Applying the Science of Improvement

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Learning Objectives

• Increase knowledge of the science of improvement and how to apply the science of improvement to program design and implementation

• Learn the 3 essential questions for improvement – the Model for Improvement

• Identify at least three key resources to learn more about today’s topic
References


• Institute for Healthcare Improvement
  www.ihi.org


Acknowledgements

• Patti Simino-Boyce, RN, PhD
  Life Safety Institute

• Pat Waniewski, RN, MS
  Director, Bureau of Community Chronic Disease Prevention

What is Quality Improvement?

A formal approach to the analysis of performance and systematic efforts to improve it
Why is Quality Improvement important in Public Health?

QI ensures the reliance on deliberate, defined processes that are responsive to community needs and improving population health.

QI is continuous and ongoing. It achieves MEASURABLE changes in: efficiency, effectiveness, accountability, performance, and outcomes of processes/services to improve the health of a community and achieve health equity.

*Riley, WJ et al*

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### Quality Improvement, not Quality Assurance

<table>
<thead>
<tr>
<th>Quality Improvement</th>
<th>Quality Assurance</th>
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<tbody>
<tr>
<td>What can we do to improve? -Proactive</td>
<td>What went wrong? -Reactive</td>
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<tr>
<td>Avoids blame, fosters system change</td>
<td>Often punitive, tries to find who was at fault</td>
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<tr>
<td>Focuses on the entire system</td>
<td>Focuses on the specific incident</td>
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<tr>
<td><strong>Continuous</strong></td>
<td><strong>Periodic look-back</strong></td>
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<tr>
<td>Exceeds expectations</td>
<td>Meets a set standard (pass/fail)</td>
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The Science of Improvement

Deming’s System of Profound Knowledge

Subject Matter Knowledge

Increased capability to make improvements

Profound Knowledge


Model for Improvement - 3 Questions

Model for Improvement

Aim Statement

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

Strategies

Measure

Act

Plan

Study

Do
1. What are We Trying to Accomplish? The Project AIM

- A written statement of the accomplishments expected from the team’s improvement effort

- Aim addresses the gap between where the team knows they are now, and where the team wants to be.

![Diagram showing goal and baseline with a gap between them.]

SMAART AIMS

- Specific: Understandable, unambiguous
- Measurable: Numeric goals
- Actionable: Who, what, where, when
- Achievable (but a stretch)
- Relevant to stakeholders and organization
  - Strategic, Compelling, Important
- Timely: with a specific timeframe
SMAART Aim

To improve the health and wellbeing and reduce risk factors for obesity among the students enrolled in the Alliance Afterschool Program, the program development team will design and implement opportunities to increase student and parent awareness of risk factors and increase opportunities for enrolled students to engage in physical activity so that, by January 2013:

- 100% of enrolled students and families are provided with evidence-based education materials
- 75% of enrolled students engage in 30 mins or more of physical activity during afterschool school hours
- Enrollment in the Alliance Afterschool Program is maintained or increased

2. How will we know the change is an improvement?

Measures

\[ \geq \leq \uparrow \downarrow \% \]
Project-wide Measures

**Outcome Measures**
Voice of the consumer

**Process Measures**
Voice of the system

**Balancing Measures**
Look at the system from different perspective

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We have 2 quarterly data points - is this an improvement?

![Executive Time Series](image-url)
Are we assuming something like this?

Executive Time Series - linear trend

But it could be like this ...

Executive Time Series - no trend
Annotated Run Chart

• Plot small samples frequently over time

3. What changes can we make that result in improvement?

“All improvement requires change, but not all change is improvement.” –> Develop changes to TEST

Developing purposeful, fundamental change
- Logical thinking
- Benchmarking
- Technology
- Creativity
- Change concepts
Improvement?

**Testing Changes**
The Plan-Do-Study-Act (PDSA) cycle is shorthand for testing a change in the real work setting — by planning it, trying it, observing the results, and acting on what is learned.


Institute for Healthcare Improvement
www.ihi.org

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**PDSA cycle: Learning and Improvement**

- **Act**: Develop a plan for what team intends to do. State why it is important.
- **Plan**: Define to GAP and how you plan to close it (proposed strategies)
- **Study**: Try out, test, the changes. Document problems/unexpected outcomes
- **Do**: Assess if objective was accomplished. Compare to prediction. Check for negative consequences. Summarize learning

What modifications to make?
What is the next cycle?
Sequential Building of Knowledge

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

**Changes That Result in Improvement**
- Hunches
- Theories
- Ideas
- Changes

**Very Small Scale Test**
- Data
- Implementation of Change

**Wide-Scale Tests of Change**
- Follow-up Tests

**Improvement Team**
- Team is needed to:
  - provide different perspectives
  - take on the work (it’s a lot of work!)
  - increased buy-in by staff and consumers
  - provide different levels of support across the system (e.g. management)

- To identify the right team, you need to have an idea of the Aim (What are you trying to accomplish? Who will need to be on board to maximize opportunity for success?)
Key Elements Required by the Improvement Team

**Will** to do what it takes to change to a new system

**Ideas** on which to base the design of the new system

**Execution** of the ideas

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Project BREATHE
A Comprehensive In-Patient Interdisciplinary Education Collaboration with the Asthma Coalition of Long Island

Anne Little, MPH, AE-C
Asthma Coalition of Long Island
What are we trying to accomplish?

Problem:

• Hospitalizations for children in Nassau County are more than twice the Healthy People 2010 Goals and many underserved communities in the area have as much as FOUR times this rate.

• Between January and September of 2009 the pediatric service at the Children’s Hospital admitted 105 asthma patients.

Aim:

ACLI will partner with the Children’s Hospital Pediatric Department through a team approach using the Chronic Care Model (CCM) to improve health outcomes by enhancing asthma management of 40 patients 2-18 who are admitted to the hospital for an asthma exacerbation in the period March 22, 2010 through March 21, 2011 so that:

Measures:

How will we know our change is an improvement?

• 90% of target patients and families will be educated about asthma through a team approach: Nursing, Medicine, Respiratory Therapy, Social Work and Home Care.

• 90% of target patients will be assessed for severity and control.

• 90% of patients will be discharged with an Asthma Action Plan and will receive ACLI’s Asthma to go Kit.

• 50% of patients will have at least two home visits by visiting nurse to reinforce education.

• 50% of those eligible will complete environmental assessment and remediation.

• # of hospitalizations will be reduced by 50% within one year.

• # of emergency department visits will be reduced by 50% within one year.
Team

Hospital Staff:
• Nursing
• Nursing Education
• Case Management
• Child Life
• Pediatric Attendings
• Respiratory
• Social Work

Community Partners:
Asthma Coalition of Long Island – American Lung Association of New York
Nassau County Department of Health Home Environmental Program
Visiting Nurse Agency
New York State Department of Health

What changes will you make in your system that will result in an improvement?

Strategies

Community Resources
Provider education by ACLI
Environmental assessments
Remediation through Nassau County DOH
Linkage with specialty practice

Self-Management
Asthma handout on admission
Asthma Action plan & spacer training
Use of family guide to Asthma flipchart

Decision Support
“Breathe” flow sheet
Team education on EPR-3 guidelines
Device training with Pocket guides & DVDs

Clinical Info. Systems
Data collection track sheet for follow up at 72 hours,
3, 6, 12 months
NSLUH @ NSUH
Electronic documentation for tracking & monitoring

“BREATHE” Care Model

Delivery System
Nursing, RRT, Child Life,
Physicians, Case managers,
School Readiness, &
Home Care
Referrals: home visits &
School nurse

Plan to expand to ED to capture ED visits
Plan Do Study Act - PDSA
Testing, Implementing and Spreading the Change

Hunches Theories Ideas: Changes That Result in Improvement

Data

Implementation:

Wide-Scale Tests: Revised Flowsheet based on feedback, tested with five more patients.

Follow-up Tests: Revised Flowsheet based on feedback, tested with five more patients.

Small test: Tested BREATHE Flowsheet with five patients to monitor workflow and data collection feasibility.

Develop Flow Sheet

Changes That Result in Improvement

Refined for all asthma patients, used as model.

Outcomes - Results
(N=92 patients one-year post-intervention)

- **80%** - Reductions in hospital readmissions
  
  $(p<0.0001)$

- **50%** - Reductions in emergency department revisits
  
  $(p<0.0001)$

- **100%** - Patients received asthma action plans

- **100%** - Asthma care core measures met

- 95 and 15 – Missed school days/year for an eleven-year-old girl with asthma before and after enrollment in BREATHE’s School Re-entry
From Local to National…
The Evolution of an Asthma Coalition Community Outreach Project

Anne Little, Coordinator
Asthma Coalition of Long Island

Funded by a Grant from the New York State Department of Health to the American Lung Association of New York State

Partners in Collaboration – Project Team

Girl Scouts
New York State Department of Health
American Academy of Allergy Asthma & Immunology
American Lung Association of New York State, Inc.
What are we trying to accomplish?

**Problem:**
- 17% Girl Scouts have asthma
- Girl Scouts programs do not include patch programs about asthma, the most common chronic childhood disease
- Of Girls Scouts with asthma (in Pilot Troop) 50% lived in a home with at least 1 smoker
- Of girls with asthma (in Pilot Troop) 50% had pets

**Aim:**
Design and implement a bi-lingual, national asthma education program for the world’s largest volunteer organization for girls, the Girl Scouts of America.

Through a series of interactive activities and processes: # Girl Scouts will earn the Asthma Awareness Patch and will have increased knowledge, skills and understanding of the importance of healthy lifestyle changes and their relationship to controlling asthma, so that:

Measures -
How will we know our change is an improvement?

- 90% of Girl Scouts completing Breathe Easier will report increased knowledge of asthma pathophysiology, including trigger identification and asthma treatment.
- 90% of Girls Scouts completing Breathe Easier will report knowledge of how to respond when someone is having difficulty breathing.
- 90% of Girl Scouts completing Breathe Easier will report knowledge of the health impact of smoking and its relationship to asthma, helping to empower the girls to make healthy lifestyle choices.
**Strategies**

- What changes can we make that will result in improvement?

  - Expand patch programs to include an Asthma Awareness Patch for Girl Scouts
  - Develop a culturally and linguistically appropriate asthma education program for Girls Scouts to earn Asthma Awareness Patch.
  - Grow partnership to support development and implementation of program

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**Plan Do Study Act - PDSA**

Testing, Implementing and Spreading the Change

- **Changes That Result in Improvement**
  - Revised for GSUSA, translated, spread globally.
  - Revised, spread to GSNC (21,000 Girls)

- **Wide-Scale Tests:**
  - Revised based on feedback from Girl Scouts and their Leaders, tested with each of age levels.

- **Follow-up Tests:**
  - Piloted activities for one level of Girls Scouts which we based on NHLBI Guidelines with one Brownie troop.
Helping Girls Breathe Easier
Troop Leader Evaluations 2006-2009
N = 2673 Girl Scouts

Demographics:

17% Girl Scouts have asthma -- US Population 9.3%*

- 29% live with a family member with asthma
- 78% know someone with asthma

Discover:
- 2,506 (94%) learned something new about asthma
- 2,531 (95%) would stay calm when someone was having trouble breathing

Connect:
- 2,643 (99%) would know how to help people having trouble breathing

Take Action:
- 2,558 (96%) understand smoking is not a healthy choice
- 2,571 (96%) will not smoke in the future

*Source: Centers for Disease Control and Prevention 2009
Remember this...

1. Model for Improvement = a method for changing the system so it is built to achieve the best results.

2. Be CLEAR and FOCUSED about what you are trying to accomplish.

3. Develop a measurement plan – and use it!

4. A committed, activated team is a must-have.

Discussion