Surgical Improvement Project (SIP)
UW Medical Center

February 9, 2005

Executive Sponsors:  Lisa Brandenburg
                    Dr. Ed Walker
                    Dr. Ernie Weymuller
Agenda

- Welcome
- SIP Overview
- Lean Overview
  - Waste
  - Quality
  - Steady Flow
  - Process Standardization
- Break
  - Process Walk
  - Visual Systems
- Swedish Medical Center
- Moving Forward
- Q & A

Sponsors
- Dr. Mika Sinanan 5 min
- J.Duncan, M.Alotis, Y.Jackson 60 min
- Jeff McAuliffe 5 min
- Dr. Mika Sinanan 10 min
- 15 min
Surgical Improvement Project Mission

- Make UWMC the First Choice for Patients seeking Excellence in Surgical Care
- Make UWMC a Premier Practice and Work Site for All Members of the Surgical Team
- Assure a Safe, Patient Centered, and Efficient Environment that Contributes to Fiscal Success for UWMC
- Integrate Academic, Educational, and Service Roles of UWMC Surgical Faculty and Staff Seamlessly
Surgical Improvement Project Teams

SIP 1
Schedule to 00:01 on the Day of Surgery

SIP 2
Day of Surgery: 00:02 to Incision First Case

SIP 3
Day of Surgery: After Incision for First Case to Midnight

SIP 4
Leadership and Culture

SIP 5
Strategy/Strategic Planning
# Project Timeline

<table>
<thead>
<tr>
<th>Milestones</th>
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Surgical Improvement Project Countdown

172 days until August 1st
Lean Methodology Has A Rich History

**Origin**
- Modeled after JIT training for industrial engineers
- Toyota workshops for suppliers

**Characteristics**
- Intensive education and learning by doing
- All organization levels learn together
- Rapid turning of Plan-Do-Check-Act Cycle (PDCA)
- Creates spirit of improvement
- Analysis, visioning and implementation during the project to achieve at least 50% improvement
- “Ownership” of improvements

**Similar Approaches**
- Toyota, Boeing, GM, GE, Hillenbrand, Genie Industries
- Swedish, Children's, Virginia Mason, HMC
What is Lean?

- Reduce Waste
- Reduce Flow Time
- Reduce Cost
- Reduce Variation
- Increase Visual Cues
- Improve Teamwork

Do not reach for perfection –
Go for 50% improvement TODAY!
Waste-ology

Definition by Webster’s Dictionary:

**waste** [waɪst]
- verb: to use something or use something up carelessly, extravagantly, or without effect
- noun: unwanted or unusable by-products

**Lean** definition *

“**Waste** being any activity that **does not add value** to the final product….”

- **Removal of Waste** begets:
  - Increased Resource
  - Decreased Cycle Time
  - Reduced Cost
  - Increased Quality

* Ohno, Shingo, *Value Stream Mapping*
8 Deadly Wastes

“Disguised as Useful Work”

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<th>Waste Comes in Many Forms</th>
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<td>Transportation</td>
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<td>Inventory</td>
<td>Space</td>
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<td>Wait Time</td>
<td>Complexity</td>
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Why Focus on Waste?

Because most processes are 95–99% non-value-added, a focus on eliminating waste is the best leverage for an improvement effort.
First Unit Dose for Medication from Order to Patient Delivery

Total time = 70 minutes
VA time = 6.5 minutes
Percent of NVA time = 91%
Travel distance = .25 mile

Number of Process steps = 25
Value-added steps = 4
Number of Inspection steps = 4
Number of queues = 11
Lean

- Quality
  - Waste
  - Process Walk
  - Visual Systems
  - Process Stabilization
  - Steady Flow
What is An Acceptable Quality Standard?

At one error in 1000 events, here is what happens:

- 22,000 checks are deducted from the wrong bank account everyday
- 500 incorrect surgeries are completed every week
- 2,000 unsafe airplane landings made every day
- 16,000 pieces of mail are lost by the Postal Service every hour
Level 5: **Eliminate** Opportunities for Errors (CPOE)

Suppliers → 1 → 2 → 3 → 4 → 5 → Customers

Process controls and design **prevent** error
Level 3: **Work Unit** Inspects
(Needle and Sponge count)

Level 4: **Self** Inspection and Correction
(Patient ID, Surgery Site Check)
Level 1: **Customer** Inspects  
(DOH)

Level 2: **Company** Inspects (at the end of the process)  
(QA, Audit, Narcotic Count)
Levels of Quality System

Level 1: Customer Inspects
Level 2: Company Inspects
Level 3: Work Unit Inspect
Level 4: Self Inspection
Level 5: Eliminate Opportunities for Errors

Prevent Errors

Detect Errors

Check for Defects
Keep the Process Moving, Forward
(Streamlined Process)

BEFORE LEAN

AFTER LEAN
Batch and Queue of Patients

Patient gets admitted

Patient waits to be seen

Patient gets seen by PreOp RN

Patient waits

Patient gets taken to Holding Area

Patient waits

Patient gets seen by Surgeon

Patient waits

ETC....
Steady Flow Processing

- Even, steady pace and rhythm to the work flow
- Attention and completion to “one-at-a-time”
- Agile, speedy customer response time
Benefits of Steady Flow Processing

- Better communication
- Decreased response time
- Increased productivity
- Requires less space
- Identifies quality problems upstream in the process
The Steps to Steady Flow Processing

1. Plan and implement the sequence of work activities and the physical layout

2. Standardize the work methods

3. Keep pace with customers’ demand—one complete transaction at a time

4. Cross-train everyone to balance the work
Which Problem Would You Rather Have?

Problem 1

Problem 2

Random vs. Predictable
Which Problem Would You Rather Have?

Problem 1

Problem 2

Random vs. Predictable
Which of these is the major cause of process variation in results?
Attack Variation

Which of these is the major cause of process variation in results?

People

Materials

Equipment

Work Methods

Results

Which of these is the major cause of process variation in results?
Why is Variability Critical?

A Process is as Strong as the Weakest Link …

… Reliable Methods are:
• Safer
• More Predictable
• More Controllable
• More Repeatable
• Less Costly
Monitoring a Stable Process

- Process Measure
- Process Measure
- Process Measure

Output Measures

- Focus on the customer
- Reflect the purpose and scope of the process
- Are simple, repeatable, quantifiable
- Are accepted as fair and helpful
- Keeps the people and the process honest
Lean

Waste

Quality

Process Walk

Visual Systems

Steady Flow

Process Stabilization
Process Walk: 3 Essential Steps

“Improvement does not happen in a conference room.”

- Go to the Actual Place
- Talk to the Actual People working in the process
- Observe the Actual Process
How do you do a Process Walk?

**During the Walk**
1. Walk Worksheet
2. Waste Worksheet

**After the Walk**
3. Process Layout
4. Process Flow
5. Process Data Summary
6. List of Problems and Opportunities

### Observations from 3 Actuals Walk

<table>
<thead>
<tr>
<th>Types of Waste</th>
<th>Observations</th>
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<tbody>
<tr>
<td>Processing</td>
<td>Multiple &quot;inspections.&quot;</td>
</tr>
<tr>
<td>Correction</td>
<td>Bid errors found by customer</td>
</tr>
<tr>
<td>Inventory</td>
<td>38 quotes in process</td>
</tr>
<tr>
<td>Wait Time</td>
<td>Wait time for customer. Wait time for responses from other departments.</td>
</tr>
<tr>
<td>Search Time</td>
<td>Jobs lost in process</td>
</tr>
<tr>
<td>Transportation</td>
<td>Long distances traveled by Mail Clerks.</td>
</tr>
<tr>
<td>Space</td>
<td>Poor use of refrigerator space–spoiled food pulled every week.</td>
</tr>
<tr>
<td>Complexity</td>
<td>Too much checking and inspection. Too many handoffs.</td>
</tr>
</tbody>
</table>
Process Layout

Locations

People Movement

Workstations
Flow Charting

- Eliminate assumptions
- Everyone has a common understanding of the process and issues
Process Flow

SIP 3

Pre Op Hold (Main) – 1st pt left OR

Main Or

PT

Patient Pre-Operative Holding
Roll into OR

Scrub RN

Overhead pages for HA & A. Tech
Clean list and take to SIP
Take specimen to Pathology, turn in x-ray
Check lab cart
1000 Rush check
Bathroom break

RN

Escort to PACU
Pick up Op report
Check except allergy, site marking, paperwork
Write equip variation on board or talk to HA

Surg

Talk to family, watch in room, bathroom break, dictate

HA

Receive pager message
Recheck lines, clean room, garbage, setting up operating bed, procuring equipment

Anesth Tech

Clean, replenish equipment, get drug tray, take off tranx

Anesth

Deep drug, get new drug, check equip, write equip prep

Liner, blocks etc

Issues

Care cart location variable
When is OR ready for pt? How does the pt know when the OR is ready for pt? How does the surgeon know when the pt is in OR?
<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>New</th>
<th>Variation</th>
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</thead>
<tbody>
<tr>
<td># of process steps</td>
<td>66</td>
<td>39</td>
<td>- 41%</td>
</tr>
<tr>
<td>Total process time</td>
<td>834 min</td>
<td>512 min</td>
<td>- 39%</td>
</tr>
<tr>
<td>% of VA steps</td>
<td>42%</td>
<td>51%</td>
<td>+ 21%</td>
</tr>
<tr>
<td>% of VA time</td>
<td>50%</td>
<td>66%</td>
<td>+ 32%</td>
</tr>
<tr>
<td># of checking steps</td>
<td>18</td>
<td>11</td>
<td>- 39%</td>
</tr>
<tr>
<td># of handoffs</td>
<td>12</td>
<td>8</td>
<td>- 33%</td>
</tr>
<tr>
<td># of queues</td>
<td>14</td>
<td>8</td>
<td>- 60%</td>
</tr>
<tr>
<td>Work in progress</td>
<td>82</td>
<td>41</td>
<td>- 50%</td>
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</tbody>
</table>
Workflow
- 45% reduction in the number of PYXIS “stock out” calls per day
- 66% reduction in wait time from report to fill in PYXIS

Physical Layout
- A picture is worth a thousand words

Error reduction
- 40% reduction in reported misfills
- 86% reduction in pick errors for the load process
Visual Systems

Lean

- Waste
- Quality
- Steady Flow
- Process Walk
- Process Stabilization
Visual System (5 S)

“A system of organization that is visible and intuitively obvious.”

- Sort (Seiri)
- Set in Order (Seiton)
- Shine (Seiso)
- Standardize (Seiketsu)
- Sustain (Shitsuke)
Benefits of a Visual System

- Eliminates non-value-added search time
- Provides a foundation for process standardization
- Reduces “space requirements”
- Communicates “how we are doing” to everyone
- Can trigger corrective action

Pharmacy RPI

BEFORE

AFTER
<table>
<thead>
<tr>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>July 2001, SPD-Decontam</td>
<td>Providence</td>
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<tr>
<td>Sept 2001, SPD-Assembly</td>
<td>Providence</td>
</tr>
<tr>
<td>Oct 2001, SPD-Decontam</td>
<td>First Hill</td>
</tr>
<tr>
<td>Dec 2001, SPD-Assembly</td>
<td>First Hill</td>
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<tr>
<td>March 2002, Case Cart-Assembly</td>
<td>Providence</td>
</tr>
<tr>
<td>April 2002, OR 5S work</td>
<td>First Hill</td>
</tr>
<tr>
<td>Sept 2002, Case Cart Assembly</td>
<td>First Hill</td>
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<tr>
<td>July 2003, PreOp Chart Assembly</td>
<td>First Hill</td>
</tr>
<tr>
<td>May 2003, OR Turnaround</td>
<td>First Hill</td>
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<tr>
<td>May 2004, Periop Vision Workshop</td>
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<tr>
<td>Winter/Spring 2004, Value Stream Mapping</td>
<td></td>
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<tr>
<td>Nov 2004, Patient Flow/Tracking</td>
<td>First Hill</td>
</tr>
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Assembly Lead Time

Baseline

Target

The Swedish Medical Center Experience
Sterile Processing, FHC

Before - the “dump room”

Location: Triangle Room, Sterile Processing, First Hill

After - Employee development lounge

The Swedish Medical Center Experience
### ITEM RETRIEVED

<table>
<thead>
<tr>
<th>Item Description</th>
<th>EST. EXPENSE CAPTURED</th>
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<tbody>
<tr>
<td>Cysto-scope</td>
<td>$12,000</td>
</tr>
<tr>
<td>Toronto valve sizers</td>
<td>0</td>
</tr>
<tr>
<td>Computer monitor</td>
<td>$200</td>
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<tr>
<td>20 ft of old catalogs &amp; files</td>
<td>0</td>
</tr>
<tr>
<td>15 rolls of toilet paper</td>
<td>$10</td>
</tr>
<tr>
<td>2 telephones</td>
<td>$100</td>
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<tr>
<td>3 pkgs of paper towels</td>
<td>$2</td>
</tr>
<tr>
<td>1 OR wall writing shelf</td>
<td>0</td>
</tr>
<tr>
<td>50 hanging files</td>
<td>$5</td>
</tr>
<tr>
<td>1 shelf</td>
<td>$10</td>
</tr>
<tr>
<td>5 Ear Specials</td>
<td>$5000</td>
</tr>
<tr>
<td>3 ENT instrument sets</td>
<td>$3000</td>
</tr>
<tr>
<td>1 Osteome set</td>
<td>$1600</td>
</tr>
<tr>
<td>1 Microplastic set</td>
<td>$4000</td>
</tr>
<tr>
<td>50 misplaced instruments in peel packs</td>
<td>$2200</td>
</tr>
<tr>
<td>1 sink removed</td>
<td>0</td>
</tr>
<tr>
<td>Steris cupboard doors removed</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Estimated Inventory retrieved</strong></td>
<td><strong>$28,127.00</strong></td>
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*Source: Case Cart Assembly RPI, Providence Campus*
Case Cart Lead Time
First Hill Campus

Case Cart Assembly
First Hill Campus
Range of Lead Time (excluding first start)

24-40 hours
0.5 - 3.0 hours

The Swedish Medical Center Experience
Complete Case Cart Delivery
First Hill Campus

Percent of Incomplete Case Carts

- RPI Held in Late September
- Average = 22%
- Average = 4%
- 82% improvement

The Swedish Medical Center Experience
Periop Value Stream Redesign

- CIS
- Supply Chain
- Operations
- Post CIS

- DOS work cell
- Ancillary Svcs
  - Pull System
- OR Suite Stdz
- Surgery Staffing
  - Flow

The Swedish Medical Center Experience
Periop Value Stream Redesign

CIS
- Procedure list control
- OR Core & Suite stocking
- Point of Use Materials
- Material consignment
- Special Orders

Supply Chain

Operations
- DOS work cell
- Ancillary Svcs Pull System
- OR Suite Stdz
- Surgery Staffing Flow

Post CIS

The Swedish Medical Center Experience
Periop Value Stream Redesign

**CIS**
- Patient flow & tracking
- Schedule finalization & release
- 48 hour clinical review

**Supply Chain**
- Procedure list control
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**Post CIS**

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**Post CIS**
- Interface with EMR
- Barcode usage
- Charging templates

The Swedish Medical Center Experience
Moving Forward
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Communication

Value Stream for Surgical Care

1. Decide to have surgery
2. Prepare for surgery
3. Go into surgery
4. Recover from surgery
5. Be discharged

SIP 1, SIP 2, SIP 3, SIP 4, SIP 5
How will all of the changes be communicated?

- Surgispot
- Bulletin Board
- MGT meeting
- Oversight meeting
- Website
We have 172 days until August 1st

Any Questions?