NASA Kennedy Space Center:
Quality and Innovation at NASA

December 7, 2015

Welcome to the
27th Annual National Forum
on Quality Improvement in
Health Care!
Session Objectives

- Identify examples of innovation in an out-of-health-care industry that can be compared to, and applied in, their work environments
- Describe at least two examples of successful PDSA tests in the creation of the first moon rocket
- Learn some methods that IHI uses to think about innovation

What We *REALLY* Want You to Get Out of This...

- Motivation to pursue small scale-testing in your own organization
- An opportunity to learn from “in the trenches” about the value of failing forward to get to breakthroughs
- A plan for bringing your a-ha’s and ideas back to your teams and organizations
Excursion Faculty

Ninon Lewis, MS
Executive Director
Institute for Healthcare Improvement

Marian Bihre Johnson, MPH
Director, Innovation
Institute for Healthcare Improvement

Colonel Robert Springer,
USMC

Hilda Fraticelli,
Special Events Manager,
NASA

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NASA Kennedy Space Center:
Quality and Innovation at NASA

8:00 – 8:20 AM  Welcome and Introductions; Context Setting
8:20 – 9:20 AM  Transport: Gaylord Palms to Kennedy Space Center
Approx. 9:20 AM  Arrive at Kennedy Space Center
9:30 AM – 12:15 PM  Tour of Kennedy Space Center
12:15 – 1:30 PM  Lunch & Learn with Astronaut, Colonel Robert C. Springer
1:30 – 2:30 PM  Debrief
2:30 – 3:30 PM  Individual Free Time to Explore Kennedy Space Center
3:30 – 5:00 PM  Transport: Kennedy Space Center to Gaylord Palms
5:00 PM  Program Adjourn
SETTING THE STAGE

About IHI

Our Mission
To improve health and health care worldwide.

Our Vision
Everyone has the best care and health possible.

Who We Are
IHI is a leading innovator, convener, partner, and driver of results in health and health care improvement worldwide.
Setting the Stage: Why NASA?

- A long history of audacious goal-setting achieved through small scale testing and innovation
- A unique opportunity to see how a transparent culture (both internally and externally) can positively affect transformation work
- A chance to see complex systems with a new view:
  - Checklists
  - Structured communication
  - Simulation
  - Error reporting
- Space is cool!
Job #1 of an Improver: Be curious...

- Use four lenses of curiosity...
  
  - **Appreciate the system.** What factors are at play in the NASA system?
  
  - **Understand variation.** What are NASA's windows into how the system is performing?
Job #1 of an Improver: Be curious...

- Use four lenses of curiosity...
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  - **Understand the human side of change.** How do people affect the changes tested?

Job #1 of an Improver: Be curious...

- Use four lenses of curiosity...
  - **Appreciate the system.** What factors are at play in the NASA system?
  - **Understand variation.** What are NASAs windows into how the system is performing?
  - **Understand the human side of change.** How do people affect the changes tested?
  - **Understand the theory of change.** How do we know what we know?
Staying Curious

- Some starting areas of inquiry
  - How does NASA define their aims?
  - How does the team design tests?
  - How do they know they are getting where they are going/getting results?
  - How does the team learn from failed tests?
  - How does the team iterate with each test?
  - How is continuity ensured if staffing changes?
  - How do they communicate issues such as changes in plan, errors, or issues?

- Think about your environment as you observe
- Create a list of observations and thoughts from the day

Translating Innovations at NASA to Health Care

- How has NASA engineered innovation into their ongoing work?
- How does NASA reinvent itself with new ideas as technology and political expectations change?
- Are there pearls (or take-aways) that you will be using in your system?
Looking Ahead: Afternoon Process

- **Reflect** on what you observed
- **Harvest** core concepts
- **Generate** ideas to apply in your own organization

FROM IDEAS TO ACTION
Translating what we have learned....

Our NASA Observations

SYNTHESIS

Core Concepts/Themes

TRANSLATION

Ideas and solutions for our health care problems

Core concepts vs. Specific ideas

Vague, strategic, creative

Improve process to reduce anxiety

Give patients and families access to information

Use beepers for family and friends waiting

Specific, actionable, Ideas

Make beepers available to families of all surgery patients 1 day next week
### Step 1 - Observations

- Write down your ideas or observations, one per sticky note
- Aim for quantity, not quality
- Be creative – use both sides of your brain!
- Share with your table round robin style and place on flip chart paper

### Step 2 – Find the Concepts

- As a group at your table, group the observations together by general concept (i.e., affinitize the observations)
  - What general concepts are reflected in your observations?
  - Any observations that don’t fit into a concept?
  - Any concepts missing that you think are important?
- Be prepared to share your observations and concepts with the larger group
Step 3 – Apply the Concepts!

- Select one “problem” per table
- Identify concepts generated today that can help address the problem
- Generate three ideas about how one of the general concepts could be applied to the selected “problem”
- Be prepared to share your ideas with the larger group

Wrap Up

- What surprised you about what you observed and learned today? Why?
- How might you capture the spirit of what was done today to engage your own organization?
- Have you identified an area in which you would use this technique of observation and idea generation?
- What might you test in your own organization by next Tuesday? How will you evaluate its success?
Thank You!

Marian Bihrle Johnson
Director, Innovation
mjohnson@IHI.org
@mariambjohnson

Ninon Lewis
Executive Director
nlewis@ihi.org
@ninonlewis

Innovation @ IHI
Our Mission
To improve health and health care worldwide.

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Who We Are
IHI is a leading innovator in health and health care improvement worldwide, joining forces with the IHI community to spark bold, inventive ways to improve the health of individuals and populations.

Why IHI Focuses on Innovation?

Other industries have something to teach healthcare

Systems are designed to achieve the results that they are achieving

More ambitious aims: old ideas aren’t good enough
Theory – Bridging

Innovating for Impact @ IHI

Invention
- Therapeutics
- Diagnostics
- Services
- Technologies

Implementation
- Widespread Practice
- Spread & Scale-up
- Improved Process
- Changed outcomes

Our Initial Innovation Process

- Integrated into project teams
- Created great ideas
  - Bundles
  - Reliability
  - 'Move Your Dot'
- Good, but not good enough
What Was Missing

- Pace
- Staff with dedicated time
- Predictable results
- A forum for problems that needed innovation
- A reliable mechanism to transfer an idea into program development

A Test: Autumn 2006

Create a small team with dedicated resources

- Based on Huston and Sakkab’s Connect and Develop description of Proctor and Gamble’s innovation method Work in 90-day increments
- Implement “waves” of at least five projects

IHI Innovation Process

- A specific challenging question to be answered
- A network of innovators, along with other traditional methods (literature search, prototype testing)
- A specific timeline, in this case 90 days
- A set of recommendations at the end of each cycle

Components of a 90-Day Learning Cycle

<table>
<thead>
<tr>
<th>Scan</th>
<th>Focus</th>
<th>Summarize</th>
</tr>
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<tbody>
<tr>
<td>Review, conduct interviews &amp; select an angle</td>
<td>Visits, tests, analysis &amp; concept design</td>
<td>Validate, write up &amp; handoff to projects</td>
</tr>
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What goes into the Translational Step?

- Frameworks
  - Triple Aim
  - Execution Framework
  - Pop health business model
  - High Impact Leadership

- Improvement Methods
  - Real-time demand capacity for flow
  - BTS Collaborative
  - Innovation Relay

- Tools
  - Bundles & Checklists
  - Trigger tools
  - Waste removal tool
  - Whole system measures

- Applying Improvement Science to new fields
  - Pre-hospital Emergency care
  - Policy & government

Three General Themes for Projects

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## What Happens To These Projects?

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Red = Waiting  Green = Became a Program  Blue = In Use in Other Programs

## Innovation Methods Spectrum

### Innovation Lab
- With Client: Client has dedicated time for engagement
- Need a solution quickly: 6 weeks
- Clarity in the problem that needs a solution
- Problem needs a design solution
- Prototype is emphasized over principle
- Building and exercising prototypes leads to learning
- Produces a tailored solution
- Converges to a solution

### 90-day Learning Cycle(s)
- For Client: Client has limited time for ongoing engagement
- Not immediate need: 3-6 months
- Problem still needs definition and articulation
- Problem needs a research solution
- Principle is emphasized over prototype
- Articulating/validating theories inspires/informs developers
- Produces a broader deliverable
- Converges to a theory

### Innovation Relay
- For Client: Client has limited time but desires engagement at all levels
- Clarity in the problem that needs a solution
- Problem needs a team-based approach to finding a solution
- Prototype is emphasized over principle
- Building and exercising prototypes leads to learning
- Produces an energized set of creative teams
- Converges to a set of solutions