

## The Hospira System: Integrating a Comprehensive Suite of Wireless Technology to Reduce Costly Medication Errors



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### Understanding the implications of medication errors

Medication errors—the mistakes that occur in the process of prescribing, transcribing, dispensing, administering, and monitoring drug-related activities<sup>1</sup>—are equally prevalent in manual, semi-automated and computerized hospital environments<sup>1</sup>. A casualty of both human and technology-based systems, these oversights exact both a human and financial toll.

In 2006 alone, the Institute of Medicine (IOM) reported that a patient is subject to at least one medication error per day in U.S. hospitals<sup>2</sup> and that at least 1.5 million preventable medication errors occur each year.<sup>2</sup>

Common problems such as adverse drug events, improper transfusions, and mistaken patient identities can result in physical and psychological discomfort and even death for patients.<sup>3</sup> Alarming, the literature reports that at least 44,000 people and as many as 98,000 people die in U.S. hospitals each year as a result of preventable medical errors.<sup>3</sup>

From an economic standpoint, medication errors measurably burden the healthcare system at an institutional level. Each adverse event resulting from a medication error tacks on an additional \$8,750 per hospital stay on average. Cumulatively, this totals nearly \$3.5 billion per year in the U.S. alone [in 2006 dollars].<sup>2</sup>

Additional costs also stem from patient-related burdens such as adjunctive care necessitated by the errors, lost income and disability. The sum of these expenses and losses is estimated to be as much as \$29 billion per year in the United States.<sup>3</sup>

### Medication errors are multifactorial

Medication errors can happen at any point in the medication-use process (i.e., prescribing, transcribing, dispensing, etc.) and are often due to disconnected systems, inefficient processes and/or environmental factors (Figure 1).

Notably, the actual administration of therapy can be a pitfall during the medication-use process. In the treatment continuum spanning the physician, pharmacist and administering nurse, potential errors of improperly reading the prescription order, obtaining the medication, preparing the infusion and programming the infusion pump are common.<sup>4</sup>

Many practitioners assume that integration of computer technology will simply reduce medication errors. However, it is this notion that may actually lead to new opportunities for error. Mistakes may begin with the hospital staff's limited knowledge or experience with computerized entry systems or the confusion and complications that may result from the human-computer interaction.<sup>1</sup>

For example, it is frequently observed that nurses deviate from hospital procedures, workflow design or the intentions of system designers. These "workarounds" may in part be due to their belief that technology will automatically resolve errors. Nurses must focus on the immediate needs of patients and follow their instincts to efficiently perform tasks any way possible, even if it means working around the system.<sup>5</sup> Additionally, when products are not specifically designed to meet nursing workflow needs, lower adoption rates of this technology can be expected.

Bar-coded medication systems, which are intended to help ensure the "5 Rights" of medication administration—right patient, right drug, right dose, right route and right time—have been shown to generally reduce medication errors by 65% to 86%.<sup>6</sup> However, this point-of-care technology may lead to potential medication errors if healthcare personnel employ workarounds and/or operate this technology incorrectly.

#### The following is a partial list of potential errors in the bar-coded medication administration process<sup>6</sup>

- Medication does not come packaged as bar-coded unit-dose product
- Pharmacy applies correct label with bar code to wrong product
- Drugs not available in ready-to-use unit doses
- Nurse fails to scan patient
- Nurse fails to scan medication
- Bar code on patient and/or medication is unreadable
- Patient wristbands are not on patients but placed in other locations (e.g., clipboards, med rooms)
- Nurse overlooks alert displayed on computer screen
- Nurse overrides alert without investigating its cause

The lesson to be learned from this background is that most medication-related errors are preventable. Integration of comprehensive electronic prescribing and clinical decision-support systems that minimize fragmentation at the system level and unite workflow through a wireless system of checks and balances can diminish the possibility of errors.

#### To quote the IOM:

*"Health care providers in all settings should seek to create high-reliability organizations that constantly improve the safety and quality of medication use. To this end, they should implement active internal monitoring programs so that progress toward improved medication safety can be accurately demonstrated."<sup>2</sup>*

Importantly, as system-wide monitoring programs are implemented, it is imperative that clinicians embrace a culture of safety to ensure that technology is used to the best and safest of its ability. This entails consistent use of the integrated technology, strict avoidance of overrides and workarounds to previously approved protocols, instituting regular reviews of approved protocols based on historical "override" reports and critical thinking, especially in terms of evaluating pump alerts.<sup>7</sup>

In an effort to address these important industry recommendations and fulfill the obvious need for improved clinical care, Hospira offers an expandable technology suite of wireless hardware and software options complete with real-time monitoring programs and communications. This integrated system is designed to increase medication delivery efficiency, reduce medication errors and enhance workflow and patient outcomes when used with diligence and appropriate clinical consideration.

#### The Hospira system monitors and modulates drug administration without compromising patient care

The Hospira medication management solution is comprised of technologies that use server-based software to connect data from a hospital's drug information system to next-generation "intelligent" infusion devices via a Health Level 7 (HL7) interface throughout the organization. At the heart of the system, the Hospira MedNet™ server stores the hospital's drug library and interfaces with individual Hospira smart pumps to transfer and update the drug library to each individual station. Seamless wireless integration with handheld bar code-enabled point-of-care (BPOC) systems such as Hospira VeriScan™ and electronic medication administration records (eMARs) brings a level of cooperative automated safety and accuracy to augment clinical protocols.

The following is a partial list of system features and benefits:

- Smart infusion pumps are managed from remote locations, avoiding the need for time-consuming manual updates
- Wireless connectivity to the server allows automated download of most recently updated drug libraries to pumps as well as collection of data from the pumps to the server<sup>4</sup>
- Proprietary Hospira MedNet™ software can be used to develop customized drug libraries/rule sets for specific clinical care areas<sup>4</sup>
- Intelligent pumps alert the clinician programmer if defined dosing parameters are outside of proscribed limits; this helps prevent medication overdose<sup>4</sup>
- Prospective monitoring allows interventions in the short term and generates quality information for long-term safety improvements<sup>4</sup>
- Near real-time, continuous logging of data provides automatic accurate population of the eMAR
- Hospira framework supports integration with a variety of hospital information systems, such as BPOC, eMAR and the pharmacy information system, which supports "5 Rights" verification: right drug, right patient, right route, right dose, right time
- To complement existing hospital management, the system uses collected data for inventory management and asset tracking
- Extensive report-generation capabilities may be performed at the device, group and system-wide level; this allows access to data from different geographical locations and different campuses
- Collected longitudinal data illustrates practice trends in clinical use and offers the opportunity for institutional education—i.e., override reports show actual use of drugs, which helps identify practice habits and may signal a need for potential changes in the drug library
- Flexible system is based on scalable, customizable platform designed with hospital's current and projected technologies in mind

## The Hospira System Solution:

Comprehensively, the streamlined Hospira system helps improve patient safety and clinical care through an integration of the following elements:

### Hospira MedNet™ System



The Hospira MedNet Integrated Clinical Care system brings together a wide range of clinical data at the point of care: IV infusion information, pharmacy data and data from other clinical and patient information

systems. As a flexible server-based system, it is the hub around which integrated clinical care revolves, connecting the point of care not just with centralized infusion data but with a variety of hospital systems that can enhance clinical decision-making.

This software communicates with the infusion system to indicate and enforce hard and soft dosing limits based on hospital-specific dosing guidelines. Clinician alerts are issued when drug thresholds are surpassed, thereby signaling and preventing potential medication errors.

Hospira MedNet™ also enables data collection from the smart IV pumps to the server, which can then be used to generate infusion and override reports that illustrate trends in drug infusion administration practices within the hospital. Additionally, asset tracking functionality helps facility managers track their entire inventory of infusers, as well as indicate drug administration practices that could be altered or improved.

### Hospira MedNet™ Safewatch™



Preserving customer investment in Hospira MedNet™, this proactive real-time remote monitoring solution keeps equipment running with high availability and performance.

### Hospira MedNet™ Portal™



A benchmarking system based on medication error data from hospitals across the United States, this program culls infusion, override and error information from individual client hospitals to generate a blinded nationwide database charting drug administration trends.

### Hospira MedNet™ Integrator™



As the interface to a hospital's enterprise level applications, Hospira MedNet™ Integrator serves as a conduit for the exchange of data between Hospira MedNet, smart infusion pumps and third-party information systems (i.e., EMRs, CPOE and pharmacy information systems) to communicate the many elements required for optimal patient care.

# Technology and Medication Errors

## Physician Medication Process

### Tasks

- MD writes order via CPOE or MD handwrites order



### Potential Errors

- Wrong medication prescribed
- Wrong dose
- Known or unknown allergy vs. medication side effects
- Wrong diagnosis
- Transcription of handwritten prescriptions
- Look-alike vs. sound-alike medications
- Decimal points on medication doses
- Delay of orders being sent to pharmacy or entered into EMR
- Wrong patient

#### Note:

Internal workflow or hospital process varies from institution to institution



HO  
M

- Inter
- Drug

Provide Diagnosis and Identify Treatment Plan



### Potential Errors

- Inaccurate information provided by patient
- Patient does not understand questions being asked



Hospira  
MedNet™

Operability  
Library (Limits)

Pharmacy  
Receives  
Order

Automated  
Medication  
Cabinet

Five "Rights"  
of Medication  
Administration



## Pharmacist Medication Process

### Tasks

- Order entry (delay factor)
- Order verification
- Check for allergies/interactions
- Prepare medication
- Dispense medication



### Potential Errors

- Wrong medication prepared
- Wrong medication dispensed
- Known drug-drug interactions
- Allergies
- Wrong dose
- Medication dispensed for wrong patient



## Nurse Medication Process

- Receive order/medication
- Verify order with medication received
- Rationale of medication and dose

### EndoTool™ Glucose Management System

- Food intake



### Potential Errors

- Wrong medication
- Wrong patient
- Incompatible solutions
- Missed dose/medications
- Drug-drug interactions
- Program infuser incorrectly (wrong dose/rate)
- Need for patient assessment/critical thinking
- Medication rationale for dosing and/or drug
- Wrong infusion device
- Medication not ordered for patient
- Medication has been discontinued by MD
- Overlooks alerts on devices (pump or handheld)



VeriScan™

## Hospira Connectivity Engine

The core wireless engine of the total Hospira solution, this technology provides reliable and fast communication between infusers and Hospira MedNet™; the currently released engine supports 802.11a/b/g wireless network bands. Future releases to include 802.11n.

## Hospira IV pumps: LifeCare PCA™, Plum A+™ with Hospira MedNet™ and Symbiq™



Smart infusion pumps, such as the Symbiq™, Hospira LifeCare PCA™ and Plum A+™ with Hospira MedNet™ offer the ability to establish limits and clinical parameters particular to each drug administration for individual patients. Complete with dose-checking technology, these pumps enable a hospital to input defined drug-infusion protocols into their drug library and set preprogrammed dose limits. Wirelessly and automatically updated, the Hospira smart pump stores these clinical guidelines and alerts the clinician if these rules are not adhered to when the pump is programmed at the patient bedside.<sup>7</sup> For example, a smart pump will notify the clinician when a dose

outside the acceptable range for a particular patient case is programmed, thereby preventing a possible medication overdose.<sup>8</sup>

The suite of Hospira intelligent IV pumps also provides valuable patient and administration information to the pharmacy and physician level. Through consistent wireless connectivity with the Hospira MedNet™ server, these pumps allow clinicians to supervise patient medication use, monitor pump use and track equipment and medication assets. Synched with CPOE, pharmacy systems and eMAR databases, Hospira smart pumps are the sentinels that safeguard against the uncertainties and inconsistencies common to prescription processes.

## Hospira VeriScan™ Rx Medication Administration System



In an effort to improve patient safety and the accuracy of medication and documentation, the American Society of Health-System Pharmacists (ASHP) recommends the adoption of bar code-enabled medication administration (BCMA) technology to improve patient safety and the accuracy of medication administration and documentation.<sup>9</sup> Hospira VeriScan™ enables nurses to reduce opportunities for medication errors by quickly identifying medications and verifying the "5 Rights."

At the bedside, each patient is identified by a bar code or RFID tag as well as by photo image, which verifies patient identification by physical appearance—a protection against misidentification even if patient ID tags are inadvertently switched. When integrated with smart pumps via Hospira MedNet, VeriScan™ helps improve clinical workflow with automatic medication ID programming, automatic documentation and remote monitoring of the patient's infusion status without being in the patient's room. Each patient bar code or RFID-enabled wrist band and every medication are scanned to confirm that the right drug and correct administration parameters are in place for each patient.

VeriScan™ also manages patient measures, populating the eMAR and intake and output (I&O) flow sheet with actual infusion events. This offering is particularly helpful in providing continuity for the many different clinicians who attend to a patient in the course of a hospital stay. Once infusions are finished, VeriScan automatically charts all infusions with complete accuracy. This of course means that nurses don't have to. But it also means that hospitals accurately capture all infusion start and stop times to maximize their business offices' efforts to meet Center for Medicare Services (CMS) requirements.

As a whole, this technology provides an added level of assurance in meeting the "5 Rights" of medication administration. VeriScan™ ties together the patient/pump relationship; it ensures that the right pump is delivering the correct medication to the intended patient.

## Hospira EndoTool™ Glucose Management System



To address the need for glycemic control, the Hospira EndoTool™ software system uses unique mathematical algorithms and trending of glucose levels to create a patient-specific physiologic insulin dosing curve. The software, based on a current blood glucose reading entered by the caregiver, will adjust the dose of IV insulin necessary to bring the patient into the goal range selected by the clinician. The predictive and adaptive modeling with EndoTool safely controls elevated blood glucose levels while minimizing hypoglycemia. EndoTool has been shown to be safer than a paper-based protocol<sup>10</sup> and will provide a foundation for glycemic care throughout the hospital.

## Advanced application usage

In an ideal scenario, all hospitals would effectively reduce medication errors using integrated CPOE and bar code applications to streamline drug dispensing and administration. However, due to the cost and logistics involved with system-wide adoption, many hospitals continue to operate without these risk-reducing technologies in place. Survey results show that only 28% of hospitals employ CPOE, although this rate is on the rise—83% of non-user hospitals plan to implement CPOE within the next few years.<sup>11</sup>

Similarly, while implementation of bar-coded medication administration systems is up, only 29% of hospitals currently have this technology in place.

However, 86% of hospitals plan to integrate a BPOC system within the next three years. For those not planning to implement BPOC, more than two-thirds (69%) cite budgetary constraints as the reason for

delay.<sup>11</sup> As an intermediate measure, 67% of hospitals utilize bar code scanners/readers at the patient bedside.<sup>11</sup>

Conversely, a majority of hospitals have integrated smart pump technology into their technology lineup: 52% of hospitals utilize smart pumps, and 62% of these build their own drug libraries.<sup>11</sup> This level of adoption reflects the positive sentiment of health system directors of pharmacy, who rated smart pumps among the top five most important technologies to their organizations in 2008.<sup>11</sup>

Wireless connectivity has also been on the rise. As of 2008, 44% of institutions used wireless data transfer to and from their smart pumps, with a projected adoption of 81% by 2013.<sup>11</sup>

## Enhancing safety and workflow efficiency with the Hospira system

The beauty of the integrated Hospira system is that at every turn of the clinical process, a technology-based application provides a barrier against potential error. The workflow below illustrates the typical hospital workflow, from prescribing physician, to pharmacist support, to nurse administration. Note that each critical clinical decision point offers potential avenues for medication mistakes. As illustrated below, as workflow is improved through integrated computerized systems, the risk of medication errors is diminished.

**Note:** Internal workflow and/or hospital process varies from institution to institution.

	Potential inefficiencies and errors	Hospira system benefit to workflow and patient care
<b>STEP 1</b>	<ul style="list-style-type: none"> <li>Inaccurate/incomplete information received from patient                             <ul style="list-style-type: none"> <li>Patient did not understand healthcare provider's questions</li> <li>Wrong diagnosis</li> <li>Unknown allergy → adverse events</li> </ul> </li> <li>Wrong patient</li> <li>Wrong medication prescribed</li> <li>Wrong dose prescribed</li> <li>Illegible handwritten prescriptions                             <ul style="list-style-type: none"> <li>Confusion with sound-alike and look-alike medications</li> <li>Incorrect decimal points on medication doses</li> </ul> </li> <li>Undetected medication errors sent to pharmacy or entered into EMR</li> </ul>	<ul style="list-style-type: none"> <li>Use of CPOE adjunct provides an initial, immediate level of clinical decision support to care providers</li> </ul>

	Potential inefficiencies and errors	Hospira system benefit to workflow and patient care
<b>STEP 2</b>	<ul style="list-style-type: none"> <li>Delay in order entry due to extra steps in order verification                             <ul style="list-style-type: none"> <li>Drug library not updated</li> </ul> </li> <li>Missteps in verification of allergies/drug interactions                             <ul style="list-style-type: none"> <li>Patients may have drug-drug interactions or allergic reaction to medication</li> </ul> </li> <li>Medication is incorrectly prepared</li> <li>Wrong medication is dispensed</li> <li>Medication is dispensed to wrong patient</li> <li>Human error causes delay of orders</li> <li>Undetected medication errors proceed to the medication administration level</li> </ul>	<ul style="list-style-type: none"> <li>Hospira MedNet™ Integrator™ formulary interface automatically updates the Hospira MedNet™ server with new drugs approved for the drug library</li> <li>The Hospira system can be used with automated medication cabinets and robotic systems for an added level of accuracy in the pharmacy</li> <li>Hospira MedNet™ system generates reports: Edit Variance Detail, Override Variance Detail and Medications Infused by CCA</li> <li>System notifies pharmacist of real-time drug administration, which broadens the pharmacist's clinical perspective and provides educational opportunities                             <ul style="list-style-type: none"> <li>Pharmacists can view how medications are being integrated into practice, including delivery of difficult-to-administer drugs</li> <li>In turn, pharmacists can help educate nurses on the proper use and rate of delivery of problematic medications</li> </ul> </li> </ul>

Potential inefficiencies and errors	Hospira system benefit to workflow and patient care
<ul style="list-style-type: none"> <li>Nurse is given the wrong medication or wrong drug dose</li> <li>Patient identification is not verified: medication is administered to the wrong patient</li> <li>Nurse forgets drug dosing schedule, resulting in a missed dose</li> <li>Allergies/drug-drug interactions are not verified</li> <li>IV infusion is incorrectly programmed               <ul style="list-style-type: none"> <li>Infuser delivers drug at incorrect dose or rate</li> </ul> </li> <li>Wrong pump programmed</li> <li>Rushed timeframe and multiple patient needs cloud critical thinking needed to prevent medication errors</li> </ul>	<ul style="list-style-type: none"> <li>Hospira VeriScan™ BPOC technology allows nurses to visually and electronically validate patient identity and clinical concerns               <ul style="list-style-type: none"> <li>Bar-coding software ensures correct scanned drug corresponds to right patient</li> </ul> </li> <li>The Hospira MedNet™ safety software features nurse call system functionality: the wireless network provides electronic feedback through a handheld personal digital assistant (PDA), notifying a remote nurse of infusion status or an infusion alarm</li> <li>Nurses are also able to log in to their nursing floor device via PDA to view real-time status of infusions               <ul style="list-style-type: none"> <li>The system informs clinicians which medications are being infused on each patient—this allows them to monitor usage and anticipate need for refill</li> </ul> </li> </ul>

Potential inefficiencies and errors	Hospira system benefit to workflow and patient care
<ul style="list-style-type: none"> <li>Drug administered to wrong patient</li> <li>Patient may receive wrong treatment or wrong dose</li> <li>Clinician workload and logistics may result in a lag in patient management</li> <li>Delay of order entry into eMAR may cause confusion during clinician shift changes, negatively impacting patient care</li> </ul>	<ul style="list-style-type: none"> <li>VeriScan™ confirms patient identification and needs by confirming "5 Rights" parameters via BPOC and RFID</li> <li>Real-time electronic feedback allows clinicians to utilize administration data and better understand the practice               <ul style="list-style-type: none"> <li>Aids decision support on running infusions by providing pharmacists and clinicians with infusion status of running IVs and lab values</li> </ul> </li> <li>Engaged, integrated system reduces the potential for harmful medication errors at the bedside, thereby promoting "help without harm"</li> </ul>

## Conclusion

As evidenced in the literature, medication errors are common and costly. Taxing to the healthcare system and detrimental to the well-being of patients, medication errors can and do happen at every point in the hospital continuum of care. Circumstances and conditions affecting both human and technology-based interactions contribute to the incidence of these sometimes fatal mistakes. However, medication errors can be avoided, specifically through a combination of conscientious clinical effort and the integration of comprehensive monitoring-based technology solutions.

One of the most contemporary technology-based approaches is the Hospira MedNet™ server-based solution. The Hospira methodology is comprised of a flexible, programmable, wireless ensemble that utilizes a server-based hub to connect and monitor the automated systems within the hospital. Seamlessly communicating with and monitoring CPOE handhelds, BPOC technology, smart IV pumps, eMARs, EMRs and hospital and pharmacy information databases, the onsite server maintains the hospital's most updated drug library and ensures through infusion alerts that patient drug administration adheres to proscribed limits and parameters. By securing the "5 Rights" of medication administration with Hospira VeriScan™, the Hospira system helps reduce medication errors, improve quality of care, streamline clinical workflow and advance clinical best practices.

### References

- Santell J, Kowiatek J, Weber R, Hicks R, Sirio C. Medication errors resulting from computer entry by nonprescribers. *Am J Health-Syst Pharm.* 2009; 66:843-853.
- Aspden P, Wolcott J, Bootman J, Cronenwett L, eds. *Preventing Medical Errors: Quality Chasm Series.* Washington DC: National Academies Press; 2007. Accessed May 15, 2009.
- Kohn LT, Corrigan JM, Donaldson MS, et al. *To Err Is Human: Building a Safer Health System.* National Academy Press; 1999.
- Siv-Lee L, Morgan L. Implementation of wireless "intelligent" pump IV infusion technology in a not-for-profit academic hospital setting. *Hosp Pharm.* 2007; 42(9):832-840.
- Koppel R, Wetterneck T, Telles JL, Karsh BT. Workarounds to barcode medication administration systems: their occurrences, causes, and threats to patient safety. *J Am Med Inform Assoc.* 2008; 15 (4):408-423.
- Pennsylvania Patient Safety Authority. Medication errors occurring with the use of bar-code administration technology. *Pennsylvania Patient Safety Advisory.* 2008; 5 (4):122-126.
- Smetzer J, Cohen MR, Jenkins R, eds. Smart pumps are not smart on their own. *ISMP Medication Safety Alert.* 2007; 12(8):1-2.
- Grissinger M. "Smart" infusion pumps join CPOE and bar coding as ways to prevent medication errors. *P&T.* 2006; 31(10):562.
- American Society of Health-System Pharmacists. ASHP statement on bar-code-enabled medication administration technology. *Am J Health-Syst Pharm.* 2009; 66(6):588-590.
- Saager L, Collins GL, Burnside B, et al. A randomized study in diabetic patients undergoing cardiac surgery—comparing computer-guided glucose management with a standard sliding scale protocol. *J Cardiothoracic Vasc Anesth.* 2008;22:377-382.
- Halvorsen D. Survey results: taking technology for granted. *Pharmacy Purchasing & Products, State of Pharmacy Automation.* 2008; 4-6, 14-15, 40, 50-55.

### Most common errors occurring with computer entry, listed in descending order<sup>1</sup>

- Wrong dose or quantity
- Omission error
- Unauthorized or wrong drug
- Wrong time
- Extra dose
- Wrong patient
- Prescribing error
- Wrong dosage form
- Drug prepared incorrectly
- Wrong route
- Mislabeling
- Wrong administration technique
- Expired product
- Deteriorated product

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