Using Lean to Implement Best Practices

UCSF CORE LEADERSHIP RETREAT
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Why Lean?

- As scientists, you are trained to use a rigorous systematic approach to solving scientific problems.
- Administrative and operational problems are *often* approached in a different way, and we are less successful at solving these types of problems.
- Lean is a variant of the scientific method and can be applied to operational and administrative problem solving.
Scientific/Technical Problem Solving

Example: **Experiment did not work; problem with data**

1. **Brainstorm causes**
   - Instrument failure?
   - Reagent gone bad?
   - Human error?

2. **Investigate and gather evidence**
   - Dig into data
   - Ask questions
   - Listen
   - Go into lab to observe

3. **Develop a Hypothesis**

4. **Do an experiment to test that hypothesis**

5. **Analyze data, adjust hypothesis, and try again**

6. **Implement change to prevent problem from occurring again**
Administrative/Operational Problem Solving

Example: **Antibody ran out**

1. **Brainstorming**
   - Nobody in charge of ordering?
   - Staff too busy to do inventory?

2. **Investigate and Gather Evidence**
   - Dig into data
   - Ask Questions
   - Go into Lab to observe instrument or staff at work
   - Listen

3. **Develop a Hypothesis**

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Antibody ran out

1. Brainstorming
   Nobody in charge of ordering?
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2. Investigate and Gather Evidence
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   Ask Questions
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   Listen

3. Develop a Hypothesis
   Do an experiment to test that hypothesis
   Analyze data, adjust hypothesis and try again

4. Problem reoccurs; back to square one

5. Implement change to prevent that problem from occurring again
Key Principles

Lean is a system of thinking and acting
- By people, not TO people
- Supporting culture is central
- Make things easier

Central Principles of Lean
- Respect people in the process (customers, employees, partners, community)
- Engage people who do the work
- Increase value from the customer’s perspective
- Develop eyes to identify and reduce waste
- Analyze and solve problems; create repeatable processes
Model for Continuous Improvement
Plan – Do – Check – Adjust (PDCA)

- Presenting problem
- Root cause(s)
- Ideal state
- Ideas to get there
- Make standard
- Do, check, adjust
A3 Thinking for Problem Solving

The TOOL...

- A3 is paper size (11x17)
- Tells a story that anyone can understand
- A plan to solve a problem or make an improvement, on one sheet of paper
- The most important thing is the process and thinking behind creating an A3, NOT the format!

The PROCESS...

- A disciplined thinking process for solving problems and implementing a plan
- Leverages critical reasoning and problem solving skills; a structure to coach and develop this skill in others
- Promotes communication and engagement within a team, department, or organization
Title: What you are talking about?

I. Background
Why are you talking about it?

II. Current Conditions
Where do things stand today?
- Show visually using charts, graphs, drawings, maps, etc.
What is the problem?

III. Goals/Targets
What specific outcomes are required?

IV. Analysis
What is the root cause(s) of the problem?
- Choose the simplest problem-analysis tool that clearly shows the cause-and-effect relationship.

V. Proposed Countermeasures
What is your proposal to reach the future state, the target condition?
How will your recommended countermeasures affect the root cause to achieve the target?

VI. Plan
What activities will be required for implementation and who will be responsible for what and when?
What are the indicators of performance or progress?
- Incorporate a Gantt chart or similar diagram that shows actions/outcomes, timeline, and responsibilities. May include details on specific means of implementation.

VII. Followup
What issues can be anticipated?
- Ensure ongoing PDCA.
- Capture and share learning.
Steps of A3 Thinking

**Title** – What are you talking about?

1. **Background** – Why are you talking it about it? Why this, why now?
2. **Current Condition** – Where do things stand today?
   **Problem Statement** - What is the problem or performance gap? What is getting in the way of us achieving goal(s)?
3. **Goal Statement/Target Condition** – What specific outcome(s) are required (to get to future state)? What do you want to bring into existence?
4. **Analysis** – What is the root cause(s) of the problem? Reasons for why the problem exists?
5. **Proposed Countermeasures (experiments)** – What is your proposal to reach the future state or target condition?
6. **Plan** – What activities will be required for implementation and who will be responsible for what and when? What are the indicators of performance or progress? How much improvement and by when?
7. **Follow-up** – What issues can be anticipated? How can you ensure ongoing check/adjust? How do you capture and share the learning from the experiment?
Force Field

FORCE FIELD ANALYSIS

CONTRIBUTING FORCES

GOAL:

RESTRAINING FORCES
Force Field Exercise

1. Each of you individually, use a blank sheet of paper
2. Write your target ‘best practice’ in a middle box; this target is where you want to get to
3. Write down contributing forces (+) on the left side of the paper
4. Write down restraining forces (-) on the right side

Take 5 minutes to do this
Force Field Exercise - Reflection

What came up for you during this exercise?

• What did you know?
• How did you know it?
• What do you still need to learn?
• How will you learn it?
UCSF Core Facility Real World Examples
Core Immunology Lab

**Problem:** New study intake process was cumbersome and slow and created a bottleneck in getting new studies started

**Outcome Examples:**

- **Improved financial intake form to reduce emails and capture all relevant information**
  - Time spent on back and forth with PIs has been reduced
  - In addition this form saves time spent on billing

- **Developed a Change Order Form as PIs frequently make changes to study requirements after price has been agreed and this was not always captured for billing**
  - *Not found to be useful*, instead alteration of original estimate was found to be more efficient to notify PI of new costs; this also feeds into the billing process (PDCA!)

- **Investigate Project Management Software**
  - Implemented use of “Smartsheet”, which improved flow of information from intake through billing
Problem: After a reorganization, the Tissue Core needed an internal review of current conditions to identify ways to increase customer value, reduce waste, and demonstrate respect for people.

Outcomes:

Created improvement actions to “make things better” for the technicians in the lab and ultimately the end customer:

1. Continue to re-organize the physical layout of the lab space
2. Improve the definition of roles and responsibilities
3. Improve the way we store and in turn locate SOPs and protocols
4. Fully prepare protocol and SOP for new and existing work; sufficient quality to do the work effectively and efficiently
5. Continue to improve staff meetings
Recap: Key Principles

- **Lean** is a system of **thinking** and **acting**
- **Respect** people in the process (customers, employees, partners, community)
- **Engage** people who do the work
- **Increase value** from the customer’s perspective
- **Develop** eyes to identify and **reduce waste**
- **Analyze and solve problems**; create repeatable processes
Example: Using 5-Why to explore root cause of core deficit

Why?

overstaffed

Presenting Problem: Immunology Core has a deficit that continues to increase

Why?

Expenses exceed income most months

Why?

Not all work that is done is billed

Why?

Data Analysis work not fully costed

Why?

Analysis takes longer than in the past

Why?

Analysis has become more complex as number of parameters have increased
Problem – **Core in deficit, expenses exceed income most months**

- **Expenses exceed income most months**
  - Not all work that is done is billed
  - Some services not fully costed
    - Core expected to provide some services for free
    - Complexity of science, difficult to bill
    - Data analysis has become more complex as number of parameters have increased
    - Study set up has become more complex
    - Specimen processing has become more complex
    - Time of year
    - NIH grants do not go far in Bay Area costs higher than other institutions
    - PI's can't pay higher prices needed to increase salaries
    - Manager has too many responsibilities
    - PI's can't pay higher prices
    - Support junior investigators
    - NIH grants do not go far
  - Two new hires did not work out
    - Pool of applicants small not qualified
    - Delays in getting new studies started
    - Bottleneck with Core Manager
      - UCSF listing hard to find
      - Salaries not competitive
      - Desire to make sure everything perfect, slows down decision making
    - Expenses exceed income most months

*In reality, it can be very complex!*
Unnecessary movement of samples between poorly organized equipment

Ordering and storing excess of bulky lab supplies

Equipment distributed in different labs (people moving)

Core managers doing a lot of administrative work

Specimens/customers showing up late

Over the top quality control (more than is needed)

Making more aliquots of a sample than you need for planned experiments

Failing to annotate samples when collecting data