Performance Excellence
Overview

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Director, Performance Excellence
UC Davis Health System
- Serving 6 million residents in 33 counties encompassing 65,000 square miles
- Major educational, research and patient-care facilities spread across more than 140 acres
- Only Level 1 trauma center for both adult and pediatric emergencies in inland Northern California

- Licensed beds 619
- Admissions 31,025
- ED Visits 58,023
- Clinic Visits 893,788
External Data

- Market Share
- Outmigration
- Alliances
- New Programs

- Patient Satisfaction
- Market Research
- Awareness / Perception

- Population growth / stratification
- Labor supply / demand
- Income / Employment
- Other regional business developments

- Federal/State/Local legal and health regulatory mandates
- Publicly reported data
- Industry/Professional organizations
- Partners/Collaborators

Internal Data

- Financial ratios
- Service line profitability
- Payor mix
- Efficiency measures

- Recruitment
- Satisfaction
- Retention / Turnover
- Labor Expenses

- Capital requirements
- Facilities / Equipment requirements
- Capacity
- Market projections
- Program growth

- Quality metrics
- Safety metrics
- Service line utilization (statistics, trends, projections)
Possible Data Sources @ UC Davis

Internal Data Sources:
- emr
- TeleTracking
- PeopleSoft
- Decision Support Systems
- Sybase
- DaFIS

External Data Sources:
- California Health Care Safety Net Institute
- CDC
- NHSN
- PRC
- UHC
- Thomson Reuters
- Gordon and Betty Moore Foundation
- DHCS
- Office of Statewide Health Planning & Development
- AHRQ
- CALNOC
- The Joint Commission
- CMS
- California Hospital Association
- NDNQI
- U.S. News & World Report
QI Challenges

Perception

Culture
A HEALTHIER WORLD THROUGH BOLD INNOVATION

DMAIC Methodology

Define
Measure
Analyze
Improve
Control
Creating Value Through Quality Improvement

Value = \frac{\text{Quality (Outcomes} + \text{Safety} + \text{Service})}{\text{Cost (For a span of care)}}
Why use Lean + Six Sigma?

**DMAIC offers an organization:**
- A shared **methodology** for problem solving
- A shared **structure** to meet goals
- A shared system-wide **language**
- A shared **toolset** that is transferable to all levels

**DMAIC fosters innovative improvement through high impact, value-added quality initiatives (QI)** targeted to **achieve system goals**
Why use Lean + Six Sigma?

**DMAIC focuses on processes, not individuals**

“85% of the reasons for failure to meet customer requirements are related to deficiencies in systems and processes…rather than the employee.

The role of management is to change the process rather than badgering individuals to do better.”

- W. Edwards Deming
**UC HEALTH**

Performance Excellence Collaborative

<table>
<thead>
<tr>
<th></th>
<th>UCD</th>
<th>UCI</th>
<th>UCLA</th>
<th>UCSD</th>
<th>UCSF</th>
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<tbody>
<tr>
<td><strong>Program Name</strong></td>
<td>Performance Excellence</td>
<td>Lean Six Sigma</td>
<td>Performance Excellence</td>
<td>Performance Excellence</td>
<td>Operations Improvement Dept.</td>
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<tr>
<td><strong>“Start” date</strong></td>
<td>July, 2010</td>
<td>February, 2011</td>
<td>July, 2008</td>
<td>Fall 2011</td>
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<tr>
<td><strong>Methodology</strong></td>
<td>Lean Six Sigma (DMAIC)</td>
<td>Lean Six Sigma (DMAIC)</td>
<td>Lean (PDCA)</td>
<td>Lean Six Sigma (DMAIC)</td>
<td>Project Management to Lean</td>
</tr>
</tbody>
</table>
Mission:
Identify and eliminate waste and inefficiencies within our Healthcare Delivery Value System, providing optimal value to our patients, staff and community.

Goal:
Provide patient care that is:
- **Safe** (no harm)
- **Effective** (prevent disease & complications)
- **Efficient** (the right care without unwanted delay)
- **Patient-centered** (informed, involved, educated)
- **Equitable** (the right care for all)
Performance Excellence (PE) Structure

Facilitate DMAIC project management and provide expertise in the art and science of quality improvement and change management.

Provide just-in-time education and training on Lean Six Sigma methodologies in order to develop infrastructure for evolving process culture.

Provide consultation and/or coaching to Health System teams that require support in analyzing current state processes and identifying improvement opportunities.
PE Department Organization

Vision & Commitment

UC Davis Medical Center
Chief Executive Officer

Strategic Direction & Resource Commitment

UC Davis Medical Center
Chief Patient Care Services Officer

Guide & Facilitate DMAIC

PE Director
(Master Black Belt)

Lead Project Teams and Deliver Results

Medical Director
(Green Belt)

Project Manager
(Black Belt)

Project Manager
(Black Belt)

* While in the Division of Patient Care Services, the PE department works across the Health System
DMAIC Health System Roles

**Vision & Commitment**
- Executive Leadership

**Strategic Direction & Resource Commitment**
- Senior Leadership

**Own & Guide Project**
- Sponsor
- Champion

**Lead Project Teams & Deliver Results**
- Black Belt

**Solve Problems & Implement Solutions**
- Green Belts
- Team Members
Healthcare Delivery Value System

AIM
- Quality Improvement

Primary Driver
- Clinical
- Flow
- Operations
- Finance

Secondary Driver
- Clinical Case Management
- Inpatient Throughput
- Outpatient Throughput
- Environmental Services
- Perioperative Services
- Coding & Billing

Quality Initiatives (Projects)
- Mortality
- Healthcare Acquired Conditions
- Sepsis
- Intensive Case Mgmt
- ED Flow
- Inpatient Discharge
- Charge Lag
- HAI (VAP, CLABSI, CAUTI)
What is Lean + Six Sigma?

A systematic methodology utilizing effective data analysis tools and techniques driven by DMAIC [deh-may-ihk]

design processes with very high reliability, seeking to improve quality, delivery, and cost
What is Lean + Six Sigma?

- Lean
  - reduce waste
  - improve flow
- Six Sigma
  - reduce variation
  - improve quality

**requires**

- systems thinking
What is Lean + Six Sigma?

steps to achieving systems thinking...

audit perceptions → shift perspective → eliminate silos → systems thinking
Performance Excellence
A HEALTHIER WORLD THROUGH BOLD INNOVATION

Diagram:
- Problem
- Investigate
- Current State
- Root Cause Analysis
- Future State
- Define
- Measure
- Analyze
- Improve
- Control
- Intervention
- Monitor targets
- Generate ideas
- Plan
- Accomplish

UC DAVIS HEALTH SYSTEM
DMAIC up close...

Define
\[ y = f(x) \]

Measure
data collection

Analyze
data analysis

Improve
controlled interventions

Control
sustainability

Charter
Observe
Process Map

Plan
Collect
Validate

Correlation
Hypothesis
Testing
RCA

Generate
Prioritize
Pilot

Monitor
Act

Determine Current State

Obtain Future State
The DMAIC methodology utilizes a lot of data...

...therefore, we use **statistical software** to:

- solve specialized calculations
- create charts, graphs or depictions of data in a standardized format
- keep organized

Minitab  
Excel  
Visio  

**Quality Companion**
The Role of DMAIC

- Access applicable data to monitor process performance
- Perform analysis to identify and improve opportunities for improvement
- Create and publish reports

- Provide project management infrastructure
- Consult during requirement phase of tool development
- Publish data dictionary for reporting tools
PROJECT CHARTER

PROBLEM STATEMENT:
A brief description of the problem at hand and why it is a priority.

GOALS / OBJECTIVES:
Expected outcome of Quality Improvement process.

SCOPE:
Identify operational or organizational boundaries.

METRICS:
Identify critical to “X” requirements.
- Quality / Cost / Process / Safety / Delivery
- Regulations and/or standards
- Benchmarks

Start Date: xx/xx/xxxx
End Date: xx/xx/xxxx

QI Leadership:

Executive Leadership: Name

QI Champion/Sponsor: Name

QI Black Belt: Name

Member | Role | Department
--- | --- | ---
Name 1 | | |
Name 2 | | |
Name 3 | | |
Name 4 | | |
Name 5 | | |
Name 6 | | |
Name 7 | | |
### A3

**DEFINE:**

**PROBLEM STATEMENT:**
A brief description of the problem at hand and why it is a priority.

**GOAL:**
Expected outcome of Quality Improvement process.

**SCOPE:**
Identify operational or organizational boundaries.

**PROCESS MAP / VALUE STREAM MAP (VSM):**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
</table>

**MEASURE:**
Identify, collect and validate specific measurements that describe the process and reveal whether the goals have been achieved.
- SIPOC diagram
- Spaghetti diagram

**ANALYZE:**
Identify the root cause(s) of stated problem.
- Ishikawa/Fishbone diagram
- Correlation testing
- Hypothesis testing
- FMEA

**IMPROVE:**
Generate, prioritize and implement solution(s) to the stated problem. State result(s) of implemented improvement(s).
- Pilot
- Kaizen
- Standard work processes

**CONTROL PLAN:**
Develop a control plan to monitor the process in order to sustain improvement.
- Control chart
- 5S
- Poka-yoke (mistake-proofing)
PE Intranet Site

- General Information
- Resources
- Current Quality Initiatives
- Contact Information
References

American Society for Quality
   – http://www.asq.org

Institute for Healthcare Improvement
   – http://www.ihi.org/IHI/Results/WhitePapers/GoingLeaninHealthCare.htm

Joint Commission Center for Transforming Healthcare

Johns Hopkins Center for Innovation in Quality Patient Care
   – http://www.hopkinsmedicine.org/innovation_quality_patient_care/areas_expertise/lean_sigma

University of Michigan, College of Engineering, LSS for Healthcare
   – http://interpro.engin.umich.edu/Healthcare.htm


Lean Done Right (2012)
   – Thomas G. Zidel

The Certified Six Sigma Green Belt Handbook

The Certified Six Sigma Black Belt Handbook (Second Edition)

The Certified Six Sigma Master Black Belt Handbook
   – ASQ, Quality Press
QI Example 1

Improving Detection & Management of Severe Sepsis
Severe Sepsis Detection & Management QI

Improvement of severe sepsis detection and management to reduce unnecessary death and harm attributable to sepsis

- Fully leverage the EHR
- Utilize Lean Six Sigma methodologies
- Partner with
  - Gordon and Betty Moore Foundation
  - California Health Care Safety Net Institute
  - University HealthSystem Consortium
- Comply with the UCDMC DSRIP Proposal
Sepsis Improvement Collaborative
**Problem Statement:**
Severe Sepsis and Septic Shock mortality.

**Goals / Objectives:**
- Fully implement evidence-based practices for the early identification and treatment of Severe Sepsis and Septic Shock with the goal of significantly reducing Severe Sepsis and Septic Shock mortality (individually, in rate and absolute number) at UCDMC using advanced EPIC EHR tools.

**Benefits:**
- Improve detection & management of severe sepsis and septic shock
- Reduce Severe Sepsis and Septic Shock mortality
- Reduce ALOS for sepsis population in UCDMC
- Build quality improvement partnerships across UCDMC

**Scope:**
All patients admitted to UCDMC: focusing on pathways in the emergency department (ED), acute care units (ACUs) and intensive care units (ICUs)

**Metrics:**
- Sepsis related mortality data (clinical & coding sources)
- SIC bundle compliance data (clinical data from electronic screening tool)
- Financial data (UCDMC data of sepsis related patients)
- Ad hoc quality improvement data
- External reporting requirements
  - i. DSRIP – Category IV Project
  - ii. Gordon and Betty Irene Moore Foundation Grant

**QI Leadership:**

<table>
<thead>
<tr>
<th>Member</th>
<th>Lic. / Cert.</th>
<th>Role</th>
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<tbody>
<tr>
<td>Albertson, Timothy</td>
<td>MD</td>
<td>Sepsis Expert</td>
</tr>
<tr>
<td>Berger, Tony</td>
<td>MD</td>
<td>ED Physician Representative</td>
</tr>
<tr>
<td>Black, Hugh</td>
<td>MD</td>
<td>ICU Physician Representative</td>
</tr>
<tr>
<td>Chenoweth, James</td>
<td>MD</td>
<td>ED Resident Representative</td>
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<tr>
<td>Cocanour, Christine</td>
<td>MD</td>
<td>Surgery Physician Representative</td>
</tr>
<tr>
<td>DiPierro, Christine</td>
<td>RN</td>
<td>Acute Care Nursing Representative</td>
</tr>
<tr>
<td>Dunbar, Karrin</td>
<td>RN</td>
<td>Nursing Education Representative</td>
</tr>
<tr>
<td>Henk, Bobbi</td>
<td>RN</td>
<td>CQI Representative</td>
</tr>
<tr>
<td>Hill, Michelle</td>
<td>MD</td>
<td>Internal Medicine Resident Representative</td>
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<tr>
<td>Hunkins-Flores, Marcie</td>
<td>RN</td>
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<tr>
<td>Johl, Hershan</td>
<td>MD</td>
<td>Acute Care Physician Representative</td>
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<tr>
<td>Koopman, Marsha</td>
<td>RN</td>
<td>Infection Prevention Representative</td>
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<tr>
<td>Lonigan, Joleen</td>
<td>RN</td>
<td>Rapid Response Team Representative</td>
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<tr>
<td>Meyers, Jaime</td>
<td>RN</td>
<td>PCS Quality &amp; Safety Champion Representative</td>
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<td>Mondino, Karen</td>
<td>RN</td>
<td>ICU Nursing Representative</td>
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<td>Natale, Joanne</td>
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<td>Pediatric Physician Representative</td>
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<tr>
<td>Warren, Scott</td>
<td>PMP</td>
<td>Lean Six Sigma Green Belt</td>
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**Start Date:** 01/01/2012  
**End Date:** 12/31/2012
**DEFINE:**

**PROBLEM STATEMENT:**
Sepsis related mortality at UCDMC

**GOAL:**
By December 2012:
- Reduce combined severe sepsis and septic shock mortality by ≥15%
- Reduce severe sepsis mortality by ≥15%
- Reduce septic shock mortality by ≥15%
  - in percentage rate and absolute numbers
  - from 2009 baseline data

**SCOPE:**
All UCDMC patients (ED, ACU and ICU) with severe sepsis and/or septic shock

**MEASURE:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Septic Shock</th>
<th>Severe Sepsis</th>
<th>SIC Population</th>
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<tbody>
<tr>
<td>2009*</td>
<td>112</td>
<td>67</td>
<td>179</td>
</tr>
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<td></td>
<td>257</td>
<td>235</td>
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<td>2010</td>
<td>121</td>
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<tr>
<td></td>
<td>310</td>
<td>330</td>
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<td>113</td>
<td>63</td>
<td>176</td>
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<tr>
<td></td>
<td>321</td>
<td>311</td>
<td>632</td>
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<tr>
<td>2012 YTD</td>
<td>123</td>
<td>57</td>
<td>180</td>
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<tr>
<td>Jan-12 to Nov-12</td>
<td>333</td>
<td>325</td>
<td>658</td>
</tr>
</tbody>
</table>

* Source data from HIM

**ANALYZE:**

**SIC Mortality Rate by Calendar Year**
Severe Sepsis (995.92) & Septic Shock (785.52)

**IMPROVE:**
Sepsis Improvement Collaborative work products

**CONTROL PLAN:**
Sepsis Improvement Collaborative work products
Lean + Six Sigma @ UC Davis Health System

QI Example 2

Environmental Services
Inpatient Discharge Process
EVS Inpatient Discharge Process QI

Improvement of departmental efficiencies with the goal to decrease discharge cleaning turnaround time and improve process quality

- Utilize LSS to fully leverage EVS metrics
  - Logistical metrics (TeleTracking)
  - Quality metrics (Visual & ATP Monitoring)

- Engage all levels of EVS staff in QI process
EVS Inpatient Discharge Process

Operations

- Cleaning Process
  - Standard Discharge Process
  - Isolation Discharge Process
  - Space Clean Process
- Logistics
  - Staffing
  - Supplies

Quality

- Quality Improvement
  - Visual Monitoring
  - ATP Monitoring

EVS Scorecard

A HEALTHIER WORLD THROUGH BOLD INNOVATION
Quality Audit Process

**DEFINE:**

**PROBLEM STATEMENT:** Lack of standard quality audit form

**GOAL:** Design and implement standard quality audit form

**SCOPE:** Inpatient discharge process

**PROCESS MAP:**

**MEASURE:**

**CONTROL PLAN:**

**ANALYZE:**

**IMPROVE:**

**GOAL:** Design and implement standard quality audit form

**SCOPE:** Inpatient discharge process