Core
Quality Improvement Principles

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D. Evans declares that he has no financial conflict of interest

Today's Healthcare Challenge

- Approximately 8.6 million people die from "avertable" deaths every year in LMIC countries
  - 5 million from Poor Quality of HC delivered ["Amenable"]
  - 3.6 million from lack of access to HC ["lack of Access"]
- ~ 55% of all "amenable" deaths are due to poor HC quality
- IOM: new White Paper: "Crossing the Global Quality Chasm-improving Health Care Worldwide"
  - ~10-15% of all deaths are due to quality defects
  - Cost: ~ $1.5 Trillion each year

Kruk et al. "Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries" Lancet, published on-line 5 Sept. 2018

Mortality due to Poor Quality

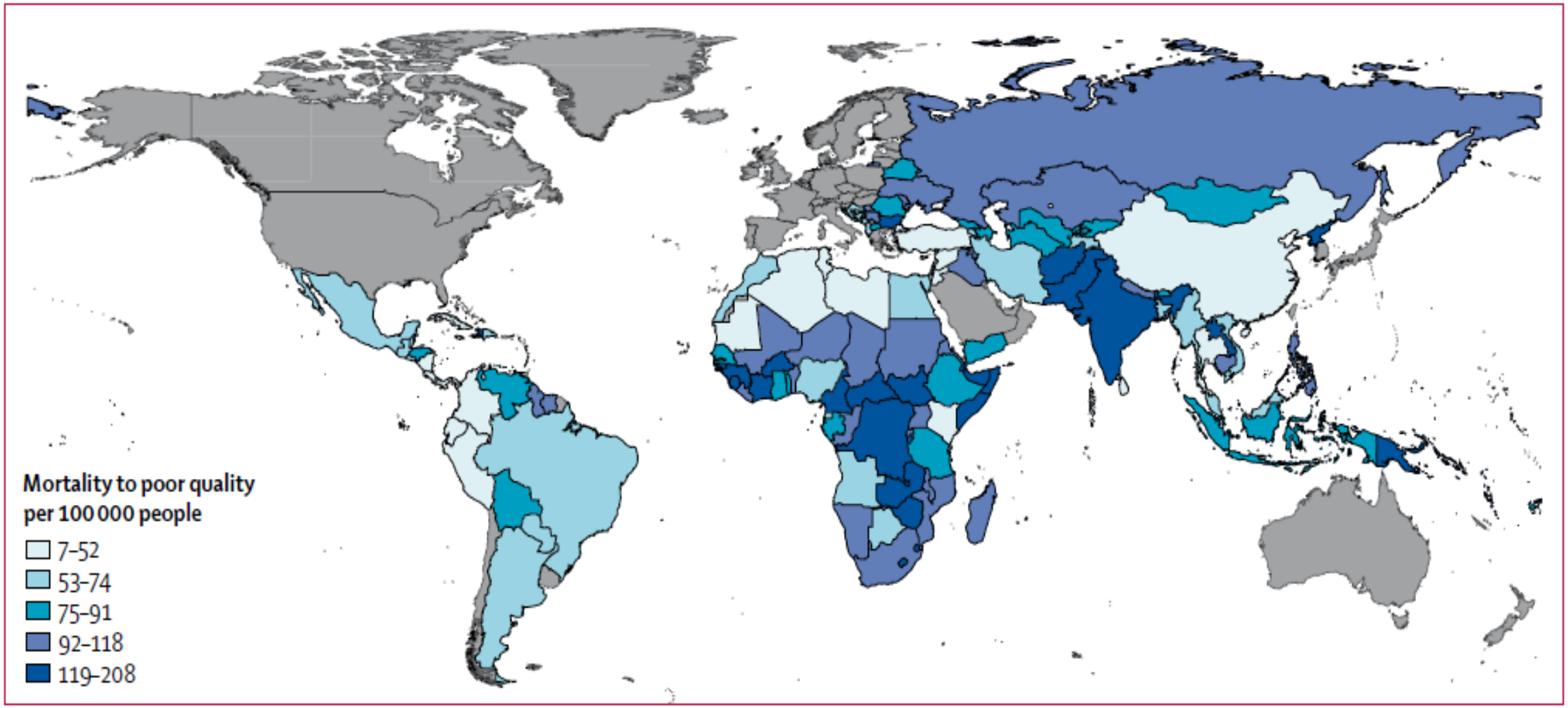


Figure 1: Mortality due to poor-quality health care by country

Kruk et al. "Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries" Lancet, published on-line 5 Sept. 2018

Science of Improvement Principles

1. "Every system is perfectly designed to get the results it gets"
   - Performance is not effort but a matter of ***System Design***
2. Learning from ***failure*** is just as important as learning from success
3. Attitude: embrace the ***humility*** to learn something new
4. ***Agility:*** "What can I do by next Tuesday"?
5. QI is "***Team Based***"

The "First Law of **Improvement**"

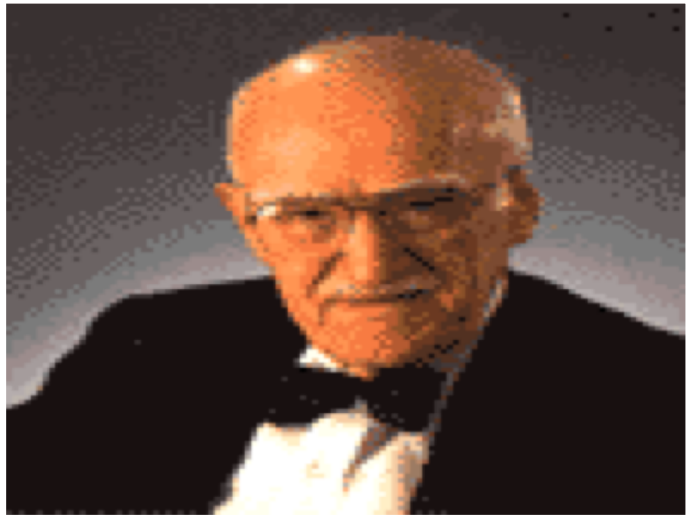
- "Every System is perfectly designed to get the results it gets." Paul Betalden, M.D.

- This reframes Performance from a matter of ***effort*** to a matter of **system *design*….**

If you want to improve results you must change the system!

Berwick D. "A Primer on Leading the Improvement of Systems" BMJ 1996;312:619-622

System Behavior



Joseph Juran

80%

Poor Performance Due to the Design of the System

20%

Poor Performance due to the efforts of the People in the System

Second Law of "Improvement" - **Transparency**

- Be open and honest about "failed" tests:
  - These are often the most valuable RCIs
  - It is natural for humans (HC workers) to want to forget about experiments that don't work

- All scientists know that learning from failure is just as important as learning from success

Third "Law of Improvement": **Attitude**

- To learn something new is **Humbling**. It requires that we put aside our "expert" status and become learners: disciples, open, teachable, obedient

- We don't like feeling stupid; we'd much rather be the Teacher, the one with all the answers, but first we must embrace the humility discipleship requires

- Willingness to **Fail**

Fourth "Law of Improvement": **Agility**

How do I implement this the new information in this **Thursday's Lancet** into next **Tuesday's** new practice?

"What can I do by Next Tuesday?"

Berwick D. "A Primer on Leading the Improvement of Systems" BMJ 1996;312:619-622

Fifth "Law of Improvement": "S of I" is "**Team Based**"

- Staff need a culture that acknowledges that the best care comes from people working as a team, not as "lone rangers" with the sole responsibility for the success or failure of their actions

  - **T ogether**
  - **E veryone**
  - **A cheives**
  - **M ore**

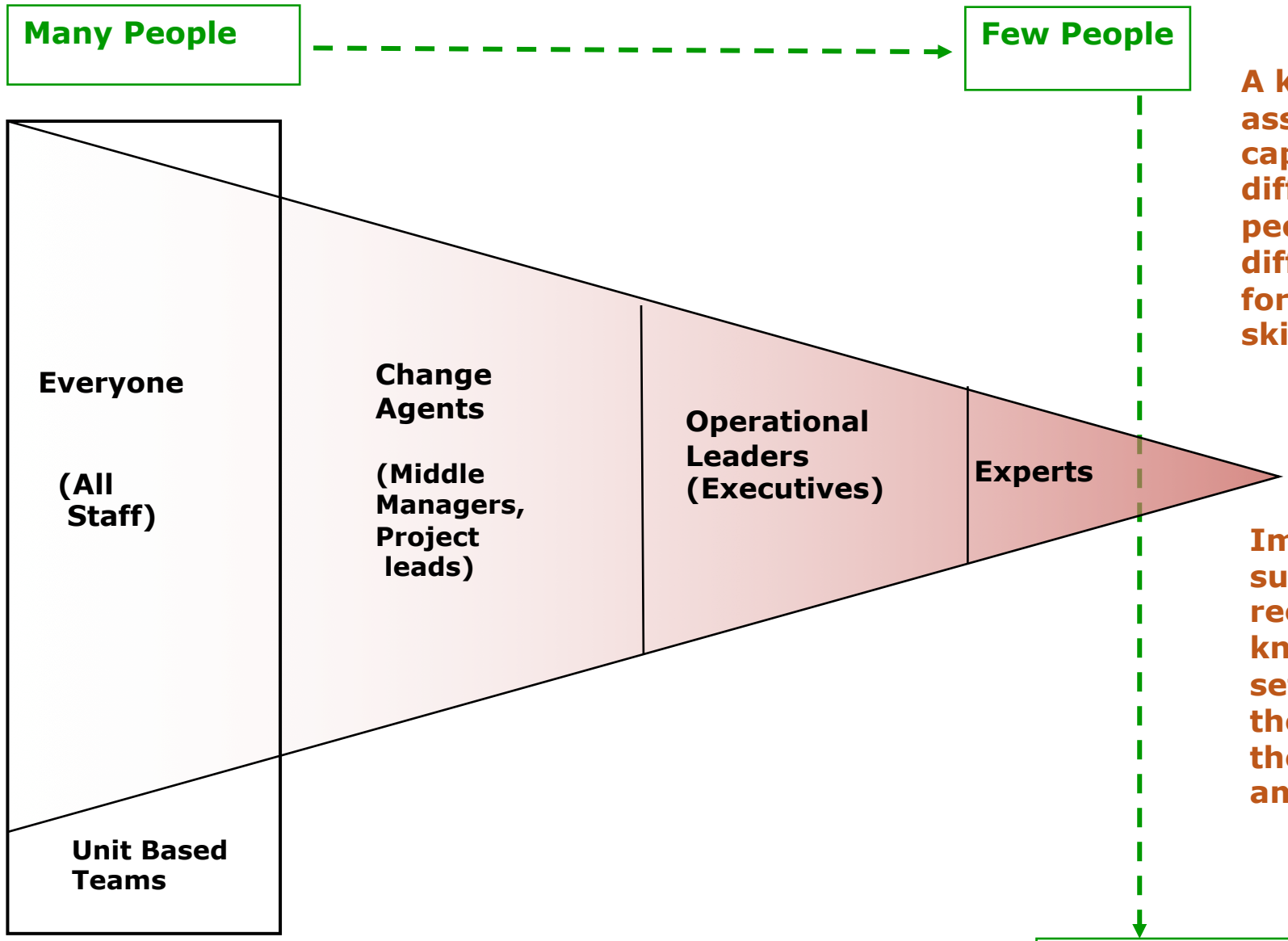
"Doctors still perceive that they are the center of the healthcare universe. Healthcare is a team sport, and we don't optimally work in teams"

Facilitate QI Adoption
Hands-on Improvement Projects

- Just lecturing or telling HC staff about QI – ideas and case studies will not motivate them to adopt QI initiatives

- QI theory and methodology is best learned through "Hands-on" improvement work
  - QI Adoption succeed best when applying it to actual clinical situation:
    - Identify an area that is important to clinicians
    - Create a platform for improvement

Content: What Skills Do Each Employee Need?



A key operating assumption of building capacity is that different groups of people will have different levels of need for PI knowledge and skill.

Important to make sure that each group receives the knowledge and skill sets they need when they need them and in the appropriate amounts

Quality Definition

The IOM Quality Definition - 6 aims

1. ***Safety***: as safe in healthcare as in our home
2. ***Effectiveness***: matching care to science; avoiding overuse of ineffective care and underuse of effective care
3. ***Patient Centeredness***: honoring the individual, and respecting choices
4. ***Timeliness***: less waiting for both patients and those who give care
5. ***Efficiency***: reducing waste
6. ***Equity***: closing gaps in health status amongst groups

Kohn L, Corrigan J, Donaldson M, eds. "To Err is Human" Washington, DC: Committee on Quality of Health Care in America, Institute of Medicine. National Academies Press; 1999.

Measure for Improvement - not for Accountability

- Data and measurement power QI
  - Improvement measures are not “performance measures”
- An improvement measure collects actual data (such as wait times) to measure the ‘System” (not people performance)
  - Why?
    - To Improved a process
- Improvement measures create high-value data that can lead to dramatic improvement
  - Saving time and resources

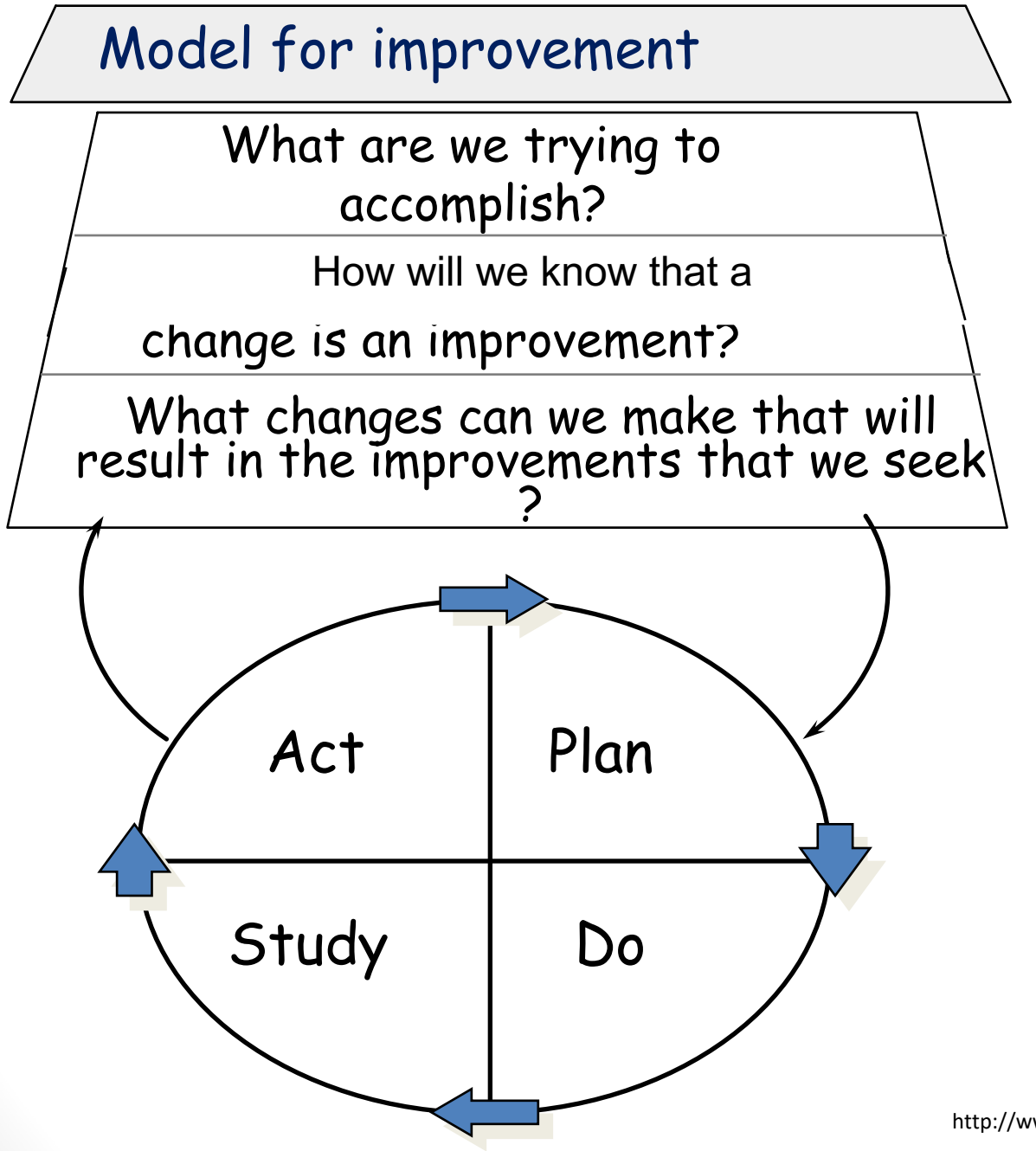
Berwick D. “A Primer on Leading the Improvement of Systems” BMJ 1996;312:619-622

Use Consistent QI Methodology (with PDSA Cycles)

- Common QI Methodologies:
  - ***Model for Improvement***: (3 questions +)
    - What are we trying to accomplish: What you AIM to improve
    - How will we know that a change is an improvement: the criteria (measurement) to know if a changes results in sustained improvement
    - What changes can we make that will result in Improvement?
    - The PDSA cycle
  - ***Lean*** thinking: emphasizes value (getting rid of waste)
  - ***Six Sigma*** (DMAIC model) and (DMADV model)
    - DMAIC: Define, measure, analyze, improve, control
      - Evaluates existing processes
    - DMADV: Define, measure, analyze, design, verify
      - Used to develop new processes

http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx

Model for improvement



goals and aims

measures

change principles

testing ideas before implementing changes

Langly, Nolan, Nolan. The *Foundations pf Improvement. Silver Spring, MD; API Publishing, 192.*

http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx

Model for Improvement

- PDSA cycles are the backbone of HC QI: not “simplistic”
  - **Plan**: the objective, what questions need to be asked? Then plan to carry out the change cycle
  - **Do:** Carry out the plan, document unexpected barriers, begin data analysis
  - **Study:** Complete data analysis, compare results to prediction and summarize what you learned
  - **Act:** Determine what changes will be make – and what the next PDSA cycle will be

  - Data powers PDSA cycles

Langly, Nolan, Nolan. The *Foundations pf Improvement. Silver Spring, MD; API Publishing, 192.*

Model for Improvement - AIM

- Use the Acronym “SMART” (to help define “aim”)
  - **S**pecific
  - **M**easurable
  - **A**ttainable
  - **R**eliable
  - **T**imely

  - A “Stretch” AIM Makes it obvious that the current system is inadequate and that a new one is required

- Example:
  - **By Jan. ‘19, the # pts transferred from ED to ward < 1 hour from decision to admit will decrease by 40%**

QI Tools

- **Run Charts**: visual display of measures over time
- **Cause and Effect Diagram**: A drawing to organize the contributing causes to a problem in order to prioritize, select, and improve the source of the problem
- **Pareto Charts**: Used to visualize qualitative data (patient perception of care and qualify of life) and focus improvement efforts
- **Process Mapping:** visualizes a process clearly by clarifying the start, end, and key decision points
- **Control Charts**: Identifies special-cause variation in a process, identify early signs of success in an improvement project, and monitor a process to ensure it is holding the gains

Lean Principles

- Identify customers and specify value
- Identify and map value streams (processes)
- Create flow by eliminating waste
- Respond to customer pull
- Pursue Perfection

Lean "Tools"

- Rapid Process Improvement Workshop ("Kaizen")
- A3 Framework
- Standardized work instructions
- "Just-in-time" training
- 5 S – Visual Workplace: [Sort, Set in Order, Shine, Standardize and Sustain]
- 5-Whys (a problem solving tool)
- A card based visual system for system feedback ("Kanban")
- Gemba Walks (front-line observations)
- "Stop the Line" immediately in case of an error

Lean - A3 Thinking

- A standardized approach to problem solving:
  - For Executive Leadership- very helpful in Strategic Planning - Administrative
  - For front-line staff – very helpful in solving unit-based problems - Clinical
- A step by step direction to problem solving
- The A3 provides a clear, concise, one page overview
  - It can consolidate large amounts of information in an understandable format using visual display
  - It tells your story in one document!

Strategic Planning Focus – A3

- The A3 process can be used for your annual Strategic Planning Conference/event to create the:
  - Vision
  - Goals
  - High-level implementation plan for the next year

- By defining “True North” you insure that your entire organization is strategically aligned

Team: (Leader),

Facilitator:

A3

1. Reasons for action:

Problem statement

Business Case

Value statement

Scope

process start — in scope

process end — out of

Change

4. Gap Analysis:

Key gaps being addressed with this VS improvement pass

Fishbone or 5-why's

Note: wherever possible, link actual documents/files to the A3 for easy updating and no additional need to submit extra documents as deliverables

Sustain

7. Completion Plans:

Administrative/task list of items needed to execute the plan plus any additional infrastructure supporting activities with andons to track status/progress

2. Initial State:

Map

Summary of map: (i.e. total cycle time, total touch time, # of steps, % of VA/VNA, # of hand-offs

Metrics

Attributes

Picture

Change

5. Solution Approach:

If-Then statements regarding chosen solution ideas/path:

if we do this.... Then we expect this....

Sustain

8. Confirmed State:

Accomplishments

Metrics (3-month tracking) with andon

grid showing connection/impact of VS metrics on TPOC metrics

3. Target State:

Map

Summary of map: (i.e. total cycle time, total touch time, # of steps, % of VA/VNA, # of hand-offs

Metrics

Attributes

Picture

Change

6. Rapid Experiments:

List of RPIWs, projects, JDIs and JSIs that will be utilized to close gaps

grid showing connection/impact of RPIWs on VS metrics

charters for events (first 2-3 events if space constrained)

Sustain

9. Insights:

Plusses/Deltas/Actions for improvement related to the VSA, event

Team picture

A3 Box 1 Reason for Action

- What is the problem statement?
- What is the scope of the problem?
- What are the boundaries you will set?

Reason for Action	Gap Analysis	Completion Plan
1	4	7
Current State	Solution Approach	Confirmed State
2	5	8
Target (Future) State	Rapid Experiments	Insights
3	6	9

A3 – Box 2 Current State

- What does the organization look like right now?
  - Data/Business case for need:
  - Identify what are the core process?
  - Flow Map the core processes
    - Identify (high-level major issues (Kapowie's)

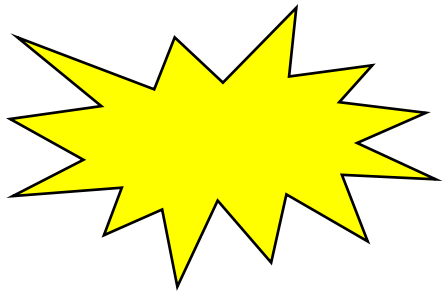
Reason for Action 1	**Gap Analysis** 4	**Completion Plan** 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insights 9

SI Tools – Process Flow Chart Format

Activity to perform in a process

Activity to start / end a process

Decision or Yes/No question



Kapowies – Points were you identify issues / backlogs

Arrows (⟶) are used to connect the symbols – sequence and interrelationships

Process Map – Surgical Site Skin Antisepsis

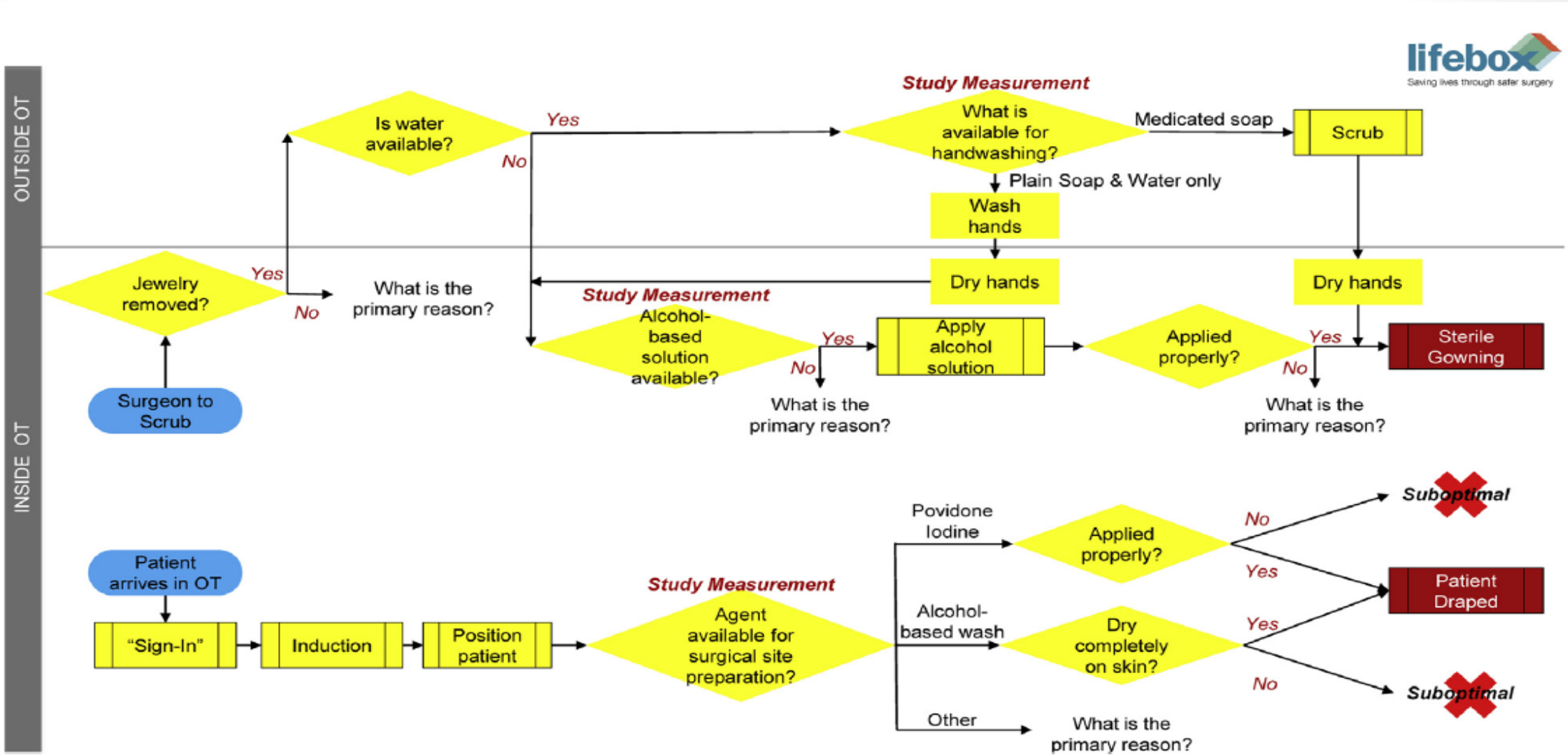


Figure 1. Hand and surgical site skin antisepsis process map. The map is to be read from the top left starting with the light blue oval

Forrestor JA, Koritanszky LA, et al. "Developing Process Maps as a Tool for Surgical Infection Prevention Quality Improvement Initiative in Resource-Constrained Settings" J Am Coll Surg 2018;226;1103-1116.

A3 – Box 3 Future (Target) State

- What do we want the organization to look like at:
  - 1 year
  - 5 years from now?
- What does “Good” look like?
- How will we know when we have made an impact?

Reason for Action 1	Gap Analysis 4	Completion Plan 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insights 9

A3 – Box 4 Gap Analysis

- What are the big differences (gaps to be closed) between the current and future state?
- How much control / influence do we have over these gaps?
- What are some of the potential root causes of the gaps?

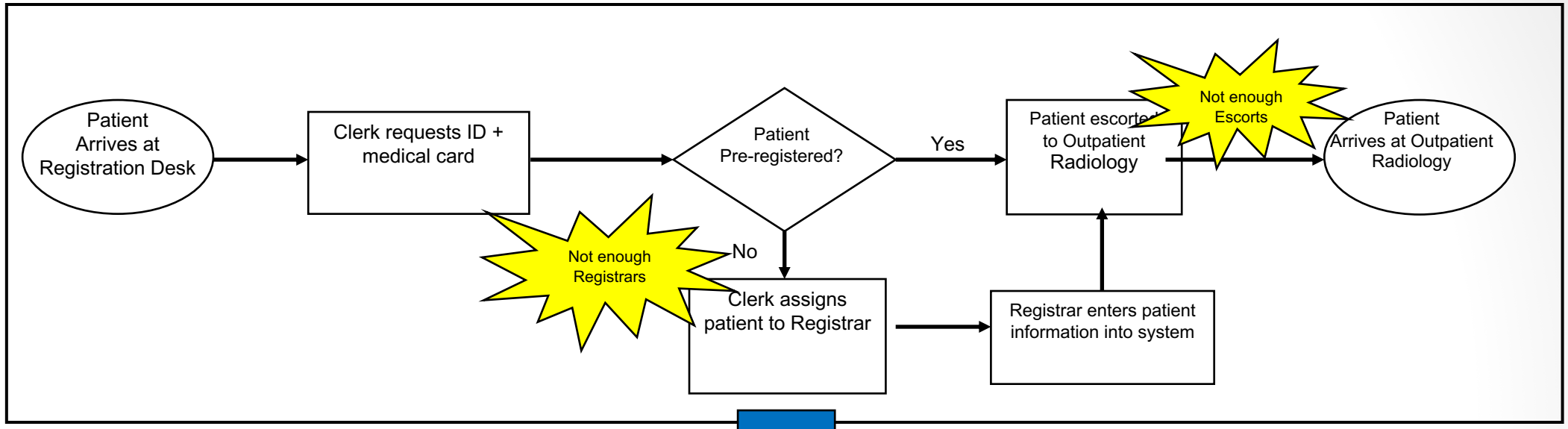
Reason for Action 1	Gap Analysis 4	Completion Plan 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insights 9

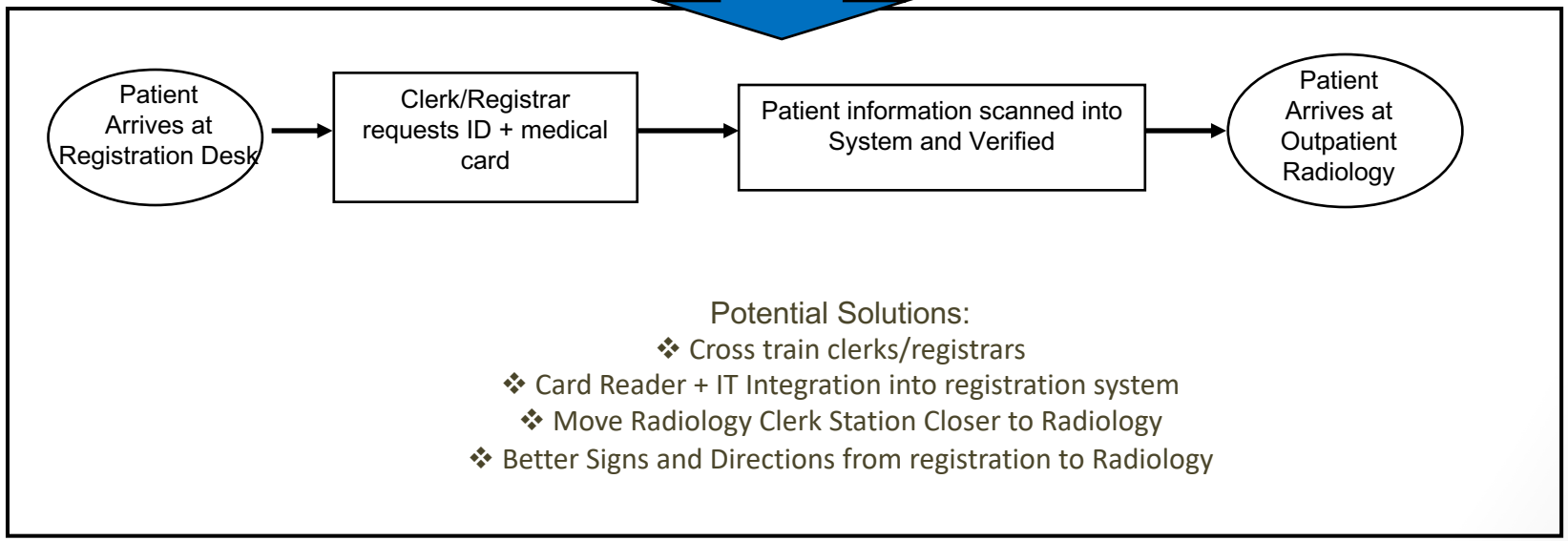
A3- Box 5 Solution Approach

- What ideas / strategies do we have for closing the gap?
- Which of the core processes have the most potential to close gaps (attain target)
- What have others done to close the gaps?
- How easy or difficult are the solutions being proposed?

Reason for Action **1**	**Gap Analysis** **4**	**Completion Plan** **7**
Current State **2**	Solution Approach **5**	Confirmed State **8**
Target (Future) State **3**	Rapid Experiments **6**	Insights **9**

Current State to Future State





Potential Solutions:

- Cross train clerks/registrars
- Card Reader + IT Integration into registration system
- Move Radiology Clerk Station Closer to Radiology
- Better Signs and Directions from registration to Radiology

A3 – Box 6 Rapid Experiments

- Proposed countermeasures to address each root cause
- Predicted results for each countermeasure
- Do multiple PDSAs
- Assessment Q:
  - Are there clear countermeasure steps identified?
  - Do the countermeasures link to the Root Cause of the prob.?
  - Who is responsible for what, by when (5 whys – I how clear)
  - Will these action items prevent recurrence of the problem?
  - Is the implementation order clear and reasonable?

Reason for Action 1	Gap Analysis 2	Completion Plan 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insights 9

A3 – Box 7 Implementation (PDSAs/RPIWs)

- Table to document how you will do the PDSA cycles to close the gaps
  - Who (who leads task)
  - What (task)
  - When (completion date)
  - Where
- Learn and improve as you go

Reason for Action 1	Gap Analysis 4	Completion Plan 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insights 9

A3 – Box 8 Confirmed State

- Accomplishments
- Metrics (data)
  - Run charts, control charts, etc.
  - Document quantified change (% improvement or % no longer happening, etc.)

Reason for Action 1	Gap Analysis 4	Completion Plan 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insight / Reflection 9

A3 – Box 9 - Insights

- What have you learned from this process?
- How can we make it better next time
- Summary: it completes the story of your successful QI Project!

Reason for Action 1	Gap Analysis 4	Completion Plan 7
Current State 2	Solution Approach 5	Confirmed State 8
Target (Future) State 3	Rapid Experiments 6	Insights / Reflection 9

Why A3 Thinking?

- A structured cycle of improvement
- A framework for organizing thinking
  - Can be used for any type of problem (clinical or Admin.)
- Eliminates the waste of debating method
- Reveals the issues, problems and previous ways of thinking
- Makes problem solving visual
- Tells a Story!

Today's Practical Exercise

- Work on your HC facility's needs:
- Examples:
  - Prevention of Surgical Site Infections
  - Improved Operating Room/Theatre Efficiency
  - Increased access to Primary Care
  - Decreased Central Line Associated Blood Stream Infections