

Hospira MedNet® Software Reports: Putting Your Data to Work to Improve Safety and Quality of Care



Ralph A. Howard, RPh, MBA
Manager, Pharmacy Clinical Support
Hospira Worldwide, Inc.

Role

As the Manager for Pharmacy Clinical Support, Mr. Howard is mainly responsible for working with Hospira clients in the creation of drug libraries for trials and simulations of the Hospira MedNet® System. Additionally, Mr. Howard assists Hospira clients in understanding the full capabilities of the Hospira MedNet System Reporting capabilities and application of safety software into improvement initiatives and benchmarking.

Knowledge and Skills

Mr. Howard has over 25 years in the healthcare industry. Prior to Hospira Worldwide, Inc., Mr. Howard was Vice President, Sales and Marketing for Rx Purchasing Associates, and held leadership positions at Premier, Inc., and AstraZeneca.

Education

Mr. Howard received his Bachelor of Science Degree in Pharmacy from the University of Illinois School of Pharmacy and completed his Masters in Business Administration from Loyola University of Chicago.

Mr. Howard is a member in the American Society of Health System Pharmacists, Illinois Society of Health System Pharmacists and American Pharmaceutical Association.

Prevalence of Medication Errors

The statistics regarding medical errors in healthcare facilities are familiar and sobering: they are the eighth leading cause of death in the United States—occurring at a greater rate than car accidents, breast cancer or AIDS—and account for 44,000 to 98,000 deaths annually.¹ Of this total, about 7,000 deaths are due to medication errors.² Medication errors in a typical hospital occur in nearly one of every five doses given to patients.³ In a typical 300-bed facility, 7%—or about 40 medication errors per day—were rated potentially harmful.³

The impact of this data is reflected in a recent American College of Healthcare Executives (ACHE) study, which shows that enhancing patient safety and improving clinical care are two of the most significant issues currently confronting hospitals.⁴ Central to these issues is the proper administration of infused medications to often critically ill patients in healthcare institutions.

The process of administering infused medications is complex. It involves numerous distinct steps, each step opening the possibility for error and potential harm—even death—to the patient. High-alert medications—those with the greatest potential to seriously harm a patient if administered improperly—are of special concern.^{5,6} Of the 19 categories of high-alert medications currently designated by the Institute for Safe Medication Practices (ISMP),⁷ four are of particular interest—anticoagulants, narcotics, *insulin* and sedatives.⁵ Only eight drugs within these four categories, including intravenous (IV) *heparin*, are responsible for 31% of all medication errors that harm patients.^{8,9}

Most errors are not the result of a single individual or practice, but are due to the breakdown of a poorly designed or mismanaged system of medication storage, prescribing, preparation and administration. Though errors can occur at any time in the process, it has been shown that many occur during the administration stage.² The impact of medication errors is most obviously felt by the patient. But they also add substantial costs to institutions—about \$3.5 billion annually according to the Institute of Medicine.²

To address these problems, institutions have turned to technology, including "intelligent" infusion technology. This paper provides an overview of Hospira MedNet® software, but focuses on the reports that can be derived from the collected data—and how they can help improve patient safety and quality of care—when Hospira MedNet software is installed in an institution.

Core Package



Plum A+® Infusion System



Symbiq® Infusion System



LifeCare PCA® System

Hospira MedNet® Software

To help hospitals minimize medication errors and improve patient safety, Hospira, Inc., developed "intelligent" infusion system technology that includes Hospira MedNet software, which is the heart of the infusion system. The software contains hospital-specific dosing guidelines, including soft and hard dosing limits, which enhance the capabilities of infusion devices (general infusion pumps or patient-controlled analgesia pumps) throughout the hospital. Depending on a hospital's infrastructure, the software and server can also connect to a facility's hospital information system (HIS), pharmacy information system (pHIS) and to bar-coded point-of-care devices. A hospital with basic connectivity can upgrade as needs change.

This system software offers numerous benefits, noted below, but perhaps one of the most important is the availability of reports derived from data that is populated on the pumps and transmitted to the network server. The reports can be used to assess medication infusion practices in your hospital and provide information that will help improve patient safety, enhance quality of care and support continuous quality improvement (CQI) initiatives.

Intelligent infusion with Hospira MedNet software

- Help reduce medication errors
- Help enhance patient care
- Help reduce in-facility costs
- Support asset management
- Support CQI initiatives
- Help improve clinical workflow
- Support caregiver confidence
- Support patient confidence

Hospira MedNet® Reports

The range of performance reports garnered from the wealth of data collected by Hospira MedNet software is one of the most important features of this intelligent infusion system. The reports can reveal a full portrait of drug infusion administration practices and patterns in your hospital to help improve patient safety and clinical care. They can identify practices that can be streamlined; highlight drug usage that can be simplified; and point out management issues that can be altered to save costs. Six reports are of special interest and will be discussed here:

- Infusion summary report
- Edit variance details report
- Override variance details report
- Medications infused by clinical care area (CCA) report
- Infusion status report
- Asset tracking report

Infusion Summary Report



Infusion Summary Report

Why use this report:

- Provides a summary of infusion activity.
- Report can be run by infuser type, time period or clinical care area (CCA).

What the data reveal:

- In this example, the summary covers all CCAs.
- Report covers one month, 01/01/08 to 01/31/08.
- The Total Programs pie chart shows clinician compliance with using the drug library.
 - 71.1% (37,136 infusions) of the time the clinician complied with using the safety software by selecting a drug from the drug library.
 - 28.0% (14,620 infusions) of the time the clinician did not select a drug from the library.
 - Frequent “no drug selected” indicates that clinicians are not using the drug library; may need to address safety software compliance.

- The Alerts pie chart shows the clinician's response to an alert.
 - 90.41% (49,214 infusions) of the infusions did not elicit an alert.
 - Of the 8.09% (4401) infusions which elicited an alert, the graph shows that clinicians overrode the soft limit (but were within hard limits) designated in the drug library.
 - The 0.50% (274) infusions with soft limit edits and the 1.00% (544) infusions with hard limit edits indicate that the clinician reprogrammed the infusion and a potential Adverse Drug Event (ADE) was avoided.
 - Frequent overrides suggest the library's limits may be too restrictive and not reflect actual hospital practice.

Edit Variance Detail Report

Hospira MedNet® Reports		Edit Variance Detail					
Advancing Wellness							
Active Drug Libraries							
02/13/08 5:10:18PM							
Infuser: Plum A+® Infusion System							
CCA: CVICU							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
AMIODARONE SOL: 150 mg/100 mL	4/13/2008 4:16	15 mg/min	_ lower soft	12	15	-20.00%	
AMIODARONE COAT 900 mg/500 mL	4/13/2008 5:19	1 mg/min	_ UPPER SOFT	6	0.6	500.00%	
AMIODARONE COAT 900 mg/500 mL	4/15/2008 4:08	1 mg/min	_ UPPER SOFT	15	1.5	1,400.00%	
Heparin units/hr 25000 units/250 mL	4/15/2008 5:15	400 units/hr	_ lower soft	12	1200	-67.00%	
Heparin units/hr 25000 units/250 mL	4/16/2008 6:37	400 units/hr	_ lower soft	19	1900	-55.25%	
CCA: ED							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
AMIODARONE COAT 900 mg/500 mL	4/12/2008 5:43	1 mg/min	_ UPPER SOFT	9	0.9	800.00%	
AMIODARONE COAT 900 mg/500 mL	4/13/2008 6:36	1 mg/min	_ UPPER SOFT	8	0.8	700.00%	
AMIODARONE COAT 900 mg/500 mL	4/14/2008 7:20	1 mg/min	_ UPPER SOFT	4.3	0.5	300.00%	
Heparin units/hr 25000 units/250 mL	4/16/2008 4:43	400 units/hr	_ lower soft	12	1200	-67.00%	
CCA: ICU							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
AMIODARONE COAT 900 mg/500 mL	4/10/2008 4:45	1 mg/min	_ UPPER SOFT	6	0.6	500.00%	
AMIODARONE COAT 900 mg/500 mL	4/10/2008 5:25	1 mg/min	_ UPPER SOFT	20	0.7	1,300.00%	
AMIODARONE COAT 900 mg/500 mL	4/11/2008 6:35	1 mg/min	_ UPPER SOFT	8	0.8	700.00%	
DOBUTAMINE 200 mg/250 mL	4/12/2008 4:50	20 mcg/kg/min	_ UPPER SOFT	205	2.5	925.00%	
Heparin units/hr 25000 units/250 mL	4/13/2008 5:25	400 units/hr	_ lower soft	13	1300	-66.70%	
Heparin units/hr 25000 units/250 mL	4/14/2008 6:24	400 units/hr	_ lower soft	15	1500	-66.25%	
Heparin units/hr 25000 units/250 mL	4/14/2008 7:32	400 units/hr	_ lower soft	19	1900	-55.25%	
Heparin units/hr 25000 units/250 mL	4/15/2008 5:23	400 units/hr	_ lower soft	15	1500	-66.25%	
Heparin units/hr 25000 units/250 mL	4/15/2008 6:36	400 units/hr	_ lower soft	15	1500	-66.25%	
Heparin wt. based 25000 units/250 mL	4/16/2008 4:23	25 units/kg/hr	_ UPPER SOFT	1500	15	5,900.00%	
CCA: 4A							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
Heparin units/hr 25000 units/250 mL	4/13/2008 3:34	400 units/hr	_ lower soft	12	1200	-67.00%	
Heparin units/hr 25000 units/250 mL	4/15/2008 4:44	400 units/hr	_ lower soft	21	2000	-94.75%	
CCA: Anesthesia							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
Propofol 10 mg/1 mL	4/12/2008 5:36	5 mg/kg/min	_ lower soft	3	5	-40.00%	

From: 04/03/08 00:00 To: 4/17/2008 00:00

Printed: 04/30/08 14:46

Screen values for demonstration only

Edit Variance Detail Report

Why use this report:

- Provides a line-item detail of every infuser program in which a clinician edited the program in response to an alert.
- Report can be run by CCA, by medication, by selected CCAs or medications or by all CCAs or medications.

What the data reveal:

- Covers a select period of time (i.e., one month); date, time and unit of each alert are also displayed in the event the clinician needs to back track to get event specifics.
- Variance is expressed as a percentage difference (+ if above the upper soft limit, - if below the lower soft limit) between the initial programmed value and the defined limit:

$$\frac{\text{Initial dose} - \text{limit violated}}{\text{Limit violated}} = \text{variance}$$

- The *first highlight* shows that 6 mg/min of amiodarone (900 mg/500 mL) was programmed to be administered.

This exceeded the library's upper soft limit of 1 mg/min, a variance of 500%. The user's edit changed the dose to 0.6 mg/min, which stays within the library's upper soft limit.

- The *second highlight* shows that 205 mcg/kg/min of dobutamine was programmed. The upper soft limit is 20 mcg/kg/min, which is a variance of 925%. The final edited dose is 2.5 mcg/kg/min, which is within the library upper soft limit.
- The *third highlight* shows a programmed dosage of 1500 units/kg/hr of weight-based heparin (25,000 units/250 mL), which exceeds the upper soft limit of 25 units/kg/hr. This represents a variance of 5,900%. The final dose administered was 15 units/kg/hr.
- Edits suggest potential adverse drug events (ADEs) were avoided.
- This report will highlight the types of limits violated along with their variances. All critical catches can then be used to quantify a return on investment.

Override Variance Detail Report

Hospira MedNet® Reports		Override Variance Detail				Hospira	
Advancing Wellness		Active Drug Library		02/13/08 5:10 11916			
Infuser: Plum A+D Infusion System							
CCA: Anesthesia							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
Propofol 10 mg/1 mL	4/13/2008 4:15	5 mcg/kg/min	_ lower soft	3	5	-40.00%	
Propofol 10 mg/1 mL	4/13/2008 4:32	50 mcg/kg/min	_ UPPER SOFT	62	62	24.00%	
Propofol 10 mg/1 mL	4/14/2008 5:15	50 mcg/kg/min	_ UPPER SOFT	65	6.5	30.00%	
Propofol 10 mg/1 mL	4/15/2008 7:23	50 mcg/kg/min	_ UPPER SOFT	65	65	10.00%	
Propofol 10 mg/1 mL	4/15/2008 8:15	50 mcg/kg/min	_ UPPER SOFT	65	65	30.00%	
Propofol 10 mg/1 mL	4/15/2008 9:21	50 mcg/kg/min	_ UPPER SOFT	52	52	54.00%	
Propofol 10 mg/1 mL	4/19/2008 3:21	50 mcg/kg/min	_ UPPER SOFT	210	210	320.00%	
Propofol 10 mg/1 mL	4/19/2008 4:14	50 mcg/kg/min	_ UPPER SOFT	214	214	320.00%	
Propofol 10 mg/1 mL	4/19/2008 5:21	50 mcg/kg/min	_ UPPER SOFT	218	218	326.00%	
Propofol 10 mg/1 mL	4/19/2008 7:35	50 mcg/kg/min	_ UPPER SOFT	55	55	10.00%	
Fentanyl 50 mcg/1 mL	4/19/2008 8:21	4 mcg/kg/hr	_ UPPER SOFT	4.5	4.5	12.50%	
CCA: CVICU							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
Propofol 1000 mg/100 mL	4/10/2008 3:31	75 mcg/kg/min	_ UPPER SOFT	174	174	132.00%	
Propofol 1000 mg/100 mL	4/11/2008 4:23	75 mcg/kg/min	_ UPPER SOFT	78	78	4.00%	
Heparin units/hr 25000 units/250 mL	4/12/2008 4:34	400 units/hr	_ lower soft	15	1500	-95.25%	
Heparin units/hr 25000 units/250 mL	4/14/2008 5:23	2000 units/hr	_ UPPER SOFT	2000	2000	60.00%	
CCA: ICU							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
Propofol 1000mg/100ml	4/11/2008 6:21	75 mcg/kg/min	_ UPPER SOFT	89	8.9	18.07%	
Propofol 1000mg/100ml	4/12/2008 4:21	75 mcg/kg/min	_ UPPER SOFT	91	91	21.33%	
CCA: 4A							
Medication/Concentration	Alert Date/Time	Limit	Limit Violated	Initial Dose	Final Dose	Variance	
Heparin units/hr 25000 units/250 mL	4/12/2008 3:32	2000 units/hr	_ UPPER SOFT	2100	2100	5.00%	
Heparin units/hr 25000 units/250 mL	4/12/2008 4:34	2000 units/hr	_ UPPER SOFT	2200	2200	10.00%	
Heparin units/hr 25000 units/250 mL	4/13/2008 5:21	2000 units/hr	_ UPPER SOFT	2300	2300	15.00%	
Heparin units/hr 25000 units/250 mL	4/14/2008 6:23	2000 units/hr	_ UPPER SOFT	2400	2400	20.00%	
Heparin units/hr 25000 units/250 mL	4/15/2008 7:23	2000 units/hr	_ UPPER SOFT	2500	2000	40.00%	
Heparin units/hr 25000 units/250 mL	4/19/2008 4:43	2000 units/hr	_ UPPER SOFT	2400	2400	20.00%	
Heparin units/hr 25000 units/250 mL	4/19/2008 5:23	2000 units/hr	_ UPPER SOFT	2500	2500	25.00%	
Heparin units/hr 25000 units/250 mL	4/19/2008 6:21	2000 units/hr	_ UPPER SOFT	2100	2100	5.00%	
From: 04/01/08 00:00		To: 4/11/2008 00:00		Printed: 04/08 14:45			

Screen values for demonstration only

Override Variance Detail Report

Why use this report:

- Provides a line-item detail of every infuser program where the user received an alert and chose to continue with the entered value.
- Report can be run by CCA, by medication, by selected CCAs or medications or by all CCAs or medications.

What the data reveal:

- Report covers a select period of time (i.e., one month) and reflects overrides from selected CCAs.
- In the *Anesthesia* CCA, the upper soft limit (50 mcg/kg/min) in nine infusions of *propofol* (concentration of 10 mg/mL) was overridden each time, for variances of 24% to 336% above the upper soft limit.
 - In only one of these (third entry) was the dose changed, from 65 mcg/kg/min to 6.5 mcg/kg/min.

- In the same CCA, the lower soft limit for *propofol* (5 mcg/kg/min) was overridden once, for a variance of -40%.
- In the *CVICU* CCA, the upper soft limit (75 mcg/kg/min) of *propofol* (concentration of 1000 mg/100 mL) was overridden twice, for variances of 132% and 4%.
- In the *4A* CCA, the upper soft limit (2000 units/hr) for *heparin* (concentration of 25000 units/250 mL) was overridden eight times for variances of 5% to 40%.
- Frequent overrides to a limit may indicate that it may not be set properly to account for actual clinical practice.
 - This report suggests that library limits for *propofol* use in *Anesthesia* may need to be adjusted so to not nuisance alarm the clinician. It is important to assess that there are hard limits in place when there is a wide soft limit range.
 - The data may also suggest there is an educational opportunity on specific units if practice trends are of concern.

Medications Infused by CCA Report

Hospira MedNet® Reports		Medications Infused — by CCA											Hospira			
Advancing Wellness																
CCA: ICU																
Medication/Concentration	Frequency	Hard Limit Alerts				Soft Limit Alerts				Final Program						
		Total Alerts	Lower Total	Upper Total	Lower Total	Lower Override	Lower Edit	Upper Total	Upper Override	Upper Edit	Confirm	Changed				
propofol 1000 mg/100 mL	8	15	0 0	1 0	2 0	0 0	2 100.0%	12	8	66.7%	4	33.3%	7	87.5%	1	12.5%
caffeine C2 gram s/60 mL	10	0	0 0	0 0	1 0	0 0	0 0 100.0%	0	0	0.0	0	0.0	10	100.0%	0	0.0%
insulin 100 units/100 mL	10	0	0 0	0 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	10	100.0%	0	0.0%
VANCOMycin POWDER L 0.75 gram s/50 mL	0	5	0 0	5 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	5	83.3%	1	16.7%
blood	4	2	0 0	0 0	2 2	100.0%	0 0 0.0	0	0	0.0	0	0.0	4	100.0%	0	0.0%
DOPamine STANDARD 400 mg/250 mL	4	2	0 0	0 0	0 0	0 0	0 0 0.0	2	0	0.0	2	100.0%	3	75.0%	1	25.0%
EPinephrine QUADSTR 4000 mg/100 mL	1	1	0 0	0 0	0 0	0 0	0 0 0.0	1	1	100.0%	0	0.0	1	100.0%	0	0.0%
asimobal 2500 mg/250 mL	2	1	0 0	0 0	1 0	0 0	0 0 100.0%	0	0	0.0	0	0.0	1	50.0%	1	50.0%
heparin 2000 unit s/250 mL	0	1	0 0	0 0	0 0	0 0	0 0 0.0	1	0	0.0	1	100.0%	8	88.9%	1	11.1%
POTASSIUM chloride POWDER 40 mEq/500 mL	2	1	0 0	1 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	2	100.0%	0	0.0%
alteplase STRIKE 500 mg/500 mL	3	0	0 0	0 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	3	100.0%	0	0.0%
DOPamine DOUBLE STR 600 mg/250 mL	2	0	0 0	0 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	2	100.0%	0	0.0%
FENTanyl 1000 mg/100 mL	2	0	0 0	0 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	2	100.0%	0	0.0%
M Fluid	7	0	0 0	0 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	7	100.0%	0	0.0%
POTASSIUM chloride CENTRAL 20 mEq/50 mL	2	0	0 0	0 0	0 0	0 0	0 0 0.0	0	0	0.0	0	0.0	2	100.0%	0	0.0%
Total:	72	43	0 0	21 0	6 2	33.3%	4 66.7%	18	9	50.0%	7	43.8%	67	93.1%	5	6.9%

From: 05/10/16 00:00 To: 05/20/16 23:59 Printed: 04/21/16 14:02 Page 1 of 20

Screen values for demonstration only

Medications Infused by CCA Report

Why use this report:

- Provides detailed information on clinician response to alerts for individual medications.
- Reports can be by CCA, medication or service line. The service line is used for mapping similar CCA units (e.g., all Adult ICUs) together.
 - This allows a multi-facility hospital to compare infusion practices across facilities. For example, when a facility has fewer alerts/edits/overrides than the others, it would be of value to find out what are they doing differently to assist the different sites.

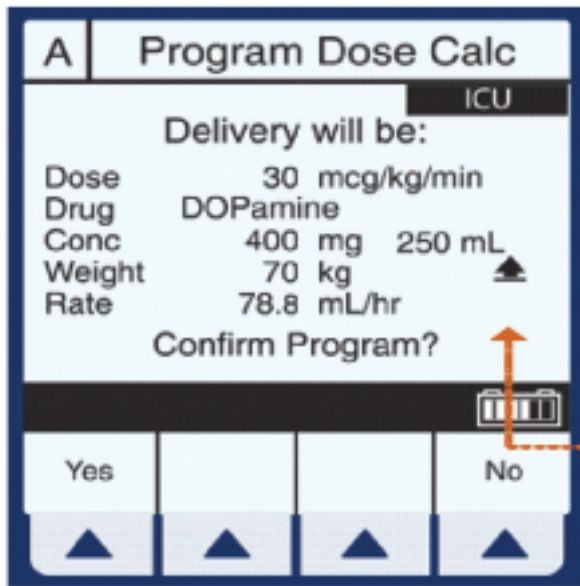
What the data reveal:

- This report shows medications infused in the ICU over a one-week time frame.
- There were 8 *Propofol* infusions with a total of 15 alerts. There was one hard limit alert, which was edited, as hard limits can not be overridden for the Plum A+® infusion system. There were two lower soft limit alerts, both of which were edited. Of the 12 upper soft limit alerts; eight were overridden and four were edited. Of the eight times the confirmation screen was reached, there was one occasion where an edit was made. This reflects the value of

the confirmation screen by having one last review of the infusion prior to initiating therapy.

- There were 10 *Insulin drip* infusions with six upper hard limit alerts, all of which were edited.
- *DOPamine* standard strength infusions included two upper soft limit alerts, which were both edited. One of the infusions was edited following review of the confirmation screen.
- There were nine *heparin* infusions with one upper soft limit alert resulting in an edit. Of the nine times the confirmation screen was reached, one infusion was edited following final review of the confirmation screen.
- The Three *Alteplase* infusions had no overrides and no edits.
- These data show that:
 - *Propofol* was used frequently with several alerts that were overridden. Likewise, *insulin* was used frequently with numerous hard limit alerts that were all edited. These data suggest that the drug limits and hospital practice for both drugs may need to be evaluated.
 - *Alteplase* was used relatively infrequently but presented no dosing concerns. In comparison, *heparin* was used frequently, but presented with only one alert, suggesting that library limits for both drugs are within hospital practice.
 - Any edits suggest that potential ADEs may have been avoided.

Confirmation Screen



The display includes a symbol indicating to the clinician that the soft upper limit is exceeded

Hard and soft limits are set by the institution according to package inserts and/or hospital best practice guidelines.

Confirmation Screen

The final confirmation screen is important for preventing errors, as it displays all of the medication parameters at a glance:

- medication name
- concentration
- rate to be infused
- total volume to be administered

The clinician must confirm this data on the touch screen before the infusion can begin (see example below).



- Cautionary Symbol (No Rule Sets)
 - Displayed when IV is being administered without rule sets



- Soft Limit Override Symbols
 - Programmed soft **upper** limits have been overridden
 - Programmed soft **lower** limits have been overridden

Infusion Status Report

Hospira MedNet® Reports		Infusion Status							Hospira	
Advancing Wellness										
Infuser: Plum A+® Infusion System					Active Drug Libraries		5.1			
CCA: ICU										
Hospira MedNet® Status										
Status	Room/Bed	Patient Name	Location	Medication	Dose	Rate	Date/Time Started	Status	Alert Type	Rule Set
within limit	Unknown	Unknown	LVL3P5	NF 100ml	8000 15000 mL/hr	8000 15000 mL/hr	03/1/08 16:16:56	stopped		
within limit	Unknown	Unknown	LVL3P5	Naloxone	2000 mL/hr	2000 mL/hr	03/1/08 16:30:15	stopped		
within limit	Unknown	Unknown	8SAP3	Insulin	4.00 6.00 units/hr	4.00 6.00 mL/hr	03/14/08 11:01:32	stopped		
within limit	Unknown	Unknown	LVL3P5	NF w/KCl 1000ml	1.40 mEq/hr	70.00 mL/hr	03/14/08 15:04:48	stopped		
within limit	Unknown	Unknown	8SAP3	Insulin	5.00 units/hr	5.00 mL/hr	03/16/08 09:33:12	stopped		
within limit	Unknown	Unknown		Antibiotic Naloxone	100.00 20.00 mL/hr	100.00 20.00 mL/hr	03/11/08 11:46:08	stopped		
within limit	Unknown	Unknown	8NAP1	Lidocaine	2.00 mg/min	30.00 mL/hr	03/11/08 12:42:35	stopped		
within limit	Unknown	Unknown	8NAP1	Lidocaine	2.00 mg/min	30.00 mL/hr	03/11/08 12:44:48	stopped		
override	Unknown	Unknown	8NAP1	Heparin	16.00	0.20	03/12/08 09:03:29	stopped	lower soft	
override	Unknown	Unknown	8NAP1	Heparin	400.00	4.00	03/17/08 19:50:28	stopped	lower soft	
override	Unknown	Unknown	8NAP2	Amiodarone	4.32	144.00	03/28/08 12:11:50	stopped	UPPER SOFT	
within limit	Unknown	Unknown	CARDIOCP1	CRITCARE NITROglycerin	25.00 mg/ml	7.50 mL/hr	03/28/08 18:57:18	stopped		
From: 03/11/08 00:00		To: 03/31/08 23:59		Printed: 03/01/08 11:54						

Screen values for demonstration only

Infusion Status Report

Why use this report:

- Provides the nurse manager and pharmacist with real-time information to monitor infusions and to follow up on those that are running outside of limits or with no limits.
- The report can be grouped by CCA or by medication.

What the data reveal:

- Within this CCA (ICU), the clinician can identify patient and location, the medication dose and rate and when the infusion was started.
 - Patient information is available when a facility has a bar-code point-of-care (BPOC) system that is interfaced with the Hospira MedNet® System.
 - Selection criteria can also be narrowed to view a CCA for overrides during a specific time period.

- In this report, alert type is also displayed and in this example there was one upper soft limit alert and two lower soft alerts, which can be attributed to an override.
- All of the infusions within hospital library limits will appear in green type and the infusions outside of the pre-defined limits will appear in red type.
- This "real-time" report can be filtered on the status (e.g., overrides), thus having the ability to go right to the patient in a BPOC environment and take action if necessary.

Asset Tracker Report

Hospira MedNet® Reports		Asset Tracker					Hospira	
Advancing Wellness		General Hospital						
Infuser: Plum A+B Infusion System								
Network Status: online								
Serial No. / Asset ID	Location	Device	CCA	Last Communication	Library Version	Date of Transfer	Hours of Use Last 30 Days	Hours of Use Last 90 Days
15955595 / Unknown	813	ID50001	CVICU	04/19/2008 13:35:21	02/29/07 5.10-1808	12/21/07 15:12	115.52	205.21
15212532 / Unknown	109	ID50002	CVICU	04/19/2008 13:35:17	12/29/07 5.10-1808	11/04/08 15:09	42.25	162.75
15212748 / Unknown	109	ID50003	CVICU	04/19/2008 13:37:59	12/29/07 5.10-1808	12/24/07 09:41	117.75	144.05
15212757 / Unknown	309	ID50004	ED	04/19/2008 13:35:12	12/29/07 5.10-1808	12/21/07 14:22	342.60	158.04
15212750 / Unknown	120	ID50005	CVICU	04/19/2008 13:35:24	02/29/07 5.10-1808	01/11/08 09:41	106.33	492.25
15212771 / Unknown	309	ID50025	ED	04/19/2008 13:35:13	12/29/07 5.10-1808	12/22/07 07:59	229.55	895.17
15212805 / Unknown	109	ID50005	CVICU	04/19/2008 13:34:57	12/29/07 5.10-1808	12/22/07 07:55	125.42	435.05
15212810 / Unknown	PACU	ID50029	PACU	04/19/2008 13:35:25	12/29/07 5.10-1808	02/26/07 13:00	327.15	80.03
15212583 / Unknown	PACU	ID50038	PACU	04/19/2008 13:35:30	12/12/07 5.10-1808	02/26/07 09:50	211.71	358.06
15212804 / Unknown	PACU	ID49395	PACU	04/19/2008 13:34:55	12/29/07 5.10-1808	02/23/07 08:31	185.75	449.01
15212931 / Unknown	510	ID49391	ONCOLOGY	04/19/2008 13:38:21	12/29/07 5.10-1808	12/21/07 14:01	348.37	952.14
15212936 / Unknown	109	ID49395	CVIC	04/19/2008 13:34:34	12/29/07 5.10-1808	12/21/07 14:03	278.40	543.07
15212939 / Unknown	OR1	ID49350	ANESTH	04/19/2008 13:37:30	12/29/07 5.10-1808	12/27/07 12:40	129.00	335.41
15213244 / Unknown	PACU	ID43325	PACU	04/19/2008 13:35:42	12/29/07 5.10-1808	12/26/07 13:33	258.72	554.12
15213235 / Unknown	415	ID44256	ONCOLOGY	04/19/2008 13:38:14	12/29/07 5.10-1808	12/21/07 13:50	331.62	658.21

Screen values for demonstration only

Asset Tracker Report

Why use this report:

- Provides information that helps the facility to efficiently manage their entire inventory of infusers; especially useful for IT, Biomedical and Materials Management departments.
- Helps track and identify infusers that have not communicated with the network for extended periods of time.
- Helps verify that all infusers have the current version of Hospira MedNet® Meds™ installed (drug library editor).
- Can be sorted by any three of the following: device, serial number, location, CCA, use in the past 30 days, use in the past 90 days.

What the data reveal:

- This report shows the approximate location of the infusers. All infusers have been used within the past 30 days; one was used only 42.25 hours while the others were used between 106.33 to 348 plus hours.
- All infusers were used in the last 90 days with the range of use from 90 hours to over 950 hours. This information assists Biomed with knowing when the next preventative maintenance is due, as well as if a device is not being used for a period of time—i.e., is it stashed away in the dirty utilities room.

Patient Safety Technology: Return on Investment (ROI)

According to research of jury verdicts, IV medications are involved in 56% of all medication errors.¹⁰ These data and those presented earlier are compelling reasons to adopt technology that will limit errors and improve patient safety. And the reports show the errors prevented, and provide data that can be used to improve patient safety.

But what about the bottom line? What kind of return on your investment can you expect?

Example 1:

Let's look at one example: In a large facility with 819 licensed beds, 171 critical care beds, a level-one trauma unit and four campuses, a Hospira MedNet[®] report showed that in administration of patient-controlled analgesia (PCA) medications, there were 82 attempts to override hard limits in a single month. Hard limits are the absolute unacceptable range for the administration of a medication. Any attempt to initiate an amount or rate *over* or *under* that range results in an alert and prevents administration of the medication.

A single ADE (in 2006 dollars) resulting from administration of an unsafe level of medication costs an institution about \$8,750.² Multiply that by 82 (assuming that each instance would have resulted in an ADE) and you would have additional monthly costs of \$ 717,500. Multiply that by 12 months (annual cost saving) and the result is nearly \$ 8,610,000 of potential additional costs that were avoided because administration of unsafe medication levels was prevented.

82

PCA attempted overrides in one month

82 x \$8,750 = \$717,500

potential additional costs per month

\$717,500 x 12 = \$8,610,000

potential additional costs per year

Example 2:

Here is an example of applying real data from a general infusion device to calculate annualized cost of ADEs while using the Hospira MedNet[®] Software.

**Actual February 2008 data – 532 Hard limit
override attempts in one month
(1% of the 48,884 total infusions)**

**532 X \$8,750 (2006 ADE cost) = \$4,655,000
(Assuming all 532 would have resulted in an ADE)**

Annualized = \$55,860,000

These data make it very clear that an intelligent infusion system with Hospira MedNet software makes sense. To learn more about installing a Hospira MedNet intelligent infusion system that will meet the needs of your institution, contact Hospira Customer Care at 1-877-946-7747 or visit www.hospira.com.

The Erlanger Health System Experience

The Erlanger Health System is an 819-bed, multi-campus teaching and Level One Trauma center in Tennessee that administers more than *50,000 infusions monthly*. Intelligent infusion reports help monitor compliance and identify areas that can benefit from *staff education*. For example, attempts to override hard limits for vancomycin may call for education on the effects of administering too fast or too slow. *Reports are reviewed at several levels* within the institution, from staff to Board of Trustees, for CQI efforts. And interceptions of potential adverse drug events are analyzed to *quantify the significant return on investment for the technology*.

—Linda Morgan, RN

The Columbus Regional Healthcare System Experience

The Columbus Regional Healthcare System, a 413-bed nonprofit community teaching hospital in Columbus, Georgia, uses intelligent infusion system reports to analyze infusion practices *hospital-wide and by clinical care area*. These data, such as tracking soft-limit overrides, help *customize the drug library*, identify topics for *staff education*, improve *efficiency* for nurses, and optimize overall *management* of IV medication administration. Importantly, the software system also *prevented potentially harmful errors*, which are compiled and analyzed to further increase safety in IV administration.

—Burnis D. Breland, MS, PharmD, FASHP

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For more information on Advancing Wellness™, contact your Hospira representative at **1-877-946-7747** or visit **www.hospira.com**

Hospira, Inc., 275 North Field Drive, Lake Forest, IL 60045 P08-1484/R2-Apr., 09

