ESSEX PARTNERSHIP UNIVERSITY NHS FOUNDATION TRUST

PROCEDURE FOR THE PREPARATION AND ADMINISTRATION OF INJECTABLES

1. INTRODUCTION

1.1. This document defines the responsibilities of registered practitioners in relation to the treatment of patients with medicines administered via any injectable route. It defines the delegated responsibility of healthcare assistants by nurses for a specific patient in the community.


2. SCOPE

2.1. All new Trust policies and guidelines for Community Health Services which include guidance related to injectable medicines shall be aligned and referenced to this injectables procedure.

2.2. All injectable routes of administration are covered by this procedural guideline.

2.3. The principal injectable routes described include the intravenous (IV), intramuscular, subcutaneous and intradermal routes.

Other routes include intravitreal, intracameral, intra-arterial, intra-osseous, intra-articular, intrathecal, intraperitoneal, and intratympanic routes. However, this list is not exhaustive and any other injectable route not defined here is subject to this procedural guideline.

2.4. The procedural guideline encompasses the key medicines management standards governing injectables to be followed throughout Community Health Services.

2.5. Cytotoxic medicines (included within BNF section 8.1) require additional precautions, not generally included within this document. The paediatric community nursing team in South East Essex must administer injectable cytotoxic medicines in line with Annex 2.

3. INTRAVENOUS (IV) ADMINISTRATION

3.1. Intravenous methods of administration include IV bolus, intermittent and continuous infusion. Refer to each specific IV monograph in the Injectable Medicines Guide for the recommended method for each medicine.

3.2. IV bolus injection: This involves injecting a small volume with a syringe. An IV bolus should be given via a needle free access device attached to the patient’s cannula. The integral injection port available on some cannulae shall only be used in an emergency.
3.2.1. Hazards

- Damage to veins
- Local reactions/toxicity where medicine is insufficiently diluted, given too rapidly, or not flushed
- The medicine is incompatible with the contents of the infusion or previously given medicine
- Clotting at cannula site (where no infusion is running)

3.2.2. General safety principles

- Always check patency of vein and observe site when giving medicine
- Check diluent and guidance given in the specific IV medicine monograph
- Check compatibility with infusion fluid and contents if giving via a giving set
- Give through injection port on solution set rather than port on cannula if possible
- Give over 3 to 5 minutes, unless otherwise specified in the procedural guideline; time this with a watch
- Unless specifically designed for multi-dose use, discard any part-used vials
- Flush with a compatible fluid before and after administration (see section 3.5.3)

3.3. Intermittent IV infusion: an infusion, which is usually administered over a period of minutes to hours and may be delivered by a gravity driven administration set or a medical infusion pump (e.g. syringe driver or volumetric pump).

3.3.1. General safety principles

- If the infusion is not provided ready prepared follow guidance on preparation in section 6.3 and the specific monograph for the medicine.
- For small volumes a syringe pump may be used; for larger volumes a volumetric infusion pump may be used. Refer to the specific IV monograph for the medicine.
- Confirm compatibility before mixing any medicines or infusion fluids. If incompatible flush well between each medicine or change the giving set - do not mix.
- Always fix a completed medicine additive label to the infusion container. If medicine requires protection from light, cover appropriately.
3.4. **Continuous infusion:** an infusion given continuously over 24 hours. The rate may or may not be variable and may be delivered by a gravity driven administration set or a medical infusion pump (syringe driver or volumetric pump).

3.4.1. **General safety principles**

- As for intermittent infusions (see section 3.3)
- Stability is much more important for a continuous infusion as the medicine(s) are at room temperature for much longer.

3.5. **Equipment for IV administration**

3.5.1. **Giving sets:** Lines and administration regimes should be arranged to minimize medicine mixing in the line. The correct set for the infusion should be chosen.

3.5.2. **Controlled infusion devices**

Competency training is required for each model of medical device used including volumetric pumps, syringe drivers and rapid infusion devices when used for administration of IV medicines.

Some medicines shall be given by controlled infusion devices, refer to the specific IV monograph. For technical information about the device, refer to the product specific information.

Some medicines are given by disposable single-use infusion devices, refer to product specific information.

3.5.3. **Flushing lines and cannulae**

Flushing with a compatible flushing solution should take place before and after each medicine is administered.

Sodium chloride 0.9% should usually be used preferentially as the flushing solution, but always check compatibility in the specific IV monograph for the medicines, as some are incompatible with sodium chloride 0.9%. Refer to the specific IV monograph for the type of fluid to be used as a flush.

Where there is no continuous IV infusion running, then the line shall be flushed regularly as specified in the referral documents.
4. **INTRAMUSCULAR AND SUBCUTANEOUS ADMINISTRATION**

4.1. Registered Nurses are assumed to have the achieved the competences of intramuscular and subcutaneous injection of medicines as part of pre-qualification training.

4.2. Other Practitioners who have no previous evidence of NHS based IM or SC competence shall undertake training and demonstrate practical competence to a validated assessor before they can give medicines via the IM route. A record of this training shall be maintained by Training Department.

5. **SUBCUTANEOUS INJECTION BY SYRINGE DRIVER**

5.1. Practitioners administering medicines by continuous subcutaneous infusion via a syringe driver are expected to have attained and demonstrated competences in:

- the procedure
- the syringe driver as a medical device
- the medicines commonly in use
- Mixing medicines
- Calculations appropriate to the medicines used in the procedure
- Use of local documentation

5.2. The procedure for administering injectable medicines using the McKinley T34 syringe driver is contained in Annex 3.

6. **STANDARDS FOR SAFER PRACTICE**

6.1. **Risk awareness**

6.1.1. Injectable medicines should only be prescribed if there is a clear clinical advantage in terms of efficacy or safety.

6.1.2. Risk assessments of clinical areas where injectable medicines are prepared shall be carried out and then reviewed annually (using the NPSA template in annex 1)

6.1.3. Risk assessments of each individual injectable product used, shall be carried out and then reviewed annually (using the NPSA template in annex 1)

6.1.4. When using an injectable route to administer a medicine, the practitioner shall be familiar with the risks associated with the different routes.
6.1.5. Healthcare professionals responsible for prescribing, administering and monitoring injectables are expected to be aware of the hazards associated with therapy and be available to advise on problems that may arise. Further advice may be obtained from a pharmacist.

6.2. Provision and use of essential technical information

6.2.1. Essential technical information shall be available in all areas where Injectables are prescribed, prepared, administered or monitored.

6.2.2. Within community hospital and in-patient sites, and community nurse bases this shall be available as printed copy at the point of use and electronically as the Injectable Medicines Guide. This can be accessed on the Medicines Management web pages within the Library on the EPUT Intranet.

6.2.3. At sites without access to the intranet, print copies shall be available.

6.2.4. Practitioners providing care in patient’s home should familiarise themselves with the reference resources within these areas and then take printed copy to the patient’s home if required. This can be stored in the patient’s hand held healthcare record.

6.2.5. The essential technical information is provided as the Injectable Medicines Guide with monographs for individual medicines. Where a clinical guideline provides additional information to support the Injectables Guide, then it shall be cross-referenced in the Injectable monograph.

6.2.6. If an specific monograph is not included in the Injectable Medicines Guide, then the prescriber shall notify the Community Health Services Pharmacy Lead and assist if necessary in obtaining a copy of the manufacturer’s technical information, which shall then be made available in the clinical area.

6.2.7. If using printed copies, it is the responsibility of each clinical area to ensure that they are using printed copies of the current version of the Injectable Medicines Guide.

6.3. Preparation

6.3.1. Injectables shall be prepared only by registered practitioners trained in safe procedures and the risks involved, and who have demonstrated their competence in administration of injectables.

6.3.2. Injectables shall be prepared in accordance with the relevant monograph of the Injectable Medicines Guide or if a specific
monograph is not available, the manufacturer’s technical information.

6.3.3. The area in which the medicine is to be prepared should be clean, uncluttered and as free from distraction and interruption as possible. Ideally, preparation within ward or clinical area should take place in an area dedicated to this process.

6.3.4. Within a home environment the practitioner preparing shall perform a risk assessment to determine the most suitable area within the home in which to prepare the injectable medicine(s). This shall be documented in patient held healthcare records. If there is no suitable area, then consideration shall be given to alternative healthcare provision. This shall be discussed with practitioner/team responsible for their care as soon as possible and documented in their notes.

6.3.5. A practitioner shall not prepare an injectable in advance of its immediate use or administer an injectable which has been prepared by another practitioner when not in their presence.

6.3.6. **Insulin:** The only exception to section 6.3.5 is the preparation of insulin syringes within a patient’s home, when all other options have been exhausted and the only option in order to allow a patient to remain in their home and receive their insulin treatment is for the injection to be prepared in advance or by another practitioner.

In these circumstances only, a registered practitioner may prepare insulin.

6.3.7. Before preparing an injectable medicine the following shall be available:

- a prescription/PGD/or similar approved Community Health Services prescription.
- Injectable Medicines Guide monograph or manufacturer’s technical information about the medicine and how to prepare and administer it.
- information on any medical devices or pumps to be used as part of the preparation or administration.

6.3.8. Before preparing the injectable, the following checks should be made to confirm that:

- The product and its container do not have obvious defects or contamination, e.g.
  - haziness, particles, discolouration
  - The product is not expired
The medicines were stored as recommended, e.g. in the refrigerator (Note: within a patient’s home if you have concerns about the temperature at which medicines have been stored, contact a pharmacist for advice or obtain a new supply.)

- The patient has no allergy to the medicine, device or latex
- Understanding of the Injectable monograph
- The prescribed medicine, dose, concentration, diluent, infusion fluid and administration rate comply with the specific monograph
- Appropriate aseptic non-touch technique (ANTT) shall be used during preparation and administration of the injection in accordance with the Infection Control Manual

Disposal of medicinal waste procedural guidelines shall also be followed (see Appendix 10 of CLPG13).

6.3.9. Where injections are prepared in clinical areas, their administration shall be complete within 24 hours.

6.3.10. All syringes, including flushes and infusions shall be labelled immediately after preparation by the person preparing them. The only exception to this is situations where preparation and bolus administration is one uninterrupted process and the unlabelled product does not leave the hands of the person preparing it. Only one unlabelled medicine shall be handled at one time including flushes.

6.3.11. Medical devices, e.g. syringes, lines with luer connections shall be used only for preparation and administration of injections.

6.3.12. Medicines identified as a high risk (NPSA template) to patients at the point of preparation shall be reviewed annually to ensure that there are no other more suitable alternatives. If none are suitable then other methods to reduce the risk shall be used. It is the responsibility of the person preparing the injectable to use the risk reduction methods indicated in the Injectable Medicines Guide or manufacturer’s technical information and to obtain a double check if appropriate.

6.4. **Mixing medicines for administration by syringe driver**

6.4.1. Mixing medicines renders the resulting mixture to be an unlicensed medicine. Licensed products should be used for preference wherever possible.
6.4.2. An independent prescriber may prescribe a mixture of medicines and a practitioner may administer on their direction. The instruction/direction to mix must be in writing.

6.4.3. Mixing should be undertaken when clinically appropriate and essential to meet the needs of the patient.

6.4.4. If mixing must be undertaken in a “near-patient” situation, prescribers should clearly identify which substance(s) should be mixed and in what dosages.

6.4.5. Prescribers should seek advice from a pharmacist in determining which substance(s) can be mixed and in what dosages or, if not possible, from an authoritative source of guidance on the combination of medicines.

6.4.6. The prescriber takes responsibility for satisfying himself that clinical governance arrangements are in place to ensure that the “mixer” is competent to undertake the task safely and effectively - especially within a non-hospital environment.

6.4.7. The person mixing the medicines shall be competent.

6.4.8. No-one should be obliged to mix and administer medicines if they do not feel competent or content to do so.

6.5. Administration

6.5.1. Injectables shall be administered only by healthcare staff (or self-administered by patients) who have been trained to use safe procedures, understand the risks involved and have demonstrated competence for the task.

6.5.2. Injectables shall be prepared in accordance with the relevant monograph of the Injectables Guide or if a monograph is not available, the manufacturer’s technical information.

6.5.3. Before administration the following should be available:

- An authorised prescription.
- Injectables Guide or manufacturer’s technical information about the medicine and how to prepare and administer it.
- Information on any medical devices to be used to administer the injection.
- Prepared and labelled medicine.
- For patients within community hospitals and units:
  - The patient’s identity and details including allergy status and any clinical effects
6.5.4. The following details should be confirmed with the patient (where possible) via

- their identity bracelet,
- prescription chart and their clinical notes
  - Patient’s last name
  - Patient’s first name
  - Patient’s NHS number (if the NHS number is not available, the patient’s identity number)
  - Patient’s date of birth
  - Patient’s allergy status

6.5.5. For patients in their own homes: The patient’s identity and details including allergy status shall be confirmed by asking patient, carer or interpreter as appropriate to state:

- their first and family name, date of birth
- the names of any medicines or product to which they are allergic. This information shall be checked against the patient notes and prescription chart. Any discrepancies shall be resolved before proceeding with the treatment.

6.5.6. Consent to treatment (see CLPG13 section 9.4) should be obtained before administration of injectable medicines.

6.5.7. The person administering the medicine shall make a record of the event as soon as possible after giving it. Make a clear, accurate and immediate record of all medicines administered, intentionally withheld or refused by the patient/client, ensuring that any written entries and the signature are clear and legible.

6.5.8. It is also her responsibility to ensure that a record is made when delegating the task of administering medicine.

6.5.9. For high risk injections, it is the responsibility of the person administering the injection to use the risk reduction methods defined in the Injectable Medicines Guide or manufacturer’s technical information and to obtain a double check if appropriate.

6.5.10. Staff administering injectable medicines are expected to know the therapeutic uses of the medicine to be administered, its normal dosage, side effects, precautions and contraindications.

6.5.11. Staff are also be expected to be familiar with the signs, symptoms and emergency management of anaphylactic shock.
6.5.12. Before administering an injectable medicine:

- Explain the procedure to the patient
- Where there is an indwelling catheter, check for phlebitis before proceeding
- Check patency of the line with appropriate flush
- Monitor the patient for the duration of administration and beyond, as appropriate, for the desired response and potential adverse reactions
- Control the flow of any infusions

6.6. Requirements for second checking of preparation and administration

6.6.1. There are circumstances where in the interests of patient safety a second check of the preparation and/or administration of the injectable is required.

6.6.2. In community hospitals and in-patient units all injectables should be second checked in the following circumstances:

- When a calculation is involved
- When part of or more than one ampoule/vial is used
- When the injectable is being used to treat paediatric patients
- When a practitioner is unsure
- When a practitioner is being supervised as part of competence training
- When the Injectable Medicines Guide states that a second check is required
- When the injectable is a Controlled Drug

6.6.3. Intravenous medicines should be second checked in accordance with the Nursing and Midwifery Council Standards for Medicines Management, 2010 which states “Wherever possible, two practitioners should check medications to be administered intravenously, one of whom should also administer the IV”.

6.6.4. The nurse manager responsible for the service shall undertake a local risk assessment to determine if the injectable medicine(s) are suitable to be prepared and administered by a lone practitioner within patient homes. If this is not clinically safe to do so then a second person who is competent to undertake the check shall be present or the patient transferred to an alternative healthcare environment.

6.6.5. The second checker shall act independently of the person preparing or administering the medicine.
6.6.6. Those able to provide a second check are registered nurses, pharmacists and doctors. A second checker does not need to have been assessed as competent to administer injectable medicines.

6.6.7. The second checker is accountable for checking correctly and accurately. He/she shall sign the prescription chart or the infusion chart to confirm that he/she has provided a second check.

6.6.8. The person administering the injection retains overall responsibility for the accurate preparation and administration of the injectable.

6.6.9. The second checker shall check that:

- The correct patient receives the medicine
- The medicine is correct
- The route is correct
- The dose is correct
- The time of administration is correct
- The name and volume of diluent is correct
- The name and volume of infusion fluid is correct
- The final concentration is correct
- The rate of administration is correct
- The duration of administration is correct
- The infusion device is correct (where relevant)

6.7. **Monitoring**

6.7.1. All injectables shall be monitored according to the Injectable Medicines Guide or the manufacturer's technical information.

6.7.2. If the patient develops a reaction to the injectable, stop administration. Assess the patient's condition, inform the prescriber and give appropriate treatment.

6.7.3. If a patient develops a reaction while at home or if the patient/carer calls to report an adverse event, then the nurse shall inform the prescriber or on-call team immediately and take appropriate action.

6.7.4. If an adverse medicine reaction has occurred follow the procedure for clinical incident reporting.
7. **STANDARDS TO ENSURE COMPETENCE**

7.1. **General statement**: In order to prescribe, prepare, administer or monitor an injectable medicine, the healthcare practitioner shall have undertaken training and demonstrated competence appropriate to the route.

7.2. **Intravenous route**

7.2.1. All medicines administered by the intravenous route shall be given according to the Community Health Services Injectables Procedural guideline.

7.2.2. All practitioners who are involved with intravenous medicines shall undertake and pass an appropriate calculation test.

7.2.3. Practitioners who have no previous evidence of NHS based IV competence shall undertake the Community Health Services Intravenous Medicine Study Day and demonstrate practical competence to a validated assessor before they can give medicines via the intravenous route. A record of this training shall be maintained by Training Department.

7.2.4. Practitioners who have evidence of NHS IV competence shall attend a Community Health Services IV update session and demonstrate competence before giving medicines via the intravenous route.

7.2.5. Staff shall undergo re-accreditation of their IV competencies every three years.

7.2.6. Prescribers without evidence of NHS based IV competence shall attend a Community Health Services Intravenous Medicines Study Day and demonstrate competence to their clinical tutor before giving medicines via the intravenous route.

7.2.7. Doctors who have NHS based evidence of training and competence assessment (DOPS record) shall attend a Community Health Services IV update session before preparing and administering IV medicines.

7.3. **Other routes**

7.3.1. Examples of other routes include epidural, intrathecal, intradermal, intravitreal, intracameral, intrapleural, intraosseous, intra-articular, intra-amniotic, intra-arterial, intratympanic, and implanted devices.

7.3.2. Administration via any of these routes is restricted to practitioners who have undertaken training as part of their professional training and able to demonstrate their competence to a validated assessor/clinical tutor. There are no specific training sessions organised by Community Health Services for these routes.
7.3.3. In general terms for doctors, administration by these other routes is restricted, until it is covered as part of their clinical training and competence has been demonstrated to their clinical tutor. Once competence has been confirmed, the doctor is then able to prepare and administer injectable medicines by this route.

8. PREPARATION TECHNIQUES

8.1. General Technique

8.1.1. Read all prescription details, and authorisation to administer carefully and confirm that they relate to the patient to be treated.

8.1.2. Ensure that the area in which the medicine is to be prepared is clean, uncluttered and free from interruption and distraction. Ideally, preparation should take place in an area dedicated to this process.

8.1.3. Assemble all materials and equipment: sharps bin for waste disposal, medicine ampoule(s)/vial(s), diluent, syringe(s), needle(s), alcohol wipes, disposable protective gloves, disposable tray.

8.1.4. Check the following:

- expiry dates;
- damage to containers, vials or packaging;
- that medicines were stored as recommended, e.g. in the refrigerator and by reading the storage temperature recordings.

8.1.5. Beware of the risk of confusion between similar looking medicine packs, names and strengths. Read all labels carefully. Check that:

- the formulation, dose, diluent, and if IV any infusion fluid and rate of administration correspond to the prescription and product information;
- the patient has no known allergy to the medicine including excipients;
- the method of preparation is understood.

8.1.6. Calculate the volume of medicine solution needed to give the prescribed dose. Write the calculation down and obtain an independent check by another qualified healthcare professional.

8.1.7. Prepare the label for the prepared medicine.

8.1.8. Cleanse your hands according to the Infection Control Policy.
8.1.9. Put on a pair of disposable protective gloves and disinfect the surface of the plastic tray.

8.1.10. Assemble the syringe(s) and needle(s). Peel open wrappers carefully and arrange all ampoules/vials, syringes and needles neatly in the tray.

8.1.11. Use a ‘non-touch’ technique, i.e. avoid touching areas where bacterial contamination may be introduced, e.g. syringe-tips, needles, vial tops. Never put down a syringe attached to an unsheathed needle.

8.1.12. Prepare the injection by following the Injectable Medicines Guide monograph, manufacturer’s product information or local guidelines.

8.2. Withdrawing Solution From An Ampoule (Glass Or Plastic) Into A Syringe

8.2.1. Tap the ampoule gently to dislodge any medicine in the neck.

8.2.2. Snap open the neck of glass ampoules, using an ampoule snapper if required.

8.2.3. Attach a needle to a syringe and draw the required volume of solution into the syringe. Tilt the ampoule if necessary.

8.2.4. Invert the syringe and tap lightly to aggregate the air bubbles at the needle end. Expel the air carefully.

8.2.5. Remove the needle from the syringe and fit a new needle or sterile blind hub.

8.2.6. Label the syringe

8.2.7. Keep the ampoule and any unused medicine until administration to the patient is complete to enable further checking procedures to be undertaken.

8.2.8. If the ampoule contains a suspension rather than solution, swirl it gently to mix the contents immediately before they are drawn into the syringe.

8.2.9. The neck of some plastic ampoules is designed to connect directly a syringe without use of a needle, after the top of the ampoule has been twisted off.

8.3. Withdrawing A Solution Or Suspension From A Vial Into A Syringe

8.3.1. Remove the tamper-evident seal from the vial and wipe the rubber septum with an alcohol wipe. Allow to dry for at least 30 seconds.
8.3.2. With the needle sheathed, draw into the syringe a volume of air equivalent to the required volume of solution to be drawn up.

8.3.3. Remove the needle cover and insert the needle into the vial through the rubber septum.

8.3.4. Invert the vial. Keep the needle in the solution and slowly depress the plunger to push air into the vial.

8.3.5. Release the plunger so that solution flows back into the syringe.

8.3.6. If a large volume of solution is to be withdrawn, use a push-pull technique. Repeatedly inject small volumes of air and draw up an equal volume of solution until the required total is reached. This 'equilibrium method' helps to minimise the build-up of pressure in the vial.

8.3.7. Alternatively, the rubber septum may be pierced with a second needle to let air into the vial as solution is withdrawn. The tip of the vent needle must always be kept above the solution to prevent leakage.

8.3.8. With the vial still attached, invert the syringe. With the needle and vial uppermost, tap the syringe lightly to aggregate the air bubbles at the needle end. Push the air back into the vial.

8.3.9. Fill the syringe with the required volume of solution then draw in a small volume of air. Withdraw the needle from the vial.

8.3.10. Expel excess air from the syringe. Remove the needle and exchange it for a new needle or a sterile blind hub.

8.3.11. The vial(s) and any unused medicine should be kept until administration to the patient is complete.

8.3.12. If the vial contains a suspension rather than solution, swirl it gently to mix the contents, immediately before they are drawn into the syringe.

8.4. Reconstituting powder in a vial and drawing the resulting solution or suspension into a syringe

8.4.1. Remove the tamper-evident seal from the vial and wipe the rubber septum with an alcohol wipe. Allow to dry for at least 30 seconds.

8.4.2. Use the procedure above to withdraw the required volume of diluent (e.g. water for injections or sodium chloride 0.9%) from ampoule(s) into the syringe.

8.4.3. Inject the diluent into the vial. Keeping the tip of the needle above the level of the solution in the vial, release the plunger. The
syringe will fill with the air which has been displaced by the solution (if the contents of the vial were packed under a vacuum, solution will be drawn into the vial and no air will be displaced). If a large volume of diluent is to be added, use a push-pull technique.

8.4.4. With the syringe and needle still in place, gently swirl the vial(s) to dissolve all the powder, unless otherwise indicated by the product information. This may take several minutes.

8.4.5. Follow the relevant steps above to withdraw the required volume of solution from the vial into the syringe.

8.4.6. Alternatively, pierce the rubber septum with a second needle to let air into the vial as solution is withdrawn. The tip of the vent needle must always be kept above the solution to prevent leakage.

8.4.7. If a purpose-designed reconstitution device is used, the manufacturer’s instructions should be read carefully and followed closely.

8.5. Adding A Medicine to an Infusion

8.5.1. Prepare the medicine in a syringe using one of the methods described above.

8.5.2. Check the outer wrapper of the infusion container is undamaged.

8.5.3. Remove the wrapper and check the infusion container itself in good light. It should be intact and free of cracks, punctures/leaks.

8.5.4. Check the infusion solution, which should be free of haziness, particles and discolouration.

8.5.5. Where necessary, remove the tamper-evident seal on the additive port according to the manufacturer’s instructions or wipe the rubber septum on the infusion container with an alcohol wipe and allow to dry for at least 30 seconds.

8.5.6. If the volume of medicine solution to be added is more than 10% of the initial contents of the infusion container (more than 50ml to a 500ml or 100ml to a 1litre infusion), an equivalent volume must first be removed with a syringe and needle.

8.5.7. Inject the medicine into the infusion container through the centre of the injection port, taking care to keep the tip of the needle away from the side of the infusion container. Withdraw the needle and invert the container at least five times to ensure thorough mixing before starting the infusion.
8.5.8. Do not add anything to any infusion container other than a burette when it is hanging on the infusion stand since this makes adequate mixing impossible.

8.5.9. Before adding a medicine to a hanging burette, stop the administration. After the addition has been made and before administration is re-started, carefully swirl the contents of the burette to ensure complete mixing of the contents.

8.5.10. Check the appearance of the final infusion for absence of particles, cloudiness or discoloration.

8.5.11. Label the infusion

8.6. Diluting a medicine in a syringe for use in a pump or syringe-driver

8.6.1. Prepare the medicine in a syringe using one of the methods described above.

8.6.2. Draw the diluent into the syringe to be used for administration by the pump or syringe-driver. Draw in some air (slightly more than the volume of medicine needed) and remove the needle.

8.6.3. Stand the diluent syringe upright. Insert the needle of the syringe containing the medicine into the tip of the diluent (administration) syringe and add the medicine to it. Alternatively, a disposable sterile connector may be used to connect two syringes together directly.

8.6.4. Check the following:

- The total volume of injection solution in the syringe is as specified in the prescription and that the infusion can be delivered at the prescribed rate by the administration device chosen. For Syringe Drivers the volume in the syringe should be made up to the volume that corresponds to 50 mm as per Syringe Driver Standard Operating Procedure.

- The rate of administration is set correctly on the administration device and according to the manufacturer’s instructions.

- Fit a blind hub to the administration syringe and invert several times to mix the contents.

- Remove the blind hub. Tap the syringe lightly to aggregate the air bubbles at the needle end. Expel the air and refit the blind hub.

- Check the syringe carefully for cracks and leaks and then label it, especially noting the requirements specific to syringe drivers.
Check that the rate of administration is set correctly on the device before fitting the syringe, priming the administration set and starting the infusion device.

8.7. Labelling injection and infusion containers

8.7.1. All injections shall be labelled immediately after preparation, except for syringes intended for immediate push (bolus) administration by the person who prepared them.

8.7.2. Under no circumstances should an operator be in possession of more than one unlabelled syringe at any one time, nor must an unlabelled syringe be fitted to a syringe driver or similar device.

8.7.3. Labels used on injectable medicines prepared in clinical areas should contain the following information:

- Name of the medicine;
- Strength, concentration or total quantity of medicine in the final infusion container or syringe;
- Route of administration;
- Diluent and final volume;
- Patient’s name;
- Expiry date and time;
- Name of the practitioner preparing the medicine.

8.7.4. Place the final syringe or infusion and the empty ampoule(s)/vials(s) in a clean plastic tray with the prescription for taking to the patient for administration.
Annex 1

Risk assessment tool for the preparation and administration of injectable medicines in clinical areas

The risk assessment process

1. Carry out a risk assessment in all clinical areas where injectable medicines are prepared and administered
2. A pharmacist and a senior clinical practitioner from the area being assessed should carry out the risk assessment
3. Risk assessments should be conducted annually, and when new injectable products or practices are introduced
4. Risk assess local practice, i.e. how injectable medicines are prepared and administered (see proforma 1)
5. Risk assess individual injectable medicine products used in the clinical area (see proforma 2) – there are examples to assist with this
6. A summary of products with high and moderate risk assessments should be completed (see proforma 3)
7. Identify risk reduction methods to minimise these risks (see guidance)
8. Where possible, implement appropriate risk reduction methods
## Proforma 1: Risk assessment of injectable medicine procedures – how medicines are prepared and administered

<table>
<thead>
<tr>
<th>Clinical area:</th>
<th>Clinical directorate:</th>
<th>Hospital site:</th>
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### Date of first assessment: [ ] Date of second assessment: [ ]

### High-risk practice

<table>
<thead>
<tr>
<th></th>
<th>Suggested risk reduction method</th>
<th>Comments/revised score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate technical information or written procedures for preparing and administering injectable medicines</td>
<td>Provide essential technical information and written procedures</td>
</tr>
<tr>
<td>2</td>
<td>Use of unlabelled bolus syringes (including flushes) and infusions – see guidance in multidisciplinary standard</td>
<td>Reinforce and audit policy to ensure all syringes and infusions containing injectable medicines that leave the hands of practitioners during use are labelled</td>
</tr>
<tr>
<td>3</td>
<td>Use of ‘open systems’. Is the injection or infusion transferred into an open container?</td>
<td>Introduce ‘closed systems’</td>
</tr>
<tr>
<td>4</td>
<td>Preparation of a cytotoxic drug outside of the pharmacy department</td>
<td>Prepare all cytotoxic drugs in the pharmacy department or use closed system products designed for use in clinical areas</td>
</tr>
<tr>
<td>5</td>
<td>Preparation of, or addition to, total parenteral nutrition (TPN) outside of the pharmacy department</td>
<td>Prepare and make all additions to TPN in the pharmacy department or use closed system products designed for use in clinical areas</td>
</tr>
</tbody>
</table>
## Proforma 1: Risk assessment of injectable medicine procedures – how medicines are prepared and administered

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<th>Clinical directorate:</th>
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<td>Date of first assessment:</td>
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<td>Date of second assessment:</td>
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</tbody>
</table>

**High-risk practice**

- **Tick when high-risk practice is found**
- **Suggested risk reduction method**
- **Comments/revised score**
  - Tick if high-risk practice remains unchanged
  - ✓

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<thead>
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<tbody>
<tr>
<td>1</td>
<td>Inadequate technical information or written procedures for preparing and administering injectable medicines</td>
<td>Provide essential technical information and written procedures</td>
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<td>Use of unlabelled bolus syringes (including flushes) and infusions – see guidance in multidisciplinary standard</td>
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<td>4</td>
<td>Preparation of a cytotoxic drug outside of the pharmacy department</td>
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</tr>
<tr>
<td>5</td>
<td>Preparation of, or addition to, total parenteral nutrition (TPN) outside of the pharmacy department</td>
<td>Prepare and make all additions to TPN in the pharmacy department or use closed system products designed for use in clinical areas</td>
</tr>
</tbody>
</table>
Proforma 2: Risk assessment of individual injectable medicine products prepared in clinical areas

<table>
<thead>
<tr>
<th>Clinical area:</th>
<th>Directorate:</th>
<th>Hospital site:</th>
<th>Date:</th>
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</table>

<table>
<thead>
<tr>
<th>Name and strength of prepared injectable product</th>
<th>Diluent</th>
<th>Final volume</th>
<th>Bag or syringe</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Therapeutic risk Where there is a significant risk of patient harm if the injectable medicine is not used as intended.</td>
</tr>
<tr>
<td>2</td>
<td>Use of a concentrate Where further dilution (after reconstitution) is required before use, i.e. slow iv bolus not appropriate.</td>
</tr>
<tr>
<td>3</td>
<td>Complex calculation Any calculation with more than one step required for preparation and/or administration, e.g. microgram/kg/hr dose unit conversion such as mg to mmol or % to mg.</td>
</tr>
<tr>
<td>4</td>
<td>Complex method More than five non-touch manipulations involved or others including syringe-to-syringe transfer, preparation of a burette, use of a filter.</td>
</tr>
<tr>
<td>5</td>
<td>Reconstitution of powder in a vial Where a dry powder has to be reconstituted with a liquid.</td>
</tr>
<tr>
<td>6</td>
<td>Use of a part vial or ampoule, or use of more than one vial or ampoule Examples: 5ml required from a 10ml vial or four x 5ml ampoules required for a single dose.</td>
</tr>
<tr>
<td>7</td>
<td>Use of a pump or syringe driver All pumps and syringe drivers require some element of calculation and therefore have potential for error and should be included in the risk factors. However it is important to note that this potential risk is considered less significant than the risks associated with not using a pump when indicated.</td>
</tr>
<tr>
<td>8</td>
<td>Use of non-standard giving set/device required Examples: light protected, low adsorption, in-line filter or air inlet.</td>
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Total number of product risk factors

<table>
<thead>
<tr>
<th>Total number of product risk factors</th>
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</thead>
<tbody>
<tr>
<td>Six or more risk factors = high-risk product (Red). Risk reduction strategies are required to minimise these risks.</td>
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<tr>
<td>Three to five risk factors = moderate-risk product (Amber). Risk reduction strategies are recommended.</td>
<td></td>
</tr>
<tr>
<td>One or two risk factors = low-risk product (Green). Risk reduction strategies should be considered.</td>
<td></td>
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</tbody>
</table>

Risk assessment undertaken by:

<table>
<thead>
<tr>
<th>Risk assessment undertaken by:</th>
<th>Name of pharmacist:</th>
<th>Name of clinical practitioner:</th>
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</table>

A summary of all high and moderate-risk injectable products should be completed for each clinical area. (See Proforma 3)
Suggested risk reduction methods that can be used to minimise risks with injectable medicines

1. Simplify and rationalise the range of products and presentations of injectable medicines. Where possible, reduce the range of strengths of high-risk products and provide the most appropriate vial/ampoule sizes

2. Provide ready-to-administer or ready-to-use injectable products – this will minimise preparation risks and simplify administration

3. Provide dose calculating tools – for example, dosage charts for a range of body weights that eliminate the need for dose calculations

4. Provide additional guidance on how to prescribe, prepare and administer high-risk injectable medicines

5. Consider the provision of pre-printed prescriptions or stickers – this will help to ensure that information on the prescription about preparation and administration of high-risk products is clearer

6. Provide locally approved protocols that clarify approved unlicensed and ‘off-label’ use of injectable medicines

7. Use double-checking systems – an independent second check from another practitioner and/or the use of dose-checking software in ‘Smart’ infusion pumps and syringe drivers

8. Use an infusion monitoring form or checklist – this will help to ensure that infusions are monitored throughout administration
### Proforma 3: Risk assessment summary for high and moderate-risk injectable medicines products

<table>
<thead>
<tr>
<th>Name of clinical area</th>
<th>Directorate:</th>
<th>Date:</th>
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#### Risk factors

<table>
<thead>
<tr>
<th>Prepared injectable medicine</th>
<th>Strength</th>
<th>Diluent</th>
<th>Final Volume</th>
<th>Biohazard risk</th>
<th>Use of concentrate</th>
<th>Complex calculation</th>
<th>Complex preparation</th>
<th>Reconstitute vial</th>
<th>Part/multiple container</th>
<th>Infusions pump or driver</th>
<th>Non-standard infusion set</th>
<th>Risk assessment score</th>
<th>Risk reduction method(s)</th>
<th>Revised score</th>
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Risk assessment undertaken by: Name of pharmacist: Name of clinical practitioner:
PROCEDURAL GUIDANCE FOR ADMINISTERING INJECTABLE CYTOTOXIC MEDICINES BY THE PAEDIATRIC COMMUNITY NURSING TEAM in SEECHS

1. INTRODUCTION

As part of their role, community paediatric nurses (PCNs) are increasingly involved in the administration of cytotoxic medicines to children both in their own homes and on paediatric wards at local Acute Trusts. They are also requested to disconnect cytotoxic medicines which have been initiated and set up for administration in hospital for the patient to continue at home without PCN input. This guidance describes the procedures required for transportation, administration and discontinuation of cytotoxic therapy.

2. SCOPE

This document is applicable to trained authorised paediatric community nurses employed by EPUT and working both in the community setting and in the acute unit.

3. PURPOSE

The purpose of this procedural guideline is to ensure that cytotoxic chemotherapy is administered safely in accordance with best practice by staff trained and competent to do so. It is intended to safeguard patients and staff by defining best practice for the administration of cytotoxic therapy and to minimise the risk associated with the administration of cytotoxic therapy.

4. DEFINITIONS

Low Risk cytotoxic chemotherapy – e.g. cytarabine, methotrexate - may be administered within patients’ homes during the paediatric community nursing team’s normal working hours.

Complex/highly cytotoxic therapies – those requiring medical review prior to procedures and availability of medical staff on hand during the procedure e.g. Vincristine - will only be administered on Neptune Ward, Southend Hospital, between the hours of 09:00 to 16:00.

A skin tunnelled catheter (HICK) is a long-term catheter that lies in a subcutaneous tunnel before entering a central vein (usually the subclavian).

A peripherally inserted central catheter (PICC) is a device that is inserted into either a vein/artery via the peripheral or central vessels.

An implantable portacath is a device made up of a titanium or plastic chamber and a silicone catheter which is tunnelled underneath the skin via the subclavian vein entering the atrium of the heart.

Intravenous cytotoxic chemotherapy will be administered via a central venous access device which is either a Hickman line, Peripherally Inserted Central Catheter (PICC) line or a Portacath.
5. TRAINING AND COMPETENCY

Injectable cytotoxic chemotherapy will only be administered by registered nurses who fulfil the following requirements:

- Are trained and competent to give injections independently in accordance with the Nursing and Midwifery Council (NMC) standards for medicines management (April 2010) and standards of conduct, performance and ethics for nurses and midwives (The Code - May 2008).
- Have satisfactorily completed competency assessment tools for the administration of subcutaneous methotrexate (NHS South East Essex tool), intravenous vincristine (Great Ormond Street workbooks 1 & 2) and intravenous cytarabine (London Pan Network Document).
- All new employees within the paediatric community nursing team will be orientated on this procedural guidance as part of the induction process.
- Pregnant women should be advised of the potential risks associated with handling cytotoxic agents and given the opportunity to refrain from preparing or administering these agents. Advice is available from the Occupational Health Department. A Risk Assessment for Pregnant Workers must be completed.

6. TRANSPORTATION OF MEDICINES AND ENVIRONMENTAL REQUIREMENTS

6.1 Cytotoxic products must only be collected from the hospital pharmacy service using a cytotoxic carrying container (red box) located on Neptune Unit and taken straight to the patient's home. Under no circumstances should cytotoxic medicines be stored at the PCN base.

6.2 Cytotoxic products must be sealed within a leak-proof plastic bag, within the carrying container. The sealed bag must only be removed immediately prior to administration of the drug. Once removed from the bag handling should be kept to a minimum and gloves must be worn.

6.3 The patency of the device must be verified.

6.4 The environment where administration occurs must have access to a sink, running water and clean work surfaces in case of accidental spillage.

7. ADMINISTRATION

7.1 Pre-administration requirements

Prior to the administration of injectable cytotoxic agents:

- Blood tests must be taken and an accurate and up to date record of results available as indicated in the patients treatment regimen.
- Patients must be assessed by the consultant/registrar for any signs of toxicity.
- Informed consent must be obtained from the child/parent/carer and documented in the patients records.
- The patient must be positively identified by asking the patient/parent/carer to verbally state the patient’s full name and date of birth immediately prior to administration.
- The patient/parent/carer must be fully informed before and after treatment of all drug side effects and action to be taken in the event of any complications or adverse reactions occurring.
- The patient/parent/carer must be informed that the patients urine, blood and
faeces should be regarded as hazardous for up to 7 days post treatment

- Cytotoxic medication must be prescribed on approved chemotherapy prescription charts.
- Prescriptions must be authorised by a consultant
- The patient's regimen must be checked against the prescription chart to confirm the treatment week/cycle number
- Confirm with the patient/parent/carer that the patient identifiable information recorded on the prescription chart is correct
- Check the prescription chart contains the following information:
  - Patients hospital ID number & NHS number
  - Patients date of birth
  - Name of consultant
  - Ward / area where drugs are to be given
  - Height, weight and surface area of the patient
  - Prescribed regimen and patient diagnosis where appropriate
  - Cycle / course number
  - Approved drug name and dose
  - Allergies
  - Route of administration
  - Date and time of dose to be given
  - Signature of the prescribing doctor and date
- Check that all syringes and containers are correctly labelled indicating the:
  - Patient’s name
  - Date & time of manufacture
  - Drug name and dose
  - Expiry date
  - Batch number
  - Drug route (a hazardous warning label should be present on all cytotoxic preparations).
- Check for other appropriate information such as any warnings or storage conditions.

7.2 Administration schedules
Due to treatment scheduling and service operating hours, injectable cytotoxic chemotherapy will only be administered by trained authorised staff and staff undertaking cytotoxic training supervised by a designated mentor at the following times:

**High-Risk Cytotoxic Medicines (e.g. Vincristine)**
**Monday to Friday** inclusive **9am-4pm**; to be administered only on Neptune Ward (Southend University Hospital NHS Trust) due to being a vesicant; to facilitate medical review prior to the procedure and ensure all relevant medical personnel (named shared care consultant, plastic surgeon and named PTC consultant) are available if required in the event of an extravasation occurring.

**Low-risk Cytotoxic Medicines**
**Monday to Sunday** inclusive **8am - 6pm** for low risk cytotoxic therapy.

**Disconnection of Cytotoxic Chemotherapy – 7am-11pm**
Cytotoxic chemotherapy administration infusion devices commenced by the paediatric oncology tertiary centre may be disconnected by the paediatric community nursing team in accordance with the guidelines provided by the
manufacturer. The service user is required to contact the team when the device is demonstrating the infusion is visibly completed. The paediatric nurse will then visit to assess and ensure the infusion has completed and is safe to flush and disconnect in accordance with the manufacturers guidance.

7.3 Personal protective equipment (PPE)

All staff administering/disposing of cytotoxic drugs must wear the following PPE:
- Disposable plastic apron
- Disposable gloves (use good quality powder free gloves made of latex, nitrile, polyurethane, neoprene or other materials that have been tested with hazardous drugs; inspect gloves for visible defects; change gloves immediately if damaged or contaminated)
- Safety goggles

7.4 Administration of cytotoxic therapies

7.4.1 The venous access site should be visibly monitored continuously during and after administration to assess for complications including:
- Signs of redness/inflammation/extravasation
- Correct positioning to ensure that there is no leakage of the cytotoxic drugs
- Patency by commencing administration of normal saline
- Integrity by confirmation of positive blood return.

7.4.2 If the patient experiences pain/inflammation or other cytotoxic related complications during the administration process stop the treatment immediately and take action in accordance with the prescriber’s instructions.

7.4.3 Device patency must be verified prior to and during the administration of each cytotoxic agent by aspirating the device for confirmation of positive blood return.

7.4.4 A double lumen Hickman line will require both lumens to aspirate blood and flush patently to ensure there is not a fibrin sleeve formation at the catheter tip causing an obstruction.

7.4.5 Particular care must be taken when administering vesicant and irritant cytotoxic agents. Staff must consider the:
- drugs potential to irritate the site
- venous flow and resistance
- type of venous access device in situ (Portacath or Hickman line)
- patient’s level of pain or discomfort

7.4.6 Cytotoxic drug boluses must be administered slowly over 5 minutes.

7.4.7 When multiple drugs are prescribed, vesicant drugs must be administered first (one at a time) when the integrity of the vein is at its greatest to help reduce the risk of extravasation.

7.4.8 Once administration is completed, disposal of sharps must be in a purple lidded cytotoxic sharps bin in accordance with the trust waste management policy and procedural guidelines.
7.4.9 Administration must be recorded on the patient’s prescription chart, System One and the patient’s medication profile.

7.4.10 Unused injectable solutions must be returned to the supplying cytotoxic unit. Small quantities of the drug may be disposed of in accordance with the trust waste management policy and procedural guidelines for hazardous medicinal waste.

7.5 Extravasation

7.5.1 Extravasation can be caused by vesicant cytotoxic drugs and if untreated can cause severe inflammatory soft tissue necrosis and ulceration.

7.5.2 Extravasation should be suspected if there is:
- Absence of blood upon aspiration.
- The patient complains of a sharp stinging burning sensation or pain at the site of access or over the chest wall, groin, intraclavicular, neck or shoulder pain, depending on the position of central venous access device.
- Solid redness and itching and / or erythema around the port needle.
- Leakage or swelling around the site.
- Resistance is felt on the syringe plunger during drug administration.
- Crying and distress during drug administration.

7.5.3 The venous access site should be monitored continuously during and after the administration to assess for extravasation.

7.5.4 If extravasation, phlebitis, irritation or a flare reaction occurs or is suspected:
- The administration procedure should/must be stopped immediately.
- With another syringe attempt to aspirate as much of the residual drug as possible and if possible draw back blood from the vascular access device.
- Leave port needle in situ.
- Retain administration set.
- Mark extravasated area with a soft tipped pen.
- Inform the patients consultant of the injury time, area and site of injury and details of the treatment involved including concentrations.
- Administer analgesia if required.

7.6 Management of spillage

7.6.1 The nurse cleaning up a spillage must wear PPE as in 5.2 above.

7.6.2 Limit access to the area and use a home cytotoxic drug spillage kit to clean up the hazardous agent. The materials used to clean up the spillage must be placed in a yellow bag found in the spillage kit and then placed a purple lidded bin for hazardous medicinal waste.

7.6.3 In the event of an incident involving contamination to the nurse, patient or parent, the following action must be taken:
- Contamination must be treated promptly (skin, mucous membranes and eyes must be washed with copious amounts of water).
- Hands must be washed after removing gloves.
Accidental infiltration of the skin with a vesicant drug must be treated for extravasation.

For staff any direct contact with a cytotoxic agent must be immediately reported to occupational health. For patients/parents, medical advice must immediately be sought. Both cases must be reported in accordance with the trust incident reporting policy and on Datix.

Excess liquid should be mopped up with paper towels. Area to be washed thoroughly with soap and water and then left to dry.

The disposal of waste materials must be in accordance with the trust waste management policy and procedural guidelines.

References

RCN Guidance for Nurses (2004): Administering subcutaneous Methotrexate for Inflammatory Arthritis

RCN (2005); Competencies; an integrated competency framework for training programmes in the safe administration of chemotherapy to children and young children.

COSHH (controls of substances hazardous to health) regulations

Greater Manchester & Cheshire NHS Cancer Network policy and procedure for chemotherapy administration 21/01/09
PROCEDURE FOR THE ADMINISTRATION OF INJECTABLE MEDICINES
BY SUBCUTANEOUS INFUSION
VIA McKinleyT34® SYRINGE DRIVER (CME MEDICAL)

1. INTRODUCTION

1.1 This document defines the responsibilities of registered practitioners in relation to the treatment of patients with medicines administered via the McKinley T34® Syringe Driver medical device.

1.2 This document aligns to CPLG13 Appendix 14: Procedure For The Preparation And Administration of Injectables, which provides general guidance on preparation and administration of injectable medicines, their risk assessment and risk reduction processes.

1.3 It adopts the principles of the National Patient Safety Agency guidance “Promoting safe use of Injectable Medicines” published in 2007 (1).

1.4 Staff should also refer to the Standard Operating Procedure for the McKinley T34 Syringe Driver which is available on the intranet.

2. SCOPE

2.1 The procedural guideline describes the key medicines management standards governing the subcutaneous infusion, via syringe driver, of injectable medicines to be followed throughout Community Health Services -(CHS).

3. RESPONSIBILITIES

3.1. The Community Health Services Pharmacy Leads are responsible for ensuring that this procedural guideline is current with legislation, national and local frameworks and good practice and also for its implementation.

3.2. All staff handling medicines administered via syringe driver within EPUTCHS are required to follow this procedural guideline.

3.3. EPUT CHS Medicines Management Committee is responsible for the approval and ratification of this document and its revised versions.

3.4. It is the responsibility of the Registered Practitioner to maintain competencies and ensure they have received training on how to use the equipment. And be signed off as competent (see section 12.0).

3.5. Line managers in clinical and operational management areas are responsible for ensuring and recording that staff handling medicines are trained in current medicines management policies and procedures, and that essential technical information sources are available.
4. DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>Infusion Rate</td>
<td>The volume in millilitres (mL) infused per hour</td>
</tr>
<tr>
<td>Dose Volume</td>
<td>Either, as appropriate:&lt;br&gt;• The volume of fluid containing the dose of individual medicine prescribed, or;&lt;br&gt;• The volume of fluid containing the dose(s) of medicine(s) prescribed to be infused from the syringe attached to the syringe driver</td>
</tr>
<tr>
<td>Mixing of Medicines</td>
<td>The combining of two or more medicinal products together for the purposes of administering them to meet the needs of a particular patient</td>
</tr>
<tr>
<td>Prescription</td>
<td>The written authority from an appropriate practitioner by which a pharmacist is able to supply a medicine or appliance prescribable under NHS Regulations</td>
</tr>
<tr>
<td>Direction to administer</td>
<td>A direction from an appropriate practitioner to administer a medicine to a specific patient, or Patient Specific Direction. Medicines legislation requires a person administering a Parenteral Prescription Only Medicine (POM) to act in accordance with the directions of an appropriate practitioner</td>
</tr>
<tr>
<td>Transcribing</td>
<td>Any act by which medicines are written from one form of direction to administer to another</td>
</tr>
<tr>
<td>Near-patient</td>
<td>In a clinical area close to the patient, as opposed to being obtained ready-prepared from a Pharmacy</td>
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<tr>
<td>CD</td>
<td>Controlled Drug</td>
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5. SYRINGE DRIVERS

5.1. A syringe driver is a portable battery-operated infusion device. It is used to deliver medicines at a predetermined rate via the appropriate parenteral route (e.g. subcutaneous) and is suitable for symptom management and palliative care (ref Marsden Manual, Dickman et al 2007)

5.2. Syringe drivers can be effective in symptom management and should not just be considered as a 'last resort' when death is imminent
5.3. The McKinley T34® syringe driver is a small battery operated continuous infusion pump. It meets the requirements of the MHRA (Medicines and Healthcare products Regulatory Agency) and the International Electrotechnical Standard (IEC) 60601-2-24. It is the choice of syringe driver for use in EPUT Community Health Services as the actions in response to NPSA Rapid Response Report 19 Safer Ambulatory Syringe Drivers^{(6)}

6. **RATIONALE FOR USING THE SUBCUTANEOUS ROUTE FOR SYMPTOM MANAGEMENT**

6.1. The syringe driver is a device permitting minimally invasive parenteral medicines administration.

6.2. Subcutaneous infusion produces relatively constant concentrations of medication in the body.

6.3. The oral route is usually the route of choice for administration of medicines, when this is possible. When the oral route is unavailable in this patient group, the subcutaneous (SC) route is the preferred method of parenteral medicine administration.

6.4. Intravenous (IV) injections are invasive and not necessarily more effective than the subcutaneous route, and should be avoided. Intramuscular (IM) injections can be painful, particularly in the cachectic patient and should also be avoided.

6.5. **Benefits of Syringe Drivers include**:

- Control within medicines administration
- Predictable medicines absorption
- Constant blood levels of medicines administered, avoiding peaks and troughs and the problems associated
- Wellbeing – reduced requirement for repeated injections when the oral route is not available or appropriate
- Mobility and independence can be reasonably well maintained

7. **INDICATION FOR USE:**

7.1. For the sub-cutaneous delivery of medication for patients where oral route is unavailable or inappropriate.

7.2. For example:

- Dysphagia
- Unable to take medicines orally
- Loss of or altered level of consciousness in someone whose symptoms were previously controlled on oral medication
- Intractable nausea and vomiting which has not responded to oral/rectal anti emetics
- Intestinal obstruction
- Malabsorption
- Terminal agitation

8. **SUBCUTANEOUS INFUSION BY SYRINGE DRIVER**

8.1. Practitioners administering medicines by continuous subcutaneous infusion via a syringe driver are expected to have attained, demonstrated and maintained competences in:

- the procedure
- the syringe driver as a medical device
- the medicines commonly in use
- Mixing medicines
- Calculations appropriate to the medicines used in the procedure
- Use of local documentation

9. **MIXING MEDICINES FOR USE IN A SYRINGE DRIVER**

9.1. Mixing of one medicine with another medicine, unless one is a vehicle for the other, usually renders the mixture as an unlicensed medicine and this has legal and clinical governance implications:

- Unlicensed medicines: See Safe & Secure Handling of Medicines Procedural Guidelines appendix 4 (CLPG13-CHS Appendix 4 available on EPUT Intranet)
- Unlicensed route of administration: see also CLPG13-CHS Appendix 4

9.2. National guidance recognises that, in some settings, it will be in the patient’s best interests for medicines to be mixed, for instance through a syringe driver or single line
9.3. Legislation “regularises” and “enables” (3&4) the clinical practice of mixing medicines and this means:

9.3.1. Doctors and dentists can mix medicines and direct others to mix

9.3.2. Nurse and Pharmacist Independent Prescribers can mix medicines themselves and direct others to mix

9.3.3. Supplementary Prescribers may mix medicines themselves and direct others to mix where that is part of the Clinical Management Plan for an individual patient

9.3.4. Nurse and Pharmacist Independent Prescribers may prescribe unlicensed medicines on the same basis as doctors and dentists and supplementary prescribers, if part of a Clinical Management Plan for an individual patient.

9.4. The principles underlying mixing of medicines and their clinical use: (2)

9.4.1. Prescribers should take account of their local employer’s policy and guidance on mixing of medicines and the prescribing of unlicensed medicines, e.g. NHS Trust or PCT or Clinical Commissioning Group

9.4.2. Mix medicines only when clinically appropriate and essential to meet patient needs

9.4.3. The instruction/direction to mix must be in writing. Prescribers should clearly identify which substance(s) should be mixed and in what dosages

9.4.4. The person mixing the medicines must be competent

9.4.5. No-one is obliged to mix and administer medicines if they do not feel competent or content to do so

9.4.6. The prescriber is responsible for satisfying him/herself that clinical governance arrangements are in place to ensure that the “mixer” is competent

9.4.7. Medicines should not be prescribed for mixing (whether for parenteral or oral administration) unless essential to meet the needs of the patient

9.4.8. Prescribers should seek advice from a pharmacist on which medicines can be mixed or, if not possible, from an authoritative source of guidance on the combination of medicines e.g., specialist palliative care teams

9.4.9. Injections and sterile medicines prepared in clinical areas should normally be administered immediately
9.4.10. A medicine mixed in a clinical area should be prepared only for individual patients and be clearly labelled with the direction that it is to be used immediately and, if not, labelled with an expiry date and time.

9.5. Technical information on stability of medicines mixed in the same syringe

9.5.1. The Trust’s recommended source of information on compatibility is the Palliative Care Formulary.

9.5.2. If another source of information is used, this should be a recognised published source, and not anecdotal.

9.5.3. Practitioners requiring guidance on the mixing of medicines and their stability and compatibility in the same syringe should contact a pharmacist, or specialist palliative care team. Record the source of information in the patient’s clinical record.

10. STEPS IN THE PROCESS

10.1. Prescriptions and/or Directions to Administer in In-Patient Units

10.1.1. Prescriptions and/or Directions to Administer shall be written on an authorised local Prescription & Administration Record Chart in accordance with Safe & Secure Handling of Medicines Procedural Guidelines (CLPG13-CHS).

10.1.2. The instruction/direction to mix medicines shall be written on the chart, indicating which medicines are to be mixed in a syringe.

10.2. Prescriptions and/or Directions to Administer in Community Settings

10.2.1. Ideally prescriptions and/or Directions to Administer shall be written by the prescriber on an authorised local Prescription & Administration Record Chart (see 10.1.1).

10.2.2. The Trust recognises that this may not be practicable across the Primary Care and EPUT Trust interface and that prescriptions and directions to administer may not be written directly on to the local Prescription & Administration Record Chart.

In these circumstances:

- Remote prescription/directions shall be transcribed on to the appropriate administration record chart.

- Communications of directions to administer shall be retained in the patient’s health records so there is an audit trail.
between the prescriber and the Prescription/Transcribed direction Chart

10.3. Transcribing Prescriptions and/or Directions to Administer in Community Settings

10.3.1. The Trust recognises that this practice may be necessary as a result of circumstances outlined in 10.2.2 and acknowledges the exceptional circumstances

10.3.2. Where staff are available, another practitioner should check the transcribed information before administration

10.3.3. Practitioners should, on initiation of each infusion, check the prepared syringe of medicine(s) against the original prescription/direction to administer communication first, and then the transcribed information on the Medicines Administration Record, to ensure the accuracy of the administration

10.4. Checking and Confirming Doses of Opioid Medicines

10.4.1. In accordance with NPSA guidance (7), when opioid medicines are prescribed, dispensed or administered, the healthcare practitioner concerned, or their clinical supervisor, should:

- Confirm any recent opioid dose, frequency of administration and any other analgesic medicines prescribed for the patient, for example through discussion with the patient or their representative, the prescriber or through medication records

- Ensure where a dose increase is intended, that the calculated dose is safe for the patient (e.g. for morphine or oxycodone in adult patients, not normally more than 50% higher than the previous dose)

- Ensure they are familiar with the following characteristics of that medicine and formulation: usual starting dose, frequency of administration, standard dosing increments, symptoms of overdose, common side effects

10.5. Preparing medicines for syringe drivers

10.5.1. Diluents:

- Water for Injection is the preferred diluent as this has minimal capacity to interact with other medicines contained in the same syringe

- Physiological Saline (0.9% w/v) is preferred by some centres. Certain combinations of medicines mixed with saline may affect stability, notably with Cyclizine
10.6. Selecting Syringes

10.6.1. For adults, use a 20 ml volume syringe. The syringe driver will accept a syringe up to 50mL if this is clinically indicated. The lock-box will not attach if a syringe greater than 20mL is in use.

10.6.2. Children - use a syringe up to 10mL volume

10.7. Labelling syringes with medicines contained

10.7.1. All injections should be labelled immediately after preparation, except for syringes intended for immediate bolus administration by the person who prepared them. (NPSA 2007) (1)

10.7.2. Under no circumstances should an operator be in possession of more than one unlabelled syringe at any one time, nor shall an unlabelled syringe be fitted to a syringe driver.

10.7.3. Labels used on injectable medicines prepared in clinical areas should contain the following information:

- Patient’s name
- NHS Number
- Name of the medicine
- Amount of medicine or medicines
- Diluent and final volume
- Expiry date and time of the prepared medicine
- Name of the practitioner preparing the medicine
- Route of administration

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>NHS Number</th>
<th>Ward/Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Subcutaneous Route,</td>
<td>Medicines Added</td>
<td>Quantity</td>
</tr>
<tr>
<td>Diluent:</td>
<td>Final Volume:</td>
<td></td>
</tr>
<tr>
<td>Prepared by</td>
<td>Date Prepared</td>
<td>Expiry date</td>
</tr>
<tr>
<td>Checked by</td>
<td>Time Prepared</td>
<td>Expiry time</td>
</tr>
</tbody>
</table>
10.8. Selecting a suitable site for subcutaneous infusion

10.8.1. Sites to consider:

- Upper arms
- Upper chest or abdomen
- Outer aspect of thigh
- Upper back (especially if the patient is confused). This site reduces the risk of the cannula being removed by the patient

10.8.2. Sites not to be used:

- Any area affected by lymphoedema, as this could cause an increased risk of poor absorption or infection
- Chest wall in very cachectic and restless patients.
- The abdomen when there is ascites
- Sites over bony prominences, as diminished subcutaneous tissue may lead to impaired absorption
- Sites near a joint, as movement may cause the cannula to displace and cause the patient discomfort
- Previously irradiated skin sites - radiotherapy can cause sclerosis of small blood vessels and reduce skin perfusion

10.9. Following the death of a patient on a syringe driver

10.9.1. Stop the pump and switch off the pump

10.9.2. Remove the cannula

10.9.3. Record the date, time and amount of solution remaining in the syringe (ml) and destroyed. The signature(s) of person present and witness (if there is one).

10.9.4. Refer to Safe & Secure Handling Of Medicines Appendix 3 regarding disposal of CDs and Appendix 10 on Disposal of Medicinal Waste generally
11. STANDARDS FOR SAFER PRACTICE

Refer to Safe & secure handling of medicines Procedural Guidelines Appendix 14 for general advice on injectable medicines

11.1. Risk awareness

11.1.1. Injectable medicines should only be prescribed if there is a clear clinical advantage in terms of efficacy or safety

11.1.2. When using subcutaneous infusion to administer a medicine, or mixture of medicines, the practitioner shall be familiar with the risks associated with the procedure

11.2. Provision and use of essential technical information about medicines in syringe drivers

11.2.1. Essential technical information shall be available in all areas where injectables are prescribed, prepared, administered or monitored.

For subcutaneous infusion of medicines via syringe drivers this includes published guidance on compatibility of mixtures of medicines in the syringe

11.2.2. Within community hospital and in-patient sites, and community nurse bases information shall be available as printed copy at the point of use and electronically

11.2.3. At sites without access to the intranet, printed copies of technical information shall be available

11.2.4. Practitioners providing care in patient’s home should familiarise themselves with the reference resources within these areas and then take printed copy to the patient’s home if required. This can be stored in the patient’s hand held healthcare record

12. STANDARDS TO ENSURE COMPETENCE

12.1. In order to prescribe, prepare, administer or monitor an injectable medicine, the healthcare practitioner shall have undertaken training and demonstrated competence appropriate to infusion by the sub-cutaneous route of administration

12.2. Practitioners shall ensure that their competences are current at the time of setting up the syringe driver

12.3. Refer to the current Syringe driver Competence framework on the EPUT website
13. REFERENCES


(2) Department of Health: 2010: Mixing of medicines prior to administration in clinical practice: medical and non-medical prescribing.

(3) Human Medicines Regulations 2012

(4) The Misuse of Drugs (Amendment No.2) Regulations 2012
http://www.legislation.gov.uk/uksi/2012/1390/contents/made


http://www.nrls.npsa.nhs.uk/resources/patient-safety-topics/medication-safety/?entryid45=92908


http://www.rmmonline.co.uk/rmm8/chapter/16/ss3

(9) Great Ormond Street Hospital Manual of Children’s Nursing procedures 1st edition