management Committees
- Infection control audits will: explore trends identified from VIP (visual infusion phlebitis) scores, patient bacteraemia associated to intravenous catheter related and invasive device related infections will be fed through from Health Care associated infection meetings through to the Infection Prevention and Control Committee and discussed as required at the bi-monthly Health Care Acquired Infections meetings. This will be led by the Trust Nurse Consultant for Infection Control.
9. CONSULTATION

The following individuals, groups of staff and Trust group(s)/ committee(s) have been consulted in the development/ update of this document:

<table>
<thead>
<tr>
<th>Contributors:</th>
<th>Communication Channel: e.g.</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV Task &amp; Finish Group, with the following representation:</td>
<td>Various meetings</td>
<td>Oct 2014 – Dec 2014</td>
</tr>
<tr>
<td>• Pharmacy</td>
<td></td>
<td></td>
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<tr>
<td>• Nursing (adult and paediatrics)</td>
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<tr>
<td>• Radiology</td>
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<td>• Medical equipment</td>
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<td>• Infection control</td>
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<tr>
<td>• Ward Sisters and Charge Nurses</td>
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</tr>
<tr>
<td>Drugs and Therapeutics/ Medicines Management Committee (which includes divisional nurse matrons and medical representation)</td>
<td>Committee meeting</td>
<td>Early draft – 09/01/2015</td>
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<tr>
<td>Drugs and Therapeutics/ Medicines Management Committee (which includes divisional nurse matrons and medical representation)</td>
<td>Committee meeting</td>
<td>Final draft – 27/03/ 2015</td>
</tr>
</tbody>
</table>

- This policy has been sent to the divisional clinical governance advisors for information and dissemination through the divisions.
- The final published version of the policy has also been sent for information at the Nursing Care Forum and Practice Development Forum.

10. EQUALITY IMPACT ASSESSMENT (EIA)

The Trust is committed to ensuring that none of its policies, procedures and guidelines discriminates against individuals directly or indirectly on the basis of gender, colour, race, nationality, ethnic or national origins, age, sexual orientation, marital status, disability, religion, beliefs, political affiliation, trade union membership, and social and employment status.

An EIA of this policy/guideline has been completed and has concluded that it does not place any individual that will use the content in their professional practice in any disadvantageous position.

11. KEYWORDS

Administration; medicines; medication; drugs; medical equipment; fluid; fluids infusion; extravasation;
12. APPENDICES

Appendix I: Procedure for aseptic non-touch technique
Appendix II: Equipment for IV access
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Appendix V: Table of possible complications: IV administration
Appendix VI: Guideline for management of extravasation
Appendix VII: Ports and Flushing of Venous Access Devices
Appendix VIII: Administration of Intravenous Drugs and Therapies to Neonates
## Appendix I

### Procedure for Aseptic Non-Touch Technique (SFHT, 2014)

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
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<tbody>
<tr>
<td>ANTT should only be performed in an appropriate clinical room, however if performed at the bedside it should not occur for at least 30 minutes after bed making or domestic cleaning, windows should be closed and electrical fans switched off – especially CVC dressing change.</td>
<td>These activities can cause airborne contamination.</td>
</tr>
<tr>
<td>Ensure the patient is informed, has given consent and is prepared for the procedure.</td>
<td></td>
</tr>
<tr>
<td>Decontaminate hands with alcohol based hand rub or soap and water, using the six stage technique.</td>
<td>Effective hand hygiene is vital to reduce the risk of contaminating key parts/sites.</td>
</tr>
<tr>
<td>If soap and water are used, pat dry hands completely with paper towel.</td>
<td>Bacteria can re-establish quickly on moist hands. Pat drying prevents skin damage.</td>
</tr>
<tr>
<td>Put on a clean plastic disposable apron.</td>
<td>To prevent uniforms being contaminated with microorganisms which may subsequently be transferred to patients.</td>
</tr>
<tr>
<td>Clean plastic tray with Clinell® Universal wipe, dry with clean paper towel, then clean with 2%chlorhexidine/70% alcohol wipe and allow to air dry before use.</td>
<td>To establish a clean working environment, allowing the alcohol solution to become effective and eliminate microorganisms. Use of alcohol alone as a hard surface cleaner is not as effective in cleaning trolleys/trays as using a universal or detergent wipe.</td>
</tr>
<tr>
<td>Collect equipment and place next to tray.</td>
<td>In clean, dry storage conditions, pathogenic micro-organisms have limited capacity to cause damage.</td>
</tr>
<tr>
<td>Check that the packing of sterile equipment is intact with no evidence of damage or moisture penetration.</td>
<td>Prove traceability and sterility of equipment by recording evidence in patient’s notes. If an object’s sterility is questionable it must be discarded and reported.</td>
</tr>
<tr>
<td>Check expiry dates, batch number and sterilisation on sterile packs.</td>
<td>Brown faded lines on the indicator tape indicate possible failure of the autoclaving process.</td>
</tr>
<tr>
<td>Where the pack has been sterilised by autoclaving ensure that the autoclave indicator tape has consistent beige and brown lines.</td>
<td></td>
</tr>
<tr>
<td>Position patient comfortably so that area required for procedure is easily accessible.</td>
<td></td>
</tr>
<tr>
<td>Decontaminate hands, put on non-sterile gloves.</td>
<td>Hands may have become contaminated by handling equipment. Apron must be worn where there is a risk of contamination from bodily fluids.</td>
</tr>
<tr>
<td>Open package carefully.</td>
<td>Prevents contamination of key parts during removal from packaging.</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>Assemble equipment and arrange in an orderly manner in aseptic field.</td>
<td>An orderly aseptic field decreases risk of contaminating key parts.</td>
</tr>
<tr>
<td>Ensure key parts are protected at all times with needle and sheath.</td>
<td>Exposed key parts increases risk of contaminating key parts.</td>
</tr>
<tr>
<td>Consider all of the dressing equipment as key parts, keep these protected at all times.</td>
<td></td>
</tr>
<tr>
<td>Ask the patient to remove clothing or assist the patient to remove any clothing that prevents easy access to the cannula.</td>
<td>Ensure IV access is patent and avoid contamination via contact during procedure.</td>
</tr>
<tr>
<td>Remove gloves and decontaminate hands.</td>
<td>Hands must be washed after glove removal as micro-organisms thrive in the warm, moist environment beneath gloves and the exterior surface may have become contaminated during the procedure.</td>
</tr>
<tr>
<td>Put on clean non-sterile gloves.</td>
<td>Help maintain asepsis</td>
</tr>
<tr>
<td>Clean port/injection site with 2% chlorhexidine/70% alcohol wipe and allow to dry.</td>
<td>Air drying of any cleaning solution is vital for disinfection to be complete</td>
</tr>
<tr>
<td>Administer drug(s) using non-touch technique.</td>
<td>Reduce risk of cross infection</td>
</tr>
<tr>
<td>When procedure is completed, dispose of all single use items.</td>
<td>Devices designated for ‘single use’ must not be re-used under any circumstance. Re-use can affect their safety and performance.</td>
</tr>
<tr>
<td>Decontaminate all re-usable items according to Trust policy and method and manufacturer’s instructions.</td>
<td>Decontamination will ensure safety and prevent the transmission of micro-organisms.</td>
</tr>
<tr>
<td>Remove gloves and apron.</td>
<td>To decrease the colonisation of transient micro-organisms. Hands must be washed after glove removal as micro-organisms thrive in the warm, moist environment beneath gloves and the exterior surface may have become contaminated during the procedure. To reduce the risk of cross infection.</td>
</tr>
<tr>
<td>Decontaminate hands.</td>
<td></td>
</tr>
<tr>
<td>Document the procedure in the nursing and/or medical care notes.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix II - Consumable Items for IV Administration

1. Single or double needle free connector for peripheral venous access.

2. Double needle-free connector with anti-reflux valves for peripheral venous access.

3. Central Venous multi-port needle-free connector

4. Needle free valve connector.
5. Volumetric gravity infusion administration set (note red air inlet valve above chamber).

6. Volumetric infusion administration set for GP (adult only) volumetric infusion pump.

7. Volumetric infusion administration set for VP (paediatric only) volumetric infusion pump.

8. Single extension line with anti-syphon valve. For use with syringe pumps. (device specific).
9. Single extension line with anti-syphon valve and pressure disc. For use with syringe pumps (device specific).

10. PICC line (Peripherally Inserted Central Catheter)

11. Port-a-cath device.

12. Hickmann line.
Appendix III

INFUSION PUMPS

Volumetric Pumps

Asena/Alaris GP pump

(Adults)

Asena/Alaris VP Pump

(Paediatric/Neonates)
Asena/Alaris Signature Gold Pump
(Welcome Treatment Centre)

Syringe Pumps

Asena/Alaris GH and GH Plus
(Adult)

Asena/Alaris CC
(Paediatric/neonates)
Graseby 3100
(Adult)

Graseby 3400
(specialist use- theatres/radiology)

PCA/Epidural CADD Solis Smith Medical
(New devices starting to be used in February 2014)
<table>
<thead>
<tr>
<th>Infusion pump type</th>
<th>Description</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gravity infusion</strong> (No infusion pump)</td>
<td>Depends entirely on gravity to deliver the infusion.</td>
<td>Inexpensive, easy to set up.</td>
<td>Limited flow rate, no monitoring, no alarms, free flow therefore requires frequent observations and adjustments.</td>
</tr>
<tr>
<td><strong>Volumetric</strong></td>
<td>Works by delivering the rate calculated depending on the volume and timed delivery of the infusion prescribed.</td>
<td>Can overcome resistance to flow by increased delivery pressure (pump initiates). Delivers a calculated drop rate, delivers a specific volume, alarms, air in line detector, alerted to pressure increase, anti-tamper facility, easily monitored.</td>
<td>Extravasation risks, alarms, expensive, <em>training issues-user error</em>, possible lack of equipment and dedicated consumables.</td>
</tr>
<tr>
<td><strong>Syringe</strong></td>
<td>Low volume, high accuracy devices designed to infuse at low flow rate.</td>
<td>Delivers calculated rate, alarms, alerted to pressures, anti-tamper facility (model specific), easily monitored.</td>
<td>Extravasation risks, alarms, expensive, <em>training issues-user error</em>, possible lack of equipment and dedicated consumables.</td>
</tr>
<tr>
<td><strong>Ambulatory</strong></td>
<td>Portable battery operated infusion device. It is used to deliver medication at a predetermined rate via the appropriate route usually for patients who are unable to tolerate oral medication.</td>
<td>Delivers calculated rate, alarms, patient comfort, dignity and convenience, easily monitored.</td>
<td>Limited alarms, expensive, <em>training issues-user error</em>, possible lack of equipment and dedicated consumables.</td>
</tr>
<tr>
<td><strong>Anaesthetic</strong></td>
<td>Used by anaesthetists only to deliver anesthetic medication.</td>
<td>Delivers calculated rate, alarms, easily monitored.</td>
<td>Limited alarms, expensive, <em>training issues-user error</em>, possible lack of equipment and dedicated consumables.</td>
</tr>
</tbody>
</table>
Appendix IV  Procedural guidelines for practice (bolus / continuous & intermittent)

Appendix IV(i) – Procedure guideline: Medication: injection by bolus of intravenous medicines

Essential equipment

- Clinically clean receiver or tray containing the prepared medication to be administered
- Patient’s prescription chart
- Protective clothing as required by hospital policy and (for specific medicines)
- Sterile needles (safety where available) and Luer lock® syringes (where available)
- 10 mL for injection of a compatible flush solution – e.g. 0.9% sodium chloride
- 2% chlorhexidine/70% alcohol swab
- Sharps container

NOTE: This is a 2–registered person check procedure from start to finish

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain and discuss the procedure with the patient. Establish verbal consent, where the patient lacks capacity; ensure that a 2-stage test and a best-interests checklist are in place to support the procedure in the patient’s best interest. For children ensure that consent for care has been obtained.</td>
<td>To ensure that the patient understands the procedure and gives their valid consent where it is possible.</td>
</tr>
<tr>
<td></td>
<td>To ensure that care is given for the patient’s best interests.</td>
</tr>
<tr>
<td>2. Before administering any prescribed medication, check that it is due and has not been given already. Check that the information contained in the prescription chart is complete, correct and legible.</td>
<td>To protect the patient from harm.</td>
</tr>
<tr>
<td>3. Before administering any prescribed medication, consult the patient’s prescription sheet and ascertain the following using the 5 R’s approach:</td>
<td>To ensure that the patient is given the correct medication in the prescribed dose using the appropriate diluent via the correct route.</td>
</tr>
<tr>
<td>- Right patient</td>
<td>To protect the patient from harm.</td>
</tr>
<tr>
<td>- Right medication</td>
<td>To comply with SFHT Medicines Policy.</td>
</tr>
<tr>
<td>- Right dose</td>
<td></td>
</tr>
<tr>
<td>- Right time</td>
<td></td>
</tr>
<tr>
<td>- Right route</td>
<td></td>
</tr>
<tr>
<td>Also check the patient’s allergy status.</td>
<td></td>
</tr>
<tr>
<td>4. Select the required medication and check the expiry date. Check the packaging for any signs of damage that may affect the contents.</td>
<td>Treatment with medication that is outside the expiry date is dangerous. Medicines deteriorate with storage. The expiry date indicates when a particular medication is no longer pharmacologically efficacious.</td>
</tr>
<tr>
<td>5. Wash hands with soap and water and assemble necessary equipment and apply personal protective equipment.</td>
<td>To minimize the risk of infection.</td>
</tr>
<tr>
<td>6. Prepare the medication for injection Refer to UCL injectable medicines guide Ensure compliance with 2 registered persons checking procedure (see point 3).</td>
<td>To prepare the medication correctly using correct dilution solution if required.</td>
</tr>
<tr>
<td>7. Prepare a 10 mL syringe of 0.9% sodium chloride (or compatible solution) for injection, as described, using aseptic non- touch technique.</td>
<td>To use for flushing before, during (if more than one medication) and after administration of medication. To clear the line and prevent possible interaction of solutions.</td>
</tr>
<tr>
<td>Step</td>
<td>Instruction</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>8.</td>
<td>Place medication/s to be administered and flushing solution into the clinically clean tray along with 2% chlorhexidine/70% alcohol swab. Remove gloves.</td>
</tr>
<tr>
<td>9.</td>
<td>Collect any additional equipment necessary to complete the procedure.</td>
</tr>
<tr>
<td>10.</td>
<td>Approach the patient with the second registered person to check and complete the 5 R’s checking procedure immediately prior to administration (see point 3).</td>
</tr>
<tr>
<td>11.</td>
<td>Wash hands thoroughly and apply gloves and any other necessary PPE.</td>
</tr>
<tr>
<td>12.</td>
<td>Clean the end of the needle free connection device with a 2% chlorhexidine/70% alcohol swab and allow drying. If a single port needle-free access device is currently in use with an infusion attached, it is acceptable to replace this with a multi-port needle-free access device using ANTT. It is not acceptable to disconnect any infusion line and leave it without reconnecting immediately. Check compatibility of solution in use with the medication to be administered.</td>
</tr>
<tr>
<td>13.</td>
<td>Inspect cannula site prior to administering any flush pre-administration of the medicine. <em>For children remove the bandage over the cannula and inspect the entry site throughout the procedure.</em></td>
</tr>
<tr>
<td>14.</td>
<td>When both registered persons are satisfied with all parts of the checking procedure open the clamp on the needle free connector and administer a 5 mL 0.9% sodium chloride flush, if the line is deemed patent then the medication should be administered according to the recommended appropriate bolus rate. Only administer 1-2mls of 0.9% sodium chloride flush to infants and younger children. Refer to UCL injectable medicines guide. Administer 0.9% sodium chloride. Close the clamp on the needle free connection device after flushing to create positive pressure.</td>
</tr>
<tr>
<td>Step</td>
<td>Instructions</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15.</td>
<td>Consult the patient during the administration about any discomfort.</td>
</tr>
<tr>
<td>16.</td>
<td>Inspect the insertion site of the device.</td>
</tr>
<tr>
<td>17.</td>
<td>Repeat for any further IV bolus administrations ending with 0.9% sodium chloride or compatible solution.</td>
</tr>
<tr>
<td>18.</td>
<td>For children assess the need to re-bandage over the cannula.</td>
</tr>
<tr>
<td>19.</td>
<td>Check patient is comfortable, answer any queries or questions they may have.</td>
</tr>
<tr>
<td>20.</td>
<td>Ensure used equipment and any ampoules are disposed of in appropriate waste containers.</td>
</tr>
<tr>
<td></td>
<td>Record the administration on the medicine administration chart ensuring that the two registered persons sign.</td>
</tr>
</tbody>
</table>
Appendix IV(ii) – Procedure guideline: Intermittent or continuous infusion of intravenous medicines

Essential equipment

- Patient’s prescription and chart
- Personal protective equipment as required per trust policy for infection control/the policy for administration of cytotoxic medicines
- Container of appropriate intravenous infusion fluid/dilutant
- ‘Drug Additive’ label
- IV line label (if new or change of line)
- IV infusion pump
- IV administration set
- IV infusion stand
- Clean dressing trolley (depending on amount of equipment) or clinically clean blue plastic procedure tray containing the prepared medication to be administered
- Sterile needles (safety devices where available) and syringes
- 10 mL for injection of a compatible flush solution – e.g. 0.9% sodium chloride
- 2% chlorhexidine/70% alcohol swab
- Alcohol-based hand wash solution or rub
- Sterile dressing pack if the procedure requires e.g. TPN
- Hypo-allergenic tape
- Sharps bin/or sharps bin to be adjacent

NOTE: This is a 2–registered person check procedure from start to finish

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain and discuss the procedure with the patient. Establish verbal consent, where the patient lacks capacity; ensure that a 2-stage test and a best-interests checklist are in place to support the procedure in the patient’s best interest.</td>
<td>To ensure that the patient understands the procedure and gives their valid consent where it is possible.</td>
</tr>
<tr>
<td>For children ensure that consent for care has been obtained.</td>
<td>To ensure that care is given for the patient’s best interests.</td>
</tr>
<tr>
<td>2. Before administering any prescribed medication, check that it is due and has not been given already. Check that the information contained in the prescription chart is complete, correct and legible.</td>
<td>To protect the patient from harm.</td>
</tr>
</tbody>
</table>
| 3. Before administering any prescribed medication, consult the patient’s prescription sheet and ascertain the following using the 5 R’s approach:  
  - Right patient  
  - Right medication  
  - Right dose  
  - Right time  
  - Right route  
  Check the patient’s allergy status. | To ensure that the patient is given the correct medication in the prescribed dose using the appropriate diluent via the correct route. |
| CHECK THAT COMPATIBLE SOLUTION HAS BEEN PRESCRIBED CORRECTLY ON THE FLUID PRESCRIPTION CHART | To protect the patient from harm. |
|                                                                       | To comply with SFHT Medicines Policy. |
4. Select the required medication and check the expiry date. Check the packaging for any signs of damage that may affect the contents. | Treatment with medication that is outside the expiry date is dangerous. Medicines deteriorate with storage. The expiry date indicates when a particular medication is no longer pharmacologically efficacious.

5. Wash hands with soap and water and assemble necessary equipment and apply personal protective equipment. | To minimize the risk of infection.

6. Prepare a 10 mL syringe of 0.9% sodium chloride (or compatible solution) for injection, using aseptic non-touch technique and place into a clinically clean receiver. | To use for flushing before, during (if more than one medication) and after administration of medication. To clear the patient’s existing or new line and prevent possible interaction of solutions.

7. Prepare the medication for administration using aseptic non-touch technique (Appendix 1). Introduce into the compatible IV fluid agitate gently to mix. (Refer to UCL injectable medicines guide) Complete and apply ‘Drug Additive’ label to the solution. Perform a visual check to ensure that no particulate formation has taken place or that no compromise to the IV fluid bag has occurred. Correct preparation of the medication to be used, minimising the risk of infection to the patient. To enable others to identify and be informed of the medication infusion in process. To ensure that no reaction between additive and solution has occurred, or that no accidental compromise of the IV fluid bag has occurred during the mixing process. Safe checking following the 5 R’s principles to prevent patient harm.

**Ensure compliance with 2 registered persons checking procedure (see point 3).**

Discard all used sharps and equipment safely into appropriate waste containers.

8. Prime the intravenous administrations set with infusion fluid and suspend it from the infusion stand, or place into the appropriate infusion pump. | To ensure removal of air from set and check that tubing is patent. To prepare for administration.

9. Approach the patient with the second registered person to check and complete the 5 R’s checking procedure immediately prior to administration (see point 3). | To ensure that the patient is given the correct medication in the prescribed dose using the appropriate diluent via the correct route. To protect the patient from harm. To comply with SFHT Medicines Policy.
10. **Clean hands, and apply appropriate PPE.** Clean the end of the needle free connection device with a 2% chlorhexidine/70% alcohol swab and allow drying.

   If a single port needle-free access device is currently in use with an infusion attached, it is acceptable to replace this with a multi-port needle-free access device using ANTT. It is not acceptable to disconnect any infusion line and leave it without reconnecting immediately.

   Check compatibility of solution in use with the medication to be administered.

   **Blood transfusions must never be stopped: a second cannula will be needed.**

11. Inspect the patient’s cannula site and surrounding tissue.

   To detect any signs of inflammation, infiltration, and so on. If present, take appropriate action.

12. **Administer gently 5 mL of 0.9% sodium chloride for injection check that no resistance is met, no pain or discomfort is felt by the patient, no swelling is evident, no leakage occurs around the device.**

   **Administer 1-2mls of 0.9% sodium chloride to infants and younger children.**

   To confirm the patency of the device and vein.

13. Connect the infusion to the needle-free access device port using ANTT and begin infusion.

    If using an infusion pump double check of rate and volume to be infused. On an hourly basis check and record volume infused and cannula site.

14. Check the insertion site and ask the patient if they are comfortable.

    To confirm that the vein can accommodate the extra fluid flow and that the patient experiences no pain.

15. Secure the administration set in a way that places no strain on the device, which could in turn damage the vein.

    **For children if it is felt the cannula may become dislodged re-bandage over the cannula**

    To reduce the risk of mechanical phlebitis or infiltration.

16. Record the administration on the medicine administration chart ensuring that the two registered persons sign.

    To maintain accurate records, provide a point of reference in the event of any queries and prevent any duplication of treatment.
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Stop the infusion when the prescribed volume to be infused has been administered. (A ‘minibag’ may be used to flush the medication through the tubing but the cost implications of this as well as the risk to patients on restricted intake should be considered before this is adopted routinely).</td>
</tr>
<tr>
<td></td>
<td>To ensure that all the prescribed mixture has been delivered and prevent air infusing into the patient. To ensure correct medication dosage is administered.</td>
</tr>
<tr>
<td></td>
<td><em>For children, flush the infusion line with 30mls of 0.9% sodium chloride or other compatible solution.</em></td>
</tr>
<tr>
<td>18.</td>
<td>Clean hands, and apply appropriate PPE. Disconnect the infusion set and clean the end of the needle free connection device with a 2% chlorhexidine/70% alcohol swab and allow drying. Flush the device with 5 mL of 0.9% sodium chloride or other compatible solution for injection.</td>
</tr>
<tr>
<td></td>
<td>To prevent contamination of the device to the patient/to protect the wearer from any hazardous substances. To flush any remaining solution away from the cannula and to prevent any possible interaction with subsequent fluids administered.</td>
</tr>
<tr>
<td>19.</td>
<td>Check patient is comfortable, answer any queries or questions they may have.</td>
</tr>
<tr>
<td></td>
<td>To ensure the patient is comfortable and any anxieties have been addressed.</td>
</tr>
</tbody>
</table>
### Complication

#### Infiltration:

The RCN (2010) defines this as the inadvertent administration of non-vesicant medication or solution into the surrounding tissue instead of into the intended vascular pathway.

<table>
<thead>
<tr>
<th>Possible Signs and Symptoms</th>
<th>Actions/Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Localised swelling</td>
<td>• Stop the infusion and record severity of infiltration</td>
</tr>
<tr>
<td>• Skin blanching</td>
<td>• Inform medics</td>
</tr>
<tr>
<td>• Pain</td>
<td>• Report and record actions</td>
</tr>
<tr>
<td>• Numbness</td>
<td>• Remove the cannula and treat site as requested</td>
</tr>
<tr>
<td>• Leakage of infusate</td>
<td>• Elevate and monitor the site</td>
</tr>
<tr>
<td>• Discolouration and</td>
<td>• Re-site the cannula as appropriate (Royal Marsden)</td>
</tr>
<tr>
<td>circulatory impairment</td>
<td></td>
</tr>
</tbody>
</table>

#### Extravasation:

The RCN (2010) defines this as the inadvertent administration of vesicant medication or solution into the surrounding tissue instead of into the intended vascular pathway.

Vesicant medication can include boluses or infusions that are:

- Acid e.g. Clarithromycin, alkaline e.g. Aminophylline, vasoconstrictor e.g. Noradrenaline, cytotoxic e.g. Vincristine and hypertonic e.g. Sodium chloride 1.8% (seek advice from Pharmacy).

<table>
<thead>
<tr>
<th>Possible Signs and Symptoms</th>
<th>Actions/Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Localised swelling</td>
<td>• Stop the infusion</td>
</tr>
<tr>
<td>• Redness</td>
<td>• DO NOT remove the cannula until instructed to do so</td>
</tr>
<tr>
<td>• Warmth</td>
<td>• Seek IMMEDIATE advice from medics</td>
</tr>
<tr>
<td>• Burning, stinging pain</td>
<td>• Instigate treatment as requested</td>
</tr>
<tr>
<td></td>
<td>• Report and record actions</td>
</tr>
<tr>
<td></td>
<td>Medics may:</td>
</tr>
<tr>
<td></td>
<td>• Aspirate through the cannula to remove medication if possible</td>
</tr>
<tr>
<td></td>
<td>• Use steroid injections, antihistamines and analgesia, antidote (Royal Marsden)</td>
</tr>
</tbody>
</table>

#### Speed shock/fluid overload:

When an intravenous medication is given too rapidly, ‘speed shock’ may occur (Royal Marsden).

<table>
<thead>
<tr>
<th>Possible Signs and Symptoms</th>
<th>Actions/Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Headache</td>
<td>• Stop the infusion</td>
</tr>
<tr>
<td>• Flushing</td>
<td>• Seek IMMEDIATE advice from Medics</td>
</tr>
<tr>
<td>• Chest tightness and</td>
<td>• Instigate treatment as requested</td>
</tr>
<tr>
<td>irregular pulse</td>
<td>• Report and record actions</td>
</tr>
<tr>
<td>• Tachycardia and fall in</td>
<td>• Always check the medication information leaflet prior to administration</td>
</tr>
<tr>
<td>blood pressure</td>
<td>• Maintaining a fluid input/output chart will aid monitoring and prevention of complication</td>
</tr>
<tr>
<td>• Syncope and the risk of</td>
<td></td>
</tr>
<tr>
<td>cardiac arrest</td>
<td></td>
</tr>
</tbody>
</table>
### Phlebitis:
The RCN (2010) defines this as inflammation of the intima of the vein which may be infective, mechanical or chemical.

- Redness
- Tenderness and swelling around the site
- The vein feels hard on palpation
- Possible evidence of ‘tracking’ (red lines running up the arm)

- Stop the infusion
- Remove the cannula and treat as required
- Re-site the device as appropriate
- Report and record actions (VIP score)

### Air emboli:
Introduction of a bolus of air into a vessel.

- Rapid drop in blood pressure
- Tachycardia
- Cyanosis
- Unconsciousness

- Stop the infusion
- Seek **IMMEDIATE** advice from medics
- Report and record actions
- Ensure all infusion lines are carefully primed and connections air tight
- Medics may advise turning the patient on the left side and lower the head of the bed to prevent air entering the pulmonary artery (Royal Marsden)

### Thrombosis:
The RCN (2010) defines this as the formation of a thrombus (small blood clot) within a vessel.

- Redness
- Tenderness and swelling around the site
- The vein often feels hard on palpation

- Stop the infusion
- Seek **IMMEDIATE** advice from medics
- Report and record actions
- Ultrasound may be needed to diagnose clot in the arm (Royal Marsden)

### Cannula occlusion:
This may occur when an infusion is allowed to run dry or incompatible solutions are administered.

- Unable to administer bolus, infusion

- Flush the cannula before, after and in between medication administration gently using a 10ml syringe of 0.9% sodium chloride. If resistance is met stop and re-site the device (peripheral device) (Royal Marsden)
- Report and record actions
<table>
<thead>
<tr>
<th><strong>Allergic reaction:</strong></th>
<th></th>
<th><strong>Septicaemia:</strong></th>
</tr>
</thead>
</table>
| Allergic reaction due to sensitivity to an intravenous fluid, additive or medication. | • Itching  
• Rash  
• Shortness of breath | **Stop the infusion**  
**Seek IMMEDIATE advice from medics**  
**Report and record actions**  
**Ensure hydrocortisone and epinephrine are available (Royal Marsden)**  
**Always check for allergy before administration of medication** |
|  |  | **Stop the infusion**  
**Seek IMMEDIATE advice from medics**  
**Report and record actions**  
**Always adhere to aseptic techniques when performing all intravenous procedures**  
ANTT (RCN, 2010) |

**Septicaemia:**  
Blood stream infection causing sepsis.  
• Pyrexia  
• Rigors  
• Tachycardia
GUIDELINE FOR MANAGEMENT OF EXTRAVASATION

Extravasation is a severe complication in the administration of cytotoxic chemotherapy. It causes pain, erythema, inflammation, discomfort and if left undiagnosed or inappropriately treated can lead to necrosis, secondary infection and functional loss of the tissue and/or limb concerned. This may also hinder future treatments in some cases. If treatment is delayed, surgical debridement, skin grafting and even amputation may be the consequence.

1. STOP the injection immediately, but leave the cannula in place
2. Classify the agent using the tables below and treat as directed (if not listed below consult Pharmacy)
3. Collect extravasation kit
4. Apply COLD pack immediately (WARM if non DNA binding Vesicants)
5. Aspirate as much fluid as possible through the cannula, try to draw back about 3 to 5ml of blood
6. Mark the extravasation area with a permanent marker pen
7. Contact the patient’s doctor
8. Remove the cannula only after appropriate treatment

**Vesicants**
- DNA-binding
  - Amacrine
  - Bendaamustine
  - Camustine
  - Dacarbazine
  - Daunorubicin
  - Doxorubicin
  - Etoposide
  - Ifosfamide
  - Mitomycin C
  - Mustine
  - Thiotepa
  - Trofosfain

**Vesicants Non-DNA-binding**
- Carboplatin
- Cisplatin
- Paclitaxel
- Vinblastine
- Vincristine
- Vindesine
- Vinflunine
- Vinorelbine

**Irritants**
- Amebic Toxoid
- Chlorophosphamide
- Liposomal Daunorubicin
- Liposomal Doxorubicin
- Eltopsid
- Fluorouracil
- Ganciclovir
- Ifosfamide
- Mephalan
- Mitoxantrone
- Streptozocin

**Possible Irritants**
- Carboplatin
- Cisplatin
- Docetaxel
- Gemcitabine
- Oxaliplatin
- Topotecan

**Non-vesicants**
- Alkeran
- Asparagisine
- Bleomycin
- Bortezomib
- Brentuximab vedotin
- Cladribine
- Cisplatin
- Cytarabine
- Erlubin
- Etoposide phosphoridate
- Fludarabine
- Gemcitabine
- Ifosfamide
- Ortemabraganacin
- Interferons
- Interleukin-2
- Methotrexate
- Mifamurtide
- Monoclonal antibodies
- Nelarabine
- Penometrexed
- Pentostatin
- Rituximab
- Temsirolimus
- Thioguanine
- Vincristine

**AIM: LOCALISE & TREAT**
- Neutralise the infusate by applying a thin layer topical DMSO to the marked area using a cotton bud. Do not use DMSO if blistering is 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 30 minutes. Repeat every 4 hours for 24 hours to help localise the infusate.
- 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.

**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.

**NB:** Administration of hyaluronidase should begin within 1 hour of extravasation for best results.

**For latest version see**
www.eastmidlands.cancer.nhs.uk

**Further information**
More detailed information may be available from the National Extravasation Information Services:
http://www.extravasation.org.uk/home.html

**Prepared by:** Dheen Bhikhuwada
**Checked by:** EM Oncology Nurse Group and EM Oncology Pharmacist Group
**Date:** Sept 11
**Last updated:** Sept 2013
**EMCN-DC-003-10**
Appendix VII

Ports and Flushing of Venous Access Devices

Ports

Sherwood Forest Hospitals NHS Foundation Trust promotes the use of a needle free device to be used in accessing an intravenous cannula.

No infusion should be instilled using the coloured ports. Many studies over the past decade have recognised that using the port for administering IV medication is implicated in higher rates of infection and reducing the life of the intravenous device. (Hadaway 2012; EPIC 3, 2015).

Potential infection risks are due to difficulties in cleansing the port prior to accessing it and ensuring it is a sterile pathway prior to using it. In addition the ports often pop open allowing bacteria entry, and it often catches on clothes and bedding causing trauma to the site allowing bacteria to enter the blood stream and potentially cause phlebitis.

Vessel health and survival are of paramount importance to ensure the patient has a positive experience and successful treatment. Using the ports to perform saline flushes jeopardises that experience, increasing the risk of an unintentional poor outcome.

Flushing of Venous Access Devices

Flushing of a cannula via a venous access device should only be undertaken by a Registered Nurse, Midwife, Radiographer or Doctor.

Band 3 Healthcare Assistants can flush a cannula after they have inserted it using a Posiflush to ensure the cannula is patent. The healthcare assistant must not flush a cannula at any other time. Staff must ensure they have attended training and a completed competency has been signed and recorded by Professional Education and Training Team (PETT).

Registered Professionals are required to have accessed the IV Study Day and:

- Successfully completed the IV therapy medicines calculation test.
- Completed a minimum of 4 supervised assessments of competency administering intravenous flushes within their clinical area, and returned these competency forms to the Professional Education and Training Team (PETT).
- A single check of medicines for intravenous administration is not acceptable.
- The Trust Medicine Policy state that “ALL intravenous medicines must be checked by TWO registered practitioner, one of whom must be the administering Doctor or Registered Nurse/ Midwife.”
- Both Registered healthcare professionals are required to sign the prescription chart in order to document that a robust 2-person check has been completed.

Preceptorship Nurses

- Nursing staff undergoing Preceptorship will be required to complete a formal induction and the Trust Training Package RD04 Administration of Intravenous Peripheral Drugs/ Infusions (Part A) and during this period may undertake role developments RD06 and RD07 and participate in these procedures.
- Nurses on Preceptorship can participate in the administration or the checking of intravenous drugs or therapies once all training (as stipulated above) has been completed.

Preceptees are prohibited from:

- Being the 2nd nurse checker for 2 nurse check medication until they have completed the medication optimisation pack including all assessments.
- Being the 2nd nurse checker for IV medication until they have completed the medicines optimisation pack including assessments and passed the calculation test
- Giving IV medication until they have passed the IV calculation test, have attended the IV study day and have completed the IV competency pack.
- Undertaking extended roles until they have completed their Preceptorship

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
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<tr>
<td>Prepare a 10 mL syringe of 0.9% sodium chloride (or compatible solution) for injection, as described, using aseptic non-touch technique.</td>
<td>To use for flushing before, during (if more than one medication) and after administration of medication. To clear the line and prevent possible interaction of solutions.</td>
</tr>
<tr>
<td>Clean needle free connector with a 2% chlorhexidine/70% alcohol swab Apply with friction, rubbing the cap in a clockwise and anticlockwise manner at least five times and allow to air dry.</td>
<td>To reduce the number of pathogens introduced at the time of the insertion. To ensure complete disinfection has occurred.</td>
</tr>
<tr>
<td>Attach the syringe to the needleless port using a non-touch technique.</td>
<td>To prevent cross contamination from gloved hands</td>
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<tr>
<td>Using a push-pause method, inject the contents of the syringe (inject 1 ml at a time).</td>
<td>To prevent excessive pressure on the veins reducing any pain or trauma.</td>
</tr>
<tr>
<td>Maintain pressure on the plunger as the syringe is disconnected from the cap.</td>
<td>To remove syringe safely without disconnecting the needle free bung/device.</td>
</tr>
<tr>
<td>Clamp device tubing if necessary.</td>
<td>Clamp tubing to prevent backflow of fluid/blood to prevent any clotting or blockage.</td>
</tr>
</tbody>
</table>

Please note prior to connecting these needle free devices they must be flushed through with 0.9% saline using a non-touch technique to prevent any air entering the venous line.

References
- SFH Medicines Policy,
- SFH Policy for the Care of the Patient Undergoing Intravenous Therapy,
- RD04 RD04 Administration of Intravenous Peripheral Drugs/Infusions
- RD06 (Fluid Management Intravenous Peripheral Infusion.
- RD07 (Administration of Intravenous Peripheral Line Flushing.

(Original authors of Appendix VII: Denise Clay, Michaela England and Tracy Brown)
Appendix VIII

Administration of Intravenous Drugs and Fluids to Neonates

INTRODUCTION
Neonates are prescribed a variety of drugs and fluids depending on their clinical diagnosis, which are administered via different routes to meet specific therapeutic outcomes. Drugs or fluids may be administered as a continuous or intermittent infusion or as a bolus. The reasons for intravenous administration are as follows:

- To achieve high and predictable therapeutic levels
- When the drug is not absorbed via the gastrointestinal tract
- The drug would be inactivated by the gastrointestinal tract
- When the gastrointestinal tract needs to be rested
- When the enteral route cannot be used

The main types of intravenous access are:

- Peripheral venous cannula
- Umbilical venous catheter (UVC)
- Percutaneous long line

A percutaneous long line or UVC should not routinely be used for the administration of bolus or intermittent infusions as there is an increased risk of infection from frequently accessing a central line. Furthermore these forms of access are commonly used for parenteral nutrition (PN) or continuous drug infusions that should not be flushed or interrupted. It must be noted however that the UVC may be the only form of access in some small babies through which all drugs and fluids need to be given. This should only be done after discussion with a consultant.

Training and competence

- Prior to the administration of intravenous therapy, practitioners must be familiar with the infant’s plan of care.
- The health care professional, prior to the administration of an infusion/drug must ensure they have checked the following and comply with the SFH Trust Medicines Management Policy:
  - The drug prescription for route, date, time and dosing frequency, correct dose range and signature of prescriber,
  - Reasons for prescription
  - Compatibility with other drugs/fluids,
  - Side effects,
  - Potential associated hazards,
  - Prescription is written as per SFH Medicines Management Policy.
- Check the infusion/vial and the container for any faults or contamination
- Two registered health professionals, need to prepare the medication and take it to the patients bedside and check the patients identity as per SFH Medicines Management Policy.
Administration

- When using a syringe pump to administer intravenous fluids a bag of fluid should not be left attached to the syringe.
- Ensure the administration equipment is loaded into the infusion pump correctly before connecting the infusion to the baby, and staff have been assessed as competent in the use of the infusion device.
- The registered nurse or medical practitioner and second checker, double check the infusion rate and total volume to be infused against the prescription, prior to commencing an infusion.
- Always check the cannula site and clean the port of the cannula / needle free device (bionector), with an alcohol wipe (70% Isopropyl alcohol / 2% Chlorhexidine gluconate) and allow time for it to dry, before administering the medication and follow the SFH Trust infection control policy.
- Always pre and post flush the cannula with sodium chloride 0.9% (and in between if multiple drugs are to be given). Use an alternative if sodium chloride 0.9% is contraindicated.
- In neonates, a doctor must always prescribe the flush.
- The tiny total hourly amounts of fluid intake required means that pre and post flushes of the cannula should only be between 1-2mls (in 5ml syringe) of sodium chloride 0.9% (and in between if multiple drugs). In fluid-restricted infants, record the flush volume as an intake. i.e., when flushing a cannula, use 0.75 ml – 1 ml to check patency. If multiple drugs are to be given, use 0.25 – 0.5 ml, then use 0.75 ml – 1 ml afterwards to flush the drug through.
- Never share a drip stand between two patients.

FOR INTRAVENOUS INFUSIONS

- Check and document on the infusions chart the infusion rate and volume infused hourly.
- Double check the infusion rate and total volume to be infused against the prescription or prescribed fluid demands at each rate change and both practitioners sign the infusions chart indicating the time of rate change.
- Ensure all clamps are closed prior to the removal of an administration set from the infusion device, or if switching the pump off.

Ongoing Nursing Management

- At each shift change the nurse handing over and the nurse taking over the care of the infant must double check the infusion rate and total volume to be infused with each other and sign the infusions chart.
- At each shift change the nurse taking over the care of the infant must check that all discontinued infusions have been disconnected from the baby with the only exception being a sliding scale insulin infusion.
- Complete a VIP Score and document when commencing an infusion or giving a bolus.
- When administering solutions that are hyperosmolar/highly irritant to peripheral veins there may be an increased risk of extravasation injury. In this case the peripheral cannula should be highly visible and assessment of the cannula site should be more frequent, no less than every 15 minutes.
- All infusions must be changed as per Neonatal Unit Medicines Management Folder.
Monitoring

- Whilst an infant is receiving an infusion they must be continuously monitored and as a minimum heart rate, respiratory rate and O₂ saturations documented hourly or more frequently if necessary.
- If the baby deteriorates the possibility of fluid overload must be considered along with other potential causes.
- Observe whether the intravenous line remains patent, shows signs of phlebitis, or extravasation and document infusion pressure reading hourly on the infusions chart.

Special Considerations

- PN should not be administered peripherally.
- An aseptic non-touch technique must be used for all peripheral lines and an aseptic technique for all central line access.
- Ensure pump pressure limits are set appropriately; the default setting is 40mmHg. An increase in this pressure may be required depending on the viscosity of the infusion, the infusion rate, the lumen size of the giving set and venous access device, and this pressure limit recorded on the infusions sheet.
- Pumps should be at the same height as the venous device to ensure optimum administration.

Related documents

- Neonatal Nursing Procedure C4 – Administration of intravenous drugs via central umbilical venous catheter.
- Neonatal Nursing Procedure C5 – Management of a central umbilical venous catheter.

Keyword

Infusions, neonate, intravenous, UCV, cannula

(Original authors' request for Appendix VIII: via Kate Rodgers)
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<th>Care of Patient Undergoing Intravenous Therapy (Bolus, Continuous &amp; Intermittent)</th>
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<td>Clinical Policies and Guidelines</td>
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<tr>
<td>Reference:</td>
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<tr>
<td>Version number:</td>
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<tr>
<td>2.3</td>
<td>Paediatric Governance Meeting (new Appendix VIII for Neonates)</td>
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<tr>
<td>Issue date:</td>
<td>25th April 2019 (v2.2)</td>
</tr>
<tr>
<td>Review date:</td>
<td>April 2020 (ext1)</td>
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<tr>
<td>Job title of author responsible for the document/ author name:</td>
<td>IV Task and Finish Group Lead By Alison Davidson, Practice Development Matron, Corporate Nursing</td>
</tr>
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<td>Corporate/ Nursing – Professional Practice Development Team</td>
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<td>• Medical Director and Chief Nurse</td>
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<tr>
<td>Date Equality Impact Assessment completed/ updated:</td>
<td>12/02/2015</td>
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| Superseded document(s): (Ref No., Version number, previous title if changed, date issued – review date) | v1.0 Issued 9th April 2015 to Review Date January 2018  
v1.1 Issued 20th July 2016 to Review Date January 2018  
v2.0 Issued 23rd Jan 2017 to Review Date January 2020  
v2.1 Issued 14th Sept 2018 to Review Date January 2020  
v2.2 Issued 21st Nov 2018 to Review Date January 2020 |

**Version History and Practice Changes/ Amendments**

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<th>Version</th>
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| 25-04-2019 | 2.3 | • Appendix VIII added for neonates  
• (Amend/ Addition originally requested by Kate Rodgers, Feb 2018) |
| 21-11-2018 | 2.2 | • Appendix VII, sub-heading and information for “Preceptees are prohibited from” added in line with information in ‘Preceptorship Policy’.  
• (Amend requested by Adam Hayward as agreed at N,M&AHPB) |
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<td>14-09-2018</td>
<td>2.1</td>
<td>- P12, minor update to wording under subheading for “Nursing Staff” in Section 7 for Education, Mandatory Training and Regulation</td>
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<td></td>
<td>- Appendix VII, minor update to wording for “Preceptorship Nurses” who can now participate in administration/ checking of IV drugs/ therapies once all training completed.</td>
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<td>- (Amends requested by Adam Hayward via N,M&amp;AHPB)</td>
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<tr>
<td>23-01-2017</td>
<td>2.0</td>
<td>- Revision of Appendix VII to state that Band 3 HCAs can flush a cannula after they insert it but not at other times (requested by Tracy Brown).</td>
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<td>20-07-2016</td>
<td>1.1</td>
<td>- Addition of Appendix VII - Ports and Flushing of Venous Access Devices (requested by Alison Davidson) and added to intranet as a separate document</td>
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<td>09-04-2015</td>
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<td>- Not Applicable – new document</td>
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**Distribution (Circulation):**
- This document will be accessible via the Trust’s intranet.

**Communication:**
- Information regarding the initiation and subsequent updates of this document will be communicated via the earliest weekly Trust staff bulletin/ nursing bulletin and/ or other agreed communication method.