

PEDSnet Scholars Program

2019-2020 Cohort

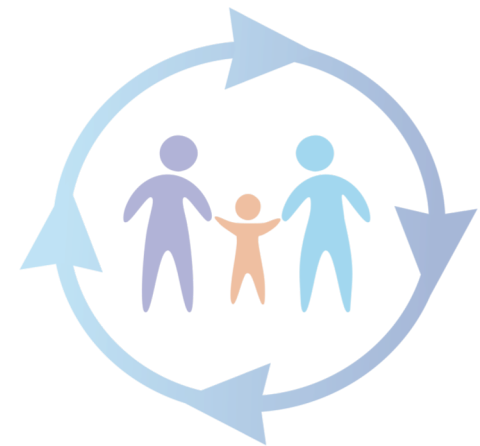
Introduction to Learning Health Systems

Learning Session #2

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What is a learning health system? – Results from Scholar submissions

08/19/2019

| DOMAINS (# mentions) | Scholars | | | | | | | | |
|---|----------|----|----|----|----|----|----|----|----|
| | SB | KC | AH | TO | SR | AS | ES | CV | MS |
| Research (7) | X | X | | X | X | | X | X | X |
| Data science or informatics (4) | X | | | | X | | | X | X |
| Quality improvement (7) | X | X | | X | X | X | X | X | |
| Stakeholder engagement (7) | X | X | X | | X | X | X | | X |
| Adaptable (2) | X | | X | | | | | | |
| Integration of discovery and application (8) | X | X | X | X | X | | X | X | X |
| Cyclical learning processes (6) | | X | X | X | X | | X | | X |
| Continuous monitoring (1) | | X | | | | | | | |
| Hierarchical (1) | | X | | | | | | | |
| Use exhaust/data of routine clinical operations (5) | | X | X | X | X | | X | | |
| Learning culture (4) | | X | X | | X | | | | X |
| Incentives for learning and improvement (3) | | | X | | X | | | | X |
| Transparency (1) | | | X | | | | | | |
| Focus on outcomes (3) | | | | X | | | X | X | |
| Coproduction of outcomes (1) | | | | X | | | | | |
| Implementation science (2) | | | | | X | X | | | |

How would you define a learning health system to your CEO?

System - from systems science

Systems - sets of elements standing in interrelation

Closed systems - isolated from their environment; thermodynamic laws only apply to closed systems.

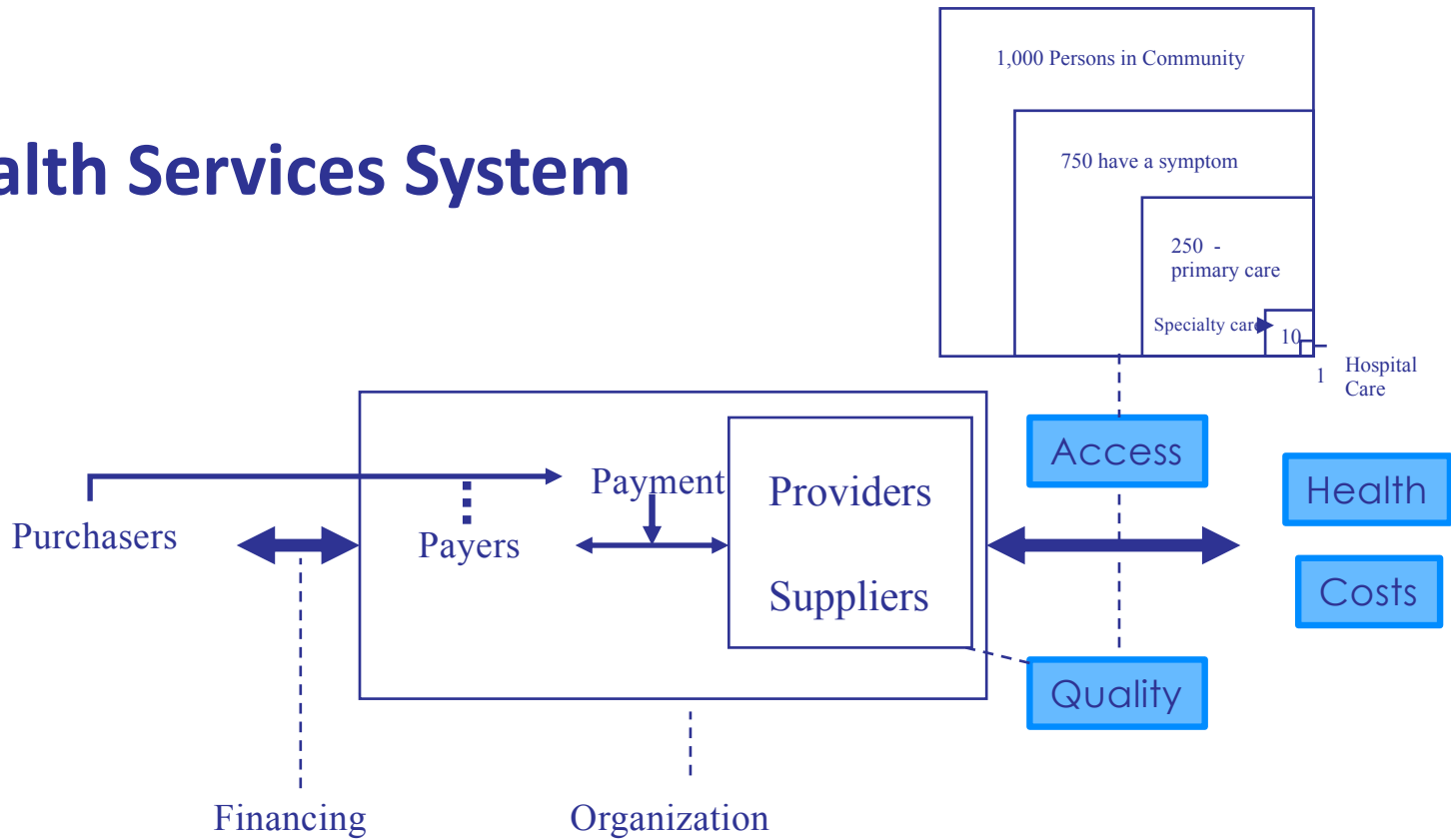
Open systems - interact with environment; maintain themselves in a continuous inflow and outflow, a building up and breaking down of components, never in a state of thermodynamic equilibrium, but maintained in a so-called steady state.

Source: Ludwig von Bertalanffy. (1968). General Systems Theory: Foundations, Development, Applications. New York: George Braziller.

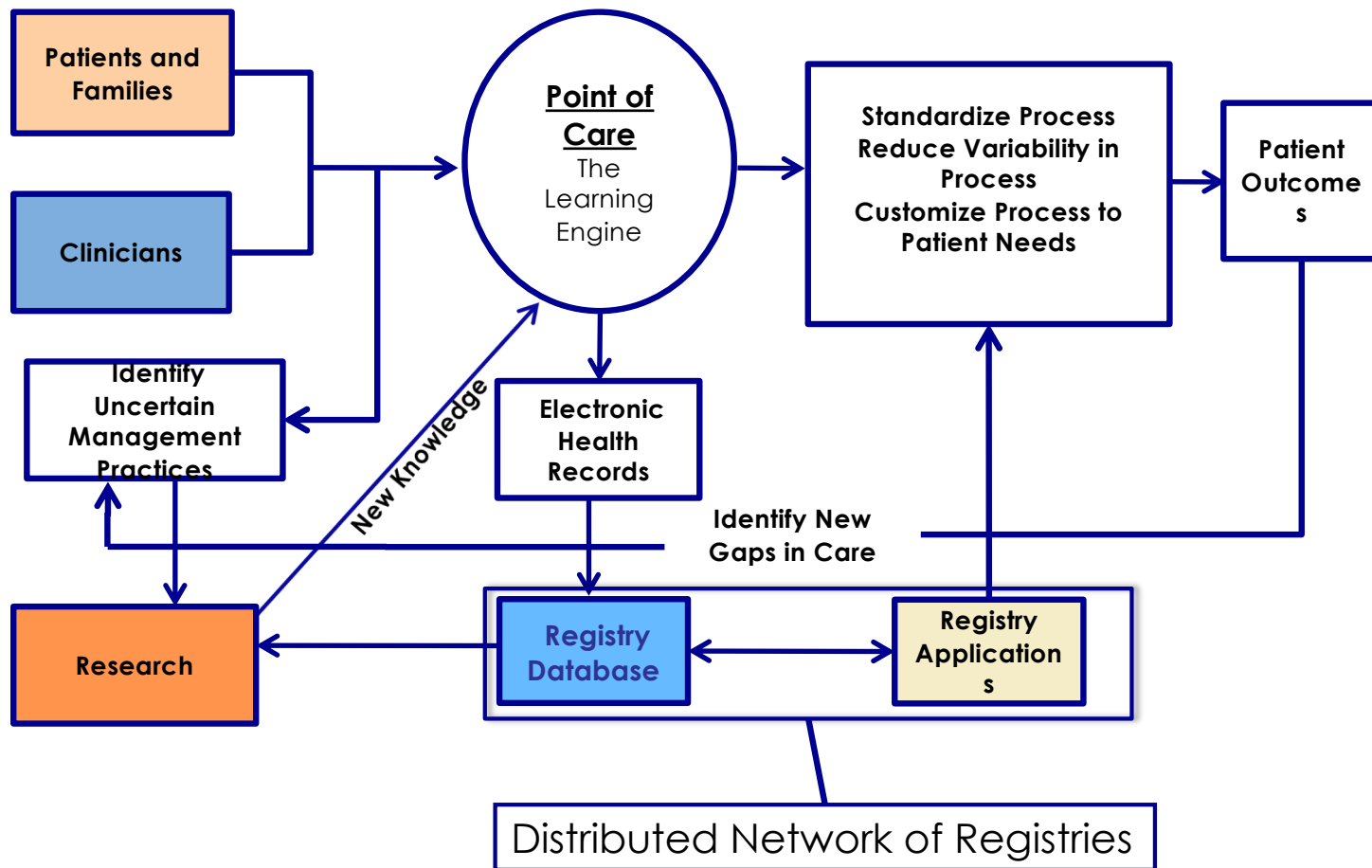
System Properties

- Composed of agents that interact (think network)
- Hierarchical
- Complex
 - Emergence
 - Non-linear
- Adaptive
- Fit for purpose
 - “All systems produce the outcomes that they are designed for”
- Feedback loops
 - self balancing: homeostasis
 - self reinforcing: bandwagon effect, development
- Learn
 - Open systems can learn from their interactions/experiences
 - Learning generates “intelligence” – ability to accomplish goals
 - “Wicked” learning environments require new approaches to learning

Health Services System



Improving Outcomes with a Learning Health System



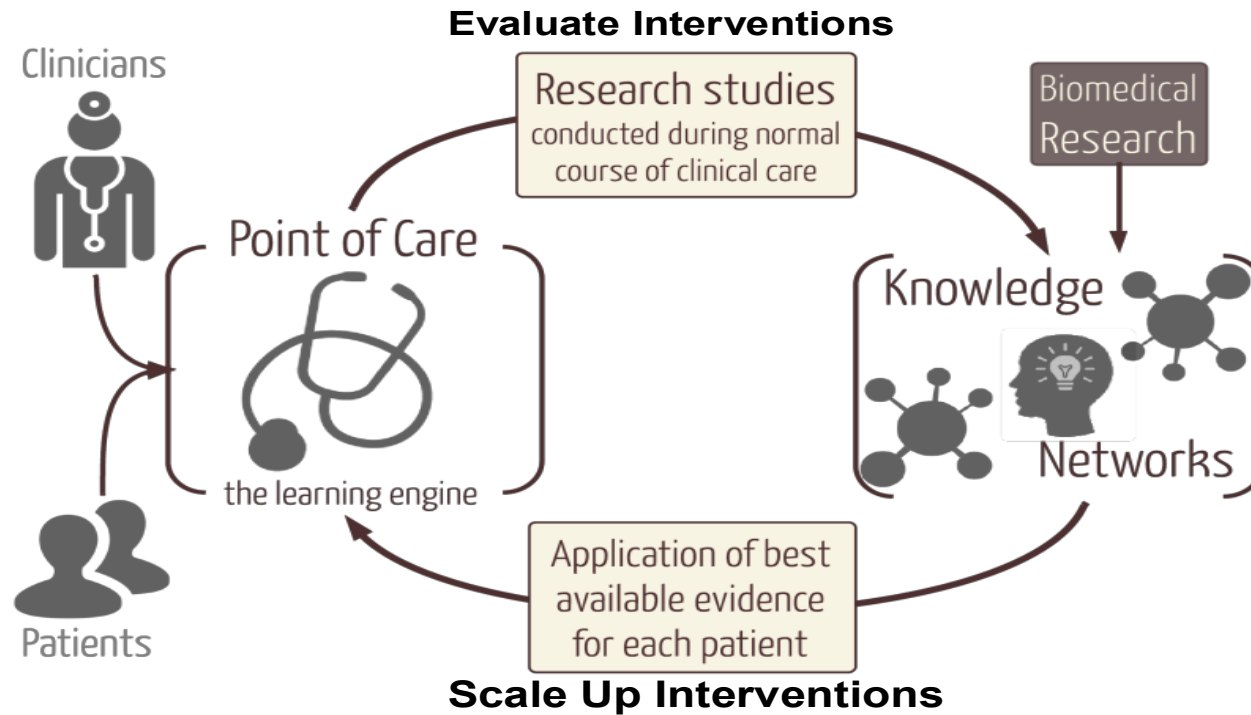


Figure 1. The Learning Cycle in Clinical Settings begins with generation of research questions culled from interactions between patients, clinicians, system leaders, and researchers. New knowledge is generated through LHS research, integrated into the biomedical knowledge network, then scaled to patients, taking into consideration the unique needs of each person and their local system and community contexts.

Learning Health Systems

Health systems, at any scale, that can continuously and routinely study and improve themselves.



 The NEW ENGLAND
JOURNAL of MEDICINE

Perspective: Jan 3, 2013

“Code Red and Blue — Safely Limiting
Health Care’s GDP Footprint”

Arnold Milstein, M.D., M.P.H.

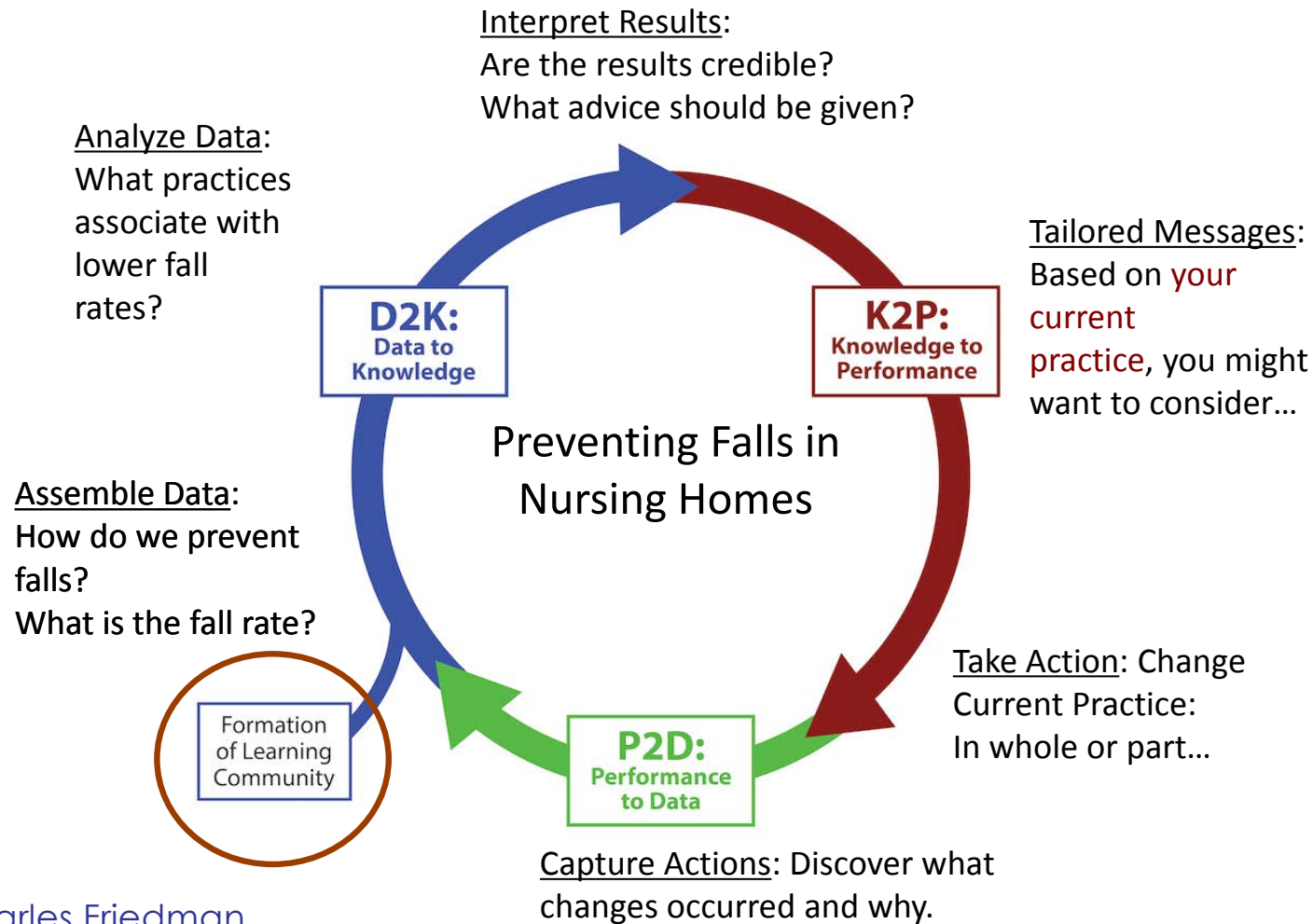
*...U.S. health care needs to adopt new work
methods, outlined in the Institute of Medicine’s
vision for a learning health system...*

Learning Health Systems

1. Focus on the **outcomes** of people & systems
2. **Research** ↔ **Improvement** seamlessly linked
3. Leverage **existing data**, such as EHRs
4. Deeply **engage** stakeholders
5. **Embed** researchers in the system

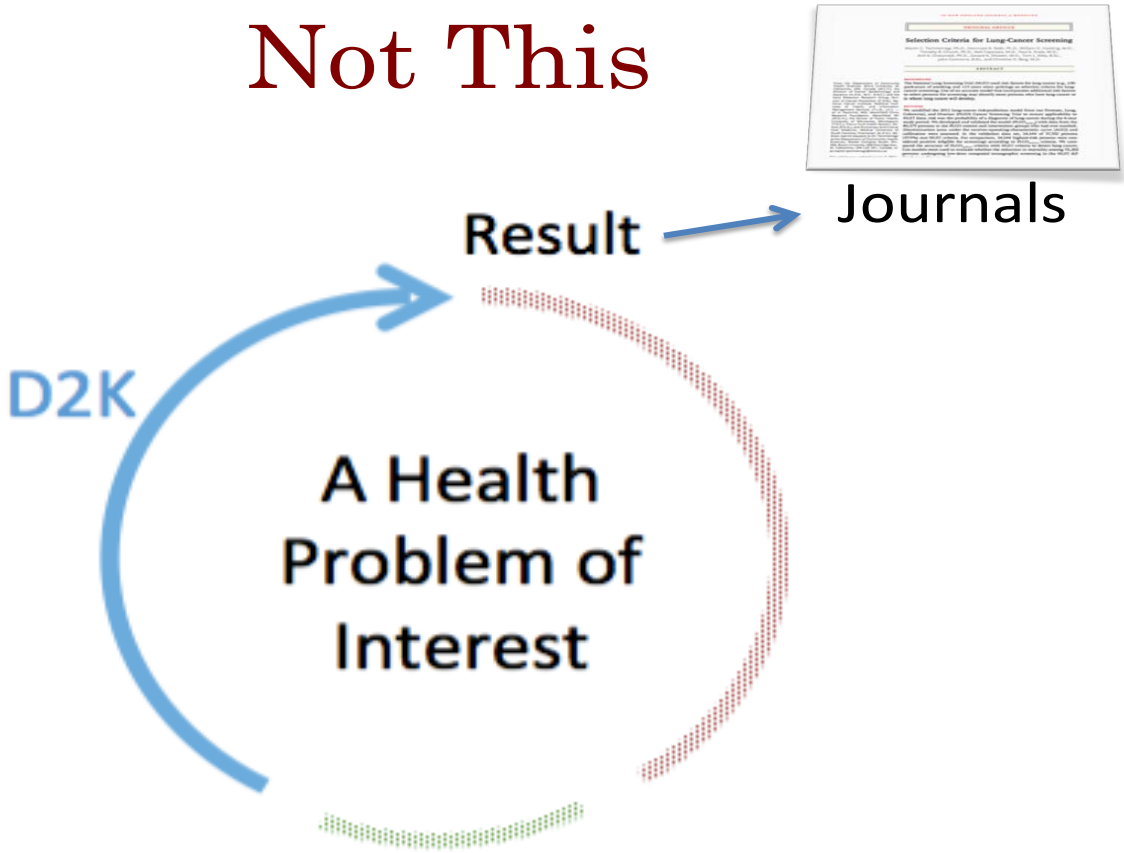
Source: National Academy of Medicine, 2013; Forrest et al, Health Affairs, 2014

Example of A Virtuous Learning Cycle



Source: Charles Friedman

Not This



Source: Charles Friedman