# Organizational Assessment of Smart Pump - EMR Interoperability Readiness

Smart Pump – Electronic Medical Record (EMR) interoperability is the new standard of care for intravenous (IV) infusion therapy. While advances such as computerized provider order entry (CPOE) and barcode medication administration (BCMA) have demonstrated increased safety, smart pumps continue to be a source of administration errors.[1] Pharmacy Purchasing and Products journal reported just 32% of hospitals have linked smart pumps to BCMA in their 2016 State of Pharmacy Automation.[2] So what limits organizations' abilities to implement smart pump interoperability? Interoperability can be complex, difficult and costly, sending organizations down a long and frustrating path. Prior to embarking towards the beacon of smart pump safety, organizations should carefully examine their current technology portfolio and ensure the necessary infrastructures are in place to support a smooth implementation and optimize success.[1]

This tool was created based on referenced literature and the expert opinion of members of the American Society of Health-Systems Pharmacists (ASHP) – Section Advisory Group on Pharmacy Operations Automation. It is intended to be used by organizations as a general guide in assessing their readiness for smart pump - EMR interoperability. It may not include all criteria for required for implementation. Organizations should consult individual manufacturers for product-specific requirements.

| Criteria | Discussion | *Implemented* | |
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| | | ***Yes*** | ***No*** |
| ***Infrastructure / Hardware*** | | | |
| Wireless networking capability and reliability | It recommended the facility implements wireless networking to optimize the transfer for smart pump drug library and patient order information between the EMR and smart pumps. The wireless network should also be assessed to ensure it is available and reliable in all patient access and smart pump storage areas. | | |
| EMR interface capability with smart pumps | It is recommended that the EMR be on the appropriate code level and have the capability to support smart pump interoperability. | | |
| Smart pump interface capability with EMR | It is recommended that the smart pumps currently in practice or purchased have the capability to support smart pump interoperability. | | |
| Smart pump wireless network capability | It is recommended that the smart pumps currently in practice or purchased have the capability to operate on a wireless network. | | |
| Scanner integrity and reliability | It is recommended that scanners already be in place with BCMA, unless planning to implement both barcoding and interoperability concurrently. Scanners should be assessed for integrity, quantity, sufficient length, workflow design and reliability prior to implementation. | | |
| Smart pumps are on wireless network to optimize smart pump drug library management. | It is recommended that smart pumps be managed through a wireless network to provide most up to date drug library in addition to real time clinical input from EMR to perform interoperability. | | |

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| CPOE is optimized for medication orders (e.g., orders contain infuse over time, standardized rates, order sets, favorites folders). | It is recommended that CPOE be optimized to default pertinent data required to program pump to reduce input by the end user. This is especially important for urgent medications where pharmacy verification may not occur prior to nurse attempting to scan medication at the smart pump. Identify any area that is not utilizing CPOE. | | |
| Timely CPOE and pharmacy order review (including 24 hour pharmacy services) | It is recommended that timely order entry and pharmacy order review are completed to ensure data is available for smart pump interoperability prior to nurse attempting to scan medication. Identify any area where orders are not reviewed by pharmacy. | | |
| Pharmacy formulary is optimized (including infusion time, standardized rates, order sets, labels, dispensing volume and correlation with smart pump library). | It is recommended that the pharmacy formulary be optimized to default pertinent data required to program smart pumps to reduce input by the end user. There will need to be consensus between pharmacy and nursing on infusion rates and other pertinent data. Defaulting these values into the pharmacy formulary can provide standardization. | | |
| ***Electronic Medication Administration Documentation*** | | | |
| Electronic medication administration record (eMAR) is used for documenting. | It is recommended that the electronic documentation of medication administration already be utilized in clinical practice unless planning to implement both barcoding and interoperability concurrently. Identify any area that is not using an eMAR for documentation or is using a different documentation system. | | |
| ***Barcode capabilities*** | | | |
| Barcode medication administration (BCMA) | It is recommended that BCMA already be utilized in clinical practice unless planning to implement both barcoding and interoperability concurrently. | | |
| BCMA continuous quality improvement and compliance data are tracked and reported to achieve high rates of compliance with scanning safety features. | It is recommended that BCMA should be optimized before implementing new workflow procedures. | | |
| ***Smart Pump*** | | | |
| Smart pumps | It is recommend that smart pumps already be utilized in clinical practice unless planning to implement both smart pumps and interoperability concurrently. | | |
| Smart pump library and guardrails enabled and are up to date. | It is recommended that the smart pump database be optimized before implementing new workflow procedures. | | |
| Smart pump alerts are | | | |

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| meaningful and not masked by nuisance. alerts. | | | |
| Smart pump data on alerts and subsequent actions are regularly analyzed and modified to improve medication safety and clinical alarm management by an interdisciplinary team. | | | |
| Smart pump continuous quality improvement and compliance data are tracked and reported to achieve high rates of compliance with smart pump safety features. | | | |
| Workflow analysis to identify procedural challenges (e.g., bolus, titration, IV piggyback) and key stakeholders. | It is recommended that workflow analysis be completed prior to beginning the smart pump interoperability project. For example, how will the pump be primed and will it be primed with saline or the medication are key processes which must be standardized. Will medications be delivered in syringes or bags? How will smart pump integration impact infusion documentation in the EHR? | | |
| ***Project Management*** | | | |
| Project implementation team is established (Nursing, Pharmacy, Physicians, Information Technology/Clinical Informatics, Biomedical Engineering, Quality, Data Analyst, Executive Sponsorship, Clinical Education Specialist, EMR Vendor, Smart Pump Vendor and Project Lead). | It is recommended that an interdisciplinary project team be in place prior to beginning the smart pump interoperability project. | | |
| Budget established and | It is recommended that appropriate budgetary | | |

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| approved including staff time, hardware, software, device upgrades, interfacing, testing and training. | measures and approvals be in place prior to beginning the smart pump interoperability project. | | |
| Implementation timeline established and integrated into hospital's strategic plan. | It is recommended that a realistic readiness and implementation timeline be in place prior to beginning the smart pump interoperability project. | | |
| Determine pre- and post-implementation metrics to measure success. | It is recommended that measures of success be in place prior to beginning the smart pump interoperability project. | | |

**Reference(s):**


1. Vanderveen, T., Wilson, N., Moatsos, K., Obsheatz, M., Interoperability Preparedness: What Hospitals Can Do to Be Ready for Smart Pump-EMR Interoperability. Patient Safety & Quality Healthcare (PSQH). December 9, 2016. Retrieved January 3, 2017. http://www.psqh.com/analysis/interoperability-preparedness-what-hospitals-can-do-to-be-ready-for-smart-pump-emr-interoperability/
2. State of Pharmacy Automation 2016 . Pharmacy Purchasing & Products. BCMA. August 2016. Volume: 13, Number 8, page 73. https://www.pppmag.com/digitalmag/Main.php?MagNo=168&PageNo=1