NHS Grampian

Policy and Procedures for Prescribing, Preparation and Administration of Injectable Medicines and Infusions in Near Patient Areas By Clinical Staff Working Within NHS Grampian

Co-ordinators:	**Consultation Group:**	**Approver:**
Specialist Palliative Care Pharmacist Practice Development Nurse (SACT)		Grampian Area Drug and Therapeutics Committee
Signature:		**Signature:**

Identifier:	**Review Date:**	**Date Approved:**
NHSG/Policy_InjectableM/ 1573	October 2027	October 2024

Uncontrolled when printed

Version 3

Executive Sign-Off

This document has been endorsed by the Director of Nursing

Signature: _____

Replaces: NHSG/Policy_InjectableM/GADTC1133

Document application: NHS Grampian

Impact Assessed: 9th December 2024

Revision History:

Revision Date	Previous Revision Date	Summary of Changes (Descriptive summary of the changes made)	Changes Marked* (Identify page numbers and section heading)
November 2023	Dec 2020, published Mar 2021	All references checked and updated where possible Additional references added to support older documents	Throughout document Pages 9; 10; 11; 14
		Changes to wording of student nurse section regarding flushing	Section 3.3.4 Page 9
		Incorporation of HEPMA (Hospital Electronic Prescribing and Administration of Medicines) as a means by which parenteral medicines may be prescribed and their administration recorded	Throughout document.
		Labelling section updated	Section 3.2.5, p13
August 2024	Dec 2020, published Mar 2021	Clearer explanation of role of second checker	Section 3.2.3, p 7 Section 3.3.1, p 9
		Addition of speed shock explanation within flushing guidance	Section 3.3.4, p 11
		Added label requirements to procedures	Appendices 3, 4, 5, 6 – pages 17, 18, 19 & 21 respectively

* Changes marked should detail the section(s) of the document that have been amended i.e. page number and section heading.

Contents **Page No**

Policy and Procedures for Prescribing, Preparation and Administration of Injectable Medicines and Infusions in Near Patient Areas by Clinical Staff Working Within NHS Grampian

1. Introduction

The use of injectable medication has many healthcare benefits for patients. The complexities associated with the prescription, preparation and administration of injectable medicines and infusions means that there are greater potential risks for patients than for other routes of administration.

This policy applies to all healthcare professionals involved in the prescribing, preparation and administration of injectable medicines and infusions in the general area in which the patient is examined, treated and cared for, for example the ward, clinic, surgery or the patient's home.

The administration of medicines by injection is a hazardous process. However, for some patients and/or medicines there are no alternatives. This policy provides guidance on standards of practice that should apply in the prescribing, preparation and administration of injectable medicines and infusions in near patient areas – as recommended by National Patient Safety Agency (NPSA) Safety Alert 20 – Promoting Safer Use of Injectable Medicines (2007).

1.1 Objectives

To ensure safe prescribing, preparation, administration and disposal of injectable medicines and infusions in near patient areas.

1.2 Definitions

Please see Glossary of Terms in Appendix 8.

1.3 Clinical Situations

This policy document covers the prescription, preparation and administration of injectable medicines and infusions within NHS Grampian.

1.4 Patient Groups to Which This Document Applies

This policy applies to all healthcare professionals who may be required to prescribe, and/or prepare and administer injectable medicines / infusions.

1.5 Patient Groups to Which this Document Does Not Apply

This document does not apply to the administration of Epidural, Intrathecal and Cytotoxic injectable medicines where specific policies are available.

2. Evidence Base

2.1 Staff Responsibilities

Healthcare professionals must adhere to agreed policies and procedures when prescribing, checking the prescription, preparing and administering injections and infusions. Staff must adhere to the Professional Guidance on the Administration of Medicines in Healthcare Settings published by the Royal Pharmaceutical Society (RPS) and Royal College of Nursing (RCN) (2019) to ensure the safe administration of medicines by healthcare professionals.

In addition, The Royal Pharmaceutical Society has also published Professional guidance on the safe and secure handling of medicines (2018). The Royal College of Nursing has also published Medicines Management: An overview for Nursing (2020).

When preparing and administering injectable medicines and infusions, an aseptic technique must be used throughout to keep the injection free from microbial contamination. Prior to the administration of injectable medicines and infusions, staff must have a working knowledge of medicines specific to their clinical area. It is best practice for all intravenous medicines to be checked by two staff, although there may be situations where this will be challenging, e.g., community. Regarding student nurses and midwives, stage 3 & 4 nursing, and midwifery students can sign as 2nd checker (Future Nurse: Standards of Proficiency for registered nurses, NMC 2018 and Standards of proficiency for midwives, NMC 2019)

Consent to procedures must be obtained in line with current NHS Grampian consent policy.

2.2 Education and Training

2.2.1. Healthcare Professionals

Healthcare Professionals should satisfy their professional body's accepted standards of practice and conduct. Senior staff must ensure that they and all the registered members of their team are competent to prescribe, prepare, administer and monitor injectable therapy as appropriate to their role and responsibilities. NHS Grampian provides programmes of study for medicine skills training which can be accessed via TURAS Learn. These blended education programmes provide theoretical knowledge followed by a period of work based supervised practice, assessment and achievement of competence.

All newly appointed healthcare professionals may provide written evidence of education and training from previous employment. They will also need to demonstrate clinical and technical knowledge and practical competence to the satisfaction of their line manager, prior to undertaking the skill. Maintenance of competence is the healthcare professional's responsibility, and she/he must keep up to date with current clinical practice. Healthcare professionals must acknowledge limits in competence and only accept responsibility for those activities in which they are competent. It is suggested that continued competence is discussed at annual appraisal and recorded on TURAS.

2.2.2. Nursing & Midwifery Students

NHS Grampian recognises that the primary role of the pre-registration nursing student undertaking a Practice learning experience is that of a learner. It is important to ensure students' learning opportunities address the competencies, as outlined by the NMC domains, detailed within the Practice Assessment Document (PAD) and are relevant for the student's stage of learning.

Medication preparation and administration by nursing and midwifery students must be directly observed and supervised at all times to meet the requirements of the Nursing and Midwifery Council: (Future Nurse: Standards of Proficiency for registered nurses, NMC 2018)

Pre-registration students can be involved in the preparation of IV medications from Stage 2, but not act as 2nd checker or undertake the drug administration.

From Stage 3 & Return to Practice Student Nurses/Midwives can prepare, check and administer IV medications, but only under the direct supervision by a Registered Nurse/Midwife

Any roles delegated to student Nurses/Midwives must only be undertaken if the registrant observing is assured that the student has completed the appropriate theoretical education programme. The theory should then be followed by a period of placement based direct supervised practice and assessment, before achievement is signed off in the IV Drug Administration/Electronic Infusion Device competency pack (student) and Practice Assessment Document (PAD).

Please note; on qualifying registered nurses/midwives must be able to demonstrate the ability to undertake the medicine administration procedures outlined in Annex A & B for nurses and Domain 6 for midwives, at an appropriate level for their intended field(s) of practice (Future Nurse: Standards of Proficiency for registered nurses, NMC 2018).

Education and training evolve over time; refer to the RGU Practice Learning website Practice Learning | RGU for assessment arrangements currently in place for Nursing and Midwifery students.

2.2.3. Patients or Carers

Patients / carers may be shown, if applicable, how to prepare and administer injectable medicines, and given adequate opportunity to practise under supervision until they are familiar and confident with the procedure and have achieved a satisfactory standard. It is good practice that records of initial instruction and re-assessment should be kept, signed by the healthcare professional and the patient / carer (Clinical Resource and Audit Group, 2002). Services should have policies and procedures in place to support all aspects of preparation and administration of parenteral medicines by patients or carers including the education and training required and plans for ensuring ongoing monitoring of competence.

2.3 Infection Control

An aseptic technique must be used throughout to keep the injection free from microbial contamination. Hand hygiene must be carried out as per the current National Infection Prevention and Control Manual - Standard Infection Control Precautions (SICPs) which can be accessed online:
National Infection Prevention and Control Manual: Chapter 1 - Standard Infection Control Precautions (SICPs)

Non sterile (nitrile gloves) must be worn to avoid contamination of the injection being prepared and to protect the operator from inadvertent skin contamination.
National Infection Prevention and Control Manual: Appendix 5 - Gloves Use and Selection

The National Infection Prevention and Control Manual highlights that appropriate Personal Protective Equipment (PPE) must be used at all times and guidance on waste disposal is available in the National Infection Prevention and Control Manual. Staff should refer to the NHS Grampian Waste Management policy (2018) and guidance relating to Healthcare Waste Segregation

3. Process

3.1 Prescribing

Medicines should only be given by injection when no other route is suitable.

All injectable medicines and infusions administered by healthcare professionals must be prescribed or given under the terms of an approved Patient Group Direction (PGD). In all cases, their administration must be recorded on the NHS Grampian Hospital Electronic Prescribing and Medicines Administration (HEPMA) System or NHS Grampian approved paper-based documentation and comply with 'Instructions for Prescribing and Administration of Medicines using the NHS Grampian Prescription and Administration Record' and any additional documentation outlined in the relevant PGD or protocol. Student nurses/ midwives are not permitted to administer under the terms of a PGD.

3.1.1 Key Recommendations

The following should be adhered to:

- Steps should be taken to minimise the number of injectable medicines prescribed and administered to patients.
- All sections of the patient administration record (electronic or paper-based) must be completed.
- Standardised doses and concentrations should be used to avoid complex and unfamiliar preparation processes.
- The prescription must be reviewed regularly, preferably at least once every 24 hours to assess whether it is appropriate to continue with the injectable medication. For patients on long-term maintenance therapy, a review at least

annually is required, GMC (2021) Good practice in prescribing and managing medicines and devices.

3.1.2 Prescribing of Injectable Medicines

All prescriptions for injectable medicines and infusions **must** specify the following:

- Patient's name
- CHI number (10 digits)
- Date of Birth
- The allergy status of the patient
- Start date for the prescription
- Date and time of administration
- The generic or approved medicine name
- The dose and frequency of administration
- The route of administration
- Finish/review date for antibiotic prescriptions or for a medicine with a defined treatment course
- Maximum number of doses in 24 hours for 'as required' medication
- Prescriber's signature, with name printed (ideally including a contact number / bleep number) or appropriate HEPMA authorisation.

3.1.3 Where appropriate the prescription / local protocol must also specify the following:

- Concentration or total quantity of medicine in the final infusion container/syringe
- Name and strength of diluent and total volume to be infused or injected
- Date and duration of administration
- Medical Physics (MP) number of rate-control infusion device(s) to be used
- Arrangements for fluid balance or clinical monitoring should be made on an individual patient basis and according to local protocol and clinical need
- Patient's weight (must be specified if dose is weight dependent)
- Patient's height (if crucial to dose calculation, e.g., to calculate ideal body weight/ body surface area) NPSA (2007).

3.2 Preparation

Incidents can occur at all stages of the medication process. Injectable medicines may require manipulation in the clinical area to prepare a dose suitable for administration. Staff should review the safer sharps policy prior to undertaking the preparation of any injectable medicine. NHS Grampian Policy for the Managment of Medical Sharp Instruments. There is evidence to suggest that luer lock syringes should be used for higher risk medicines. The Royal Marsden Manual Online supports the use of luer lock syringes which provides security when administering, e.g. cytotoxic medications and any medicines administered via a syringe pump.

3.2.1 Information

Appropriate information should be available in areas where injectable medicines are prescribed, prepared and administered. Information can be accessed from:

- British National Formulary (BNF) Available at: https://www.medicinescomplete.com
- NHS Grampian Intranet, e.g. Grampian Joint Formulary
- Medusa Injectable Medicines Guide available at: http://nhsgintranet.grampian.scot.nhs.uk/portal/hospitalportal/Pages/default.aspx
- Clinical pharmacists/ Medicines Information
- Manufacturers' product information leaflet
- Electronic Medicines Compendium (eMC) (www.medicines.org.uk) also provides up to date information.
- Drug Clinical Information accessed via HEPMA system

3.2.2 Environment

The preparation of injections in near patient areas should be carried out in a suitable environment using safe procedures i.e., easily cleaned and not cluttered, NHS Grampian Storage of Medicines within Clinical Areas Policy
Staff must maintain Standard Infection Control Precautions (SICP's) and Hand Hygiene procedures. National Infection Prevention and Control Manual: Chapter 1 - Standard Infection Control Precautions (SICPs) (scot.nhs.uk). Where a ready to administer form of the injection is not available a multi-professional risk assessment should be carried out by pharmacy and departmental registered practitioners to determine the most appropriate place for preparation.

3.2.3 Medicines

If the volume of medicine solution to be added is more than 10% of the initial contents of the infusion container (for example, more than 50mL to a 500mL or 100mL to a 1litre infusion), an equivalent volume of diluent must first be removed with a syringe and needle. For high risk medicines, where accurate concentration is imperative, e.g., inotropes, the same volume of diluent should be removed as the volume of medicine to be added.

Ampoules or vials should never be used to prepare more than one injection unless specifically labelled by the manufacturer for 'multi-dose' use https://www.sps.nhs.uk/wp-content/uploads/2019/12/Multiple-Use-of-Injectable-Medicines-in-Clinical-Areas-V2-February-2020.pdf. Please review individual medicines summary of product characteristics at www.medicines.org.uk to get further details regarding the product.

Practitioners and second checkers must:

- Read all prescription details carefully and confirm that they relate to the patient being treated.
- Check packaging as there is a risk of confusion between similar looking medicine packs, names and strengths, and ensure:
  - Products are within expiry date (taking account of administration time)

    - That there is no damage to the containers, vials or packaging
    - Medicines are stored as recommended, e.g. in a refrigerator appropriately monitored for temperature.
    - Check there is no obvious contamination or degradation
- Confirm the formulation, dose, diluent, infusion fluid, method of preparation and rate of administration correspond to the prescription and product information.
- Confirm the dose is appropriate for patient.
- Independently check any dose calculation. It is good practice to record the dose calculation in the patient's notes, e.g. gentamicin and vancomycin where online dose calculators are available.
- Complete a label for the prepared medicine, if required.
- Prepare and administer medication for one patient before starting preparation for another patient.

3.2.4 Displacement Values

For many injections presented as powders for reconstitution, the powder adds to the volume of the final solution after the diluent has been added. This 'displacement value' must be considered when the dose needed is less than the full contents of the vial or ampoule. The displacement value can sometimes be found on the package insert or in the Medusa injectable medicine guide. It may vary with brands, so it is crucial to check the package insert or the Medusa monograph for the specific product being used. Some products have been formulated to contain an overage to take account of the displacement value, producing the desired concentration when reconstituted.

An example of a calculation using the displacement value is given below and is also included in the Medusa guide:

Example: To give a dose of 125mg of a medicine from a 250mg vial
The displacement value of 250mg of the medicine is 0.2mL
If 4.8mL of diluent is added to a 250mg vial, the volume of the resulting solution is 5mL (i.e. 4.8mL plus 0.2mL)
Therefore 125mg will be contained in 2.5mL of the solution.

3.2.5 Labelling injectable medicine and infusion containers

All injectable medicines and infusions, other than single bolus injections, must be labelled immediately after preparation. Unlabelled injections must not be left unattended. If it cannot be given immediately, it must be labelled. MEDUSA must be consulted for storage and administration guidance. Under no circumstances should an operator be in possession of more than one unlabelled syringe at any given time, nor must an unlabelled syringe be fitted to a syringe driver or similar device, NPSA (2007).

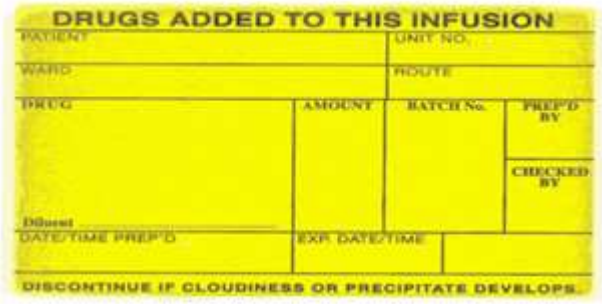
Labels used on injectable medicines prepared in clinical areas should contain the following information:

- Name of the medicine
- Amount (+ concentration)

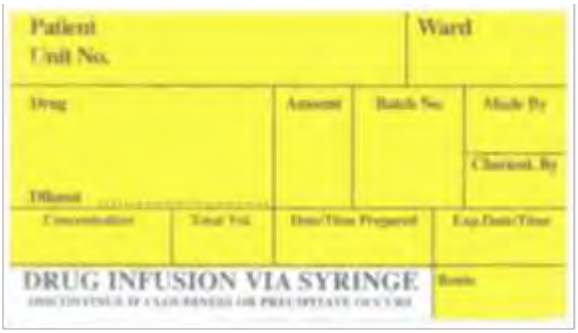
- Batch numbers of the medicines (and infusion fluid if appropriate)
- Route of administration
- Diluent (this is the final solution to which the medicine is added and not the solution used when reconstituting powders)
- Final volume
- Patient's name
- Ward
- Patient's CHI number
- Date of Birth
- Date and time prepared
- Expiry date and time
- Name of the practitioner preparing the medicine
- Name of practitioner checking medicine.

Once labelled, the final syringe or infusion and the empty ampoule(s)/vial(s) should be placed in a clean plastic tray.

The following labels are available from the Pharmacy department:



Drug added to Infusion label



Drug added to syringe label

The **'**Drug added to syringe' label is intended for use for drug infusions via syringe pump and complements the standard 'Drug added to Infusion' Label.

Smaller labels are available on the Professional Electronic Commerce Online System (PECOS) and are intended only to **identify** contents of individual syringes. For example, your patient is prescribed an injectable medicine and a saline (0.9% Sodium Chloride) flush; you would only have to identify the flush using the small Saline label.

3.3 Administration

When using a cannula, you must have an extension set attached with a needle free device to reduce catheter manipulation (Gorski et al., 2016).
All injections prepared in near patient areas should be administered immediately. Seek advice from pharmacist if administration is delayed.

3.3.1 Before administering any injectable medicine, practitioners and second checkers must check:

- All aspects of the prescription are complete including prescriber's signature or HEPMA authorisation.
- For incompatibilities, e.g., medicine / diluents or where medicines may be administered concurrently.
- Patient's full name, date of birth, CHI number or address.
- The medicine due for administration at that time has not already been given.
- Total daily dose is not exceeded.
- Proposed site of injection is intact, free from inflammation and infection (Gorski, 2016).
- The allergy status of the patient.
- Patient's understanding of the procedure (if possible).
- Patient knows to inform staff promptly of any discomfort at the injection site (if possible).
- Rate and duration of administration (refer to MEDUSA)
- Type of rate-control pump or device(s) if required.

3.3.2 If an access device is required for administration, ensure:

- An appropriate access device is in place.
- The access hub should be decontaminated as per NHS Grampian Venous Access Devices policy and the Quality Improvement Tool (QIT) Literature Review - PVC Insertion and Maintenance of Peripheral Venous Catheters (PVC) (NHS Scotland 2022)
- The device is flushed with a compatible flushing solution prior to and after administration of a medicine and between doses of different medicines administered consecutively. The recommended flushing solution is stated in the Medusa injectable medicine guide is available at: http://nhsgintranet.grampian.scot.nhs.uk/portal/hospitalportal/Pages/default.aspx
- The site is monitored for signs of leakage, infection or inflammation prior to and during administration. The findings must be recorded within NHS Grampian recording systems.

3.3.3 In addition if administration via intermittent or continuous infusion, ensure that:

- The administration set is attached to the infusion container carefully, placing infusion bag on a flat surface to prevent puncturing, using the technique appropriate to the type of container (NPSA 2007).
- The administration set is primed according to manufacturer's guidance immediately before starting an infusion.
- Arrangements for monitoring fluid balance or clinical parameters are in place.

3.3.4 Flushing Peripheral and Central Lines

Flushing solutions are Prescription-only Medicines (PoM) and, as such, must be prescribed or administered under a Patient Group Direction (PGD). Pre-filled syringes may be available, some of which may be classified as medical devices which do not need to be given under the terms of a PGD.

For compatible medicines, Sodium Chloride 0.9%, can be used to flush the peripheral or central line. This can be done by 'Patient Group Direction for the Administration of Sodium Chloride 0.9% w/v Solution for Injection for Flushing Intravenous Catheters/ Cannulae by Certified Healthcare Professionals Working within NHS Grampian' available on the NHS Grampian intranet. Any other flush solution will require to be prescribed if no relevant PGD is available.

When flushing peripheral and central lines, you must:
- Use a compatible (single use) flush solution to maintain patency
- Flush with at least twice the volume of catheter and add on device
- Flush should be undertaken using a syringe no smaller than 10ml
- Maintain positive pressure using the push pause technique.

To reduce the risk of speed-shock (an adverse physiological reaction resulting when IV medications are administered too fast), please administer the flush at the same rate as the drug was administered.

HCSW's, student nurses and student midwives, once signed off, may undertake cannulation unsupervised if BD Posiflush™ is used to check cannula patency in the clinical area/ Practice Learning Environment (PLE). Stage 2 students may not undertake cannulation unsupervised if 0.9% Sodium Chloride is used to check patency as this would be administration of IV medicines. However, stage 3 and stage 4 students can do so under direct supervision. Evidence must be provided of previous cannulation training and subsequent competency (including the flushing of cannulae) details can be found on TURAS Learn.

For specific guidance on flushing peripheral and central lines, access the current NHS Grampian Venous Access Device Policy. Accessible via Grampian Guidance.

Please seek specialist advice from appropriate medical/nursing team when accessing a subcutaneous port or specialist lines, e.g., dialysis lines, paediatric lines.

4 References

1. British National Formulary (BNF). Available at: https://www.medicinescomplete.com
2. Clinical Resource and Audit Group (CRAG) (2002). Good Practice Statement for the preparation of Injections in near Patient areas, including clinical and home environments. Accessed 05/06/23. Available at: https://webarchive.nrscotland.gov.uk/3000mp_/https://www.gov.scot/Resource/Doc/46932/0013922.pdf
3. Electronic Medicines Compendium (EMC). Available at:www.medicines.org.uk
4. General Medical Council (GMC) (2021). Good practice in prescribing and managing medicines and devices. Available at: https://www.gmc-uk.org/-/media/documents/prescribing-guidance-updated-english-20210405_pdf-85260533.pdf
5. Gorski et al (2016) Infusion Therapy standards of practice. Journal of Infusion Nursing, 39 (1S) 159
6. Health Improvement Scotland. Scottish Palliative Care Guidelines. Available at: https://rightdecisions.scot.nhs.uk/scottish-palliative-care-guidelines/
7. Medicine Management: An overview for Nursing, (2020). Royal College of Nursing (RCN). Available at: https://www.rcn.org.uk/Professional-Development/publications/pub-009018
8. Medusa Injectable Medicines Guide. Available at: http://nhsgintranet.grampian.scot.nhs.uk/portal/hospitalportal/Pages/default.aspx
9. National Services Scotland (NSS) (2022): PVC Insertion and Maintenance of PVCs
10. Quality Improvement Tool (QIT) Literature Review - PVC Insertion and Maintenance of Peripheral Venous Catheters (PVC). Available at: https://www.nss.nhs.scot/media/3361/quality-improvement-tool-qit-literature-review-pvc-insertion-and-maintenance-of-peripheral-venous-catheters-pvc.pdf
11. National Services Scotland. National Infection Prevention and Control Manual (2023) Available at: National Services Scotland. National Infection Prevention and Control Manual.
12. National Services Scotland. National Infection Prevention and Control Manual. Chapter 1. Standard Infection Control Precautions (SICPs). (August 2023). Available at: https://www.nipcm.scot.nhs.uk/chapter-1-standard-infection-control-precautions-sicps/
13. National Services Scotland. National Infection Prevention and Control Manual. Appendix 5: Glove Use and Selection. Version 3 (June 2022). Available at: https://www.nipcm.scot.nhs.uk/appendices/appendix-5-gloves-use-and-selection/
14. NHS Grampian Intranet - Instructions for Prescribing and Administration of Medicines using the NHS Grampian Prescription and Administration Record' (2021). Available at: https://www.nhsgrampian.org/globalassets/foidocument/foi-public-documents1---all-documents/guide_instr_par.pdf

15. NHS Grampian Intranet – Grampian Joint Formulary. Available at: https://www.grampianformulary.scot.nhs.uk/default.asp
16. NHS Grampian Intranet - Patient Group Direction for the Administration of Sodium Chloride 0.9% w/v Solution for Injection for Flushing Intravenous Catheters/ Cannulae by Certified Healthcare Professionals Working within NHS Grampian http://nhsgintranet.grampian.scot.nhs.uk/depts/GrampianMedicinesManagementGroup/MedsGuidelinesandPolicies/Medicines%20Guidelines%20and%20Policies/Patient%20Group%20Directions/PGD_NaCl_Flush.pdf
17. NHS Grampian Guidance on Healthcare Waste Segregation (2020) http://nhsgintranet.grampian.scot.nhs.uk/depts/FacilitiesandEstates/SustainabilityComplianceRisk/Pages/WastePostersGuidance.aspx
18. NHS Grampian - Insertion and Management of Venous Access Devices Policy (2018) https://scottish.sharepoint.com/sites/GRAM-Guidance/Shared%20Documents/Venous%20Access%20Device%20Policy.pdf
19. NHS Grampian Policy for the Management of Medical Sharp Instruments (2021). Available at https://nhsgintranet.grampian.scot.nhs.uk/depts/HandS/Policies%20Guidelines%20Documents/Documents/NHS%20Grampian%20Policy%20for%20the%20Management%20of%20Medical%20Sharp%20Instruments.pdf
20. NHS Grampian - Storage of Medicines within Clinical Areas Policy (2023) https://nhsgintranet.grampian.scot.nhs.uk/depts/GrampianMedicinesManagementGroup/MedsGuidelinesandPolicies/Medicines%20Guidelines%20and%20Policies/Policies/Policy_Storage_CA.pdf
21. NHS Grampian Waste Management policy (2018) http://nhsgintranet.grampian.scot.nhs.uk/depts/FacilitiesandEstates/Documents/NHSG%20Waste%20Management%20Policy.pdf
22. NPSA (2007). Patient Safety Alert 20 - Promoting safer use of injectable medicines
23. Nursing and Midwifery Council (2018): Future Nurse: Standards of Proficiency for registered nurses. Available at: https://www.nmc.org.uk/globalassets/sitedocuments/education-standards/future-nurse-proficiencies.pdf
24. Nursing and Midwifery Council (2019): Standards of proficiency for midwives. Available at: https://www.nmc.org.uk/globalassets/sitedocuments/standards/2024/standards-of-proficiency-for-midwives.pdf
25. Quality Improvement Tool (2022) Quality Improvement Tool (QIT) Literature Review - PVC Insertion and Maintenance of Peripheral Venous Catheters (PVC) NHS Scotland 2022
26. Royal Marsden Manual Online. Available at: https://rmmonline.co.uk Accessed 5th June 2023.
27. Royal Pharmaceutical Society (RPS) and Royal College of Nursing (RCN), (2019). Professional Guidance on the Administration of Medicines in Healthcare

Settings. Available at: https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Professional%20standards/SSHM%20and%20Admin/Admin%20of%20Meds%20prof%20guidance.pdf?ver=2019-01-23-145026-567
28. Royal Pharmaceutical Society (RPS) (2018). Professional Guidance for the Safe and Secure Handling of Medicines. Available at: https://www.rpharms.com/recognition/setting-professional-standards/safe-and-secure-handling-of-medicines/professional-guidance-on-the-safe-and-secure-handling-of-medicines
29. Specialist Pharmacy Service (SPS) (2020). Multiple use of injectable medicines in clinical areas. Available at: https://www.sps.nhs.uk/wp-content/uploads/2019/12/Multiple-Use-of-Injectable-Medicines-in-Clinical-Areas-V2-February-2020.pdf.

5 Consultation Group

Alison Mitchell	SCN Cardiology, ARI
Alistair Duncan (Lead)	Specialist Palliative Care Pharmacist, ARI
Andrew Noble	IPC Team, ARI
Charity Shonge	Clinical Pharmacist, Medicine and Endocrine, ARI
Dorothy Farquharson	Paediatric Chemotherapy Practitioner, RACH
Elaine Dempster	SCN, Accident and Emergency, ARI
Elaine Neil	Lead Pharmacist, Aberdeenshire CHP
Elizabeth Irvine	SCN, Theatre Recovery, ARI
Fiona Carnegie	SCN, Surgical Division, ARI
Jill Carnegie	HEPMA, Pharmacist, ARI
Justine Collie (Lead)	Practice Development Nurse (SACT), ARI
Karen McDougall	IPC Team, ARI
Lindsay Cameron	Medication Safety Advisor, NHSG
Sumy Sunny	SCN Cardiac Cath Labs, Ward 401, ARI
Victoria Russell	HEPMA Pharmacist, ARI
Csilla Szabone	Senior Staff Nurse, Ward 105, ARI
Lauren Shaw	Practice Educator, CSS 3 Division, ARI

Appendix 1 - Pre and Post Procedure

These general instructions should be observed prior to commencing any injectable medicines procedure.

Step	Pre Procedure
1	Hand Hygiene using water and soap or alcohol gel / rub and don apron.
2	Clean trolley or tray with 70% alcohol surface wipes.
3	Whilst tray dries, gather equipment required for procedure, including sterile field for community staff.
4	Apply non sterile nitrile gloves.
5	Open equipment and prepare medicines.
6	Reconstitution – Please see specific Appendices.

These general instructions should be observed when a procedure has been completed.

Step	Post Procedure
1	Dispose of sharps, waste, equipment, gloves and apron as per the NHS Grampian Waste Disposal procedures.
2	Hand Hygiene using water and soap or alcohol gel / rub.
3	Clean tray, wash with warm water and multi-purpose detergent, thoroughly dry with paper towels, then place in a designated storage area.
4	Hand hygiene with water and soap or alcohol gel / rub.
5	Document the procedure in the appropriate records.

Appendix 2 - Withdrawing solution from an ampoule (glass or plastic) into a syringe

Step	Procedure
1	Follow Pre-Procedure General Directions.
2	Tap the ampoule gently to dislodge any solution in the neck.
3	If the ampoule contains a suspension rather than solution, it should be gently swirled to mix the contents immediately before they are drawn into the syringe.
4	Snap open the neck of glass ampoules, using an ampoule snapper if required.
5	Attach a safety needle to a syringe and draw the required volume of solution into the syringe. If glass ampoule, use a blue needle 23G or a filter needle following manufacturers recommendations when provided. If plastic ampoule, the neck may be designed to connect directly to a syringe without use of a needle, after the top of the ampoule has been twisted off. Tilt the ampoule if necessary.
6	Invert the syringe and tap lightly to aggregate the air bubbles at the needle end. Expel the air carefully.
7	Remove the safety needle from the syringe and dispose of immediately into appropriate sharps container. Fit a new needle or sterile dead ender/cap.
8	When preparing more than one syringe, label each syringe (see section 3.2.5 within the policy)
9	Keep the ampoule and any unused medicine until administration to the patient is complete to enable further checking procedures to be undertaken.
10	Follow Post-Procedure General Directions.

Appendix 3 - Reconstituting powder in a glass ampoule and drawing the resulting solution or suspension into a syringe

Step	Procedure
1	Follow Pre-Procedure General Directions.
2	Tap the ampoule gently to dislodge powder from neck of medicine ampoule.
3	Snap open the neck of glass ampoules, using an ampoule snapper if required.
4	Attach a safety needle to a syringe and draw the required volume of compatible diluent into the syringe. If glass ampoule, use a blue needle 23G or filter needle following manufacturers recommendations when provided. If plastic ampoule, the neck may be designed to connect directly to a syringe without use of a needle, after the top of the ampoule has been twisted off. Tilt the ampoule if necessary.
5	Invert the syringe containing diluent and tap lightly to aggregate the air bubbles at the needle end. Expel the air carefully.
6	Gently discharge the diluent into the ampoule.
7	Swirl gently to mix the contents, immediately before they are drawn into the syringe.
8	Withdraw the required volume of solution or suspension. Tilt ampoule if necessary.
9	Invert the syringe and tap lightly to aggregate the air bubbles at the needle end. Expel the air carefully.
10	Remove the safety needle from the syringe and dispose of immediately into appropriate sharps container. Fit a new needle or sterile dead ender/cap.
11	When preparing more than one syringe, label each syringe (see section 3.2.5 within the policy)
12	Keep the ampoule and any unused medicine until administration to the patient is complete to enable further checking procedures to be undertaken.
13	Follow Post-Procedure General Directions.

Appendix 4 - Withdrawing a solution or suspension from a vial into a syringe

Step	Procedure
1	Follow Pre-Procedure General Directions.
2	Remove the tamper-evident seal from the vial and wipe the septum with an alcohol impregnated swab (70% Isopropyl alcohol swab). Allow to dry fully (minimum 30 seconds).
3	Using a blue safety needle 23G with the needle sheathed, draw into the syringe a volume of air equivalent to the required volume of solution to be drawn up.
4	If the vial contains a suspension rather than solution, it should be gently swirled to mix the contents, immediately before they are drawn into the syringe.
5	Remove the needle cover and insert the needle into the vial through the septum.
6	Invert the vial. Keep the needle in the solution and slowly depress the plunger to push air into the vial.
7	Release the plunger so that solution flows back into the syringe.
8	If a large volume of solution is to be withdrawn, use either the equilibrium method or the venting method below: **Equilibrium method –** Repeatedly inject small volumes of air and draw up an equal volume of solution until the required total is reached. This helps to minimise the build up of pressure in the vial. **Venting method –** Pierce the 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.
9	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.
10	Fill the syringe with the required volume of solution then draw in a small volume of air. Withdraw the needle from the vial. Do not re-sheath.
11	Expel excess air from the syringe. Remove the safety needle and exchange it for a new needle or a sterile dead ender/cap. Place used needle directly into appropriate sharps container.
12	When preparing more than one syringe, label each syringe (see section 3.2.5 within the policy)
13	The vial(s) and any unused medicine should be kept until administration to the patient is complete.
14	Follow Post-Procedure General Directions.

Appendix 5 - Reconstituting powder in a vial and drawing the resulting solution or suspension into a syringe

Step	Procedure
1	Follow Pre-Procedure General Directions.
2	Remove the tamper-evident seal from the vial and wipe the septum with an alcohol impregnated swab (70% Isopropyl alcohol swab). Allow to dry fully (minimum 30 seconds).
3	Snap open the neck of glass ampoules (diluent), using an ampoule snapper if required.
4	Attach a safety needle to a syringe and draw the required volume of compatible diluent into the syringe. If glass ampoule, use a blue needle 23G or a filter needle following manufacturers recommendations when provided. If plastic ampoule, the neck may be designed to connect directly to a syringe without use of a needle, after the top of the ampoule has been twisted off. Tilt the ampoule if necessary.
5	Invert the syringe and tap lightly to aggregate the air bubbles at the needle end. Expel the air carefully.
6	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 (Appendix 4 step 8).
7	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	Push the air back into the vial, with the vial still attached, invert the syringe.
9	Fill the syringe with the required volume of solution then draw in a small volume of air. Withdraw the needle from the vial. Do not re-sheath.
10	Expel excess air from the syringe. Remove the safety needle and exchange it for a new needle or a sterile dead ender/cap. Place used needle directly into appropriate sharps container.
11	When preparing more than one syringe, label each syringe (see section 3.2.5 within the policy)
12	The vial(s) and any unused medicine should be kept until administration to the patient is complete.
13	If a purpose-designed reconstitution device is used, the manufacturer's instructions should be read carefully and followed closely.
14	Follow Post-Procedure General Directions.

Appendix 6 - Adding a medicine to an infusion

Key Recommendations

- Medicines should be added to infusion fluids only where this is specifically indicated.
- It is essential to check the compatibility before a medicine is added to a fluid as the addition of a medicine may result in harmful physical or chemical changes. An incompatibility between a medicine and a fluid does not always produce visible changes.
- The addition of more than one medicine to a fluid increases the likelihood of incompatibilities arising and is therefore not recommended. Exceptions may be Palliative care, Intensive Therapy Unit (ITU), etc where more than one medicine may be added after checking compatibilities.
- Care should also be taken when medicines / fluids are likely to mix during administration through an add-on device, e.g., octopus.
- Medicines must **never** be added to:
  - Blood or blood products
  - Plasma expanders
  - Mannitol or sodium bicarbonate solutions
  - Parenteral nutrition products

Step	Procedure
1	Follow Pre-Procedure General Directions.
2	Prepare the medicine in a syringe using method described in appendix 2, 3, 4 or 5.
3	Check the outer wrapper of the infusion container is undamaged.
4	Remove the wrapper and check the infusion container itself in good light. It should be intact and free of cracks, punctures / leaks.
5	Check the infusion solution is free from particles and cloudiness, and the appearance is as expected.
6	Where necessary, remove the tamper-evident seal and / or wipe the septum on the infusion container with an alcohol impregnated swab (70% Isopropyl alcohol swab). Allow to dry fully (minimum 30 seconds).
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	Check the final infusion is free from particles and cloudiness, and the appearance is as expected.
9	Label the infusion (see section 3.2.5 within the policy).
10	Follow Post-Procedure General Directions.

Appendix 7 - Diluting a medicine in a syringe for use in a syringe pump
(only one medicine should be in the syringe, except in areas such as palliative care and ITU where more than one medicine may be used).

Step	Procedure
1	Follow Pre-Procedure General Directions.
2	If diluting only one medicine for use in a syringe driver, this can be prepared using method described in appendix 2, 3, 4 or 5.
3	For more than one medicine, measure each medicine in a separate syringe of appropriate size and leave needle attached, using one of the methods described above.
4	Draw the diluent into the syringe to be used for administration by the syringe pump. Draw in some air (slightly more than the volume of medicine needed) and remove the needle.
5	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.
6	Check 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.
7	Fit a sterile deadender / cap to the administration syringe and invert several times to mix the contents.
8	Remove the sterile deadender / cap. Tap the syringe lightly to aggregate the air bubbles at the needle end. Expel the air and refit the sterile deadender / cap.
9	Carefully check the syringe for cracks and leaks.
10	Label the syringe (see section 3.2.5 within the policy), especially noting the requirements specific to syringe pumps.
11	Ensure the syringe is fitted correctly into the device, prime the administration set, entering the correct administration rate before starting the infusion.
12	Follow Post-Procedure General Directions.

Guidance on how to set up a subcutaneous infusion in Palliative Care via the BD Bodyguard T syringe pump (formerly CME Medical T34 syringe pump) is available at: https://rightdecisions.scot.nhs.uk/scottish-palliative-care-guidelines/ or contact local specialist palliative care teams.

Appendix 8 - Glossary of Terms

Access device	A device inserted or implanted for diagnostic and/or therapeutic purposes.
Administration Devices	Medical devices, designed to regulate or control, mechanically or electronically, the administration of injections or infusions of medicines.
Ampoule/Vial	A small, sealed glass/plastic container with a liquid or a powder for reconstitution. Liquids may or may not require further dilution before use. Powder will always require reconstitution with a suitable diluent prior to use.
Aseptic Technique	Technique designed to minimise the risk of microbial contamination of a sterile medicine during preparation.
Bolus (push)	Administration of a small volume of a sterile solution of medicine directly into a tissue, organ or vein. This may be given using a syringe as a single dose, over a short period of time.
Diluent	Any sterile injection solution, such as water for injection or sodium chloride 0.9%, commonly used to dissolve (reconstitute) or dilute a medicine immediately before administration.
Flush solution	A compatible sterile, compatible solution, such as sodium chloride 0.9%, used to flush access devices (e.g., cannula), administered prior to, between and after any injectable medicines.
Hazard, risk	Any factor, such as a difficult procedure or a complex calculation, with the potential to cause harm if carried out incorrectly.
Healthcare professional	Doctors, nurses, pharmacists and all other healthcare professionals involved with prescribing, preparing or administering injectable medicines.

Infusion	Administration, from a syringe/ other rigid or collapsible container, of a sterile injectable medicine directly into a tissue, organ or a vein. Delivered at a controlled rate, under gravity or by means of an electronic/ mechanical device over a defined period.
Injectable medicines	Sterile medicines intended for administration by bolus injection or infusion via any of the following routes, intravenous, intramuscular, intrathecal, intraosseous, subcutaneous, intradermal, intraventricular, epidural, intravesicular, intravitreal, intrapleural and intraocular.
Low-risk medicines	Where the hazard associated with preparation is least likely to have serious consequences for the patient or operator.
Luer Lock/ Slip	Types of connection used to allow attachment of syringes and similar medical devices to catheters, cannula and other access devices.
Single-dose injectable medicines	Most injections do not contain an antimicrobial preservative and are licensed for single use only i.e. the preparation of a single dose for administration to one patient on one occasion.
Multi-dose injectable medicines	Where the injectable medicine label specifically indicates that it is licensed and intended to be used on more than one occasion or to provide more than a single dose on any one occasions within a specified time period.
Near patient area	The general area, in which the patient is examined, treated and cared for, e.g., wards, clinics, GP surgeries, the patient's home.
Patient Group Direction (PGD)	This is a written direction relating to the administration and/or supply of a medicine in a specified clinical situation. It is signed by a doctor, a pharmacist and a senior representative of the professional group authorised to use the PGD.
Ready to use	Requires no further dilution or reconstitution before transfer to an administration device, e.g., a liquid in an ampoule, of the required concentration that only requires to be drawn up into a syringe.
Ready-to-administer injectable medicines	Requires no further dilution or reconstitution and are presented in the final container or device, ready for administration or connection to a needle or administration set, e.g., an infusion bag, with no additive required.