Standardizing Patient Care to Improve Outcomes in Cardiac Surgery

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Process Improvement Specialist
Background

• Open Heart Surgeries: 700,000 annually in US
• > 67% are Coronary Artery Bypass Grafting
• Surgical Site Infection (SSI) occurs 2 – 5 % of surgical patients
• Mediastinitis - rare surgical site infection that occurs after cardiac surgery
Significance

• Increased mortality
• Increased length of stay
• Re-admission
• Re-operation
• Increased costs
• Preventable
Significance

• The Joint Commission - National Patient Safety Goals 2010
  Goal # 7 – Reduce the risk of healthcare associated infections

• CMMS- “Never Event” – reduce reimbursement

• Cardiac surgery program
  ➢ Society of Thoracic Surgeons database
  ➢ Publicly reported data
Initial Approach

- Creation of Clinical Task Force
- Goal: To Reduce Infection Rate
- Focus on hospital processes
- Meeting Frequency: Every 2 weeks
- Physician operating practices outside scope
Initial Barriers

• Timeline waste
• Postponing decisions
• Delaying meetings
• Burning platform changes
• Unclear accountability
• Challenge of data rather than problem-solving
Subsequent Approach

• Identification of Need
  ➢ Breakthrough Strategy
  ➢ Better Leadership
  ➢ More cohesive team

• Resources Applied
  ➢ Process Excellence Department & Tools
  ➢ Senior Leadership Commitment
  ➢ Infection Control, Floor Staff, Clinical Offices etc
Breakthrough Strategy

- The Use of Kaizen Event conveyed:
  - Sense of urgency
  - Decision-making
  - Excuses unacceptable
  - Efficiency
  - RESULTS NOW!– Deliverables
  - Patient-centric
Kaizen Event Basics

- Team committed to work 3 full-time days
- Resources are dedicated just for the Kaizen event
- Project Charter/ Scope and Goal are defined prior to event
- Executive and Physician Project Champion well committed
- Basic prevalent data collected prior to event
- Evidence-based practices researched prior to event
- Commitment of support areas made available to team
Barriers to Kaizen Events

• Self-fulfilling prophecy: staff can’t handle quick changes
• Doubt: Leadership and Commitment
• Fear: Mistakes, Blame
• “That’s not how we’ve done it in the past!”
Standard Kaizen Deliverables

- Current State Assessment
- Highlighted Opportunities for Improvement
- Highly Detailed Issue Tracking Log (Follow-ups and accountabilities)
- Future State Developments
- Action Plans
- Implementation Date
- Key Leading Indicators and Performance Metrics
- Presentation to Hospital Senior Leadership
Project Charter

• Target infection rate = 0%
• Use of Evidence-based practices
• Standardization of hospital processes
• Prospective vs. retrospective approach
• Project Scope:
  decision from surgery- to- hospital discharge
Preparation for Kaizen Event

• Draft project charter
• Identify project champion, facilitator, process owner and team members
• Observe processes & departments – patient perspective
• Order training materials
• Schedule event
• Choose PI tool ➔ STANDARD WORK
• Review of Kaizen guidelines
Why Standard Process?

- Improve efficiency
- Improve productivity
- Work smarter
- Reduce variation among individuals or groups
- Provide a basis for training new people
- Provide a trail for tracing problems
- Provide a means to capture and retain knowledge
- Give direction in case of unusual conditions

IMPROVE QUALITY!
## Formation of PEx Mediastinitis Team
(determine kick-off members vs. as needed members)

<table>
<thead>
<tr>
<th>Process Improvement Specialist</th>
<th>Cardiothoracic Surgeons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes Manager</td>
<td>Anesthesiologists</td>
</tr>
<tr>
<td>Infection Prevention Practitioner</td>
<td>Case Manager</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Perfusion</td>
</tr>
<tr>
<td>Rounding Nurses - surgeons' offices</td>
<td>Pre-Procedure Cath Lab</td>
</tr>
<tr>
<td>Clinical Nurse Manager - PAT and Pre-Op</td>
<td>Nurse Manager - Inpatient Cardiac Unit</td>
</tr>
<tr>
<td>Clinical Nurse Manager - OR</td>
<td>Staff Nurse - Inpatient Cardiac Unit</td>
</tr>
<tr>
<td>Staff Nurse - OR</td>
<td>Nurse Manager - Critical Care</td>
</tr>
<tr>
<td>Nurse Manager - Recovery Unit</td>
<td>Clinical Nurse Manager - Critical Care</td>
</tr>
<tr>
<td>Nurse Manager - Stepdown Unit</td>
<td>Staff Nurse Educator</td>
</tr>
<tr>
<td>Clinical Nurse Manager - Stepdown Unit</td>
<td>Vice President, Heart Services</td>
</tr>
<tr>
<td>Vice President, Quality and Patient Safety</td>
<td>Vice President, Surgical Services</td>
</tr>
</tbody>
</table>
Kaizen Event

• 3-day meeting: Nov 18, 19, 20
• Current State Mapping
• “Starbursts” – Areas of Opportunities/ Improvement
• Future State Mapping
• Continuous PI tool – Development of Standard Work
• Multiple action plans and 17+ recommendations
• Development of Daily Dashboard and Metrics
Future State

Target for implementation – mid December 2009

A → PreOp

- Standard Work
  - PreOp Teaching from Offices

- Standard PreOperative Orders
  - Standard protocol for shower, bathing frequency and products
  - 4% Exidine (Chlorhexidine)
  - Sage 2%
  - Bactroban
  - Nasal Swab

- Selection of ATB preop
- Standard work
  - Clipping of Male patients

B → OR

- Standard work
  - Skin prep by PA’s

- Time of ATB given to be part of the Time Out
- OR Attire

C → OHRU

- Standard work
  - Care of Incisions postop

- Selection of ATB post op and duration (48hours)

D → OH Step Down

- Standard work
  - Care of Incisions postop

E → Discharge

- Selection of ATB post op and duration (48hours)

Together we are OhioHealth Process Excellence
PI Tools

• Pre-Printed Order Set (PPO)
• Standard Work
  – Hospital staff
  – Patient instructions for elective cases
• Process Maps
• Metrics
Standard Work

• Tool used to assure maximum performance with minimum waste through the best combination of associate and equipment

• Standard work is **not** the same as work standards

• Orientation towards improvement not rigid standards
Characteristics of Standard Work

- Sets a routine/habit/pattern for work performance
- Consistency - every patient, every time gets the same care
- Makes managing resources and schedules easier
- Basis to make problems/solutions visual
- Prevents backsliding
<table>
<thead>
<tr>
<th>RECOMMENDATION</th>
<th>PI TOOL</th>
<th>SPECIFICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Pre-op Evaluation</td>
<td>Pre-printed Order Set</td>
<td>• Inpatient and elective cases</td>
</tr>
<tr>
<td></td>
<td>(PPO)</td>
<td>• Limited choices</td>
</tr>
<tr>
<td>MRSA rapid screening (nasal swab)</td>
<td>Standard Work</td>
<td>• Rapid test methodology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Results in 4 hours</td>
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<tr>
<td></td>
<td></td>
<td>• Determines ATB choice</td>
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<tr>
<td>Nasal decolonization with Mupirocin</td>
<td>Standard Order</td>
<td>• 10 dose regimen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BID dosing for 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inpatients - start evening before surgery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Elective patients – start 3 days prior to surgery</td>
</tr>
<tr>
<td>Chlorhexidine bathing/showering for skin decolonization</td>
<td>Standard Work</td>
<td>• Bath night before OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bath morning before OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Elective cases shower in Pre-op</td>
</tr>
<tr>
<td>RECOMMENDATION</td>
<td>PI TOOL</td>
<td>SPECIFICS</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
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<td>------------------------------------------------</td>
</tr>
<tr>
<td>Hair removal outside OR; no re-clipping in OR</td>
<td><strong>Standard Work</strong></td>
<td>• Clipper only</td>
</tr>
<tr>
<td>Chlorhexidine scrub to surgical site (Sage prep)</td>
<td><strong>Standard Work</strong></td>
<td></td>
</tr>
<tr>
<td>Prophylactic ATB w/i 60/120 minutes</td>
<td><strong>Standard Work</strong></td>
<td>• Ancef - Anesthesiology</td>
</tr>
<tr>
<td></td>
<td><strong>Process Map</strong></td>
<td>• Vanco – joint effort</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anesthesiology &amp; Nursing</td>
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<tr>
<td></td>
<td></td>
<td>Pre-op and Intra-op</td>
</tr>
<tr>
<td>Prophylactic ATB weight dosed</td>
<td><strong>Standard Order</strong></td>
<td>• Ancef and Vancomycin</td>
</tr>
</tbody>
</table>
## Standard Work Instructions

**Campus**  
Riverside Methodist Hospital

**Department/Area**  
Surgery PreOp

**Process Name**  
Pre-Op SAGE (chlorhexadine) prep for OHS patients  
ADS - after clipping and showering  
IP - after clipping  
Feb 9, 2009

### Step No. - Work Elements - What to do

<table>
<thead>
<tr>
<th>Step No.</th>
<th>Work Elements - What to do</th>
<th>Key Points How to do it (Quality, Safety, Knack)</th>
<th>Time</th>
<th>Visuals (Highlight Key Points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Obtain 3 packs of SAGE washcloths (for a total of 6 washcloths) from SAGE warmer.</td>
<td>If patient is scheduled for CABG with radial artery grafting, obtain 4 packs of SAGE washcloths (8 washcloths total).</td>
<td>Feb 9, 2009</td>
<td><img src="image1" alt="Washcloth #1" />, <img src="image2" alt="Washcloth #2" /></td>
</tr>
<tr>
<td>2</td>
<td>To open package: Holding top of package in one hand, lift flap on backside of package with other hand. Grasp flap at top and pull down to tear flap away and expose foam OR using scissors, cut off end seal of package.</td>
<td>Avoid contact with eyes, ears and mouth. Use a scrubbing motion (up and down, back and forth), DO NOT RINSE.</td>
<td></td>
<td><img src="image3" alt="Washcloth #3" />, <img src="image4" alt="Washcloth #4" /></td>
</tr>
<tr>
<td>3</td>
<td>Fold gown down to expose chest area and abdomen.</td>
<td>Avoid contact with genital area. Use a scrubbing motion (up and down, back and forth). DO NOT RINSE.</td>
<td></td>
<td><img src="image5" alt="Washcloth #5" />, <img src="image6" alt="Washcloth #6" /></td>
</tr>
<tr>
<td>4</td>
<td>Wash the sternal area with SAGE washcloth #1.</td>
<td>Wash around the sternal incision area DO NOT cross over the sternal incision area and wash side to side.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wash abdominal area below umbilicus and to the right of midline, including the right groin area, with SAGE washcloth #3.</td>
<td>Wash around the left incision area DO NOT cross over the sternal incision area and wash side to side.</td>
<td></td>
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</tr>
<tr>
<td>6</td>
<td>Wash abdominal area below umbilicus and to the left of midline, including the left groin area with SAGE washcloth #4.</td>
<td>Wash around the left incision area DO NOT cross over the sternal incision area and wash side to side.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cover chest and abdomen with clean gown.</td>
<td>Wash around the left incision area DO NOT cross over the sternal incision area and wash side to side.</td>
<td></td>
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</tr>
<tr>
<td>8</td>
<td>Expose entire right leg (up to groin) and wash front and inside of leg down to the ankle with SAGE washcloth #5.</td>
<td>Use a scrubbing motion (up and down, back and forth), DO NOT RINSE.</td>
<td></td>
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</tr>
<tr>
<td>9</td>
<td>Expose entire left leg (up to groin) and wash front and inside of leg down to the ankle with SAGE washcloth #6.</td>
<td>Use a scrubbing motion (up and down, back and forth), DO NOT RINSE.</td>
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<tr>
<td>10</td>
<td>Cover with additional blankets as needed.</td>
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<tr>
<td>11</td>
<td>Ask if patient needs anything else before exiting.</td>
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</tr>
<tr>
<td>12</td>
<td>Report to Admission RN: condition of skin if warranted and that clipping (if done), shower, and chlorhexadine SAGE prep is complete.</td>
<td></td>
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</tr>
</tbody>
</table>

### Total Process Cycle Time = Min/Patient

Safety  
Quality
Process Map for Vancomycin Administration

Inpatient

Vanco case identified by Pre-Op nurse

Pre-op nurse places yellow Vanco card on front of chart

PACU nurse places yellow Vanco card on front of chart

Chart Room clerk places patient label on yellow Vanco card

Pre-Op nurse adds Vanco to Pre-Op screen

Patient arrives to OR room

Vanco infusion completed prior to incision

Incision made

UC in PACU to remove yellow card from chart, place in container for Surgery OM to collect

Pre-Op RN inserts IV before nursing assessment completed

Pre-Op RN inserts IV per Standard Work

NO, “start later per 2ND PHONE CALL”

OR circulator confers with anesthesiologist regarding start time of Vanco for NEXT CASE

 START TIME OF NEXT CASE within 60 min - 1 gm
90 min - 1.5 gm

YES, “start now”

Pre-Op RN inserts IV before nursing assessment completed

Pre-Op RN inserts IV per Standard Work

OR circulator and anesthesiologist determine start time of Vanco

OR circulator calls Pre-Op nurse with start time for Vanco

2ND PHONE CALL

By Vocera

566-6111

“CALL _____ ______”

Anesthesiologist documents Vanco completion time on Anesthesia record

OR circulator completes yellow card — in OR time, time infusion complete, time of incision

Patient arrives to OR room
## INTRA-OP

<table>
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<tr>
<th>RECOMMENDATION</th>
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<tbody>
<tr>
<td>Surgical skin antisepsis with Chloraprep</td>
<td><strong>Standard Work</strong></td>
<td>• PAs involved in creating Standard Work</td>
</tr>
<tr>
<td>Standardized dressing to sternal incision</td>
<td><strong>Standard Work</strong></td>
<td>• Collaboration between OR and recovery unit nurses</td>
</tr>
</tbody>
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<th>Department/Area</th>
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<th>Time</th>
<th>Visuals (Highlight Key Points)</th>
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</thead>
<tbody>
<tr>
<td>Riverside Methodist Hospital</td>
<td>OHS/Surgery</td>
<td>Post-Op Dressing</td>
<td>Obtain supplies for dressing: 1 Tegaderm 4”x10” #1627 1 Non adherent dressing #Na0304-1 4 All purpose sponges (4x4's) #8044 1 3” silk tape</td>
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<td></td>
<td>Peel back drapes but DO NOT REMOVE</td>
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<td></td>
<td>Wash and dry incision, chest tube and pacing wire sights</td>
<td>Pacing wire ends should be exposed with a 6 inch tail for Post-Op use.</td>
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<td></td>
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<td></td>
<td>Cut Telfa to length of incision</td>
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<td></td>
<td>Place on incision</td>
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<td></td>
<td></td>
<td></td>
<td>Cover with Tegaderm</td>
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<td></td>
<td></td>
<td></td>
<td><strong>DO NOT INCORPORATE CHEST TUBE SITES OR PACING WIRES UNDER TEGADERM</strong></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Wash and dry incision, chest tube and pacing wire sights</td>
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<td></td>
<td></td>
<td>Place cut 4x4's around chest tube insertion sites</td>
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<td></td>
<td></td>
<td>Place 1 folded 4x4 over pacing wire sites</td>
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<td></td>
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<td></td>
<td>Tape chest tube and pacing wire dressings with 3” silk tape</td>
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<td></td>
<td>Tape top of chest tube dressing</td>
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<td></td>
<td></td>
<td></td>
<td>Tape beneath chest tubes</td>
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<td></td>
<td>Place notched tape around each chest tube</td>
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<td></td>
<td>Ensure that chest tubes are secure to chest tube drainage system</td>
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<td></td>
<td></td>
<td></td>
<td>Tape chest tube connections with 3” silk tape (spanning entire connection)</td>
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<td></td>
<td>Fold over the end of the tape on the chest tube to create a pull tab for easier removal in postop.</td>
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<td></td>
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<td></td>
<td>Place coverlet over leg incision</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Remove drapes</td>
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<td></td>
<td>Write date and time on dressing and sign with initials</td>
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</tbody>
</table>

**Total Process Cycle Time =** Min/Patient
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<tbody>
<tr>
<td>Standardized order set for recovery unit patients</td>
<td>Pre-printed Order Set</td>
<td></td>
</tr>
<tr>
<td>Prophylactic post-op ATB weight dosed</td>
<td>Standard Order</td>
<td></td>
</tr>
<tr>
<td>Post-op ATB – 5 doses and DC w/ I 48 hours</td>
<td>Standard Order</td>
<td></td>
</tr>
<tr>
<td>24 hour sterile dressing change</td>
<td>Standard Work Process Map</td>
<td>• Based on Banner Good Samaritan Medical Center Phoenix, AZ</td>
</tr>
<tr>
<td>48 hour dressing removal and sterile cleansing</td>
<td>Standard Work</td>
<td></td>
</tr>
<tr>
<td>POD 3 incision care</td>
<td>Standard Work</td>
<td></td>
</tr>
<tr>
<td>POD 4 incision care</td>
<td>Standard Work</td>
<td></td>
</tr>
</tbody>
</table>
Metrics

• Mediastinitis – by CDC definition
• All process metrics
  ➢ Have to be documented to be considered done
  ➢ Weekly dashboard that consists of key leading indicators
Kaizen Event to Implementation

• Developed Standard Work documents
• Trial/ Test of Standard Work
• Established process for each recommendation
• Used an Issues Tracking Log
• Developed resource/ reference book with all documents
• Educated staff ~10 days prior to implementation date
• Gemba walks
Gemba Walk

Gemba - “the real place”

• Who – leaders, managers and supervisors
• Where – “go to where the work is done”
• When – everyday
• What – gemba walk with a purpose
• Why – commitment, alignment, coordination & support
Implementation

• Gemba walks executed by Outcomes Manager and PEx resource
  ➢ Observed standard work
  ➢ Provided feedback
  ➢ Coached staff
  ➢ Creation of a process indicators
• Resolved change management issues
• Followed-up on opportunities same day
• Used issue tracking log
• Defined accountability
Defined Accountability

- Engage all levels of associates – senior leadership, directors, managers, staff at bedside
- Daily discipline
- Metrics for mediastinitis and all recommendations
- Metrics reported at all levels
- Outcomes Manager follow-up: CONSTANT COMMUNICATION
  - Email
  - Email/phone call
  - Conversation in person
  - Team meeting
Results

Coronary Artery Bypass Grafting (CABG)
Surgical Site Infection
Deep Infection - Chest (FY10)

Infection Rate Percent


63%
Mediastinitis Occurrence

• Immediate review while patient is in hospital
  – Standardized method of review
  – All processes
  – Culture results
  – Risk factors
  – Blood utilization
  – Glycemic control
  – Discharge information

• What is current state – now?
• Continuous process improvement
Sustaining Results

- Every Patient, Every Time!
- Daily discipline
- GEMBA WALKS
- Observation
- Regular team meetings
- Continuous process improvement
Lessons Learned

• Make changes that are best for patient rather than provider
• Change culture, one person at a time
• Communication and perception are everything – use visuals
• Build effective teams
• Commitment from Senior Leadership
• Empowerment of Process Owner
• Empowerment of Kaizen Team
QUESTIONS?