

Systems as Patients

Leveraging Design & Innovation Methodology for QI

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Learning Objectives

- *By the end of this session, participants should be able to:*
 - *List at least 3 frameworks used for health systems problem-solving*
 - *Describe how each of these frameworks vary slightly from each other and from the scientific method*
 - *Compare the cognitive approach to solving problems for a patient and for systems*
 - *Design a health system innovation project plan leveraging the Systems as Patients framework*

Disclosures

- *AMA Reimagining Residency Grant*
- *AMA Subject Matter Expert Honorarium*

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- *“Funding for this presentation was made possible by cooperative agreement U1OHA30535 from the Health Resources and Services Administration HIV/AIDS Bureau. The views expressed do not necessarily reflect the official policies of the Department of Health and Human Services nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government. Any trade/brand names for products mentioned during this presentation are for training and identification purposes only.”*

Level Setting at the Risk of Patronizing

- **Process** - A series of steps
- **System** - A collection of interconnected people, processes, and infrastructure (both physical and virtual) arranged in a way that produces a pattern of behavior or a goal
- **Quality Improvement (QI)** - A discipline focused on enhancing healthcare safety, effectiveness, patient-centeredness, timeliness, efficiency and equity¹ by making changes to systems
- **Innovation** - A discipline focused on rapid validation; testing value-producing ideas faster, less expensively, and more reliably²

1. Corrigan, J.M., 2005. Crossing the quality chasm. *Building a better delivery system*, 89.
2. Asch, D.A. and Rosin, R., 2015. Innovation as discipline, not fad. *N Engl J Med*, 373(7), pp.592-594.

*Tools, not formulas.
Hand tools, not power tools.*



Photo Credit: Wikimedia Commons

Dr. Edward Jenner

- Created the world's first vaccine (Smallpox) in 1796.



Photo Credit: Wikimedia Commons

Dr. Donald Henderson

- Spearheaded WHO efforts to eradicate Smallpox from 1967-1977.
- Smallpox declared eradicated in 1980, 184 years after vaccine invented.

Lecture Outline

- Problems
- Problem-Solving

Problems

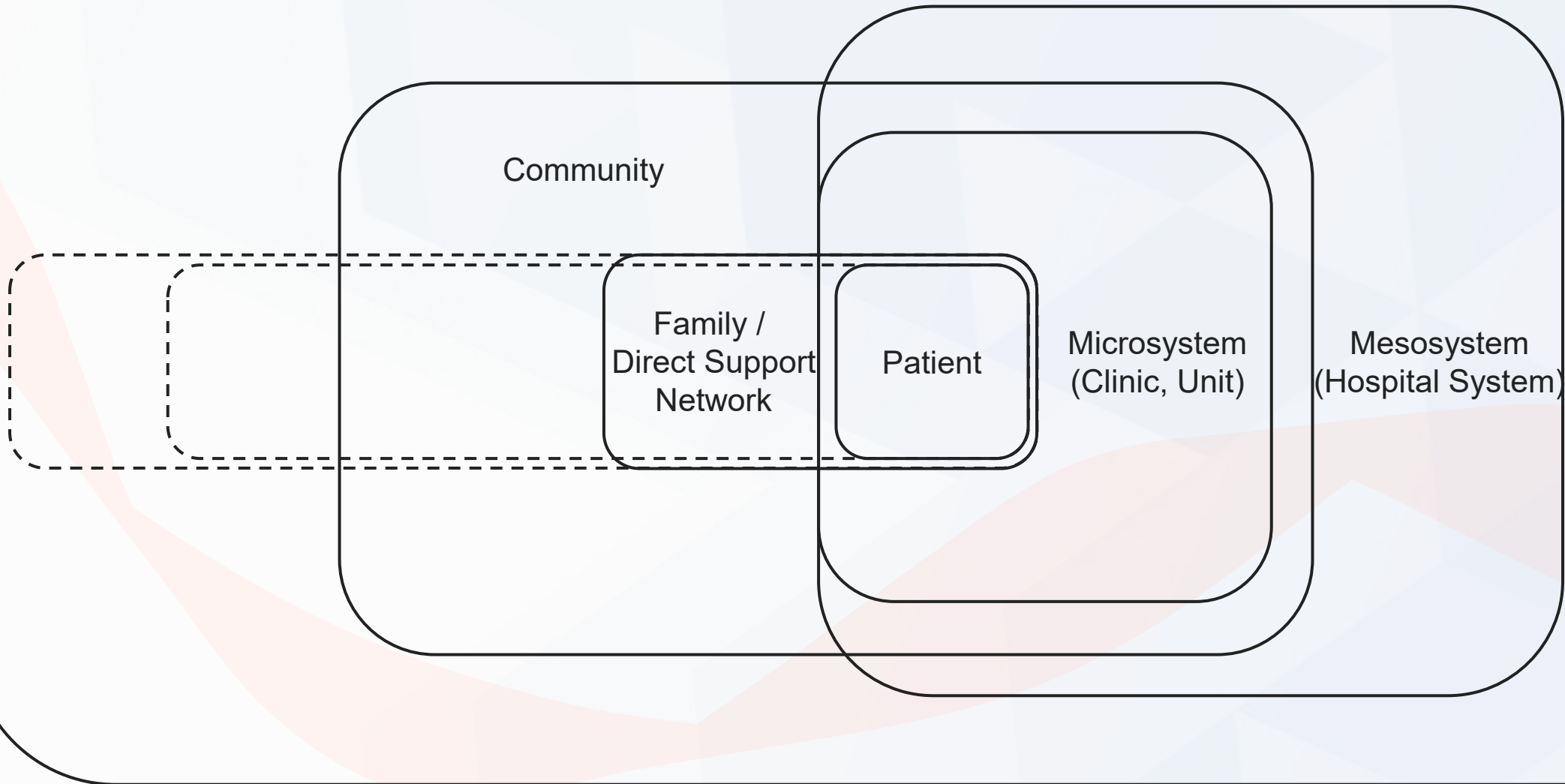
Wicked Problems

“Problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing.”

C.W. Churchman

Churchman, C. W. *Wicked Problems*. *Guest Editorial of Management Science*, vol. 4, no. 14. B-141-42, 1967.

US Healthcare Macrosystem



Impact of Social Determinants of Health

Drivers of Health Outcomes

- Health Care: 20%
- Health Behaviors: 30%
- Physical Environment: 10%
- Socioeconomic Factors: 40%

What can I do?

What can I do?

- Things were designed this way at some point for a reason.
- I don't have the skillset to fix anything this complex.

Unlearning Objectives

- ~~■ Things were designed this way at some point for a reason.~~
- ~~■ I don't have the skillset to fix anything this complex.~~

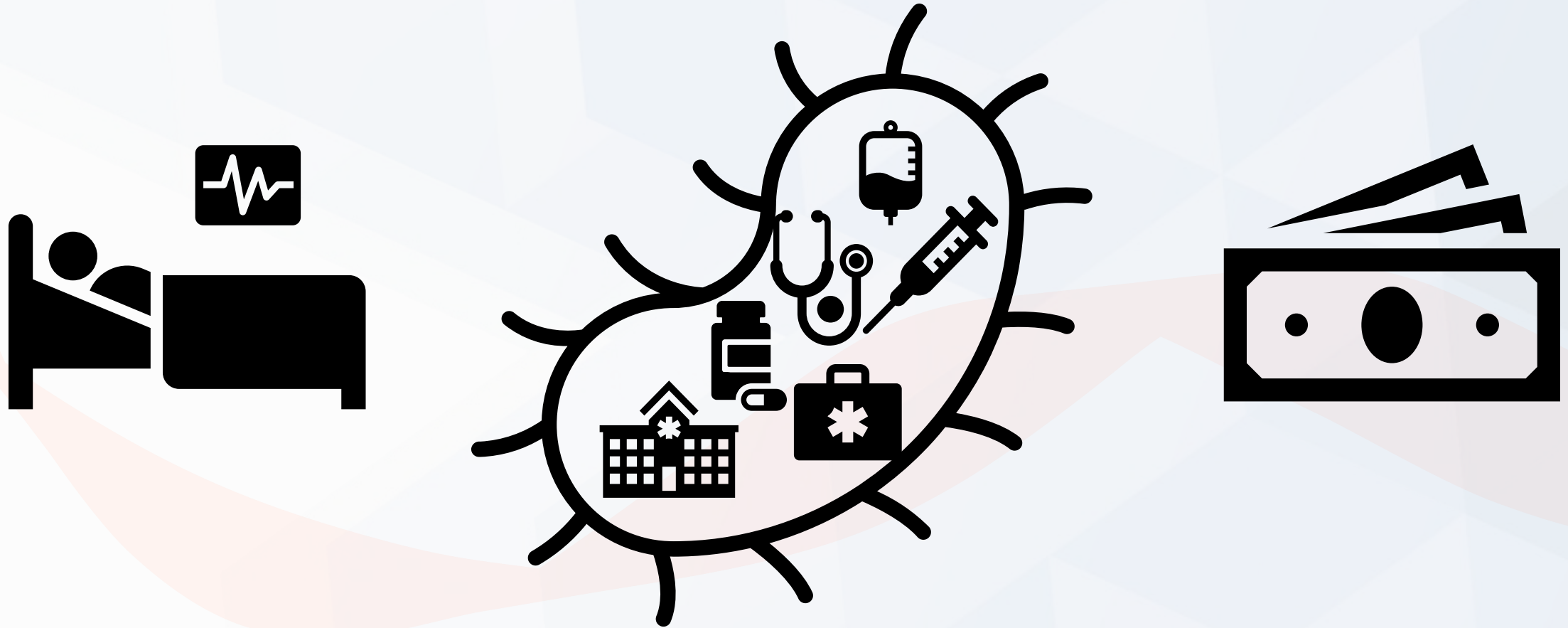


U.S.
healthcare
was never
designed

A Brief History Lesson

- The end of WWI brought on massive inflation.
- To avoid this after WWII, Congress passed the Stabilization Act of 1942.
- All wages & salaries became fixed.
- Fringe benefits were not fixed.
- The employer-based health care system is born out of competition for employees.
- CMS formed in 1965.

Evolution of Health Care Delivery



Problem-Solving

How Humans Solve Problems

- System 1 & System 2 Thinking¹
- Lean Six Sigma
- IHI Model for Improvement
- Human-Centered Design / Design Thinking
- Double Diamond
- Biodesign

1. Kahneman, Daniel. *Thinking, fast and slow*. macmillan, 2011.

Lean Six Sigma

Lean

- Born out of Toyota Production System in 1950s
- Focus on eliminating waste
- Introduced a “Plan, Do, Check, Act” cycle of improvement

Six Sigma

- Born out of Motorola in 1980s
- Focus on reducing variability & minimizing defects
- Basis for a lot of statistical assessment of health systems

IHI Model for Improvement

- Formally founded in 1991
- Early applications of Lean & Six Sigma Principles in 1986
- “Model for Improvement” Created in 1993
- The Improvement Guide published 1996
- National Patient Safety Foundation formed 1997

Steps:

1. What are we trying to improve?
2. How will we know that a change is an improvement?
3. What change can we make that will result in improvement?
4. PDSA

A3 No. and Name	Team members (name & role)	Stakeholders (name & role)	Department	Organisation objective						
	1. 2. 3. 4.	1. 2. 3. 4.								
Team Leader (name & 'phone ext)				Start date & planned duration						
1. Clarify the problem		4. Analyse the Root Cause		7. Monitor Results & Process						
<p>Is:</p> <p>Is not:</p> <p>Problem statement:</p>										
2. Breakdown the problem					5. Develop Countermeasures	8. Standardise & Share Success				
		<table border="1"> <thead> <tr> <th data-bbox="1034 929 1523 961">Countermeasure</th> <th data-bbox="1561 929 2035 961">Impact on target</th> </tr> </thead> <tbody> <tr> <td data-bbox="1034 972 1523 1003">1</td> <td></td> </tr> <tr> <td data-bbox="1034 1015 1523 1048">2</td> <td></td> </tr> </tbody> </table>		Countermeasure	Impact on target	1		2		
		Countermeasure	Impact on target							
1										
2										
3. Set the Target		6. Implement Countermeasure								
1										
2										

Photo Credit: Wikimedia Commons

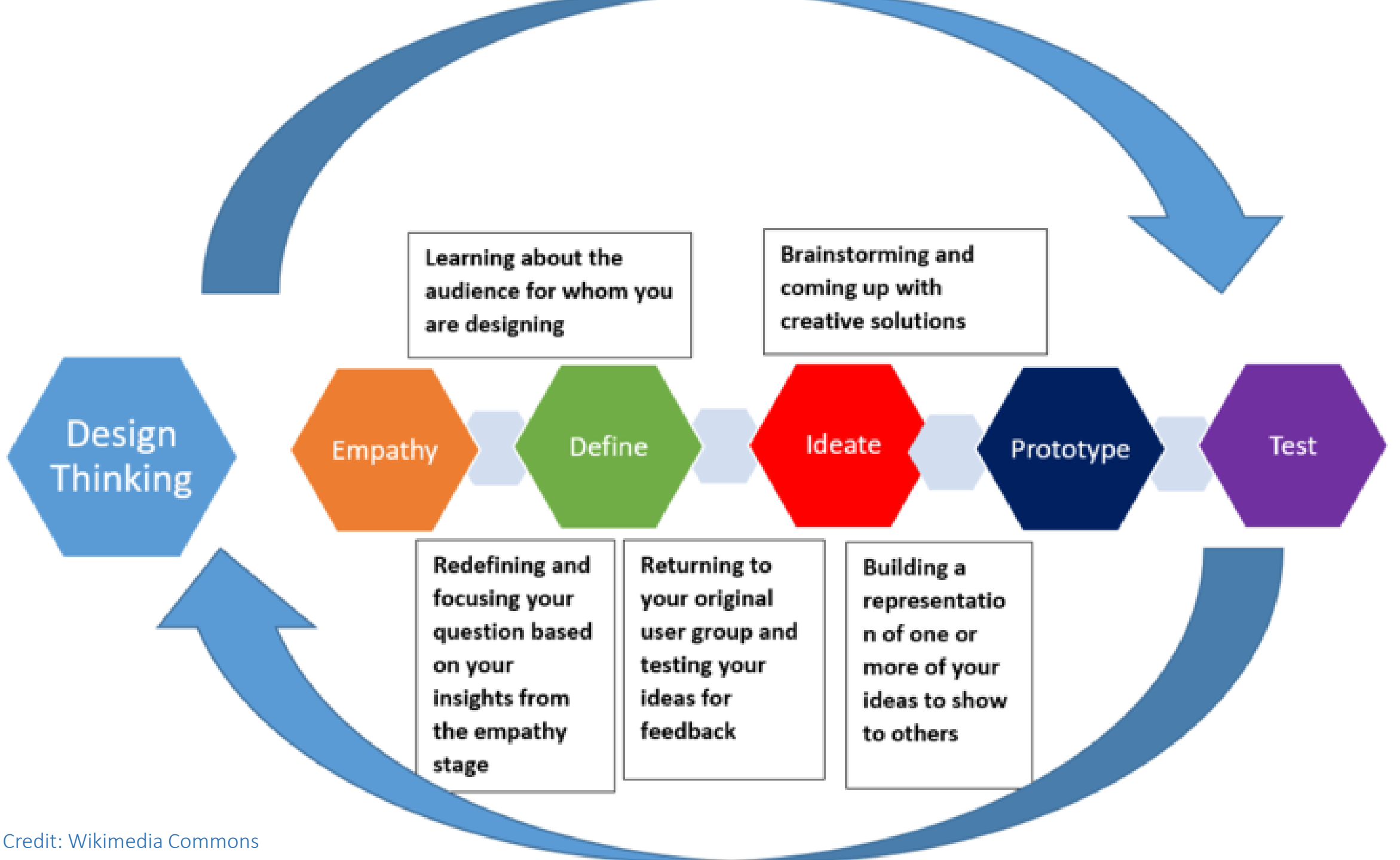
Human-Centered Design

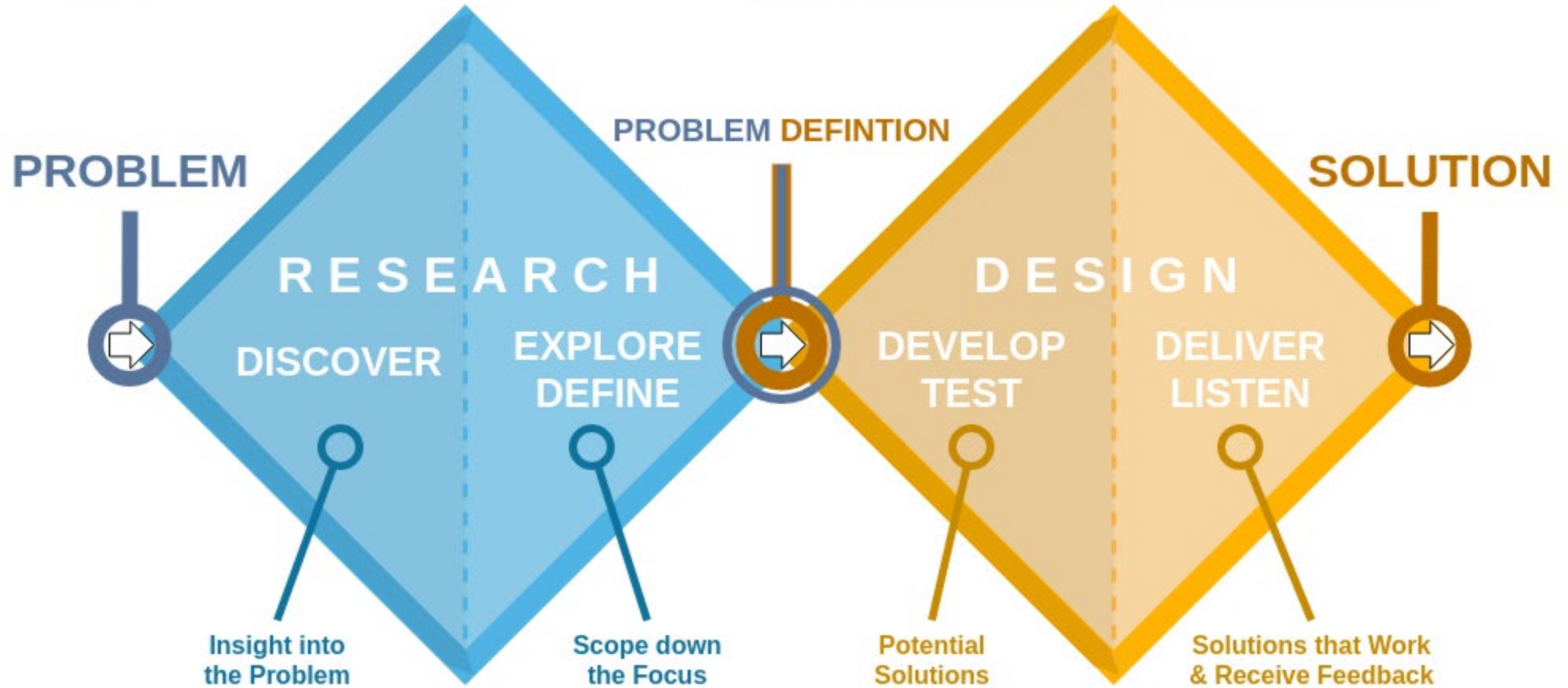
IDEO (1991)

- First Apple Mouse
- Personal Digital Assistants
- Countless Toys
- First Layperson AED
- Keyser's Patient-Centered Bedside Nurse Report

Stanford d.School

- Formalized “Design Thinking” as curriculum
- Shift from designing products to processes & experiences
- Target audience **not** designers





Biodesign

- Medical Device Network (MDN) formed in 1998
- Biodesign Program Evolved from MDN in 2000
- Process Formalized for Teaching and Program Launched in 2001
- Surgical Fellowship Developed in 2005
- Biodesign Textbook released in 2009

Biodesign Steps

- | | | |
|-------------------------|---|-----------|
| 1. Needs Finding | } | IDENTIFY |
| 2. Needs Screening | | |
| 3. Concept Generation | } | INVENT |
| 4. Concept Screening | | |
| 5. Strategy Development | } | IMPLEMENT |
| 6. Business Planning | | |
| 7. Launch | | |

The Common Ancestor

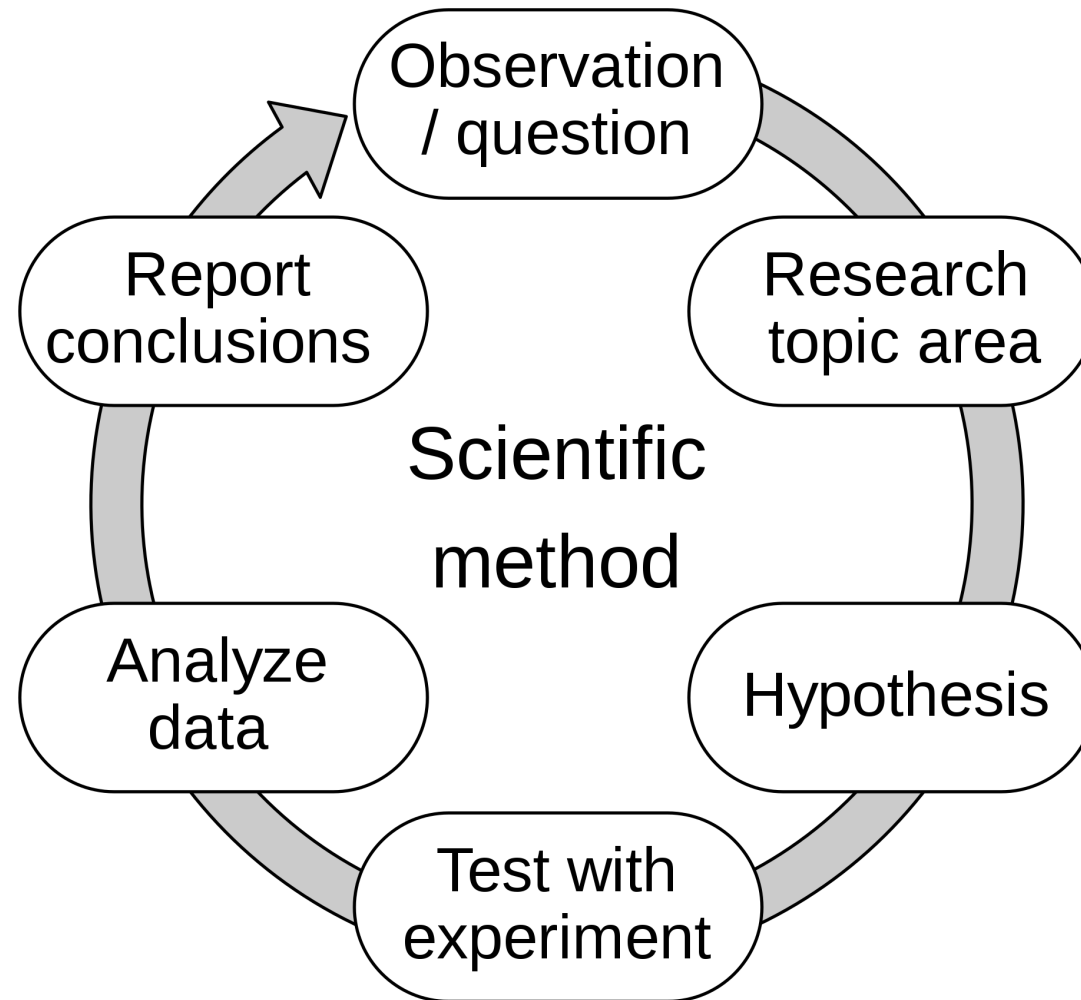


Photo Credit: Wikimedia Commons

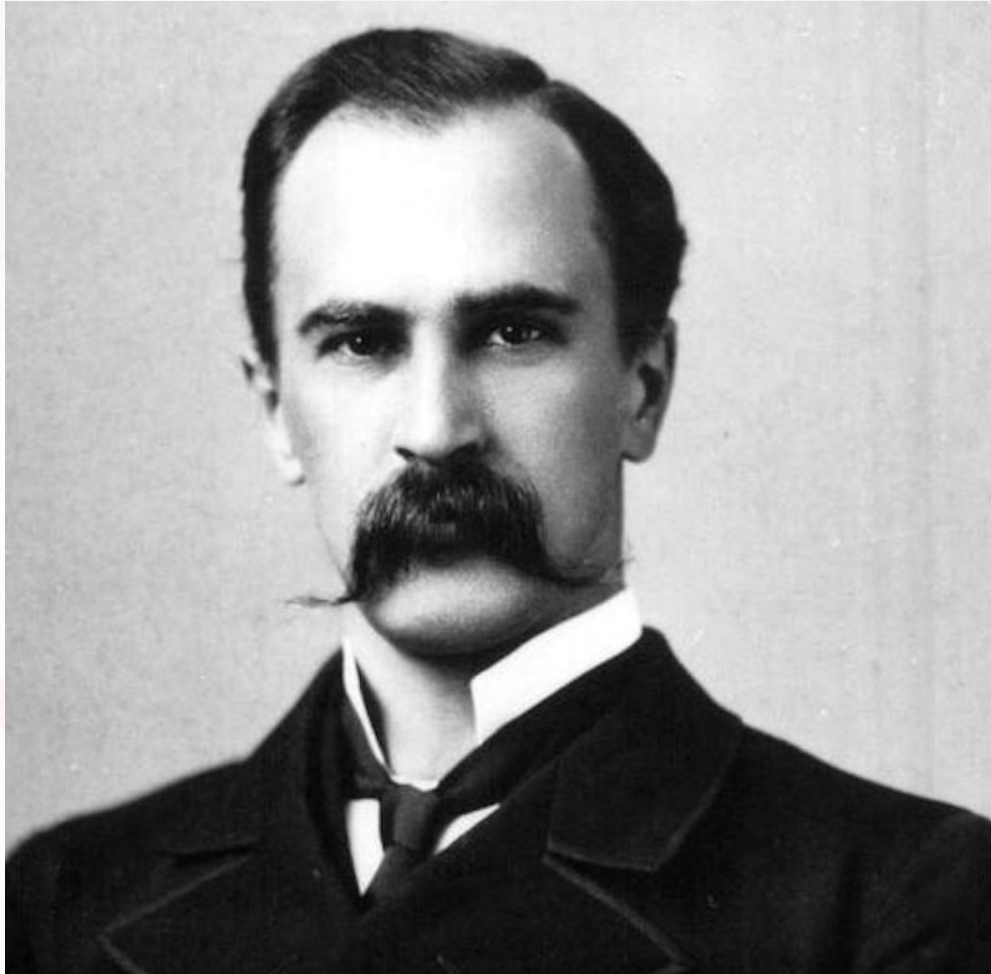
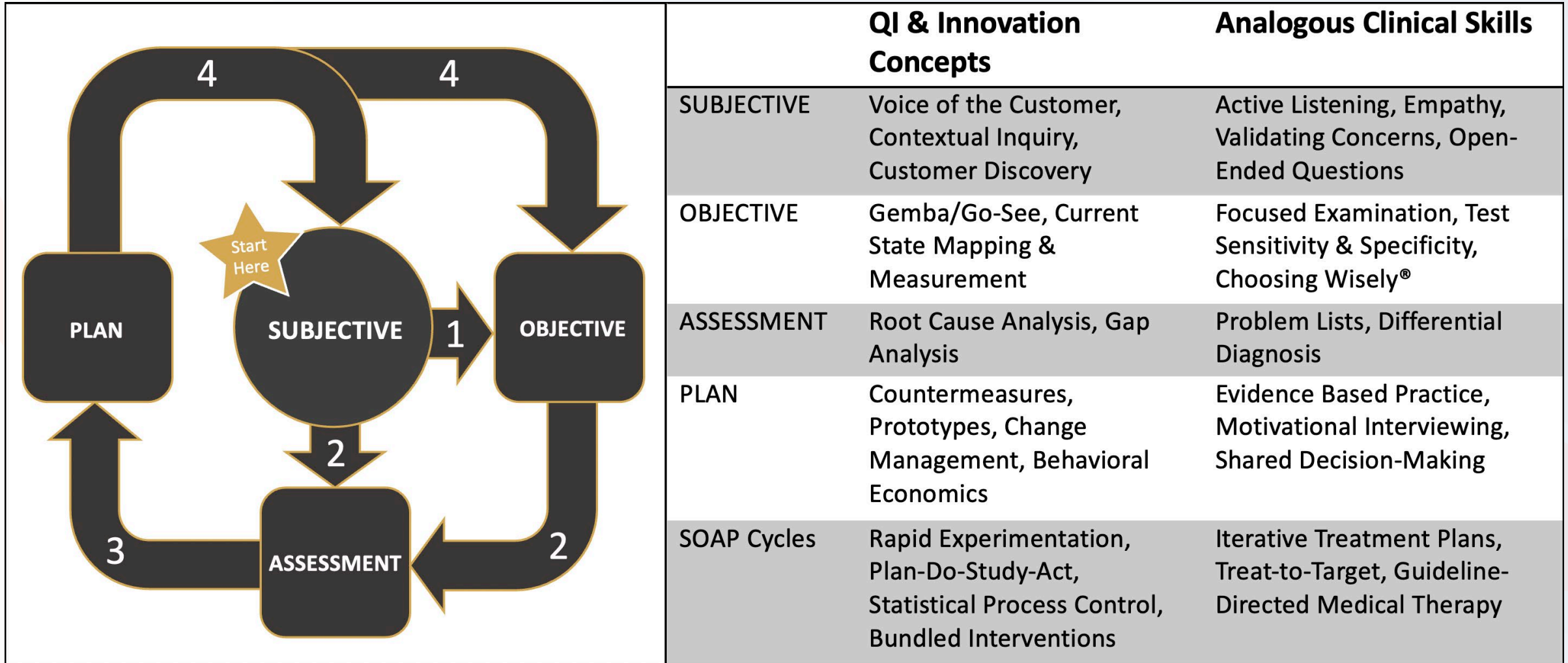


Photo Credit Wikimedia Commons



Dr. Lawrence Weed

Systems as Patients



Subjective

- Interview with empathy
- Solve problems for *others*
- Build rapport and trust
- Ask open-ended questions
- “Tell me more”
- “What do you think is going on?”
- Practice Active Listening
- Validate concerns

Objective

- Physical examination & data examination
- Driven by *Subjective*
- Must be present or immersed to examine
- Not a “shotgun” approach
- Best metrics (sensitivity & specificity) vs. available metrics

Assessment

- Start with a problem list
- “Ideas” & “Concerns” = “Features” & “Constraints” = Hypotheses
- Restructure problems as needs
- Formulate a problem representation/definition
- Translation of insights from *Subjective* & *Objective* into a shared mental model (system map)

Plan

- (In)validate hypotheses through experimentation
- Shared Decision-Making
- Motivational Interviewing
- Determine design features
- Determine design constraints
- Design
- Iterate

Systems as Patients Curriculum

- Developed iteratively over 12 implementations and counting
- 24 exercises from various disciplines leveraging clinical analogy
- Flexible formatting (workshop, elective rotation, capstone)
- Can be used as standalone resource or supplement other training opportunities

Use Cases

- PSOM Frontiers Course
- VUSM Medical Innovators Development Program
- VUMC GME Improvement & Innovation Consult Service
- VUMC-UMMC GME GOLLD Program Capstone
- VUMC GME Health Equity Elective Workshop
- Wond'ry Health Care IDEA Studio

Thank you!

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