Cheshire and Mersey Critical Care Network

Administration of Intravenous Medication in Critical Care
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**Pre-requisites for Intravenous training**

All candidates must be registered general nurses who work in a Critical Care environment; candidates must also have appropriate support available for supervision and assessment. This self directed learning package will form the foundation of the knowledge and understanding that is required for the safe administration of intravenous medications and fluids to the critically ill. In the future, completion of this pack may be an entry requirement to the Pharmacology & Medicines Administration in Critical Care E-Learning Module delivered at Edge Hill University.

**Criteria for competence in this skill**

1. Attendance at a locally arranged study day which includes successful demonstration of numeracy skills.

2. Thereafter the nurse will be responsible for maintaining, updating and reviewing his/her intravenous medicine administration skills (NMC Code of Conduct 2008, HPC Standards of conduct, performance and ethics 2003).
INTRODUCTION

This workbook has been produced to ensure healthcare professionals in critical care have baseline knowledge and competence in the calculation, action, and safe administration of IV drugs.

To determine your competence you are required to complete the following:
- Attendance at formal Trust/Unit training sessions
- Successful completion of the workbook
- Competency Assessment using the framework provided

How to use this workbook

The workbook is divided into sections. There are questions and activities included which form an important part of your learning and training. Please attach separate sheets if needed. **It is your evidence of learning.**

You will need to obtain and read several documents to assist you in completing this workbook and you will require access to books and other reference materials (see bibliography). When completed this workbook will form part of your evidence of learning, professional development and competence. Please keep this package in your portfolio as it could be used to gain further credits at university or college and assist in meeting continuing professional development (CPD) requirements.

Aim

“Drug administration can be defined as the way medicines are selected, procured, delivered, prescribed, administered and reviewed to optimise the contributions that medicines make to producing informed and desired outcomes of patient care” (Audit Commission 2001)

In relation to Intravenous medication;

“An immediate therapeutic effect is achieved owing to rapid delivery of the drug to its target site, which allows a more precise dose calculation and therefore more reliable treatment” p217 The Royal Marsden Hospital Manual of Clinical Nursing Procedures Seventh Edition (2008).

**Learning Outcomes**
Having completed this you will be able to:

1. Demonstrate awareness of the resources available to increase knowledge of intravenous (IV) therapies (UCL Hospitals Injectable Medicines
1. Define the registered practitioner’s legal and professional responsibilities in the checking, preparation and administration of IV therapies
2. Identify national and local policies in relation to IV therapy
3. Demonstrate the ability to accurately complete necessary mathematical calculations prior to preparation and administration of IV therapy
4. Identify the advantages and disadvantages of choosing the IV route of administration
5. To identify the advantages and disadvantages of peripheral and central IV access devices
6. Define the steps required to check, prepare and administer medications for IV administration, including equipment required
7. Critically analyse the potential complications associated with IV therapy and discuss appropriate actions to prevent and/or treat these complications
8. To identify issues surrounding stability and compatibility of IV therapies
9. To demonstrate the safe handling of items used in IV therapy, e.g. infusion pumps, needles, syringes, ampoules and vials
10. To describe the procedure for reporting incidents and accidents involving self, patient and others

**ACTIVITY 1**

Identify your local ‘Medicine’s Policy’ and find out about local training requirements for staff. Write what the requirements are here;

East Cheshire NHS Trusts’ ‘Policy for the safe and Secure Handling of Medicines’ 2012 states that;

All staff groups involved in handling medicines should receive training related to medicines management. The training should be tailored to the requirements of the staff group involved. Aspects of training should include: All groups of staff involved in handling medicines should receive a medicines management training session as part of their induction, Training specifically for nursing staff should include: a training session and assessment for all nurses before undertaking administration of intravenous drugs. Training needs specifically tailored to individuals, or departments, may be identified following a review and identification of trends from the Trust Drug Incident Reporting scheme.
**NMC Standards for Medicines management (2008)**

The NMC states the following in relation to IV drug administration; the administration of medicines is an important aspect of the professional practice of persons whose names are on the Council’s register. It is not solely a mechanistic task to be performed in strict compliance with the written prescription of a medical practitioner (now independent/supplementary prescriber). It requires thought and the exercise of professional judgement...

**Standards for practice of administration of medicines**

**Standard 8:** As a registrant, in exercising your professional accountability in the best interests of your patients:

- You must be certain of the identity of the patient to whom the medicine is to be administered
- You must check that the patient is not allergic to the medicine before administering it
- You must know the therapeutic uses of the medicine to be administered, its normal dosage, side effects, precautions and contra-indications
- You must be aware of the patient’s plan of care (care plan/pathway)
- You must check that the prescription or the label on medicine dispensed is clearly written and unambiguous
- You must check the expiry date (where it exists) of the medicine to be administered
- You must have considered the dosage, weight where appropriate, method of administration, route and timing
- You must administer or withhold in the context of the patient’s condition (e.g. digoxin not usually to be given if pulse below 60) and co-existing therapies e.g. physiotherapy
- You must contact the prescriber or another authorised prescriber without delay where contra-indications to the prescribed medicine are discovered, where the patient develops a reaction to the medicine, or where assessment of the patient indicates that the medicine is no longer suitable
- You must make a clear, accurate and immediate record of all medicine administered, intentionally withheld or refused by the patient, ensuring the signature is clear and legible; it is also your responsibility to ensure that a record is made when delegating the task of administering medicine

In addition:
• Where medication is not given the reason for not doing so must be recorded

**ACTIVITY 2**

Locate the following documents and familiarise yourself with their contents:

- NMC - Code of Professional Conduct (June 2002)
- NMC - The Scope of Professional Practice (2002)
- NMC Standards for Medicines Management (2008)
- National Patient Safety Agency (NPSA) 2007, Promoting Safer use of Injectable Medicines
- Matching Michigan (2009)
- High Impact Intervention No. 5 (DOH, 2006)
- Trust/Unit incident reporting policy
- Trust frameworks, guidelines, protocols and documentation related to intravenous therapy
- The nurse must be aware of the ‘Best Practice Guide to preparation and administration of intravenous medications (2006), Greater Manchester Critical Care Network
The nurse must be aware of local Learning & Development Policy guidance regarding attendance of an IV course
**RCN Online guidance 2009**

**Drug errors by registered nurses:** Drug errors may be caused by pressure of work leading to inattention to detail, misinterpretation of drug names and dosage, or errors in the route for administration. They may also be caused by reckless practice when there are no excuses for carelessness.

When practitioners are open and honest about an error and report it promptly, their manager should not allow this to compromise their practice. Following a proper examination of all the facts and circumstances, if appropriate, a nurse should be offered support and retraining and assessment of competence.

Drug errors should not be concealed. It is important that the error is reported as soon as a nurse is aware of it. The primary concern must be for the patient.

### ACTIVITY 3

Describe why you are undertaking training in intravenous therapy

- Trust requirement in order to administer IV drugs
- To update / increase clinical skills and knowledge.
- Part of personal development.
- Function as effective member of the Critical Care team
- Participate in attempts to reduce related clinical incidents as an effective knowledgeable practitioner.
- NPSA 20 training recommendation

### ACTIVITY 4

How will you demonstrate your knowledge and competence following this training?

- Completion and assessment of the workbook
- Attend related training sessions, courses and conferences
- Self-assessment and review of personal practice
- Professional Development and peer reviews
- Incident free and safe clinical practice
Safety issues in nursing – administration of medicines

Certain nursing work practices are associated with increased risk of patient safety incidents (PSIs). Medication administration is one such process. The Institute of Medicine review of patient safety and the nursing environment cites a number of studies indicating high levels of PSIs in what is, traditionally, a nursing role.

The administration of medications is a complex process with many opportunities for error. The growing number of drugs available increases the burden of responsibility. Nurses need to remain up to date about drug action, side-effects and correct dosage. Lack of awareness in these areas has been exposed. Studies have identified common flaws such as overdosing of anti-emetics, mixing drugs in incompatible solutions and over rapid infusion of intravenous drugs.

Poor mathematical skills account for error rates of three per 100 according to human factors studies. When these calculations are performed under stress they are likely to increase. Other factors implicated in medication errors are interruptions, fatigue and overwork; miscommunication, including the illegibility of written orders; lack of information about the patient; and problems with infusion pumps and IV delivery. (BHCS, IOM 2004).

Medication administration provides opportunity for the full range of error to occur. Active failures associated with adverse drug events include: mistakes due to knowledge gaps, slips due to regularity of procedures, distractions and interruptions of the process and misperceptions due to illegibility of drug orders.

Latent conditions can make drug administration errors more likely: unsafe staffing levels and nurse fatigue can create conditions conducive to errors of this kind. Other latent conditions include the increasing complexity of work processes and the rising number of new medicines.

Activity 5 Checking medications

What is the process for checking IV medications/fluids?

Check prescription; date, time, drug, dose, allergy status, patient wrist band – names date of birth and hospital number, Consider renal dosing, Check drug and/or fluid including batch number, expiry date, volume in which to be administered, method of administration and time over which to administer, type of giving set, whether an infusion pump is required, consider patient access and compatibility with other medication being infused concurrently. Look at patients CVAD and check VIP/other visual inspection tool score prior to administering the drug. Consider what patient monitoring is required.

Section 4 Standards for practice of administration of medicines
Standard 8: Administration
As a registrant, in exercising your professional accountability in the best interests of your patients:
you must be certain of the identity of the patient to whom the medicine is to be administered
you must check that the patient is not allergic to the medicine before administering it
you must know the therapeutic uses of the medicine to be administered, its normal dosage, side effects, precautions and contra-indications
you must be aware of the patient’s plan of care (care plan or pathway)
you must check that the prescription or the label on medicine dispensed is clearly written and unambiguous
you must check the expiry date (where it exists) of the medicine to be administered
you must have considered the dosage, weight where appropriate, method of administration, route and timing
you must administer or withhold in the context of the patient’s condition, (for example, Digoxin not usually to be given if pulse below 60) and co-existing therapies, for example, physiotherapy
you must contact the prescriber or another authorised prescriber without delay where contra-indications to the prescribed medicine are discovered, where the patient develops a reaction to the medicine, or where assessment of the patient indicates that the medicine is no longer suitable (see Standard 25).
you must make a clear, accurate and immediate record of all medicine administered, intentionally withheld or refused by the patient, ensuring the signature is clear and legible. It is also your responsibility to ensure that a record is made when delegating the task of administering medicine.
Where medication is not given, the reason for not doing so must be recorded.

(NMC Standards for Medicines Management)

Check with another nurse independently.

What do you understand by the term ‘Independent second checker’?

When checking a drug to be administered to a patient – all of the above checks, this should be done first by one nurse and then separately by a second nurse (they should not check all of the above together as this can lead to ‘auto-suggestion’ and a higher incidence of medication errors).
Activity 6
Follow this link;
Complete the e-learning module, print off the certificate at the end and attach to the workbook
Legal & Ethical Considerations

Civil Law: Civil Law includes Personal injury cases for example; they rely on one individual arguing that another has done him or her harm (Martin 2005).

In health care, personal injury is taken a step further with the added dimension that the individual has put his or her trust in the healthcare professional to provide appropriate care or treatment (Martin 2005).

Failure to care for a patient adequately is a form of negligence.

Negligence is the form of civil law that nurses are most likely to encounter should their professional practice fall below an acceptable standard.

Civil Law seeks to establish accountability and award damages (Scales 1996)

Activity 7

i. List below some examples that you would consider to be civil and criminal actions in relation to IV therapies and explain the differences between the two;

Civil law - administration of a medication through an infected cannula, causing extravasation, sepsis. Administration of a drug that the patient is known to be allergic to, but didn’t check properly – negligence.

This is where individuals can initiate cases in common law, usually for negligence, against nurses for damages. There are three distinct elements that must be established for negligence to be proven. Firstly it has to be established that there was a breach in duty of care. This breach of duty could be due to an omission or commission. An omission would be a prescribed treatment not being administered due to communication failures within the multidisciplinary team. An example of commission would be an erroneous medication overdose being given. Both could be seen as negligent but the claimant has to prove that foreseeable harm has been caused, and that the nurse knew that what was, or was not, done was negligent.

Criminal Actions - example is doctors who were tried for manslaughter when vincristine was given intrathecally instead of intravenously causing death. This was a systems failure rather than a premeditated act, as in the Allitt case, hence the manslaughter charges rather than murder.

Differences

Civil law deals with the disputes between individuals, organizations, or between the two, in which compensation is awarded to the victim. Criminal law is the body of law that deals with crime and the legal punishment of criminal offenses.
ii. What do you understand about vicarious liability?

NHS bodies are legally liable for the negligent acts and omissions of their employees (the principle of vicarious liability), and should have arrangements for meeting this liability. NHS Indemnity applies where: the negligent health care professional was working under a contract of employment (as opposed to a contract for services) and the negligence occurred in the course of that employment; or the negligent health care professional, although not working under a contract of employment, was contracted to an NHS body to provide services to persons to whom that NHS body owed a duty of care.

NHS Indemnity, Arrangements for Clinical Negligence Claims in the NHS

http://www.nhsia.com/NR/rdonlyres/1CFE5864-05C3-4770-982C-7003294B8161/0/NHSIndemnity.rtf

- A duty of care exists when the healthcare professional enters into a contract with a patient.

- By accepting a patient allocation the healthcare professional has entered into such a contract and has a legal duty to care for the patient to an acceptable standard.

- If the allocation exceeds the healthcare professional’s skills and abilities, he or she should bring this to the attention of the nurse in charge (NMC 2008a).

- An example of negligence associated with IV therapy might be the incorrect administration of a drug resulting in physical injury to the patient.

- For example, drugs with extreme pH or osmolarity are known to be harmful to veins and it is recommended that they should be given centrally and not administered via small peripheral veins with low blood flow (Royal College of Nursing (RCN) 2005).

- If a nurse administers a harmful drug peripherally, and if the patient experiences chemical phlebitis resulting in pain and disfigurement, the nurse will be vulnerable to a claim of negligence.
In this case, the nurse had a duty to give the drug correctly (duty of care), the nurse did not give the drug correctly (breach of the duty of care) and the patient experienced pain and disfigurement (harm as a direct result of the breach of the duty of care).

Activity 8
Follow this link to the MHRA website and complete the e-learning opioid module;

http://www.mhra.gov.uk/ConferencesLearningCentre/LearningCentre/Medicineslearningmodules/index.htm

Activity 9
Clinical Incident reporting

What is the difference between a medication error and a medication incident?

A medication incident is a mistake with medication, or a problem that could cause a mistake with medication. "Medication error" is another name for one kind of medication incident. Medication incidents include obvious things like receiving the wrong medication or dose, but might also include problems like a confusing label that might lead to someone receiving the wrong medication.

To whom and how would you report an error?
Initially to the nurse in charge and medical staff involved in the care of the patient, the incident should then be reported according to local trust policy and using the local system (i.e. Datix)

To whom and how would you report an incident?
In the same way as for a medication error
**What are the implications of not reporting an incident?**

*Awareness of the problem isn’t raised*
*Potential of recurrence of incident – not learning from mistakes*
*Training to support and learning needs can’t then be implemented*
*Patients remain at risk & practice doesn’t change*

**Access sites; central, peripheral and PICC lines**

The main veins used for central venous access are:

Internal and external jugular subclavian veins (all types of CVADs).

Cephalic and basilic veins (for peripherally inserted central catheters and mid-lines).

The right side of the patient is usually favoured because vessel anatomy allows for direct access to the SVC and it provides the shorter and easier route for the practitioner inserting the device, although this might not always suit the patient.

**The Internal Jugular**

This is a good site due to its high success rate for insertion and low incidence of complications. The internal jugular vein allows an easier insertion than the subclavian and the right internal jugular provides the shortest and straightest route, thereby reducing the problem of malposition. It also avoids injury in the vagus nerve and carotid artery.

Problems associated with this vein are;
*Catheter occlusion & irritation due to head movement*
*Difficulty in maintaining an intact dressing*

**External jugular**

More easily observable and easily entered vein, though it varies in size between patients and its junction with the subclavian vein is angulated, making it more difficult to cannulate.

**Subclavian vein**

This has a diameter of 19mm and is the vein of choice for long term central venous access, for example, a tessio line for long term chemotherapy administration.

**Basilic vein**
This has a diameter of 8mm.

Although associated with more valves, this is the preferred vein for insertion of peripherally inserted central catheters because it is a shorter, straighter vein. This enables advancement of the catheter and increases haemodilution capability.

**Cephalic vein**

This has a diameter of 6mm and is a large, easily palpable vein, which is longer than the basilic vein. The angle at which it enters the subclavian vein can result in a more difficult peripherally inserted central catheter (PICC) insertion.

**Femoral vein**

This vein is used more often in children, with the tip of the catheter located in the inferior vena cava.

It is a difficult area to dress and there is risk of infection and thrombosis.

Femoral sites can't be continuously observed as with other sites because of the need to keep the site covered to maintain patient dignity.

**PICC lines**

Inserted via the antecubital veins in the arm and advanced into the central veins, with its tip located in the lower third of the superior vena cava. It is usually inserted following application of local anaesthetic and can be performed at the patients’ bedside.

**Advantages of PICC lines:**

Ease of insertion

Low complication rates
Reduction of insertion hazards, such as pneumothorax and haemorrhage

It is the device of choice for vulnerable patient’s e.g those on anticoagulants, with low platelet counts, immuno-compromised or a high risk of infection.

The line is made of either silicone or polyurethane, and is available in varying sizes, either single or dual lumen and can remain in situ for up to a year.

The main disadvantage is mechanical phlebitis, line occlusion or blockage.

### Activity 10

1. How long can the following stay in situ?

   a. Peripheral cannula

   3-4 days – see local trust policy

   48-72 hours (RCN, 2003)

   There is some evidence to suggest that (based on individual patient need and VIP score) peripheral cannula can sometimes stay in longer.

   b. PICC line

   7 days to one year see local area policy and manufacturers guidance

   c. Central line

   7-10 days or based on clinical judgement and need and signs and symptoms of infection – see local area policy

4. Why would a central line be used to administer certain drugs, e.g. Noradrenaline, Amiodarone?

   Where possible Amiodarone should be administered through a central venous catheter, an in-line filter should be used during administration, concentrations greater than 3 mg/ml have been associated with a high incidence of peripheral vein phlebitis but concentrations of 2.5 mg/mL or less appear to be less irritating. Therefore, for infusions longer than 1 hour, concentrations should not exceed 2 mg/mL unless a central venous catheter is used.

   Noradrenaline should be given into a large vein, particularly an antecubital vein because the risk of necrosis of the overlying skin from prolonged vasoconstriction is reduced. Occlusive vascular diseases (for example, atherosclerosis, arteriosclerosis, diabetic endarteritis, Buerger’s disease) are more likely to occur in the lower than in the upper extremity. Therefore, one
should avoid the veins of the leg in elderly patients or in those suffering from such disorders. Gangrene has been reported in a lower extremity when infusions of Noradrenaline were given in an ankle vein. The infusion site should be checked frequently to avoid extravasation of Noradrenaline into the tissues, local necrosis might occur due to the vasoconstrictive action of the drug. Blanching along the course of the infused vein, sometimes without obvious extravasation, has been attributed to vasa vasorum constriction with increased permeability of the vein wall, causing leakage.

5. Describe characteristics of medicines/prescriptions that are suitable for peripheral administration – give examples & state where you would find out relevant information.

Vesicant therapies such as chemotherapy can cause damage to skin cells and are not suitable for peripheral administration. Colloid and crystalloid with low concentration of potassium and glucose can be given peripherally.

Individual drugs must be checked using the UCL IV administration guide, for peripheral admin suitability, staff can also liaise with Pharmacist and check IV medication manufacturers insert

(C) Some medicines can be given peripherally AND centrally, this can depend on concentration. Review the following examples & give the concentration at which central administration is necessary:

**Glucose**

Infusion too quickly may cause local pain and venous irritation.

5%, may be infused into a peripheral line

10%, 15%, 20% and 40% can all go into a smaller vein

50% can be administered into a larger peripheral vein (emergencies only)

Concentrations greater than 20% may cause venous irritation and thrombophlebitis if infused peripherally. Central administration is preferable.

**Potassium Chloride**

IV infusion into a peripheral line via an infusion pump, maximum concentration 40mmol/l, maximum infusion rate 20mmol per hour. Administration of concentrations exceeding 40mmol over a period of less than one hour poses a serious risk of asystole. Pain or phlebitis may occur during peripheral administrations of solutions containing more than 30mmol/l of potassium.

Extravasation may cause tissue damage.

Central line concentrations greater than 40mmol/l are only given in monitored areas via a syringe driver or volumetric pump.
Nursing care of patients receiving IV medicines

With all IV therapy, the nurse’s responsibilities include:

- Checking the IV access site for patency, changes and phlebitis and documentation of findings
- Check the dressing is clean, intact and the age of the dressing
- Checking the infusion therapy fluid and container for any obvious faults or contamination
- Ensuring the administration of the prescribed fluid is to the correct patient at the correct rate, carrying out any observations necessary
- Maintaining all other appropriate records: fluid balance, care plan and nursing evaluation records
- If a medicine is not fully administered for any reason it should be documented in the notes and drug prescription chart
- At patient handover, nurses should check the medication prescription chart with the receiving nurse. Any omissions should be documented and accounted for.

Activity 11
What assessment tools do you use to inspect peripheral vascular access devices in your place of work? VIP
At what frequency? Once per shift
How do you assess central vascular access devices? Please write about it here. We use VIP scores at Macclesfield, some areas use the MR VICTOR central line visual inspection tool

What is your local policy for cleaning vascular access devices prior to administration of medicines?
Refer to local policy
Methods of administering IV drugs (continuous infusion, intermittent infusion and bolus)

Medicines can be administered either as a bolus, a short infusion or a continuous infusion. An infusion pump may or may not be used in the administration. Advice regarding the administration of IV medications can be found in the UCL book / BNF / Medusa.

**Bolus administration:** This is the giving of a medicine diluted in a small amount of diluent, normally water for injection or 0.9% sodium chloride, into a vein, over a short period of time, usually 3-5 minutes (Dougherty 2002).

**Indications**

When optimum levels of a medicine are required rapidly. If a medication is incompatible or unstable in infusion fluids.

**Advantages**

Minimises fluid administration.
Cost effective method of administration as no further equipment is needed.
Maximises patient and nurse contact time.

**Disadvantages**

The medicine is frequently administered too fast.
Irritation of the vein can be caused by some medicines.

**Intermittent intravenous infusion:** The addition of a medicine to a small volume bag of intravenous fluid and administered over at least 10 minutes e.g. Pabrinex (Dougherty 2002).

**Indications**

Direct injection is likely to cause venous irritation – phlebitis.
Direct injection would give toxic medication levels e.g. Vancomycin.

**Advantages**

Controlled rate of administration

**Disadvantages**

Increased volume of fluid administered.
Delay in medicine administration.
Administration of additional electrolytes e.g. Na+ in 0.9% saline.
Increased cost

**Continuous intravenous infusion:** An addition of medicine to a small volume of fluid in a syringe or infusion bag to be given by a slow infusion by a motorised syringe pump or infusion device e.g. Morphine, Insulin (Dougherty 2002).

**Indications**
If a medicine is metabolised or excreted quickly, or it is necessary to maintain a constant blood level.

**Advantages**
- Allows for a constant blood level of medicine for optimum efficacy
- Allows for the titration of medication to meet treatment goals

**Disadvantages**
- Restricts patient mobility
- Increased risk of infection

**Fluid balance**
Irrespective of how intravenous medicines are delivered, careful consideration of the quantity of fluid administered must be made. The amount of fluid should be recorded in the patient’s fluid balance records (along with any nasogastric or oral input). Ensure that any output is also recorded to keep an accurate record of the patient’s fluid balance status.

**Activity 12**
What do you know about insensible loss?

Consider patient’s body temperature, secretions, oedema, drain output, bowels, etc...

This can account for a fluid deficit and be apparent in their physiological status.

Importance of accurate fluid balance monitoring and daily patient weight.

In your workplace, what is your practice to accommodate this in your fluid balance chart?

Procedure as per hospital

**Documentation**
The RCN (2010) Standards for IV infusion therapy states that documentation should include;
‘Clear, accurate and detailed record of intravenous medicines administered, as soon as possible after the event (NMC, 2008a; NPSA, 2007f)’

**Injection and access caps/ports**

**Standard**
Injection and access caps/ports (which include injection caps, needle-free caps, catheter hubs or administration ports integral to an administration set) must be decontaminated using aseptic technique prior to accessing (NICE, 2003; MHRA, 2005a; Kaler and Chinn, 2007; MHRA, 2008c).

A safety device system, for example a needle-free system, is the preferred method of accessing injection and access caps/ports. Injection and access caps/ports which are not integral to the device should be changed at established intervals according to manufacturers’ instructions, or immediately if the integrity of the access site is compromised or if residual blood remains within the access site (MHRA, 2005a).

Injection and access caps/ports that are not integral to the device should be of Luer-Lok™ design (INS, 2006)

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<td>Which needle free devices are used in your area? Write about bionectors, swann lock, octopus etc.. here</td>
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<tr>
<td>How long do they remain in situ prior to changing? Up to 72 hours or as per local area policy</td>
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<tr>
<td>Are there any emergency situations in which they cannot be used, and why? For the administration of emergency drugs during a cardiac arrest – the drug syringe will not fit onto the end of the needle-free device</td>
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**Guidance**

- The integrity of the injection and access caps should be confirmed before and immediately after each use. If the integrity of the injection or access cap is compromised, it should be replaced immediately, and consideration should be given to changing the device and/or administration set (MHRA, 2005a)

- Under no circumstances should devices be left with caps open or exposed
• Any time an injection access site is removed from a vascular access device, it should be discarded and a new sterile injection access site should be attached (MDA, 2000)

• ANTT principles MUST be adhered to when administering any IV medication or fluid

• The optimal interval for changing injection and access caps/ports on central, peripherally inserted central and midline catheters should be in accordance with manufacturers’ recommendations (MHRA, 2005a)

Infection control issues
Infection is one of the most serious complications associated with intravenous therapy (Hamilton 2006). The skin is the body’s most important defence system and when its integrity is breached infection is possible. In IV therapy there is a skin breach at the cannula or catheter site, every time this is accessed the risk of infection increases. Although uncommon an infection of this kind may be life threatening especially in this compromised group of seriously ill patients (Hamilton 2006).

Activity 14
Think of the patients in your clinical area who are receiving IV medication. Do any of them have factors which make them particularly at risk of infection?

What are they?
Immunopsuppressed patients, malnourished, those with multiple co-morbidities, - all critically ill patients

What can you do to prevent the risk of infection?
Scrupulous hand hygiene, ANTT, damp dusting, breaking the chain of infection

Aseptic Non Touch Technique ANTT
Aseptic technique
Asepsis means freedom from infection or infectious microorganisms. For a venous access device related infection to occur, it must be contaminated by a sufficient number of virulent, pathogenic organisms. Aseptic technique is a technique that prevents such a level of pathogenic organisms from entering the patient’s blood stream. It is achievable in the clinical setting.

**Aseptic Non-Touch Technique (ANTT)**

Aseptic Non-Touch Technique maintains asepsis and is non-touch in nature. This is an important factor to appreciate as other terms such as “sterile technique”, are often used inaccurately and subsequently can confuse practitioners and patients.

**Sterile Technique**

Sterile means “free from all microorganisms”

It is not possible to achieve a true sterile technique for most IV procedures in a typical environment – even when wearing sterile gloves.

**Gloves will be worn when preparing and administering IV medications**

Wear sterile gloves if you cannot avoid touching the key parts of the equipment OR wear non-sterile if you can.

**Key parts**

These are parts of the equipment that come in contact with blood and liquid infusion and should not be touched even with sterile gloves.

It cannot be emphasised enough that the risks from infection can have catastrophic consequences for patients in your care. You therefore have a duty to be aware of the risks and the evidence based measures necessary to reduce them.

**Aseptic Non Touch Technique**
<table>
<thead>
<tr>
<th><strong>Catheter Insertion</strong></th>
<th>Creates an open pathway for skin organisms to enter the patients' bloodstream. This is the most common infection route.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessing the Catheter</strong></td>
<td>Medication, Flushing, Tubing / cap changes all introduce microorganisms into the lumen. Hub manipulation is the most common source of infection in long-term catheters.</td>
</tr>
<tr>
<td><strong>Infection</strong></td>
<td>Organisms affecting other sites or systems can move to the foreign object (VAD) and cause a Catheter Related Bloodstream Infection (CRBSI).</td>
</tr>
<tr>
<td><strong>Contaminated fluid or medication</strong></td>
<td>Considered rare. Outbreaks of HIV, Hep B &amp; C have been attributed to contaminated multi-dose vials. Polymicrobial outbreaks have also been traced to large bags of saline solution being used for multiple catheter flushes.</td>
</tr>
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Aseptic Non Touch Technique
ASSESSMENT IN PRACTICE IV ADMINISTRATION COMPETENCY FOR THE PERIPHERAL ROUTE INFUSION/BOLUS

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<thead>
<tr>
<th>Key Performance indicators</th>
<th>Signature of Assessor and Date</th>
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<tbody>
<tr>
<td><strong>Prior to procedure</strong></td>
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</tr>
<tr>
<td>• Explains correct procedure to patient and/or relatives</td>
<td></td>
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</tr>
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<td>• Mixes &amp; labels the solutions appropriately</td>
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### Aseptic Non Touch Technique

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<td>3. Records administration on prescription sheet</td>
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# Aseptic Non Touch Technique

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**Activity 15** Complications

The following are complications which relate to intravenous access devices and the administration of IV fluids/medication. Write a sentence for each about the **causes** of the complications;

- **Emboli**
  
  Air - air in giving set, bags run through under pressure improperly primed, cvc removal

  Thrombo-embolus - due to line management issues, clots from the end of lines being flushed into the patients’ circulation

- **Extravasation**

  The accidental administration of intravenously infused medications into the extravascular space/tissue around infusion sites

- **Anaphylaxis** A severe, life-threatening, generalised or systemic hypersensitivity reaction

- **Haematoma**

  Defined as a bruise or collection of blood in the tissues (Collins et al, 2002). Haematomas appear as a dark red/black collection of blood standing proud of the skin.

- **Pneumothorax**

  Air that is trapped next to a lung - a risk associated with CVC insertion

- **Haemothorax**

  Accumulation of blood in the pleural cavity - a risk associated with CVC insertion

- **Haemorrhage**

  Defined as bleeding or abnormal flow of blood, can be caused by line insertion. Mention importance of checking clotting prior to insertion/removal of lines
Sources of information

- BNF.org
- epic2
  http://www.epictvu.ac.uk/epicphase/2.html
- learning.bmj.com
- Injectable medicines: prescribing, preparing, and administering
  http://learning.bmj.com/learning/search-result.html?moduleId=10009161
- Matching Michigan
  http://www.nrls.npsa.nhs.uk/resources/?entryid45=65615
- RCN (Oct 2003) Standards for infusion therapy
- CC3N Clarification Statement
- Royal Marsden manual of Clinical Nursing Procedures
  www.rmmonline.co.uk
- MHRA http://www.mhra.gov.uk/index.htm#page=DynamicListMedicines
- NPSA http://npsa.nhs.uk/
- NICE http://www.nice.org.uk/

References & Additional Reading


Koschel M (2001) Filter needles American Journal of Nursing. 101(1) 75

Medusa: Medicines Usage in Wales monographs http://medusa.wales.nhs.uk


http://www.nhsia.com/NR/rdonlyres/1CFE5864-05C3-4770-982C-7003294B8161/0/NHSIndemnity.rtf


Ray C (1999) Infection control principles and practices in the care and management of central venous access devices Journal of IV Nursing 22(6)


Royal College of Nursing IV therapy Forum (2005) Standards for infusion therapy Royal College of Nursing