

PURPOSE

To provide clinicians with guidelines for the management of parenteral infusions of medications using an infusion device with Dose-Error Reduction Software (DERS) within BC Children's Hospital, Sunny Hill Health Center, BC Women's Hospital and Health Center and BC Mental Health and Substance Use Services.

SITE APPLICABILITY

This applies to all BCCH, SHHC, and BCWH&HC employees.

DEFINITIONS

Dose Error Reduction System (DERS): Dose error reduction systems (DERS) allow infusion pumps to warn users of prescriber calculation error, administration calculation errors, or miss-programming that would result in significant under- or over delivery of a drug, electrolyte, or other fluid. This is done by checking programmed doses against preset limits specific to a drug and to a clinical application or location. If the programmed dose is outside the limits, the pump alerts clinicians and can either require confirmation before beginning delivery (referred to as a soft limit) or not allow delivery at all (referred to as a hard limit).

POLICY STATEMENTS

Education and Competency Assessment

1. All Registered Nurses (RN's) at BC Children's Hospital, Sunny Hill Health Center, and BC Women's Hospital and Health Center must complete the Clinical Skills Validation: Alaris Pump System prior to using the pumps in clinical practice.
2. All RN's & RTs must complete the annual peer to peer validation tool and submit it to their Clinical Nurse Coordinator or designated leader for review as part of annual performance planning and review (PPR). The frequency of validation is determined by the clinical care program and at the minimum every two years.

Pump Programming

3. The DERS feature on the infusion pumps will be used in conjunction with current program specific policies related to the administration of parenteral therapy.
4. The use of the infusion device with DERS does not replace the need for the RN to follow the seven rights of medication administration:
 - Right Drug
 - Right Dose
 - Right Route
 - Right Time
 - Right Client
 - Right Reason
 - Right Documentation
 - Right Concentration

IV THERAPY: USE OF INFUSION PUMP WITH DOSE-ERROR REDUCTION SOFTWARE

- Right Rate of Administration
 - Right Expiry Dating
 - Right Diluent
5. The RN will use the DERS feature for the administration of all medications listed in the drug library.
 6. The RN will only bypass the DERS feature on the pump if:
 - The situation is emergent and there is no time to locate the drug library without the potential to cause harm to the patient. Infusions will be reprogrammed using the DERS feature when the emergent need has passed.
 - There has been a change in the formulary and the new drug or dose has not yet been uploaded into the drug library.
 - The physician has ordered drugs dosage outside of the range within the drug library.
 7. The RN who assumes care of a patient will verify correct programming of the pump through an independent double check. Please refer to Independent Double Check for Medication Administration policy. Check that the VTBI shown on the pump screen is within the accepted variance of 5%.
 8. The RN will select the correct profile based on care area

Profile Name	Care Area
.Critical Care/CH OR	Pediatric Critical Care (PICU), Operating room (OR), Emergency
.NICU	Neonatal Intensive Care Unit (NICU), OR
.Oncology	Oncology Inpatient and Outpatient units , OR
.Pediatrics	Pediatric Medical and Surgical Inpatient Units, PACU, OR
.Women's Hospital	All patient care areas at BC Women's
COI OVER 3 months	All areas EXCEPT PICU, NICU and BC Women's
PCA 20 - 30 kg	All areas - Orders written by Acute Pain Service (APS) only
PCA 30 - 40 kg	
PCA 40 - 50 kg	
PCA 50 -60 kg	
PCA 60 - 70 kg	
PCA over 70 kg	
x Comfort	<p>Physicians Order Required to use this profile</p> <p>Oncology - for palliative patients, orders written by Palliative Care or APS Physicians</p> <p>All other Areas - orders written by APS only</p>
x ECLS x	Used ONLY by Extracorporeal Life Support (ECLS) technicians in the PICU

Rationale: Many drugs will be available in multiple profiles; however, the programmed safety limits may differ between profiles as limits will be determined by many factors such as patient population and monitoring available in the care area.

9. The RN will use **Guardrail IV Fluids** infusion type for programming hydration (IV fluids with or without additives).
10. The RN will select the correct drug entry in the **Drug Library**.

Rationale: A drug may have more than one selection in a Profile to account for the varying concentrations and dosages. Selection of the correct drug entry is required to ensure the most

accurate safety limits are being utilized. The RN will use Primary and Syringe method for administering continuous medications found in the drug library.

11. The RN will use Primary, Secondary and Syringe methods for administering intermittent medications. Determination of which method to use for an intermittent infusion is made by the RN based on pharmacokinetics of medication and patient's ability to tolerate fluids in consultation with pharmacist and/or prescriber. The RN will use **Basic Secondary** if:

- The drug is not in the drug library.
- The physician has ordered drugs *off protocol* or it is an undesignated treatment

12. The RN will flush medications as outlined in Intermittent Intravenous Medication infusion via Primary, Secondary "Piggy Back" or Syringe Delivery Policy.

http://bccwhcms.medworxx.com/Site_Published/bcc/document_render.aspx?documentRender.IdType=30&documentRender.GenericField=1&documentRender.Id=19535

13. The RN will use the **Basic Infusion** type programming for IV fluids not listed in the drug library and assign the appropriate channel label.

Soft and Hard Limits

14. When encountering a **soft limit** that has been programmed into the pump the RN will:

- Verify the correct profile has been selected.
- Verify the correct drug entry and infusion concentration (i.e. X mg in Y mL) are entered per the prescribers orders.
- Verify the correct patient weight is entered into the pump. If using BSA verify the amount (i.e. mg/m²) and rate/time are entered as per the prescriber's orders. Check the VTBI shown on the screen is within the accepted variance of 5%.
- Use nursing judgment to determine the clinical appropriateness of the order through consultation with colleagues, review of relevant drug information and discussion with pharmacy and ordering prescriber if necessary.
- If the RN finds the order **is** clinically appropriate they may override the soft limit and proceed with infusion.
- In the RN finds the order **is not** clinically appropriate they will contact the physician and obtain an order within the limits and re-program the pump.

15. **Hard Limits** are programmed into the pump and cannot be overridden. When encountering a hard limit the RN will:

- Verify the correct Profile has been selected.
- Verify the correct drug entry and infusion concentration (i.e. X mg in Y mL) are entered as per prescribers orders.
- Verify the correct patient weight is entered into the pump. If using BSA verify the amount (i.e. mg/m²) and rate/time are entered as per the prescriber's orders. Check that the VTBI shown on the screen is within the accepted variance of 5%.
- If a programming error is identified the RN will re-program correctly and proceed with infusion if it is within limits. If a soft limit is encountered as a result of re-programming the RN will follow the policy for soft limits.

- If a programming error is not identified despite second RN verification, the RN will contact the physician and obtain an order within the limits and re-program the pump. If it is clinically appropriate for the patient to receive a prescribed dose which is above the hard limits, the RN will program the pump using a Basic Infusion, document the discussion with the physician, and notify the Clinical Nurse Coordinator or Charge Nurse that the infusion profile appropriate for that area does not include the dosage ordered for the patient.

16. Clinical Alerts will be programmed into the drug library for those medications with special considerations or requirements for safe infusion.

17. The pump module will be turned off between patients to ensure previous programming is cleared.

Drug Library Updates

18. When notified that a new version of the pump library is available the RN will:

- Ensure all pumps are turned on.
- Once the drug library has uploaded wirelessly, the new library is activated by performing the following steps: Turn the pump **OFF**, then **ON** and select **NEW PATIENT**.
- If the new drug library fails to upload, the RN will complete a Biomedical Engineering Service request and send the pump to Biomedical Engineering.

Pump Maintenance

19. In the event of pump malfunction, breakdown, degradation of surfaces or need for maintenance the RN will:

- Remove the pump from the treatment area
- Clearly label the pump so other health care providers can easily ascertain that the pump cannot be used and the reason.
- Submit a Biomedical Engineering Service Request Form and send the pump to Biomedical Engineering ensuring the pump is cleaned beforehand.

20. Clean the pump between patients as per manufacturer's instructions and C&W infection control guidelines.

REFERENCES

Adapted from BC Cancer Agency Nursing Practice Reference: IV THERAPY: USE OF INFUSION PUMP WITH DOSE-ERROR REDUCTION SOFTWARE effective date: November, 2014

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