

## TITLE

**INFUSION PUMPS FOR MEDICATION & PARENTERAL FLUID ADMINISTRATION**SCOPE

Provincial, Clinical

## DOCUMENT #

PS-70

## APPROVAL LEVEL

Executive Leadership Team

## SPONSOR

Provincial Medication Management Committee

## INITIAL EFFECTIVE DATE

January 04, 2016

## CATEGORY

Patient Safety

## REVISED

Not applicable

**NOTE:** The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

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**PURPOSE**

- To improve patient safety by providing direction for the procurement, selection, maintenance and general use of **infusion pumps** across Alberta Health Services.

**POLICY STATEMENT**

- Alberta Health Services shall assess the ability to limit, where possible, the variety of infusion pumps in the organization.
- Alberta Health Services shall aim to use programmable pumps with **dose error reduction software (DERS)** to support the safe use of parenteral medications.
- Alberta Health Services shall establish and follow processes to ensure the safe use of infusion pumps.
- Zones/departments/programs may produce more detailed governance documents based on their business rules, care setting and health services provided to patients that comply with this policy suite.

**APPLICABILITY**

Compliance with this policy is required by all Alberta Health Services employees, members of the medical and midwifery staffs, students, volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary). This policy does not limit any legal rights to which you may otherwise be entitled.

## POLICY ELEMENTS

### 1. Requirements for Infusion Pumps

- 1.1 Where possible, limit the number of brands of infusion pumps used in Alberta Health Services while ensuring program and site-specific requirements are met, and that infusion pumps meet the needs of the patient population for optimal patient care.
- 1.2 Wherever possible, infusion pumps shall be programmable with dose error reduction software.
- 1.3 Wherever possible, Alberta Health Services should implement a wireless, networked environment to facilitate timely **drug library** updates and review of continuous quality improvement infusion pump data.
- 1.4 The infusion pump risk potential shall be assessed whenever the need is required (e.g., for purchase or replacement, or after an **adverse event** involving an infusion pump, etc.).
  - a) The risk potential assessment includes, but is not limited to obtaining appropriate clinical and technical input as applicable (e.g., Pharmacy, Nursing, Physicians, Clinical Engineering, Infection Prevention & Control, Quality Healthcare Improvement, Human Factors, Information Technology, etc.).
- 1.5 The type and number of pumps required for use in any care area shall be determined by:
  - a) patient conditions and acuity;
  - b) patient type (e.g., adult, child, neonate);
  - c) medications or other solutions to be infused (route, volume, rate, hazard potential) and;
  - d) requirement per provincial or local parenteral monographs for the medication to be infused via an infusion pump.

### 2. Education and Support

- 2.1 Managers and staff educators shall ensure that **health care professionals** receive ongoing training on all infusion pumps used within their practice environment. (See Alberta Health Services *Standards and Guidelines for Infusion Pump Education* for further information).
- 2.2 Health care professionals shall have access to easily accessible and simple to understand equipment instructions and user guides, for each type of infusion pump used in the service area (including patient homes).

- 2.3 When patients are provided with patient-operated infusion pumps (e.g., patient-controlled analgesia [PCA] pumps, insulin pumps), Alberta Health Services staff shall provide training to ensure the patient and family members understand how to use the infusion pump safely. The training provided, including what written information was given, is documented in the patient health record.
- a) When an ambulatory infusion pump and/or patient-operated infusion pump is used and managed by patients in their homes, the patient shall have access to easy to understand instructions, including troubleshooting information, and information regarding who to contact for additional help.
- 2.4 Alberta Health Services *Provincial Parenteral Manual* monographs or Zone legacy parenteral manuals shall be followed regarding infusions requiring medication delivery via an infusion pump.
- 2.5 Variance:
- a) Zones within Alberta Health Services may determine, in consultation with Pharmacy, which medications and rates of infusion require delivery via an infusion pump, when this information is not addressed in the Alberta Health Services *Provincial Parenteral Manual* monographs or Zone legacy parenteral manual.
- b) In the pre-hospital environment, Emergency Medical Services shall continue to follow *Emergency Medical Services Provincial Medical Control Protocols: Adult and Pediatric* with regard to infusion rates, medication concentrations and rate/volume devices (e.g., control-a-flow device).
- Note:** During inter-facility transfers, where a medication infusion is initiated by the sending facility, Emergency Medical Services **health care providers** shall follow the Alberta Health Services *Provincial Parenteral Manual* monographs with regard to infusion rates and medication concentrations. The sending facility shall provide a copy of the monograph(s) and infusion charts (where available), for the medication infusions being administered by Emergency Medical Services health care providers.

### 3. Infusion Pump Maintenance and Repair

- 3.1 Each site shall be responsible for ensuring regular cleaning of infusion pumps, as described in the user guides or manuals, and per Zone, program or site-based policies and procedures. Routine maintenance of infusion pumps shall be conducted by Clinical Engineering or appropriate delegate.

#### 4. Adverse Events and Close Calls

- 4.1 In the case of an adverse event or **close call** due to a problem with an infusion pump, refer to the Alberta Health Services *Infusion Pumps for Medication & Parenteral Fluid Administration* Procedure (section 3).

#### 5. Independent Double-checks

- 5.1 Refer to the Alberta Health Services *Management of High-alert Medications* Policy, Procedure and guidelines for a list of **high-alert medications** requiring an **independent double check**.
- a) Be aware of Zone, program, or site-based additional medications that require an independent double-check.
- 5.2 Independent double-check of pump settings shall be performed for all infusion pumps, including infusion pumps with Dose Error Reduction Software (DERS), for those medications identified as requiring an independent double-check as per the Alberta Health Services *High-Alert Medications* Procedure.
- a) Refer to the Alberta Health Services *Independent Double-check* Guideline for information on how to perform an independent double-check of pump settings for parenteral medications requiring an independent double-check.
- 5.3 The manual programming of non-standardized medication concentrations shall be verified through an independent double-check. Refer to Alberta Health Services *Standardized Medication Concentrations for Parenteral Administration* Policy for further information.

#### 6. Dose Error Reduction Software (DERS)

- 6.1 Drug libraries for pumps with dose error reduction software (DERS) shall be created and maintained for all patient populations in consultation with multidisciplinary care teams.
- 6.2 Zone or program leadership, in conjunction with applicable programs (e.g., Pharmacy Services, Clinical Engineering, etc.), are responsible for oversight of the development and maintenance of drug libraries for infusion pumps with dose error reduction software, including:
- a) ensuring resources are identified to create, update, maintain and audit the drug library;
- b) directing how the drug library will be created, changed and updated (creating or updating medication libraries shall be restricted to authorized users);

- c) designating who shall create, update, maintain, and review the drug library (this should include representation from physicians, nursing, Pharmacy and others identified within the Zone/program);
  - d) determining frequency of drug library updates;
  - e) developing a website, or other feedback mechanism, to provide information on changes to the drug library, including a feedback system (e.g., online database) for requesting drug library changes; and
  - f) establishing a plan for reviewing data from infusion pumps with dose error reduction software. This shall include, but not be limited to –
    - (i) who shall download the data,
    - (ii) how the data will be downloaded and the frequency of downloading, and
    - (iii) who shall review the data and make changes to the drug library.
- 6.3 When creating a drug library for pumps with dose error reduction software, a multidisciplinary committee, such as a Medication Management Committee, shall ensure consistency between drug libraries within each Zone or program.
- 6.4 When creating a drug library for pumps with dose error reduction software, a multidisciplinary committee, such as a Medication Management Committee, should seek consistency between drug libraries across the province, where possible.
- 6.5 Dose error reduction software shall be activated and utilized, when available. The appropriate drug profile from the drug library shall be utilized, where available.
- a) For pumps with dose error reduction software, the drug library shall contain **soft stops/limits** for all medications.
  - b) For pumps with dose error reduction software, the drug library shall contain **hard stops/limits** for, at a minimum, all high alert medications listed in the Alberta Health Services *Management of High-alert Medications* Policy, Procedure and guidelines.
  - c) There are occasions when a medication or parenteral fluid must be administered beyond the soft stop/limit. Refer to Appendix A *Infusion Pumps for Medication and Parenteral Fluid Administration* Procedure for information on how to safely override a soft stop/limit.
  - d) It is not possible to override an established hard stop/limit. If a hard stop/limit is encountered, refer to Appendix B *Infusion Pumps for Medication and Parenteral Fluid Administration* Procedure for guidance on how to proceed.

**Warning:** If a health care professional programs the infusion pump and disregards or disables the dose error reduction software limits, the safety features of that infusion pump will not be available and patient safety will be at risk.

- 6.6 Quality improvement data resulting from dose error reduction software use shall be evaluated on a Zone and/or site level on a regular basis to confirm appropriateness of soft and hard stops/limits, to have those soft and hard stops/limits revised as required based on this evaluation.
- 6.7 Quality improvement data resulting from dose error reduction software use shall be evaluated on a regular basis to identify pump programming errors, where education or the implementation of additional safety strategies may be required.

## DEFINITIONS

**Adverse event** means an event that could or does result in unintended injury or complications arising from health care management, with outcomes that may range from death or disability to dissatisfaction, or require a change in care, such as prolongation of hospital stay.

**Close call** means an event in which a patient is exposed to or involved in a situation with the potential for harm. For one or more reasons the danger did not reach the patient (that is, no harm occurred).

**Dose error reduction software (DERS)** means pre-determined programming for compatible pumps with digital memory, including minimum and maximum doses and minimum and maximum rates of administration, for given standard concentrations of solution. Pumps that use this software are also known generally as “SMART” or “smart technology” pumps.

**Drug library** means a digital memory, often for use with an electronically loadable infusion pump, containing a plurality of medication information entries, including, but not limited to, minimum, default and maximum parameters for concentration, delivery rate, dose and bolus size. (Adapted from Baxter/United States Patent and Trademark Office [2013])

**Hard stops/limits** means a pre-set alert, in an infusion pump, that will notify the user that the dose, rate or concentration selected is out of the institution-determined safe range for that medication, and will not allow the infusion to be administered unless the pump is reprogrammed within the acceptable range. (Provincial Infusion Pump Education Working Group, 2010)

**Health care professional** means an individual who is a member of a regulated health discipline, as defined by the *Health Disciplines Act* [Alberta] or the *Health Professions Act* [Alberta], and who practises within scope and role.

**Health care provider** means any person who provides goods or services to a patient, inclusive of health care professionals, staff, students, volunteers and other persons acting on behalf of or in conjunction with Alberta Health Services

**High-alert medications** means medications that bear a heightened risk of causing significant patient harm when used in error. (Institute for Safe Medication Practices [ISMP], 2012)

**Independent double-check** means a verification process whereby a second health care provider conducts a verification of another health care provider’s completed task. The most critical aspect is to maximize the independence of the double-check by ensuring that the first health care provider does not communicate what he or she expects the second health care provider to see, which would create bias and reduce the visibility of an error. (Institute for Safe Medication Practices [ISMP], 2005)

**Infusion pumps** means all pumps used to control delivery of parenteral fluid and/or medicated solutions, including but not limited to syringe, epidural, patient-controlled analgesia (PCA), dose error reduction software (DERS; also known as “SMART” or “smart technology”), “general purpose”, large volume and ambulatory pumps.

**Soft stops/limits** means a pre-set alert, in an infusion pump, that will notify the user that the dose, rate or concentration selected is out of the anticipated range for that medication. However, soft stops/limits can be overridden by the user, and the medication can still be infused without changing the dose error reduction software pump settings. (Provincial Infusion Pump Education Working Group, 2010)

**REFERENCES**

- Alberta Health Services Governance Documents:
  - *Infusion Pumps for Medication and Parenteral Fluid Administration Procedure (#PS-70-01)*
  - *Reporting of Clinical Adverse Events, Close Calls and Hazards Policy (#PS-11)*
  - *Immediate and Ongoing Management of Clinically Serious Adverse Events Guideline (#PS-11-01)*
  - *Government of Alberta Health & Alberta Health Services Emergency Medical Services Provincial Medical Control Protocols: Adult and Pediatric*
- Alberta Health Services Resources:
  - *Alberta Health Services Health Professions Strategy & Practice Standards and Guidelines for Infusion Pump Education*
- Non-Alberta Health Services Documents:
  - *Accreditation Canada QMentum Program, Medication Management Standards (For Surveys Starting After: January 1, 2014)*

**VERSION HISTORY**

Date	Action Taken
July 28, 2015	Initial approval date
January 04, 2016	Initial effective date