



performance improvement

# Improvement Methodologies: How to Spur Change

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COAP meeting

Adapted from the PI QIOSC, Qualis Health, with  
information from the IHI and Wellman and Associates





## Objectives

- Review the challenge of early extubation
- Discuss QI methodologies
  - Using data feedback
  - Engaging physicians
  - The Model for Improvement and PDSA
  - Lean
  - Reliability concepts
- Identify new changes to test



## Early Extubation

- Measure: Percent of risk-adjusted CABG and valve patients extubated within 6 hours postoperatively
- Why: Patient centered measure
  - Discomfort
  - Atelectasis
  - Ineffective airway clearing
  - Not necessary!



## Early Extubation

- What do the data show?
  - 65% compliance
  - STS measure is for patients still intubated at longer than 24 hours!!!
- What can we do to improve performance on this measure and provide better care for patients?



## Improvement Methods & Tools

- Data Feedback
- Engaging Physicians
- Model for Improvement/PDSA
- Lean
- Reliability Theory

## Data Feedback

- Necessary but not sufficient for change
- A  $10^{-1}$  reliability concept (more later)
- Requirements for effectiveness:
  - Transparency
  - Continuous updating
  - Taking specific action based on data
  - Multiple venues for feedback
  - Real benchmarking (why not world-class?)



## Intent, Vigilance and Hard Work: 10<sup>-1</sup> Performance: 80% or so...sound familiar?

- Common equipment
- Standard order sheets
- Personal checklists
- ***Feedback of information on compliance***
- Awareness and training

## Recent VHA Study

- Looked at VHA facilities that attained 95% and higher on 24 measures
- Asked HOW they got there
  - 55.6% = organizational change
    - Such as offering new services, changing roles/responsibilities, etc.
  - 41.4% = clinical reminders
  - 39.6% = audit and feedback to clinicians
- Craig TJ, Perlin JB, Fleming BB. Self-Reported Performance Improvement Strategies of Highly Successful Veterans Health Administration Facilities. *Am J Med Qual.* 2007; 22: 438 - 444





## Engaging Physicians

- Critical for results!
- Difficult for several reasons:
  - Physicians' relationships with hospitals are often not as employees
  - Physicians' quality and business agendas can appear to be in conflict with those of hospitals
  - Belief in personal responsibility leads to:
    - Lack of systems perspective
    - Tendency to blame individuals when things go wrong



## Engaging Physicians

- So what can we do?
- IHI's framework has six steps:
  - 1) Link the Hospital Quality Agenda to the Physician Quality Agenda (what do physicians want)?
    - 1) Improve patient outcomes
    - 2) Reduce hassles and wasted time
    - 3) Understand the organization's culture
    - 4) Understand legal opportunities and barriers



## Engaging Physicians, cont'd

- IHI's six steps continued
  - 2) Reframe Values and Beliefs
    - 1) Make physicians partners, not customers
    - 2) Promote BOTH system and individual responsibility for quality
  - 3) Segment the Engagement Plan
    - 1) Use the 80/20 rule
    - 2) Identify and activate champions
    - 3) - 5): inform structural leaders, develop project management skills, work with "laggards"



## Physician Engagement, cont'd

- IHI's six steps continued
  - 4) Use “Engaging” Improvement Methods!
    - 1) Standardize only what is standardizable (more later)
    - 2) Generate light, not heat, with data
    - 3) Make the “right thing” easy to try
    - 4) Make the “right thing” easy to do!



## Physician Engagement, cont'd

- IHI's six steps, continued
  - 5) Show Courage!
    - 1) Provide backup all the way to the BOARD level
  - 6) Adopt an Engaging Style
    - 1) Involve MDs from the start
    - 2) Work with the real leaders
    - 3) Choose messages/messengers carefully
    - 4) Make MD improvement visible
    - 5) Build trust with each initiative
    - 6) Communicate candidly and often
    - 7) Value physicians' time with your time

## Resource paper

Reinertsen JL, Gosfield AG, Rupp W, Whittington JW.  
Engaging Physicians in a Shared Quality Agenda. IHI  
Innovation Series White paper. Cambridge, Massachusetts:  
Institute for Healthcare Improvement; 2007 (available on  
[www. ihl.org](http://www.ihl.org))



## Model for Improvement (MFI)

The MFI is based on a “trial and learning” approach. This trial and learning approach revolves around three questions.

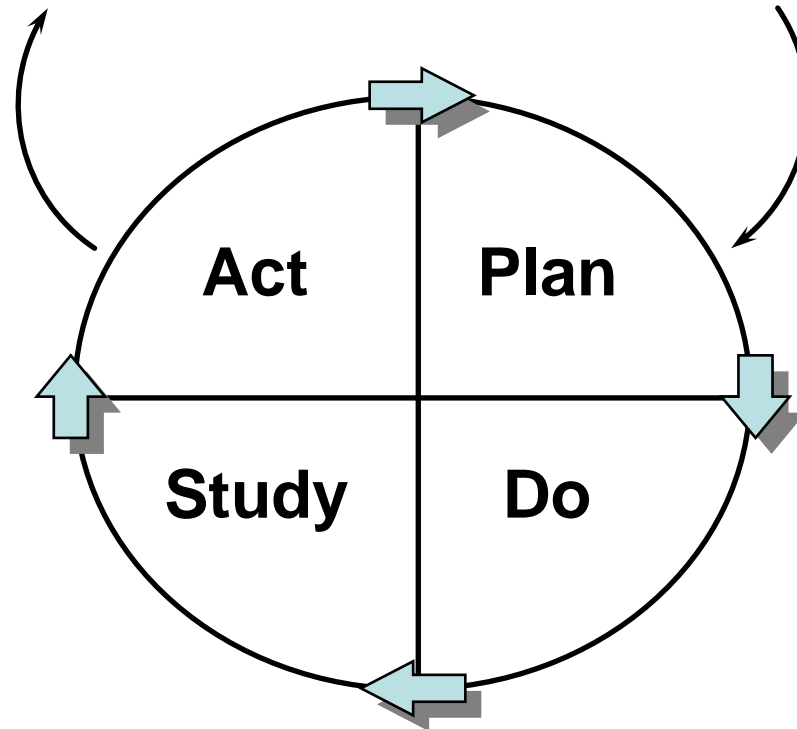
- **What are we trying to accomplish? (AIM)**
- **How will we know that a change is an improvement? (Criteria or Measures)**
- **What changes can we make that will result in improvement? (Testing Changes)**
- Focusing on these questions accelerates the building of knowledge by emphasizing a framework for learning, the use of data and the design of **effective** tests or trials.

# Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

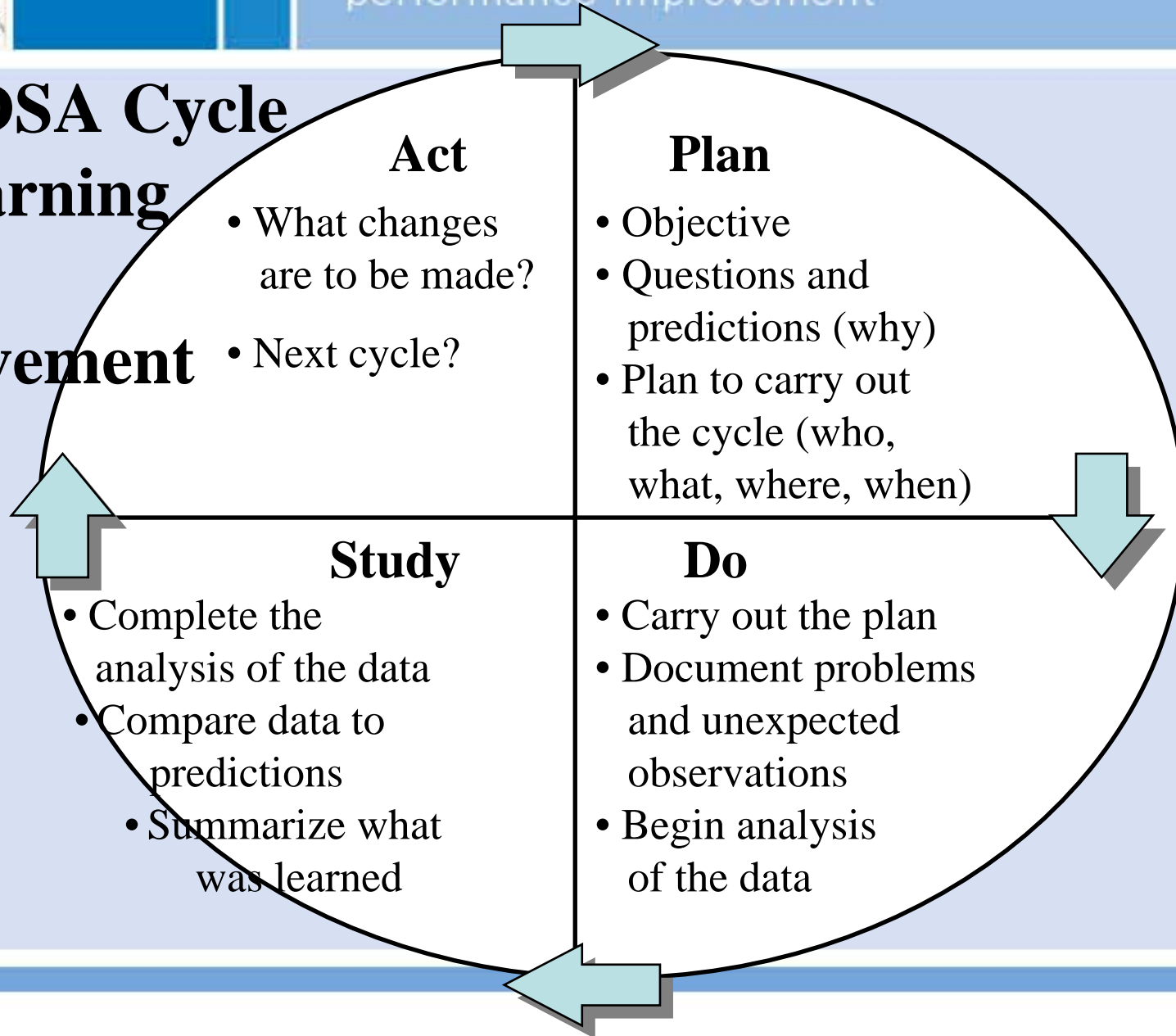
What change can we make that will result in improvement?







# The PDSA Cycle for Learning and Improvement





## Why test?

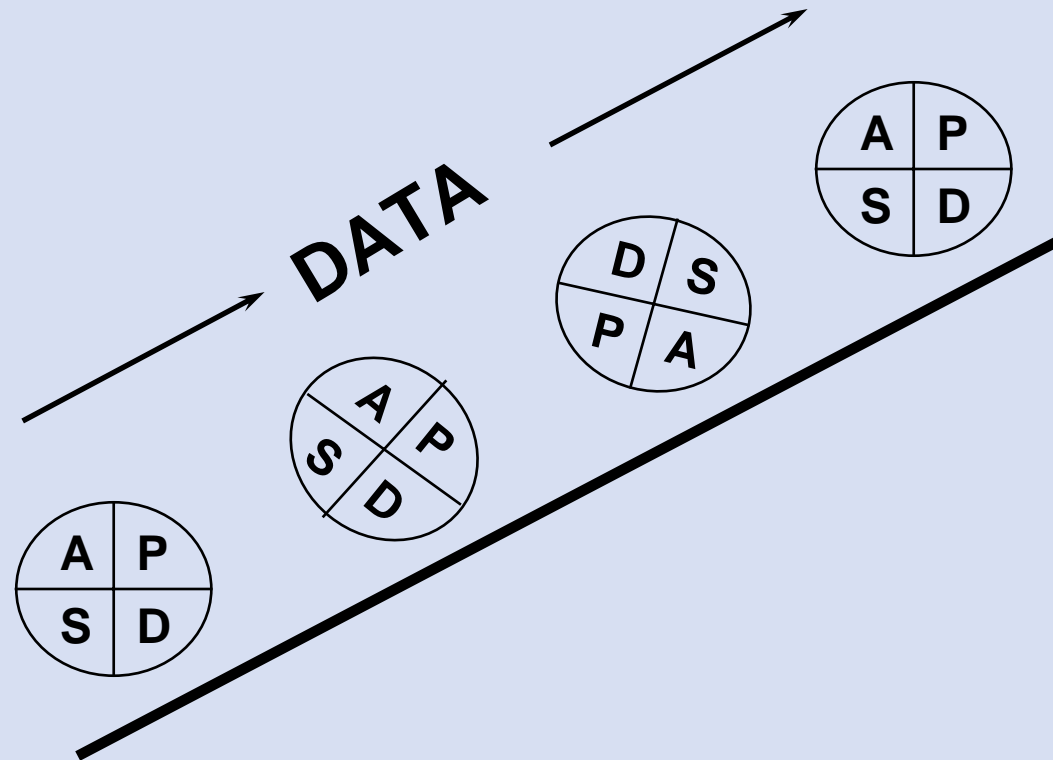
- Learn how to adapt the change to conditions in the local environment.
- Evaluate costs and side-effects of the change.
- Minimize resistance upon implementation.





# Repeated Use of the Cycle

Changes That  
Result in  
Improvement



Hunches  
Theories  
Ideas



## Healthcare applications of MFI

- **The Model for Improvement has significantly affected healthcare through the IHI Breakthrough Series Collaborative which incorporates the Model for Improvement.**
  - [www.qualityhealthcare.org](http://www.qualityhealthcare.org)
  - [www.improvingchroniccare.org](http://www.improvingchroniccare.org)
  - [www.ihl.org](http://www.ihl.org)
  - **Book: Langley G., Nolan K., Nolan W., Norman C., Provost L.: The Improvement Guide. Jossey-Bass 1996**

# Lean Thinking

- Definition
  - Lean Thinking is a way to do more and more work with less and less-less human effort, less equipment, less time, and less space-while coming closer and closer to providing customers with exactly what they want.
  - The aim of lean is to **eliminate** waste.

## Defining Lean

- *containing little or no fat* – Webster.com
- The least-wasteful way to provide **value to a customer.**
- What is value-added?
- History of Lean: Taichi Ohno

# Lean Objectives

- Search For and Eliminate Waste
- Reduce Time Waiting and Processing
- Reduce Cost
- Add value for the customer: everything else is waste

# Lean Principles

- Waste Elimination
- Standardized, Steady Flow Processing
- Inspection
- Visual Cues





## Defining Waste

- *damaged, defective, or superfluous material produced by a manufacturing process* – Webster.com
- Something that consumes resources, but adds no value to a product or service.



## Types of Waste

- Processing
- Inspection
- Inventory
- Wait Time
- Search Time
- Transportation
- Space
- Complexity
- People



# Standardized, Steady Flow Processing

From “batch and queue” to pull systems with standard work

## Benefits of Standard Steady Flow Processing

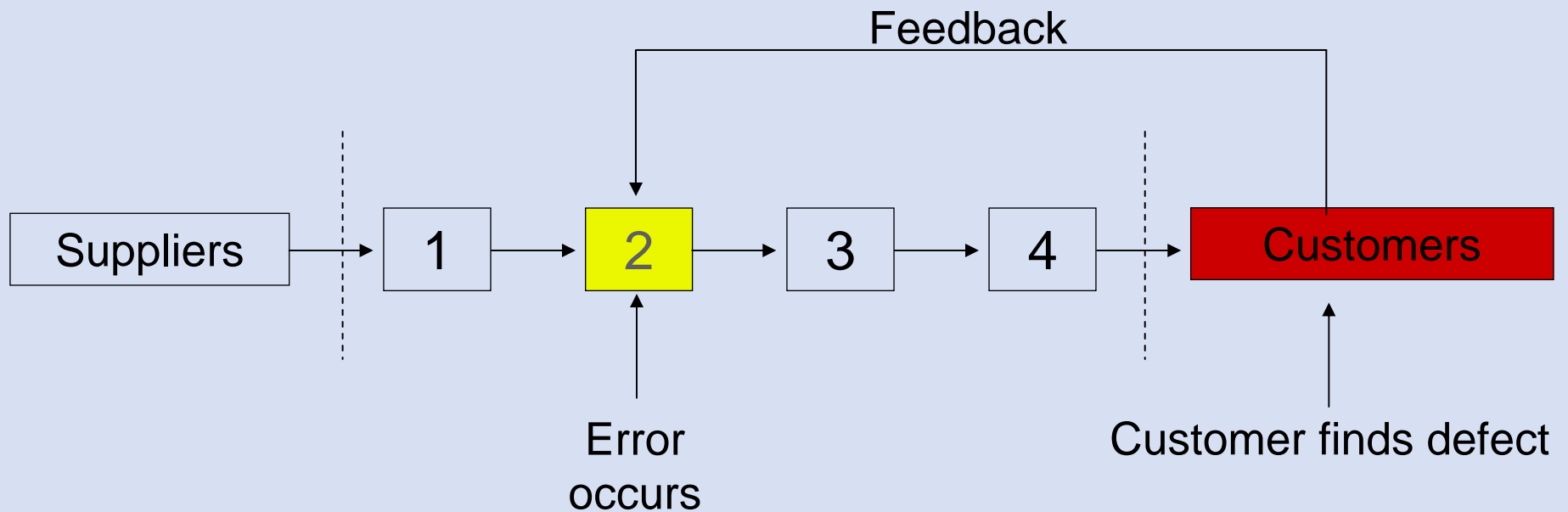
- Less frustration and pressure for employees
- Identifies quality problems upstream in the process
- **Visual cues** make it clear when to work, what to work on, and when to start and stop processing
- Process begins to manage itself



# Inspection: Driving out Defects

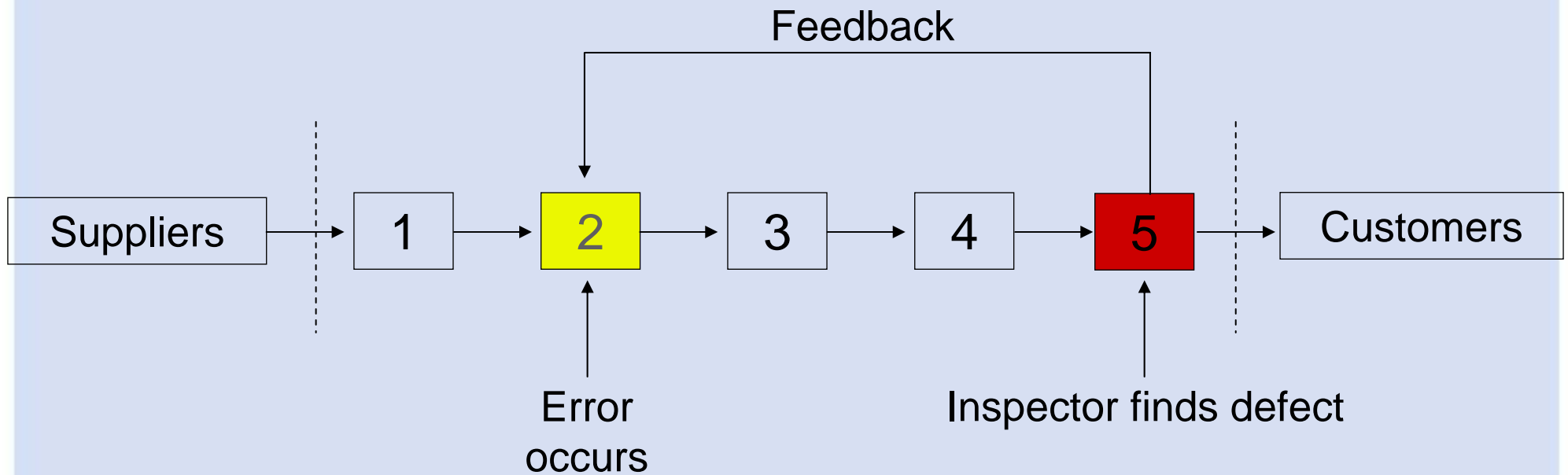


# Level 1: Customer Inspects



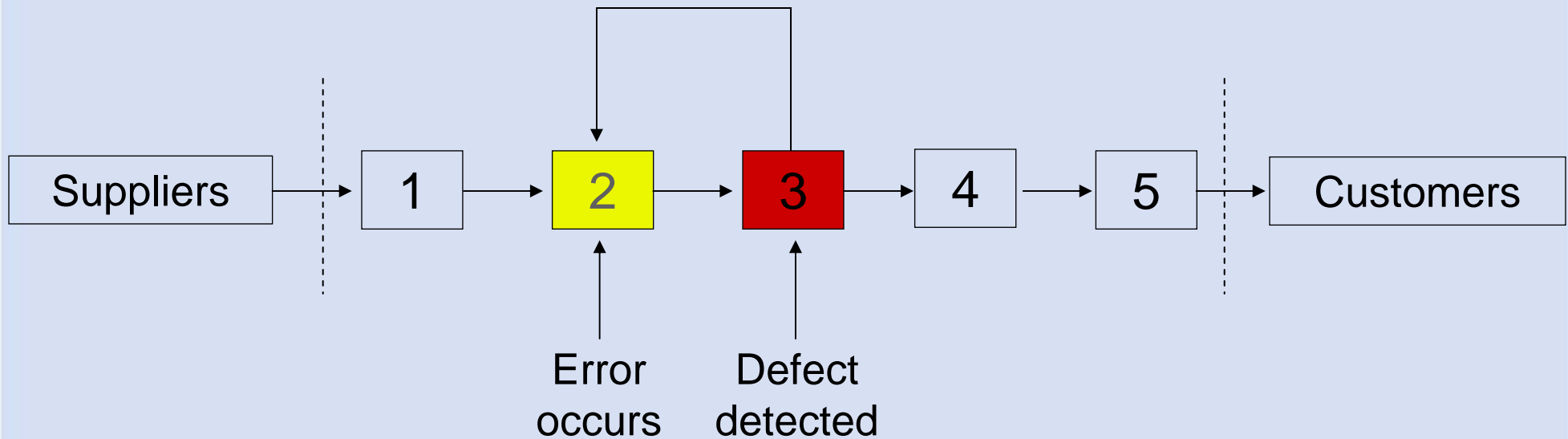


# Level 2: Company Inspects





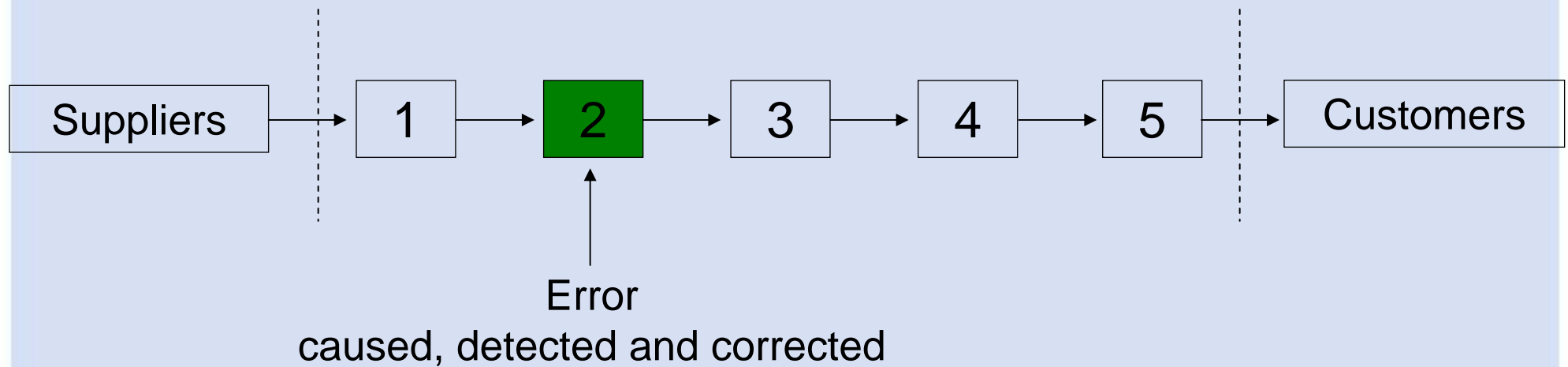
# Level 3: Work Unit Inspects





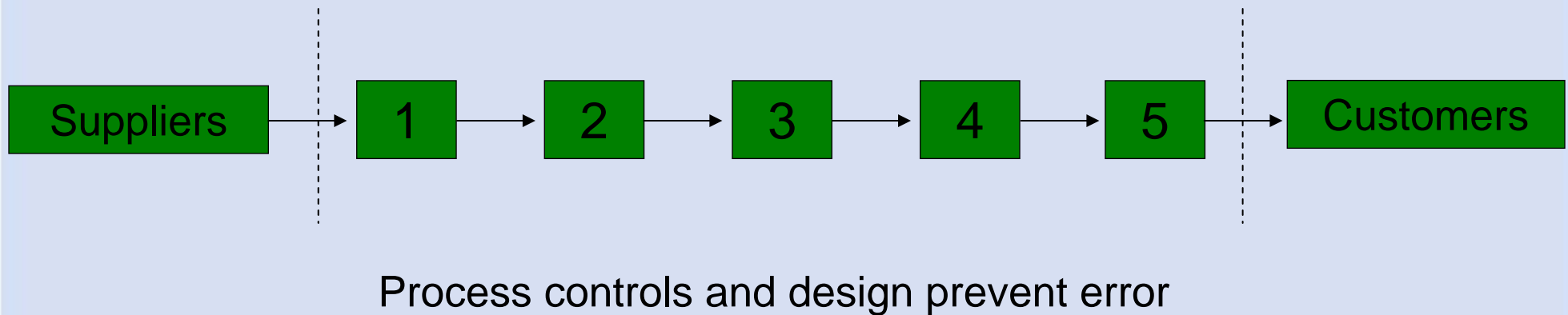


# Level 4: Self Inspection and Correction





# Level 5: Eliminate Opportunities for Errors





## Spirit of Improvement

- Use our minds first, not our money
- Challenge current thinking
- Look for leadership at all levels
- Substitute “we don’t know how to do it yet” for “we can’t”
- Remember that you are the experts





# Key Tools of Lean Thinking

## **Tools include, but are not limited to the following**

- Value Stream Mapping
- Process Mapping
- Poka-Yoke (error-proofing)
- Pull Systems (Kanban – “signal”)
- Visual workplace (5S - Sort, Straighten, Shine, Standardize, Sustain)

*On Lean Enterprise and Its Potential Healthcare Applications*, by Martin, K. *Journal for Healthcare Quality*. Vol 25. No 5. Sept/Oct 2003.



## Reliability Theory/Science

- Deliberate process design
- Goal:
  - Catastrophic processes
  - Non-catastrophic processes
- $10^{-2}$  reliability: 5 or fewer defects per 100 opportunities!



# Premises

For service system failures without immediate catastrophic consequences:

- $10^{-1}$  performance indicates **no articulated common process (that's where we are!)**  
**Test: 5 frontline staff cannot easily articulate the process**
- $10^{-2}$  performance indicates processes with medium to high variation
  - Test: there is some variation but 5 frontline staff CAN easily articulate the process
- $10^{-3}$  performance indicates a well designed system with low variation and cooperative relationships





## $10^{-2}$ is the ONLY goal for....

- Non-catastrophic processes
  - Definition: failure of the process does not lead to death or severe injury within hours of the failure
  - $10^{-1}$  performance or worse is commonly seen in these processes

Why are we operating at  $10^{-1}$  despite all of our talents and resources?



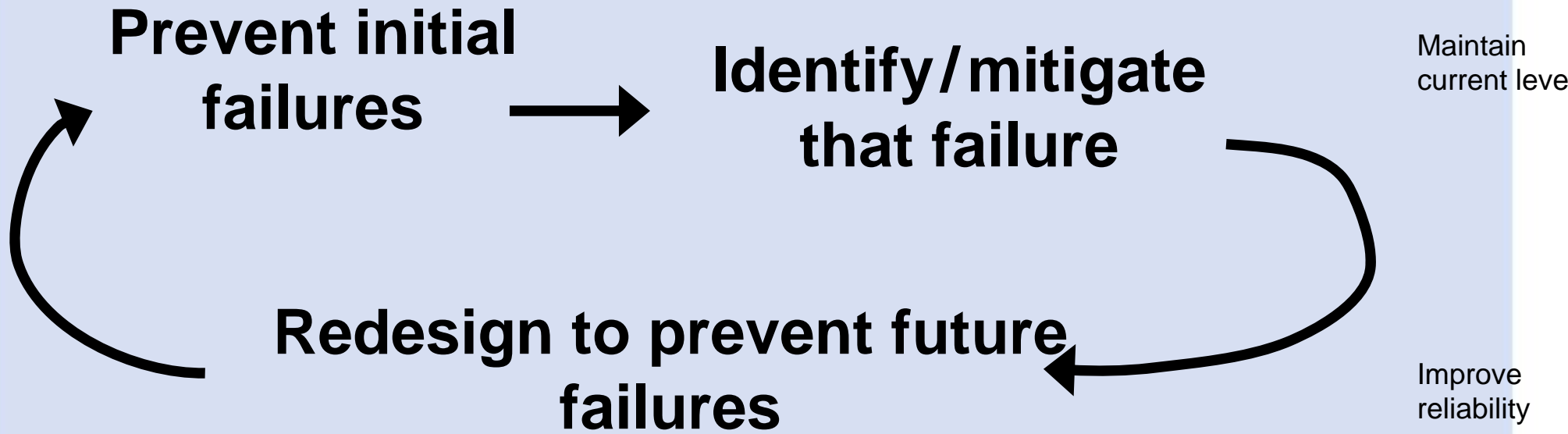
## Why not $10^{-2}$ NOW?

- Current improvement methods are highly dependent on vigilance and hard work
  - Human factors science tells us there's a limit to this
- Focus on benchmarked outcomes gives clinicians a false sense of security: biology protects us.
  - What's our comparison? “cream of the crap” vs. world class performance
- Permissive clinical autonomy allows wide performance margins. ***Benchmark to best practice, not aggregate averages; it's simplistic to blame the docs....***
- Deliberate design to achieve ***articulated reliability goals*** rarely occurs





## 3-Tier Reliability Design Model





## Getting to $10^{-2}$ : it's easy!

- Your first step (standardization) is 80% effective
  - Then, of 100 patients, 80 receive the care
- Your second step (mitigation) is 80% effective
  - Then, of the remaining 20%, 16 receive the care
- You have given the care to 94% by designing for 80% effectiveness in the two steps.
- This allows the freedom to design for less than perfection. Designs are simple and “leave out the oddballs (standard design for standard inputs)



## Challenge:

Why not 10 -2 or better for YOUR patients?

Why not YOU being a leader in the 10-2 model?

AIM: 95% of patients who are able to be extubated within 6 hours ARE extubated!

Standardize; mitigate; redesign!!!

