

# The Purchase and Implementation of Smart Infusion Pump Technology:

## Lessons Learned at a Multi-Hospital System

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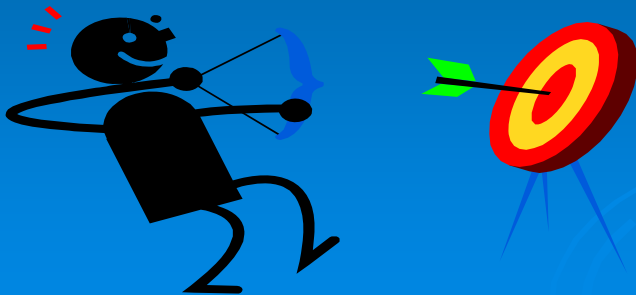
# Background



- Leading Integrated Delivery Network in South Jersey (20 miles outside Philadelphia)
  - 4 Acute Care Hospitals (950 beds)
  - 2 Long Term Care Facilities
  - Outpatient Health Centers, Outpatient Surgery Centers, Home Care and Fitness Center
- Non-Profit Organization
  - ✓ Employs 7,300 clinical and administrative personnel
  - ✓ 1,800 medical staff members
- Early adopter of Six Sigma in healthcare

# Objectives

- Share experiences regarding the purchase and implementation of Smart Infusion Pumps
- Demonstrate the use of Six Sigma and the principles of DMAIC methodology to improve utilization of the medication library to achieve optimal compliance
- Understand the utilization of technology as a catalyst to the culture of safety journey



# Timeline of Events

March 2004 -  
Leadership  
Approval of  
Smart Infusion  
Pumps

Vendor  
evaluations,  
trials, RFP  
process  
occurred over  
16 month  
period

July – November  
2005 - Contract  
awarded,  
implementation plan  
developed, including  
IT and drug library  
build

March 2006 - Virtua  
Health replaced  
over 800 IV infusion  
pumps with  
Hospira's Plum A+  
pump and  
implemented use of  
drug library and  
began trending  
library utilization

January 2007 -  
Trending reports  
indicated  
utilization of the  
Hospira pump  
MedNet® Safety  
Software was  
low

June 2007 - Hospira Six Sigma Team Kick off

# Defining the Problem

Noted increased overrides and poor compliance

Utilization of safety software low (~12%)

Nursing, pharmacy, & clinical education attempted to drive increased compliance

Virtua & Hospira collaborated to review CQI data

Hospira Six Sigma Team Kick off project

Interdisciplinary team using DMAIC principles to implement change and provide overall process improvement

January 2007



June 2007



June 29, 2007

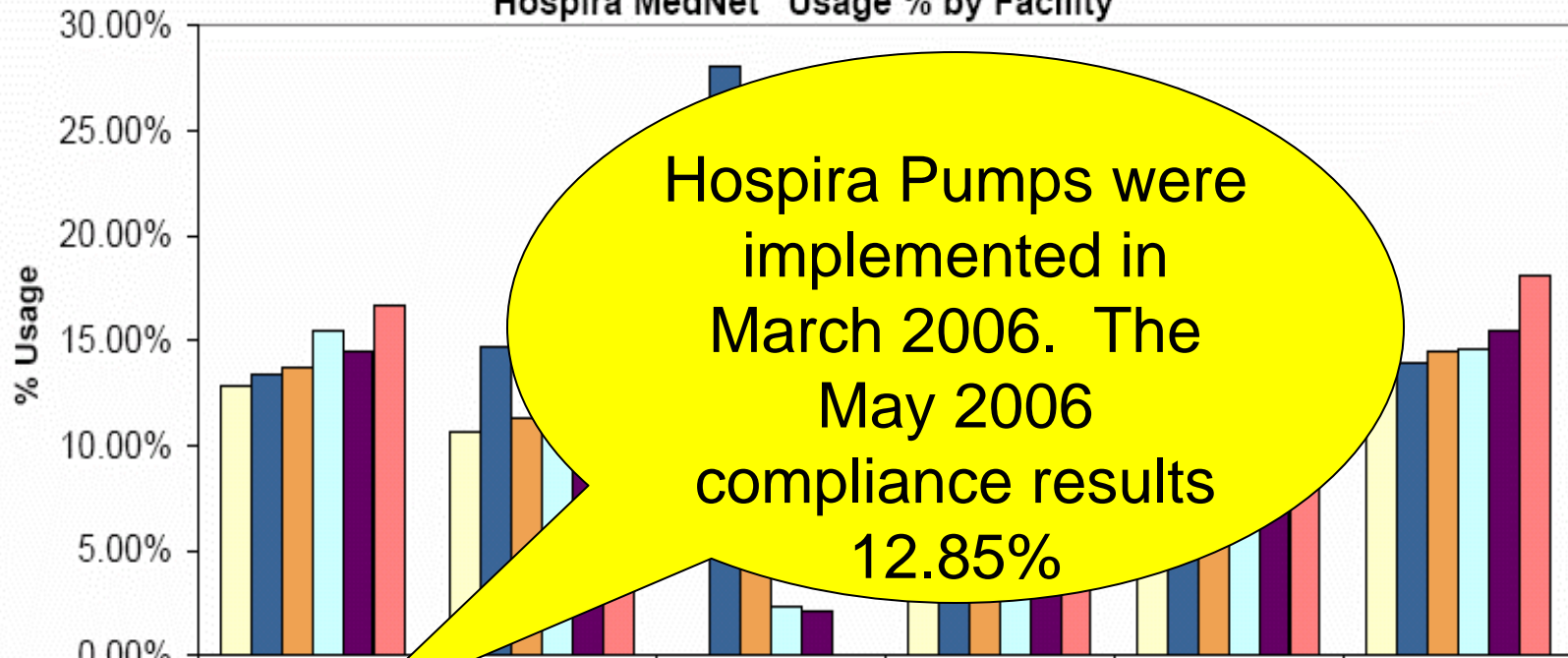


Present

# Initial Results...

Overall - Virtua Health System - 6 Month Trend

Hospira MedNet® Usage % by Facility



	Virtua Health Syst	Berlin	Camden	Marlton	Memorial	Voorhees
May	12.85%	10.80%	0.00%	15.31%	11.60%	13.13%
June	13.43%	14.74%	28.00%	13.18%	12.84%	13.93%
July	13.70%	11.25%	4.44%	12.89%	14.49%	14.51%
Aug	15.49%	17.92%	2.33%	14.57%	16.11%	14.80%
Sept	14.43%	12.04%	2.08%	13.75%	14.83%	15.44%
Oct	16.62%	12.30%	0.00%	16.59%	16.67%	18.10%

# What is Six Sigma?

- ***Measure of Quality***
  - ***Process For Continuous Improvement***
  - ***Enabler for Culture Change***
- 
- The background of the slide is a solid blue color. In the lower right quadrant, there are several decorative elements consisting of concentric circles, resembling ripples in water. These circles are light blue and vary in size and opacity, creating a subtle pattern.

# DMAIC Methodology

<b><u>Define</u></b>	<ul style="list-style-type: none"><li>Define (Who are the customers? What are the customers' requirements for products and services? What are the customer expectations?) <b><i>For Hospira, the customer is Virtua, as well as the registered nurses and patients</i></b></li></ul>
<b><u>Measure</u></b>	<ul style="list-style-type: none"><li>Measure the performance <b><i>For Hospira, we are measuring compliance with the utilization of the MedNet® safety software</i></b></li></ul>
<b><u>Analyze</u></b>	<ul style="list-style-type: none"><li>Analyze the data collected and process map to determine root causes of defects and opportunities for improvement <b><i>For Hospira, key root causes of poor compliance included: knowledge deficit, confidence in own skill, and time issues</i></b></li></ul>
<b><u>Improve</u></b>	<ul style="list-style-type: none"><li>Improve the target process by designing creative solutions to fix and prevent problems <b><i>For Hospira, improvement is around education (competencies and real time), availability of pumps, and continuous monitoring by APNs</i></b></li></ul>
<b><u>Control</u></b>	<ul style="list-style-type: none"><li>Control the improvements to keep the process on the new course <b><i>For Hospira, this is ongoing monitoring of compliance reports</i></b></li></ul>



## Customer Need

- Nurses will adhere to using the MedNet Library prior to administration of IV medications
- Enhance patient safety by reducing the frequency and severity of medication errors for medications delivered intravenously
- Develop process for integrating MedNet reports into current Process Improvement/Continued Quality Improvement plan
- Revise reporting parameters to meet nursing management needs to monitor and take action when appropriate
- Maintain and update library on a more consistent basis

# Project Y

## Prioritized Project Y

### Critical To Quality:

- Increase overall compliance in the utilization of MedNet Library to 30% (Focus on Critical Care areas)

### Critical To Quality:

- 100% of pumps accept current library within 48 hours of library transfer

Y1: Number of times yes is selected to “drug library” when programming and administering IV medications

Y2: Number of hours between the upload transfer and when new library is accepted at the pump

# Formula for Success....

*Enabler For Cultural Change*

$$Q \times A = E$$

Quality solutions x acceptance and accountability = effective results

*62% of quality efforts fail, we think from lack of attention to the cultural and people side of change — the “A.”*

# The goals of the Hospira Project are aligned with the Virtua STAR

- Supports a culture of safety
- State of art patient care

- Reduce cost of treatment with decreasing medication errors



- Decrease the incidence of medication errors related to pumps
- Utilize data to develop, implement and monitor continuous quality improvement

- Increase nursing staff's competency in use of technology

# Lessons Learned

*“Hindsight is 20/20”*

- Pharmacy – standardized medication policies, doses, concentrations and review standing orders
- IT- understanding server capability, wireless capability, bad pump behavior
- Departmental roles and responsibilities - Biomed, IT, CSR, Operations
- Project Management (facility and vendor) is crucial
- Assessment of number of pumps needed – evaluation of current policies
- Inventory/Asset Management – do you have a current system?
- Underestimation of work load by all stakeholders
- Understanding of data availability...shortcomings
- Poor compliance vs. high cost of equipment
- Current “culture of safety” within the organization not clearly understood

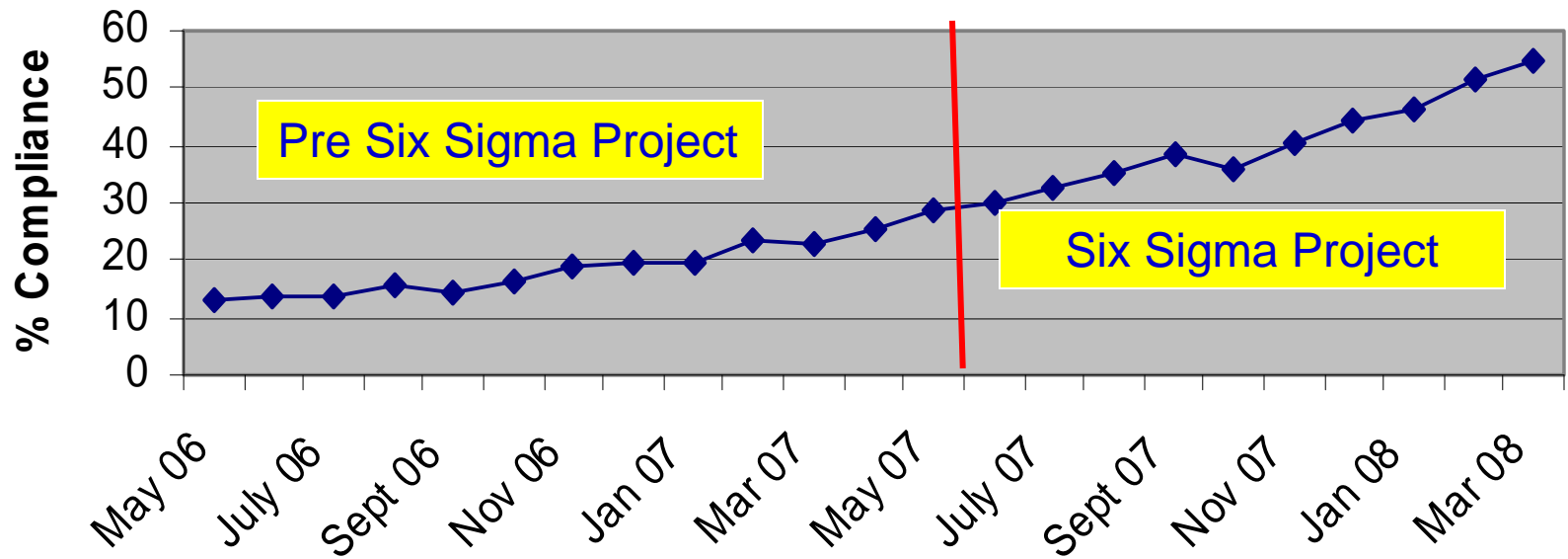
# Lessons Learned

## *"Moving Forward"*

- Provide managers with unit specific data and demand accountability
- Clearly written nursing practice P&Ps need to be in place and implemented
- Clearly communicate the difference between old/new equipment capabilities during roll-out
- Recognize the value of the Advanced Practice Nurses (or other entity) in initiatives
- Vendor relationships/partnerships are critical to success
- Global metric for performance improvement as a system
- Monitor IV related adverse drug events and evaluate...we have not had an adverse event since project began, and heightened awareness
- Library pushes and server require constant monitoring
- Role for System Administrator
- Use of Six Sigma Methods and tools to drive improvement

# Progress...

## Overall Compliance Since Implementation of Hospira Infusion Pump



# Virtua Health

Coming in 2010-  
Healthcare Campus of the Future



# Questions?

