<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Description</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 AM</td>
<td>Introduction</td>
<td>Welcome and description of the agenda. Precourse assessment.</td>
<td>Brent Petty</td>
</tr>
<tr>
<td>8:15 AM</td>
<td>Making the Case for QI</td>
<td>How to engage leaders in support of QI projects and colleagues to participate.</td>
<td>Nate Spell</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Overview of Improvement Methods</td>
<td>Overview of improvement methodologies (Lean, Six Sigma, &amp; The Model for Improvement), with a more in depth focus on The Model for Improvement.</td>
<td>Nate Spell</td>
</tr>
<tr>
<td>8:45 AM</td>
<td>Aim statement</td>
<td>Learn to write clear, useful, and focused aim statement.</td>
<td>Lisa Vinci</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Process mapping</td>
<td>Introduction to Process Mapping. Group exercise on mapping a process.</td>
<td>Lisa Vinci</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>Break</td>
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<tr>
<td>9:30 AM</td>
<td>Measure</td>
<td>Strategies for choosing measures, collecting data, and presenting results.</td>
<td>Lisa Vinci</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>PI Tools</td>
<td>How do you answer the question of what changes might result in an improvement? Using process improvement tools as an aid to brainstorming. Exercise on creating a fishbone diagram and using tally sheets.</td>
<td>Lisa Vinci</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>PDSA</td>
<td>Description of the process to create small tests of change with an exercise on creating a test of change that will then be critiqued by the group.</td>
<td>Nate Spell</td>
</tr>
<tr>
<td>10:30 AM</td>
<td>Debrief</td>
<td>Address remaining questions about the model for improvement - Record problems from home for later discussion</td>
<td>Full Faculty</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:15 PM</td>
<td>Reliability - Overview</td>
<td>Overview of the Reliability Design Strategy as described by Roger Resar</td>
<td>Rick Gitomer</td>
</tr>
<tr>
<td>12:30 PM</td>
<td>Segmentation</td>
<td>Overview of how segmentation simplifies improvement activities with a short exercise on segmenting a project.</td>
<td>Rick Gitomer</td>
</tr>
<tr>
<td>1:00 PM</td>
<td>Standardization</td>
<td>Overview of the power of standardization with an exercise on creating a standardized process.</td>
<td>Rick Gitomer</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>Detection &amp; mitigation</td>
<td>Overview of creating a &quot;Detection &amp; Mitigation&quot; step to enhance reliability.</td>
<td>Rick Gitomer</td>
</tr>
<tr>
<td>1:40 PM</td>
<td>Capture failures &amp; input into redesign</td>
<td>Description of how continuous improvement is enhanced by examining defects and using the knowledge gained to inform the design process.</td>
<td>Rick Gitomer</td>
</tr>
<tr>
<td>2:10 PM</td>
<td>Debrief</td>
<td>Address remaining questions about the Reliability Design Strategy and discuss real issues from home.</td>
<td>Full Faculty</td>
</tr>
<tr>
<td>2:20 PM</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 PM</td>
<td>Scholarly Recognition</td>
<td>Optimizing Scholarly Recognition for Your QI Activities</td>
<td>Tom Staiger</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>Debrief</td>
<td>Applying the Model for Improvement and Reliability Design Strategy at Home</td>
<td>Full Faculty</td>
</tr>
<tr>
<td>3:40 PM</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:50 PM</td>
<td>Project design</td>
<td>Design a project using the Model for Improvement and Reliability Design Strategy for MOC or to solve a problem at your home organization</td>
<td>Full Faculty</td>
</tr>
<tr>
<td>4:00 PM</td>
<td>MOC or use at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:20 PM</td>
<td>Wrap-Up/Post-Test/Evaluations</td>
<td>Question and answer session to address any clarification of the class content, or specific questions about projects at home. Post-test.</td>
<td>Group</td>
</tr>
<tr>
<td>5:00 PM</td>
<td>Adjourn</td>
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</tbody>
</table>
Get Better Faster!
Quality Improvement Skills for Reliable Care

April 24, 2014
SGIM 2014 Annual Meeting
San Diego, CA
Welcome to Get Better Faster!

Before we start please complete the pre-session assessment
Introduction

Brent Petty
Associate Professor
Johns Hopkins
Disclosures

• No industry sponsorship
• No financial conflicts
## Agenda

### Get Better Faster! Quality Improvement Skills for Reliable Care 2014

<table>
<thead>
<tr>
<th>Session</th>
<th>Presenter</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome, Agenda, &amp; Precourse Assessment</td>
<td>Brent Petty</td>
<td><a href="mailto:bgp@jhmi.edu">bgp@jhmi.edu</a></td>
</tr>
<tr>
<td>Making the Case for QI</td>
<td>Nate Spell</td>
<td><a href="mailto:nspell@emory.edu">nspell@emory.edu</a></td>
</tr>
<tr>
<td>Overview of Improvement Methods</td>
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### Model for Improvement

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<thead>
<tr>
<th>Topic</th>
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<tbody>
<tr>
<td>Aim Statement</td>
<td>Lisa Vinci</td>
<td><a href="mailto:lvinci@medicine.bsd.uchicago.edu">lvinci@medicine.bsd.uchicago.edu</a></td>
</tr>
<tr>
<td>Process Mapping</td>
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<td>Measure</td>
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<td></td>
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<tr>
<td>PI Tools</td>
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<tr>
<td>PDSA</td>
<td>Nate Spell</td>
<td><a href="mailto:nspell@emory.edu">nspell@emory.edu</a></td>
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</table>

### Reliability Design Strategy

<table>
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<tbody>
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<td>Rick Gitomer</td>
<td><a href="mailto:rgitome@emory.edu">rgitome@emory.edu</a></td>
</tr>
<tr>
<td>Detection &amp; Mitigation</td>
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<td>Capture Failures &amp; Redesign</td>
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</tbody>
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### Scholarly Recognition

<table>
<thead>
<tr>
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<th>Email</th>
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</thead>
<tbody>
<tr>
<td>Optimizing Scholarly Recognition</td>
<td>Tom Staiger</td>
<td><a href="mailto:staiger@u.washington.edu">staiger@u.washington.edu</a></td>
</tr>
</tbody>
</table>
## Agenda (continued)

<table>
<thead>
<tr>
<th>Putting it All Together</th>
<th>Faculty</th>
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</thead>
<tbody>
<tr>
<td>Debrief: Applying the Model for Improvement and Reliability Design Strategy at Home</td>
<td>Faculty</td>
</tr>
<tr>
<td>Project Design for MOC or Use at Home</td>
<td>Faculty</td>
</tr>
<tr>
<td>Wrap-Up Post-test Evaluations</td>
<td>Group</td>
</tr>
</tbody>
</table>

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*SGIM Society of General Internal Medicine*
• Making the Case for QI
• Overview of Improvement Methods

Nate Spell
CQO, Emory University Hospital
Disclosures

• No industry sponsorship
• No financial conflicts
Learning objectives for this talk

• Be able to identify and apply techniques to obtain support from leaders and engagement of staff in your quality improvement projects
The Inertia Problem:
Change is harder than no change

<table>
<thead>
<tr>
<th>Leaders</th>
<th>Staff/Peers</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Doing too many things may make you less successful</td>
<td>- Comfort with their own way or the current way</td>
</tr>
<tr>
<td>- Competition for attention</td>
<td>- Not perceiving it is their problem to solve</td>
</tr>
<tr>
<td>- Competition for resources (data, staff attention, staff time)</td>
<td>- Overburdened already</td>
</tr>
<tr>
<td>- Improvements in one area may have unintended consequences</td>
<td>- Competing priorities</td>
</tr>
<tr>
<td></td>
<td>- Experience with failed QI attempts</td>
</tr>
<tr>
<td></td>
<td>- Managing complexity</td>
</tr>
</tbody>
</table>
The lingering effects of project failure

- Staff disillusionment and disengagement
- Loss of credibility
- Unwillingness to try something new, again
- Evidence-based: they have experiential evidence that QI doesn’t work
Reasons for project failure

• It lost momentum
  – Pace of improvement too slow
  – Poorly aligned with goals of leaders or staff

• It was too hard
  – Relied on vigilance and hard work (people-dependent) rather than robust process change
  – Was an add-on and not integrated in work flow

• It was not transferrable/spreadable
  – Too focused on one area
  – Lack of key stakeholders

• It created problems elsewhere in the system
Resistance to be overcome

You want me to do my job or QI?

OK, I’ll do my job and QI

Making my work better is part of my job
Building the will for change

Create discomfort with the status quo

- Tell stories of harm
- Bring data to describe the problem
- How does the problem make life harder for staff/peers

Describe an attractive future

- Don’t just come with a problem
- Describe an achievable solution
- Identify best practices
- Stories of charm
Emory warns of mad cow-like risk

By DAVID WAHLBERG
dwahlberg@ajc.com

More than 500 surgery patients at Emory University Hospital may have been exposed to a fatal disease that resembles mad cow after a patient who had brain surgery Sept. 10 later tested positive for the disorder, Emory officials said late Thursday.

The officials called the risk of transmission of Creutzfeldt-Jakob disease “remote.”

The hospital is notifying 98 patients who had brain or spinal surgery and who may have had contact with surgical instruments used on the initial patient, whose probable diagnosis Sept. 15 awaits definitive test results that could take weeks.

Emory is also informing 418 non-neurosurgical patients who were operated on Sept. 10-27. They are at lower risk, officials said.

“Although we believe the chances of an exposure are extremely small, we cannot guarantee they are zero,” said Dr. Allan Levey, Emory’s chairman of neurology. “That is why Emory is taking every possible step to deal with this matter.”

Hospital officials said there was nothing affected patients could or should do in response to the notification, but Emory
Doctor's orders killed cancer patient
Dana-Farber admits drug overdose caused death of Globe columnist, damage to second woman

By Richard A. Knox
GLOBE STAFF

When 33-year-old Reby A. Lehman died suddenly last Dec. 3 at Boston's Dana-Farber Cancer Institute, near the end of a grueling three-month treatment for breast cancer, it seemed a tragic reminder of the risks and limits of high-stakes cancer care.

In fact, it was something very different. The death of Lehman, a Boston Globe health columnist, was due to a horrendous mistake: a massive overdose of a powerful anticancer drug that ravaged her heart, causing it to fail suddenly just as she was preparing to go home to her husband and two young daughters. The error was discovered only last month by Dana-Farber clinic staff days before she was started on the wrong dose of chemotherapy by a doctor's mistaken order.

Lehman was not the only victim. Two days before she was admitted, a 92-year-old breast cancer patient was given the same four-fold overdose of the same toxic drug by the same team of caregivers. The correct dose was intended to be just short of lethal for maximum tumor-killing effect.

More than three months later, that woman is still in the Hebrew Israel Hospital. Dana-Farber officials yesterday characterized her as "chemically dehydrated," and according to several sources she has sustained serious, reversible heart damage.

Her husband, who asked for anonymity, said he could not bring himself to discuss what happened to her. "I really can't talk right now," he said. "It's still too tender."

One of the most striking aspects of the two overdosing cases is that they occurred at one of the world's most respected cancer research and treatment centers, a place that often trades on its reputation for gold-standard care and research to attract patients and research funds.

Dana-Farber officials still have no explanation of how such a thing could have happened, ascribing it merely to "an error." The error was not an isolated mistake by a single provider.
Discomforting Data:
2006 UHC Quality and Accountability Study

Group #1 (n = 10)
Median Score = 65.61%
Max = 67.90%
Min = 65.11%
AMCs included: Mayo Clinic, Michigan, Cedars-Sinai, Brigham, Ohio State, Wisconsin, Vanderbilt, Rush, Northwestern, & Utah

Group #2 (n=21)
Median Score = 63.22%
Max = 65.09%
Min = 61.34%
AMCs included: 2, 7, 8, 16, 21, 32, 34, 39, 40, 42, 48, 54, 57, 71, 79, 83, 89, 179, 236, 240, 336

Group #3 (n=20)
Median Score = 60.28%
Max = 61.22%
Min = 58.88%
AMCs included: 1, 5, 6, 12, 14, 17, 19, 26, 29, 33, 38, 43, 60, 67, 69, 73, 80, 180, 214, 234

Group #4 (n=20)
Median Score = 56.86%
Max = 58.78%
Min = 56.27%
AMCs included: 4, 9, 10, 15, 17, 22, 23, 28, 45, 53, 57, 61, 70, 72, 74, 77, 80, 91, 92, 218

Group #5 (n=10)
Median Score = 54.63%
Max = 55.77%
Min = 52.25%
AMCs included: 13, 35, 37, 46, 47

Emory University Hospital Midtown
Emory University Hospital
Public Reporting & Available Data

Access is a measure of the patients' ability to seek and receive care with the provider of their choice, at the time they choose, regardless of the reason for their visit. Counting the third next available appointment is the healthcare industry's standard measure of access to care and indicates how long a patient waits to be seen. For Family Practice and Internal Medicine providers, two appointment types will be measured: physical exams and office visits. Physical exams are generally for the purposes of monitoring and maintaining an individual's health. Office visits include acute as well as routine follow-up appointments. For OB providers, one appointment type will be measured, first prenatal visit. These measures represent the average time from when a patient calls to schedule an appointment to the third next available opening for their request and should reflect the experience of the patients within your clinic.

**Key:**
- **Physical Exam**
  - Minimum: 1.0
  - Average: 13.0
  - Maximum: 38.0

**Select a Physician Group:**

**OR by Region:**
Convincing people to join you

How many people do you need to convince? Square root of N rule.

Whom to target? Diffusion of innovation concept.

Diagram:
- 2.5% Innovators
- Early Adopters 13.5%
- Early Majority 34%
- Late Majority 34%
- Laggards 16%

Source: Everett Rogers, Diffusion of innovations model
Alignment

Wrong site procedures
Using CPOE order sets
Faster discharge summary completion

Hand hygiene

Improving nurse / resident collaboration

Medication reconciliation on admission

**Hospital agenda items**
- Meaningful use
- ED discharge med instructions
- Reducing med errors at discharge

Hospital likely to increase resources for accurate med history on admission
Alignment

- With system-level or departmental goals
- With publically-reported quality/safety measures
- With financial goals
  - Reduce LOS for inpatients
  - Reduce utilization of high-cost items
  - Reduce need for extra staffing through efficiency
- With new competencies needed under changing reimbursement, alternative quality contracts, etc.
  - Managing chronic diseases
  - Reducing inpatient utilization
Optimization - Suboptimization

- The optimization of each department will always result in a plant which is suboptimal. The optimization of the whole system will require that some departments be operated suboptimally. However, by encouraging competition between managers, most organizations make it impossible for departments to cooperate for the good of the company.

_Donald Wheeler, Understanding Variation_

Lesson: Can you anticipate the good and ill effects of your project on operations and other intersecting processes? You need this view that comes from including all key stakeholders.
Review of change concepts

• Momentum for change
  – Discomfort with status quo
  – Attractive vision

• Stories of harm

• Data
  – Performance, especially public
  – Comparative performance

• Build a team with the stakeholders

• Diffusion of innovation and the square root of N

• Alignment

• Optimization/suboptimization
Improvement Methodologies
Outline

• Brief history of process improvement
• Lean
• Six Sigma
• The Model for Improvement
Processes of Care

71 ICU VAP Bundle Compliance

- Started Team Meetings
- Standardized mouth care kit placement
- Changed sedation vacation time
- Standardized data collection
- Stars at 30 deg on bedrails
- Began testing daily goal sheet
- Refined oral care process
Sir Francis Bacon (1561 – 1626)

The Scientific Method

• Observe
• Hypothesize
• Design test of hypothesis
• Run Test

“Truth emerges more readily from error than from confusion”
Frederick Winslow Taylor (1865 – 1915)

- Assembly line
  - Work broken down into components
  - Each component of work is standardized

- Scientific management
Taylorism

“It is only through enforced standardization of methods, enforced adoption of the best implements and working conditions, and enforced cooperation that this faster work can be assured. And, the duty of enforcing the adoption of standards and enforcing this cooperation rests with management alone.”

Walter Shewhart (1891 – 1967)

Physicist & Mathematician
Bell Laboratories

Statistical Process Control Chart
W. Edwards Demming
(1900 – 1993)

- Obligations & responsibilities of management
- Famous for the PDCA cycle: Plan, Do, Check (Study), Act
Joseph Juran
(1904 – 2008)

Electrical Engineer
Western Electric

Organizational management of quality improvement
Improvement Methodologies

- Lean - Toyota Production System
- Six Sigma
- Model for Improvement
Lean – Eliminate Waste

Lean reduces waste
Six Sigma

- Define the problem
- Measure key aspects of the process
- Analyze the data
- Improve the processes
- Control the future process
Six Sigma

• Target is to achieve < 3.4 DPMO (Defects Per Million Opportunities)

• Defect is defined as any product that is not desired by the customer

• Must reduce variation to eliminate defects
Lean – Six Sigma

Lean reduces waste

Six Sigma improves reliability
The Model for Improvement

• What are we trying to accomplish?  
  **AIM STATEMENT**

• How will we know if a change is an improvement?  
  **MEASURE**

• What changes can we make that will result in an improvement?  
  **PI TOOLS**

• Tests of change  
  **PDSA**
## Improvement Methodologies

<table>
<thead>
<tr>
<th>Method</th>
<th>Key Concept</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model for Improvement</td>
<td>Tests of change</td>
<td>Easy to learn</td>
<td>Slow pace if not managed well</td>
</tr>
<tr>
<td>Lean</td>
<td>Eliminate Waste</td>
<td>Rapid &amp; incremental</td>
<td>Skilled facilitation</td>
</tr>
<tr>
<td>Six Sigma</td>
<td>Reduce Defects (&lt; 3.4 defects/million)</td>
<td>Improves reliability</td>
<td>Trained infrastructure</td>
</tr>
<tr>
<td>Reliability Science</td>
<td>Applicable with any methodology – Apply science of human factors to any process design</td>
<td></td>
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</tr>
</tbody>
</table>
The Model for Improvement

- What are we trying to accomplish? **AIM STATEMENT**
- How will we know if a change is an improvement? **MEASURE**
- What changes can we make that will result in an improvement? **PI TOOLS**
- Tests of change **PDSA**

**Model for Improvement Diagram**

- What are we trying to accomplish?
- How will we know if a change is an improvement?
- What changes can we make that will result in improvement?
The Model for Improvement

- Aim Statement
- Process Mapping
- Measure
- PI Tools

Lisa Vinci
Medical Director, Primary Care Group
University of Chicago
Disclosures

• No industry sponsorship
• No financial conflicts
The Model for Improvement

- What are we trying to accomplish?  
  - AIM STATEMENT
- How will we know if a change is an improvement?  
  - MEASURE
- What changes can we make that will result in improvement?  
  - PI TOOLS
Aim Statement

• What are you trying to accomplish?

• The SSMART aim
  – Specific
  – Stretch
  – Measurable
  – Achievable
  – Relevant
  – Timely
SSMART AIMS

• **Specific**- Who? What? Where?
• **Stretch**- Set high enough standard
• **Measurable**- How will you know an improvement has been made?
• **Achievable**- Feasible, flexible
• **Relevant**- To providers, patients, institution?
• **Timely**- Define your deadline—not too long
• Make sure patients follow up after discharge

The AIM Game
TASK# 1
Create an AIM statement that contains all of the key elements to focus the work of your team
Understand the process

• To change outcomes we must change processes

Process + Structure \(\rightarrow\) Outcome

Process

- Often
  - what the process is
  - what the process is supposed to be
  - what stakeholders think the process is
    - are 3 different things.....

- The blind men and the elephant
Process Mapping

• A process map or flowchart is a picture of the sequence of steps in a process

• Useful for
  – Planning a new project
  – Documenting a standard way for doing a job
  – **Describing a current process**
  – **Building consensus about the process (correct misunderstandings about the process)**
  – **Identifying steps in a process to focus change**
Process Mapping

- Can be “high-level” to get an overview of the process

1. Patient arrives in ER
2. Assessed in ER
3. Admitted?
   - Yes: Diagnosed And Treated
   - No: Discharged
4. Sent to floor
Process Mapping

• Ovals are beginnings and endings

• Boxes are steps or activities

• Diamonds are decision points

• Arrows show sequence/chronology
Process Mapping

• Choose a process
• **Map the current process as it is!**
  – Not what you want it to be
  – Not what you think it is
• Obtain process owner input
Process Mapping Programs

- Vizio (Microsoft)
- Word
- Excel
- Google Docs
- I-Pad apps
- Mac?
- Sticky notes
TASK# 2

Create a process map of the current process for scheduling and completing an appt

Start: Decision to discharge
End #1: Patient attends appointment
End #2: Pt does not attend appointment
How will we know if a change is an improvement?

Measurement
Measurement

“If you can not measure it, you can not improve it”

Lord Kelvin - physicist
Measurement

“If you did not measure it, you can not use it to get promoted”

Committee on Promotions in Academic Medicine
Measurement

• **Structure** – People, Resources, Policies

• **Process** - Actions, Steps, Workflow

• **Outcomes** - Results
  – Intermediate
  – Long term
Types of Measures: Structure, Process, or Outcome?

- Number of CT scanners in a hospital
- Percent of patients who receive flu vaccine
- Percent of kids with asthma who present to ER
- 30 day re-admission rate
- Warfarin dosing protocol
- % of patients with DM who have a HbA1c checked within 6 months
- % of patients with DM with HbA1c < 7
- Patient satisfaction scores
Structure, Process, and Outcomes

- Change structure and process to improve outcome
- Structural changes last (more sustainable) but harder to make
- Process changes easier to make but harder to sustain
- Outcomes hardest to change but most important
  - What would this project’s outcome measure be?
  - Pt behavior can have big impact on outcomes
Measurement Strategies

• How will you measure the effect of an intervention/change?
  – Pre/post, Control group
  – Run chart (see IHI website)

• Have measurement plan in place before intervention

• Identify resources needed- IT, personnel, expertise

• Look for existing sources of data

• In general for QI do not need to meet statistical significance
  – 30-40 charts are often enough unless looking for a small change of 5-10 %
Asthma Action Plans are getting completed well above the national average but our pass rate is still low due to incomplete forms!!

Asthma Action Plan Completion vs. Pass Rate - Run Chart
ICU Bundle Compliance - Statistical Process Control Chart

71 ICU VAP Bundle Compliance

Rate

Week Of

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%


Started Team Meetings

Standardized mouth care kit placement

Changed sedation vacation time

Standardized data collection

Stars at 30 deg on bedrails

Began testing daily goal sheet

Refined oral care process

p-bar
p-hat
LCL
UCL

SGIM
Society of General Internal Medicine
TASK# 3
Propose your measures

How often would they be reported?
What changes can we make that will result in an improvement?

Process Improvement Tools
Process Improvement Tools

- Process maps
- Ishikawa (fishbone) diagram
- Tally sheets
Fishbone (Ishikawa) Diagram

Failure to complete the post-discharge appointment.
TASK# 4
Create a Cause and Effect Diagram

• Using sticky notes, list all the reasons for failure of the post-discharge appointment process
  – You have 4 min to complete this step
  – One reason per sticky

• Once complete, divide into affinity groups
  – Large bones are general topics/areas
  – Small bones are individual items
  – Head is ‘Failure to complete post-discharge appt’”
# Tally sheets

## Tally sheet- Appointment Failures

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>No appointment available</td>
<td></td>
</tr>
<tr>
<td>Not scheduled</td>
<td></td>
</tr>
<tr>
<td>Patient forgot</td>
<td></td>
</tr>
<tr>
<td>Appt with wrong MD</td>
<td></td>
</tr>
<tr>
<td>No transportation</td>
<td></td>
</tr>
<tr>
<td>MD cancelled</td>
<td></td>
</tr>
<tr>
<td>Lost to follow up</td>
<td></td>
</tr>
</tbody>
</table>
The Model for Improvement

- PDSA

Nate Spell
CQO, Emory University Hospital
Do you have any “tales of woe?”

• You agree to test a new note template this week but discover next week (or month!) that no one updated the old note.

• You agree to test the daily time patients can tolerate the passive range of motion device after knee replacement but discover after 2 weeks of collecting data that every nurse has a different way of recording the start/stop times.

• You roll out a major change in the order sets that took weeks to program but learn that it is confusing to the physician users and thus creates new errors. Your IT people cannot fix this right away because of the work involved.
Causes of woe

- Biting off too big a change
- Too much “skin in the game”
- Lack defined roles/jobs for team
- Poorly defined measurement
- Measuring strategy too difficult
- Measuring too little or too much
- Allowing too much time to lapse between tests of change
- Not setting clear start/stop dates
- Leaving out key stakeholders
- “fixing” someone else’s problem

Source: Langley et al. (1996)
Tests of change should start small

- Really... start small
  - One patient, one doc, one day
- 1 test can show you a fatal flaw
- We are enamored of our ideas yet tend to under-invest in planning how to test them
PDSA Worksheet for Testing Change

Aim: (overall goal you wish to achieve)

Every goal will require multiple smaller tests of change

Describe your first (or next) test of change:

<table>
<thead>
<tr>
<th>Person responsible</th>
<th>When to be done</th>
<th>Where to be done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plan

List the tasks needed to set up this test of change

<table>
<thead>
<tr>
<th>Person responsible</th>
<th>When to be done</th>
<th>Where to be done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predict what will happen when the test is carried out

<table>
<thead>
<tr>
<th>Measures to determine if prediction succeeds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Do

Describe what actually happened when you ran the test

Study

Describe the measured results and how they compared to the predictions

Act

Describe what modifications to the plan will be made for the next cycle from what you learned

Institute for Healthcare Improvement
Reliability Design Strategy

- Segmentation
- Standardization
- Detection & Mitigation
- Capture Failures & Redesign

Rick Gitomer
President & CQO
Emory Healthcare Network
Disclosures

• No industry sponsorship
• No financial conflicts
A Standard Process That Failed to Sustain
Vaccine Administration Run Chart

Vaccine Performance
EUH Midtown

Reliability Strategy Initiated

Week of 11/17/2010
Week of 11/21/2010
Week of 11/28/2010
Week of 12/12/2010
Week of 12/19/2010
Week of 12/26/2010
Week of 1/2/2011
Week of 1/9/2011
Week of 1/16/2011
Week of 1/30/2011
Week of 2/6/2011
Week of 2/13/2011
Week of 2/20/2011
Week of 2/27/2011
Week of 3/6/2011
Week of 3/13/2011

% Screened
% Core Measure Met

SGIM
Society of General Internal Medicine
<table>
<thead>
<tr>
<th>Step</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segmentation</td>
<td>Divide the population to simplify tests of change</td>
</tr>
<tr>
<td>Standardization</td>
<td>Standardize the process to an 80% level of reliability</td>
</tr>
<tr>
<td>Detection &amp; Mitigation</td>
<td>Reliably identify and correct defects</td>
</tr>
<tr>
<td>Examine &amp; Learn From Defects</td>
<td>Examine defects and feed back to the design process</td>
</tr>
</tbody>
</table>
Segmentation

What is Segmentation?
• Divide the target population into manageable groups

Why Segmentation?
• Simplifies the improvement work
• Allows sequential management of barriers
• Helps scope the work
Segmentation

• Start with easiest segment
• Have a strategy for advancing through the segments
  – Control barriers to make initial improvement work easier
    • Patient characteristics, willingness to change, geography, provider characteristics
• Ideally 3 to 5 segments
• Segments must be easily recognizable
Example:
Vaccine Administration @ EHC

• Segmentation
  – Regular admissions to the floor
  – Admissions to ICU & discharge from the floor
  – Admission & discharge from the ICU
  – Stays of less than 24 hours
How might you segment the following?

• We aim to increase the % of AMI patients who present to our facility whose 1st contact to balloon time is less than 90 minutes to 90% by 1/30/2014.

• We aim to increase the % of patients with DM in our practice who have an HbA1c < 7.0 to 60% by 1/30/2014.
Task #5: Segmentation

Based on the limited information in this case and your experience in your own institution, how might you segment this project?

(For guidance see the bottom of page 7)
## Reliability Design Strategy

<table>
<thead>
<tr>
<th>Step</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Examine &amp; Learn From Defects</td>
<td>Examine defects and feedback to the design process</td>
</tr>
</tbody>
</table>
Why Standardization?

- Defines the who, what, where, when, and with what
- Facilitates training and competency
- Allows the consistent delivery of evidence-based medicine
- Allows feedback about defects and application of learning to design
Keys to Standardization

- Provides the appropriate **INFRASTRUCTURE**
  - Who, what, when, where, how, and with what
- Based on the **BEST AVAILABLE EVIDENCE**
- Apply knowledge of **SYSTEMS & HUMAN FACTORS**
- **SMALL TIME INVESTMENT** by experts **TESTED ON A VERY SMALL SCALE**
- **CHANGES TO THE PROTOCOL** are strongly encouraged and monitored for improvement ideas

Does your standard process incorporate these elements?
<table>
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</thead>
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</tbody>
</table>
Characteristics of Detection & Mitigation Step

• Usually, more **RESOURCE INTENSIVE**
• Requires a **RELIABLE STANDARDIZATION STEP** (80%)
• **INDEPENDENT** of standardization step
• Closely link detection & mitigation step
• Generally, a redundant step, therefore **WASTE**
Why Detection & Mitigation

• Allows imperfect standardization step
  – Results in less complex standardization step
• Better use of resources
• Fosters culture of mitigation & recovery
Detection & Mitigation Step

Daily review by “Core Measure Nurse” who contacts responsible RN to reverse defects.

Vaccine Detection & Mitigation

- Reviewed by CNS/UD/Shift Manager daily
- Bedside nurse notified of defects
What might be a good detection & mitigation step for the above project?

“We aim to reduce % of DM patients in our clinic with HbA1c > 9 % to less than 8% by 01/31/2013”

• Standardization step:
  1. Standard protocol during office visit where pts. with A1c > 9% have A1c every 3 months.
  2. Standard therapy escalation (AACE/ACE Diabetes Algorithm adopted by practice) implemented by practice.
Task #6: Detection & Mitigation

Create a redundant process that reliably identifies potential failures, and mitigates them before the outcome is compromised.

That is, identify a process where the patient who misses an appointment is captured reliably and the failure is mitigated where the patient gets a visit.
<table>
<thead>
<tr>
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</tr>
</tbody>
</table>
Examine Defects & Feed Learning Into Design Process

- CNS or Vaccine Champion reviews defects
- Defects are brought to the design team meeting
- Feedback provided to the responsible nurse.

### Vaccine Exceptions Grid
**True Defects - Week of January 8, 2012**

<table>
<thead>
<tr>
<th>Discharging Unit</th>
<th>Patient Name</th>
<th>Medical Record Number</th>
<th>Discharge Day</th>
<th># Pneumococcal Vaccines Ordered</th>
<th># Pneumococcal Vaccines Administered</th>
<th># Influenza Vaccines Ordered</th>
<th># Influenza Vaccines Administered</th>
<th>Reason Vaccine Not Given</th>
<th>Defects</th>
</tr>
</thead>
<tbody>
<tr>
<td>51S</td>
<td>Patient Name</td>
<td>3041734</td>
<td>01/09/2012</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>Automatically cancelled due to discharge</td>
<td>TRUE</td>
</tr>
<tr>
<td>52</td>
<td>Patient Name</td>
<td>0300089</td>
<td>01/12/2012</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Automatically cancelled due to discharge</td>
<td>TRUE</td>
</tr>
<tr>
<td>71</td>
<td>Patient Name</td>
<td>8808674</td>
<td>01/12/2012</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>No reason documented</td>
<td>TRUE</td>
</tr>
<tr>
<td></td>
<td>Patient Name</td>
<td>627656</td>
<td>01/14/2012</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>Insufficient documentation</td>
<td>TRUE</td>
</tr>
</tbody>
</table>
Weekly Core Measure Team Meetings

- Review performance
- Correct system causes for failure
- Oversee tests of change to prevent failures
Steps to Feed Back Learning Into Redesign Process

• Reliable process to **IDENTIFY** FAILURES

• **AGGREGATE** failures to identify patterns

• **PRESENT** to design team as usable information
Task #7: Examine & Learn From Defects – Group Discussion

Describe a process where the failures are captured, collated, and fed back into the design team.
<table>
<thead>
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</tr>
</tbody>
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QUESTIONS?

- Model for Improvement
- Reliability Design Strategy

FACULTY
Scholarly Recognition

• Optimizing Scholarly Recognition for Your QI Activities

Tom Staiger
Medical Director
University of Washington
Disclosures

• No industry sponsorship
• No financial conflicts
Outline

• Chairs perspectives on QI activities and promotion
• Taking a scholarly approach to QI activities
• Maximizing opportunity for peer-reviewed publications
  – Quasi-experimental research designs
  – Reporting a clinical protocol as one of the outcomes
  – Publication sites
• Frequency of study designs in the current QI literature
• Optimizing scholarly recognition for QI activities outside peer-reviewed journals
Chairs perspectives on QI activities and promotion

- Survey of Chairs of Depts. of Medicine in US and Canada to assess the importance of recognition of QI/PS (patient safety) activities in academic promotion

- 78% agreed that faculty should be promoted based on QI/PS work

- 51% felt their current promotion criteria were not useful on only a little bit useful in assessing QI/PS work

- 26% commented that evidence of scholarship should be required

The Scholarship of Quality

• Understand the definitions in your department’s promotion criteria and how your promotions committee applies them

• One framework for scholarship:
  – Investigation and discovery (journals/research reports)
  – Creation of new knowledge and innovations through academic depts., professional societies, and quality improvement organizations (integration and application)
  – Knowledge dissemination and training

(Modified from Nash DB, The Scholarship of Quality, Health Policy Newsletter, 2008;21:1-2.)

• Key features of scholarship:
  – Tangible product
  – Peer review
  – Informed by the literature and best practices
  – Dissemination of knowledge
Taking a Scholarly Approach to QI Activities

Adapted from Shojania K “Achieving synergy between designing quality improvement projects and writing them up for publication” (See resources)

• **Plan from the outset to write up your project**
  – Enhances design and execution
  – Inform design with best practices from the literature
  – Start writing the abstract while designing the project
  – Document intervention implementation methods and modifications as the project evolves
  – Review SQUIRE Guideline-see references

• **Articulate a theory for why the intervention will work**
  – Specify the “active ingredients” of the intervention
  – Explain how these ingredients address the cause of the target safety or quality problem
Bivalrudin Overuse: Problem & Intervention
From White, A. Work in Progress

- **Confusion about appropriate test**
  - Remove SRA from catalog, make reflexive to HIPA
  - Build institutional guidelines

- **Underuse of 4T score**
  - Require calculation of 4T score when ordering test

- **Overuse of testing with low probability patients**
  - Prevent test in low 4T score

- **Slow conversion to proper anticoagulant**
  - Decision support

- **Delayed discontinuation of bivalrudin**
  - Amalga and Theradoc alerts + counterdetailing
  - Bival + no test, bival + negative test
Taking a Scholarly Approach to QI Activities

From Shojania K “Achieving synergy between designing quality improvement projects and writing them up for publication”

• Capture a range of quantitative and qualitative outcomes that capture the main outcomes of interest and the degree to which the intervention is working successfully
  – Describe how/why implementation plan evolved, important lessons learned and modifications made as result of tests of change through PDSA cycles
  – Having a good evaluation plan increases chance of project success

• Don’t rush to evaluation before insuring intervention is ready
  – Rigorous trial of a poorly conceived intervention is useless
Taking a Scholarly Approach to QI Activities

Modified from Goldmann D, Ten tips for incorporating scientific quality improvement into everyday work. BMJ Qual Saf. 2011;20:i69-i72

- Select projects that are important to patients and participating providers
- Select bold, clear, measurable aims and an achievement timeline
- Assemble best multidisciplinary team possible
- Be creative in recruiting experts
  - Systems engineers, health services researchers, qualitative researchers, behavioral scientists, etc.
Taking a Scholarly Approach to QI Activities
Modified from Goldmann D

- Don’t assume external funding is necessary to perform credible improvement work
  - Address your hospital’s (or local unit’s) QI goals and utilize their performance improvement, project management, and data infrastructure

- Develop most rigorous study design possible without disrupting normal work unduly
  - Incorporate data collection into usual activities of staff

- Avoid sacrificing data quality and completeness
  - Intermittent and non-standard data collection are a principle impediment to publication and dissemination of QI work
  - Use your hospital’s QI data capture
Taking a Scholarly Approach to QI Activities

Modified from Goldmann D

- Pay careful attention to the ethics of QI work, but craft projects that are either unlikely to require formal IRB approval or in which formal approval will not likely be a barrier
  - RCT’s will virtually always require IRB, but most scholarly QI work is quasi-experimental (i.e. PDSA)
  - Encourage your QI dept to work with IRB to determine which projects are exempt, which require expedited approval, and which require formal approval
    - Goldmann proposal: exempt projects designed to improve care to conform to established or accepted standards
Tips for producing scholarly QI work

• Involve your housestaff
  – Literature searches on best practices
  – Front line input into theories of why interventions will work and selection of interventions
  – Input into study design
  – Data gathering
  – Manuscript preparation
Maximizing Opportunities for Peer Reviewed QI Publications

- Understand when & how to use quasi-experimental research designs (i.e. PDSA QI research)
  - Research designs which lack random allocation but address issues of internal validity
    - Goal is to clearly establish the direct relationship between process changes and variation in outcomes
  - Basic approach is a series of multiple measurements at baseline and during intervention
    - May include a non intervention control, a series of interventions, on-off-on interventions, statistical process controls
    - See Speroff T “Study designs for PDSA QI Research” Q Manage Health Care, 2004;13:17-32
Quasi-experimental Time Series Design

Saturno PJ. Reducing time delay in the thrombolysis of myocardial infarction.

Time delay for providing Thrombolytic treatment.
Quasi-experimental Time Series Design


Hand hygiene compliance rate

Leaders signed commitment letter (4/08)
HH certification introduced (3/08)
Start of statewide campaign (1/08)
Initial presentation to hospital leaders (4/07)
Electronic learning module introduced (1/07)
Start of marketing campaign (11/06)
Leadership endorsement of initial trial of conveniently placed hand sanitiser (7/06)
Initiation of monthly unit specific feedback (1/06)
Maximizing Opportunities for Peer Reviewed QI Publications

• When developing clinical protocols, consider reporting the protocol as one of the outcomes
  – Clinical protocols developed and implemented with a scholarly approach may be of interest to others
    • SQUIRE guidelines don’t include specific recommendations on how to format a report on the development and implementation of a clinical QI protocol (Staiger TO, JGIM, Commentary on Stevens, 2014)
    • Authors employed a format that includes a methods and results section for each of protocol development, implementation, and evaluation which may be a useful template for others
Maximizing Opportunities for Peer Reviewed QI Publications

- Use Standards for QUality Improvement Reporting Excellence (SQUIRE) publication guideline during design and as a manuscript checklist
  - Davidoff F, Ann Int Med. 2008;149:670-76

- QI Publication Sites
  - See Aug 2011 SGIM Forum “Journal Venues for Safety and QI Publications”
Frequency of QI study designs in a sample of the literature

Wong CJ, Work in Progress

Note: Time series without statistical analysis such as process control charts, were not considered quasi-experimental

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>125</td>
<td>100.00%</td>
</tr>
<tr>
<td># pre experimental</td>
<td>118</td>
<td>94.40%</td>
</tr>
<tr>
<td># quasi experimental</td>
<td>2</td>
<td>1.60%</td>
</tr>
<tr>
<td># experimental</td>
<td>5</td>
<td>4.00%</td>
</tr>
</tbody>
</table>
Frequency of QI study designs in a sample of the literature

<table>
<thead>
<tr>
<th>Pre-experimental</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-post (P-PPS)</td>
<td>16</td>
</tr>
<tr>
<td>time series (P-TSE)</td>
<td>9</td>
</tr>
<tr>
<td>Post intervention only (P-POS)</td>
<td>6</td>
</tr>
<tr>
<td>case study</td>
<td>14</td>
</tr>
<tr>
<td>survey</td>
<td>22</td>
</tr>
<tr>
<td>cohort</td>
<td>4</td>
</tr>
<tr>
<td>Case control</td>
<td>4</td>
</tr>
<tr>
<td>instrument/model</td>
<td>18</td>
</tr>
<tr>
<td>cross sectional</td>
<td>25</td>
</tr>
<tr>
<td>total</td>
<td>118</td>
</tr>
</tbody>
</table>
Systematic review of the application of the PDSA method to improve quality in healthcare

Taylor M. BMJ Qual Saf. 2014;23:290-8

• Of 73 articles that reported using PDSA method to improve quality in a healthcare setting:
  – 47 documented PDSA cycles sufficiently to fully analyze using authors framework
  – < 20% (14/73) fully documented the application of a sequence of iterative cycles
  – 15% (7/47) reported the use of data at monthly or more frequent cycles to inform progression of cycles
Optimizing scholarly recognition for QI outside peer-reviewed journals

- Disseminate tangible, peer reviewed knowledge
  - Collaborate on regional and national presentations, posters, workshops, and lectures
  - Submit to SGIM Clinical Practice Innovations session
  - AHRQ Innovations Exchange
  - Develop and disseminate curricula and other educational materials

- Preserve results from QI projects to document leadership and service roles in QI projects
  - See Quality Portfolio at SGIM Academic Hospitalist Taskforce website
Resources


- Goldmann D, Ten tips for incorporating scientific quality improvement into everyday work. BMJ Qual Saf. 2011;20:i69-i72


- Shojania K “Achieving synergy between designing and reporting quality improvement projects” Improvement science webinars (Good site for other lectures): http://www.health.org.uk/areas-of-work/improvement-science/improvement-science-webinars/

- Speroff T, Study designs for PDSA QI Research Q Manage Health Care, 2004;13:17-32


Questions?
Maintenance of Certification

• Get MOC credit for your PI project at home

Faculty
American Board of Internal Medicine MOC requirements

• 20 points of Practice Assessment every 5 years
  – Practice Improvement Modules (PIMs)
  – Approved Quality Improvement Pathway
    • Defined options
    • Self-directed or Completed Project PIM

• Self-directed or Completed Project PIM
  – Baseline data no more than 12 months old
  – Must use approved performance measure
Use the Measures Library to identify performance measure options
ACTIVITY

• Work through parts A – C, imagining that you are doing a self-directed PIM
• If you have internet access, you can look up more specific performance measures
• Faculty are here to assist you
• We will debrief in 15 minutes
Summary

• Post-Course Assessment
• Feedback & Suggestions

Brent Petty
Associate Professor
Johns Hopkins
Disclosures

- No industry sponsorship
- No financial conflicts
### Measure Set Groupings

<table>
<thead>
<tr>
<th>Group</th>
<th>Setting(s)</th>
<th>Measure Set(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent Medicine/Pediatrics</td>
<td>Outpatient</td>
<td>Acute Otitis Externa/Otitis Media with Effusion</td>
</tr>
<tr>
<td>Allergy/Immunology</td>
<td>Outpatient</td>
<td>Acute Otitis Externa/Otitis Media with Effusion Adult Sinusitis Asthma Atopic Dermatitis</td>
</tr>
<tr>
<td>Behavioral Health</td>
<td>Outpatient</td>
<td>Major Depressive Disorder – Adult Substance Use Disorder</td>
</tr>
<tr>
<td>Cardiac</td>
<td>Inpatient</td>
<td>AMI: Acute Myocardial Infarction CHF: Congestive Heart Failure (inpatient) PCNASR - Stroke Registry Stroke and Stroke Rehabilitation VTE: Venous Thromboembolism</td>
</tr>
<tr>
<td></td>
<td>Outpatient</td>
<td>Atrial Fibrillation And Flutter CAD: Chronic Stable Coronary Artery Disease Heart Failure – Outpatient Management IVD: Ischemic Vascular Disease Primary Prevention of Cardiovascular Disease VTE: Venous Thromboembolism (outpatient)</td>
</tr>
<tr>
<td>Care Transitions</td>
<td>Inpatient</td>
<td>Care Transitions</td>
</tr>
</tbody>
</table>

Last reviewed: August 2013
<table>
<thead>
<tr>
<th>Group</th>
<th>Setting(s)</th>
<th>Measure Set(s)</th>
</tr>
</thead>
</table>
| Chronic Illness (cont.)    | Outpatient | HIV/AIDS - Health Maintenance  
HIV/AIDS - Women’s Health  
IVD: Ischemic Vascular Disease  
Osteoarthritis  
Osteoporosis  
Rheumatoid Arthritis |
| Critical Care Medicine     | Inpatient  | CAP: Community-Acquired Pneumonia (inpatient)  
Central Line-Associated Bloodstream Infections  
Intensive Care  
Sepsis  
VTE: Venous Thromboembolism |
|                            | Outpatient | VTE: Venous Thromboembolism (outpatient)                                  |
| Diabetes                   | Outpatient | Diabetes                                                                      |
| Emergency Medicine         | Inpatient  | Emergency Medicine                                                            |
|                            | Outpatient | Diabetes                                                                      |
| Endocrine                  | Outpatient | Diabetes                                                                      |
|                            |            | Osteoporosis                                                                  |
| ESRD                       | Outpatient | ESRD – End-Stage Renal Disease – Adult  
ESRD – Anemia Management  
ESRD – Hemodialysis (HD) Adequacy  
ESRD – Peritoneal Dialysis (PD) Adequacy |
| Gastrointestinal           | Inpatient  | Adult Inflammatory Bowel Disease  
Endoscopy and Polyp Surveillance |
|                            | Outpatient | Adult Inflammatory Bowel Disease  
Endoscopy and Polyp Surveillance  
Gastroesophageal Reflux Disease  
Hepatitis C |
| Geriatric                  | Inpatient  | PCNASR - Stroke Registry  
Pressure Ulcers  
Stroke and Stroke Rehabilitation |
|                            | Outpatient | Geriatrics  
Osteoporosis  
Preventive Care |
| Hematologic/Oncologic      | Inpatient  | Care at End-of-Life                                                           |
|                            | Outpatient | Breast Cancer  
Care at End-of-Life  
cGVHD: Chronic Graft Versus Host Disease  
Chemotherapy-Related Symptom/Toxicity Management  
Colon and Rectal Cancers  
Core Oncology  
IC: Infection Control after HCT  
ITP: Idiopathic Thrombocytopenia  
Lung Cancer: Non-Small Cell |
<table>
<thead>
<tr>
<th><strong>Group</strong></th>
<th><strong>Setting(s)</strong></th>
<th><strong>Measure Set(s)</strong></th>
</tr>
</thead>
<tbody>
<tr>
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<td>Outpatient</td>
<td>Multiple Myeloma</td>
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<td>Myelodysplastic Syndrome (MDS) and Acute Leukemia</td>
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<td>Non-Hodgkin’s Lymphoma</td>
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<td>Oncology</td>
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<td>HIV/AIDS</td>
<td>Outpatient</td>
<td>HIV/AIDS</td>
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<td></td>
<td>HIV/AIDS - Adherence/Self-Management</td>
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<td>HIV/AIDS - ARV Management</td>
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<td>HIV/AIDS - Health Maintenance</td>
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<td>HIV/AIDS - Women’s Health</td>
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<tr>
<td>Hospice/Palliative Care</td>
<td>Inpatient</td>
<td>Care at End-of-Life</td>
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<tr>
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<td>Inpatient</td>
<td>CAP: Community-Acquired Pneumonia (inpatient)</td>
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<td></td>
<td>Central Line-Associated Bloodstream Infections</td>
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<td></td>
<td></td>
<td>Methicillin-Resistant Staphylococcus Aureus (MRSA) Infection</td>
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<td></td>
<td>VAP: Ventilator-Associated Pneumonia</td>
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<td>Acute Otitis Externa/Otitis Media with Effusion</td>
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<td>cGVHD: Chronic Graft Versus Host Disease</td>
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<td>IC: Infection Control after HCT</td>
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<td>Outpatient Parenteral Antibiotic Therapy</td>
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<td>Nephrologic</td>
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<td>CKD: Chronic kidney disease</td>
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<td>ESRD – End-Stage Renal Disease – Adult</td>
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<td>ESRD – Hemodialysis (HD) Adequacy</td>
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<td>ABIM Locum Tenens Survey</td>
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<td>CAHPS Clinician &amp; Group Survey</td>
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<tr>
<td>Patient Safety</td>
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<td>Medication Systems</td>
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<td>Methicillin-Resistant Staphylococcus Aureus (MRSA) Infection</td>
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<td><strong>Group</strong></td>
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<td>Patient Safety (cont.)</td>
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<td>Sepsis</td>
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<td>Outpatient</td>
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<td>Prevention</td>
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<td>HIV/AIDS</td>
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<td>HIV/AIDS - Health Maintenance</td>
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<td>HIV/AIDS - Women’s Health</td>
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<td>Preventive Care</td>
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<td>Primary Prevention of Cardiovascular Disease</td>
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<td>Primary Care Access</td>
<td>Outpatient</td>
<td>Primary Care Access</td>
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<td>Endoscopy and Polyp Surveillance</td>
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<tr>
<td>Pulmonary</td>
<td>Inpatient</td>
<td>CAP: Community-Acquired Pneumonia (inpatient)</td>
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<td>VAP: Ventilator-Associated Pneumonia</td>
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<td></td>
<td></td>
<td>VTE: Venous Thromboembolism</td>
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<td>Outpatient</td>
<td>Asthma</td>
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<td></td>
<td>CAP: Community-Acquired Pneumonia (outpatient)</td>
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<td></td>
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<td>COPD: Chronic Obstructive Pulmonary Disease</td>
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<td>Lung Cancer: Non-Small Cell</td>
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<td>Obstructive Sleep Apnea</td>
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<td></td>
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<td>VTE: Venous Thromboembolism (outpatient)</td>
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<td>Registry</td>
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<td>PCNASR - Stroke Registry</td>
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<td>Rheumatologic</td>
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<td>Rheumatoid Arthritis</td>
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<td>Sleep Medicine</td>
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<td>Obstructive Sleep Apnea</td>
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<td>Sports Medicine</td>
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<td>Back Pain</td>
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<td>Women’s Health</td>
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<td>Breast Cancer</td>
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<td>HIV/AIDS - Women’s Health</td>
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<td>Maternity Care</td>
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<td>Osteoporosis</td>
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<td>Preventive Care</td>
</tr>
</tbody>
</table>
1. “PDSA” is a common term used in quality improvement. What does it stand for and what is it used for?

2. What are three commonly used general topic areas used with fishbone (Ishikawa) diagrams?

3. What are the features of a SMART “aim statement” as used in quality improvement?

4. Define “segmentation” as used in quality improvement.

5. List three techniques that will help you engage others in quality improvement.

6. Describe the key differences between Lean and Six Sigma improvement methodologies.
1. List three methods that will help you engage colleagues in quality improvement.

2. What are the key differences between Lean and Six Sigma methodologies?

3. What is segmentation?

4. List three general topic areas used with fishbone (Ishikawa) diagrams.

5. List the features of a SSMART “aim statement.”

6. What does “PDSA” mean and for what is it used?
Quality Improvement Case

BACKGROUND:

You are a member of a Physician Hospital Organization (PHO) who is looking forward to becoming an Accountable Care Organization. Your state hospital association, using publicly reported data, sends your CEO a report outlining the impact of Value-Based-Purchasing that will go into effect October 2013.

As you and the rest of the leadership team examine the report, you note that the greatest opportunity is your hospital’s performance on readmissions. Your readmission rate falls in the bottom 10% nationally. While the data used for the report are 18 months old, you note that your readmission rate has not changed substantially over the past 36 months. You are aware of the article in Annals describing Project RED that used evidence-based interventions to reduce readmissions by 30%.

PI PROJECT:

The key elements from Project Red are:

1. Medication reconciliation
2. Reconcile discharge plan with national guidelines
3. Follow-up appointments scheduled before discharge
4. Identification of outstanding tests for communication to the next care team
5. Post-discharge services (e.g. home health or durable medical equipment)
6. Written discharge plan
7. Instructions on what to do if problem arises
8. Patient education about their condition
9. Assess patient understanding of the teaching
10. Discharge summary sent to PCP
11. Telephone follow-up after discharge to monitor for problem and facilitate keeping the post-discharge appointment.

As you peruse the list, you realize that you cannot control all of these interventions and will need to partner with your ambulatory colleagues. So, you create a process improvement team that includes the following:

1. Hospital medicine
2. Floor nurse
3. Social service
4. Pharmacy
5. Nurse educator
6. Ward clerk
7. Ambulatory physician
8. Ambulatory nurse
9. Ambulatory front desk staff

The team decides to meet weekly. At the first meeting you present the background information, as well as a Project Red presentation that you got off of the AHRQ web site.

Your team is a bit overwhelmed by the task at hand. In an attempt to scope the work, the team decides to do a manual chart review of the last 50 discharges to identify the gaps in care when compared to the 11 Project Red interventions.

Knowing that you may have some credibility challenges with other providers, you elect to review 50 charts. In order to complete that many chart reviews by the next meeting, you decide to divide the work among 5 of the team members. To ensure that the reviews are consistent, you create a tally sheet with definitions of each of the Project Red elements (Figure 1). Your finance department creates a list of the last 50 discharges, which you divide evenly for each of the five team members who use the tally sheet to review their 10 charts. These results are then collated and you create a histogram (Figure 2).

You take the histogram to the second meeting and the team discusses the findings. As expected, the data frames the discussion, though more questions arise.

**AIM STATEMENT**

Rather than taking on all 11 elements of Project Red, the team decides that the first
area of focus will be the appointment process. In order to maintain the appropriate pace, you guided the team in creating an aim statement for the next 90 days.

**TASK #1:** Create an Aim Statement that contains all of the key elements to focus the work of your team.
Armed with the aim statement to focus your work, you begin work on improving the appointment process. However, it is not clear from the data collection where in the appointment process the failures occurred. In order to satisfy this data element, the appointment had to be scheduled and the patient had to have attended the appointment. Even though there was representation around the table from every role that touched the process, no single person could articulate the entire process.

You realize that the best way to get everyone on the same page with respect to the appointment process is to create a process flow map.

**TASK #2:** Based on your understanding of the process of scheduling from the inpatient setting to the patient completing the appointment in the outpatient setting create a Process Map.
MEASURE

Now that everyone understands the process as described by the process flow map, it is important to answer the question, “How will we know that a change is an improvement?” by identifying a Measure. You are fortunate that your PHO has a health information exchange with all members of the PHO. You are able to electronically track every patient discharged and determine whether they arrived at the physician’s office. You can produce this report as frequently as you need. Since you are meeting weekly, you choose to run the report weekly.

Understanding the electronic availability of this data, you may choose to change your aim statement, so you do not need to develop another data collection strategy.

PROCESS IMPROVEMENT TOOLS

Now that you have an aim statement, measure, and a shared understanding of the process described by your process map, your team is ready to generate hypotheses for testing by answering the question, “What changes might result in an improvement?” by using process improvement tools.

You decide to create a cause & effect diagram (fishbone) to identify the reasons why the post-discharge follow-up appointment failed to occur.

In order to have everyone on the same page, let’s use the following process map for the rest of the exercise.

Figure 3. Process Map of Existing Process
**TASK #3:** Create a **CAUSE & EFFECT DIAGRAM** by doing the following...

1) Give each member of the team a short stack of sticky notes.
2) Take 4 minutes, in silence, and have each person list all the reasons for failure of the post-discharge appointment process (one reason per sticky note).
3) Once completed, divide all the reasons into affinity groups.
4) The affinity group is the large category on the cause & effect diagram.
5) The small bones on the cause & effect diagram are the individual items on the sticky notes.
6) The head in the fish is, “Failure to complete the post-discharge appointment”.

Figure 4. Cause & Effect
Your team completed the cause & effect diagram and then created a tally sheet to determine the frequency of the failure modes identified. They then manually reviewed 30 failures and came up with the following frequency distribution.

Figure 5. Tally Sheet & Histogram

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No appointment available</td>
<td>16</td>
</tr>
<tr>
<td>Not scheduled</td>
<td>12</td>
</tr>
<tr>
<td>Patient forgot</td>
<td>9</td>
</tr>
<tr>
<td>Apt w/ wrong MD</td>
<td>7</td>
</tr>
<tr>
<td>No transportation</td>
<td>4</td>
</tr>
<tr>
<td>MD cancelled</td>
<td>3</td>
</tr>
<tr>
<td>Lost to follow-up</td>
<td>2</td>
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</tbody>
</table>
SMALL TEST OF CHANGE (PDSA)

You bring this data to your weekly team meeting. Based on this data, the team designs a test of change.

**TASK #4**: Design a test of change (PDSA) based on the frequency distribution above.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of change</td>
<td></td>
</tr>
<tr>
<td>Who</td>
<td></td>
</tr>
<tr>
<td>What</td>
<td></td>
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<tr>
<td>Where</td>
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<td>When</td>
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<td>How</td>
<td></td>
</tr>
<tr>
<td>With what</td>
<td></td>
</tr>
<tr>
<td>Set-up</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure</th>
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</thead>
<tbody>
<tr>
<td>Who</td>
<td></td>
</tr>
<tr>
<td>What</td>
<td></td>
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<tr>
<td>When</td>
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<tr>
<td>Where</td>
<td></td>
</tr>
<tr>
<td>How</td>
<td></td>
</tr>
<tr>
<td>With what</td>
<td></td>
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</tbody>
</table>
Your team has continued to meet for the past 12 weeks. You have done a series of tests of change (1-2 per week) with continued improvement in your performance. However, over the past 4 weeks your team’s performance seems to have plateaued as noted in figure 5.

Your standard process for completing a post-discharge appointment with the primary care physician is as follows:

1. Transition Manager captures the name of the primary care physician on admission and enters into the electronic medical record (EMR) in the discharge instructions module.
2. Transition Manager calls the physician office the day prior to discharge to schedule the appointment for less than 14 days after discharge and records in the EMR in the discharge instructions module.
3. Appointment date and time are confirmed with the patient when the discharge instructions are reviewed on the day of discharge.
4. The Transition Manager calls within 3 days after discharge and completes a post-acute-care checklist, which includes a confirmation/reminder of the follow-up appointment time and date.
5. The patient arrives for the appointment at the appointed day and time.

However, regardless of the changes for the last few weeks, the team cannot improve reliability beyond 80%.

For the purposes of this exercise, let’s assume your team's aim statement is:

By August 15, 2012 (90 days from the beginning of the project) 95% of all patients discharged from High Quality Municipal Hospital will have completed an appointment with the appropriate physician within 14 days of discharge.

Therefore, at 80% performance, our process is not meeting our aim. Being data-driven the team reviewed the last 30 failures and created the histogram in figure #6. There may be more than one failure per chart.

**SEGMENTATION**

Your current process is now functioning at an 80% level of reliability. However, this level of reliability is not meeting your aim, and will not allow you to meet your overall goal of reducing readmissions.
**TASK #5:** Based on the limited information in this case and your experience in your own institution, how might you segment this project? The first task is to identify a group of providers, a patient population, or other characteristic that defines a subpopulation in which you will have the greatest likelihood for success (no more than 3 to 5 segments).

Looking at the process that you designed above, consider what areas might be the easiest, or most difficult. The characteristics of those populations will give you insight into a meaningful segmentation strategy.

**Segmentation Strategy:**

<table>
<thead>
<tr>
<th>Segment</th>
<th>Characteristic to overcome</th>
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<tbody>
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</table>
**STANDARDIZATION**

The next step in the strategy is standardization. Your work on the project, to this point, has created a standardized process that results in an 80% level of reliability. While this process is not meeting your stated specification (95%) for the process, it is adequate for your needs as you apply the Reliability Design Strategy.

**DETECTION & MITIGATION**

With the performance inadequate to meet our specifications, and the inability to refine the process without more resources that you don't have, we decide to implement the next step in the Reliability Design Strategy, Detection and Mitigation.

**TASK #6:** Create a redundant process that reliably identifies potential failures, and mitigates them before the outcome is compromised. That is, identify a process where the patient who misses an appointment is captured reliably and the failure is mitigated where the patient gets a visit.
EXAMINE DEFECTS & FEED BACK INTO THE DESIGN PROCESS

In order to foster continuous improvement, the last step in the Reliability Design Strategy is to capture the defects, count and combine them in a meaningful form and feed the information back to the design team, so they can continuously improve.

TASK #7 (Group Discussion): Describe a process where the failures are captured, collated, and fed back into the design team