

Medication Safety: ISMP Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps (2020)

About the Guideline

- The Institute for Safe Medication Practices (ISMP) met in 2009 to examine the clinical practice of smart infusion pump (SIP) implementation and associated drug libraries. The first set of recommendations was then developed and publicized thereafter.
- Issues raised by errors reported to the ISMP National Medication Errors Reporting Program prompted a second national summit of the ISMP in 2018, which led to newly revised and expanded guidelines.
- The guidelines were developed by a wide variety of representatives from professional organizations, as well as pharmacists, nurses, physicians, and biomedical engineers.
- Best evidence, clinical articles, and published literature at the time, along with expert consensus, were used to develop the guidance document.

Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting.

Infrastructure

- Establish organizational policies, procedures, and practice guidelines regarding the use, education, assessment, monitoring, and maintenance of smart infusion pumps with a dose-error reduction system throughout the organization.
- Establish an organizational goal of 95% or greater for the use of SIPs for intravenous (IV) administration of medications and solutions throughout the acute care setting, including ambulatory settings.
- Use SIPs that are capable of wireless drug library updates, data transmission, and bi-directional communication with the electronic health record (EHR).
- Use tracking technology to locate and manage SIPs within the organization.
- Develop organizational policies regarding the use of SIPs whenever patients are transferred both within and outside the organization.
- Establish standardized ongoing training for the use of SIPs and required competency assessment for all users across the organization.
- Collect adverse events, close calls, and hazardous conditions with the use of SIPs and report the findings and strategies to reduce risks and errors to practitioners and required external safety organizations.

Drug Library

- Establish an interdisciplinary team to develop, test, and update, at least quarterly, the drug library.
- Ensure that a standardized SIP library is used across the health care system and that there is a process for communicating drug library changes to end users.

- Require an independent double check of all drug entries, updates, and modifications to ensure alignment with the EHR and that care areas and profiles are met prior to going live.
- Use standardized drug name nomenclature, dose-rates, terms for IV administration, bolus dosing, container overfill, flushing parameters, and loading dose infusion.
- Tailor care areas and profiles to specific patient populations, acuity, and/or patient weight.
- Restrict or limit the ability to manually program continuous and intermittent medication infusion concentrations.
- Develop a requirement in the drug library and clinical alerts that the practitioner must acknowledge during the infusion programming.

Continuous Quality Improvement (CQI) Data

- Use dedicated time and resources to regularly (at least quarterly) review and analyze SIP data.
- Review and use internal and external information about adverse events, close calls, and hazardous conditions associated with the use of SIPs for CQI.
- Monitor and identify in the drug library, on a regular basis, barriers to compliance with established organizational baselines and target values for identified CQI metrics.
- Use advanced CQI metrics to improve infusion safety using SIP technology.

Clinical Workflow

- Use and follow the manufacturer's instructions to set up and install the SIP.
- Perform a double check by two clinicians when starting selected facility-defined high-alert medication infusions and at additional facility-defined steps.
- Ensure that the drug library care area and profile are appropriate for the receiving unit when a patient is transferred to a different clinical unit.
- Trace, by hand, the tubing from the solution container to the pump and then to the patient when infusions are started, reconnected, or changed.
- Use only infusion pumps cleared by the Food and Drug Administration that are specific to the type of infusion used, such as enteral nutrition, epidural infusions, bolus dose, or loading dose infusion, and only use International Organization for Standardization route-specific connectors.
- Immediately discard all continuous IV medications and epidural infusions after discontinuation.

Bi-Directional SIP Interoperability with the EHR

- Use SIPs that have bi-directional interoperability with the EHR.
- Establish a multidisciplinary team to oversee the planning, financial resources, and labor needed for the successful implementation of SIP interoperability with the EHR.
- Establish a goal of 95% compliance with auto-programming for the administration of IV fluid infusions and medication infusions contained within the drug library.
- Ensure that the wireless infrastructure of the organization in all patient care areas is capable of supporting the use of SIPs.
- Perform a risk assessment along with variable practice patterns across the organization.
- Ensure that there is standardization for medication administration and fluid infusions and that all medication names, concentrations, dosing units, and dosing limits and flow limitations occur from the EHR to the SIPs.
- Perform, in a test environment or on a test patient, a test of all infusion orders, including when EHR and drug library updates occur, prior to going live with SIP implementation across the organization.

- Ensure that a permanent, accessible, readable, and cleanable unique barcode label correctly identifies all SIPs and channels.
- Ensure that workflows exist for patients transferred between areas with and without interoperability.
- Clarify procedures for SIP dissociation between its use on separate patients.
- Ensure that downtime procedures and a response plan are established to guide workflow when the system has gone down.
- Develop and implement standard initial and ongoing staff training and competency assessment for the use of interoperability workflows.
- Monitor, collect, and share EHR and SIP data with key stakeholders to ensure that needed interoperability performance improvements are made.

Reference

Institute for Safe Medication Practices. (2020). *Guidelines for optimizing safe implementation and use of smart infusion pumps*. <https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps>