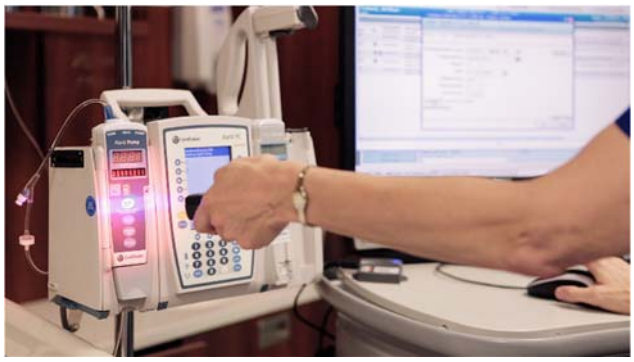
Abstract: Interoperability Preparedness: What Hospitals Can Do to Be Ready for Smart Pump-EMR Interoperability

December 9, 2016

See more at: http://www.psqh.com/analysis/interoperability-preparedness-what-hospitals-can-do-to-be-ready-for-smart-pump-emr-interoperability/#sthash.qoa2CIOE.dpuf



By Tim Vanderveen, PharmD, MS; Nicole Wilson, RN, MSN, CPHIMS; Katie Moatsos, BS; Monica Obsheatz, RPh, MPM

The following article abstract is based on the knowledge gained from implementation of infusion system–electronic medical record (EMR) interoperability at more than 135 hospitals to date. Many considerations go into preparing for safe and reliable smart pump–EMR interoperability. The authors realize that many infusion device companies are addressing these issues; however, as employees of BD/CareFusion, they have no direct knowledge of these efforts. The approaches suggested in this article are presented to help educate and encourage further discussion of what hospitals can do before the actual implementation begins to optimize the success of smart pump–EMR interoperability.

Smart pump–EMR interoperability is the new standard of care for intravenous (IV) infusion therapy. The IV route of administration for medications often results in the most serious outcomes of medication errors (Hicks, Cousins, & Williams, 2003). Despite the many advances made by computerized prescriber order entry (CPOE), bar code medication administration (BCMA), and intelligent infusion safety systems or "smart pumps" (Pettus & Vanderveen, 2013), problems remain. A study at a major medical center found that 67% of smart pump IV infusions have one or more errors associated with their administration (Husch et al., 2005). Multiple studies have pointed to the need for smart pumps to be interfaced with other medication use information systems, such as an EMR, CPOE, BCMA, and pharmacy information system (PIS), to generate meaningful improvements in patient safety (Husch et al., 2005; Russell, Murkowski, & Scanlon, 2009; Schnock et al., 2015).

Infusion device–EMR interoperability

With infusion system–EMR interoperability, bar code scanning is used to trigger the transmission of physician-ordered, pharmacist-reviewed infusion parameters from the EMR to pre-populate the smart pump, reducing the number of error-prone keystrokes used in manual programming. Time-coded infusion data—such as rate changes, pauses, starts, and stops—flows back into the patient's EMR in near real time.
Interoperability also provides association between infusion pumps and specific patients, enabling accurate, time-stamped IV infusion data to improve charge capture and reimbursement. Interoperability can enable pharmacy to view the infusion status of all pumps to better plan pharmacy workflow and prepare infusions as close as possible to the time they are actually needed, reducing waste from discontinued and expired medications.

However, as ECRI has pointed out, infusion device–EMR interoperability can be "complex, difficult, and costly" (ECRI Institute, 2013). Infusion devices and the EMR were developed in separate "silos," and many elements need to be aligned for interoperability to succeed. A change to any component of the separate systems affects all other components, and the work of one department affects all other departments. Fortunately, with more than 135 implementations completed, much has been learned to smooth the process, streamline implementation, and optimize success.

Preparing for interoperability

A growing number of hospitals have interoperability on their 24-month (or longer) road map, and they want to know how they can prepare (even before they contract with their vendors) to minimize anxiety, rush work, unplanned costs, and rescheduling.

Interoperability implementation shines a spotlight on all aspects of medication ordering, pharmacy review, and nursing administration of IV infusion medications. For example, a hospital may assume compliance with medication safety technologies is good, but preparing for interoperability reveals exactly how CPOE, BCMA, and the smart pump drug libraries are being used. Interoperability will also bring nursing practice into sharp focus—are nurses all following policy and procedure, or is there immense variability? The more that can be done to standardize practice and procedures ahead of time, the easier the implementation will be. In a previous article in PSQH (Vanderveen & Husch, 2015), we discussed the top 10 lessons learned from early implementations, with a goal of helping hospitals better understand the complexity involved and how to work with vendors most effectively from kickoff through go-live and continuing use.

In this article, our purpose is to help hospitals optimally prepare before the implementation teams arrive. Success factors include:

- Planning for the team, budget, timing and metrics,
- Assessing software and hardware, wireless infrastructure, scanners and ergonomics,
- Evaluating practice from the perspective of physician prescribing, pharmacy and nursing workflows,
- Aligning drug library databases,
- Strengthening the culture of safety.

For recommendations and insights, see the full article at Patient Safety & Quality Healthcare: http://www.psqh.com/analysis/interoperability-preparedness-what-hospitals-can-do-to-be-ready-for-smart-pump-emr-interoperability/#sthash.qoa2CIOE.dpuf

Summary

As noted in an earlier report, “Smart pump–EMR interoperability is more than worth it for safe and efficient medication management—it is a requirement. In both critical and non-critical care areas, interoperability helps reduce error-prone manual infusion programming, streamline nursing workflow, and ensure accurate and timely capture of infusion data. Smart pump–EMR interoperability encompasses the patient in full-loop IV medication management that improves both safety and quality” (Pettus & Vanderveen, 2013).

Preparing for interoperability accomplishes two goals at once. First, even before the smart pump and EMR vendors’ implementation teams arrive, hospital staff can work to reduce the complexity, difficulty, and cost of implementation. Second, by thoroughly reviewing and optimizing the hospital’s technology and practices, hospital staff immediately improve current practice and quality of care. The effective pharmacy-nursing collaboration that implementation requires also improves interdepartmental understanding and communication. Strengthening the culture of safety benefits everyone.

Tim Vanderveen *was vice president of the BD (formerly CareFusion) Center for Safety and Clinical Excellence in San Diego, California. He may be contacted at tim.vanderveen@BD.com.* ***Nicole Wilson*** *is manager, clinical marketing at BD.* ***Katie Moatsos*** *is director of professional services at BD.* ***Monica Obsheatz*** *is senior pharmacy consultant on the BD Clinical Operations Project Management team for connectivity projects.*

References

ECRI Institute (2013). Infusion pump integration. *Health Devices,* July 2013, 210–221.

Hicks, R. W., Cousins, D. D., & Williams, R. L. (2003). Summary of information submitted to MEDMARX in the year 2002: The quest for quality. Rockville, MD: USP Center for the Advancement of Patient Safety. See more at www.psqh.com/analysis/medication-safety-averting-highest-risk-errors-is-first-priority/#sthash.Fkd88dJn.dpuf

Husch, M., Sullivan, C., Rooney, D., Barnard, C., Fotis, M, Clarke, J., Noskin, G. (2005). Insights from the sharp end of intravenous medication errors: implications for infusion pump technology. *Qual Saf Health Care, 14*(2), 80–86.

Institute for Safe Medication Practices (2016, May 19). Reporting and second-order problem solving can turn short-term fixes into long-term remedies. *ISMP Medication Safety Alert!, 21*(10), 1-4.

Pettus, D.C., & Vanderveen, T. (2013). Closed-loop infusion pump integration with the EMR. *Biomed Instrumentation Tech,* Nov/Dec 2013, 467–477.

Russell, R., Murkowski, K., & Scanlon, M. (2010). Discrepancies between medication orders and infusion pump programming in a pediatric intensive care unit. *Quality & Safety in Health Care,* 19i31-5. doi:10.1136/qshc.2009.036384

Schnock, K., Dykes, P., Albert, J., Ariosto, D., Call, R., Cameron, C., … Bates, D. W. (2016, February 23). The frequency of intravenous medication administration errors related to smart infusion pumps: A multihospital observational study. *BMJ Qual Saf.* doi:10.1136/bmjqs-2015-004465.

Vanderveen, T., & Husch, M. (2015, June 15). Smart pumps, BCMA, and EMRs: Lessons learned about interoperability. *Pt Safety Qual Healthcare.* Retrieved October 19, 2015 from http://psqh.com/may-june-2015/smart-pumps-bcma-and-emrs-lessons-learned-about-interoperability

See more at: http://www.psqh.com/analysis/interoperability-preparedness-what-hospitals-can-do-to-be-ready-for-smart-pump-emr-interoperability/6/#sthash.JYarq68K.dpuf