Continuous Performance Improvement Through Lean Six Sigma in the Military Health System

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Disclosures

Presenter has no financial interest to disclose.

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Learning Objectives

At the conclusion of this activity, the participant will be able to:

• Introduce Lean Six Sigma as a management system for achieving measurable results
• Understand the required infrastructure for Lean Six Sigma
• Understand the general structure of the DMAIC methodology
• QDR Mandate
Agenda

• QDR Mandate

• Lean Six Sigma (LSS) Basics
Agenda

- QDR Mandate
- Lean Six Sigma (LSS) Basics
- LSS “Fit” in Strategic Performance Execution
Agenda

• QDR Mandate
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• Linking Strategy to Performance Improvement
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- QDR Mandate
- Lean Six Sigma (LSS) Basics
- LSS “Fit” in Strategic Performance Execution
- Linking Strategy to Performance Improvement
- **Lessons Learned**
Everyone in DoD must adopt some form of Continuous Process Improvement
Select the CPI method most appropriate for the MHS
Select the CPI method most appropriate for the MHS—*common vocabulary, toolsets*
MHS QDR Mandate

• Select the CPI method most appropriate for the MHS—common vocabulary, toolsets

• Implement across all MHS components in a consistent fashion
MHS QDR Mandate

• Select the CPI method most appropriate for the MHS—common vocabulary, toolsets

• Implement across all MHS components in a consistent fashion—learn, grow together
• Select the CPI method most appropriate for the MHS—common vocabulary, toolsets

• Implement across all MHS components in a consistent fashion—learn, grow together

• Accelerate MHS’ CPI “journey” from current stage
MHS QDR Mandate

- Select the CPI method most appropriate for the MHS—common vocabulary, toolsets
- Implement across all MHS components in a consistent fashion—learn, grow together

- Accelerate MHS’ CPI “journey” from current stage—improve sooner rather than later
Three Changes for HRO

• **Leadership** commitment to zero patient harm
• Incorporation of all principles and practices of a **Safety Culture** throughout the organization
• Widespread adoption and deployment of the most effective of **Process Improvement** tools and methods (Lean, Six Sigma, Change Management)
Robust Process Improvement Enabling a HRO

1. Train Organization
   - Appropriate to role
   - Required for all staff
     - Onboarding
     - CE
     - Min Requirements for GB/BB
   - Standardized toolkit
   - Standard process for documentation: PowerSteering

2. PI Need Identified
   - Routine performance monitoring
     - Gap Identified
   - Event Management
     - Safety
     - Error
   - Adverse Outcome
   - Near Miss
   - Complaint

3. Document Event / Select Approach
   - Strategy
   - Financial
   - Process

4. Prioritize, Resource, and Execute
   - Work section or Unit-wide
   - Project Type
     - Change Event
       - Safety
     - Error
     - Adverse Outcome
   - Near Miss
   - Complaint
   - Draft Project Charter

5. Capture, Share and Monitor
   - Work section: Change event or Lean Project
   - Unit-Wide:
     - Assign Project Sponsor/Belt
     - Complete Draft Project Charters
     - Resource
     - Execute project

- Capture results in PowerSteering
- Communicate
- Monitor metrics
- Celebrate successes and replicate
Lean Six Sigma Basics
...LSS Builds Upon a Foundation of Continuous Performance Improvement!
LSS Basics

- **Industry best practice** management framework combines “Lean” and “Six Sigma” strategies
LSS Basics

• Industry best practice management framework combines “Lean” and “Six Sigma” strategies

• “Lean” methods...
LSS Basics

• Industry best practice management framework combines “Lean” and “Six Sigma” strategies

• “Lean” methods...
  • Remove non-value added waste from processes
  • Thus, reduce process lead time
  • Happy customers—reduced cost!
LSS Basics

- Industry best practice management framework combines “Lean” and “Six Sigma” strategies
- “Lean” methods...
  - Remove non-value added waste from processes
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  - Happy customers—reduced cost!
- “Six Sigma” methods...
Industry best practice management framework combines “Lean” and “Six Sigma” strategies

“Lean” methods...
- Remove non-value added waste from processes
- Thus, reduce process lead time
- Happy customers—reduced cost!

“Six Sigma” methods...
- Analyze and reduce variability in processes
- Thus, improve quality
- More happy customers—more reduced cost!
What’s Different About LSS?

YOU’VE GOT TO IMPLEMENT A SIX SIGMA PROGRAM OR ELSE YOU’RE DOOMED.

AREN’T YOU THE SAME CONSULTANT WHO SOLD US THE WORTHLESS TQM PROGRAM A FEW YEARS AGO?

I ASSURE YOU THAT THIS PROGRAM HAS A TOTALLY, TOTALLY DIFFERENT NAME.

WHEN CAN WE START?

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What’s Different About LSS?
This is...

- **Prescriptive** framework
  ...vs descriptive framework
What’s Different About LSS? This is...

- *Prescriptive* framework... vs *descriptive* framework

- *Trained* experts leading *trained* project teams ... vs reading a book and trying it on the fly
What’s Different About LSS?
This is...

- **Prescriptive** framework
  ...vs descriptive framework

- **Trained** experts leading **trained** project teams
  ...vs reading a book and trying it on the fly

- Execution **pervades the organization**
  ...vs “that’s the QA Department’s job”
What’s Different About LSS?
This is...

- *Prescriptive* framework …vs descriptive framework
- *Trained* experts leading *trained* project teams …vs reading a book and trying it on the fly
- Execution *pervades the organization* …vs “that’s the QA Department’s job”

- *Data-driven* project selection and improvements …vs guessing, windage, shooting from the hip
At each level of organizations:

Executive Steering Committee
- Senior Leader
- Deployment Director
- Senior Financial Mgr
- Critical Process Owners
- Master Black Belt (Advisor)

Recommended LSS Infrastructure Based on Industry Best Practice
Multi-level multi-phased training:

Training:
- Executive Leader
- Project Sponsor
- Project ID/Selection
- Project Team/Yellow Belt
- Organizational Awareness

Training & Certification:
- Green Belt
- Black Belt
- Master Black Belt
Multi-level/multi-phased training:

Training:
- Executive Leader
- Project Sponsor
- Project ID/Selection
- Project Team/Yellow Belt
- Organizational Awareness

Training & Certification:
- Green Belt
- Black Belt
- Master Black Belt

Stand-up Program:
- Assessment
- Project Sponsor Trng
- Organizational Awareness Trng
- Project ID & Selection Wksp
- Project Team Trng
- BB/GB Trng
- MBB Trng

Perform Projects:
- Harvest Results and Share Knowledge

Timeline:
- Month 1
- Month 2
- Month 3
- Month 4
- Month 5
- Month 6
- Month 12
- Month 18
- Month 24+
LSS Basics: Project Execution

- Customer Issues/Opportunities
- Business Strategy
- Goals/Objectives
- Priorities

Structured Project Selection
LSS Basics: Project Execution

- Customer Issues/OppORTunities
- Business Strategy
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- Priorities

Prioritized by Leader/Mgmt Team

Structured Project Selection

- BENEFIT
- EFFORT

Low Med High
Low Med High
LSS Basics: Project Execution

- Customer Issues/Opportunities
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Prioritized by Leader/Mgmt Team

Assign Project to Sponsor and Select Belt

Structured Project Selection

BENEFIT

Low

Med

High

EFFORT

Low

Med

High

Project Candidates

Assign Project to Sponsor and Select Belt

Structured Project Selection
Prioritized by Leader/Mgmt Team

Assign Project to Sponsor and Select Belt

Structured Project Selection

DMAIC Project Management Framework

Define project purpose and scope
Measure current performance
Analyze causes & confirm with data
Improve by removing variation and non-value added activities
Control gains by standardizing

Sponsor inspects deliverables & checkpoints for each phase

Define Measure Analyze Improve Control

BENEFIT Low Med High
EFFORT Low Med High
**LSS Basics: Project Execution**

- Customer Issues/Opportunities
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- Goals/Objectives
- Priorities

### Prioritized by

- Leader/Mgmt Team

### Assign Project to Sponsor and Select Belt

#### Structured Project Selection

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- Measure
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#### DMAIC Project Management Framework

- **Define** project purpose and scope
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LSS Basics: Project Execution

- Customer Issues/Opportunities
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Assign Project to Sponsor and Select Belt

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Low

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Assign Project to Sponsor and Select Belt

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8-41
LSS Basics: Project Execution

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Prioritized by Leader/Mgmt Team

Assign Project to Sponsor and Select Belt

Sponsor Inspects Progress

Structured Project Selection

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Define

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Structured Project Selection

DMAIC Project Management Framework

- **Define**: project purpose and scope
- **Measure**: current performance
- **Analyze**: causes & confirm with data
- **Improve**: by removing variation and non-value added activities
- **Control**: gains by standardizing

<table>
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Prioritized by Leader/Mgmt Team

Assign Project to Sponsor and Select Belt

Sponsor Inspects Progress

Results are Captured and Sustained

**Customer Issues/Opportunities**

**Business Strategy**

**Goals/Objectives**

**Priorities**
**LSS Basics: Project Execution**

- Customer Issues/Opportunities
- Business Strategy
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![Structured Project Selection Diagram]

**Structured Project Selection**

- Prioritized by Leader/Mgmt Team
- Assign Project to Sponsor and Select Belt
- Sponsor Inspects Progress
- Results are Captured and Sustained

**DMAIC Project Management Framework**

- Define: project purpose and scope
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**UNIFORMED SERVICES UNIVERSITY of the Health Sciences**
LSS “Fits” in Your Toolkit!

• Must have aligned organizational strategy
LSS “Fits” in Your Toolkit!

• Must start with aligned organizational strategy

• LSS fits as a Strategy Improvement Engine
LSS “Fits” in Your Toolkit!

• Must start with aligned organizational strategy

• LSS *fits* as a Strategy *Improvement Engine*
  • Evaluate objective targets, gaps to reach them
LSS “Fits” in Your Toolkit!

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  • ID initiatives to close gaps
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• LSS *fits* as a Strategy *Improvement Engine*
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  • Those initiatives become LSS projects!
LSS “Fits” in Your Toolkit!

• Must start with aligned organizational strategy

• LSS fits as a Strategy Improvement Engine
  • Evaluate objective targets, gaps to reach them
  • ID initiatives to close gaps
  • Those initiatives become LSS projects

• **Aligns commitment, resources, and effort against strategically-focused projects!**
LSS “Fits” in Your Toolkit!

- The MHS is ahead of the rest of the DoD!
• The MHS is ahead of the rest of the DoD!
  • Strategy and objectives defined
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  • Strategy and objectives defined
  • Data-driven decision-making is routine
LSS “Fits” in Your Toolkit!

- The MHS is ahead of the rest of the DoD!
  - Strategy and objectives defined
  - Data-driven decision-making is routine
  - Data-mining already part of our infrastructure
An Army Medicine example: at a high level...
linking Organizational Strategy to Performance Improvement using Lean Six Sigma and Best Practice Transfer!
**Army Medicine Strategy Map**

**Mission**
- Promote, Sustain and Enhance Soldier Health
- Train, Develop and Equip a Medical Force that Supports Full Spectrum Operations
- Deliver Leading Edge Health Services to Our Warriors and Military Family to Optimize Outcomes

**Vision**
America's Premier Medical Team Saving Lives, Fostering Healthy and Resilient People

**ARMY MEDICINE**
Bringing Value...Inspiring Trust

**Strategic Themes & Results**

<table>
<thead>
<tr>
<th>ENDS</th>
<th>WAYS</th>
<th>MEANS</th>
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<tbody>
<tr>
<td>Patient/Customer/Stakeholder</td>
<td>Internal Process</td>
<td>Learning and Growth</td>
</tr>
<tr>
<td>CS 1.0 Improved Healthy and Protected Warriors</td>
<td>IP 1.0 Optimize Medical Readiness</td>
<td>LG 1.0 Improve Recruiting and Retention of AMEDD Personnel</td>
</tr>
<tr>
<td>CS 2.0 Improved Healthy and Protected Family Beneficiaries and Army Civilians</td>
<td>IP 2.0 Improve Information Systems</td>
<td>LG 2.0 Improve Training and Development</td>
</tr>
<tr>
<td>CS 3.0 Responsive Battlefield Medical Force</td>
<td>IP 3.0 Implement Best Practices</td>
<td>LG 3.0 Improve and Culture Innovation</td>
</tr>
<tr>
<td>CS 4.0 Optimize Care and Transition of Wounded, Ill, and Injured Warriors</td>
<td>IP 4.0 Provide Safe Patient Care</td>
<td>LG 4.0 Improve Knowledge Management</td>
</tr>
<tr>
<td>CS 5.0 Inspire Trust in Army Medicine</td>
<td>IP 5.0 Optimize Physical, Psychological Health Promotion and Prevention</td>
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</tr>
<tr>
<td>CS 6.0 Improved Patient and Customer Satisfaction</td>
<td>IP 6.0 Optimize Quality, Outcome-Focused Care and Services</td>
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</tbody>
</table>

**Sustain**
- Maximize Value in Health Services
  - Effectively and efficiently provide the right care at the right time to promote a healthy population and ready force.

**Prepare**
- Provide Global Operational Forces
  - Agile and adaptive medical teams ready to execute relevant, responsive Health Services in any operational environment and in combination with any partnered team.

**Reset**
- Build the Team
  - A compelling place to serve and a preferred partner in leading joint interagency health services.

**Transform**
- Balance Innovation with Standardization
  - A culture of innovation which provides standardized solutions to support best practices and optimal outcomes.

**Optimize Communication and Knowledge Management**
- Leverage Communication to impart knowledge and build meaningful, positive relationships.

---

**Resource**
- R 1.0 Optimize Resources and Value
- R 2.0 Optimize Lifecycle Management of Facilities and IT Infrastructure
- R 3.0 Maximize Human Capital

---

This has been a dynamic, living document since 2001

For more information go to: https://ke2.army.mil/bsc
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Maximize Value in Health Services
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A culture of innovation which provides standardized solutions to support best practices and optimal outcomes.

Optimize Communication and Knowledge Management
Leverage Communication to impart knowledge and build meaningful, positive relationships.

We recognize we have a performance gap in Access to Care...

ENDS
Patient/customer/Stakeholder
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- CS 2.0 Improved Healthy and Protected Families, Beneficiaries and Army Civilians
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- IP 3.0 Implement Best Practices
- IP 4.0 Provide Safe Patient Care
- IP 5.0 Maximize Physical and Psychological Health Promotion and Prevention
- IP 6.0 Improve Quality, Outcome-Focused Care and Services
- IP 7.0 Improve Access and Continuity of Care
- IP 8.0 Build Relationships and Enhance Partnerships
- IP 9.0 Tell the Army Medicine Story
- IP 10.0 Leverage Research, Development and Acquisition

And Patient-Centered Medical Home

MEANS
Learning and Growth
- LG 1.0 Improve Recruiting and Retention of AMEDD Personnel
- LG 2.0 Improve Training and Development
- LG 3.0 Promote and Foster a Culture of Innovation
- LG 4.0 Improve Knowledge Management

Resource
- R 1.0 Optimize Resources and Value
- R 2.0 Optimize Lifecycle Management of Facilities and IT Infrastructure
- R 3.0 Maximize Human Capital

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## Value Stream #9: Improve Access & Continuity of Care

### PVC #1: Maximize Value in Health Services

<table>
<thead>
<tr>
<th>Suppliers</th>
<th>Inputs</th>
<th>Process</th>
<th>Outputs</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patients</td>
<td>• Need for Care (preventive, acute)</td>
<td>• Customer Service</td>
<td>• Satisfied beneficiary</td>
<td>• DOD Title 10 patients (e.g., Soldiers, retirees, families)</td>
</tr>
<tr>
<td>• DOD Healthcare Professionals</td>
<td>• Healthcare staff</td>
<td>• Telephone Services</td>
<td>• Accessible appointments</td>
<td>• Non-Title 10 patients (e.g., civilian emergencies, contractors, foreign officers and families, etc.)</td>
</tr>
<tr>
<td>• IMCOM</td>
<td>• Facilities and infrastructure</td>
<td>• Provider Support Staff Utilization</td>
<td>• Standardized, utilized support staff</td>
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<td></td>
<td>• Primary Care Exam Room Utilization</td>
<td>• Optimized provider productivity</td>
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<td>• Patient Appointing, Referral Mgt.</td>
<td>• Optimized referral execution, delivery</td>
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<td>• TRICARE Online Appointment</td>
<td>• Increased utilization of on-line appointment system</td>
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<td>• Call Volume</td>
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<td>• # of Appts. Requested</td>
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<td>• Type of Care Requested</td>
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<td>• Staff Availability</td>
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<td>• Facility Availability</td>
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<td>• Call Hold and Handle Times, Call Abandon Rate</td>
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### Suppliers Inputs Process Outputs Customer

- **Suppliers**
  - Patients
  - DOD Healthcare Professionals
  - IMCOM

- **Inputs**
  - Need for Care (preventive, acute)
  - Healthcare staff
  - Facilities and infrastructure

- **Process**
  - Customer Service
  - Telephone Services
  - Provider Support Staff Utilization
  - Primary Care Exam Room Utilization
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- **Outputs**
  - Satisfied beneficiary
  - Accessible appointments
  - Standardized, utilized support staff
  - Optimized provider productivity
  - Optimized referral execution, delivery
  - Increased utilization of on-line appointment system

- **Customer**
  - DOD Title 10 patients (e.g., Soldiers, retirees, families)
  - Non-Title 10 patients (e.g., civilian emergencies, contractors, foreign officers and families, etc.)

### High level process maps (SIPOCs) help us better focus on the problem/s in our work...

- **Output Metrics**
  - Patient Satisfaction
  - Access to Care Standards (e.g., achieve acute care appt. within 24 hours)
  - Support Staff to Primary Care Provider Utilization ratio
Value Stream #9: Improve Access & Continuity of Care

PVC #1: Maximize Value in Health Services

 Suppliers | Inputs | Process | Outputs | Customer
---|---|---|---|---
 | • Patients | • Need for Care (preventive, acute) | • Customer Service | • Satisfied beneficiary
 | • DOD Healthcare Professionals | • Healthcare staff | • Provider Support Staff Utilization | • Accessible appointments
 | • IMCOM | • Facilities and infrastructure | • Primary Care Exam Room Utilization | • Standardized, utilized support staff
 | | | | • Optimized provider productivity
 | | • Telephone Services | | • Optimized referral execution, delivery
 | | | | • Increased utilization of on-line appointment system
 | | | | • DOD Title 10 patients (e.g., Soldiers, retirees, families)
 | | | | • Non-Title 10 patients (e.g., civilian emergencies, contractors, foreign officers and families, etc.)

...and we decided to start by improving the Telephone Appointing Process

Customer | Input Metrics | Process Metrics | Output Metrics
---|---|---|---
• DOD Title 10 patients | • Call Volume | • Call Hold and Handle Times, Call Abandon Rate | • Patient Satisfaction
• Non-Title 10 patients | • # of Appts. Requested | • Care Appointment Availability | • Access to Care Standards (e.g., achieve acute care appt. within 24 hours)
• Type of Care Requested | • Staff Availability | • Schedule Availability | • Support Staff to Primary Care Provider Utilization ratio
• Facility Scheduling | | • Facility Availability |
LSS Project LD00373: Access to Care—Improve Telephone Appointing Process at Carl R. Darnall Army Medical Center

Documented in PowerSteering!
## PROBLEM / BASELINE / GOAL

**PROBLEM STATEMENT**
The telephone appointing process at CRDAMC has observed low patient satisfaction scores and long process hold times. Over the last six months, it takes an average of 3:14 minutes to answer customer calls to make an appointment. This has led to numerous customer complaints which have led to lower patient satisfaction scores for telephone appointing services.

**BASELINE**
- Army’s largest call center: 10,000+ calls a week
- Low customer satisfaction: 68%
- Average wait time: 3:14 minutes
- Calls answered under 90 seconds: 65%
- Overall call abandon rate: 26%; Peak time: 49%

**GOAL**
- Decrease process hold time to less than 90 seconds per call
- Decrease overall abandoned call rate to less than 10%
- Decrease peak time call abandon rate to less than 25%

## RESULTS / BENEFITS

- Overall average hold time reduced to 33 seconds
- Overall call abandon rate reduced: 3%
- Peak time call abandon rate reduced: 22%
- Call volume reduced 20% due to less call backs
- Calls handled increased from 4700 to 7300 / week
- Agent training time reduced from 6 weeks to 4 weeks
- Agent turnover reduced

## IMPROVEMENTS

- Agent scheduling changes to handle peak times
- Agent training, area setup, shift change by SOP
- Phone menu tree and call handling improved
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**REPLICATION / WAY-AHEAD**

- Performance Action Plan completed; Access to Care Initiative 17.2
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*Project Summary: Carl R. Darnall AMC*  
*Telephone Appointing*  
*Mark Hernandez – Black Belt Candidate*

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*the initial project was conducted at Fort Hood’s Carl R. Darnall Army Medical Center (CRDAMC)*...
## PROBLEM / BASELINE / GOAL

### PROBLEM STATEMENT
The telephone appointing process at CRDAMC has observed low patient satisfaction scores and long process hold times. Over the last six months, it takes an average of 3:14 minutes to answer customer calls to make an appointment. This has led to numerous customer complaints which have led to lower patient satisfaction scores for telephone appointing services.

### BASELINE
- Army’s largest call center: 10,000+ calls a week
- Low customer satisfaction: 68%
- Average wait time: 3:14 minutes
- Calls answered under 90 seconds: 65%
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### GOAL
- Decrease process hold time to less than 90 seconds per call
- Decrease overall abandoned call rate to less than 10%
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## RESULTS / BENEFITS
- Overall average hold time reduced to 33 seconds
- Overall call abandon rate reduced: 3%
- Peak time call abandon rate reduced: 22%
- Call volume reduced 20% due to less call backs
- Calls handled increased from 4700 to 7300 / week
- Agent training time reduced from 6 weeks to 4 weeks
- Agent turnover reduced

## IMPROVEMENTS
- Agent scheduling changes to handle peak times
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...high call volume, low patient satisfaction, long process cycle time, high variation...
### Problem / Baseline / Goal

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### Improvements

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### Replication / Way-ahead

- **Results / Benefits**
  - The project sought to decrease process cycle time and call abandon rate to improve patient satisfaction...

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8-63
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**Disciplined, Corporate Action to Harvest and Replicate Across MEDCOM**
ERMC/LRMC: Streamlining the Landstuhl Regional Medical Center (LRMC) Crash Cart System (LD24008), Master Black Belt Richard Rhodes / Black Belt Candidate MAJ Daniel Coulter

- Increase the Crash Cart defect-free rate from 65% to 100%
- Reduced 13 Crash Carts from facility

SRMC/BAMC: Group of nine independent projects focused on OR optimization

- Reduced the housekeeping turn-over time from 50.48 to 16.62 minutes
- Reduced the Sterile Products Process from 56 hours to 16 hours
- Improved the Preadmission process from 93 min to 63 min
- Reduced Total Logistics Response Time-Maintenance (TLRT-M) from 32 to 8 days
- Reduced the Cholecystectomy procedures averaged 132 min with a standard deviation (SD) of 44.62 min to 87 min with a SD of 16.49 min with 100% of procedures within the 119 min standard.
- Improved the documentation of anesthesia blocks in S3 from 23% to 89%
- Reduced complexity and errors in patient information from 100% to 6.32%
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  …their training is imperative
Lessons Learned

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• Project ID, Selection, and Chartering upfront
  …then worry about belt selection/training
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- Best and brightest leaders selected for belts…if it doesn’t hurt, you’ve probably selected poorly
- Belt candidates’ time dedicated 100% to LSS…during didactics & project execution part of trng

- **Coaching critical to project execution**…must have MBB/BB mentors engaged
Points of Contact

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Session 16: Continuous Performance Improvement Through Lean Six Sigma in the Military Health System

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