Model for Improvement, Part 2
The PDSA Cycle
A Model for Learning and Change

When you combine the 3 questions with the PDSA cycle, you get...

...the Model for Improvement.

PDSA Experience

• Raise your hand
  – If you know what PDSA stands for
  – If you have ever run a PDSA cycle
  – If you have run a complete PDSA Cycle in one day
Sequential Learning: Repeated Use of PDSA Cycles

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?

Act | Plan | Study | Do

Evidence & Data

Theories, hunches, & best practices

Develop a change

Test a change

Implement a change

Spread Improvement

Breakthrough Results

California Hospital Engagement Network
Learning the Sequence

1. What are we trying to accomplish?
   - We have found a new technology represented by a sequence that can help our organization improve patient safety. We want to discover the rule (or theory) that generated this sequence.
   - Each table is an improvement team and should run a series of tests to determine the rule. When you are sure that you have the rule (based on enough trials), then implement the technology in your organization.
Learning the Sequence

2. How will we know that a change is an improvement?
   - Correct predictions of the results of tests
   - A statement of the correct rule upon implementation
3. What changes can we make that will result in improvement?

- Each team can test one sequence on each cycle. Write down the specific sequence (example) being tested. The faculty will classify your sequence as either conforming or not conforming to the rule.

- Run as many cycles (tests) as required until you are sure you know the rule. Keep track of the number of cycles, and whether the example test sequence was conforming or not conforming to the theory (rule) you have proposed.

- When testing cycles are complete, wait until all teams are done to report the implementation cycle (state the rule to the faculty).
## Results of the Sequence Technology Improvement Efforts

<table>
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<th>PDSA Cycle</th>
<th>Theory for the Sequence</th>
<th>The Sequence</th>
<th>Correct</th>
<th>Not Correct</th>
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**Rule for Implementation:**

- 2, 4, 6
2-4-6 Sequence Game

What are your observations?
Test Early and Often!

Key Lessons from the 2-4-6 exercise

• We need to identify the theories and assumptions in our project and test them early and often.
  
  – That’s the mechanism that leads to effective innovation and better results!

• Avoid the Confirmation trap
Sequential Learning: Repeated Use of PDSA Cycles

Model for Improvement

- What are we trying to accomplish?
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Theories, hunches, & best practices

- Develop a change
- Test a change
- Implement a change
- Spread Improvement

Evidence & Data
A PDSA Cycle

Act
• What changes are to be made?
• Next cycle?

Plan
• Objective
• Questions and predictions (why)
• Plan to carry out the cycle (who, what, where, when)

Study
• Complete the analysis of the data
• Compare data to predictions
• Summarize what was learned

Do
• Carry out the plan
• Document problems and unexpected observations
• Begin analysis of the data
Teachback: First PDSA

• **Objective:** Use Teachback to improve patient understanding of their care plan

• **Questions:** How much more time will it take to “close the loop” for patients? Will it be worthwhile? Will we have the information we need to answer their questions? What will we do if they don’t understand?

• **Predictions:** It will take more time at first (5-10 min per patient) but we will start to learn better communication skills, and the extra time will feel worthwhile (and possible prevent future rework); we will have the answers to their questions; If patients are not able to explain back their care plan, we will need to adjust it.

• **PLAN:** On Monday, each resident will test using teachback on the last patient of the day.
Teachback: First PDSA

DO: Three residents attempted teachback at the end of the day on Monday. Two residents did not find anything they needed to ask patients to teachback on. Jane found that her patient did not understand the medication schedule for her child and they were able to review it and at the end she was confident the mom was going to be able to give the medication appropriately.

STUDY: It was a real eye-opener for Jane on the assumptions she had been making about the clarity of the medication info sheets she had been handing out – she realized these should be re-written – maybe with the input of some parents.

ACT: Jane is planning to use teachback any time she prescribes medication – although it may take more time she now understands the importance. The other residents are going to work on using teachback specifically for medications for the next week. They would like to pull together a team to work on some of the medication information sheets with parent input but they are tabling this till they figure out when they can work on it.
A PDSA Cycle

Act
- What changes are to be made?
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A: focus more testing on using teachback for meds;

P: Try teachback with one patient at the end of the day

S: There is not always an opportunity for teachback, but medications are a big opportunity; written materials are not patient friendly

D: Jane learned her patients don’t always understand how to take their meds!
PDSA Objective: Improve Patient Understanding Through Use of Teachback

Will asking patients to teachback uncover gaps in understanding that will improve patient adherence to care plans?

Cycle 1/Day 1: residents on Monday will use teachback on the last patient of the day

Cycle 2/Day 2:

Cycle 3: Residents decided to focus use of teachback on medication instructions – all patients with new meds Tuesday-Friday

Cycle 5: Pat (nurse expert) will conduct a workshop on teachback for all residents

Residents discovered nursing expertise in teachback – for one week, Pat will shadow 1 pt/day who is likely to need new meds and give them feedback on their teachback technique

Improved patient understanding

Appt cycle time, ability to teachback

Will asking patients to teachback uncover gaps in understanding that will improve patient adherence to care plans?
The Sequence of Improvement

Developing a change

Theory and Prediction

Testing a change

Make part of routine operations

Implementing a change

Sustaining improvements and spreading changes to other locations

Test under a variety of conditions

Data are used throughout the sequence

Act

Plan

Study

Do
Guidance for Testing a Change Concept

- A test of change should answer a specific question!
- A test of change requires a **theory** and a **prediction**!
- Test on a small scale and collect **data over time**.
- Build knowledge **sequentially** with multiple PDSA cycles for each change idea.
- Include a **wide range of conditions** in the sequence of tests.
- Don’t confuse a **task** with a **test of change**!
Smaller Scale Tests: Oneness

Conduct the next test

- in 1 facility
- in 1 office or ward
- with 1 nurse
- with 1 physician
- with 1 patient

Start Small ~ 1:3:5:All
Shrink the Timeframe!

- Years
- Quarters
- Months
- Weeks
- Days
- Hours
- Minutes

Drop down next “two levels” to plan test cycle!
More Tips for Testing

- Test with volunteers
- Use simulation (you don’t need a computer!)
- Do not worry about getting buy-in, consensus, committee approval, etc.
- Be innovative to make test feasible
- Collect useful data during each test
- As cycles proceed, test over a wider range of conditions
- Conduct rapid tests in short periods of time
“Knowing begins and ends in experience; but it does not end in the experience in which it begins.”

From C. I Lewis: Mind and the World Order (1929)
Quoted in Exploring the epistemological origins of Shewhart’s and Deming’s theory of quality Influences from C.I. Lewis’ conceptualistic pragmatism, Mauleon, C and Bergman, B. International Journal of Quality and Service Sciences. Vol. 1 No. 2, 2009 pp. 160-17
Failed Test…Now What?

- Be sure to distinguish the reason:
  - Change was not executed
  - Change was executed, but not effective

- If the prediction was wrong – not a failure!
  - Change was executed but did not result in improvement
  - Local improvement did not impact the secondary driver or outcome
  - In either case, we’ve improved our understanding of the system!
The Value of “Failed” Tests

“I did not fail one thousand times; I found one thousand ways how not to make a light bulb.”

Thomas Edison
October Sky PDSAs
How many PDSAs do they run?
Working in Parallel on Multiple Change Ideas or Drivers

Risk assessments
Clinical management meetings for those with PUs
Caseload cleansing and management
Staffing levels
Aim: To reduce pressure ulcers acquired within the ELFT extended primary care service (EPCS).
PDSA Worksheet

PLAN your next PDSA
- What could you plan to learn when you get back to work?
- Don’t forget Question and prediction!
- What’s the smallest scale test you could learn from?

MODEL FOR IMPROVEMENT

Objective for this PDSA Cycle

DO: CARRY OUT THE CHANGE OR TEST; COLLECT DATA AND BEGIN ANALYSIS.

STUDY: COMPLETE ANALYSIS OF DATA; SUMMARIZE WHAT WAS LEARNED.

ACT: ARE WE READY TO MAKE A CHANGE? PLAN FOR THE NEXT CYCLE.