Diluting Medications for Parenteral Administration

Site Applicability

PHC – All sites

Practice Level

Basic:

- All clinicians with preparation and administration of parenteral medications within their scope

Requirements

1. All medications for parenteral administration must be labelled upon preparation, and include the following information: Patient name, drug name, drug concentration, date and time of preparation, initials of the clinician who prepared the syringe.
2. If the parenteral medication is hazardous (per the Provincial Hazardous Drugs List), follow the Safe Work Procedure for Preparation of Parenteral Hazardous Drugs in place of this guideline.

Need to Know

1. An Automated Dispensing Cabinet (ADC aka Omnicell®) label is generated when a parenteral medication issued from the ADC is scanned during removal, and may be used to label the medication. A medication label may also be manually filled out.
2. Pre-filled saline syringes are not to be used for dilution and administration of medications.
    a. Pre-filled saline syringes are indicated only for flushing vascular access devices.
    b. Volumes in pre-filled saline syringes are approximate.
    c. Unlabelled diluted medications may be mistaken for pre-filled saline syringes without medication.
3. When diluting or reconstituting medications, use single dose sterile saline or sterile water product with the appropriate size of syringe.
4. If withdrawing medication from an ampoule, a **blunt filter** needle is required to remove microscopic glass shards or shavings.
5. If withdrawing medication from a vial – use an **unfiltered blunt fill** needle.
6. If using fill needle insert into vial at 90 degrees to avoid coring the stopper.

Equipment and Supplies

- Alcohol swabs
- Single dose vial or polyampoule of sterile saline or sterile water – refer to the Parenteral Drug Therapy Manual (PDTM) for appropriate diluent
- Luer lock syringe - appropriate size for final volume
- Needles:
- Unfiltered blunt fill needle for vials
- Blunt filter needle for ampoules
- Sterile cap or appropriate size needle for administration of medication
- Medication to be diluted or reconstituted
- Medication label

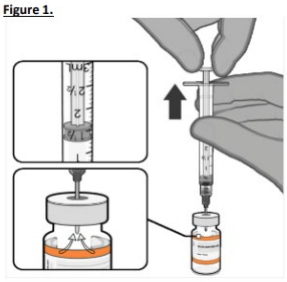
Procedure

1. Check medication administration record (MAR) and prescriber's order.
2. Refer to the PDTM to determine the appropriate diluent and volume of diluent for the ordered route of administration.

Reconstituting medication in a vial:

1. Attach an unfiltered blunt fill needle to the syringe.
2. Remove cap from both the drug vial, and diluent vials if using.
3. Scrub/clean vial septum(s) (silicone/rubber seal) with alcohol swab, allow to dry.
4. Inject air into the diluent vial equal to the volume to be withdrawn (not required if using a polyampoule).
5. Withdraw the required volume of diluent.
6. Inject the diluent into the medication vial.
7. Equalize vial pressure before removing the needle from the vial by withdrawing an equal amount of air to the diluent added from the 'air portion of the vial' into the empty diluent syringe (see Figure 1 below).

Figure 1.



8. Mix the medication and diluent per drug specific instructions (i.e. PDTM, manufacturer's instructions).

9. Insert needle and inject air (same volume to be removed) into medication vial, withdraw correct dose into syringe.
10. Apply a completed medication label and appropriate size needle for administration to the syringe if it is to be administered by syringe.
11. Refer to Diluting section below if dilution in an IV bag is required.

Withdrawing medication from an ampoule and reconstituting in a syringe:

1. Attach a blunt filter needle to the syringe.
2. If using diluent from a vial:
    a. Remove plastic cover on diluent vial. Clean with alcohol swab, allow to dry.
    b. Inject air into the diluent vial equal to the volume to be withdrawn.
3. Open the medication ampoule using an ampoule breaker, alcohol swab or gauze to protect hands.
4. Withdraw the required dose of medication into the syringe.
5. Withdraw the required volume of diluent into the same syringe.
6. Detach unfiltered blunt fill needle from syringe and discard in sharps container.
7. For administration by syringe, attach a completed medication label, and appropriate size of needle for administration.
8. For further dilution in an IV bag change to an unfiltered blunt needle before injecting the medication into the bag to reduce risk of injecting glass shards. Refer to Diluting section below.

Diluting:

In an IV bag (e.g. minibag):

a. Clean minibag port with an alcohol swab.
b. Use a needle (not blunt) to inject the drug into the minibag.
c. Remove the needle from the minibag port.
d. Dispose of needle and syringe into sharps container.
e. Gently mix the IV bag.
f. Apply a completed medication label to the IV bag.

Documentation

1. Document medication administration in the MAR.
2. In areas without ADCs, document issue of narcotics and controlled substances, and any waste in the narcotic book as required.
3. Document in Intake and Output as appropriate.
4. Document intravenous access and care in iView, or clinical flowsheet.

Patient and Family Education

- Inform patient of name of medication, route of administration, side effects and expected outcomes of medication.
- Ask patient to report any adverse effects to the clinician.
- Assess need for medication education and provide information as necessary.

Related Documents

1. B-00-16-10050 - Safe Work Procedure for Preparation of Parenteral Hazardous Drugs
2. BD-00-12-40045 – CVC: Non-Tunneled Central Venous Catheter (NT-CVC) - Basic Care and Maintenance (Adult)
3. PHC Pharmacy Policy: Preparation of Parenteral Medications for Administration by Syringe
4. Parenteral Drug Therapy Manual (PDTM)
5. Elsevier Clinical Skills: Medication Administration: Injection Preparation from Ampoules and Vials.

References

1. BD Medical. (2019) BD Blunt Fill and BD Blunt Filter Needles: Important usage guidelines. Retrieved June 29 2022 from https://www.bd.com/documents/guides/user-guides/MPS_HY_BD-1656-Blunt-Fill-user-guide_UG_EN.pdf
2. ISMP. Is it really saline? Retrieved June 29 2022 from: https://www.ismp.org/resources/it-really-saline
3. Elsevier Clinical Skills Medication Administration: Injection Preparation from Ampoules and Vials (2021). Retrieved June 29 2022 from Elsevier Clinical Skills
4. Erkoc Hut, A., & Yazici, Z. A. (2021). Glass particle contamination threat in nursing practice: A pilot study. Journal of Advanced Nursing, 77(7), 3189–3191. https://doi.org/10.1111/jan.14847
5. Stein HG. (2006). Best practice. Glass ampules and filter needles: an example of implementing the sixth “R” in medication administration. MEDSURG Nursing, 15(5), 290–294.

Persons/Groups Consulted

Practice Consultant, Medication Safety, Professional Practice

Developed/Revised By:

Nurse Educators, Medication Safety, Professional Practice

First Released Date:	JUN 2013
Posted Date:	05-JUL-2022
Last Revised:	05-JUL-2022
Last Reviewed:	05-JUL-2022
Approved By: *(committee or position)*	PHC
Owners: *(optional)*	PHC