Sling Health Didactic Segment & Group Learning Exercise

“Identifying Clinical Problems and Needs-Oriented Innovation Opportunities”
Sling Health: Our Story and Mission

- Est. in 2013 in STL by medical students to make healthcare entrepreneurship more attainable for medical trainees
- Developed an 8-month-long program for students to form teams and solve pressing clinical problems with coordinated mentorship from industry and clinical medicine
- National network includes 11 Sling Health chapters at 16 top universities
- Collaborators with the AMA to further promote entrepreneurial opportunities for medical students
  - Clinical Problem Database (CPD)
Our Objective Today

1. To introduce the concept and practice of writing Need Statements
   a. Critical initial step in need-oriented entrepreneurial, innovation, and quality improvement (QI) initiatives

2. Empower student attendees to identifying opportunities to improve healthcare through entrepreneurship, innovation, and QI

Why the MSS?
○ Medical students are uniquely positioned to gather critical insights to the comprehensive care experience as experienced by each key stakeholder
Why Start with a Need?

Starting with an unmet clinical need is paramount to assuring innovations solve real medical problems and protect against expensive technologies that drive up cost without adding value to patient care.

“The best way to get startup ideas is not to try to think of startup ideas. It’s to look for problems.”

- Paul Graham (Y-combinator)
What is a Need Statement?

“Need statements articulate the problem and the change in outcome that is required to satisfy the clinical dilemma” - Stanford Biodesign

Includes three essential components:
1) Problem  
2) Impacted population  
3) Targeted Change in Outcome

Examples:

- Need: “A way to prevent urinary tract infections in ICU patients that decreases hospital stay” - Stanford Biodesign
- Need: A way to remotely monitor the progression of AMD that is proficient and convenient for the patient to use.
Step 1: Develop a Point of View

1. Identify Stakeholders
   Be mindful of each group’s unique perspective and experience.

2. Observe Patterns
   What are providers always struggling with?
   What do patients constantly complain about?
   What risk factors are frequently mentioned?

4. Critically Reflect
   Have you observed recurrent negative outcomes? Explore ways to shorten the clinical learning curve. Identify problems faced by both students and senior providers.

5. Interview
   Engage each stakeholder. Ask what their greatest challenges are. **Don’t ask their opinion on a solution -- ask about their specific problems.**

6. Read
   Brainstorm ways to bring cutting edge diagnostics and therapeutics to care.
Real-World Example

Observations:
- Difficulty advancing biliary stents
- Claimed discomfort over many ERCP procedures

Problem: Physicians experience pain in their hands, neck, and back due to manual advancement of stents through an endoscope. Over many repetitions, this can lead to cumulative trauma disorders and/or shortened practice.
Step 2: Develop a Need Statement

Generic Format: A way to address [problem] in [population] that [outcome]

Characteristics of a Good Need Statement:

- “Solution Free”
- Actionable
  - Avoid overarching Need Statements
- Appropriate Scope
  - Don’t limit the range of possible solutions
- Not stuck in current practice
- Based on observation, not speculation
  - Validate your Need Statement -- it’s an iterative process!
Pitfalls of Poor Need Statements

Solution Embedded: A urinary catheter that decreases the incidence of urinary tract infection in ICU patients
  - Limited scope for potential solutions (only considers catheters)

Too Broad: A way to improve outcomes of spine surgery
  - Not actionable; outcome is ambiguous and not quantifiable

Stuck in Current Practice: A way to close sternotomy that reduces risk of sternal-wire breaking
  - Limited scope for potential solutions
A way to assist the endoscopist in advancing stents that reduces cumulative trauma and improves longevity of practice.
Audience Exercise

Assemble into groups. Write Need Statements based off personal experiences/first-hand observations.

Potential Topic Areas:

- Cardiovascular Health
- Surgery
- Mental Health
- Management of Chronic Conditions (DM, HTN, COPD)
- End of Life Care
End; Extra Slides Below
Keys of a Good Need Statement

- Based on observation, not speculation
  - Validate your Need Statement -- it's an iterative process!
- “Solution Free”
- Appropriate Scope
  - Don’t limit the range of possible solutions
- Embraces constraints

FIGURE 1.3.1
Embedding a solution within a need can dramatically limit the number and types of solutions that an innovator eventually explores.
Launching Medical Technology Entrepreneurs
Empathize: Develop a deep understanding of the challenge

Define: Clearly articulate the problem you want to solve

Ideate: Brainstorm potential solutions; select and develop your solution

Prototype: Design a prototype (or series of prototypes) to test all or part of your solution

Test: Engage in a continuous short-cycle innovation process to continually improve your design
1. Needs Finding
2. Needs Screening
3. Concept Generation
4. Concept Screening
5. Strategy Development
6. Business Planning

Phases:
- Identify
- Invent
- Implement

Stages:
- 1. Needs Finding
- 2. Needs Screening
- 3. Concept Generation
- 4. Concept Screening
- 5. Strategy Development
- 6. Business Planning

Project Launch
Research saying we need clinical innovators

https://jamanetwork-com.ezp-prod1.hul.harvard.edu/journals/jama/article-abstract/1669828
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4424228/#CR11

Couldn’t really find something like they had suggested in the email