Performance Improvement and Cultural Strategies for Reducing HAIs

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Quebec, Canada

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Main Line Health System
APIC President 2007

Infection Preventionist – Advanced Competencies

✓ ***Advanced facilitation, group process, team building and performance improvement skills***

✓Looking outside of healthcare (engineering) to understand how to hardwire process improvements

✓Enhanced abilities to collaborate, negotiate and influence others at all levels of the organization

- *Influence front line staff to see patient experience vs. task list!*

Source: Excerpts from the Proceedings of APIC Future Summit 2007

Proposed Key Strategies for Eliminating HAIs

1. **Reduce Device Use**
2. **Increase vaccination of healthcare personnel**
3. **Aggressive Antimicrobial Stewardship**
4. **Culture change** – moving towards a culture of safety that includes patients and families as members of the healthcare team
5. **C-Suite Engagement** - Strong role for leadership to support improvements
6. **System-based approaches/protocols/checklists**
7. **Better use of technology**
8. **Public reporting of validated data**
9. **Partnerships**, traditional and non-traditional
10. **Handwashing**

U.S. Department of Health and Human Services
Office of the Assistant Secretary for Health
Office of Healthcare Quality

http://www.hhs.gov/ash/initiatives/hai/
http://www.hhs.gov/ash/ohq/

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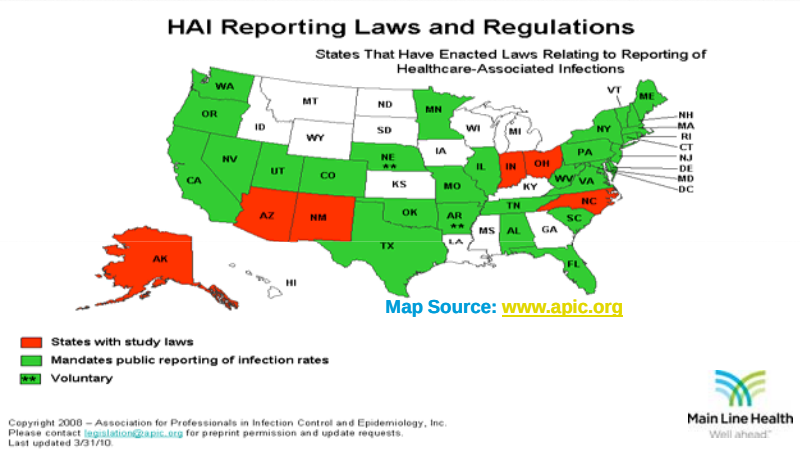
Transparency

- Public reporting requires transparency; accuracy and validation of data
- ***Demand for transparency driving legislation***



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What is the role of *culture* in improving performance (safety)?

- Culture is the set of beliefs , values and "norms" that shape the way organizations think and act…it's the "way we do things around here."
- Culture trumps strategy every time…so you must understand it before successful prevention measures can reduce harm.

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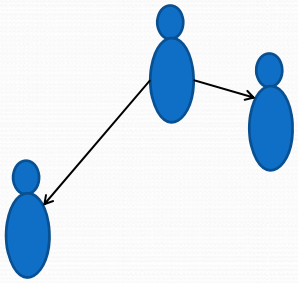
Power Distance is the extent to which the less powerful expect and accept that power is distributed unequally. PD is a measure of interpersonal power or influence superior-to-subordinate *as perceived by the subordinate.*



Healthcare Perspective:

- ***Surgeons & anesthesiologists view low***
- ***Nurses view as significantly higher***

Source: *from* * Weick & Sutcliffe attribute of HRO's:5. Deference to expertise.

Actions:

Use *organizational culture* to reduce power distance found in professional cultures.

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Creating a reliable culture means 3 things

1. Set clear expectations (about safety behaviors)
2. Educate and provide tools/skills needed to meet expectations
3. Hold everyone accountable
   to work as a team focused on safety

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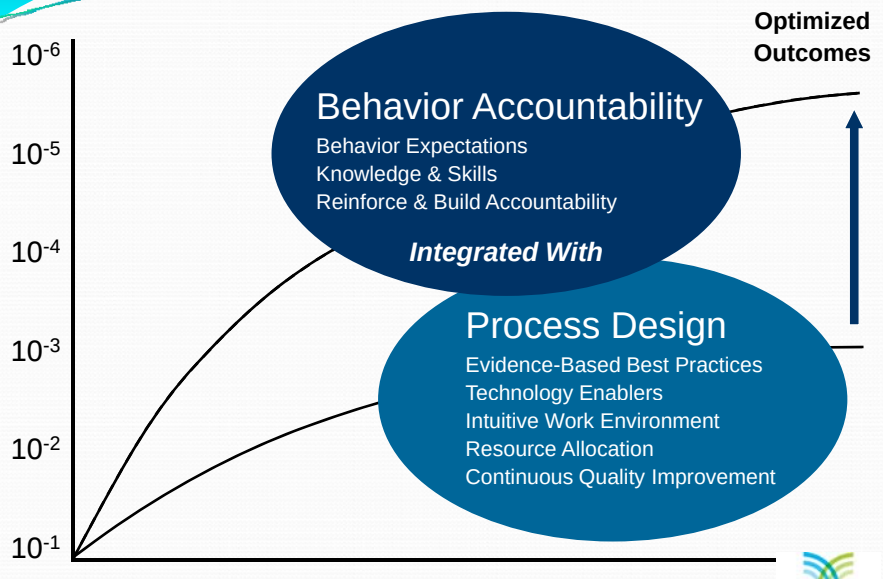
Reliability: *Not By Process Design Alone*



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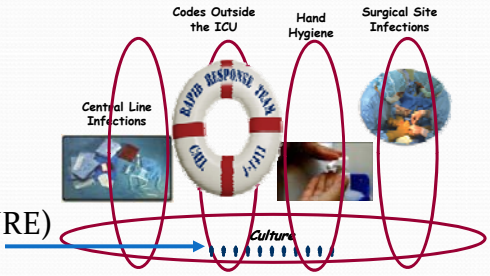
Focus on Implementation of and Compliance with Infection Prevention *bundles* with behavioral or "people" bundle*

- CLABSI
- CAUTI
- VAP
- SSI
- PEOPLE BUNDLE (CULTURE)



"Bundles" are a group of evidence-based clinical measures or best practices proven to prevent harm.

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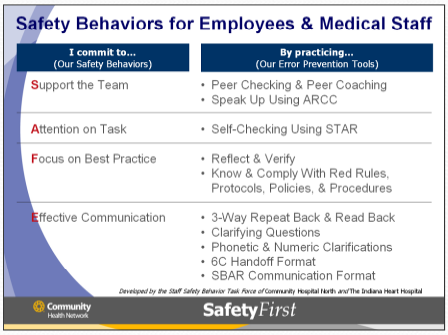
Process Design + Behavioral Accountability

VAP Prevention

1. Elevation of the head of the bed to between 30 and 45 degrees
2. Daily "sedation vacation" and assessment of readiness to extubate
3. Peptic ulcer disease (PUD) prophylaxis
4. Deep venous thrombosis (DVT) prophylaxis (unless contraindicated)

"Clinical Bundle"



"People Bundle"

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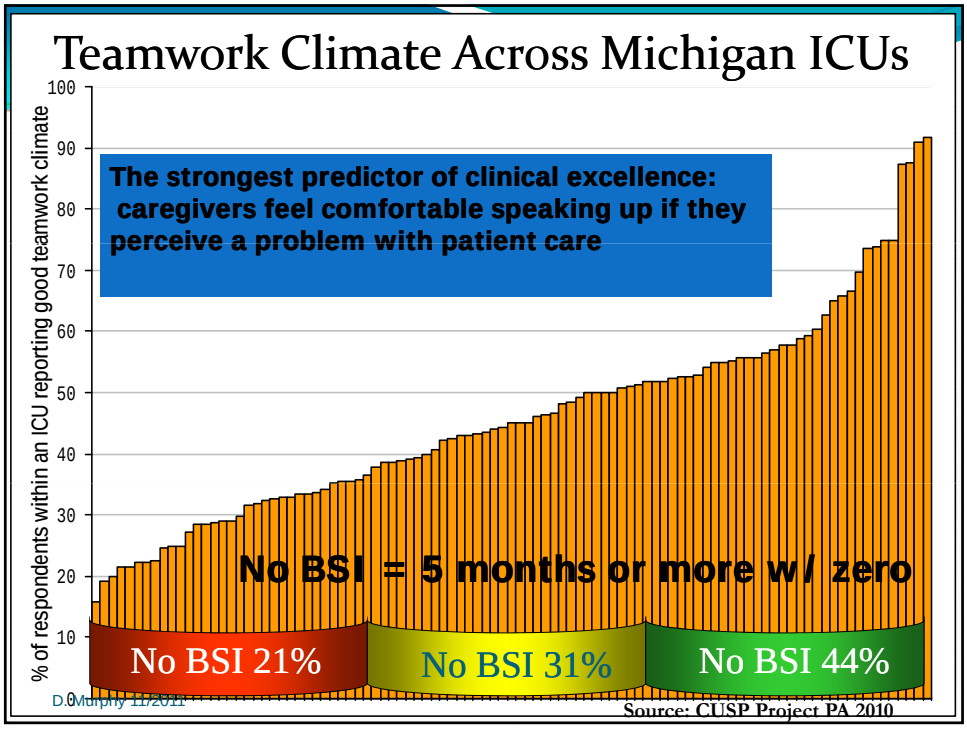
Teamwork Climate Across Michigan ICUs
% of respondents within an ICU reporting good teamwork climate
100
90
80
70
60
50
40
30
20
10
0
The strongest predictor of clinical excellence: caregivers feel comfortable speaking up if they perceive a problem with patient care
No BSI = 5 months or more w/ zero
No BSI 21%
No BSI 31%
No BSI 44%
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Source: CUSP Project PA 2010


PROCESS IMPROVEMENT
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Choosing your PI Initiatives

- Required Measures
  - ✓For accreditation: CMS Core Measures; Nat'l PS Goals
- Organizational Annual Operating Goals –
  - ✓ PI Initiatives for clinical effectiveness, efficiency
- Departmental Goals and Objectives

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Goals

- Must be SMART
  - **S**pecific
  - **M**easurable
  - **A**ttainable
  - **R**ealistic
  - **T**imely

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Team Roles

- Champion/Executive Sponsor: person who can remove barriers for team
- Leader: Process owner
- Facilitator: IP or person driving the improvement effort
- Member: key stakeholders, customers, front-line staff
- PI mentor: Assists the team in applying PI methodologies

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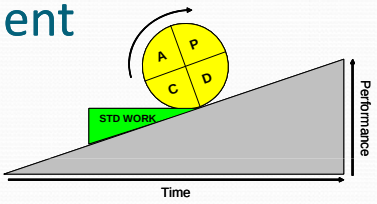
Performance Improvement Methodology



FOCUS PDCA (PDSA) Model

- Find a process to improve
- Organize a team (that knows the process)
- Clarify current knowledge of the process
- Understand sources of process variation
- Select the process improvement (solution)
- Plan the improvement and continue data collection
- Do: implement the improvement, collect data
- Check and study the results or impact of interventions
- Act to hold the gain and continue to improve the process

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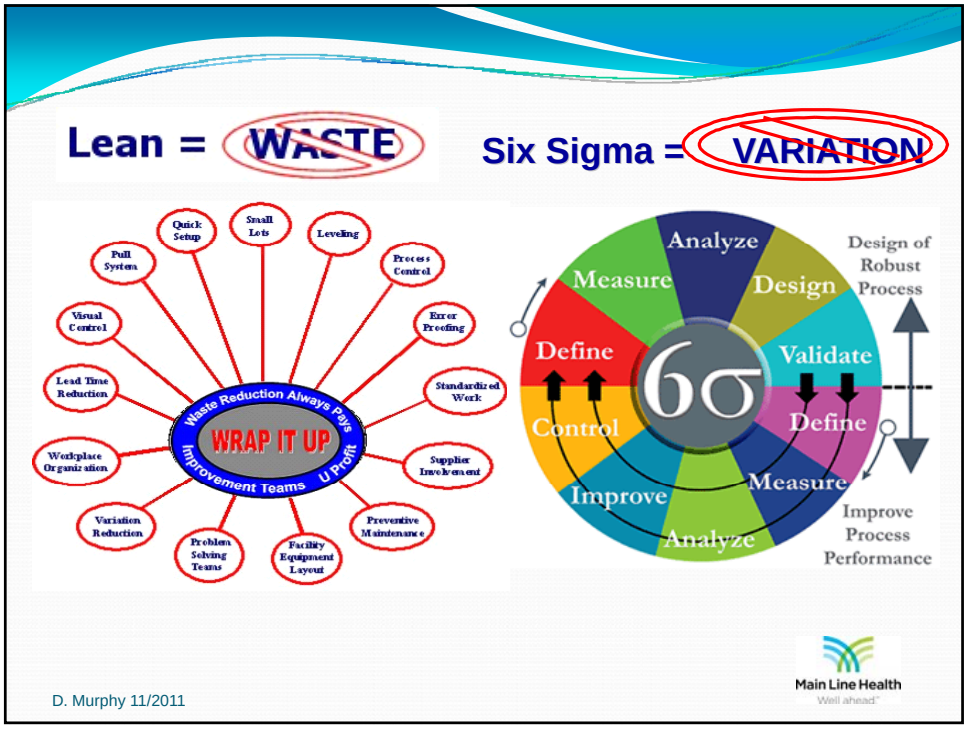

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What is Lean/Six Sigma?

- Combination of Lean and Six Sigma methodologies for quality improvement
- A tool box of quality and performance improvement techniques
  - Includes familiar tools such as
    - Process mapping
    - Voting on improvements
    - FMEA: Failure Modes Effects Analysis
    - Outcome & process measurement

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Six Sigma Basics

- Understanding the current process
  - Inputs>Activity>Outputs
- Identifying any variation in the process
  - Standard Deviation (Sigma)
- Identifying what is critical to quality of the product
  - As determined by customers
- Measuring the current process
  - Capability of the process to create a positive outcome
  - Identify where defects lie
- Re-defining the process to reduce defects and variation while meeting the customer's expectations

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Methodology: DMAIC

- **Define:** Scope and align your project
- **Measure:** Establish the baseline
- **Analyze:** Determine the inputs that create your result $Y = f(x)$
- **Improve:** Optimize the process & input
- **Control:** Sustain the results

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- **Y=f(x)**
  - Understanding the function (f) of the combined inputs (x) creates the output/result (Y)
  - Inputs = steps in the process or process measures
  - Y = the product/service the customer requires
- Example: Sterile technique(x_1) + skin disinfection (x_2) + hand hygiene (x_3) = (Y) Infection free placement of a central venous catheter

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Introduction to Lean

- Lean is a business system devoted to continuous improvement.
- Lean focuses on managing processes and leading people in the workplace rather than traditional techniques of managing the business and leading from the back office.

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Lean' Customer Focus

- Value is defined by the customer
- Value-add activities directly "transform" the service or product into what the customer's willing to pay for; everything else is Waste (non-value)
- There are two general categories of waste:
  1) Pure Waste
     - completely useless activity (ex. searching for supplies, sending orders to Lab or Pharmacy without required information—creating rework or defects, calling to check order status)
  2) Necessary Waste
     - required by today's process but not by the customer (ex. excessive patient transport & high supply inventories)

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The 8 Operational Wastes

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1. **DEFECTS:** (Wrong info. / Rework / Inaccurate information).
2. **OVERPRODUCTION:** (Duplication / Extra information).
3. **WAITING:** (Patients / Providers / Material).
4. **NEGLECT OF HUMAN TALENT:** (Unused Skills / Injuries / Unsafe Environment / Disrespect).
5. **TRANSPORTATION:** (Transactions / Transfer Moving)
6. **INVENTORY:** (Incomplete / Piles).
7. **MOTION:** (Finding Information / Double entry).
8. **EXCESS PROCESSING:** (Extra Steps / Quality Checks / Workarounds / Over processing / Inspection / Oversight) .

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Basic Lean Principles

- **Flow:** The continuous creation or delivery of value without interruption
- **5S:** A complete system for workplace organization, including the process for sustainment
- **Visual Management:** Using visual signals for more effective communication
- **Pull:** Working or producing to downstream demand only
- **Standard Work:** Identifying the "best practice" and standardizing to it, stabilizing the process (predictability)
- **1 by 1:** Reducing batch size to one whenever possible to support flow
- **Zero Defects:** Not sending product/service to downstream customer without meeting all requirements

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Gap Analysis

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Process Mapping

- What is a process?
  - A series of steps or activities that transforms inputs into outputs (desired result)
- Illustrates how steps and activities are linked
- Keeps focus on facts and actual process steps
- Assists with identifying waste, non-value added work

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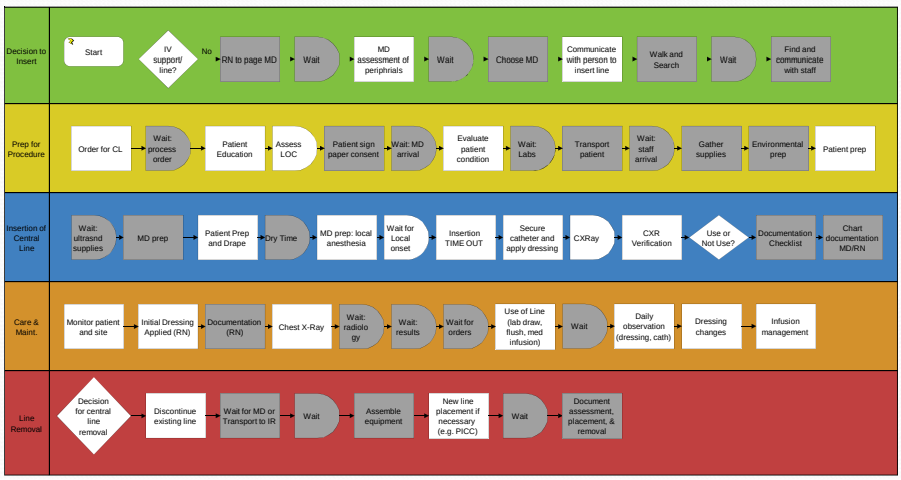
Improve the Experience of a Patient with a Central Venous Catheter

High Level Current State



White = value added; Grey = non-value added

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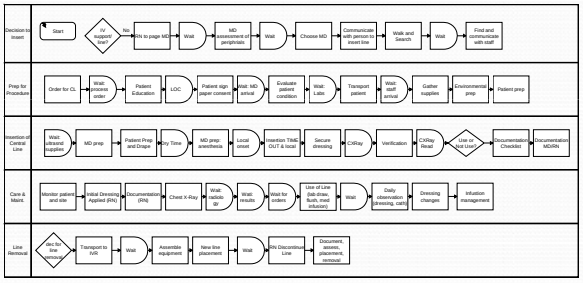
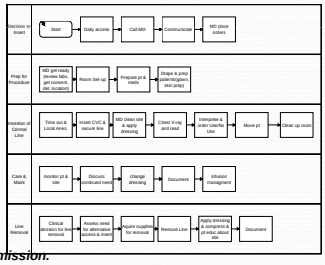
Current State to Future State

Current State



Future State



6 fewer steps

11 fewer steps

7 fewer steps…

47% Decrease in Steps!

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SOURCE: Barnes-Jewish Hospital, St. Louis. Used with permission.

Gap Analysis for Central Line VSA

- Lack of RN competency with peripheral sticks
- Lack of dedicated vascular access experts
- Lack of standard process for decision to insert and remove
- Lack of staff to assist physician with insertion
- Lack of standard work (SW) for line insertion/care
  - No SW for preparation/set up/break down
  - No procedure checklist for line insertion
  - No SW for documentation of line insertion, care and maintenance
- Supplies/Equipment not available as needed
  - Kits not standardized to contain what is needed
  - Supplies not available at point of care
  - Equipment (e.g. ultrasound) not readily available

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Observations

Gemba Walk

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Selecting Appropriate Goals (Targets)

- Start by evaluating how close you are to the chosen benchmark
- Targeting Zero:
  - Early on, may be *theoretical* goal to drive organization's commitment
  - If at NHSN's top quartile, aim for top decile (0.00)
- The decrease you select depends on your current rates
  - If worse than pooled mean a 50% decrease is reasonable
  - If at top decile a 20% decrease is a real stretch
- Select a Realistic goal that stretches the team but is not completely unattainable

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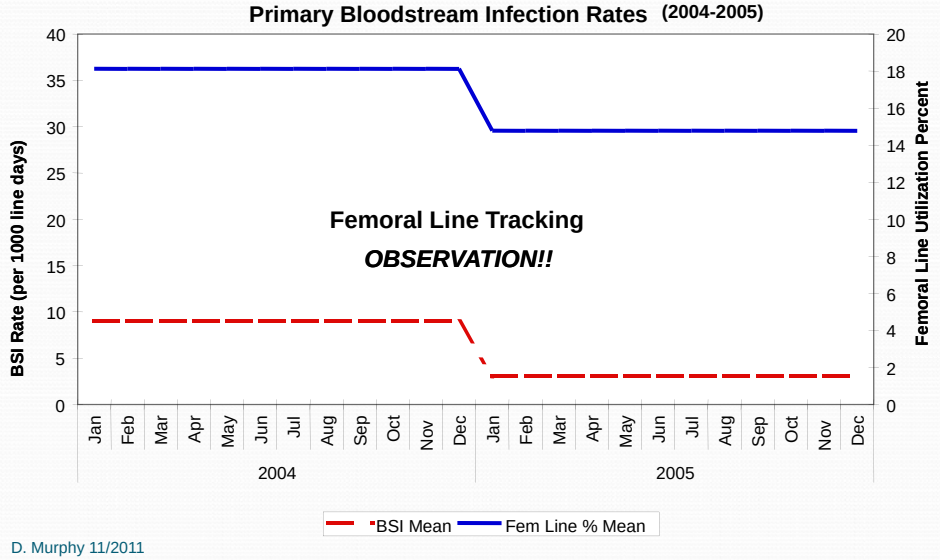
Use your data to tell a story…demonstrate the need for process change…

Medical ICU
Femoral Line Utilization % *and*
Primary Bloodstream Infection Rates (2004-2005)



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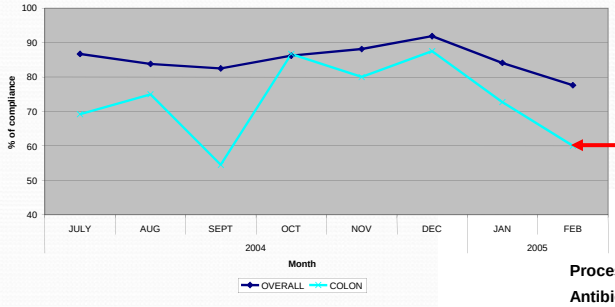
SCIP: Pre-intervention state: colorectal service

Prophylactic antibiotic received within one hour prior to surgical incision

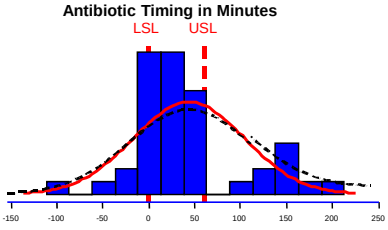
BJH SIP Colorectal Procedures vs. BJH Overall SIP Procedures



COLORECTAL SERVICE

Six Sigma: reducing variation

Process Capability Analysis for Antibiotic Timing in Minutes



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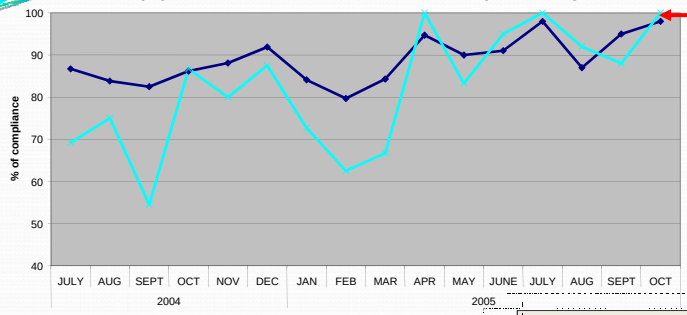
SOURCE: Barnes-Jewish Hospital, St. Louis

SCIP: Post-intervention state

SIP 1 Prophylactic antibiotic received within one hour prior to surgical incision

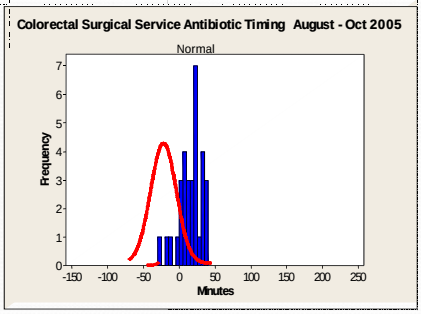


COLORECTAL SERVICE

Interventions:

- Colorectal pre-op and post-op standing orders were revised to reflect SCIP guidelines
- Roles were clarified
  - ✓Surgeons are responsible for writing pre-op antibiotic orders
  - ✓Anesthesia staff responsible for administration of pre-op antibiotics
- ***Antibiotic question was added to the surgical "time out"***
- A method was developed for rapid electronic feedback of individual service compliance rates to surgeons/anesthesiology

SOURCE: Barnes-Jewish Hospital, St. Louis



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What about HUMAN FACTORS?

- People
- Tools
- Work
- Environment

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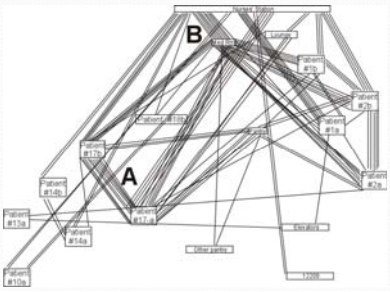
A Typical Patient Care Unit

ENVIRONMENT
Noise, Lighting, Workflow, Equipment

Solution: Noise Reduction



Solution: Workflow redesign

Solution: Visual Management

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Visual Management and Workflow Redesign

ORANGE = CVC supplies and equipment in all storerooms, carts, and bins!

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STOP INTERRUPTIONS DURING CVC INSERTION!

HUMAN FACTORS ENGINEERING!

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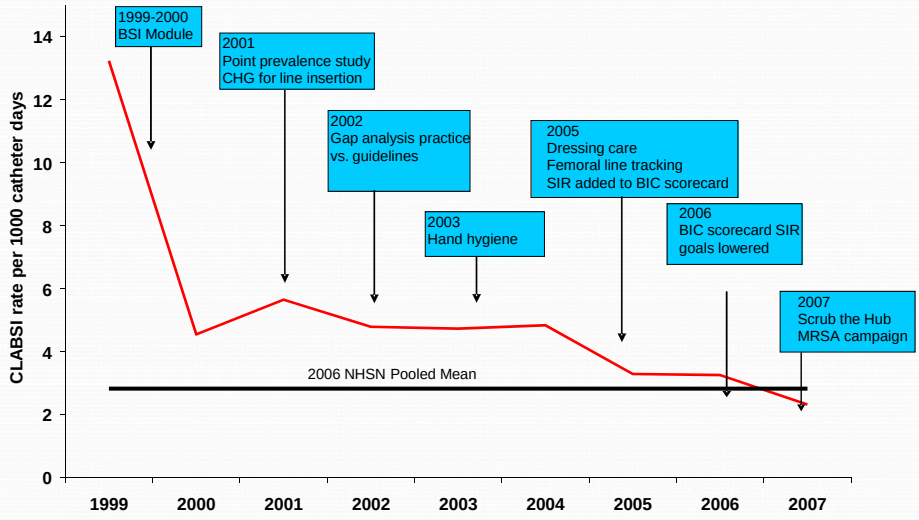
CLABSI Rate Chart and Associated Process Improvements



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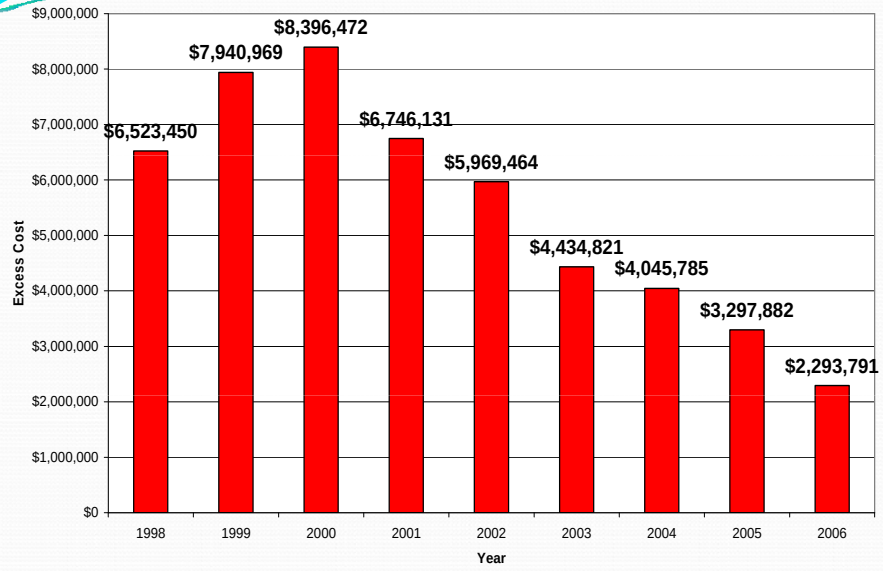
Healthcare Associated Infections
BJC Excess Cost 1998 - 2006



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Process Improvement Project Results

Item	Current annual cost	Estimated annual future cost
CL catheter	$14,938	$14,938*
CL Kit	$15,732.64 + (single supplies $25.54 ea)	$21,560
CL Carts	N/A	$39,521.88
Ultrasound	N/A	$92,000
Cost of CA-BSI	$2,088,000 (58 BSIs over 12 mos)	$1,368,000 (38 BSIs, 1/3 reduction)
TOTAL	$2,118,670	$1,536,019
Savings of $582,651		

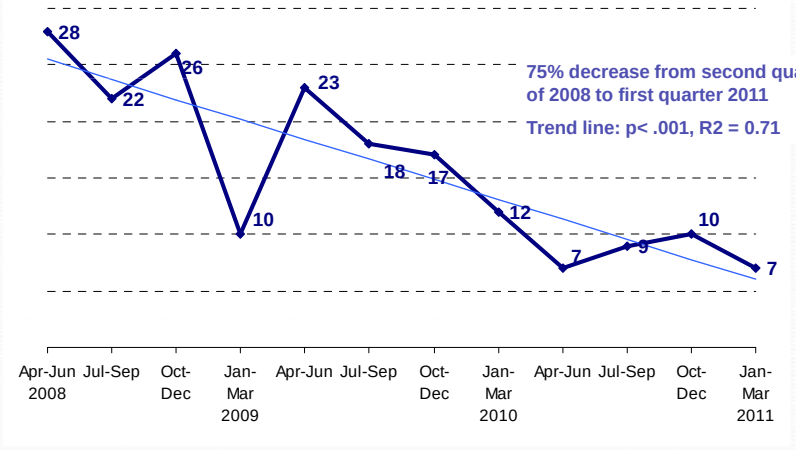
SOURCE: Barnes-Jewish Hospital, St. Louis. Used with permission.

Metrics for CVC Rapid Improvement Event

Metric	Baseline	Post Experiment	Target
Standardized CL Kits	ICU 0% Nursing Division 0%	100%	100%
POC CL Supplies – Procedure Cart	ICU = 100% Nursing Division = 4.5%	100%	100%
# Types of CL kits	>3	1	1
Motion (ft) to Gather Supplies	Nursing Division = 3810 ft (.72 mi)	283 Ft	Decrease by 25%
Time to Gather Supplies	Nursing Division = 30-45 min (~.5 FTE/year)	2.2 min (8 min to restock cart)	5 min
# Items to Gather	17	2	Decrease by 50%

SOURCE: Barnes-Jewish Hospital, St. Louis. Used with permission.

Main Line Health System (*All Patients)
CLABSI (#) April 2008 - March 2011



*All Patients = all patients in house with central line

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Data Source: NHSN via DMA Infection Control Database

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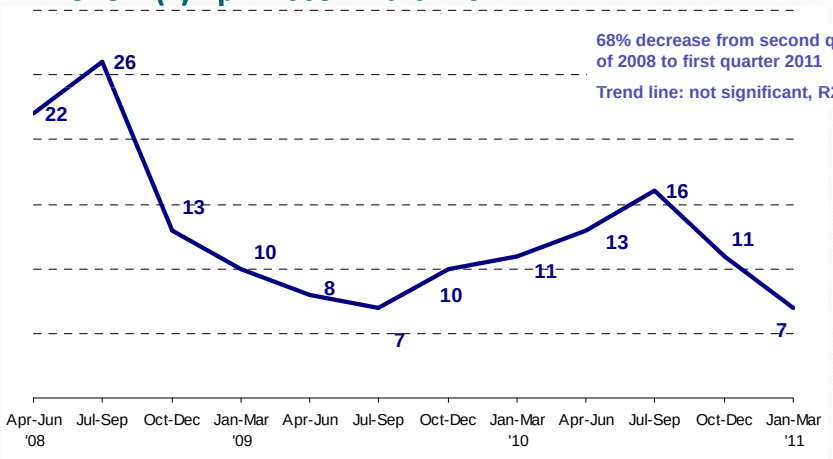
Main Line Health System (Med/Surg/Tele Units)
CAUTI (#) April 2008 - March 2011



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Data Source: NHSN via DMA Infection Control Database

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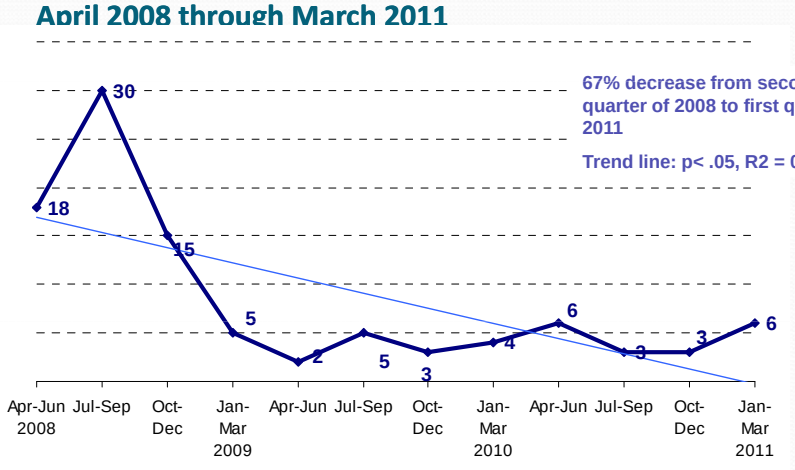
Main Line Health System (Critical Care Units)
Ventilator Associated Pneumonia (#)
April 2008 through March 2011



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Data Source: NHSN via DMA Infection Control Database

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In summary.....

Performance Improvement and Cultural Solutions:

- Performance is improved through good process design *and* behavioral accountability
- Understand role of PROCESS DESIGN and BEHAVIORAL ACCOUNTABILITY: there are different solution approaches
- Promote transparency and continuous learning; this allows for mistakes to be openly discussed without fear of penalty (culture of safety).
- Select process improvement tools and methods easy for teams to embrace
- View problems and solutions from a cultural and human factors perspective (People, Tools, Work, Environment).
- Provide real time data to leaders and front-line staff for the purpose of driving improvement.
- Demonstrate return on investment – ROI!

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THANK YOU.
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