MP12
Injectable Medicines Policy

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1.0 Policy Statement

The use of injectable medicines has many healthcare benefits for patients. The complexities associated with the prescribing, preparation and administration of injectable medicines means that there are greater potential risks for patients than with other routes of administration. Safe systems are needed to minimise these risks (NPSA 20 March 2007).

A key risk mitigation for staff is the use of needle-free or safer sharp devices to reduce the risk of needle stick injuries. Please refer to HS03 Sharps Safety Policy for more details.

Injectable medicines representing a high risk to patients or staff will be reviewed and mitigations put in place such as the procurement of a pre-filled preparation, closed-system drug transfer devices or preparation of the product in Pharmacy Aseptic Services.

The purpose of this policy is to inform staff of their responsibilities in relation to safe handling and storage, prescribing, preparation, and administration of injectable medicines to ensure that:

- All staff involved with the use of injectable medicines are aware of the Trust procedures for dealing with these medicines and that they always follow the procedures.
- Current best practice guidance and relevant legislation with respect to injectable medicines is always adhered to.
- Patient safety risks associated with the prescribing, supply, preparation and administration of injectable medicines are reduced to a minimum.

SCOPE

An injectable medicine is any medication that is administered directly into the body using a needle and syringe. For the purpose of this policy this includes both licensed and unlicensed medicines.

This policy covers the use of all injectable medicines. Additional training and competence assessments beyond those mentioned in this policy are required for specialist procedures such as epidural, intraarticular, intraocular and intrathecal injections. Intrathecal chemotherapy injections are also covered in the Trusts Intrathecal Chemotherapy Policy CP52.

It excludes injectable medicines registered as medical devices (UKCA mark). These are not classified as medicines.

This policy should also be read in conjunction with Trust or local policies and procedures that include:

- Medicines
- Cytotoxic medicines
- Extravasation
- Intrathecal, epidural medicines
- Intravenous Potassium
- Unlicensed medicines
- Intravenous training and assessment requirements
- clinical trials
- training in the safe administration of medicines
- Incident reporting
- training and assessment requirements for staff
- Aseptic Non-Touch Technique (ANTT)
- Waste Management
- Neonatal Doses
- Non-Medical Prescribing
- Controlled Drugs
- Preparation and administration of injectable medicines
- Homecare medicines
- Parenteral nutrition

In adhering to this Policy, all applicable aspects of the Conflicts of Interest Policy GOP109 must be considered and addressed. In the case of any inconsistency, the Conflicts of Interest Policy is to be considered the primary and overriding Policy.

2.0 Definitions

Injectable medicine	Any medication that is administered directly into the body using a needle and syringe
Prescriber	A doctor, dentist or non-medical prescriber or supplementary prescriber working within their competence.
SC	Subcutaneous - an injection given under the skin
IM	Intramuscular – an injection given into the muscle
IV	Intravenous – an injection given into the vein
Intrathecal	An injection directly into the spinal canal
SACT	Systemic anti-cancer therapy. This refers to all medicines used in the treatment of cancer including injections.
Cytotoxic	Toxic to living cells
Extravasation	Leakage of vesicant fluid from a blood vessel into the tissue around it
Unlicensed medicine	A medicine that has no UK licence for it to be used
Off Label medicine	A medicine that has a UK licence, but is being used in a way that falls outside of that licence.
Medical Device	A product (which may contain a medicine) that has been registered with the MHRA as a medical device and has a UKCA mark.
ANTT	Aseptic non-touch technique

3.0 Accountabilities

All staff who handle injectable medicines in any way

This policy applies to all members of staff who handle injectable medicines in any way, irrespective of role, grade or contract status. Individuals have a professional responsibility to update themselves on this policy on a regular basis.

All staff employed by the Royal Wolverhampton NHS Trust who are involved with any aspect of intravenous (IV) drug administration or diagnostic therapy must adhere to both the recommendations of their independent professional bodies, the guidance of this policy and any local procedures for the administration of injectable medicines.

Clinical Director of Pharmacy and Trust Medicines Management Group

The Clinical Director of Pharmacy and the Trust Medicines Management Group (MMG) oversee medicines management across the organisation on behalf of the Chief Medical Officer (the responsible Trust Executive) and the Chief Executive Officer.

The Clinical Director of Pharmacy is responsible for ensuring that effective governance arrangements are in place across the organisation for all injectable medicines, whether prepared in clinical areas, in pharmacy or outsourced.

The Clinical Director of Pharmacy is responsible for the adequate resourcing of the Pharmacy Aseptic Service to ensure that it meets the defined national standards as described in Quality Assurance of Aseptic Preparation Services 5th edition 2016.

The MMG will provide guidance on policy and practice relating to the use of injectable medicines and will coordinate actions required to improve practice if the need is identified through incident reports, risk assessments and audits.

The MMG will review and approve any risk assessments and local arrangements for injectable medicines.

Divisions and Directorates

It is the responsibility of each Division and directorate to be assured that all services have robust procedures in place for the management, prescribing and administration of injectable medicines

Ward / Department Managers

It is the responsibility of ward / department managers for ensuring the appropriate staff in their departments are trained and competent to handle, prepare and administer injectable medicines and that their staff are made aware of this policy.

Prescribers

It is the responsibility of medical staff and other Trust approved prescribers to follow this policy when prescribing injectable medicines and to maintain their competence in prescribing injectable medicines.

It is the prescriber's responsibility to ensure that all medicines prescribed by the intravenous route are appropriate for this method of administration, and they must give clearly, in writing, all the necessary instructions on exactly how the drug should be administered, including the route for administration.

Clinical Staff
It is the responsibility of all clinical staff to follow this policy when prescribing, preparing, and administering injectable medicines, including ensuring the safe handling and storage of injectable medicine in clinical areas. Clinical staff must not prescribe, prepare, or administer injectable medicines unless they are trained and competent to do so (see section 4.1)

Pharmacy Staff
It is the responsibility of Pharmacy staff to follow this policy when involved in managing medicines. Pharmacy staff are not permitted to prepare or dispense injectable medicines without training and demonstrating competence.

The pharmacy procurement team will ensure that all new injectable medicines have a product risk-assessment. The specialist pharmacist or medicines safety team will support the procurement team with the risk-assessment and help identify appropriate risk mitigation where it is required. Strategies to manage risk include:

- Purchase a ready to administer product.
- Manufacture the product in Pharmacy Aseptic Services.
- Implement closed-system transfer devices.
- Seek an alternative medicine with a lower risk.

4.0 Policy Detail

4.1 Training and Assessment of Competence

Staff authorised to prescribe, prepare and administer injectable medicines must have this recognised and documented as part of their job role and it be within their scope of practice; they must also have successfully completed the training and competency requirements described below.

Non-medical Staff
Prior to being eligible to prepare and administer, or second check, injectable medicines for patients, non-medical staff must have completed the training and competency assessments identified in table 1 below. This training includes intravenous, subcutaneous and intramuscular administration.

Staff must have completed a period of supervised practice within six months of completing the required injectable medicines training course(s) and have competency assessments signed off as complete by their ward/department manager or a member of the clinical skills team. Persons assessing competence must themselves be competent in injectable medicines preparation and administration.

Staff who are eligible to prepare and administer injectable medicines must also have their competence reassessed every three years.

When a non-medical clinician first joins the Trust and they can provide necessary evidence of competence, they will be asked to complete the clinicalskills.net modules and if also administering IV must complete the IV refresher training. They will then have a once only assessment of competence completed in their clinical area.

Training for long IV lines and administration of parenteral nutrition must be undertaken prior to obtaining competency in the administration via long IV lines and the administration of parenteral nutrition.

If it is identified that a staff member is making errors with injectable medicines, then refresher training will be necessary for them to re-confirm competence.

For all routes of administration, staff must have relevant and up to date evidence of competency, a copy of which is kept in the personal file, which is reviewed at the staff members annual appraisal.

All staff who are authorised to administer injectable medicines must be:

- Aware of their professional accountability.
- Aware of and have demonstrated a working knowledge of the Trust Medicines Policies
- Have knowledge of the present condition of the patient, and their medical, nursing, and pharmaceutical history.
- In possession of evidence of completion of the required training associated with injectable medicines administration.
- Assessed as competent to practice this technique.
- Able to understand the potential complications of the procedure.

All practitioners have the right to refuse to administer a drug if they have any concerns regarding the prescription, drug to be administered or the patient's condition. The practitioner must escalate their concern and seek advice from the medical team or clinical pharmacist.

Table 1: Non-medical staff authorised to prepare and administer injectable medicines and the training and competency requirements

Staff authorised to prepare and administer injectable medicines	Training and competency required
Administration of SC and IM injections	
Any practitioner who has injectable medicine administration as a recognised and documented element in their job role and scope of practice.	Competency in oral medicines administration Clinicalskills.net modules: Injectable medicines Aseptic technique MyAcademy module: Infection Prevention level 2 Complete the Non-IV administration competency workbook on My Academy
Ongoing competence requirements: Individual competency review - based on incident trends.	

Administration of IV medicines	
Any practitioner who has IV medicine administration as a recognised and documented element in their job role and scope of practice, including the role of the second checker.	All training included in the administration of SC and IM injections must be completed. If unable to gain competency in oral drug administration and/or SC/IM due to their role then the IV preparation course (face to face) training must be completed. Book Via MyAcademy There are 12 eLearning packages for IV Administration - the following are mandatory • IV Administration - Introduction to IV Therapy • IV Administration - Infection Prevention and Medication Administration • IV Administration - Legal, Professional and Ethical Aspects • IV Administration - Medication Errors • IV Administration - Pharmaceutical Aspects of Intravenous Medication • IV Administration - Safe Storage of Medications The number of additional packages required from the following list is dependent on the clinical area: • IV Administration - Acute Pain Management and Intravenous Therapies • IV Administration - Blood Transfusion IV Administration - Critical Medicines and Antimicrobial Stewardship • IV Administration - Intravenous Nutrition • IV Administration - Intravenous Longlines and Incident Reporting • IV Administration - Neonates and Paediatrics Relevant e-learning packages are detailed in the IV course document located directly on the training booking page on MyAcademy.

	Assessment: Complete the Trust IV Therapy Administration competency document and be signed off.
Ongoing competence requirements: e-learning update and refresher training – Every three years Plus Individual competency review - based on incident trends.	
Systemic Anti-Cancer Therapy (SACT)	
Any practitioner whose role involves the administration of SACT (all parenteral routes)	Nurses: UKONS SACT training via compasly (or have completed the SACT administration course) Pharmacy: BOPA SACT Passport Assessment: Observed administration, completed competency document in their clinical area and be fully signed off. Name on the register of nurses signed off to administer SACT Pharmacy: Accountable pharmacist sign off and added to list of approved pharmacists who can verify SACT prescriptions within the appropriate SOP
Ongoing competence requirements: Annual revalidation to demonstrate ongoing competence. Individual competency review - based on incident trends.	
Physician Associates (PAs)	
Physician Associates (PAs) receive training to administer injectable medicines as part of their university training and students have a competency package that includes preparing and administering IV, IM and SC medicines that is completed during their clinical placements. This training is captured by the completion of a clinical skills passport which is then assessed as part of the PA course curriculum. PAs that have successfully passed all university components can then be entered for the PA registration assessment (PARA), which is overseen by the Royal College of Physicians. PAs undertaking extended procedural skills not covered by the clinical skills passport must undergo formal simulation and theory sessions. They then undertake a period of directly supervised practice and are expected to complete clinical direct observation of procedural skills (DOPS) until deemed competent to perform procedures independently. This is documented in a portfolio of evidence which their clinical and developmental supervisors sign off.	

Ongoing competence – PAs must have an active portfolio of work and logbook of cases. These are reviewed during supervision guidance and at annual appraisal. Individual competency review must also be triggered based on incident trends.
Please refer to GOP03 – Group Physician Associate Governance Policy for additional detail.

Medical Staff

Medical staff receive training to administer injectable medicines whilst at medical school and through supervised practice during their foundation programme. Medical students have a competency package that includes preparing and administering IV, IM and SC medicines that is completed during their hospital placements.

Medical staff must be assessed as competent by another competent individual before they may administer injectable medicines unsupervised. Ensuring this is completed is the responsibility of the individual doctor who is also responsible for maintaining records of their training and competency assessment.

Beyond foundation training, medical staff undertake additional, role-specific training, supervised practice and competency assessments.

Medical Staff involved in SACT prescribing must also complete the scope of practice for chemotherapy document (FM-7) held within the directorate quality management system, staff must be assessed as competent by another competent individual be named on the register of clinicians approved to prescribe SACT.

The chemotherapy registers can be found here.

4.2 Indications for injectable medicines:

Injectable medicines are indicated in the following circumstances:

- To maintain fluid/electrolyte balance in patients unable to take fluids by mouth.
- To achieve high and predictable drug levels e.g. antibiotics in life threatening infections.
- For patients whose gastrointestinal tract must be rested e.g. patients with non-functioning or inadequately functioning gastrointestinal tracts or following gastrointestinal surgery.
- For patients who cannot tolerate medicines via the oral route e.g. if vomiting or unconscious.
- When the drug is broken down in, or not absorbed from, the gastrointestinal tract e.g. insulin.
- When the drug is not available in an oral formulation.
- When a rapid response is required

4.3 Routes of administration

Injectable medicines can be given via a variety of methods. The choice may depend on the pharmaceutical properties of the drug, clinical condition of the patient, desired therapeutic outcome and the type of venous access the patient has. Appendix 1 provides more information

4.4 Prescribing injectable medicines

Medicines must only be prescribed by injection when other routes of administration

have been excluded. The use of the injectable route should be subject to regular review and switched to oral, or another suitable alternative route, as soon as clinically appropriate.

SACT medicines can only be prescribed by practitioners who have demonstrated competencies and are on the Directorate's SACT prescribing register.

Medicines for injectable administration must be prescribed in accordance with MP01, the Trust Medicines Policy. Additionally non-medical prescribers must also prescribe in accordance with MP07, the Trust Non- Medical Prescribing Policy.

In addition to the minimum information required on all prescriptions described in MP01, all prescriptions for injectable medicines must also specify the following:

- Age (if under 16)
- Rate of administration
  - For bolus injections state the duration the dose is to be administered over
  - For infusions state the duration the dose is to be administered over and/or the infusion rate
- Patients weight
  - Where the medicine is prescribed based on weight for adults
  - For all paediatric and neonatal patients
- If an intravenous drug is to be titrated, the minimum and the maximum dose, frequency of dosing, plus any relevant clinical parameters for determining doses.

Where relevant, the prescription, or a readily available local protocol, must specify the following:

- Brand name and formulation of the medicine.
- Concentration or total quantity of medicine in the final infusion container or syringe.
- When prescribing insulin the word "units" must be written in full to avoid any dose confusion.
- Name and volume of diluent and/or infusion fluid.
- Stability information to determine the expiry date of the final product.
- Type of rate-control pump or device(s) to be used.
- Date on which treatment should be reviewed.
- Arrangements for fluid balance or clinical monitoring should be made on an individual patient basis and according to local protocol and clinical need.

The prescriber must ensure that the medicine is suitable for the injectable route and that the patient has appropriate access available.

All injectable medicines must be prescribed within ePMA, or on a Trust approved prescription chart. These medicines must be regularly reviewed and prescribed in a timely manner to prevent unintended discontinuation of therapy.

When more than one prescription chart is in use it is essential that they are cross-referenced so practitioners are aware of all prescribed medicines. These may include (but are not limited to):

- ChemoCare (Cancer ePMA system) for SACT
- Fluid chart
- Insulin prescription chart, including sliding scale
- Parenteral nutrition prescription

The Trust uses the online Medusa Injectable Medicines Guide and on line BNF as easily accessible on line resources for injectable medicines. Also refer to the Summary of product Characteristics (SPC) within the packaging or available online via www.medicines.org.uk

Dosing protocols for some injectable medicines can be found on the Trust intranet under Strategies and Policies > Clinical Policies, Procedures, Guidelines > Guidelines.

4.5 Sodium Chloride 0.9% Flushes

The administration of an intravenous flush is a routine task associated with the care of patients who have an intravenous access device. The most common fluid administered as an IV flush is sodium chloride 0.9%. Sodium chloride 0.9% ampoules, vials and bags are classified as Prescription Only Medicines (POMs). Legislation and MP01, the Trust Medicines Policy, stipulates that all POMs must be prescribed and their administration recorded. The Trust Medicines Management Group (MMG) reviewed this approach in relation to intravenous flushes of sodium chloride 0.9%; practice in other hospitals and relative risk to patients of not receiving an intravenous flush. The MMG determined that it would be accepted practice within the Trust for intravenous flushes of sodium chloride 0.9% to be administered without a prescription or administration record being made as part of the routine care of patients who require IV fluids/medicines to be administered via an intravenous access device, this includes:

- On insertion of an intravenous access device to ensure patency.
- At specified intervals in patients with an intravenous access device to maintain patency.
- Before and / or after the administration of an IV medicine via the intravenous access device.
- During the administration of multiple IV medicines.

Therefore, the process of not prescribing or recording the administration of an intravenous flush of sodium chloride 0.9% is an authorised exemption to the normal practice for all other POMs. The following applies:

- Intravenous flushes of sodium chloride 0.9% for adult patients do not require to be prescribed nor the administration recorded.
- Intravenous flushes of sodium chloride 0.9% for paediatric patients do not require to be prescribed but a record of the volume administered should be recorded.
- The exemption does not apply to neonates.

The recording of the administration of the IV medicine by the nurse or other healthcare professional on ePMA or the paper prescription chart also signifies the administration of the intravenous flush of sodium chloride 0.9%.

Non-registered staff e.g. Healthcare Support Workers, student nurses and Phlebotomists who have undergone training and who are assessed as competent may only administer a pre-filled UKCA approved sodium chloride 0.9% medical device flush as part of the peripheral cannula insertion process.

Non registered staff within the IV team who are trained and competent may also flush long peripheral vascular access devices including PICC lines, Mid-lines and short term mid-lines in cases where occlusion is suspected using a pre-filled UKCA approved sodium chloride 0.9% medical device flush.

Some pre-filled syringes of sodium chloride 0.9% intended to be used as intravenous flushes are registered medical devices with a UKCA mark (e.g. some pre-filled syringes). These are preferred as they are a pre-filled device and therefore associated with a lower risk to the patient. The same prescription exemptions apply.

4.6 Preparation of Injectable Medicines

The preparation and administration of injectable medicines should be undertaken only by registered healthcare professionals who have undergone the necessary training and are deemed competent. Exceptions to this are stated below:

- Student nurses are permitted to undertake the process when under the direct supervision from a registered nurse. In this situation, for intravenous administration, a second independent check is still required from another suitably trained and competent healthcare professional.
- Healthcare Support Workers working in Adult Community Services who have undergone training and competency assessment are permitted to administer subcutaneous insulin and low molecular weight heparin in prefilled syringes for the purpose of VTE prophylaxis (the dose must be a full syringe), and subcutaneous insulin in prefilled syringes when prescribed for type 2 diabetes.

To be authorised under these exemptions, non-registered staff must have completed the same training for non-medical staff in table 1.

Non-registered staff must not routinely prepare injectable medicines. Exceptions are stated above.

If medicines are drawn up and labelled in a theatre setting ideally this is done by the person who will administer them. Where this is not possible and when a practitioner requires that a medicine be drawn up on their behalf e.g. when working in a sterile field, these medicines must be:

- Checked with the requesting practitioner before they are opened.
- Drawn up in the presence of the requesting practitioner.
- The following checked by the requesting practitioner before administration: medicine, route of administration, diluent, dose, expiry date.

Preparation must only take place if there is a prescription, a patient group direction or other written instruction; and essential information is available about the product for safe preparation and administration.

Aseptic non touch technique (ANTT) must be used during all aspects of preparation of injectable medicines. Injectable medicines prepared in clinical areas should always be administered immediately after preparation. They should not be stored before use. Where available, ready-to-administer or ready-to-use products should be used to reduce the risk to patients.

Some medicines lose their potency or interact when solutions are mixed, medicines must not be mixed in infusion bags or bottles, or administered via the same cannula

or lumen of a central line unless it is certain there is no incompatibility, see section 4.9.

Most injectable medicines are licensed for “once only” use and should be used to prepare a single dose for an individual patient on one occasion. This includes bags of infusion fluid, which must not be used to reconstitute multiple doses.

Where a vial is labelled as multi-dose, it can only be used for individual patients. This is because even when licensed for multiple use, containers shared between patients, can act as a vector in the transmission of infection. If a multi-dose vial is to be used for multiple patients a risk assessment must be in place that has MMG approval (e.g. Covid-19 vaccine administration). MMG approval must be recorded in the MMG minutes and communicated via directorate governance processes.

When being used multiple times for a single patient multi-dose vials must be labelled with the name of the patient, and the date of first use. These vials may contain sufficient material to enable their re-use, but it is essential to check the manufacturer’s recommendations, especially regarding storage and expiry after withdrawal of the initial dose, prior to any re-use. Each withdrawal of a drug dose must be made with a new sterile syringe and needle.

Multi-dose vials must have the rubber septum examined prior to use, and if there is evidence of coring (occasionally the rubber can be removed when the needle is inserted, this is coring), it should be discarded. If in doubt about the integrity of a multidose vial, all excess quantities of medicine must be disposed of and a new vial used.

No further additions are to be made to an infusion bag once an infusion has started or to a preparation provided in a ready to use form from the Pharmacy Aseptic Service.

No additions or further manipulations are to be made to parenteral nutrition solutions in clinical areas.

Injectable cytotoxic medicines must **not** be prepared at ward level. They must always be supplied from pharmacy in a ready to administer form (see section 4.23).

Preparation should take place in an area dedicated to this process. Adequate uncluttered surface space and clean trays for each patient must be available for drawing up, arranging and holding the syringes and drugs used in each procedure.

Where preparation is undertaken in clinical areas, the Injectable Medicines Guide (Medusa) drug monographs must be used to provide instructions for preparation and/or the Summary of Product Characteristics (SPC) found in the packaging.

All materials and equipment must be assembled before starting preparation, this includes: prescription chart and record of medicines previously given (electronic or paper record), medicine ampoule(s)/vial(s), diluent, infusion fluid, syringe(s), blunt needle(s)/ vial access devices, alcohol wipes, labels, clean re-usable plastic tray and a sharps bin for waste disposal, and where applicable; disposable protective gloves, goggles, apron.

When preparing infusions the number of additions to the infusion bag via the additive port should be kept to a minimum.

Clinicians who have received Trust recommended training and have demonstrated competence are permitted to personally add medicine to infusion fluids (where this service is not available from Pharmacy) in accordance with the prescription. The must be labelled in accordance with section 4.8. Compatibility must be checked prior to addition (see section 4.9)

Table 2 indicates the maximum fill additions which the Pharmaceutical Aseptic Service Group (PASG) recommends to be used by practitioners working in clinical areas without the need to know the specific limits for an individual bag brand. This information can be safely used for any infusion bag listed below:

- Baxter Viaflo
- Baxter Viaflex
- Macopharma Easyflex N
- Macopharma Macoflex
- Macopharma Macoflex N
- Fresenius Freeflex
- B Braun Ecoflac

Table 2 – PASG maximum fill additions to infusion bags for doses prepared in clinical areas

Bag size (mL)	Maximum additional volume to be added to the infusion bag (mL)
50	15
100	25
150	25
250	50
500	100
1000	100

Pharmacy aseptic units have access to detailed information for these containers and therefore may apply higher fill volumes when compounding aseptically prepared products.

4.7 Second independent check

The injectable medicines that require a second independent check are:

- SACT
- Insulin
- Schedule 1,2 and 3 Controlled Drugs
- All medicines/fluids to be administered via the intravenous route
- Subcutaneous syringe drivers for palliative care patients where it requires the mixing of two or more drugs
- Complex manipulation (i.e. has 5 or more defined steps)
- Medicines where a complex calculation is required (i.e. one with more than one step)
- Where an automated device is used to administer the medicine
- Where the Injectable Medicines Guide (Medusa) indicates a high level of risk (NPSA risk rating of 6 or above)
- Neonates and paediatric departments

The only exceptions to the above are:

- When working as a lone worker in a patient's home.
- In the theatre environment if the patient is at risk if the drug is not administered in a timely fashion.
- In an emergency where a patient is at risk of being harmed if administration of the medicine is delayed.
- Where a risk assessment has been approved by the MMG.

In these situations, the practitioner must self- check all medicines prior to administration.

Where a risk assessment has been approved a copy signed by the MMG chairperson must be held within the department for reference.

Persons authorised to provide a second check are:
Any registered healthcare professional who has the requirement of undertaking the second check of an injectable medicine as a recognised and documented element in their job role and scope of practice. Non-medical staff who have undertaken the Trusts injectable medicines training and be authorised as competent to undertake this task (see Table 1). This authorisation must be documented in their staff training records.

The second checker is responsible for witnessing that the correct preparation and administration process is adhered to, and that the administering practitioner administers/commences the medicine to the correct patient. As such the checker must accompany the administering practitioner to the patient. The role of the administrator and checker are of equal importance and responsibility during the process of injectable drug administration.

Prior to preparing the medicine, both practitioners must independently check any calculations required on the prescription.

For each medicine container, diluent, infusion fluid and item of equipment to be used the following must be checked by both practitioners:

- Expiry dates of all products used in the preparation
- Damage to containers, vials or packaging
- Infusion containers must be checked for particulate matter
- Storage is as recommended (e.g. in the refrigerator)
- That the formulation, dose, diluent, infusion fluid, route and rate of administration correspond to the prescription and product information
- That the patient has no known allergy to the medicine
- That you understand the method of preparation. There should be sufficient information available for you to prepare the product.

Where injectable medicines are double checked both must sign the administration record. The ePMA system will request the password of the checker. On paper prescription charts the administration box should be divided in two and the person administering the drug should sign in the top half and the checker should sign in the bottom half.

4.8 Labelling Injection and Infusion Containers

All injectable products, including flushes, syringes and infusions, must be labelled

immediately after preparation by the person who prepared them.

All injectable medicines prepared by the pharmacy aseptic unit and supplied in a ready to use form will be labelled appropriately and will not require additional labels to be added in clinical areas.

Only approved IV additive labels are to be used on injectable medicines prepared in clinical areas. These should be applied to the front of the infusion bag or the barrel of a syringe.

When labelling syringes care should be taken to ensure that volume graduations on small syringes are not obscured. The label must contain the following information:

- Name of the medicine
- Strength
- Route of administration
- Diluent and final volume
- Patient's name
- Date and the time the injectable medicine was prepared
- Expiry date and time
- Name of the practitioners preparing and checking the medicine

The only exception to these labelling requirements is for syringes intended for immediate bolus (push) administration, where preparation and administration is one uninterrupted process, and the unlabelled product does not leave the hands of the person who prepared it. In this case only one unlabelled medicine must be handled at one time.

If preparing two injections for administration at the same time, then the syringes must be appropriately labelled. No operator should be in possession of more than one unlabelled syringe at any one time.

Medicines and fluids used in the theatre setting must be readily identifiable at all times during the procedure, pre-labelled empty syringes and unlabelled or poorly labelled presentations are unsafe and must be immediately discarded.

4.9 Stability and Compatibility

All injectable medicines prepared in clinical areas must be administered ***immediately (within 30 minutes)*** after preparation. Injectable medicines must not be prepared in advance and/or stored before use and/or left unattended.

The duration of administration of any infusion prepared in clinical areas must not exceed the documented stability of the medicine (refer to established reference sources e.g. Medusa or the Summary of Product Characteristics) and must never be longer than 24 hours. In exceptional circumstances where an infusion from a single container is intended to continue for more than 24 hours, a risk assessment must be undertaken by the clinical area and approved by the MMG. Every effort should be made to source and use a ready-to-administer product.

The mixing of medicines is defined as 'the combination of two or more medicinal products together for the purposes of administering them to meet the needs of a particular patient'. This includes the administration of more than one injectable medicine where mixing takes place at a 'Y' site but does not include mixing where one product is a vehicle for the other.

Compounding and mixing of medicines should, wherever possible, be carried out in the Pharmacy Aseptic Unit.

Additions must not be made to the following infusions and these infusions should always be infused separately:

- Parenteral nutrition solutions
- Sodium bicarbonate infusions
- Phosphate preparations
- Blood components
- Plasma substitutes e.g. artificial volume expanders and gelatins.

It is best practice to use a single lumen of an intravenous cannula to administer each medicine, which is then flushed between administration. However, it is accepted that this may not always be possible.

All medicine mixtures should be checked for signs of incompatibility, for example cloudiness, change in colour, haze or formation of precipitate. Compatibility with diluent, infusion fluid, other medicines and administration devices should be confirmed with the electronic Injectable Medicines Guide (Medusa). This is available via the Trust intranet.

Some medicines lose their potency or interact when solutions are mixed. Medicines must not be mixed in infusion bags or bottles or administered via the same cannula or lumen of a central line unless it is certain there is no incompatibility.

In general, compatibility information relates to two-drug combinations – additions of three or more medicines cannot usually be guaranteed to be compatible but may be acceptable on the basis of established use.

If two or more additives are prescribed for use within one infusion fluid, it is essential that the stability and compatibility are checked by reference to any of the sources of information below before proceeding, these include:

- Electronic Injectable Medicines Guide (Medusa). This is available via the Trust intranet.
- British National Formulary (BNF) – Guidance on intravenous infusions
- British National Formulary for Children (BNFC) – Guidance on intravenous infusions
- Product package insert for the injectable medicine
- Summary of Product Characteristics (SmPC) – available on electronic medicines compendium
- Palliative Care Formulary http://www.pallativedrugs.com
- Contacting the ward pharmacist or medicines information service
- Trust approved guidelines

The Pharmacy Aseptic Service can prepare products with longer dated shelf lives in the validated cleanrooms. In these instances, the Accountable Pharmacist is responsible for assuring the stability of the products. The final volume on the prescription for products prepared by pharmacy aseptics may be amended by the aseptic pharmacist to maximise shelf life.

4.10 Administration of Intravenous Medicines

Staff permitted to administer injectable medicines and who have met the training and competency requirements set out in section 4.1 may administer injectable medicines subject to the following conditions:

- They are satisfied that they are giving the correct medicine via the correct route at the correct rate/dose/diluent/volume. If there is **any doubt,** the prescriber or a pharmacist must be contacted before the dose is given.
- They have a current prescription, or Patient Group Direction.
- They have an appropriately prepared and labelled injectable medicine and are satisfied that the appropriate checks have been performed on the injectable medicine in accordance with this policy
- Aseptic non touch technique (ANTT) has been used during all aspects of preparation and for administration.

Under no circumstances must any practitioner administer an injectable medicine that has been prepared by another practitioner unless they have witnessed the preparation themselves.

Central Line Administration

If administering a medicine via a central line the practitioner must be trained and competent in the administration of intravenous medicines via a central line. Evidence of training and competence must be held in the practitioner's personal file.

It is recommended good practice that administration of a drug via an infusion into a central line is undertaken through an appropriate medical device (4.17), of which the user has received the appropriate training.

When administering a medicine via a central line:

- medicines must not be added to any fluids already being infused.
- medicines must not be administered by the same lumen as parenteral nutrition is administered.

Anaesthetic Practice

In conjunction with this policy, MP12 Attachment 5: Guidelines for safe intravenous drug management in anaesthetic practice must be followed.

4.11 Before Administration

Before administration of an injectable medicine check all the following is clear and correct on the prescription:

- Patient's name and date of birth
- Prescriber's signature
- Approved name of the medicine
- Dose and frequency of administration
- Date and route of administration
- Rate of administration: bolus **or** infusion indicated by duration and/or rate
- Allergy status of patient
- Weight (when dose is based on patient weight and paediatrics)

Also check, where relevant:

- Brand name and formulation of the medicine

- Concentration or total quantity of medicine in the final infusion container or syringe
- Name and volume of the diluent and/or infusion fluid
- Stability information to determine the expiry date of the final product
- Type of rate-control pump or device(s) to be used
- Date and/or time on which treatment should be reviewed

Check that the medicine is due for administration at that time and has not already been given. Remember to check paper prescription charts and ePMA when both are in use or a patient has moved between areas e.g. Theatres and wards, ED and wards.

Check that the prepared product shows no signs of defect such as incorrect clarity (incorrect colour, opaqueness, crystallisation), contamination such as particulates

Check that an appropriate access device is in place. Flush the device immediately before and after the administration of a medicine and between doses of different medicines administered consecutively.

4.12 During administration

Infusions must be monitored to ensure safe administration of prescribed treatment. For infusions containing ACTIVE MEDICINES (anything that is not a simple infusion fluid) the patient, cannula and infusion site, the administration set, and the infusion pump or device must be monitored on an hourly basis. Simple infusion fluids should be monitored as clinically appropriate for the patient.

4.13 After administration

After completion of an intravenous infusion or injection, flush the access device as per the clinicalskills.net process.

Ask the patient/carer to report promptly any redness, local inflammation or soreness at the injection site or discomfort of any sort.

The person administering the injectable medicine must personally record administration on the prescription chart as soon as possible after the event. Continuous or long infusions require a record of administration at the start and the end of the infusion.

Once the injection has been administered or an infusion is commenced, discard the empty ampoules/vials from which the injection was prepared and any unused medicine.

Re-check the administration site for signs of leakage, infection or inflammation and continue to monitor the patient, contents of the infusion container and the rate of infusion.

Once disconnected, infusions must not be reconnected. If an infusion is disconnected before it is completed it must be discarded and a new infusion prepared.

For all injectable medicines being administered intravenously consider the

extravasation risk. Appropriate precautions and monitoring of the injection site should be taken. Refer to CP4 – management of extravasation injury.

4.14 Untoward Intravenous Incident

If an intravenous injection/infusion is not administered, or administration is terminated due to extravasation, adverse reaction, change in clarity or contamination of the infusion mixture, the following actions must be taken:

- The infusion must be stopped, and a medical practitioner informed, who should confirm and record any clinical and other signs exhibited by the patient.
- The manager in charge of the ward/department must be informed, who must ensure that a record is prepared of all the relevant details of the incident on a Trust Clinical Incident Report Form and that the patient is informed
- If the infusion is stopped due to extravasation the medical practitioner must implement a plan to minimise harm. Additional monitoring of the site must be undertaken.
- If it is suspected that the incident is caused by a defective medicinal product, the manager or the practitioner will stop any suspect infusions immediately, unless specifically instructed not to do by a responsible medical practitioner acting on clinical grounds. The whole of the batch must be kept in quarantine at ward/department level or in a community base pending removal by a member of the pharmacy team. No other staff may remove suspected batches of defective medicines from wards or departments. A yellow card report must be submitted.
  The Clinical Director of Pharmacy (or deputy) must be informed as soon as practicable and must receive a copy of the incident form.
- It must be emphasised that on no account should any suspect solutions be destroyed or otherwise disposed of. Any suspect solution, containers, and accessories must be labelled and retained to facilitate the recall of any similar suspect solutions on a district, regional or nation-wide basis, if this is considered necessary following pharmaceutical analysis. Any replacement infusion must be from another batch using a replacement giving set.
- In the event of an incident, the MP04 Management of Medication Incidents Policy must be followed. Identified incidents must be recorded in the patient's notes and, if relevant, in the personal file for the practitioner(s) concerned. An incident may highlight the need for further education, training, or supervision, and such initiatives must be organised by the appropriate manager for the practitioner(s) concerned where so identified.

4.15 Waste Disposal

All departments must follow Trust Policy HS01, HS03 and HS10

4.16 Open procedures

Injectable medicines must not be decanted or exposed to open procedures during reconstitution, dilution and preparation through to administration to patients. The use of gallipots and other types of open containers is not allowed.

This applies to preparation of injectable medicines in any clinical area and Pharmacy Aseptic Services unit.

The only permitted exception is embolization procedures involving embolic agents that need to be prepared openly.

By definition, a closed procedure is a procedure where a sterile medicinal product is prepared by transferring sterile ingredients or solutions to a pre-sterilised sealed container, either directly or using a sterile transfer device, without exposing the solution to the external environment.

The use of a solution from a sealed ampoule can be regarded as a closed procedure when a single withdrawal is made from the ampoule, immediately after opening, using a sterile syringe and needle or equivalent sterile device.

4.17 Infusion Devices

All infusion devices must be approved for use by the Clinical Engineering Department. All medicines to be used in infusion devices must be approved by Pharmacy.

Infusion devices should be labelled for the intended use and have security and safety features such as locks and pass codes.

Verification of each medicine line must include; drug concentration, default rate, hard and soft limits, bolus administration limits if appropriate and additional advisories.

See MP12 Procedure 1 – Infusion devices “smart” pump drug library verification procedure (attachment 1)

4.18 Risk Assessment of Injectable Medicines

All injectable medicines that are NOT in a ready to administer form must have a risk rating. This includes medicines that require reconstitution and/or dilution.

Risk ratings are available for injectable medicines in the online Injectable Medicines Guide (Medusa).

Where the medicine risk rating is included in Medusa, the Trust will adopt the risk rating listed in the monograph.

If the medicine is high risk in Medusa or not included in Medusa a Specialist Pharmacy Service (SPS) risk assessment tool: Preparation of injectable medicines must be completed (Appendix 2). It is the responsibility of the Pharmacy Procurement team to ensure this is done before a product is purchased, they will be supported by the Specialist Pharmacist and Medicines Safety team.

The SPS has also provided information on risk factors to consider which can be found here (a log in may be needed).

All medicines rated as high risk must have an individual Trust risk assessment completed with mitigating actions documented to minimise risk. The SPS risk assessment tool and Trust risk assessment must then be submitted to Trust MMG

for approval. The MMG will maintain a list of approved High Risk medicines on the pharmacy page of the intranet.

New injectable medicines which are introduced for use within the Trust through the MMG Formulary application process must have a risk rating with any supporting mitigation before the submission is made.

Injectable cytotoxics and parenteral nutrition must always be supplied as ready-to-administer products to clinical areas.

High Risk injectable medicines approved by MMG should be reviewed by the department using it every 3 years, or sooner if anything changes.

4.19 Strong potassium

Concentrated potassium is defined as 10%, 15% and 20% solutions of potassium chloride, and solutions of potassium hydrogen phosphate and potassium dihydrogen phosphate, in ampoules and vials. Although not in the NPSA alert, the Trust considers Addiphos which contains 1.5g in 20ml as strong potassium under this procedure. Please follow MP12 Procedure 3 (attachment 3) – Handling Strong Potassium Chloride injections in clinical departments.

4.20 High Strength Midazolam

The storage of high strength midazolam (5mg/mL in 2mL and 10mL ampoules or 2mg/mL in 5mL ampoules) is restricted to specifically approved locations such as general anaesthesia, intensive care, palliative medicine and clinical areas where its use is essential. A risk assessment must be in place for all areas where high strength midazolam is kept.

In all other clinical areas only low strength midazolam (1mg/mL in 2mL or 5mL ampoules) should be stored and used.

By exception clinical areas can be approved by pharmacy to keep both high and low strength midazolam. A local risk assessment and risk reduction processes must be in place to prevent selection of the incorrect strength.

4.21 Storage of Epidural infusions

Epidural infusions must be stored in separate locked cupboards or refrigerators and clearly differentiated from those holding intravenous and other types of infusions. They must have clear signage stating “For Epidural Use Only”.
All epidurals also have to be clearly labelled with ‘For Epidural Use Only’. They must have dedicated infusion devices and must be in a ready to administer product. Refer to the relevant epidural protocol.

4.22 Sodium Chloride 0.18% with Glucose 4% infusion in areas that treat children

Sodium chloride 0.18% with glucose 4% intravenous infusion must not be stocked for general use in areas that treat children. General stock of this intravenous infusion is restricted to critical care and specialist wards such as renal, liver, and cardiac units.

4.23 Pharmacy Aseptic Services

The Pharmacy Aseptic Service provides ready to use injectable medicines for use in clinical areas, thereby removing the risk of local preparation of these, often high risk, injectable medicines.

Pharmacy staff preparing injectable medicines within the Pharmacy Aseptic Unit must have undertaken the appropriate training programme and must undertake regular competency assessments as documented in the unit's local procedures

The service operates under the Section 10 exemption of the Medicines Act 1968, which allows pharmacists to prepare unlicensed medicines without a manufacturing licence. Medicines must be prepared against a prescription on a named patient basis. The service must adhere to Good Manufacturing Practice (GMP) and undergoes annual external quality audits.

All intravenous cytotoxic medicines and parenteral nutrition are supplied by Pharmacy. These preparations must never be prepared, or further additions made, outside of the Pharmacy Aseptic Service.

The opening times of the aseptic unit are:
Monday to Friday 08.45-17.00
Sunday 09.00-17.00

The core services provided are

- Chemotherapy
- Centralised Intravenous Additive Service
- Total parenteral nutrition
- Monoclonal antibodies/antivirals

The Aseptic Service must be contacted before any agreement is made to develop a service that may require their support, this includes growth of existing services and new services. This is because the workload and capacity must be strictly controlled to maintain patient and staff safety.

4.24 Incident reporting

All patient safety incidents must be reported and managed in accordance with the Risk Management and Patient Safety Reporting Policy, OP10. Medication incidents must also be managed in accordance with the Management of Medication incidents Policy, MP04.

The current list of "never events" regarding injectable medicines is:

- Mis-selection of a strong potassium solution
- Administration of medicine by the wrong route
- Overdose of insulin due to abbreviations or incorrect device
- Overdose of methotrexate for non-cancer treatment
- Mis-selection of high strength midazolam during conscious sedation

These must always be recorded and trended for investigation and quality purposes.

Any adverse drug reaction (ADR) associated with injectable medicines must be notified to medical staff immediately and a submission made to the yellow card reporting scheme.

5.0 Financial Risk Assessment

1	Does the implementation of this policy require any additional Capital resources	No
2	Does the implementation revenue resources of this policy require additional	No
3	Does the implementation of this policy require additional manpower	No
4	Does the implementation of this policy release any manpower costs through a change in practice	No
5	Are there additional staff training costs associated with implementing this policy which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments	

6.0 Equality Impact Assessment

Authors are required to complete an Equality Impact Assessment via the following link and issues identified from the assessment must be included here with a summary of redress action.

An equality analysis has been carried out and it indicates that:

Tick	Options
☑	A. There is no impact in relation to Personal Protected Characteristics as defined by the Equality Act 2010.
	B. There is some likely impact as identified in the equality analysis. Examples of issues identified, and the proposed actions include:

7.0 Maintenance

The Clinical Director of Pharmacy is responsible for keeping this policy up to date. Any revisions to the policy will be reviewed by the Trust's Medicines Management Group before being submitted through the Trust's policy approval procedure

8.0 Communication and Training

This policy will be published on the Trust Intranet and updates will be communicated through Trust-wide communications pertaining to policy updates.

Managers must ensure that all staff are briefed on its contents and on what it means for them.

9.0 Audit Process

In all areas where injectable medicines are used regular review of incidents, normally undertaken at directorate clinical governance, will guide the necessity for audit. The directorate may use the audit tools below to undertake assurance checks of compliance with policy and procedures.

The Medicine Safety Group reviews harm incidents. Based on the outcome of this review they may instruct a directorate to undertake an audit

Criterion	Lead	Monitoring method	Frequency	Committee
Directorate audit of injectable medicine practice	Clinical Director / Matron	safer use of injectable medicines Audit attachment 3	As required, based on incident trends	Directorate Governance and Trust Medicine Safety Group
Epidural audit	Clinical Director / Matron	Epidural Audit attachment 4	As required, based on incident trends	Directorate Governance and Trust Medicine Safety Group
High Risk Medicine Review	Pharmacy	Review of procurement data and high risk medicines risk assessments	Annually	Directorate Governance and Trust Medicine Safety Group
Injectable medicine risk assessment assurance check	Assistant Clinical Director of Pharmacy - Quality and Governance	Report on injectable medicines currently in use and risk assessment score in place	3 years	Trust Medicine Safety Group

10.0 References

1. Good practice in prescribing and managing medicines and devices - ethical guidance summary - GMC (gmc-uk.org)
2. Royal Pharmaceutical Society, A competency framework for all prescribers, September 2021 A Competency Framework for all Prescribers | RPS (rpharms.com)
3. Royal Pharmaceutical Society/ Royal College of Nursing, Professional Guidance on the administration of medicines in healthcare settings, January 2019
4. Royal Pharmaceutical Society, Professional guidance on the safe and secure handling of medicines, December 2018
5. NPSA. Patient Safety Alert 20. Exemplar standard operating procedure for prescribing, preparing and administering injectable medicines. March 2007.
6. NPSA. Patient Safety Alert 20. Promoting safer use of injectable medicines
7. NHS Improvement Patient Safety Alert. Restricted use of open systems for

injectable medication. September 2016. https://improvement.nhs.uk/documents/301/NHSI_Patient_Safety_Alert_-_Restricted_use_of_open_systems.pdf

8. NPSA Patient Safety Alert 2011/PSA001 Safer Spinal (Intrathecal), epidural and regional devices. [ARCHIVED CONTENT] Safer spinal (intrathecal), epidural and regional devices
9. NPSA Patient Safety Alert 2002/PSA001 Potassium solutions: risks to patients from errors occurring during intravenous administration [ARCHIVED CONTENT] Potassium solutions: risks to patients from errors occurring during intravenous administration (nationalarchives.gov.uk)
10. Royal College of Nursing (RCN) (2016) 4th edition Standards for Infusion Therapy. Royal College of Nursing, London. Standards for infusion therapy | Infection prevention and control | Royal College of Nursing (rcn.org.uk)
11. Clinicalskills.net
12. Quality Assurance of Aseptic Preparation Services. 5th edition. 2016 https://www.rpharms.com/recognition/setting-professional-standards/quality-assurance-of-aseptic- preparation-services .
13. NHS England – Never Events List 2018
14. Specialist Pharmacy Service SPS Risk factors: manipulation of injectable medicines

11.0 Part A - Document Control

To be completed when submitted to the appropriate committee for consideration/approval

Policy number and Policy version: **MP12 v1.0**	**Policy Title** **Injectable Medicines Policy**	**Status:** Final		**Author:** Assistant Director of Pharmacy **Chief Officer Sponsor:** Group Chief Medical Officer
Version / Amendment History	Version	Date	Author	Reason
	1.0	December 2025	Assistant Director of Pharmacy	New Policy, separating injectable medicines from MP01

Intended Recipients: All staff involved in the procurement, supply, prescribing, administration and monitoring of injectable medicines	
Consultation Group / Role Titles and Date: Medicines Management Group July 2026	
Name and date of Trust level group where reviewed	Trust Medicine management group March 2026 Group Policy Meeting Membership – April 2026 Executive Sponsor Approval – July 2026
Name and date of final approval committee	Trust Medicine management group March 2026 Group Policy Meeting Membership – April 2026 Executive Sponsor Approval – July 2026
Date of Policy issue	July 2026
Review Date and Frequency	July 2029
Training and Dissemination: Through Trust Brief and divisional communications	
Publishing Requirements: Can this document be published on the Trust's public page: **Yes**	
To be read in conjunction with: OP4, OP10, MP01, MP02,	
Initial Equality Impact Assessment (all policies): Completed Yes / No Full Equality Impact assessment (as required): Completed Yes / No / NA If you require this document in an alternative format e.g., larger print please contact Policy Administrator 8904	
Monitoring arrangements and Committee	Two-yearly audit by medicine safety group, reporting to medicine management group
Document summary/key issues covered. The Safe use of injectable medicines, Ensuring risk assessments are in place for all	

injectable medicines are used, that necessary training is completed by staff involved in the use of injectable medicines, to require local SOPs are in place for the handling of injectable medicines and the review compliance with the standards required from NPSA Alert 20.	
Key words for intranet searching purposes	Injectable medicines NPSA 20 Medicines
High Risk Policy? **Definition:** • Contains information in the public domain that may present additional risk to the public e.g. contains detailed images of means of strangulation. • References to individually identifiable cases. • References to commercially sensitive or confidential systems. If a policy is considered to be high risk it will be the responsibility of the author and chief officer sponsor to ensure it is redacted to the requestee.	**No** If Yes include the following sentence and relevant information in the Intended Recipients section above – In the event that this policy is made available to the public the following information should be redacted:

13.0 IMPLEMENTATION PLAN

To be completed when submitted to the appropriate committee for consideration/approval

Policy number and policy version MP12 V1	**Policy Title** **Injectable Medicines**	
Reviewing Group	MMG	**Date reviewed: March 2026**
Implementation lead: Print name and contact details		
Implementation Issue to be considered (add additional issues where necessary)	**Action Summary**	**Action lead / s (Timescale for completion)**
Strategy; **Consider** (if appropriate) 1. Development of a pocket guide of strategy aims for staff 2. Include responsibilities of staff in relation to strategy in pocket guide.	n/a	
Training; Consider 1. Mandatory training approval process 2. Completion of mandatory training form	n/a	
Development of Forms, leaflets etc; Consider 1. Any forms developed for use and retention within the clinical record **MUST** be approved by Health Records Group prior to roll out. 2. Type, quantity required, where they will be kept / accessed/stored when completed	n/a	
Strategy / Policy / Procedure communication; Consider 1. Key communication messages from the policy / procedure, who to and how?	Delivered via Trust Comms to staff Submitted to Divisional governance to distribute Shared with Clinical Directors and Heads of Nursing groups.	Nick Carre May/June 2026 once approved at policy group
Financial cost implementation Consider Business case development	n/a	
Other specific Policy issues / actions as required e.g. Risks of failure to implement, gaps or barriers to implementation		

MP 12 Appendix 1
Routes of Parenteral Administration

Injectable medicines can be given via a variety of methods outlined below. The choice may depend on the pharmaceutical properties of the drug, clinical condition of the patient, desired therapeutic outcome and the type of venous access the patient has.

IV bolus:
This method is used when a rapid response or high serum concentration is required. The drug and diluent are injected directly into the bloodstream via a peripheral cannula or a central venous catheter. *Giving sets used to administer bolus intravenous medication should be single use.*

Slow IV Bolus Injection
Most drugs that are given by slow IV bolus, need to be injected over a period of several minutes. If no specific information is available regarding the injection time, it is recommended that a slow bolus is given over no more than 5 minutes.

Rapid IV Bolus Injection
A very small number of drugs need to be given as a rapid intravenous bolus e.g. adenosine, and some radiological contrast injections. In these cases, the rapid injection should be followed by a rapid flush of a recommended flush solution that is compatible with the drug.

Practitioners should refer to product literature and / or the electronic injectable medicines guide, Medusa, available on the Trust Intranet, and use the recommended injection time.

IV infusion
Intermittent Intravenous Infusion
This refers to an infusion which is usually administered over a period of typically between 10 minutes and 2 hours but can be longer as a one-off or repeated at specific time intervals. It is used as an alternative to bolus administration for regular dosing, and when slow administration or greater dilution is required to avoid toxicity. *Giving sets used to administer intermittent intravenous medication should be single use and staff must ensure that any completed infusions are discarded immediately.*

Continuous IV Infusion
This is an infusion intended to be given, over a longer period, at a constant or variable rate. A continuous infusion is used where a consistent or controlled therapeutic response is required. It may also be used to permit greater dilution, than is usually possible with an intermittent infusion, and to avoid toxicity.

Continuous intravenous infusions e.g. infusion bags or syringes should be changed at least every **24hrs**. The start date and time should be clearly indicated on the IV additive labels provided.

In exceptional circumstances where an infusion from a single container is intended to continue for more than 24 hours, a formal risk assessment must be undertaken to determine the safest course of action.

Some giving sets can be used for a longer duration:
24 hours - for TPN, light sensitive drugs (Nimodipine), drugs with absorbency effects with syringes or lines (Actrapid) and lipids (Propofol)
72 hours - crystalloids, colloids, drugs in diluents (those not light sensitive, no absorbency effects to syringes or lines)

Volumes are variable and range from 50mL to 1000mL. Practitioners should refer to product literature and / or the electronic injectable medicines guide, Medusa, available on the Trust Intranet, and document the recommended infusion time.

Patient Controlled Analgesia (PCA)
A PCA infusion provides rapid pain relief when a quick response or high serum concentration is required. They can come in the form of bags and syringes. PCA administration is usually via a peripheral or central venous catheter, but in exceptional circumstances can be administered subcutaneously. PCA infusions are commonly used in the post-operative period. They allow patients to self-administer a bolus of analgesia, within specific limits defined by the prescriber.

All PCA infusions should be initiated in theatre by an anaesthetist however a trained practitioner can renew the syringe. Infusion rates must only be altered by an anaesthetist or a practitioner from the Acute Pain Service. There may be circumstances where a PCA is initiated in a non-theatre area, local procedures should be adhered to in this circumstance.

Intramuscular Route
Intramuscular injection is a less efficient method of parenteral administration than the intravenous route because:

- It has a slower onset of action (as the proportion of drug that enters the circulation quickly is less than with intravenous drugs).
- The proportion of drug that is absorbed is unreliable and often incomplete.

For some agents this will be a disadvantage e.g. antibiotics, but for others these characteristics are advantageous e.g. those which require a delayed onset of absorption, e.g. depot injections, vaccines.

The intramuscular route is easily accessible, particularly in situations where IV administration is not practical due to lack of access or in an uncooperative patient.

Intramuscular injections should be avoided, where possible, in patients treated with anticoagulant therapy (warfarin, Direct Oral Anticoagulants such as apixaban, unfractionated and low molecular weight heparin etc). Where an intramuscular injection is used in such patients there must be valid clinical reasons why no other route can be used.

Intramuscular injections should not be administered to those with thrombocytopenia or other bleeding disorders without specialist advice.

Intramuscular injection maybe the only option for drugs that cannot be formulated for intravenous administration.

Subcutaneous route
The subcutaneous route of administration is used for drugs which require a slower rate of absorption than achieved intravenously or intramuscularly. It also has the benefit of being a less painful site for injection and is suitable for administration of larger volume solutions by continuous infusion.

It is the favoured route to administer maintenance insulin therapy and for symptom management in palliative care. Suitable sites for injection include the lateral aspects of the upper arms and thighs, the abdomen in the umbilical region, the back and the lower loins. The preferred injection site may be defined within the technical product information.

Rotation of sites can decrease the likelihood of irritation and ensure improved absorption. It is good practice to document the site of administration on the patient's administration chart to facilitate this.

The minimum possible volume should be administered via subcutaneous injection to prevent irritation.

Intrathecal route (non-cytotoxic)
Preparation of intrathecal injections (non-cytotoxic only) is permitted in theatre and critical care areas; however, capacity allowing, preparation within the aseptic unit is preferred whenever the stability of the medicine allows. Where a preparation has been assessed during the approval process as being suitable for preparation within the clinical area, this preparation and administration must always be performed by or under the direct supervision of a consultant / specialist registrar who is competent in the technique.

The NPSA issued a Patient Safety Alert in 2011 (NPSA/2011/PSA001) which requires that all spinal (intrathecal) bolus doses and lumbar puncture samples are performed using syringes, needles and other devices with connectors that will not also connect with intravenous Luer connectors.

Intrathecal route (Cytotoxic)
See Trust Intrathecal Cytotoxic policy CP52 for specific management of intrathecal chemotherapy.

Epidural and Intrathecal Infusion
Refer to Trust epidural policies and procedures for full details:

An epidural infusion is an infusion that is given into the epidural space to provide pain relief, most frequently in the peri-operative period or during labour. Intrathecal infusions are given into the intrathecal space and are most frequently prescribed in

palliative care patients with severe pain.

The positioning of the epidural or intrathecal catheter will determine the extent of the nerve block.

Intra-operatively, an epidural infusion will be initiated in theatre by the anaesthetist or a designated anaesthetic assistant on instruction from the anaesthetist. All intrathecal infusions can only be initiated by an anaesthetist.

There must be close monitoring of the patient, appropriate to the clinical circumstances, throughout the period of continuous epidural or intrathecal analgesia.

A designated epidural or intrathecal pump must be used for all epidural or intrathecal infusions as appropriate. The pump must be clearly marked with the words “For epidural use only” or “For intrathecal use only” as relevant to the route.

A designated administration set and line must be used with yellow colouring to distinguish them from other administration lines.

Intra-arterial Route

This is an increasingly utilised, specialised therapeutic technique whereby an arterial catheter is placed in the appropriate artery. Most of these procedures are performed by interventional radiologists or cardiologists and performed entirely within the angiographic labs according to specific protocols.

Great care is needed when using the intra-arterial route as drugs given in this way may reach rapid, high concentrations in the blood, where there is potential for adverse reactions which may be severe.

Extracorporeal Drug Delivery

This is a specialised process usually undertaken by perfusionists. It involves the isolation of an area and using external mechanical systems to provide targeted treatment without affecting the whole body. It is also used to maintain blood supply to areas that have been isolated during surgery, e.g. heart bypass, and to eliminate drugs or toxins from the bloodstream e.g. haemodialysis.

Risk Assessment Tool: Preparation of Injectable Medicines

*****Before using the tool users please read the supporting information**
Assessing risks when reconstituting injectable medicines (SPS page)***

Name and strength of prepared medicinal product:
Hospital site:
Diluent:
Final volume:
Pre-preparation storage condition and expiry:
Date of assessment:
Bag, syringe, other (please specify):
Post preparation storage condition and expiry:

Risk Assessment Tool: Preparation of Injectable Medicines

*****Before using the tool users please read the supporting information Assessing risks when reconstituting injectable medicines (SPS page)*****

	Risk factors	Description of individual risks	Allocated score	Score if applicable
1	Therapeutic risk	There is a significant inherent risk of patient harm if the injectable medicine is not prepared and/or administered as intended. (see notes page 5)		**1**
2	High risk route of administration	Examples include intra-ocular, intrathecal, intracerebral, epidural, intraosseous etc.		**10**
	Use of a concentrate	Where further dilution after first reconstitution is essential for safe administration use, i.e. when slow iv injection of undiluted medicine is not appropriate and/or potentially harmful (see notes page 5)		3
4	Complex calculation	Any calculation with more than one step required for preparation and/or administration		**1**
5	Complex method	Complex preparation method - tick all in the list below that apply	**N/A**	**N/A**
5.1	Complex method	Greater than 5 non-touch aseptic manipulations		**1**
5.2	Complex method	Syringe-to-syringe transfer		**1**
5.3	Complex method	Use of a burette admin set		**1**
5.4	Complex method	Any other "open system" manipulations such as use of ampoules (higher risk of microbial contamination than vials)		**1**
5.5	Complex method	*Mandatory* removal of fluid from infusion container		**1**
5.6	Complex method	Preparation does not follow SmPC exactly e.g. use of an alternative diluent or method		**5**
5.7	Complex method	Multiple preparations needed to administer a single "dose" because the shelf-life of the infusion is shorter than 24 hours, or less than the expected duration of infusion		**1**
6	Reconstitution of powder in a vial	Where a dry powder must be reconstituted with a liquid solvent		**1**
7.1	Use of a part vial or ampoule, or use of more than one vial or ampoule	Part vial/ampoule		**1**
7.2	Use of a part vial or ampoule, or use of more than one vial or ampoule	2-4 vials/ampoules		**2**

7.3	Use of a part vial or ampoule, or use of more than one vial or ampoule	5-10 vials/ampoules		**4**
7.4	Use of a part vial or ampoule, or use of more than one vial or ampoule	11-20 vials/ampoules		**5**
8	Use of an infusion pump	Tick all that apply	**N/A**	**N/A**
8.1	Use of an infusion pump	All infusion pumps require some element of calculation and therefore have potential for error and should be included in the risk factors. However this potential risk is considered less significant than the risks associated with not using a pump when indicated.		**1**
8.2	Use of an infusion pump	Use of an elastomeric infusion device at near-body temperature		**2**
9	Use of any administration set or other device with which staff may not be familiar	Examples include: empty infusion bag, light protected, low adsorption, non-PVC administration set, set with non-standard in-line filter or air inlet		**1**

Add all risk scores together and determine total risk rating

Total risk score	

Risk Score less than 6	Low Risk: Proposed method/ arrangements have controlled the risks to acceptable levels and preparation can proceed as assessed once assigned actions are complete.	☐
Risk Score 6 to 8	Medium Risk: Proposed method/arrangements control some risks, but residual risks remain. Preparation may proceed as assessed after introduction of assigned actions. Additional mitigation should be considered where possible to further reduce these risks. Where the risk points come from multiple starting containers (i.e. vials), these cannot be mitigated in a clinical area, and preparation in pharmacy is recommended.	☐
Risk Score greater than 8	High Risk: Despite proposed method/arrangements, the risk remains high. To proceed with preparation the organisation must fully understand and accept the risks and must ensure that all proposed mitigations are implemented. Written justification must be documented and an entry in the organisation's risk register should be made. Regular review of the process is required to identify further risk reduction opportunities. Where the risk points come from multiple starting containers, use of elastomeric device at near body temperature and/or doesn't exactly follow the SmPC, these risks cannot be mitigated in a clinical area, and preparation in pharmacy is recommended.	☐

Risk assessment undertaken by: (appropriately experienced nurse/clinician and pharmacist)

Risk Assessment Tool: Preparation of Injectable Medicines

*****Before using the tool users please read the supporting information**
Assessing risks when reconstituting injectable medicines (SPS page)***

Pharmacist Name		**Clinician Name:**	
Signature		**Signature**	

The Royal Wolverhampton NHS Trust

MP 12 Procedure 1
Infusion devices “smart” pump drug library verification procedure

Contents

1.0 Procedure Statement (Purpose / Objectives of the Procedure)

This procedure covers the validation and assurance process for infusion devices drug library verification and drug error reporting at the Royal Wolverhampton NHS Trust. It is written to ensure safe and rational use of medicines within the Trust.

Background
Safe and effective administration of intravenous medicine includes managing the associated risks of formulation, rate administration and concentrations errors. “Smart” pumps, drug libraries and drug error reporting software can mitigate some of these errors via standardisation, placing administration limits and alerts and via data collection to monitor administration trends and ensure appropriate updates.

Infusion device smart pumps are in use on selected wards at the Royal Wolverhampton NHS Trust (RWT). These pumps have drug library software to enable a master list of intravenous medicines to be individually developed reflecting evidence based concentrations and administration rates. This master list can then be used to develop individual datasets for different specialties to reflect hospital guidelines and local practice.

The development of the drug library master list and the subsequent monitoring and adaptation requires coordinated work between pharmacists, clinicians and nurses.

2.0 Accountabilities

Medical Physics and Clinical engineering (MPCE) are responsible for:

- Managing inventory of smart pump devices.
- Managing the update of infusion devices to current data sets.
- Accessing infusion device reports at the discretion of the clinical team investigating incidents. Including but not limited to medication administration errors, medical device incidents and near miss events.

Pharmacy are responsible for:

- Providing input into this procedure through the consultation process and approving this procedure prior to the ratification process.
- Updating MP12 with any amendments to this procedure
- Monitoring rates and trends of missed doses and clinical incidents being reported which involve delayed and omitted doses of medicines as a result of the use of infusion devices.
- Recommending changes in practice because of drug incident reporting.

Nurse educators, working with medical device trainers, are responsible for:

- Ensuring staff are IV drug competent or staff are working under direct supervision in accordance with MP12.
- Becoming a link trainer to deliver training to staff in the clinical area.
- Ensuring staff have completed training to use the smart pump devices in use.
- Assessing staff competency using the smart pump devices in use every three years.
- Remaining updated with changes of software and upgrades to the smart pump devices in use.
- Managing a register of nurses trained to use the infusion device.
- Ensuring that a minimum of 75% of the nursing staff in the ward are trained in using the smart pump devices in use prior to the implementation of drug libraries in clinical practice.
- Ensuring 95% of the nursing staff are trained to use the smart pump devices in use after the implementation of drug libraries.

Nursing staff are responsible for:

- Completing the three yearly mandatory training for medical devices on My Academy.
- Accessing further training from the Education team as and when required.

The healthcare professional administering the medication must exercise professional accountability in the best interest of the patient and must always conform to the relevant Trust policies and procedures.

The healthcare professional or pharmacist must contact the prescriber, or deputy, in case of doubt about medicine-related issues. Healthcare professionals must contact a pharmacist if still in doubt.

A healthcare professional may legitimately refuse to administer a particular medicine if they have sufficient doubts about the safety or clinical appropriateness of doing so. In such cases, the consultant in charge of the patient must be directly involved in the resolution of such a dispute, involving the Clinical Director of Pharmacy if necessary

3.0 Procedure Details

3.1 Individual directorate data set verification and implementation

3.1.1 Verification of each medication line must include; drug concentration, default rate, hard and soft limits, bolus administration limits if appropriate and additional advisories.

3.1.2 Verification of each medication will initially be completed by the directorate working group

3.1.3 Each directorate should identify a working group including a pharmacist,

doctor and nurse to co-ordinate implementation of the individual directorate data sets. The names, job title and contact details of the individuals in each working group must be sent reviewed annually (Appendix 1).

3.1.4 Provide the proposed data set to MPCE for verification and update of the master list

3.1.5 Once the master list is verified, each directorate will build a dataset to include medicines that are relevant to their clinical area.

Example Individual data sets:

- B8 Cardiothoracic Ward
- B9 Integrated Critical Care Unit
- B10 Cardiac Theatres
- B14 Cardiology Ward
- B15 Catheter Suite
- B15 Day Case Ward

3.1.6 Once an individual dataset has been selected, reviewed and signed off by all members of the directorate working group, they are to be sent to MPCE. The infusion devices pharmacist will then submit to infusion device company for upload to a single testing device. The infusion device company will then notify the pharmacist when this upload has taken place, who will inform directorate working group of a testing period.

3.1.7 The drug library will be reviewed for accuracy and usability on the test device. At least two practitioners from the list below should do the review:

a. Directorate lead pharmacist
b. Nurse educator/nominated senior nurse for the directorate
c. Nominated clinician for directorate.

3.1.8 After review, the final approval documentation requires the signatures of the directorate lead pharmacist, nurse educator/nominated senior nurse for the directorate, and the nominated clinician for the directorate.

3.1.9 The final approval documentation must then be sent to the MPCE for onward submission to the infusion device company with an agreed timeframe with clinical engineering for upload to all devices within RWT

3.2 Amendment of master list drug lines and data sets

3.2.1 If an amendment to a drug line within the master list is required after implementation, a request form (Appendix 2) with rationale and changes requested will need to be completed by the directorate working group and sent to MPCE.

3.2.2 The infusion devices pharmacist will identify if the requested amendment impacts more than one directorate drug library and inform lead pharmacists for relevant directorates of the request.

3.2.3 Directorate lead pharmacists will take requests to their working groups for approval.

3.2.4 If the amendment is agreed by all directorates concerned and returned to the MPCE, the amendment can be submitted to the infusion device company for upload.

3.2.5 Alternatively, if an amendment to a drug line within a single data set or for a single care area is required a request form (see appendix 2) with rationale and changes requested will need to be completed by the directorate working group and sent to the MPCE.

3.2.6 The MPCE will then submit to the infusion device company for upload to a single test device.

3.2.7 After review by the requesting directorate working group, the final approval documentation requires the signatures of the directorate lead pharmacist, nurse educator/nominated senior nurse for the directorate, and the nominated clinician for the directorate.

3.2.8 Final approval documentation to be sent to directorate pharmacist for onward submission to the smart device company with an agreed timeframe with MPCE for upload to all devices within RWT (see update process).

3.2.9 For example, if the Cardiology team wanted to increase the hard limit on the Actrapid regimen, then this would need to be escalated to the named pharmacists on each dataset with Actrapid built in, as well as the infusion devices pharmacist in charge of the master list to plan any required changes.

3.2.10 Alternatively, if the cath lab request change in limits to Tirofiban, because it is only used in the cath lab, this would be made on single dataset and not require escalation to named pharmacists on each dataset.

3.3 Additions to master list and data sets

Addition of new drug lines to the library will require a request to the infusion devices pharmacist using the same process as amendments (Appendix 2).

3.4 Training records

3.4.1 Nurse educators for the clinical area or department, will be responsible for ensuring staff under their remit will be trained to use the smart pump devices in use. Nurse educators will ensure a minimum of 75% of nurses are trained to use these infusion devices prior to go live date.

3.4.2 A record of trained individuals will be kept with nurse educators and sent to the medical devices training team once 75% threshold achieved.

3.4.3 New starter nursing staff will undertake infusion devices training including use of drug library as part of routine induction.

4.0 Update process

4.1.1 MPCE, nurse educators and the infusion devices pharmacist will work together to co-ordinate time of uploads to infusion devices.

4.1.2 Once an update has been submitted to the infusion device company by

MPCE, a timeline for implementation should be agreed by MPCE, nurse educators, the infusion device company and pharmacy.

4.1.3 Once implementation date is confirmed MPCE will receive a zip file from the infusion device company and a copy of the Drug Library Manager sign off form from the directorate working group.

4.1.4 MPCE will then be responsible for each infusion device downloading the most up to date dataset (containing the most up-to-date drug library) within 10 days of the pre-agreed go-live dates.

a. All devices plugged into a power source or in standby will receive these updates immediately.
b. All infusion devices in use will install the update at the next on/off cycle.

4.1.5 MPCE will be responsible for keeping track of inventory over this period and ensuring any devices not plugged into a power source are located and updated within the 10 day implementation period.

4.1.6 Ongoing drug library evolvement will be through a maximum of quarterly uploads to allow for trends in usage to develop and to provide a comprehensive list of drugs with limits.

4.1.7 MPCE will report on progress for any new upload and report and track any pumps that have not been updated. They will work with directorates to identify these pumps and communicate with the teams that they must not be used until the upload has been completed.

5.0 Out of date drug library on a pump

5.1.1 If a pump is found to have an out of date drug library HS11 protocol 6 must be followed by:

- Quarantining the pump
- Notify MPCE
- Do not use the pump until authorised by MPCE

6.0 Equipment Required

To fulfil the requirements of the standard operating procedure, staff require the following:

- Access to the smart pump devices in use.

7.0 Training

New starter nursing staff will undertake infusion devices training including use of drug library as part of routine induction.

Nurse educators for the clinical area or department, will be responsible for ensuring staff under their remit will be trained to use the infusion smart pump devices.

8.0 Financial Risk Assessment

1	Does the implementation of this document require any additional Capital resources	No
2	Does the implementation of this document require additional revenue resources	No
3	Does the implementation of this document require additional manpower	No
4	Does the implementation of this document release any manpower costs through a change in practice	No
5	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programs or allocated training times for staff.	No
	Other comments	

9.0 Equality Impact Assessment

Refer to MP12

10.0 Maintenance

The standard operating procedure will be the responsibility of The Critical Care Pharmacy team and Medical Physics & Clinical Engineering – Section Head for the Heart and Lung Centre. It will be reviewed in line with Trust Policy OP01 every 3 years or following any significant changes

11.0 Communication and Training

Communications regarding guideline update will be sent to the Medication Safety Group, Critical Care Education Team and the Cardiology, Cardiothoracic and ICCU Governance Meetings for dissemination to the wider clinical team.

12.0 Audit Process

The Clinical Director of Pharmacy and Medicines Optimisation has overall responsibility for the update and maintenance of this procedure. Review to be undertaken every three years via the governance process.

Criterion	Lead	Monitoring method	Frequency	Evaluation

1. 95% of the nursing staff are trained to use the smart pump devices in use after the implementation of drug libraries	Nurse educators for clinical area	Data collection from register of IV competent nurses and medical devices induction register	Annually	Report
2. Missed doses and clinical incidents being reported which involve delayed and omitted doses of medicines as a result of the use of infusion devices	Pharmacy team	Data collection from incident reporting (Datix) register	Annually	Report

Appendix 1

Directorate working group:

Directorate:				
Name	**Job title**	**Email**	**Extension**	**Lead (Tick)**

Appendix 2

New Medicines and changes to the master list and dataset

Ward/department area:

Summary of change and Rationale:

Drug name	Clinical Advisory	Infusomat/ Perfusor	Conc	Default rate	Hard limit min	Soft Alert min	Soft Alert max	Hard limit max

Manual Bolus	Programmed Bolus									
	Bolus amount					Duration				
Yes/ No	Default (if applicable)	Hard limit min	Soft Alert min	Soft Alert max	Hard limit max	Default (if applicable)	Hard limit min	Soft Alert min	Soft Alert max	Hard limit max

Has it been confirmed with the directorate working group Y / N
Will this affect other directorate data sets: Y / N

Step 1. Requesting directorate

Print Name	Signature

Step 2. Other directorate approval if applicable

Directorate	Name	Signature

Step 3. Directorate working group Lead signature ……

Step 4. Test device checked by Name…… Signature……. Date……

Part A - Document Control

Procedure/ number and version MP12 Procedure 001 Version 1.0	**Title of Procedure** Infusion Devices Smart Pump Library Verification Procedure		**Status:** Final	**Author: Jane Lewis**
Version / Amendment History	Version	Date	Author	Reason
	1	3/11/25	Assistant Director of Pharmacy	New procedure
Intended Recipients:				
Consultation Group / Role Titles and Date:				
Name and date of group where reviewed				
Name and date of final approval committee (if trust-wide document)/ Directorate or other locally approved committee (if local document)				
Date of Procedure/Guidelines issue				
Review Date and Frequency (standard review frequency is 3 years unless otherwise indicated)				

Training and Dissemination: as part of MP12	
Publishing Requirements: Can this document be published on the Trust's public page: **Yes** If yes you must ensure that you have read and have fully considered it meets the requirements outlined in sections 1.9, 3.7 and 3.9 of OP01, Governance of Trust-wide Strategy/Policy/Procedure/Guidelines and Local Procedure and Guidelines, as well as considering any redactions that will be required prior to publication.	
To be read in conjunction with Trust Policies:	
Initial Equality Impact Assessment: **Completed** Yes as part of MP12 If you require this document in an alternative format e.g., larger print please contact Policy Administrator 85887 for Trust- wide documents or your line manager or Divisional Management office for Local documents.	
Contact for Review	
Monitoring arrangements	
Document summary/key issues covered.	
Key words for intranet searching purposes (Pharmacy Intranet site only)	

MP12, Procedure 2

Procedure for handling potassium chloride concentrate and other strong potassium solutions in clinical areas

1.0 Procedure Statement

The purpose of this procedure is to ensure the safe supply, prescribing, storage and administration of concentrated potassium solutions within the Trust. This procedure should be read in conjunction with MP12 Injectable Medicines Policy.

A National Patient Safety Agency Alert was issued in July 2002 following several incidents of inappropriate administration of concentrated potassium solutions, these included reports of fatalities where concentrated potassium solutions had been mistaken for 0.9% sodium chloride injection and administered to patients. The alert set out the actions required by NHS Trusts to reduce the risk of accidental overdose arising from the use of concentrated potassium solutions, these actions required all Trusts to adopt a formal potassium policy.

In 2018 mis-selection of strong potassium solution was included in the NHS Never Events list.

This procedure restricts the storage of concentrated potassium solutions to named clinical areas and requires the ordering, supply, storage and recording of these products using controlled drug methods.

Concentrated potassium solutions are defined as solutions of potassium greater than or equal to 10% potassium (1g in 10mL or 1.3mmol/mL potassium chloride). These solutions usually require dilution or manipulation prior to administration. Examples of concentrated potassium solutions are:

- Potassium Chloride 10% (1g in 10mL or 1.3mmol/mL)
- Potassium Chloride 15% (1.5g in 10mL or 2.0mmol/mL)
- Potassium Chloride 20% (2g in 10mL or 2.6mmol/mL)
- Potassium hydrogen phosphate solutions in ampoules and vials
- Potassium dihydrogen phosphate solutions in ampoules and vials.
- Potassium acid phosphate (13.6%) 10ml

All other potassium containing infusions used in the Trust are supplied as ready-diluted products. A full list is found in Appendix A. These products are not subject to any additional controls in relation to ordering, supply, storage and recording,
In adhering to this Procedure, all applicable aspects of the Conflicts of Interest Policy (GOP109) must be considered and addressed. In the case of any inconsistency, the Conflicts of Interest Policy is to be considered the primary and overriding Policy.

2.0 Accountabilities

The **Trust Chief Executive** is responsible for ensuring that medicines optimisation within the Trust conforms to best practice at all times. This responsibility is delegated to the **Chief Medical Officer** who is the Executive responsible for medicines and pharmacy, and the **Clinical Director of Pharmacy** who is the medicines optimisation lead for the Trust.

The **Clinical Director of Pharmacy** is responsible for ensuring that there is a clear policy and guidance available for healthcare staff who use injectable medicines, including concentrated potassium solutions. They are also responsible for ensuring pharmacy staff are aware of and comply with this procedure.

Clinical Directors are responsible for ensuring medical staff are aware of this procedure.

Heads of Nursing / Midwifery are responsible for ensuring nursing staff are aware of this procedure.

Ward / Department Managers are responsible for ensuring that this procedure is applied within their clinical and operational areas and that nursing and healthcare staff are trained in the use of concentrated potassium solutions.

Consultants are responsible, within their clinical and operational areas, for ensuring medical staff and prescribers are aware of this procedure and prescribe concentrated potassium solutions as stipulated.

The **Medicines Management Group** is responsible for oversight and assurance of medicines use within the Trust and for reviewing and approving this procedure, including any amendments.

This procedure applies to **all staff** who are involved with ordering, supply, storage prescribing and administration of concentrated potassium solutions.

3.0 Procedure

3.1 Storage

Concentrated potassium solutions will only be stored in the following areas as a stock item:

- Main Dispensary, New Cross Hospital
- Main Dispensary, Cannock Chase Hospital
- Pharmacy Aseptic Unit
- Neonatal Unit

For storage in other areas as a stock item a risk assessment must be completed and approved by the Medicines Management Group.

Concentrated potassium solutions must be stored in a controlled drugs cupboard and managed as a schedule 2 controlled drug. Ordering, supply, receipt, storage, administration, recording and return to Pharmacy will follow the Trust procedure for controlled drugs.

Wards / departments which have agreed stock of concentrated potassium solutions must never loan ampoules to other clinical areas.

3.2 Prescribing

Ready-to-administer commercially available potassium containing solutions must be prescribed wherever possible (see Appendix A for a list of those available).

Concentrated potassium solutions must only be used where there is a clear clinical indication, and the use of a more dilute potassium solution is not acceptable.

Potassium Chloride is always given by intravenous infusion, NEVER by bolus injection.

The usual maximum concentration to be administered via a peripheral line is 40mmol/L. Higher strengths can cause inflammation of the vein and pain at the injection site.

Concentrations exceeding 40mmol/L require a central line and infusion pump control.

The rate of administration should not normally exceed 10mmol per hour.

Administration rates of above 20mmol per hour require cardiac monitoring due to the risk of arrhythmias.

All prescriptions for intravenous potassium must clearly state: the dose in millimoles of potassium, the diluent and volume, duration and/or rate of administration, and the route.

3.3 Supply

Supply of concentrated potassium solution will only be made against a controlled drug requisition.

Concentrated potassium solutions must never be supplied from one ward / department to another.

Supply to areas that do not stock concentrated potassium solutions will only be made

against a controlled drug requisition and a valid prescription that has been clinically screened and authorised by a pharmacist. Unwanted product should be returned promptly to Pharmacy when no longer needed or as soon as the patient leaves the area. The returns process for controlled drugs must be followed.

If there is a requirement for potassium while the pharmacy department is closed the emergency on-call pharmacist must be contacted.

3.4 Preparation and Administration

Ready-to-administer commercially available potassium containing solutions must be used wherever possible (see Appendix A).

Concentrated potassium injection must not be used to prepare intravenous fluids where premixed bags are available. Concentrated potassium injection must not be added to bags which already contain potassium.

Ideally infusions that require additional potassium will be prepared by the Pharmacy Aseptic Service rather than manipulation of concentrated potassium solutions at ward/department level. However, the Pharmacy Aseptic Service is subject to capacity limits and therefore this service may not be readily available.

All preparation and administration of injectable medicines must be in accordance with MP12 Injectable Medicines Policy. A second practitioner must always check for correct product, dosage, dilution, mixing and labelling during the preparation of and again prior to the intravenous administration of solutions containing concentrated potassium solution.

Where concentrated potassium solution is being used to prepare an infusion at ward/department level, the infusion once prepared must be thoroughly mixed to prevent layering and minimise the risk of administration of high concentrations of the drug.

3.5 Integrated Critical Care Unit (ICCU)

To avoid the unnecessary use of strong potassium injection the ICCU use a pre-diluted concentrated infusion of 50mmol potassium in 50ml sodium chloride 0.9%. This is for central line administration only and the patient must be continuously monitored. The maximum rate of administration must not exceed 20mmol per hour. The product is unlicensed.

The pre-diluted infusion is also used in other areas.

- Deansley
- Beynon
- Beynon Theatre 3 recovery
- B8 – Heart Surgery
- B14 – cardiology
- B11 - cardiology

- Theatre 3/4 recovery

3.6 Glucose Insulin Potassium (GIK) regime for diabetic patients

The GIK regime is commonly used to manage adult diabetic patients during surgery, labour or when unwell. Pre-diluted bags of 10% glucose with 10mmol of potassium are available from Pharmacy. The product is unlicensed. Strong potassium chloride injection must not be used to prepare this solution.

4.0 Equipment Required

None

5.0 Training

See MP12 Injectable Medicines Policy.

6.0 Financial Risk Assessment

1	Does the implementation of this document require any additional Capital resources	No
2	Does the implementation of this document require additional revenue resources	No
3	Does the implementation of this document require additional manpower	No
4	Does the implementation of this document release any manpower costs through a change in practice	No
5	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programs or allocated training times for staff.	No
	Other comments	

Appendix A

Potassium Containing Infusion Fluids Available From Pharmacy

Potassium (mmol)	Infusion Fluid	Volume
10	Sodium Chloride 0.9%	500ml
20	Sodium Chloride 0.9%	500ml
20	Sodium Chloride 0.9%	1000ml
40	Sodium Chloride 0.9%	1000ml
20	Glucose 5%	500ml
20	Glucose 5%	1000ml
40	Glucose 5%	1000ml
20	Sodium Chloride 0.18%/Glucose 4%	1000ml
40	Sodium Chloride 0.18%/Glucose 4%	1000ml
10	Sodium chloride 0.45%/Glucose 5%	500ml
10	Sodium chloride 0.18%/Glucose 10%	500ml
10	*Glucose 10%	500ml
FOR INTENSIVE CARE UNIT USE ONLY		
50	*Sodium Chloride 0.9%	50ml

*Commercially available, but unlicensed

Part A - Document Control

<table>
<tr><td>MP12 Procedure 2
Version 1.0</td><td colspan="3">Procedure for handling potassium chloride concentrate and other strong potassium solutions in clinical areas</td><td colspan="2">Status:

Final</td><td>Author: Assistant Director of Pharmacy

For Trust-wide Procedures and Guidelines Chief Officer Sponsor: Chief Medical Officer</td></tr>
<tr><td rowspan="3">Version / Amendment History</td><td>Version</td><td>Date</td><td colspan="3">Author</td><td>Reason</td></tr>
<tr><td>1.0</td><td>19/12/25</td><td colspan="3">Assistant Director of Pharmacy</td><td>Review and update of a similar procedure that previously sat under MP01.</td></tr>
<tr><td colspan="3"></td><td></td><td></td><td></td></tr>
<tr><td colspan="8">Intended Recipients: All staff who prescribe, order, supply, handle and administer concentrated potassium solutions.</td></tr>
<tr><td colspan="8">Consultation Group / Role Titles and Date:
Medicine Management Group March 2026</td></tr>
<tr><td colspan="4">Name and date of group where reviewed</td><td colspan="4">Medicines Management Group – March 2026 – Version 1</td></tr>
<tr><td colspan="4">Name and date of final approval committee (if trust-wide document)/ Directorate or other locally approved committee (if local document)</td><td colspan="4"></td></tr>
<tr><td colspan="4">Date of Procedure/Guidelines issue</td><td colspan="4"></td></tr>
<tr><td colspan="4">Review Date and Frequency (standard review frequency is 3 yearly unless otherwise indicated – see section 3.8.1 of Attachment 1)</td><td colspan="4">Every 3 years</td></tr>
</table>

Training and Dissemination:
Publishing Requirements: Can this document be published on the Trust's public page: **Yes** If yes you must ensure that you have read and have fully considered it meets the requirements outlined in sections 1.9, 3.7 and 3.9 of OP01, Governance of Trust-wide Strategy/Policy/Procedure/Guidelines and Local Procedure and Guidelines, as well as considering any redactions that will be required prior to publication.
To be read in conjunction with: MP12 Injectable Medicines Policy MP01 Prescribing, Storage and Administration of Drugs
Initial Equality Impact Assessment: Completed Yes / No Full Equality Impact assessment (as required): Completed Yes / No / NA If you require this document in an alternative format e.g., larger print please contact Policy Management Officer 85887 for Trust- wide documents or your line manager or Divisional Management office for Local documents.

Contact for Review	Assistant Director of Pharmacy
Monitoring arrangements	Oversight will be provided by the Medicines Management Group

Document summary/key issues covered. This procedure is to be used by registered healthcare professionals to ensure the safe use of concentrated potassium solutions. .

Key words for intranet searching purposes	Potassium Concentrated Injection

The Royal Wolverhampton NHS Trust

Audit checklist. Once completed send a copy to Medicine Safety Group

Name of organisation: **Department:**	**Date:** **Audit checklist prepared by:**

1. Review of policy and procedures

Recommended action	Suggested evidence	Assessment	Comment/further action required
Review of multidisciplinary procedures that describe safe practice for prescribing, preparing, administering and monitoring of injectable medicines. Ensure availability of, and access to, relevant procedures in all clinical areas where injectable medicines are prepared and/or administered.	Copy of: • multidisciplinary procedure; • name of approving group (e.g. MMG) • date of approval; • copy of distribution list for procedure.	Compliance or non-compliance	

Recommended action	Suggested evidence	Assessment	Comment/further action required
Review the provision, availability and type of technical information concerning injectable medicines for clinical areas that enable users to prepare and administer injectable medicines safely.	Copy of: • technical information for injectable medicines; • list of high risk medicines held in department • high risk medicines approval ; • copy of distribution list for technical information.	Compliance or non-compliance	
Ensure that all staff who prescribe, prepare, administer and monitor injectable medicines have received training and have the necessary work competences to undertake their duties safely.	Copy of: • training curriculum; • training/assessment materials; • dates of training sessions; • records of staff who have received training.	Compliance or non-compliance	

Recommended action	Suggested evidence	Assessment	Comment/further action required
PHARMACY ONLY Review the 'purchasing for safety' policy to ensure that it incorporates procurement of injectable medicines with inherent safety features. Monitor adherence to the policy.	Copy of: • 'purchasing for safety' policy; • date of Drugs and Therapeutics Committee approval; • documented 'purchasing for safety' decisions and product changes.	Compliance or non-compliance	

2. Audit of injectable medication practice: Directorate complete against or add your area MSG collate responses

Total number of injectable medicines in use in the department	The number of high-risk injectable medicines in use in the department	Percentage of injectable medicines with a technical information and procedures for injectable medicines document	Percentage of staff, who are authorised to administer injectable medicines and have received training on the safe use of injectable medicines	Percentage of clinical areas that have a documented (at least 3 yearly) risk assessment of high risk injectable products

3. Review of patient safety incident data involving injectable medicines for preceding 12 months

Clinical directorates should establish good incident reporting cultures to enable learning from incidents. Directorates that report few incidents should consider other audit methods, such as observation, to obtain further information about the safe use of injectable medicines.

3.1 Clinical outcome	Number of reports
Death	
Severe (permanent harm)	
Moderate (significant, but not permanent, harm requiring increase in treatment)	
Low (temporary harm requiring extra observation or minor treatment)	
No harm	
Total	

3.2 Type of report	Number of reports
Prescribing	
Dispensing/medicine preparation	
Administration	
Monitoring	
Total	

3.3 Type of incident	Number of reports
Wrong dose or frequency	
Omitted medicine/dose	
Wrong drug	
Wrong quantity	
Mismatching of patient and their medicine (wrong patient)	
Wrong/transposed/omitted medicine label	
Wrong/omitted/passed expiry date	
Wrong storage	
Wrong route	
Contraindication	
Patient allergic to treatment	
Wrong formulation	
Wrong method of preparation/supply	
Adverse drug reaction – when used as intended	
Wrong or omitted verbal patient directions	
Other	

Total	

3.4 Top 10 incidents involving injectable medicine products		**Number of incidents**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

4. Overall comments and actions

a) Details of remaining high-risk injectable medicine products and procedures to be added to the risk register

b) Actions concerning the further development of policies and procedures for injectable medicines

4. Overall comments and actions

c) Actions concerning the provision of technical information on injectable medicines in clinical areas

d) Actions concerning staff training on injectable medicines

e) PHARMACY ONLY Actions concerning the ‘purchasing for safety’ policy

4. Overall comments and actions

Signature of Directorate Clinical

Name of Directorate Clinical Director

Date of audit review:

Date of next audit review:

The Royal Wolverhampton NHS Trust

Audit checklist: Once completed send a copy to Medicine Safety Group

Name of organisation **Directorate:**	**Date:** **Audit checklist prepared by:**

1. Review of policies and procedures:

Recommended action	Suggested evidence	Assessment	Comment/further action required
Rationalise range of epidural products.	Copy of: • rationalised product range; • date of Clinical governance Approval	Compliance or non-compliance	
Rationalise procedures for preparing and administering epidural infusions to minimise the risk of confusion over different types and strengths of epidural injections and infusions.	Copy of: • procedures; • • name of approving group (e.g. clinical governance) • date of approval; • copy of distribution list for procedure.	Compliance or non-compliance	

Ensure all staff involved in using epidural therapy have received adequate training and have the necessary work competences to undertake their duties safely.	Copy of: • training curriculum; • training/assessment materials; • dates of training sessions; • records of staff who have received training.	Compliance or non-compliance	

2. Observation assessment of all epidurals used over a five-day period

Recommended action	Suggested evidence	Assessment	Comment/further action required
Clearly label infusion bags and syringes for epidural therapy (whether purchased commercially, manufactured by the hospital pharmacy service or prepared in clinical areas) with **'For Epidural Use Only'** in large font, and make judicious use of colour and design to differentiate these products from those for administration by intravenous and other routes.	• Number of observations. • Percentage of epidural products that meet medicines labelling recommendations.	Compliance or non-compliance	
Maximise the use of ready-to-administer epidural infusions.	• Number of observations. • Percentage of epidural infusions that were ready-to-administer.	Compliance or non-compliance	

Recommended action	Suggested evidence	Assessment	Comment/further action required
Store epidural infusions in separate cupboards or refrigerators from intravenous and other types of infusions to reduce the risk of the wrong medicine being selected.	• Number of observations. • Percentage of epidural infusions stored in separate cupboards or refrigerators.	Compliance or non-compliance	
Label all epidural administration sets with **'Epidural'** when in use.	• Number of observations. • Percentage of administration sets labelled **'Epidural'**.	Compliance or non-compliance	
Use clearly identified epidural infusion devices exclusively for epidural therapy or, if not, the device should be marked clearly and unambiguously that it is **'For Epidural Use Only'** when it is being used for that purpose.	• Number of observations • Percentage of devices clearly identified and/or labelled for epidural therapy.	Compliance or non-compliance	
Ensure all staff involved in using epidural therapy have received adequate training and have the necessary work competences to undertake their duties safely.	• Number of staff observed. • Percentage of staff authorised to administer epidurals who have received training in the department.	Compliance or non-compliance	

3. Review of patient safety incident data involving epidural medicines for the preceding 12 months

Clinical directorates should establish good incident reporting cultures to enable learning from incidents. Directorates that report few incidents should consider other audit methods, such as observation, to obtain further information about the safe use of epidural medicines.

3.2 Clinical outcome	Number of reports
Death	
Severe (permanent harm)	
Moderate (significant, but not permanent, harm requiring increase in treatment)	
Low (temporary harm, requiring extra observation or minor treatment)	
No harm	
Total	

3.3 Stage of medication process	Number of reports
Prescribing	
Dispensing/medicine preparation	
Administration	
Monitoring	
Total	

3.4 Type of incident	Number of reports

Wrong dose or frequency	
Omitted medicine/dose	
Wrong drug	
Wrong quantity	
Mismatching of patient and their medicine (wrong patient)	
Wrong/transposed/omitted medicine label	
Wrong/omitted/passed expiry date	
Wrong storage	
Wrong route (epidural medicine administered by the IV route)	
Wrong route (IV medicine administered by the epidural route)	
Contraindication	
Patient allergic to treatment	
Wrong formulation	
Wrong method of preparation/supply	
Other	
Total	

3.5 Top 10 medicine products involved in epidural medicine incidents		Number of incidents
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

4. Comments and actions recommended by Directorate

Comments:

Actions:

Signature of Directorate Clinical Director

Name of Directorate Clinical Director

Date:

MP12 Attachment 5

GUIDELINES FOR SAFE INTRAVENOUS DRUG MANAGEMENT IN ANAESTHETIC PRACTICE

Contents

Sections **Page**

1.0 Guideline Statement

Anaesthetic services involve a combination of pharmacology, physiology, and often rapid decision-making. This requires immediate access to a wide range of intravenous medications. When anaesthetic services are provided in theatres, recovery, ICCU and other areas (*e.g. ED, Radiology, Cardiac Catheter Suite, Cardiology, Endoscopy etc.*) practitioners are normally required to prepare and administer multiple injectable drugs in rapid succession. The drugs they administer are required in a time critical setting; other drugs that may be subsequently needed must be immediately available for administration.

Unlike most other healthcare settings where intravenous medications are subject to two-person checks, anaesthetic services typically involve a single practitioner who prepares, administers, and documents medications independently. Prescribing and documentation often occur retrospectively. A two-person check and prescribing prior to administration is not always practical in these circumstances and may compromise patient safety by introducing delays. However, this approach bypasses important safety checks common in other intravenous drug processes.

Medication errors in anaesthesia are a known contributor to patient morbidity and mortality. As such, the Royal College of Anaesthetists and the Association of Anaesthetists have issued specific guidance on safe medication practices in anaesthesia. Risk factors include both active contributors (*e.g. distractions, time pressure*) and passive contributors (*e.g. medication storage and presentation*). These risks are amplified during anaesthesia due to the need for rapid access to multiple injectable medications stored in a single location.

This guideline has been developed in line with national recommendations to support the safe preparation and administration of intravenous medications by anaesthetists, ACCPs, ICCU, Critical Care Outreach, Cardiac Catheter Suite and recovery nurses, and ODPs in all relevant clinical areas across RWT.

The content of Trust policies MP01 and MP12 still applies in anaesthetic practice, subject to the special provisions detailed below.

2.0 Definitions

Term	Definition
ACCP	Advanced Critical Care Practitioner – a trained and credentialed healthcare professional who provides anaesthetic or critical care services under supervision.
Anaesthetist	A medically qualified doctor specialising in anaesthesia, responsible for administering anaesthetic agents and monitoring patients during surgery or procedures.
Anaesthetic Provider	A collective term for professionals (*anaesthetists, intensivists or ACCPs*) responsible for delivering anaesthetic services.
Anaesthetic Service	The delivery of elective or emergency general, regional or local anaesthesia, or procedural sedation by an anaesthetic provider in any clinical area.
Anaesthetising Location	Any clinical area within the organisation where a patient is being anaesthetised or sedated (e.*g. Theatres, ICCU, ED, Radiology, Labour Ward, Endoscopy, Cardiac Catheter Suite, Cardiology*).
Controlled Drugs (CDs)	Medications subject to strict legal controls and legislation due to their potential for abuse or dependence stored and managed in line with legal requirements.
Drug Administration	The removal from storage, preparation and injection through a venous access device of a medication.
ePMA	Electronic prescribing and medication administration system.

EPR	Electronic patient record
Infusion Additive Label	A standardised Trust-approved label used to identify drug additives in IV infusions, ensuring safe administration and compliance with policy.
International Colour Coding System	A widely accepted standard that assigns specific colours to drug classes for syringe labelling to improve identification and reduce error risk.
ODP/Anaesthetic Nurse	Operating Department Practitioner – a registered healthcare professional providing perioperative care, including assistance with anaesthesia and recovery. Interchangeable with Theatre/Anaesthetic Nurse
Practitioner	For the purpose of this guideline, refers collectively to anaesthetists, ACCPs, ODPs, ICCU nurses, Critical Care Outreach nurses, Cardiac Catheter Suite nurses and recovery nurses involved in IV medication administration.
RWT	Royal Wolverhampton NHS Trust – the healthcare organisation to which this guideline applies.
Vasopressors	A class of medications that constrict blood vessels and raise blood pressure, often used in anaesthesia and critical care.

3.0 Accountabilities

3.1.1 Anaesthetist

- Has overall responsibility for the safe administration of anaesthetic drugs during procedures.
- Ensures all drugs are prepared, labelled, stored, administered, and recorded in line with this guideline.
- Prepares and administers intravenous drugs.
- May delegate drug administration to competent practitioners (e.g. ACCPs, ODPs, recovery nurses).

3.1.2 Advanced Critical Care Practitioner (ACCP)

- Functions as an anaesthetic provider when delivering anaesthetic services under supervision.
- May prepare, label, store, administer and record intravenous anaesthetic drugs in accordance with competencies and this guideline.
- Must follow appropriate procedures when acting on instructions from an anaesthetist, including repeat-back communication and direct supervision.
- Shares responsibility with supervising anaesthetist for safe storage, preparation, and documentation of anaesthetic drugs.

3.1.3 Operating Department Practitioner (ODP)/Anaesthetic Nurse

- Supports the anaesthetist in preparation and management of anaesthetic drugs and equipment.
- May prepare IV fluids and giving sets that do not contain additives, provided they are trained and competent.
- May administer drugs under the direct supervision of an anaesthetist in accordance with section 4.1.4 of this guideline.

3.1.4 Recovery Nurse

- Provides post-operative care and may administer prescribed infusions or medications as required.
- May prepare IV fluids without additives, provided they are competent and up to date with IV therapy training.
- May administer drugs under the direct supervision of an anaesthetist in accordance with section 4.1.4 of this guideline.

3.1.5 ICCU Nurse, Critical Care Outreach Nurse and Cardiac Catheter Suite Nurse

- May prepare IV fluids without additives, provided they are competent and up to date with IV therapy training.
- May administer drugs under the direct supervision of an anaesthetist in accordance with section 4.1.4 of this guideline.

3.1.6 Senior Nurse / Area Manager

- Ensures availability of necessary labelling supplies (e.g. pre-printed syringe labels) and oversees ordering of labels where stock is insufficient.
- Supports implementation of medication safety policies and identifies training needs for staff involved in anaesthetic care.
- Responsible for oversight of drug storage areas and ensuring that required safety standards are maintained.

3.1.7 Pharmacy Team

- Provides expert advice on drug selection, labelling, and supply in accordance with purchasing for safety principles and legislation.
- Where possible, communicates changes in drug packaging or presentation to all anaesthetic providers.
- Collaborates with clinical teams to ensure appropriate procurement and supply of medicines.

4.0 Guideline Detail

4.1 General principles

4.1.1 Due to the nature of anaesthetic practice, strict adherence to prescribing prior to administration and two-person checks when administering intravenous medication may be impractical and potentially compromise patient safety, although this practice is noted to bypass important safety checks.

4.1.2 This document aims to provide clear guidance on best practice to mitigate the risks involved in intravenous drug administration in anaesthetic practice. It provides supplementary, safe practice standards for the provision of

anaesthetic services only. All staff must also refer to the Trust's Injectable Medicines Policy MP12.

4.1.3 Intravenous drug administration during anaesthesia must adhere to the principles of:

- Check for allergies as per Trust policy
- Right drug, right dose, right patient, right route, right rate and right time.
- Confirmation that there is no contraindication to administration, e.g. no recent administration
- Accurate recording on approved systems.

4.1.4 Competent, trained ACCPs, ICCU, Critical Care Outreach, Cardiac Catheter Suite or recovery nurses or ODPs may prepare and administer drugs (excluding controlled drugs) at the anaesthetic provider's request, without a written prescription, during situations (emergency and non-emergency) when the anaesthetic provider is otherwise occupied providing direct patient care and cannot physically administer the drug provided that:

- The drug, dose and route are clearly communicated by the anaesthetist and repeated back by the ACCP, ICCU, Critical Care Outreach, Cardiac Catheter Suite or recovery nurse, or ODP **AND**
- The administration is under direct anaesthetist supervision, including package and drug check in accordance with 4.1.3 above.

4.1.5 When two (or more) anaesthetists are working together, responsibilities must be clearly assigned by the more senior anaesthetist

4.1.6 If there is a change of anaesthetist during the list, the incoming anaesthetist may, if they choose to, take charge of any drugs prepared in keeping with this guideline and ensure they are accounted for.

4.2 Purchasing of anaesthesia drugs

4.2.1 Safety-focused purchasing decisions are essential, considering labelling clarity, packaging, formulation, strength and licensed status.

4.2.2 Where drugs are available from more than one manufacturer, the clarity of labelling and appearance of the ampoule/vial/prefilled syringe/bag should be considered.

4.2.3 Drugs should be purchased or supplied in concentrations that minimise the need for dilution prior to administration.

4.2.4 Consider the use of licensed ready-to-administer formulations where available. It is expected that prefilled syringes (where available), or pre-labelled syringes are especially used for drugs prone to error or routinely prepared for emergencies.

4.3 Anaesthetic drugs storage

4.3.1 Critical drugs must be immediately accessible during procedures. Even short delays in drug availability can make a difference to patient outcome.

4.3.2 Within occupied theatres, drug cupboards *(excluding controlled drugs cupboards)* should remain unlocked during procedures. A risk assessment for this has been completed, including mitigations and has been approved by the Medicines Management Group.

4.3.3 Controlled drugs cupboards must always be kept locked when not in use.

4.3.4 Drug cupboards must be kept locked when the operating theatre is unoccupied and not in use.

4.3.5 Outside theatre environments, a selection of emergency and supplementary drugs may be kept with the provider, stored separately from prepared drugs.

- For patient transfers, an anaesthetic drugs transfer pack is generally used and contains most drugs required
- If additional drugs are needed, these must stay on the provider's person, they are responsible for this medication and they must return it to the usual stock location once it is no longer required (temperature-controlled drugs must be destroyed)
- Controlled drugs must not be kept with the provider

4.3.6 Medications must be stored according to their pharmacological group; local anaesthetic preparations must be separated from other medications in cupboards and when prepared for use.

4.4 Labelling of drugs for anaesthesia

4.4.1 The minimum requirement is that pre-printed, self-adhesive syringe labels conforming to the International Colour Coding System for Syringe Labelling should be used for all intravenous medications (*bolus drugs and continuous infusions*).

4.4.2 Infusions likely to continue post-anaesthesia must be labelled with the Trust-approved infusion additive label in accordance with the Trust Injectable Medicines Policy MP12. This must include the following information:

- Name of the medicine
- Strength
- Route of administration
- Diluent and final volume
- Patient's name
- Date and the time the injectable medicine was prepared
- Expiry date and time
- Name of the practitioners preparing and checking the medicine

4.4.3 When pre-printed labels are not available, use and fully complete blank syringe labels and report the shortage to the Senior Nurse/Area Manager.

4.4.4 Labels for time-critical drugs (4.2.4) must include preparation date and time.

4.5 Preparing and checking anaesthetic drugs

4.5.1 All intravenous drugs must be prepared using aseptic non-touch technique (ANTT), in accordance with the Trust Injectable Medicines Policy MP12.

4.5.2 Only handle one medication at a time.

4.5.3 Segregate medication preparation activities. Whenever possible do not allow distraction or answering of questions while preparing medications.

4.5.4 Check every ampoule/vial/syringe twice, once before drawing up and once after labelling. Check the medication labels for drug name, strength and expiry date.

4.5.5 All syringes must be labelled with pre-printed colour-coded syringe labels. If medications are injected into a bag of fluid for infusion the bag must be labelled with a Trust approved infusion additive label (see 4.4.2 above).

4.5.6 To reduce the risk of error, it is good practice to keep to a standard order and syringe sizing for each medication type to aid identification of each drug if more than one is drawn up.

4.5.7 Each set of anaesthetic drugs should be prepared for each individual patient.

4.5.8 Vasopressors or other emergency drugs routinely prepared at the start of a list should be prepared and stored separately from the rest of the drugs for each patient.

4.5.9 When labelling a syringe; anaesthetic practitioners should check the ampoule/vial, draw the drug up and then check the empty ampoule/vial against the label before attaching the label to the syringe.

4.5.10 The time interval between drug preparation and use should be kept as short as practicable.

4.5.11 Vial/ampoule sharing must not occur as only one vial/ampoule must be used per patient to minimise the risk of cross-infection.

4.5.12 At the end of each case and before the next case, any unused or part used syringes must be discarded before the next case commences.

4.6 Drug administration during anaesthesia

4.6.1 Except as outlined in section 4.1.4, only the anaesthetist or those under their direct supervision may administer drugs.

4.6.2 Provided they hold current, appropriate competencies in IV therapy, recovery nurses or ODPs may prepare intravenous fluid infusions without additives without a prescription. They may not prepare any other drugs (*except in the circumstances described in section 4.1.4*).

4.6.3 When multiple infusions share a single lumen IV device:

- Use anti-syphon valves for pump driven infusions.
- Use anti-reflux valves for gravity fed infusions.
- Label infusion lines at the patient end.

4.7 Storage of prepared drugs during anaesthesia

4.7.1 Store prepared drugs in separate trays for each patient.

4.7.2 Do not store drugs for different routes of administration on the same tray, e.g. drugs for neuraxial administration must be kept in a separate tray.

4.7.3 Vasopressors and other emergency drugs must be stored separately.

4.7.4 Use dedicated trays or distinct workspace areas for different drug groups, if available.

4.7.5 Security of prepared drugs remains the responsibility of the anaesthetist throughout the duration of the procedure.

4.7.6 If drugs other than appropriately labelled infusions in syringe pumps (4.4.2) are taken to recovery or other postoperative care areas with the patient, the anaesthetist must dispose of them before they leave the patient.

4.8 Prescribing and documentation

4.8.1 Record all drug prescribing and administration on the approved Trust systems as applicable:

- Anaesthesia Record
- Trust approved paper prescription chart (Maternity, Paediatric and Day-case patients)
- Emergency Department prescription chart
- ePMA for all other clinical areas

Ensure that any drugs administered are cross-referenced with any pre-existing paper prescription chart/ePMA for the patient, particularly paracetamol and antibiotics, to avoid duplication of dosing and risk of toxicity.

4.8.2 Any infusions required for the post-operative period that contain additives, even if commenced during the anaesthetic and recorded in the Anaesthesia Record, must be prescribed independently in ePMA or on a Trust approved paper prescription chart.

5.0 Financial Risk Assessment

1	Does the implementation of this policy require any additional Capital resources	No
2	Does the implementation revenue resources of this policy require additional	No
3	Does the implementation of this policy require additional manpower	No
4	Does the implementation of this policy release any manpower costs through a change in practice	No
5	Are there additional staff training costs associated with implementing this policy which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments	

6.0 Equality Impact Assessment

An equality analysis has been carried out and it indicates that:

Tick	Options
✓	A. There is no impact in relation to Personal Protected Characteristics as defined by the Equality Act 2010.
	B. There is some likely impact as identified in the equality analysis. Examples of issues identified, and the proposed actions include:

7.0 Maintenance

The Clinical Directors of the Anaesthesia, Perioperative and Pain Medicine (APPM) and Pharmacy Directorates are responsible for keeping this guideline up to date.

Any revisions to the guideline will be reviewed by the Trust's Medicines Management Group.

8.0 Communication and Training

This guideline will be published on the Trust Intranet as an appendix to the Trust's Injectable Medicines Policy MP12 and updates will be communicated through Trust-wide communications. Managers must ensure that all staff are briefed on its contents and on what it means for them. Please refer to MP12 for further information.

9.0 References - Legal, professional or national guidelines

Handling injectable medications in anaesthesia – Association of Anaesthetists. https://anaesthetists.org/Home/Resources-publications/Guidelines/Handling-injectable-medications-in-anaesthesia

Medication safety in the operating room: literature and expert-based recommendations. J A Wahr, J H Abernathy III, E H Lazarra, J R Keebler, M H Wall, I Lynch, R Wolfe, R L Cooper. British Journal of Anaesthesia 118(1):32-34 (2017) https://www.bjanaesthesia.org/article/S0007-0912(17)30113-7/fulltext

Adapted with kind permission from the Sandwell and West Birmingham NHS Trust Guideline for safe management of intravenous drugs in anaesthetic practice, Anaesthetics, Pain and Critical Care Group, 2025.

Part A - Document Control

To be completed when submitted to the appropriate committee for consideration/approval

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Final</td><td>Author:

Dr J Dyer, Clinical Director – APPM and Jane Lewis, Principal Pharmacist – APPM and ICCU Group

Chief Officer Sponsor:</td></tr>
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