Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Performance Improvement
- Performance Improvement is the process of designing or selecting interventions which may include training directed toward a change in behavior, typically on the job.
- PI is a systematic process of discovering and analyzing human performance gaps, planning for future improvements in human performance, designing and developing cost-effective and ethically-justifiable interventions to close performance gaps, implementing the interventions, and evaluating the financial and non-financial results.

Performance Improvement: Art or Science?
- PDCA/PDSA
- Six Sigma: DMAIC
- Toyota Production System (TPS) "Lean" Engineering: Get the waste out!
- Lean Six Sigma – the hybrid (Lean on the DMAIC framework)
- General Electric's Express Workout
- These approaches to PI are nothing without Change Mgt!

Bottom line...Improvement work in health care is getting much more analytical and based on scientific and mathematical principles!

Change Management
- Change management is the practice of administering changes with the help of tested methods and techniques in order to avoid new errors and minimize the impact of changes on an organization and individuals.
- Change management is a systematic approach to dealing with change, and has at least three distinct components:
  - adapting to change,
  - controlling change, and
  - effecting change.
- A proactive approach to dealing with change is at the core of all three aspects.

Change Management
- Change Management is the process, tools and techniques needed to
  - manage the people side of change processes,
  - to achieve expected outcomes
  - and to realize the change effectively...

Human Factors Engineering
- Human Factors Engineering is based on sciences of physics and ergonomics and is essentially the study of man with his/her tools in the system (environment) in which they live or work.
- HFE is a multi-faceted discipline that generates information about human requirements and capabilities, and applies it to the design and acquisition of complex systems.
- Human factors engineering provides the opportunity to:
  (1) develop or improve all human interfaces with the system;
  (2) optimize human / product performance during system operation, maintenance, and support;
  (3) make economical decisions on personnel resources, skills, training, and costs.
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Human Factors Engineering

Implementation Science or
the Art of Execution

1- Maintain focus on the “vital few” goals
   ✓ Keep strategic plan simple, communicate goals often
   ✓ Employees must be clear about their roles in achieving the most
critical 80% of the plan
2- Develop tracking systems that facilitate problem solving
   ✓ Set metrics; use charts, graphics and other tracking tools for
      planning and execution
   ✓ The right measures make expectations clear
   ✓ Each key success factor must have only one owner
   ✓ Conduct RCA* to drill down and uncover barriers to success
3- Set up formal reviews
   ✓ Conduct “toll gate” or milestone reviews
   ✓ Be specific about meeting structures, frequency, and agendas
   ✓ Personnel and resources needed should be at top of the agenda!

Root Cause Analysis

Implementation Science or
the Art of Execution

"If you’ve got the right people in the right roles and
are still not executing, then look at your resources”
Tim Stratman, CEO RRD Direct

"The most creative, visionary strategic planning is useless if it isn’t
translated into action. Think simplicity, clarity, focus... and review your progress relentlessly.”
Melissa Raffoni

Source: Three Keys to Effective Execution, Melissa Raffoni

Key Messages for Infection Preventionists

• We are doing good things in infection prevention
  and control; need more consistency
• This is a time of transition for the profession
  ➢ Consumer awareness and expectations
  ➢ Legislative, governmental mandates
  ➢ MDROs, emerging diseases, global transmission
• Customers and payers demand proactive programs
  – must focus on PREVENTION


Key messages continued

• Many programs getting to zero and sustaining!
• Sustainment goes beyond education and
  training or other traditional interventions
• Need a systems model that can design or
  engineer prevention into patient care
  ...an Infection Prevention System


What is a SYSTEM?
The basics...
Integrated collection of facilities, parts, equipment, materials,
technology, personnel and/or techniques which make an
organized whole capable of supporting some purpose or function.

Hosted by Sharon Krystofiak   sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Components of All Systems

- Interaction of elements
- Conversion processes
- Structure
- Purpose and goals and function
- Inputs or resources
- Outputs
- Environment
- Attributes
- Management, agents, and decision makers

Source: The practice of Ergonomics: Reflections on a Profession by David Meister

Basic Functions of a System

Information storage (EMR)

Sensing
- Plan of care
- Needs assessment
- Decision making

Info processed
- Obtain MD order
- Decide to insert Foley catheter

Action functions
- Insert Foley
- Record I&O

Output
- Patient output info used for decision

Output becomes feedback creating new input

Throughput
- I&O monitored via Foley; medication adjusted based on this info


What does a COMPLEX ADAPTIVE SYSTEM look like?

If people are not totally predictable, what can we build in to make processes (therefore, outcomes...) more reliable?

- Simplification
- Standardization
- Automation
- Redundancy
- Recovery methods/strategies
- Visual queues
- Right resources, roles, responsibilities
- Autonomy/empowerment
- Supportive culture

Potential Model for Prevention of CLABSI Using a System Framework

Barnes-Jewish Hospital's Value Stream Analysis – using principles of LEAN engineering aligned with a Six Sigma DMAIC (define, measure, analyze, improve, control) framework to
- map out,
- analyze,
- redesign
- and sustain

a more efficient, defect-free experience for the patient with a central line...and to eliminate CLABSI

Hosted by Sharon Krystofiak    sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Principles of Lean Systems Engineering

**VALUE**: Exactly what customers are willing to pay for

**VALUE STREAM**: ...is "everything that goes into" creating and delivering value to the customer. These are the steps/actions/processes that deliver value.

**FLOW**: Flow challenges us to reorganize the Value Stream to be continuous... one by one, non-stop, minimal waste.

**PULL**: Pull challenges us to only respond "on demand" to our downstream customers.

**PERFECTION**: Perfection challenges us to also create compelling quality ("defect free") while also reducing cost ("lowest cost").

Source: Adapted from Simpler Business Systems, Indiana, USA

Basic Elements of Lean

**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 or service to downstream customer (internal or external) without meeting all requirements

What is the Value Stream Analysis Process?

A combination of Lean tools and techniques to:

- Analyze a process
- Prescribe a plan, with timeline and assignments, for transforming the process
- Achieve breakthrough results

Deliverables of a Value Stream Analysis Event (4 days)

Three Value Stream Maps

- Current State: A clear picture of how it is today
- Ideal State: What we envision long range (perfect?)
- Future State: What we will look like in 6-12 months

Key VS performance improvement indicators (metrics)

Detailed action plan of Rapid Improvement Events (RIEs), PI projects, and Just-Do-Its (JDI)

Hosted by Sharon Krystofiak  sharon@webbertraining.com
www.webbertraining.com
**What is Value \ What is Not**

**Value-adding:**
- ANY ACTIVITY THAT PHYSICALLY CHANGES THE MATERIAL BEING WORK ON AND INCREASES IT’S VALUE

**Non-value adding:**
- ANY ACTIVITY THAT TAKES TIME, MATERIAL, OR SPACE BUT DOES NOT PHYSICALLY CHANGE THE MATERIAL OR INCREASE IT’S VALUE

Every activity required to move an item through a value stream falls into one of these two categories

Source: Simpler Business Systems

**The 8 Operational Wastes**

**DEFECTS:** (Wrong info. / Rework / Inaccurate information)
- Medication errors; misdiagnosis; wrong patient or procedure

**OVERPRODUCTION:** (Duplication / Extra information) admitting patients early for staff convenience; blood draws/tests/treatment done early, pre-op chart prep 90 days out

**WAITING/DELAYS:** (Patients / Providers / Material)
- ER staff waiting for admission; MDs waiting for test results; staff waiting for prescriptions/orders/transport/cleaning

**NEGLECT OF HUMAN TALENT:** (Unused Skills / Injuries / Unsafe Environment / Disrespect)
- Scrub Techs used as retractor holders; RNs kept from direct patient care

**Transportation:**
- Patients, meds, specimens, lab work, equipment

**Inventory:**
- Dictation waiting for transcription; Medical supplies; Specimens awaiting analysis; Patients waiting for tests, treatment or discharge

**Motion:**
- Finding missing supplies, forms, patients; equipment not within reach

**Excess Processing:**
- Asking patients the same information multiple times; completing unnecessary forms/tests; Triage; verifying orders

---

**Is the current state...**

**Valueable?**
- Is the output of the process what the customer wants and needs?
  - Are there items missing that can add value to the customer in the current process?
  - Are there items that are making the process more efficient but not creating value?

**Capable?**
- Can each step be performed the same way with the same result every time?
  - Is the result satisfactory from the standpoint of the customer?
  - Can the steps be executed in similar locations with the same output every time?

**Available?**
- Can each step be performed every time it needs to be performed?
  - Can each step be performed in the cycle time required?

**Flow?**
- Do all the steps in the process occur in tight sequence or with little waiting?

**Pull?**
- Does the downstream step signal when a process should occur?

**Level?**
- Is demand leveled so that unnecessary variation is removed from the flow?

---

**Is the Current State...**

- **Adequate?**
  - Is there enough capacity to perform each step without waiting?
  - Can the process accommodate changes to operating conditions and still meet customer requirements?
  - Can the process produce similar quality outputs across a range of operating conditions? (Robust)

- **Flow?**
  - Do all the steps in the process occur in tight sequence or with little waiting?

- **Pull?**
  - Does the downstream step signal when a process should occur?

- **Level?**
  - Is demand leveled so that unnecessary variation is removed from the flow?

---

**Ideal and Future State**

- Built knowing the current state and its weaknesses and with clarity around the end goal (outcomes)
- Built as if there were no barriers – in time, human factors, organizational constraints, cultural issues, resources, competencies, equipment, technology...
- Ideal: a reliable, dependable and nearly-perfect system (maybe after years of work)
- Future State: what can be accomplished toward the ideal state in the next 12 months (& keep resetting)

Hosted by Sharon Krystofiak  
sharon@webbertraining.com  
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes  
Denise Murphy, RN, MPH, CIC, Main Line Health System  
A Webber Training Teleclass

## Gap Analysis

<table>
<thead>
<tr>
<th>Current State</th>
<th>GAP</th>
<th>Future State</th>
</tr>
</thead>
</table>

## Action Plans

### Brainstorm Solutions

<table>
<thead>
<tr>
<th>Brainstormed Ideas</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

### Sort the action items

<table>
<thead>
<tr>
<th>Brainstormed Ideas</th>
<th>Sort the action items</th>
<th></th>
<th></th>
</tr>
</thead>
</table>

### Develop an action plan

### Events

|-------------|-------------|-------------|-------------|-------------|-------------|-------------|

### Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Project</th>
<th>Project</th>
<th>Project</th>
<th>Project</th>
<th>Project</th>
<th>Project</th>
</tr>
</thead>
</table>

### Action Items

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Action Item</th>
<th>Action Item</th>
<th>Action Item</th>
<th>Action Item</th>
<th>Action Item</th>
<th>Action Item</th>
</tr>
</thead>
</table>

## Central Line Insertion & Care  
Value Stream Analysis  
February 25-27, 2008

### Executive Champion/Sponsor: Denise Murphy;  
Physician Champions: Richard Bach, MD (ICU) and David Warren, MD/HEP;  
Process Owner/Team Leader: Amy Richmond, Manager, Infection Prevention

## Scope

The scope of this Value Stream Analysis will include the central line insertion, access & care processes  
- From the decision to insert a central venous line to line removal

Note: Process mapping for PICC lines and dialysis catheters was done prior to VSA and information incorporated into VSA

## Reasons for Action

**BJH ICUs**  
- 2007 - 66 catheter-associated BSIs (CLABSI) identified  
- 2007 – 2.2 CA-BSI/1000 catheter days (SIR 0.53)

**BJH Non-ICU areas**  
- CLABSI rates vary from 4 to 9 per 1000 catheter days  
- Compared to non-ICU rates of 1.5 in med/surg and 2.1 in general medicine published in the 2006 NHSN report  
- CLABSI attributable mortality rate = 15% (#10 BJH pts in 2007)

Bloodstream infections cost an excess of $36,000 and excess LOS = 12 days  
CLABSI is publicly reported and CMS no longer pays excess costs

**RIGHT THING TO DO FOR PATIENT SAFETY!!**

## Identify the Opportunity

![Graph showing ICU Central Line Associated Bloodstream Infection Rates from 2006 to 2008](source)

Source: Barnes-Jewish Hospital Epidemiology and Infection Prevention Department

Hosted by Sharon Krystofik  
sharon@webbertraining.com  
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Identify Current Success to Build Upon

Determine Central Line Associated Bloodstream Infection Rates
January 2006 - December 2007

Source: Barnes Jewish Hospital Epidemiology and Infection Prevention Department

Initial State

Barnes Jewish Hospital Epidemiology Infection Prevention
Central Line Insertion and Dressing Scorecard

<table>
<thead>
<tr>
<th>Unit</th>
<th>Decision to Insert</th>
<th>Preparation for Insertion</th>
<th>Insertion of CVC</th>
<th>Maintenance of CVC</th>
<th>Discontinuation of CVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>104ICU</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>56ICU</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>82CCU</td>
<td>91%</td>
<td>91%</td>
<td>91%</td>
<td>91%</td>
<td>91%</td>
</tr>
<tr>
<td>83ICU</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
</tr>
<tr>
<td>84ICU</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
</tr>
<tr>
<td>89ICU</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
</tr>
<tr>
<td>Overall</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
</tbody>
</table>

Criteria for meeting all recommendations:
- Site disinfected with CHG and air dried
- Full drape was used
- Inserter did the following: practiced HH, wore proper PPE (sterile gown, gloves, mask, cap)
- Maintained a sterile field

Solution Approach for this Event

Voice of the Customer
- Identified wastes
- Affinity Diagram
- Impact Matrix
- Flow Cell

Current State Process Map

Decision to insert
- Preparation for insertion
- Insertion of CVC
- Maintenance of CVC
- Discontinuation of CVC

Hosted by Sharon Krystofiak    sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

**CURRENT STATE**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Confirm patient ID and destination</td>
</tr>
<tr>
<td>2</td>
<td>Prepare RAEDC (Retrograde Electrical Device)</td>
</tr>
<tr>
<td>3</td>
<td>Insert catheter</td>
</tr>
<tr>
<td>4</td>
<td>Secure catheter</td>
</tr>
<tr>
<td>5</td>
<td>Monitor patient</td>
</tr>
</tbody>
</table>

**Future State**

- Elimination of CLABSIs by 2010
- ICU CLABSI SIR of 0.38 for 2008 (no more than #30 CLABSI; 13 in 2009)
- >95% Compliance with CVC insertion and dressing change recommendations
- Identify and evaluate complications related to CVC insertion (other than infection)

**Gap Analysis**

- Lack of transparency regarding competency of provider to insert central lines
- Lack of core central line competencies for floor staff
- Lack of standardized central line education
  - Patients – only given post procedure
  - Staff
- Lack of standard environment for line placement (e.g., procedure room vs. pt room)
- Lack of technology to support the central line process
  - Transparency re insertion, maintenance & care (e.g., auto-population of task lists)
- Lack of ability for rapid read of verification x-ray

**Solution Approach**

- **Just Do Its**
  - Problem/Gap:
    - Standard full barrier drape not available in all patient care areas for CVC insertion
    - Full drapes available at point of care

Hosted by Sharon Krystofiak  sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Performance Improvement Project #1
- Problem/Gap: Varying staff skill levels placing peripheral IVs
  - Initial State:
    • Multiple attempts – patient discomfort/dissatisfaction
    • Excessive utilization of central lines
    • Medication delays
  - Future State: Increased staff skill levels in placing peripheral IVs; Develop and implement plan for multidisciplinary training to include "simulation" training
  - Metric: Decreased CVC utilization rates

Central Line Utilization Ratio
Medicine Wards
January 2007 - Present

Central Line Utilization Ratio
Surgical Wards
Jan 2007 - Present

Performance Improvement Project #2
- Problem/Gap: Lack of standardized educational material for patients requiring central lines
  - Initial State:
    • There is no standardized patient educational material pre-procedure
    • Although post-procedure material exists, there is no standardization for disseminating to patients
  - Future State:
    • Create roles for patient and families relative to insertion and care of central lines
    • Create standardized educational materials and standardized process for dissemination to patient

Rapid Improvement Event #1
- Problem/Gap: No standardized process for determining when to insert or remove a central line
  - Over utilization of central lines
  - Increased risk for complications including BSIs
  - Initial State: Fragmented process throughout the hospital, causing inconsistency and variation in the evaluation process
  - Future State:
    • Standardized tool (e.g. algorithm) to predict the optimal vascular access mode for a patient
    • Consistent, reliable process that will provide appropriate vascular access utilization and monitoring
  - Metric: 90% utilization of standardized tool to predict optimal vascular access mode for patients throughout hospitalization; decrease femoral line utilization

Rapid Improvement Event #2
- Problem: Lack of standard work (SW)
  • Preparation, Insertion (Provider & Assistant), Care, Removal, Documentation
  - Initial State: Poor compliance with current policies, lack of CVC training for non-ICU staff
  - Future State:
    • Insertion checklist
    • Standardized documentation
    • Std. work for prep, insertion, care, removal, documentation
    • Visual queues to alert staff about line maintenance process steps
    • A model that empowers staff (in all roles) to STOP THE LINE when they see non-compliance with infection prevention measures
    • Engineering/administrative controls that will eliminate steps, build in "mistake-proofing" at each critical step in line insertion process
  - Metric: 95% compliance with insertion checklist

Hosted by Sharon Krystofiak  sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Rapid Improvement Events 3, 4

Problem: Lack of standard work (SW)
- Supplies/Equipment
  - CVC Kits
  - Carts
- Initial State:
  - Disorganization of supplies
  - Supplies not available at point of care
  - An abundance of wasted motion & time looking for equipment and supplies
- Future State: Standard CVC supply kits and procedure carts available at point of care
- Metric: 100% standardized CVC supplies and equipment in all areas where CVC insertion is performed (cart)

Rapid Improvement Event # 5

- Problem/Gap: Lack of coordinated approach to entire spectrum of vascular access (peripheral and central line)
- Initial State: No standardized approach; everyone works in silos, doing their own thing
- Future State: Vascular Access Coordinating Center with identified experts/best practice/standard work algorithms
- Metric: Decreased CVC Utilization

Decision Process for Vascular Access

Rapid Improvement Event #1

Scope

- Initial assessment for necessity of a central line
- Daily assessment for line necessity
  - Reasons why line is needed
  - When should a line be continued and/or discontinued

Reasons for Action

- No standardized process to decide whether to insert a central line or not
- The lack of standardization produces unnecessary procedures and increases risk for complications, including BSI
- Patient dissatisfaction

Initial State

- Throughout the hospital the decision to insert an IV access varies
- Initial assessment of line necessity or line type does not always meet the patient’s need

Hosted by Sharon Krystofiak    sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Initial State

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral IV Attempts</td>
<td>Proc 33%</td>
</tr>
<tr>
<td>% of Staff Able to Verbalize Knowledge of Procedure Team and PICC Vasc Access Team</td>
<td>Proc 33%</td>
</tr>
<tr>
<td># Central Line/PICC Lines: Removed</td>
<td>3 - 5 per wk/unit</td>
</tr>
<tr>
<td># of Communication Steps – Decision to Insert</td>
<td>3 - 22</td>
</tr>
</tbody>
</table>

Future State

- To develop a tool that will predict the optimal vascular access device for each patient
  - Standardized methodology will be utilized for line placement decisions
  - Urgent requests at discharge for PICC lines and nontips will be decreased
- To have a consistent and reliable process throughout the hospital that will provide appropriate vascular access utilization and monitoring

Gap Analysis

- Vascular Access Competency
  - Multiple "vicks"
  - Lack of trust in skill level
  - No reliable back up available
- Lack of standard work-variation floor - floor
  - Determining appropriate vascular access
  - Daily assessment of access status
  - Line Removal
- Lack of transparency
  - No cues that patient has PICC or central line for discharge planning
  - No cues for line maintenance
- Lack of knowledge
  - Procedure team
  - Method of ordering a PICC/contacting Vascular Access Services
  - Line Care and Line Removal

Rapid Experiments

- Problem:
  - Variation in process for determining appropriate IV access
- Experiment:
  - Developed a tool to assist in determining appropriate access, type, and ongoing necessity of line
  - Tool will be integrated into Eclipsys/Compass (CPOE)
  - Incorporated a daily assessment tool for line type and necessity
- Expected Impact:
  - Decrease BSI
  - Decrease LOS
  - Increase in patient and staff satisfaction
  - Standardized decision process for line placement
- Metric:
  - Decrease the % of PICV with attempts >2
  - RN/Resident comfort level w/determining appropriate access

Necessity for CVC – Scoring Tool

Hosted by Sharon Krystofiak  sharon@webbertraining.com
www.webbertraining.com
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Urgency

Decision to place & type of line

Rapid Experiments

- Problem:
  - Varying knowledge of resources available for central line placement
  - Underutilization of experts for line placement

- Rapid Experiment:
  - Screen Saver – Vascular Access and Procedure Teams
  - Dissemination of informational flyers
  - Placement of flyer on CCTV
  - Article in Physician News

- Impact:
  - Increase efficiency of determining appropriate access
  - More time for staff to focus on patient care
  - Line placed in timely manner
  - Increased patient satisfaction

- Metric:
  - Increased (95%) staff/resident awareness of resources – Vascular Access Team and Procedure Team

Need a PICC line?
Contact Vascular Access Service through ADGO (vascular access referral) or x 2-1112:
Everyday 7:30AM – 8PM

Need a central line?
Contact the Procedure Team
Mon - Fri: 8AM – 5PM at 294-4853 (also performs paracentesis, thoracentesis, and lumbar puncture)

Having trouble with venous access...need advice?

Rapid Experiments

- Problem:
  - Variation in the line removal process
  - Delays in patient discharge

- Rapid Experiment:
  - Created standard work for line removal
  - Created reference pictorial
  - Identification of available professionals in each department to remove lines
  - Created an education module for the standard process for line removal

- Expected Impact:
  - Increased patient satisfaction
  - Decrease infection
  - Decrease delays in discharge
  - Improve understanding of proper technique for line removal

- Metric:
  - # Central lines/PICC removed by nursing staff
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Confirmed State

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
<th>Post Experiment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral IV Attempts</td>
<td>33%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>% of Staff Able to Verbalize Knowledge of</td>
<td>POC 87%</td>
<td></td>
<td>95%</td>
</tr>
<tr>
<td>Protocol Team and (PICC) Vascular Access</td>
<td>Proc: 33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Central Line/PICC Lines: Removed</td>
<td>3-5 per wk/unit</td>
<td>1 hr – 3 hrs</td>
<td>1/2 hr</td>
</tr>
<tr>
<td>Wait time to remove</td>
<td>ICU</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>PICC lines placed urgently</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Communication Steps – Decision to Insert</td>
<td>3 – 22</td>
<td>4-5</td>
<td>3 when command center implemented</td>
</tr>
</tbody>
</table>

PICC LINE REMOVAL EDUCATION FOR STAFF

Equipment needed
- Wash hands
- Remove dressing
- Clean insertion area
  - with alcohol sticks
  - and Chloraprep

ETC.

Completion Plan

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Who is Responsible</th>
<th>By When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post screen saver</td>
<td>Chad Hampton</td>
<td>4/24/08</td>
</tr>
<tr>
<td>Communication plan (Publications, Meetings)</td>
<td>Jamie Gagliarducci</td>
<td>Upon completion of final RIE</td>
</tr>
<tr>
<td>Place line removal training module on Pathlore (intranet)</td>
<td>Vicky Ferris, RN</td>
<td>05/16/08</td>
</tr>
<tr>
<td>Place line removal training module on Pathlore (intranet)</td>
<td>Angie Dixon</td>
<td></td>
</tr>
<tr>
<td>Central line removal pictures</td>
<td>Melissa Schultz, RN</td>
<td>4/24/08</td>
</tr>
<tr>
<td>Vicky Ferris, RN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rapid Improvement Events #3 & 4

- Problem: Lack of standard work (SW)
  - Supplies/Equipment
  - Preparation, Insertion (Provider & Assistant), Care, Removal, Documentation
- Initial State: Poor compliance with current policies, disorganization of supplies, lack of CL training for non-ICU staff
- Target State: Standard CL supply kits; standardized procedure carts on all floors; insertion checklist; standardized documentation; SW for prep, insertion, care, removal, documentation

Confirmed State

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
<th>Post Experiment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized CL Kits</td>
<td>ICU 0%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>POC CL Supplies</td>
<td>ICU = 100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>- Procedure Cart</td>
<td>Nursing Division = 4.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td># Types of CL kits</td>
<td>&gt;3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Motion (ft) to Gather Supplies</td>
<td>Nursing Division = 283 ft</td>
<td>Decrease by 29%</td>
<td></td>
</tr>
<tr>
<td>Time to Gather Supplies</td>
<td>Nursing Division = 30-45 min (~2 FTE/year)</td>
<td>2.2 min</td>
<td>5 min</td>
</tr>
<tr>
<td># Items to Gather</td>
<td>17</td>
<td>2</td>
<td>Decrease by 50%</td>
</tr>
</tbody>
</table>
Using Performance Improvements to Improve Patient Outcomes
Denise Murphy, RN, MPH, CIC, Main Line Health System
A Webber Training Teleclass

Standardized Central Line Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Current annual cost</th>
<th>Estimated annual future cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catheter</td>
<td>$14,938</td>
<td>$14,938*</td>
</tr>
<tr>
<td>CL Kit</td>
<td>$15,732.64 + (single supplies $25.54 ea)</td>
<td>$21,360</td>
</tr>
<tr>
<td>CL Carts</td>
<td>N/A</td>
<td>$39,321.88</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>N/A</td>
<td>$92,000</td>
</tr>
<tr>
<td>Cost of CLABSI</td>
<td>$2,088,000 (58 BSI's in 4 PCA over 12 mos)</td>
<td>$1,368,000 (38 CLABSI, 1/3 reduction)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$2,118,670</td>
<td>$1,536,019</td>
</tr>
</tbody>
</table>

Savings of $582,651

* Current cost for catheter tray. Cost for catheter trays placed in new kit to be determined. Cost will also decrease due to elimination of catheter trays being opened to remove single item.

Supply Transport Options

ORANGE = CVC Supplies/Equip in all store rooms, carts and bins!

STOP INTERRUPTIONS DURING CVC INSERTION!

Cart RE-STOCKING procedure - Part of standard work!

RIE: Standardized Kits and CVC Carts
(Source: Amy Richmond)

<table>
<thead>
<tr>
<th>Item</th>
<th>Current annual cost</th>
<th>Estimated annual future cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catheter</td>
<td>$14,938</td>
<td>$14,938*</td>
</tr>
<tr>
<td>CL Kit</td>
<td>$15,732.64 + (single supplies $25.54 ea)</td>
<td>$21,360</td>
</tr>
<tr>
<td>CL Carts</td>
<td>N/A</td>
<td>$39,321.88</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>N/A</td>
<td>$92,000</td>
</tr>
<tr>
<td>Cost of CLABSI</td>
<td>$2,088,000 (58 BSI's in 4 PCA over 12 mos)</td>
<td>$1,368,000 (38 CLABSI, 1/3 reduction)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$2,118,670</td>
<td>$1,536,019</td>
</tr>
</tbody>
</table>

Savings of $582,651

IP system?

Hosted by Sharon Krystofiak  sharon@webbertraining.com
www.webbertraining.com
Who will lead this future IP System?

- Advanced skills in facilitation and group process, building and leading teams, performance improvement tools and methods, change management
- Analytic skills, such as those required to do real-time point-of-care root cause analysis
- Refined understanding of systems thinking, complex adaptive systems/systems approach to problem solving
- Advanced leadership skills: e.g., negotiation, persuasion

Thanks to Amy Richmond, Team Leader; Pat Matt, PI Engineer (Facilitator) and the Teams at Barnes-Jewish Hospital who are committed to eliminating HAI.

murphyd@mlhs.org

THE NEXT FEW TELECLASSES

<table>
<thead>
<tr>
<th>Date</th>
<th>Teleclass</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Oct. 09</td>
<td>The Changing Face of MRSA – Evolving Epidemiology</td>
</tr>
<tr>
<td></td>
<td>Speaker: Dr. Andrew Simor, Sunnybrook Hospital, Toronto</td>
</tr>
<tr>
<td>15 Oct. 09</td>
<td>The Socioeconomic Cost of Enteric Disease</td>
</tr>
<tr>
<td></td>
<td>Speaker: Dr. Doug Scott, CDC</td>
</tr>
<tr>
<td>21 Oct. 09</td>
<td>(South Pacific Teleclass) National Work on the Prevention of Healthcare Acquired Infections in Australia</td>
</tr>
<tr>
<td></td>
<td>Speaker: Dr. Marilyn Craddock, Australian Commission on Safety &amp; Quality in Healthcare</td>
</tr>
<tr>
<td>22 Oct. 09</td>
<td>(Free Teleclass) Improving Infection Control in Developing Countries</td>
</tr>
<tr>
<td></td>
<td>Speaker: Dr. Benedetta Allegranzi, World Health Organisation</td>
</tr>
<tr>
<td></td>
<td>Speaker: Russell Omvedt, St. Joseph Mercy Health System</td>
</tr>
</tbody>
</table>

www.webbertraining.com.schedulep1.php

Hosted by Sharon Krystofiak    sharon@webbertraining.com
www.webbertraining.com