
Quality Improvement and Implementation Science

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What is Quality Improvement?

- Stems from industry
- Traditionally local focus
- Systematic approach to identifying, understanding, and correcting problems in the processes of care

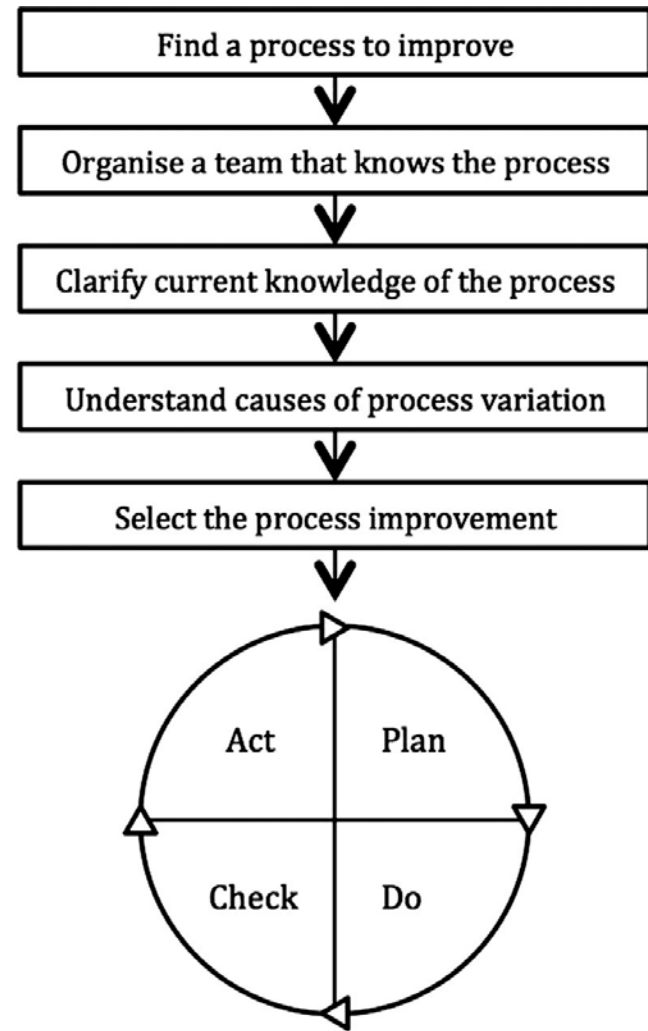
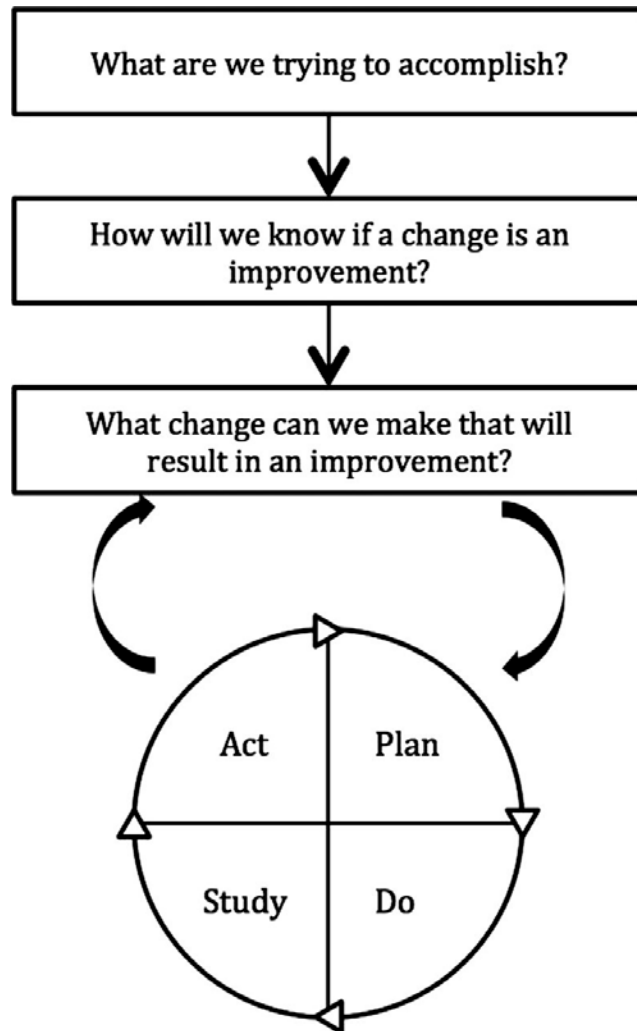


Table 1. Description of the plan–do–study–act (PDSA) cycle method according to developers and commentators

	Deming (1986)²⁵Original description of the method relating to manufacturing	Langley (1996)³⁰How the PDSA method may be adapted for use in healthcare contexts	Speroff and O'Connor (2004)³³How the PDSA method is analogous to scientific methodology
Plan	Plan a change or test aimed at improvement	• Identify objective • Identify questions and predictions • Plan to carry out the cycle (who, when, where, when)	Formation of a hypothesis for improvement
Do	Carry out the change or test (preferably on a small scale)	• Execute the plan • Document problems and unexpected observations • Begin data analysis	Conduct study protocol with collection of data
Study	Examine the results. What did we learn? What went wrong?	• Complete the data analysis • Compare data to predictions • Summarise what was learnt	Analysis and interpretation of the results
Act	Adopt the change, abandon it or run through cycle again	• What changes are to be made? • What will the next cycle entail?	Iteration for what to do next

Taylor M J et al. *BMJ Qual Saf* 2014;23:290-298

The Model for Improvement; FOCUS.



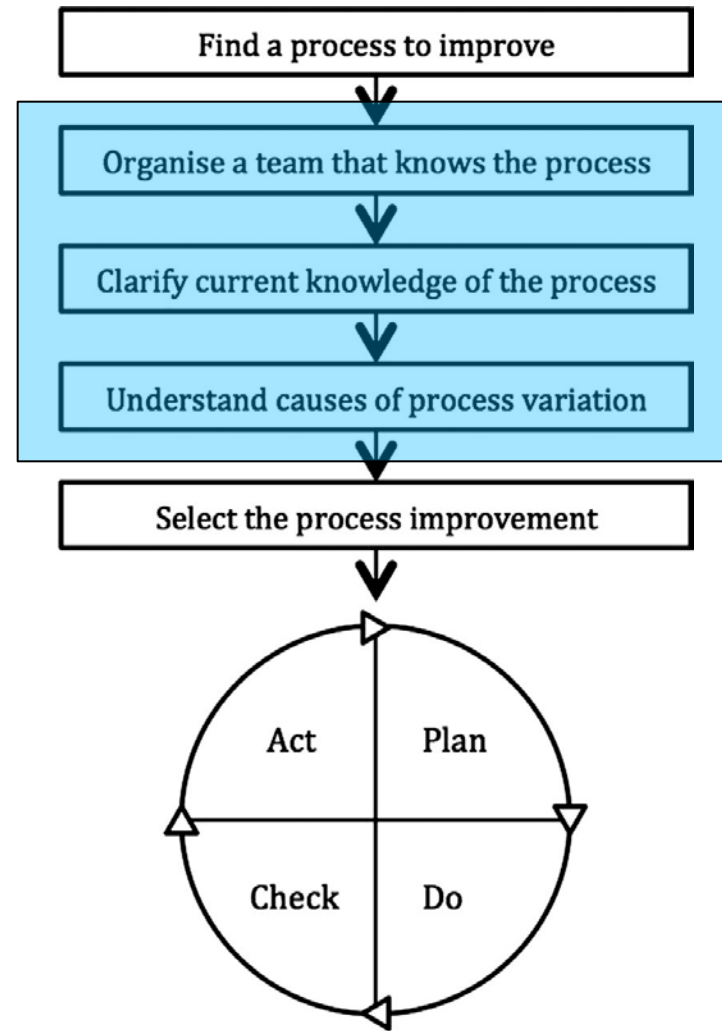
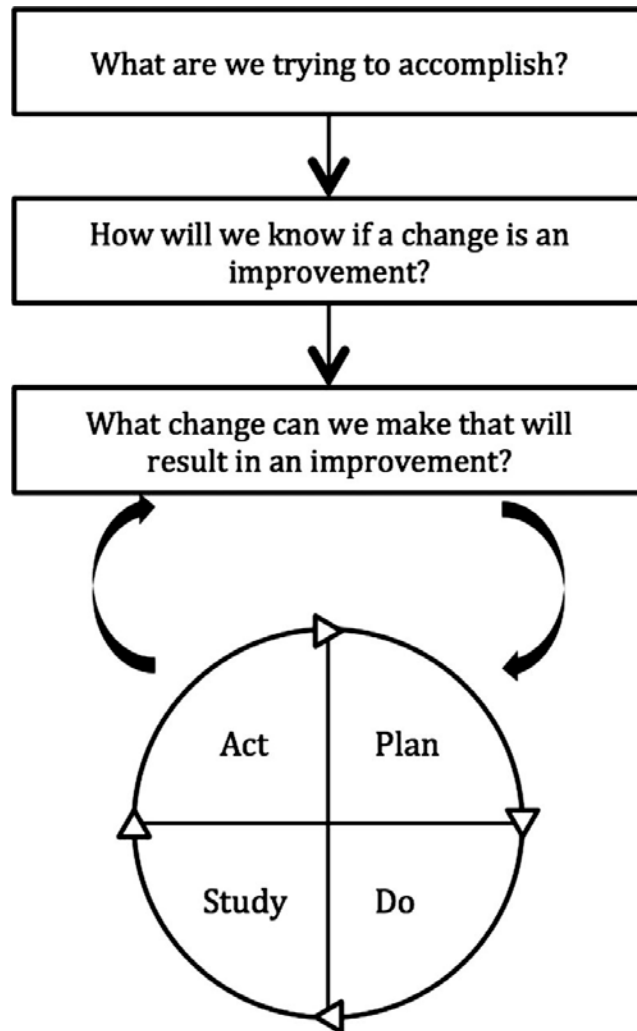
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Simple Clinical Examples



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The Model for Improvement; FOCUS.



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Benefits

- “Pragmatic scientific method”
- Small tests of change
- Rapid assessment to ensure solution is a good fit
- Minimal risk to patients, resources, and the organization
- Theoretically building to progressively higher levels and complexity



Critical Elements

- “True” understanding of process
- Prediction of outcome
 - “How will we know the change was an improvement?”
- Iteration on rapid, small scale testing
- Analysis of ineffective change versus “abandonment”
- Use of data over time



Measures

- Interests of end-user strongly represented
- Multiple measures:
 - ≤ 6 useful and manageable measures
 - Outcome or surrogate outcome
 - Process – was activity accomplished?
 - Balancing – check for unintended consequences

Langley, et al. (2009). *The Improvement Guide, 2nd Ed*

**How do we know a change is a
change?**

Common Cause Variation: Process Noise



By Whitney 2010 [CC-BY-2.0], via Wikimedia Commons

Special Cause Variation: Process Event



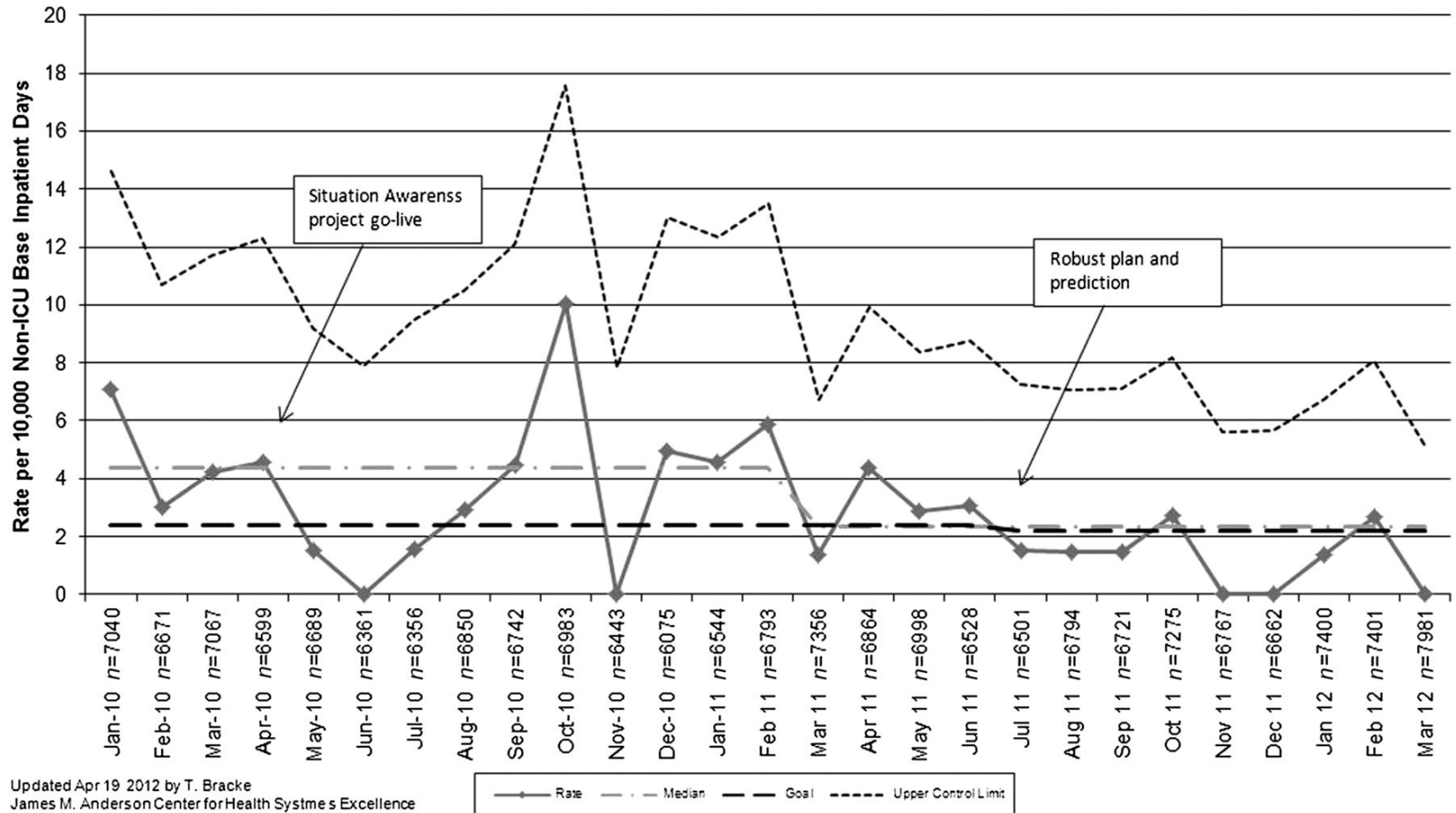
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Statistical Process Control

- A form of time series measurement of variation
- Multiple types of control charts depending on characteristics of chosen variables, sample size, and frequency of events
- Need a LOT of data points and good documentation of when changes are introduced

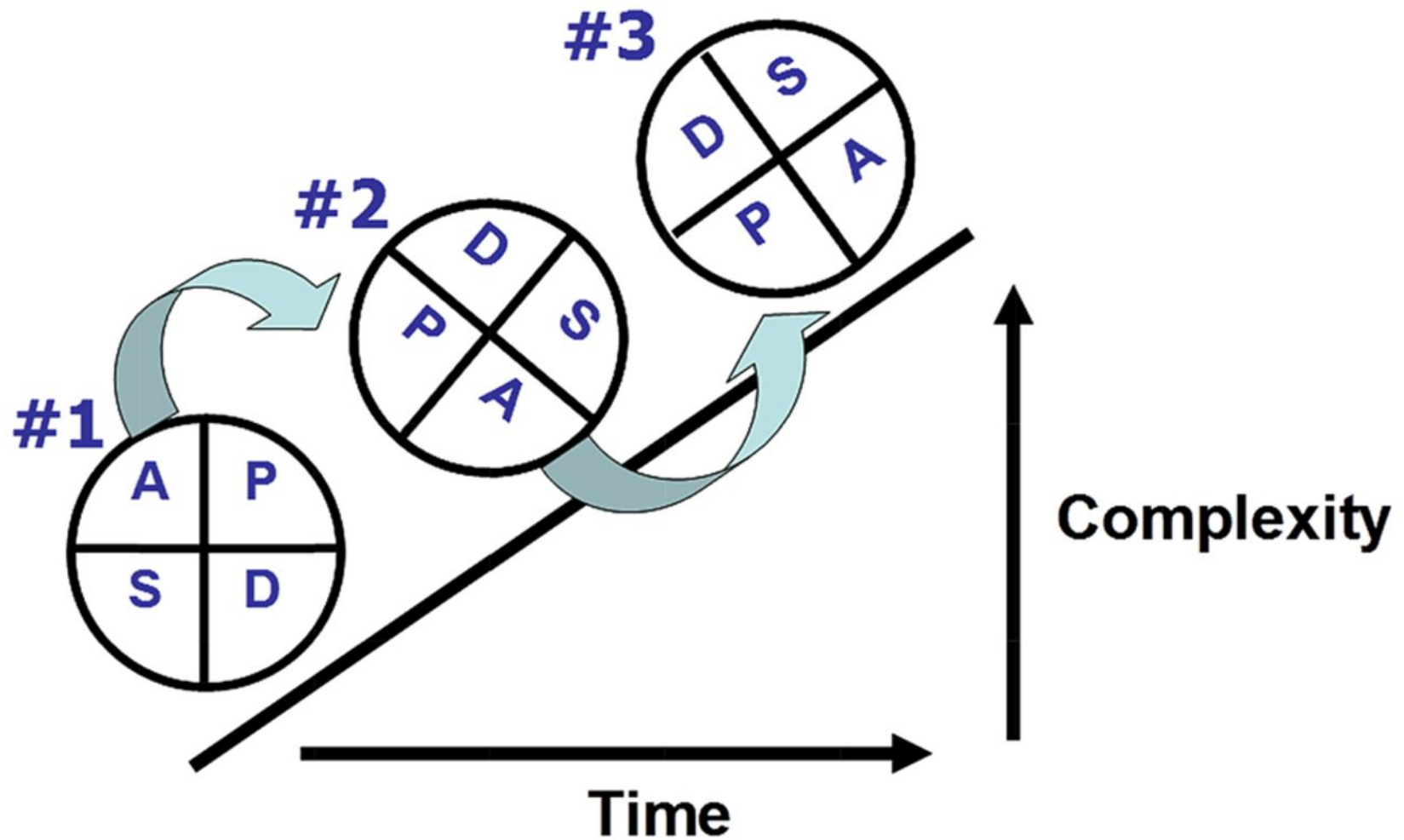


UNSAFE transfer rate chart.



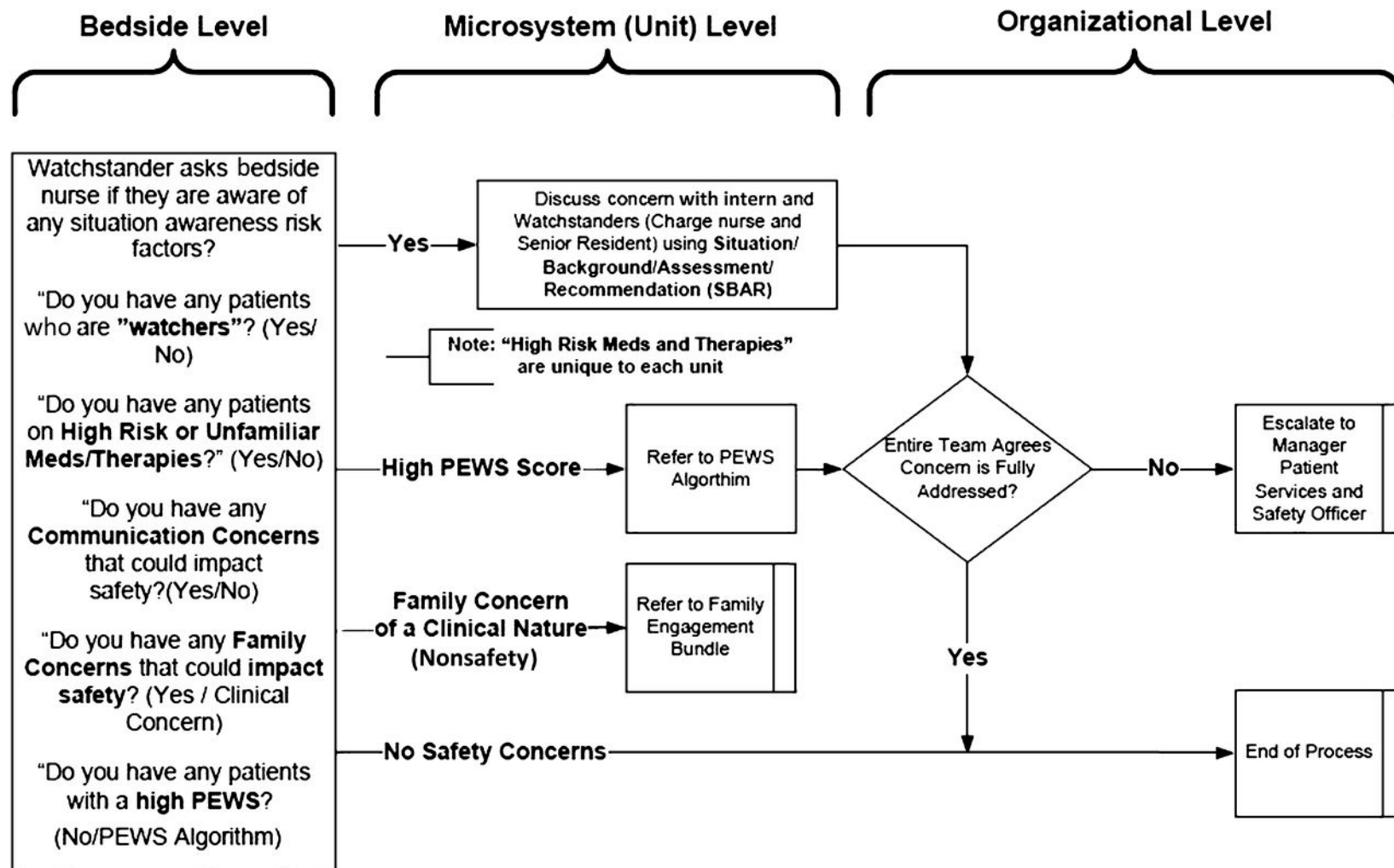
Brady P W et al. Pediatrics 2013;131:e298-e308

Traditional view of successive plan–do–study–act (PDSA) cycles over time depicted as a linear process.



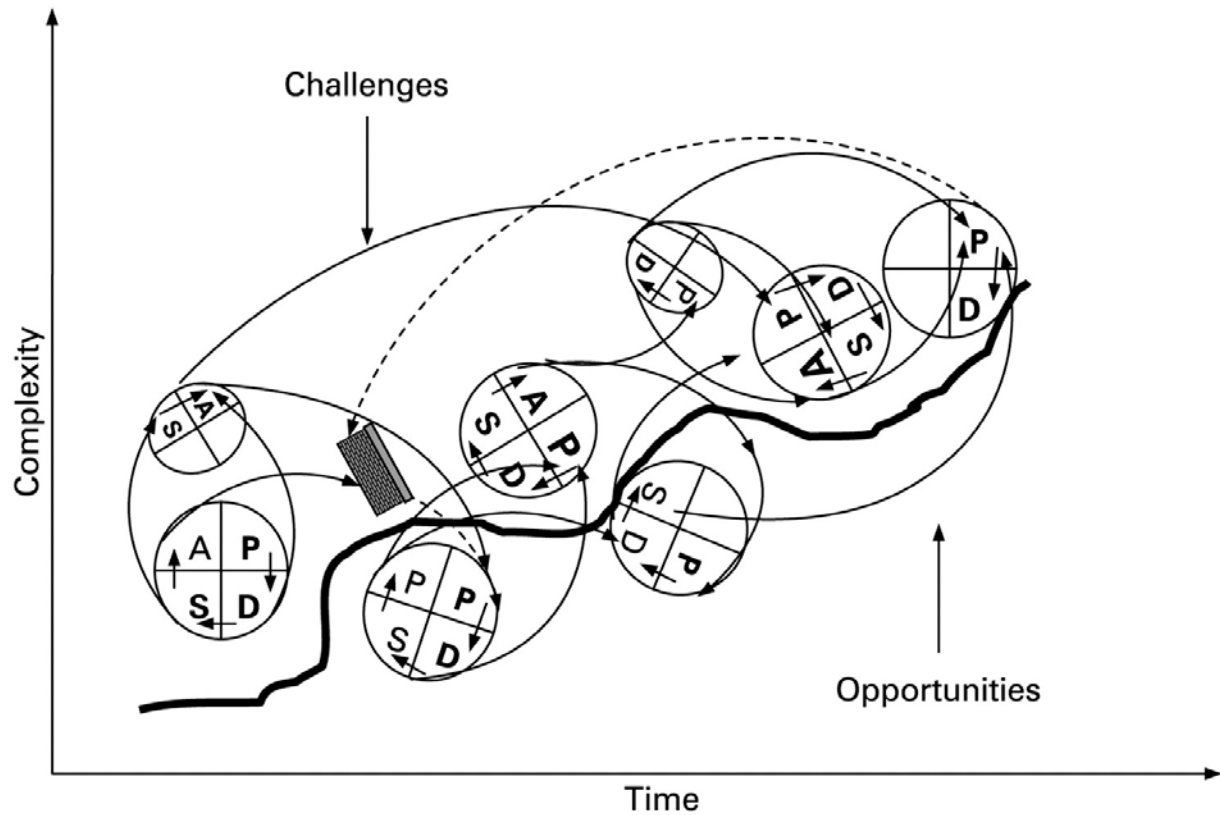
Ogrinc G , and Shojania K G BMJ Qual Saf 2014;23:265-267

Situation awareness algorithm illustrates the tool used during education and early phases and the specific questions and communication pathways.



Brady P W et al. Pediatrics 2013;131:e298-e308

Revised conceptual model of rapid cycle change.



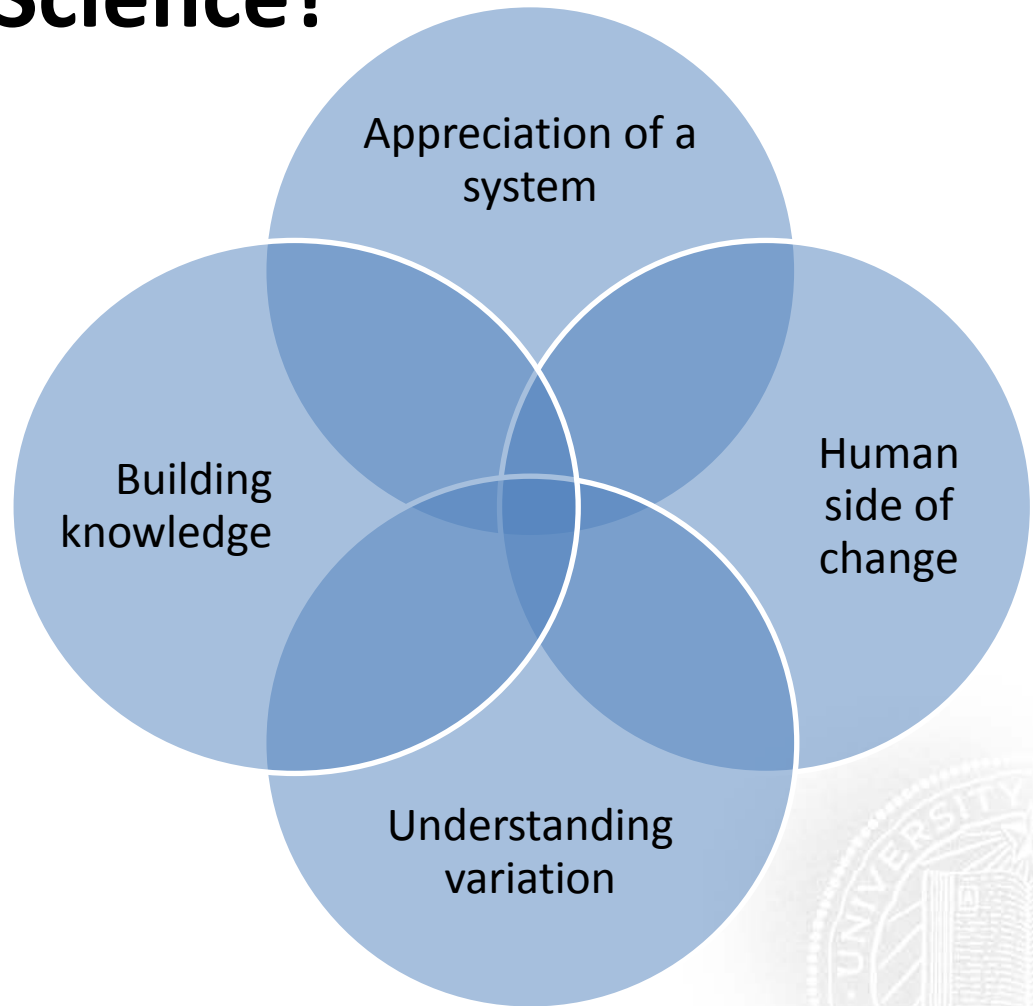
P = Plan	D = Do	 = Barrier	— = Direct flow of impact
S = Study	A = Act	----- = Lingering background impact	Arrowhead = Feedback or feedforward
Different sizes of letters and cycles and bold letters = denotes differences in importance/impact			

Tomolo A M et al. Postgrad Med J 2009;85:530-537

How does this intersect with Implementation Science?

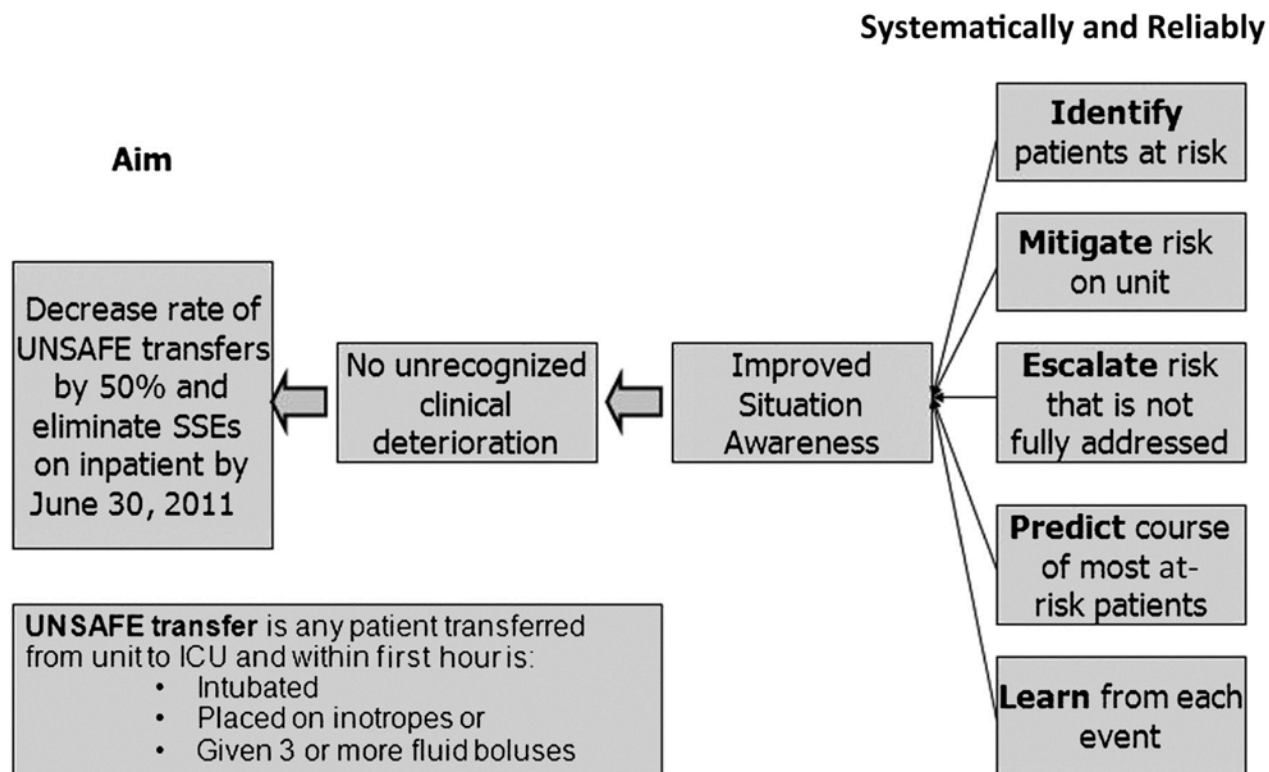
**Deming's concept of
"Profound
Knowledge" for
improvement**

Langley et al (2009) *The
Improvement Guide, 2nd Ed*



Even “local” projects do better with theory

Key driver diagram illustrates the drivers (at right) that would lead to aim through improved situation awareness and no unrecognized clinical deterioration.



Brady P W et al. Pediatrics 2013;131:e298-e308

Quality

“Why does routine care delivery fall short of standards we know we can achieve?”

How can we close the gap between what we know can be achieved and what occurs in practice?”

Ogrinc & Shojana. Building knowledge, asking questions. BMJQS 2014, 23:265-267

Implementation Science

The constellation of processes intended to get an intervention into use within an organization

The gateway between the decision to adopt an intervention and routine use of that intervention

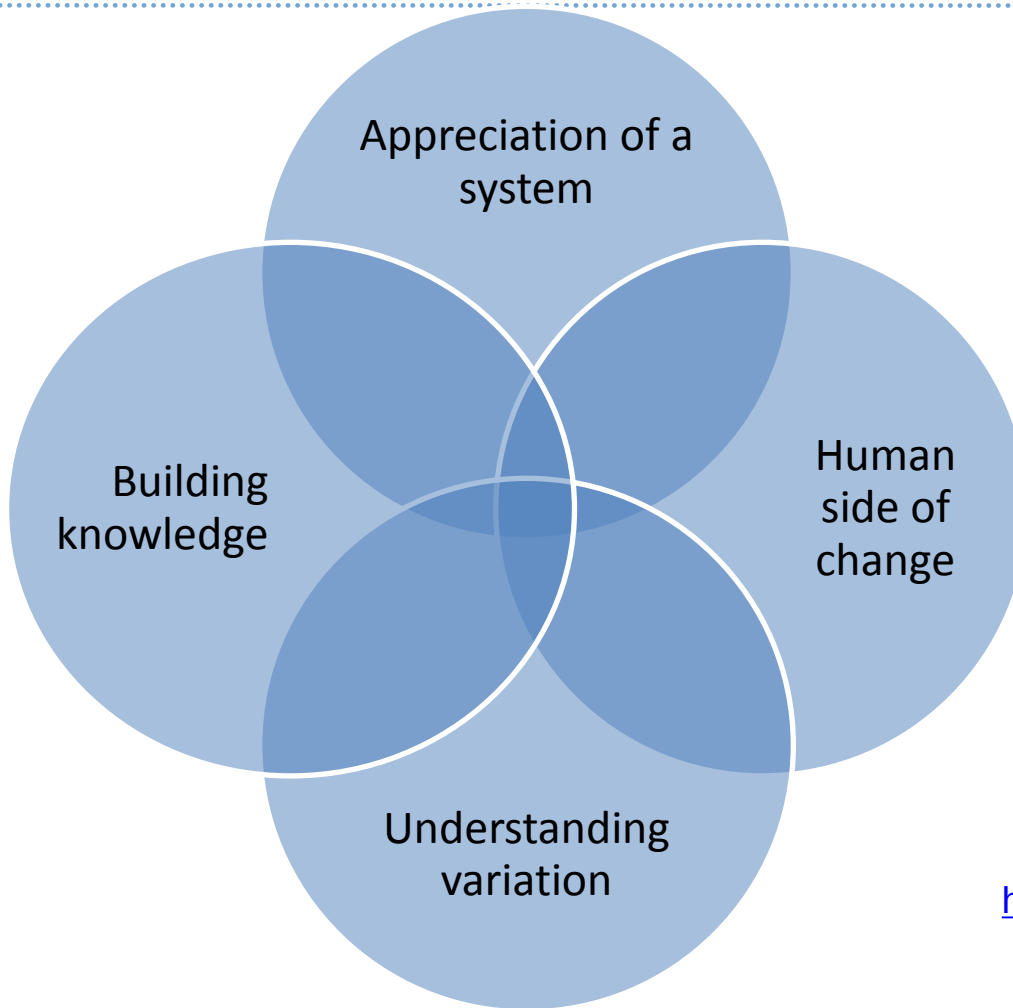
Damschroeder et al, CFIR, Implementation Science 2009, 4:50

Consolidated Framework for Implementation Research

- Intervention
 - Fit
 - Core vs. adaptable periphery
- Inner setting
- Outer setting
- Individuals
- Process of implementation (active change)

Damschroder et al. 2009. Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science..

Profound Knowledge



“The context *is* the intervention”

John Ovretreit

<http://webmm.ahrq.gov/perspective.aspx?perspectiveID=110>

Quality Collaboratives

Vermont Oxford Network

Institute for Healthcare Improvement

Michigan Hospital Association (“Keystone”)

California Perinatal Quality Care Collaborative

California Maternal Quality Care Collaborative

Hospital Engagement Networks





Four Major Recommendations for California Birth Facilities:

- Improve readiness for hemorrhage by implementing standardized protocols (general and massive).
- Improve recognition of OB hemorrhage by performing on-going objective quantification of actual blood loss during and after all births.
- Improve response to hemorrhage by performing regular on-site multi-professional hemorrhage drills.
- Improve reporting of OB hemorrhage by standardizing definitions and coding consistently.



CMQCC OB Hemorrhage Collaborative

COLLABORATIVE AIMS:

- Reduce the number of massive hemorrhages and the number of major complications from massive hemorrhage, including transfusions and hysterectomies, for all birthing women in participating hospitals by 50% by December 31, 2011
- All collaborative participants develop and implement a multidisciplinary team response to every massive obstetric hemorrhage by December 31, 2011

COLLABORATIVE CONTENT:

- Collaborative #1: Three in-person Learning Sessions
- Collaborative #2: Two in-person Learning Sessions
- Monthly All-Collaborative Conference Calls
- IHI Extranet Data Entry Portal
- Access to Expert Panel or Strategizing, Advising, Planning

Questions of fit an inner setting crucial to collaboratives

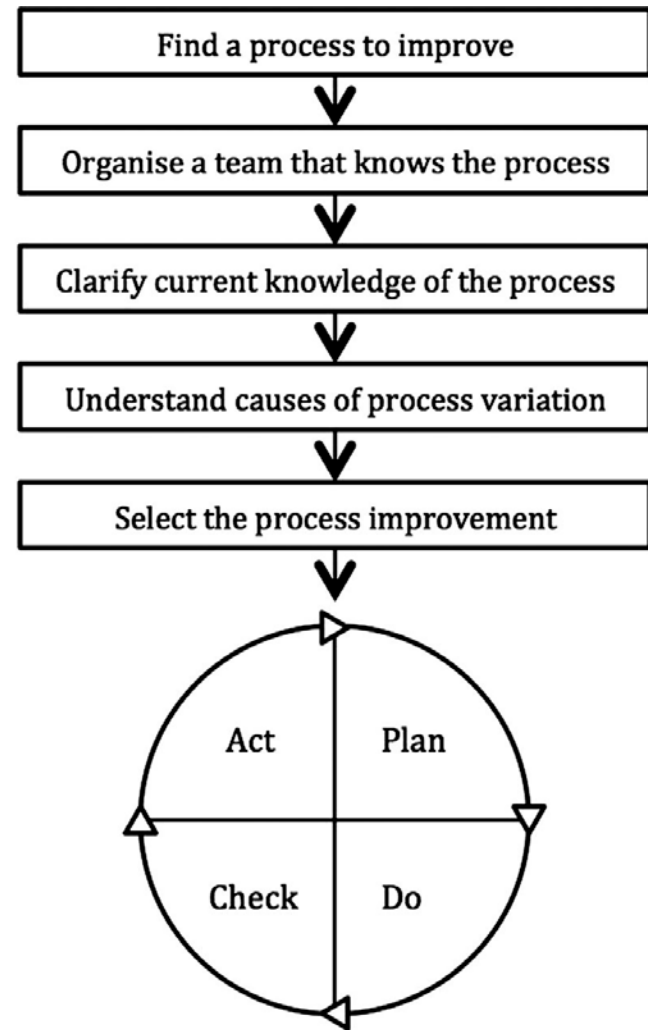
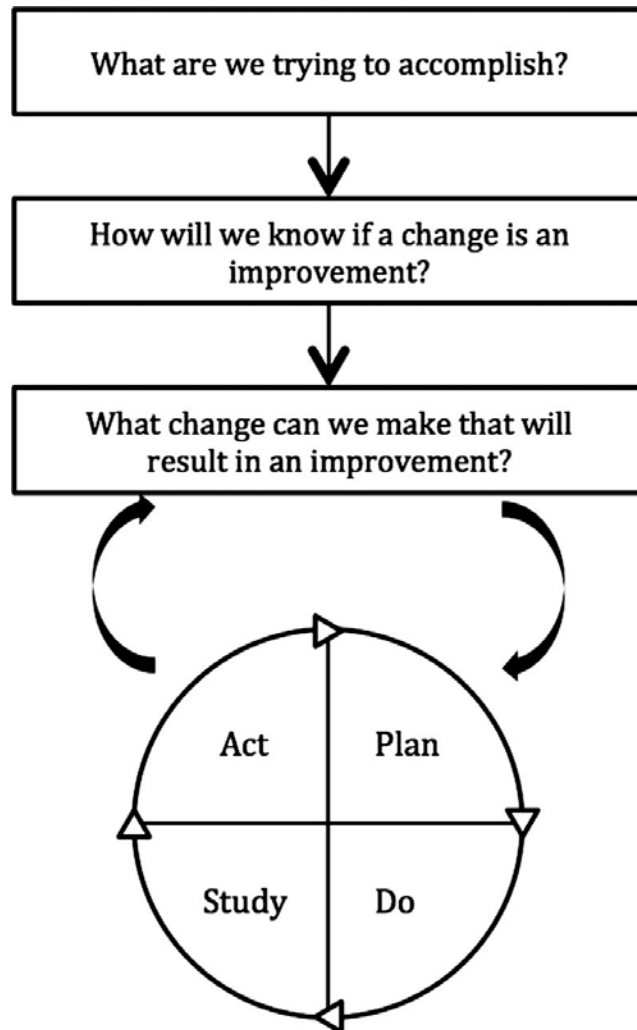
- California has about 250 hospitals that have > 50 annual births
- Rural critical access to academic quaternary centers
- Relatively few processes will be “one size fits all”
- How to even reach all these facilities?
- Data collection infrastructure



Questions of fit an inner setting crucial to collaboratives

- Adaptability
 - Degree to which intervention can be adapted, refined, or reinvented for local needs
 - Tension between consistency and flexibility
- Trialability
 - Degree to which intervention can be tested on a small scale and retracted if necessary
- Culture
 - Norms, values, and basic assumptions
 - Stakeholder engagement

The Model for Improvement; FOCUS.



Taylor M J et al. BMJ Qual Saf 2014;23:290-298

Explaining Michigan

- Institutional isomorphism – peer pressure
- Networked professional community
 - Collegial norms, social structure, horizontal support
 - Also a form of social control toward cooperation
- Framing as a social problem with stories & data
- Strong vertical core with legitimate leaders & evidence
- Varied practice changes

Explaining Michigan

- Data as discipline
 - Systematic measurement and feedback
 - Every system of measurement acts on the system being measured
 - Creates/modifies norms & social pressure
- “Hard Edges”
 - Process that could be determined and assessed
 - Sanctions
- Community-based model strongly influenced success



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