

*[Where We Started and Where
We' re going.....] A Lean Centered Surveillance
and Prevention Program*

*Presented by
Alfonso Torress-Cook, Dr.P.H.
Director of Epidemiology/Patient Safety*

Disclosures

I have received research grant from the
Federal Government.

I have taken antibiotics

I have had infections

Objectives

1. What is Lean
2. The Kaizen system
3. Reduction of waste (Muda)
4. Cost Savings
5. Sustainability of the process

The Way We Were at PHLB

- **In years past. It was generally accepted that a well designed Infection Control Program could prevent about 30% of infections acquired in the hospital.**
- **As long as we are below the national level.**
- **“Because we’ve always done it that way**

The times they are a changing.....

Bob Dylan

Changing.



The Strategic

- Quality and Improvement (PDCA)
- Patient hygiene (The Steiros Algorithm)
- The Environment
- DNV (Accreditation)
- Lean
- We allow the space for people to be creative.

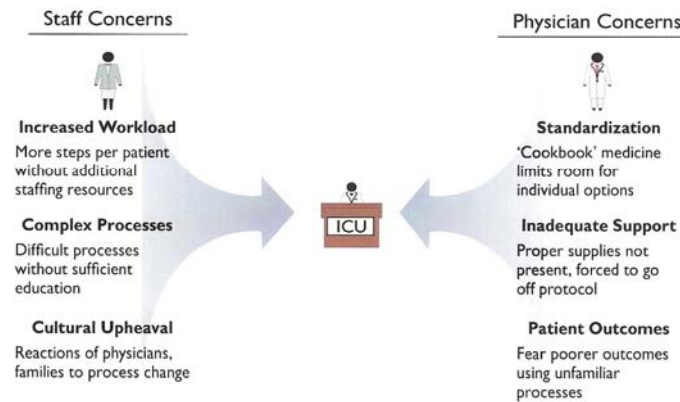
Not Paying for Non Performance – Medicare Cutting Payment

Looming Proposal to Cut Payments

Condition	Selected in FY08 Rule	Future Considerations
1. Serious preventable event—object left in surgery	✓	
2. Serious preventable event—air embolism	✓	
3. Serious preventable event—blood incompatibility	✓	
4. Catheter associated urinary tract infections	✓	
5. Pressure ulcers (Decubitus ulcers)	✓	
6. Vascular catheter associated infection	✓	
7. Surgical site infection (Mediastinitis after CABG surgery)	✓	
8. Falls	✓	
9. Ventilator associated pneumonia		✓
10. Staphylococcus aureus septicemia		✓
11. Deep vein thrombosis/Pulmonary embolism		✓
12. Methicillin resistant staphylococcus aureus		✓
13. Clostridium difficile-associated disease		✓

Cultural Change [The Initial Push]

Cultural Change Never Easy



Re-moo-ving the sacred cows of nursing

How evidence-based practice can update long-held beliefs



“ Because
We’ve always
done it that
way”

We follow
the Standard
of the
community

I never
heard of it.





What is Lean?

Every system is perfectly designed to achieve
Exactly the results it gets

The core idea is to maximize **customer value** while minimizing waste. Simply, lean means creating more value for customers with fewer resources.

The term "lean" was coined to describe Toyota's business during the late 1980s by a research team headed by Jim Womack, Ph.D., at MIT's International Motor Vehicle Program.

Purpose, Process, People

Womack and Jones recommend that managers and executives embarked on lean transformations think about three fundamental business issues that should guide the transformation of the *entire organization*:

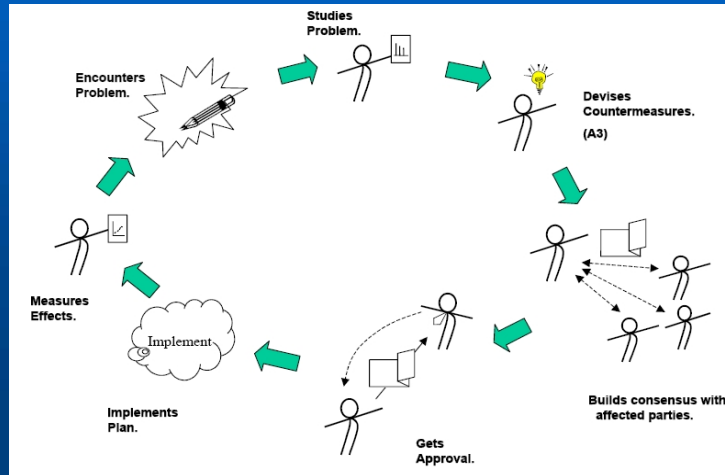
-Purpose: What customer problems will the enterprise solve to achieve its own purpose of prospering?

-Process: How will the organization assess each major value stream to make sure each step is valuable, capable, available, adequate, flexible, and that all the steps are linked by flow, pull, and leveling?

-People: How can the organization insure that every important process has someone responsible for continually evaluating that value stream in terms of business purpose and lean process? How can everyone touching the value stream be actively engaged in operating it correctly and continually improving it?

"Just as a carpenter needs a vision of what to build in order to get the full benefit of a hammer, Lean Thinkers need a vision before picking up our lean tools," said Womack. "Thinking deeply about purpose, process, people is the key to doing this."

PDCA is meant to be applied as a cycle:
a new way of operating. Visually, it looks like this:



The A3 Report forces discipline in our thinking and also allows for a venue to share our findings on one sheet of paper.

The A3 Report

To: _____
By: _____
Date: _____

THEME: "What are we trying to do?"

Background

- Background of the problem
- Context required for full understanding
- Importance of the problem

Current Condition

- Diagram of current situation (or process).
- Highlight problem(s) with storm bursts.
- What about the system is not IDEAL.
- Extent of the problem(s), i.e., measures.

Cause Analysis

- List problem(s)
- Most likely direct (or root) cause:
 - Why? Why?
 - Why? Why?
 - Why? Why?

Target Condition

- Diagram of proposed new process
- Countermeasures noted as fluffy clouds
- Measurable targets (quantity, time)

Implementation Plan

What?	Who?	When?	Where?
Actions to be taken	Responsible person	Times, Dates	

Cost: _____

Follow-Up

Plan	Actual Results
<ul style="list-style-type: none"> How will you check the effects? When will you check them? 	<ul style="list-style-type: none"> In red ink/pencil. Date check done. Results, compare to predicted.

ISSUE : Long "Patient To Bed" (PTB) times causing patient distress

BACKGROUND

once an ED patient has been admitted as an inpatient it takes time before that patient arrives in his/her room. When this time (PTB) is long it is causing added distress to patients.

CURRENT CONDITION

PROBLEM ANALYSIS

Problem: Takes a long time to determine room availability
 Why: Bed boards are inaccurate
 Why: Patient discharges / Room cleanup is sporadic
 Why: Partly because "out of hospital" doctors with variable discharge times
 Why: Unaware (for a time) that bed requires cleanup

Problem: Patient has to wait even after room assignment
 Why: "Advance Directives" does not start until after bed assignment

Problem: Patient has to wait even if a room is available
 Why: Nurse is not on duty or not ready to receive patient
 Why: Nurse can be on or near a break or be busy with another patient
 Why: Particular problems near shift changeover because it impacts a large number of nurses

(See PTB value stream map for details)

TARGET CONDITION

TO	Bill
BY	June
DATE	July 2006

COUNTERMEASURES

- Use admin or volunteer resources to check bed availability on a high frequency basis and update "bed board"
- Start "Advance Directives" before patient bed is assigned

IMPLEMENTATION PLAN

What	Who	When	Outcome
Use additional admin resources with "Go Bed" approach to free and track accurate and timely cleaning requests	John	Month of August	Collect wait time data and do before/after comparison on impact of accurate room availability information
Investigate automated bed availability and notification systems in use at hospitals. Visit a working hospital site.	Any	Month of August	Cost and implementation details for an automated system for room availability hospital wide
Implement better room availability process based on results of August activities	Any	Sept-Nov	Forecast patient wait times and staff times in finding rooms

FOLLOW UP

	Costs / Savings	Value
Monthly tracking of outcome values	Bed Availability System implementation cost (Projected over 12 months)	xxx
Monthly estimation of annual costs / savings	Staff time saved per year in tracking bed availability and converted to approx dollar savings	xxx

Outcome	July	Aug	Sep	Oct	Nov	Dec
Characteristic patient wait time (80% of patients have a wait time less than xx minutes)	xxx	xxx	xxx	xxx	xxx	xxx
Average patient wait time	xxx	xxx	xxx	xxx	xxx	xxx

Lean Manufacturing identifies 7 areas of waste or «muda».

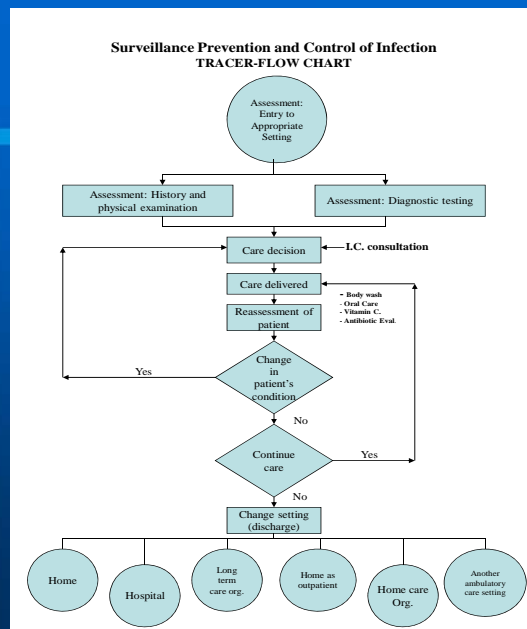
Standardize work

Progress

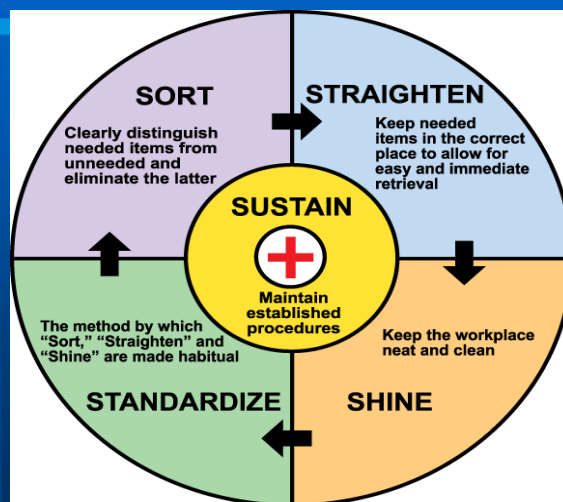
KAIZEN

- Muda caused by unnecessary stock
- Muda caused by defects/rejects
- Muda caused by unnecessary movement
- Muda caused by inappropriate processing
- Muda caused by waiting
- Muda caused by transport
- Muda veroorzaakt door overproductie

The Lean Approach (5S)



5S Methodology



The Objectives of 5S



Hygiene [A forgotten Practice]

- **Unclean skin favors the development of pathogenic organisms – dead cells that continually slough off the epidermis mix with secretions the sweat and sebaceous glands and the dust found on the skin to form a filthy layer on its surface.**

The traditional APIC-CDC-SHEA Infection Control practices focus mainly on Isolation and Hand Washing



Good Lord, what've I got??

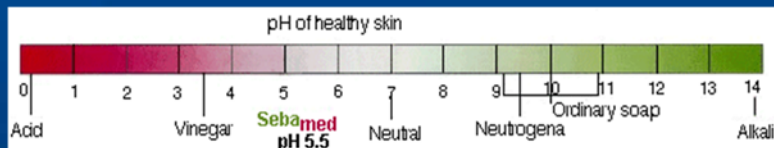


Function of the skin

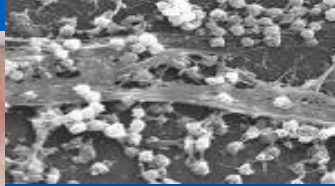
- Protection
- Sensation
- Heat regulation
- Control of evaporation
- Storage and synthesis
- Absorption

Hygiene .3

- The skin supports its own ecosystem of micro-organisms including yeast and bacteria which can not be removed by any amount of cleaning.



The Patient [The Skin is The Source]



MRSA

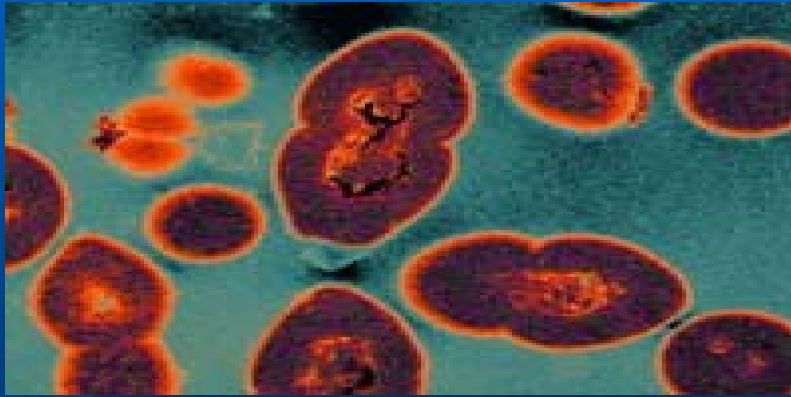
Biofilm



Bacteria Under Finger nails



Enterococcus faecalis resistant to vancomycin
(VRE)



Health care Facilities Environmental Contamination

- Healthcare facilities-acquired infections in most cases, are the results of environmental contamination, and poor patient hygiene during hospitalization, and not how sick the patient were at the time of admission.

The importance of cleaning

The Inanimate Environment Can Facilitate Transmission



~ Contaminated surfaces increase cross-transmission ~

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.



Ultra Violet Light in our ER, ICU and Surgery

Changing Vantage Points

- Infection are not longer considered inevitable consequences of treating older, sicker or uninsured patients.
- Now we hear terms like “zero tolerance”. “pursuing perfection”, “irreducible minimum”, “lean”, “six sigma”, and Positive Deviance (PD)
- The idea is to aim for perfection rather than match the bench marks set by (NHSN, APIC, SHEA)

“A pessimist see the difficulty in every opportunity; an optimist sees the opportunity in every difficulty.” Winston Churchill

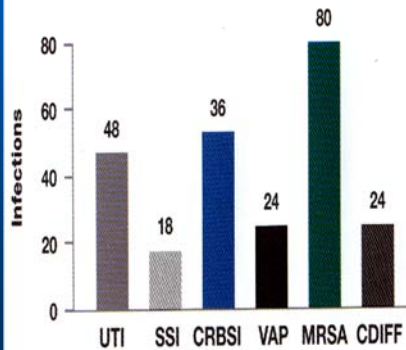


Out-Comes and Savings

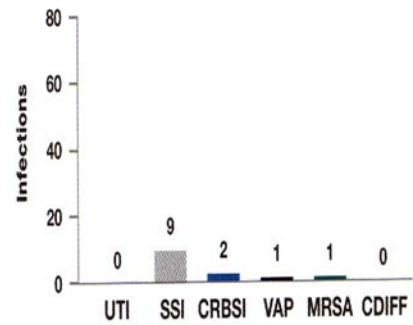


2011 EXPECTED vs. ACTUAL HAI RESULTS PHLB (TMIT/APIC Cost Calculator)

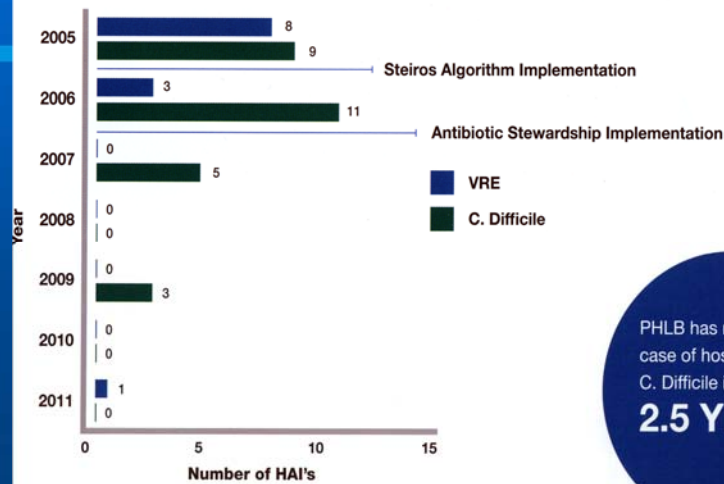
Expected Annual Infections for PHLB with an incident rate of 2.5 Infections per 1000 Pt. Days



Total Annual Infections with the Steiros Algorithm



PHLB-Hospital Acquired VRE and C. Difficile 2005-2011



PHLB has not had a case of hospital acquired C. Difficile in over **2.5 YEARS!**

1. Watson PA, Watson LR, Torress-Cook A; Institution of the Steiros Algorithm Outpatient Surgical Protocol Reduced Orthopedic Surgical Site Infection (SSI) Rates. Iowa Orthop J. 2012; 32:116-119.

Preventing Orthopedic Spinal Surgical Site Infections through a Comprehensive Lean-Centered Best Practice Bundle/Checklist

Authors: Florence Vismanos, RN, 1, Teresita Dalog, RN, 1, Cheryl Reyes, RN, 1, Luke Watson, MD, 1, Carmina Delara, RN, 1 Alfonso Torres-Cook, Dr.P.H.3, Paul Watson, MD, 2
 1. Pacific Hospital of Long Beach, 2. Lakeside Orthopedic, Omaha, Nebraska

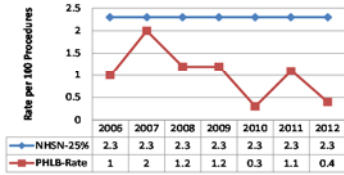
Issue: SSI surveillance data from Orthopedic Spinal Fusion (FUSN) patients in a Level 3 trauma, inner-city academic center associated, safety-net hospital were greater than the 75th percentile using NHSN/CDC

Project: The project goal was to implement a clinical process that result in SSI rates in the Spinal Fusion (FUSN) implant population (868 annually at the 25th percentile or less (zero SSIs) (NHSN, CDC, 2009). To accomplish this goal, a collaborative multidisciplinary team was formed applying a Lean Centered patient care approach and the hospital develop a plan to meet the project goal.

The process included:
 *assessment of adequacy and reliability of adherence to best clinical practice.
 *evaluation of the hygiene of the patient
 *review of scientific literature for additional best practice Opportunities
 *review of new products with potential to reduce SSIs.

The investigation resulted in development of a comprehensive surgical checklist including the five following elements in addition to SCIP standards of care.
 *Dial liquid soap "shower" the night before and morning of surgery
 *Utilization of Steiroletion by hospital staff
 *Patient warming 30 minutes prior to and during surgery using Arizant Health Care System.
 *Antibiotic infusion completed 30 minutes prior to incision
 *Team huddle prior to patient entry into the operating room to review completion of the checklist and to coordinated start time for opening of instruments.
 The checklist was implemented as part of our commitment to bring SSIs to the 25th percentile or closed to zero.

PHLB -Spinal Surgical Surveillance Summary Report 2006-2012



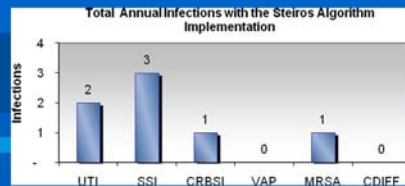
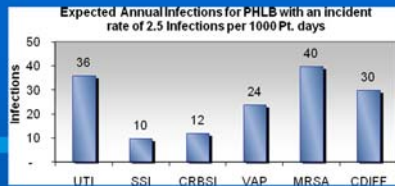
The number of Spinal Fusion (FUSN) SSIs was reduced to 0.4 infection/100 cases following the implementation of the best practice bundle that included five key elements.

A 1% incidence of SSI was projected to generate national costs of over \$900,000,000 per year for in-hospital costs alone and a total of \$1.6 billion in excess costs overall. In an NNS survey of 387,000 patients with nosocomial infections, an organ/space infection contributed to the death in 89% of the patients so afflicted. In another study involving 288,906 patients of which 11.9% had an SSI,¹⁰ in hospital mortality in infected, patients was 14.5% vs. 1.8% in non-infected patients.

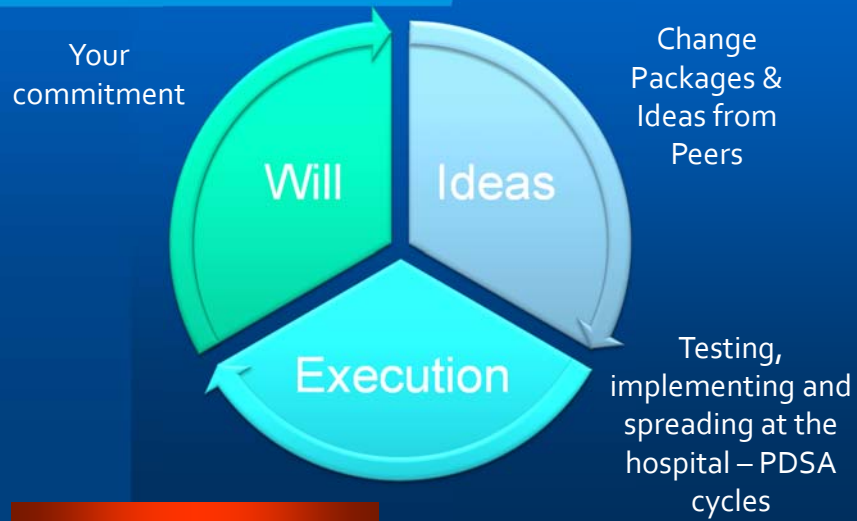
Results: SSI surveillance on Spinal Fusion (FUSN) procedures demonstrated the possibility of reduction and even bring the incident closed to zero. Not all elements were universally implemented. The Dial Liquid soap "Showers" and Steiroletion were most consistently implemented

Lesson Learned: A Lean-Centered approach was essential for defining the issue, identifying best practice, incorporating key elements of best practice into a usable checklist and monitoring outcomes.

Reference:
 1. Rampin A, Wiseman S, Davis L. Evidence that hospital hygiene is important in the control of methicillin resistant Staphylococcus aureus. J Hosp Infect. 2001;49: 10-9-116
 2. NHSN CDC 2009 Hosp. Infect.



What does it take to improve?



Summary

- If not this then what?
- If not us then who ?
- Joe Calvasso CEO Mount Carmel Hospital

Clean Care is Safe Care.....



Steiros – Algorithm a system in place at PHLB and Ernest Health Care LLC. Since 2006, and RCH Since 2010.