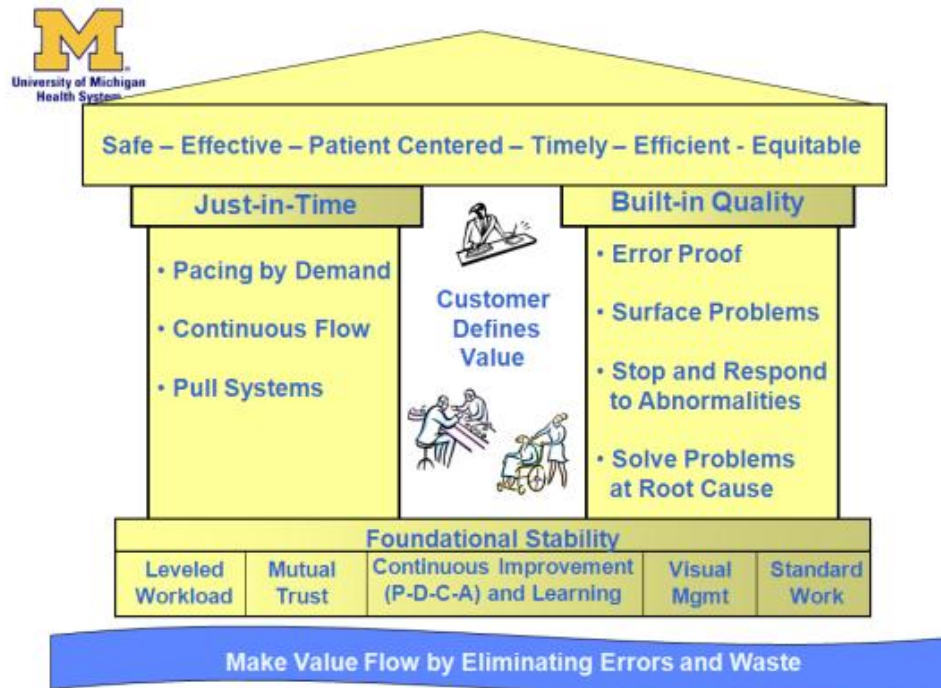


# Lean Thinking Overview



Health Care House – Sources: J. Shook, J. Bill, J. Liker, S. Hoelt, J. Womack, Park-Nicotet. Revised 5/09 W. Walters

# The Flip Side Of Lean



# What is Lean Thinking?

*“The endless transformation of waste into value from the customer’s perspective”.*

---James Womack  
author “Lean Thinking” 1996



# Why Lean?

*“It would be a lot easier if we could stop calling it lean and understand that it’s all about serving others, developing people and solving problems.”*

Jon Miller  
CEO Gemba

It's just a manufacturing thing, right?



**Healthcare is Different!**



# Healthcare's

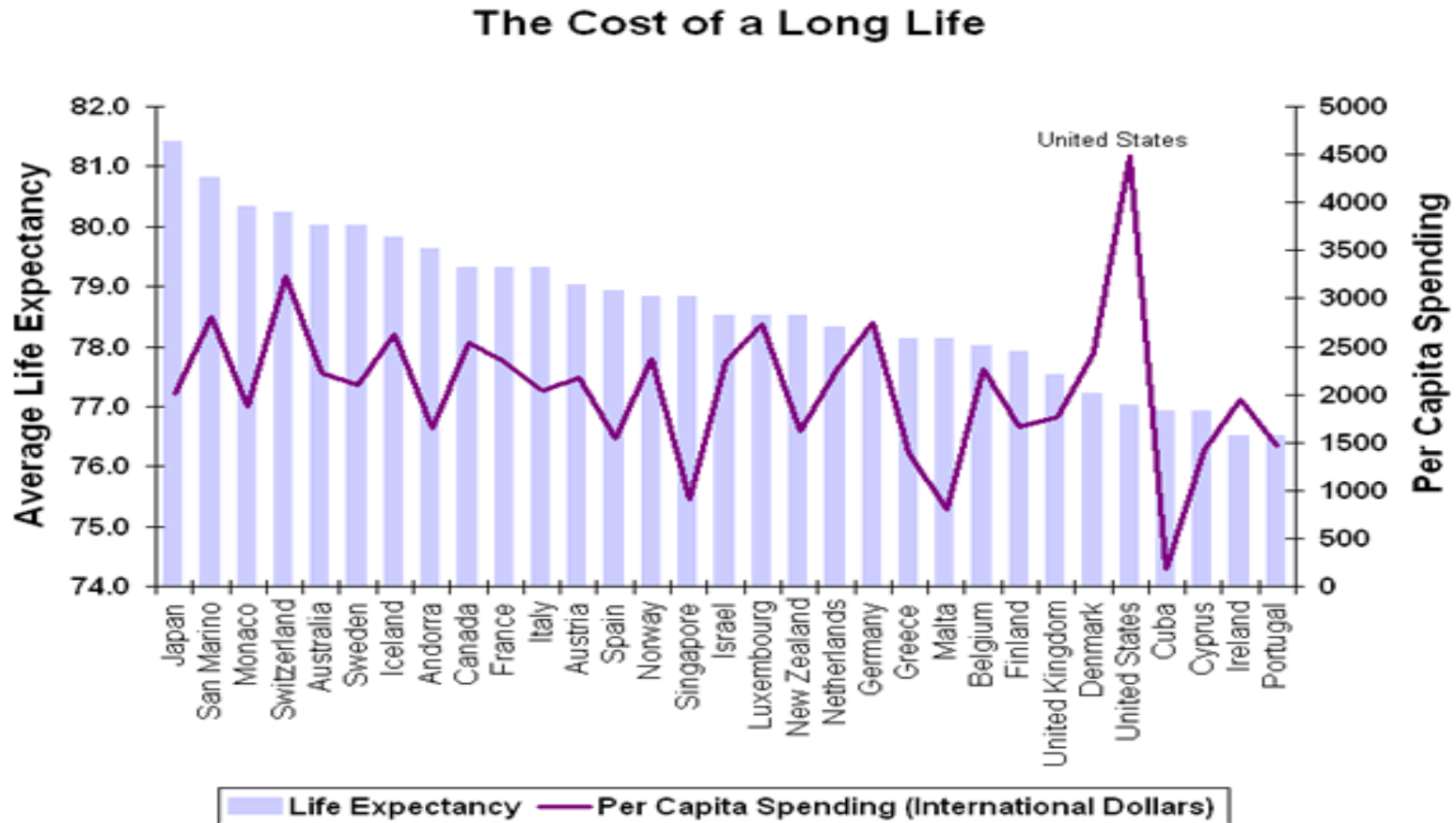
## ~~Manufacturing's~~ Ideal World

### Goods & Services

- ✓ Delivered Error Free
- ✓ Delivered On-time as requested
- ✓ Delivered Efficiently without waste
- ✓ Delivered Safely



# Why implement lean into the healthcare industry?








# A Quick Summary of Lean Thinking

- Do our work every day in a standard way that we created
  - *Not just the way the work evolved!*
- Be alert to things going wrong
  - *They always do!*
- Fix the problem now
  - *For this patient or co-worker*
- Find and fix the root causes of the problem
  - *So it never happens again!*

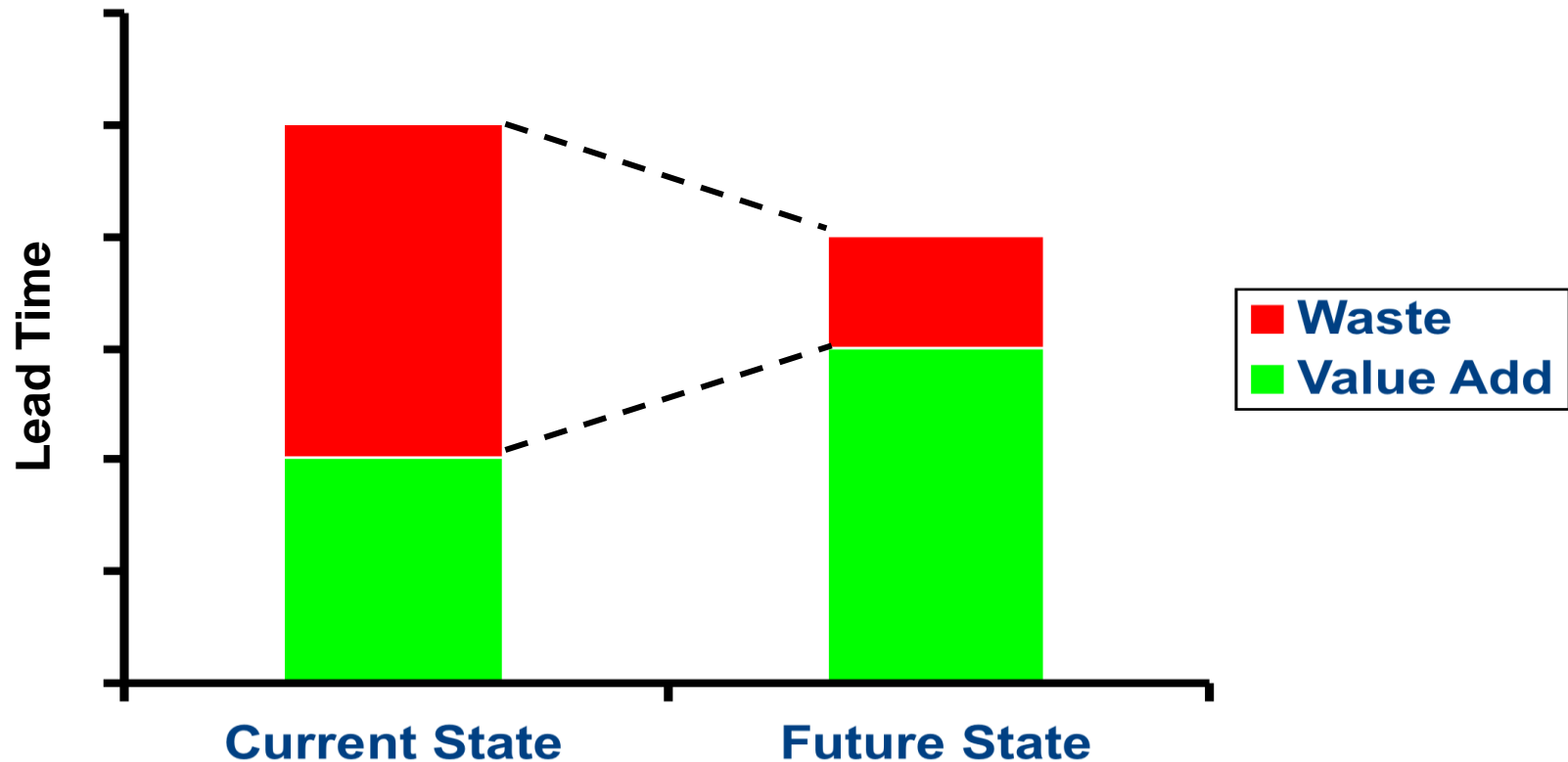
**Modified after Spear; Billi**

# How can we create (liberate) “20,000 problem solvers”?

- Help each worker take initiative to find and fix causes of problems he/she faces daily
  - This means each of us has two jobs:
    - *Do the work*
    - *Improve the work*
- Leaders' role:
  - Support improvement work (time, mentoring)
  - Align improvements so value flows to the customer

# The Objective of Our Lean Work

To increase **Value** Added Work and reduce **Waste** to Increase Throughput,  
Lower Cost and Improve Quality



# *What Is Waste?*

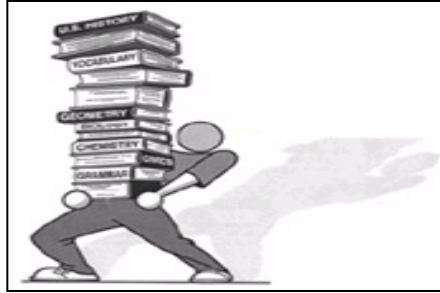
Any element of production, processing, or distribution that adds no value to the final product

*Waste only adds cost & time to a process*

*Waste can be found:*

- *In areas with rework*
- *Areas experiencing long wait times*
- *Process steps requiring multiple reviews and revisions*
- *Areas where multiple handoffs occur within & across depts.*

# *How Does Waste Affect Us?*



*Steals our time!*



# *Waste Definitions*

**Correction:** Rework, work done because of errors in the previous process

**Overproduction:** Making more than is necessary or making things faster than is necessary, working ahead

**Motion:** Unnecessary people motions, travel, walking, searching

**Material Movement:** Unnecessary handoffs, transfers, filing, distances of material & information

**Waiting:** People waiting for machines, information or people. Information waiting on people or machines

**Inventory:** Information or material waiting in queue

**Processing:** Redundant or unnecessary mental or physical work; work that is giving the customer more than he/she is willing to pay for

**Variability:** A flow of information or product processes that are not regular or constant; the lack of consistency in schedules, products, and info. (**Unevenness**)

**Overburden:** Pushing a machine or people beyond their capabilities or what is considered reasonable. (**Unreasonable-ness**)

*Some add 8<sup>th</sup> waste of **Non-utilized talent***

# *Exercise: Waste in your Area*

## *Pair and Share*

<b>Waste Category</b>	<b>Definition</b>	<b>Your Examples</b>
Correction	Rework because of defects, low quality, errors	
Overproduction	Producing more, sooner, or faster than required by the next process Inappropriate production	
Motion	Unnecessary staff movement (travel, searching, walking)	
Material Movement	Unnecessary patient or material movement	
Waiting	People, machine, and information idle time	
Inventory	Information, material, or patient in queue or stock	
Processing	Redundant or unnecessary processing	





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# 7 Wastes Plus One More!

<b>1. Correction</b>	Lab order misread and incorrect test completed
<b>2. Overproduction</b>	Lab Results delivered to people who have not asked for them and will not read them
<b>3. Motion</b>	Lab tech walking around station to retrieve printed results
<b>4. Material Movement</b>	Moving specimen from the phlebotomy station to the lab
<b>5. Waiting</b>	Patient and physician waiting for lab results
<b>6. Inventory</b>	Lab specimens awaiting testing
<b>7. Processing</b>	Lab results printed to triplicate forms that are separated and only one form is used
<b>8. Wasted Talent</b>	Disregard lab tech's proposal to rearrange work area



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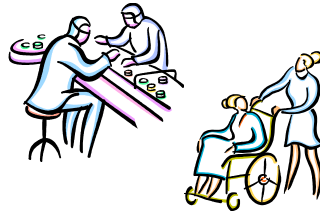
**Safe – Effective – Patient Centered – Timely – Efficient - Equitable**

**Just-in-Time**

- Pacing by Demand
- Continuous Flow
- Pull Systems



**Customer  
Defines  
Value**



**Built-in Quality**

- Error Proof
- Surface Problems
- Stop and Respond to Abnormalities
- Solve Problems at Root Cause

**Foundational Stability**

**Leveled  
Workload**

**Mutual  
Trust**

**Continuous Improvement  
(P-D-C-A) and Learning**

**Visual  
Mgmt**

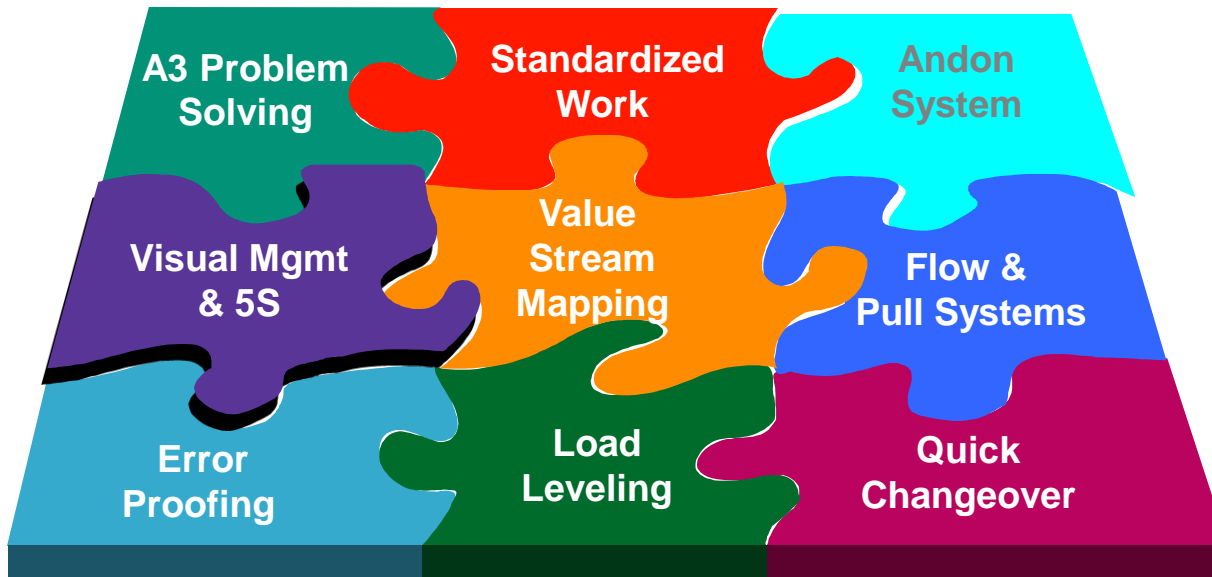
**Standard  
Work**

**Make Value Flow by Eliminating Errors and Waste**



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# Lean is a system...





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# ***“An Overview of Error Proofing”***

***Also referred to as....Mistake Proofing or Poka-Yoke  
(translation from Japanese “to avoid inadvertent errors”)***



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# Error-Proofing (Mistake Proofing)


- Allows a better process solution than a person-dependant solution
- Ensures 'Built-In-Quality'
- Examples:
  - Standardized forms with check-boxes rather than free-text
  - Anesthesia gas connections – color coded and unique



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## *Exercise: Error Proofing Pair and Share*

*What are some examples of error proofing that you have encountered in your work environment or the world at large?*



*Mistake Proofing the  
Design of Healthcare Processes,  
John Grout, Ph.D.  
(will email a copy)*



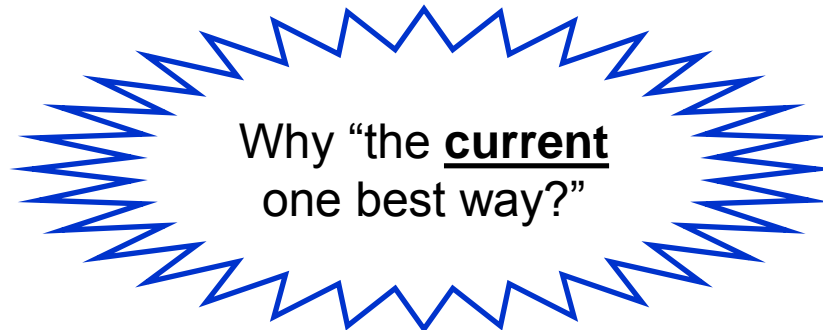
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# Standardized Work

## Definition:

The current one best way to safely complete an activity with the proper outcome and the highest quality, using the fewest possible resources





# Standardized Work Critical to Improvement Efforts

- Without the basis of Standardized Work there is no place for us to make improvements from
- A common misconception of Standardized Work...
  - ❖ Is that it robs us of our creativity – however, when implemented correctly the exact opposite is true!
- When implemented correctly...
  - ❖ It enables a flexible workforce
  - ❖ Significantly reduces errors
  - ❖ Significantly improves efficiency
  - ❖ Enables new initiatives to launch with greater success

# Should we Standardize all Healthcare Processes?

Why?

GREAT questions to ask....

- Does standardizing this method improve quality or safety?
- Within the process what portion of the work is of critical importance?
  - ❖ Typically 20% of the tasks within a process must be highly consistent

## Standardized Work Exercise – Individual Activity

- Think of an important Healthcare process that if NOT standardized would likely lead to Patient Harm
- This process will now be represented by the drawing of a pig (yes, that is right...an oink-oink pig...what else?)
- Please take the next minute or so to draw your pig on the provided blank piece of paper
- Upon completion, please hold your pig up for all to see!



## Standardized Work Exercise – Individual Activity

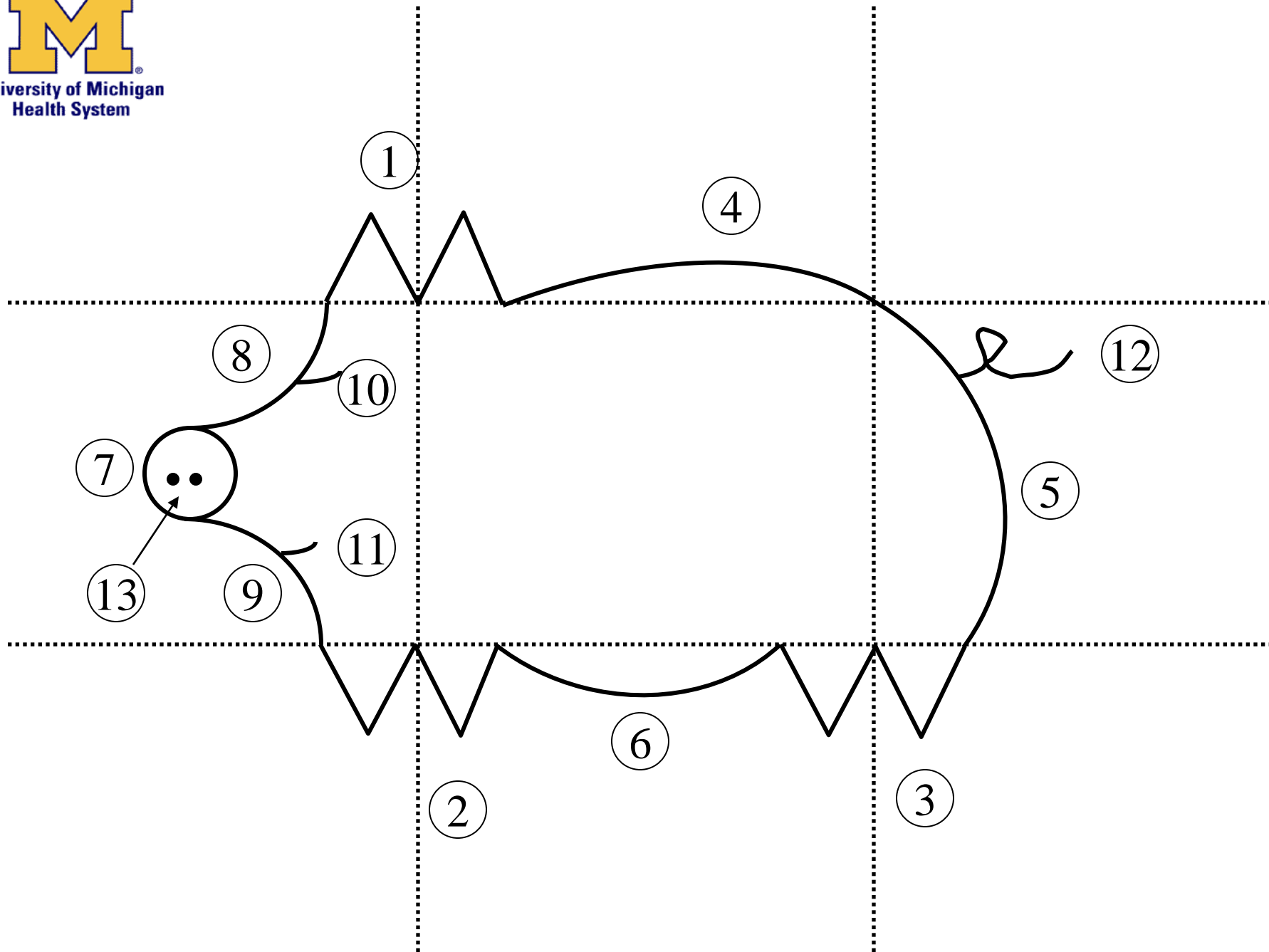
- This exercise helps illustrate the need for developing & training standardized work relative to this process!
- When developing standardized work, it is important to involve the folks who “do the work”
- For the sake of our exercise we will make the assumption this group worked together to create the standard work for our pig
- However, Standardized Work alone is never enough...people need off-line & OTJ Training as well as consistent standard reinforcing moments to become 2nd Nature
- Let’s complete some quick off-line & On The Job training on the agreed to standardized work (using the standard work instructions & one of the sheets of grid paper)



Hand out Standardized Work  
& a piece of grid paper



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## Standardized Work Exercise – Individual Activity

- Take a look at the original pig vs. the new standardized pig...
  - ❖ Which one looks more like a pig?
  - ❖ Which pigs look more alike across the room?
    - The original pigs or the standardized pigs?
- It appears that our Patient is much safer this time!!!
- \*We should always improve on the current standard...for instance
  - ❖ Re-sequence steps so pen or pencil doesn't need to lift?
  - ❖ More definition to size of nose or ears?
  - ❖ Maybe add more grid lines?
- Remember, Standard Work must be SIMPLE and created by the folks doing the work so it is meaningful in real-time in our areas

\*“Standardized work without improvement would be a stagnant workplace that never improved. Improvement without the basis for standard work might be a chaotic environment where people randomly try new methods that do not necessarily improve the overall system” – Mark Graban



# ***Root Cause of Most Problems?***

- 80-90% of root causes comes down to either no standard/standardized process in place or a standard/standardized process not being followed
- A Clinical Example including Avoiding Blame



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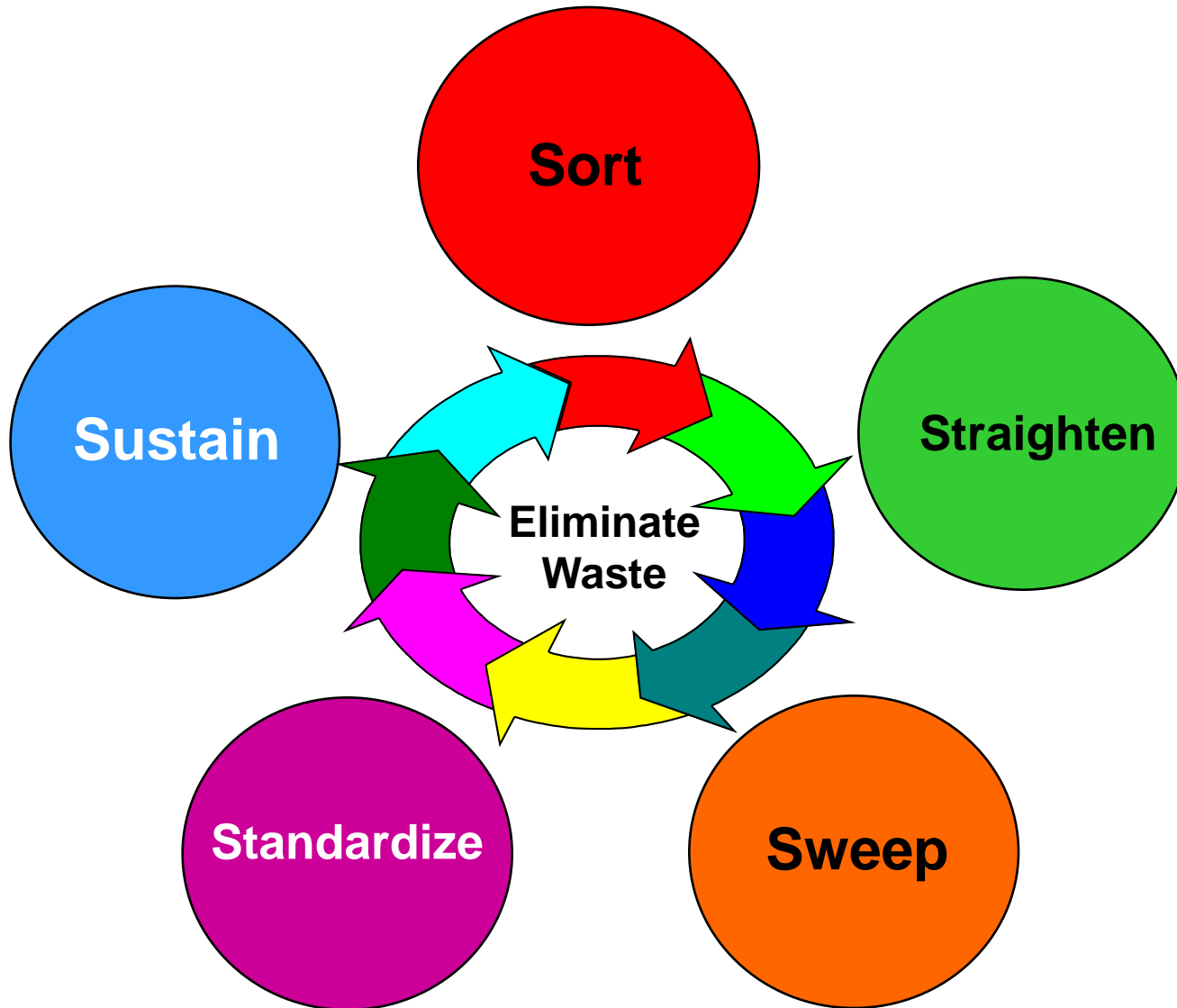
# **5S – Introduction To The Visual Workplace**

“5S methodology reduces waste through improved workplace organization and visual management...primary goal is to prevent problems and to create a work environment that allows people to provide the best patient care in the most effective way” - Mark Graban



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# Visual Workplace: The 5 S's





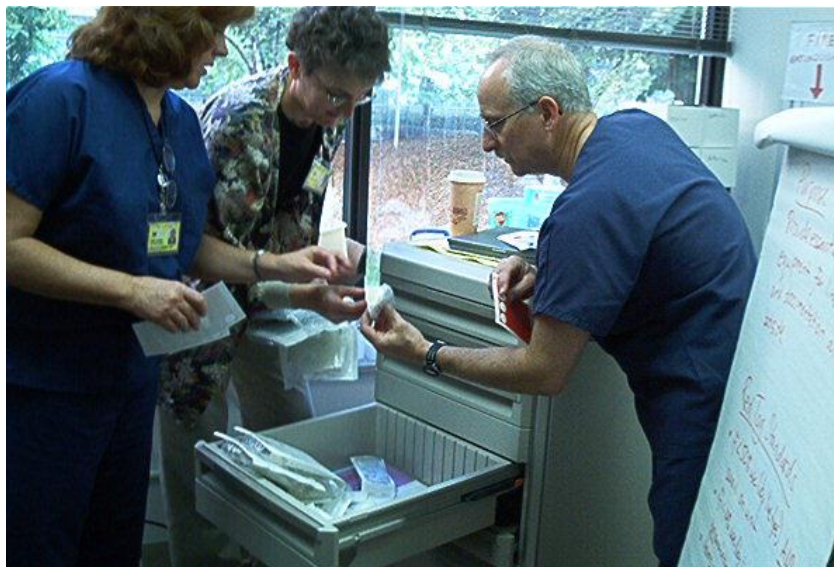
## The 5 S's: Visual Workplace

1. **Sort** – Sort through items, keep only what is needed while disposing of what is not.
2. **Straighten** (orderliness) – “A place for everything and everything in its place.”
3. **Sweep** (cleanliness) – The cleaning process often acts as a form of inspection that exposes abnormal conditions.
4. **Standardize** – Develop systems and procedures to maintain and monitor the first three S's.
5. **Sustain** (self-discipline) – Maintaining a stabilized workplace in an ongoing process of continuous improvement.

At Thedacare, 5S improvements helped reduce the amount of wasted time in an average nurse's 8 hour shift from 3.5 hours a day to just 1 hour per day



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Source: University of Michigan Health System





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# Office 5S Workshop

## Copier – Supply Room

**Before**



**After**



**Closed versus Open Storage**



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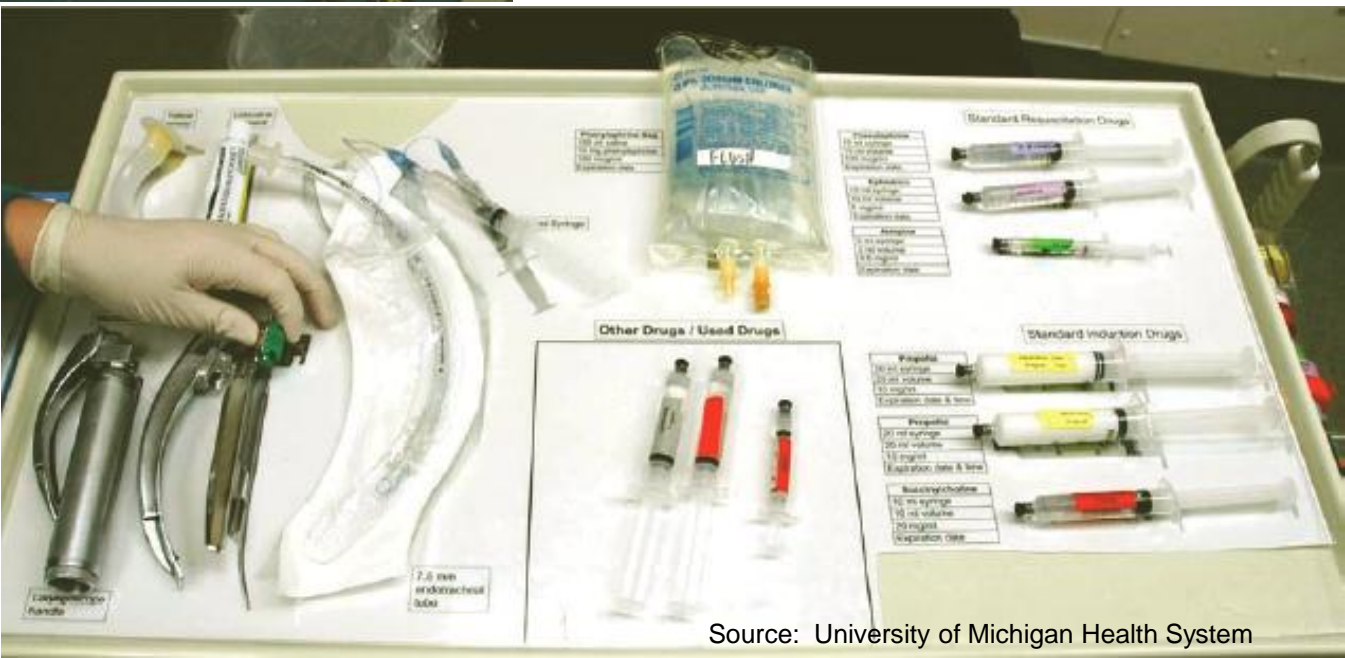
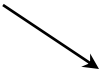
# Anesthesia Board - Standardize



Before



After







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# The 5S Numbers Game



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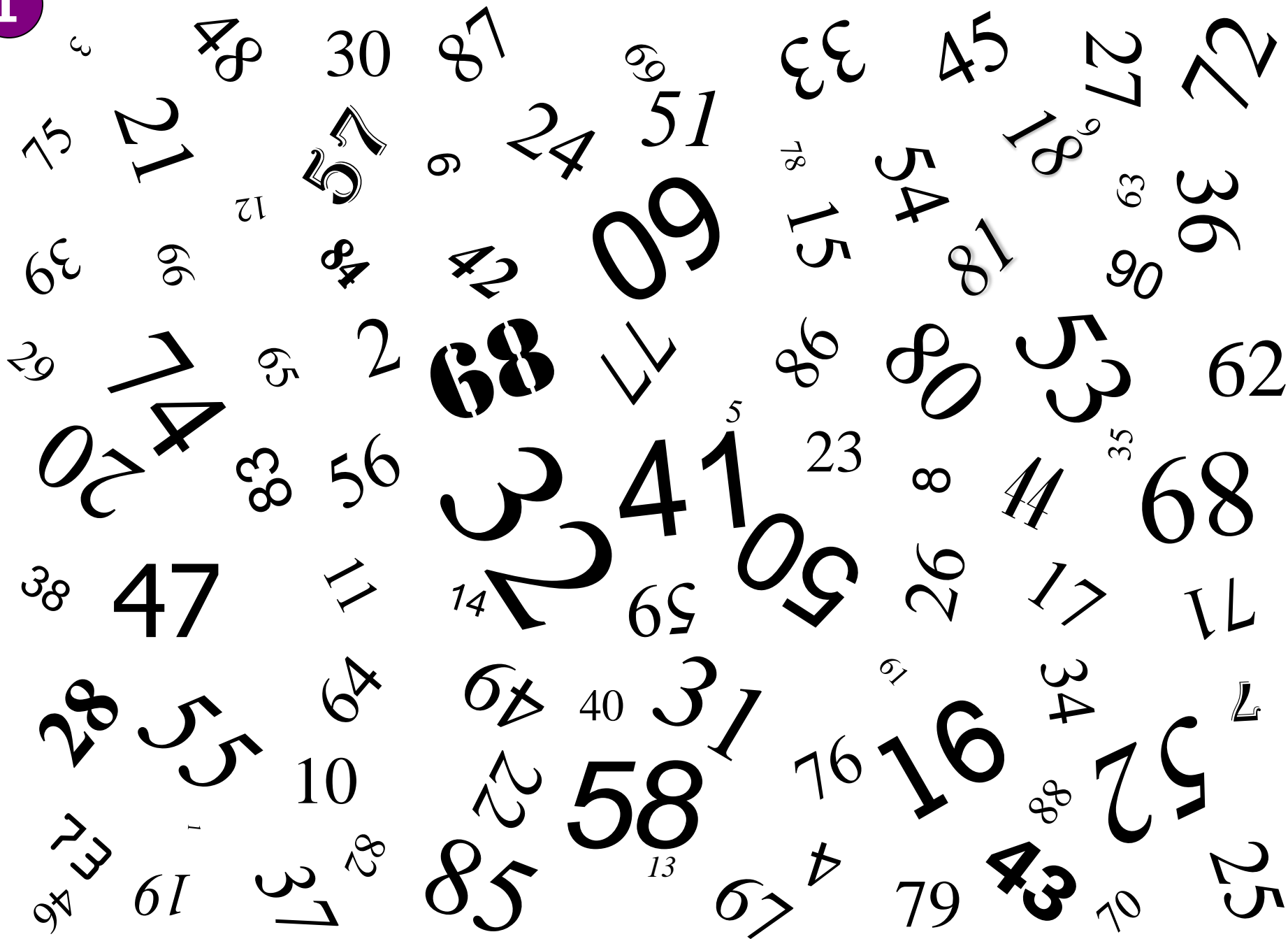
## Game – Current State

- This sheet represents our current work place.
- Our job during a 20 second shift, is to strike out the numbers 1 to 49 in correct sequence.

Example: 1 2 3

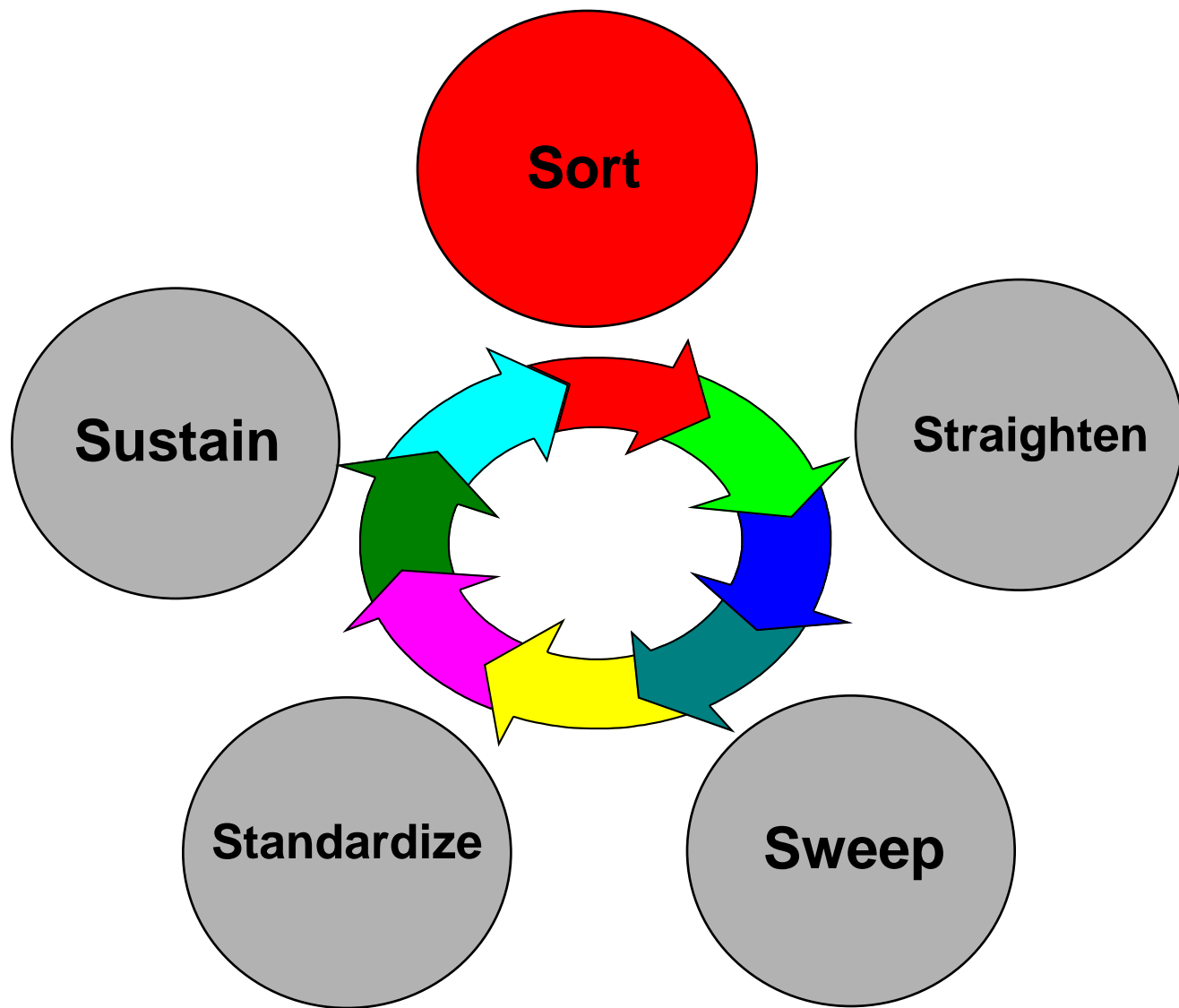
- The team score will be represented by the lowest individual score achieved.

## The Value of Workplace Organization



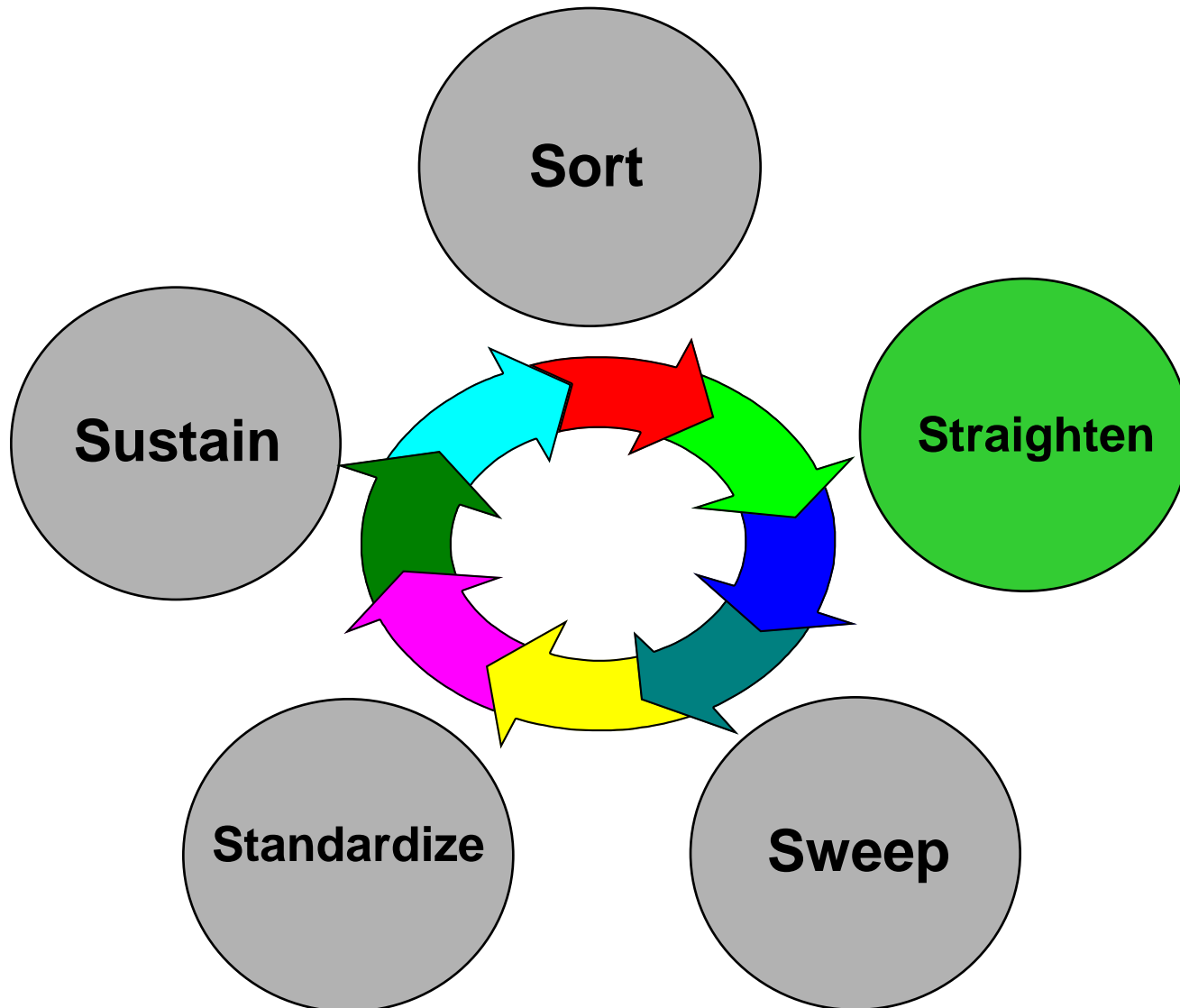


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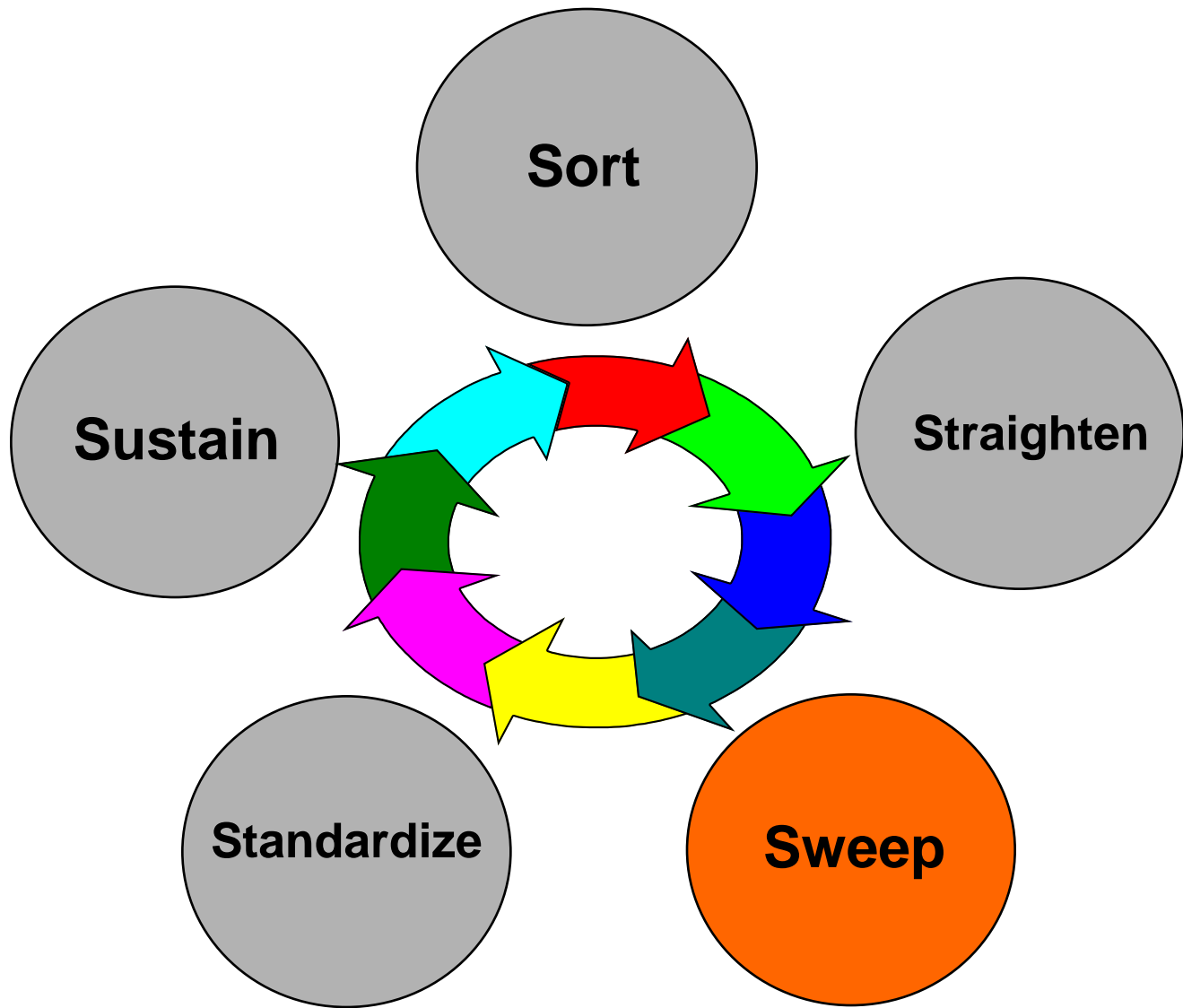


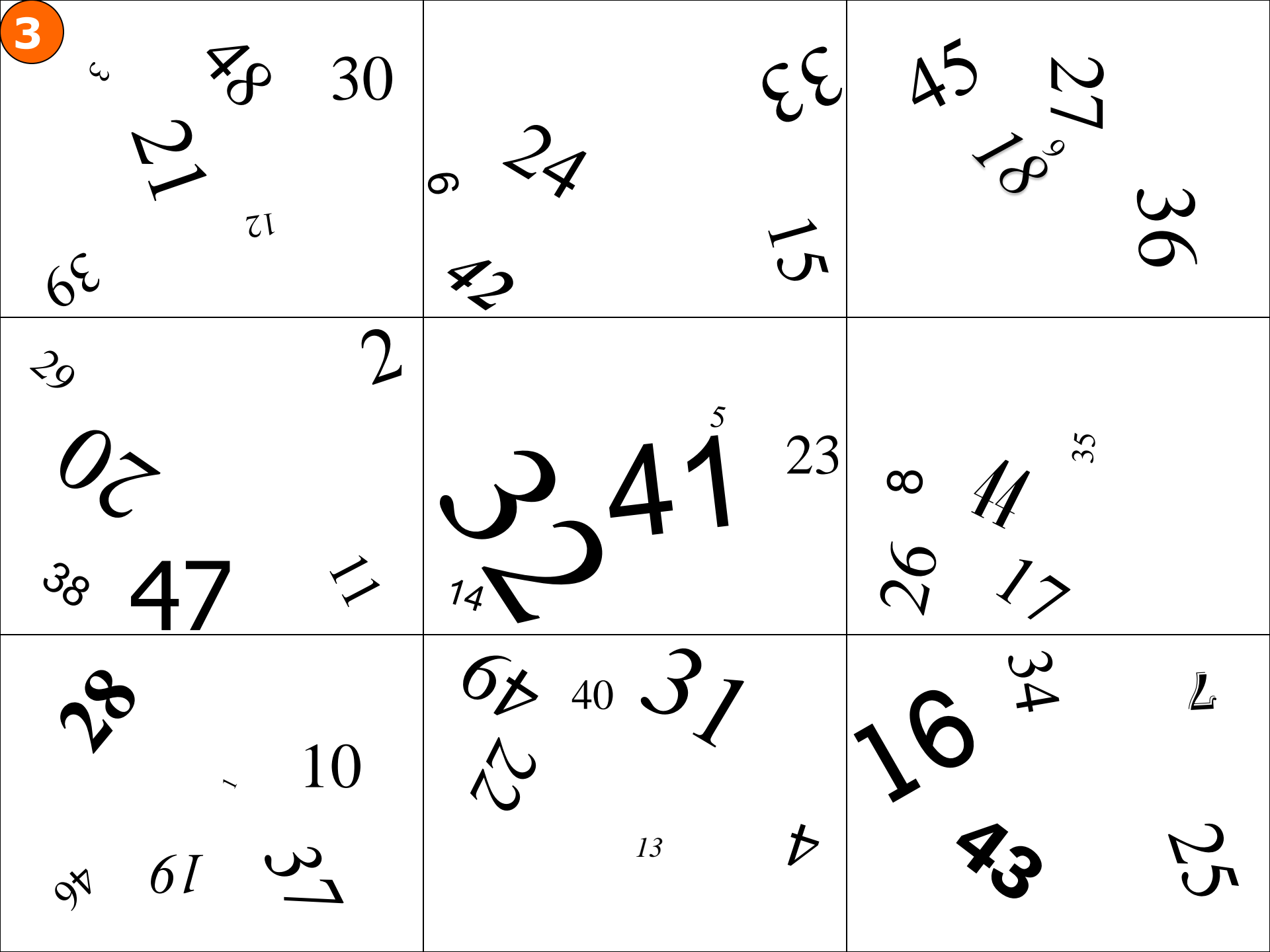
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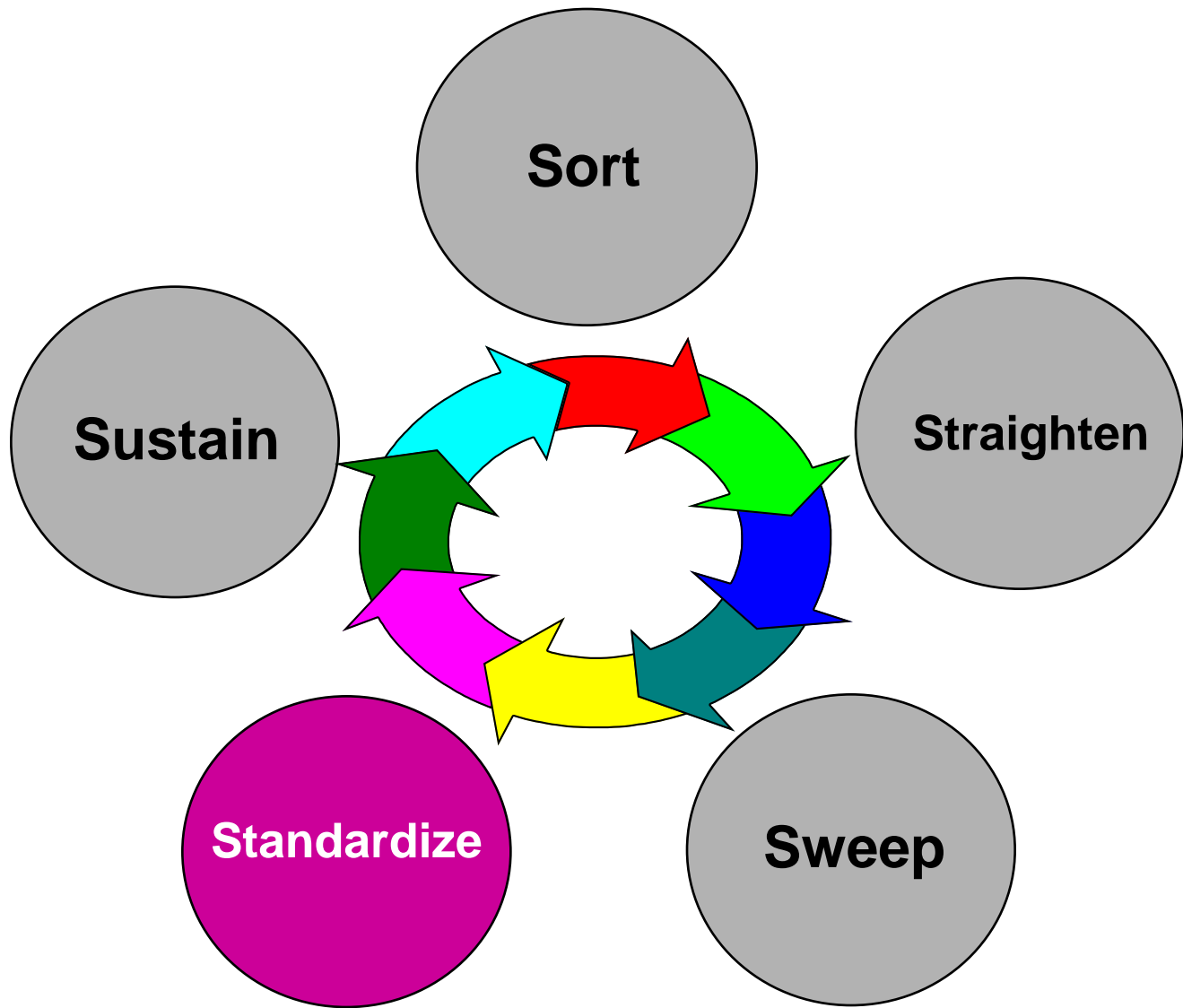
# Numbers from 1 to 49

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	



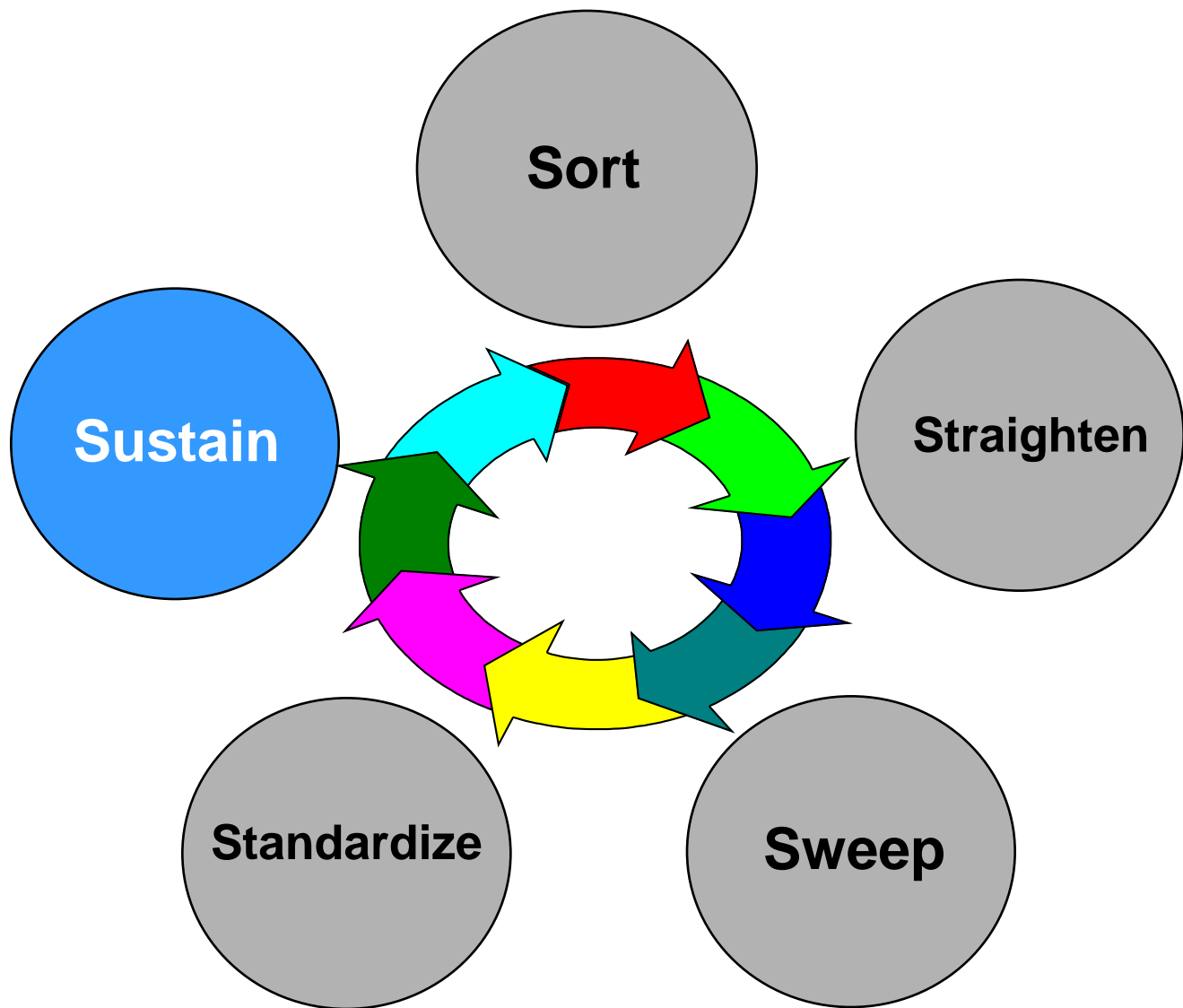


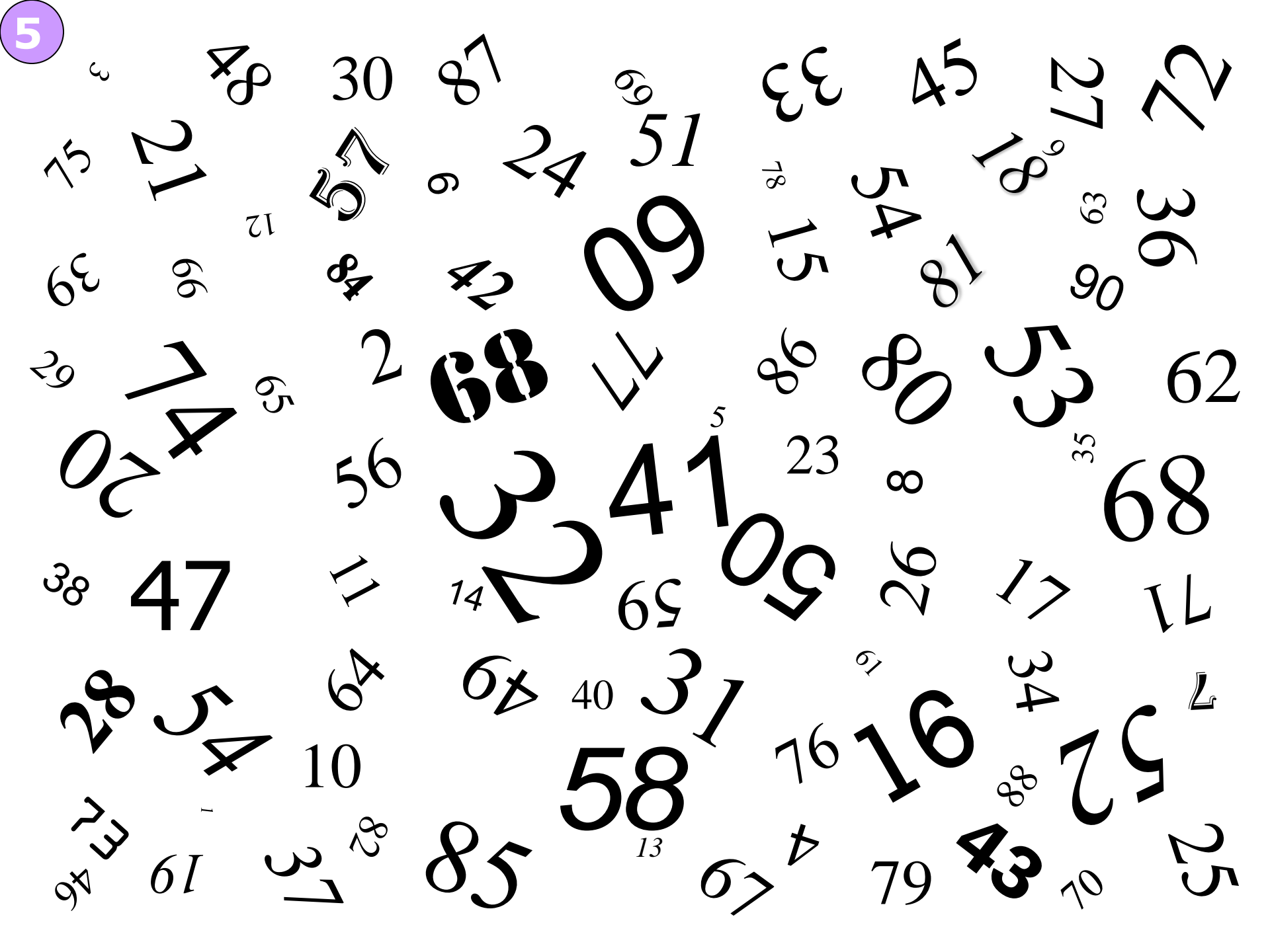
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# Find Missing Numbers

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	<b>16</b>	17	18	19	20
21		23	24	25	26	27	<b>28</b>	29	30
31	<b>32</b>	33	34	35	36	37	38	39	40
<b>41</b>	42	<b>43</b>		45	46	<b>47</b>	48	49	



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# Before



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After



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# Benefits of Reducing Batches

Think Elevator vs. Escalator



# Benefits of Reducing Batches?

- Reducing Batches
  - Shortens Cycles for each Patient
  - Reduces Excess Inventory
  - Improves Quality
  - Improves Responsiveness

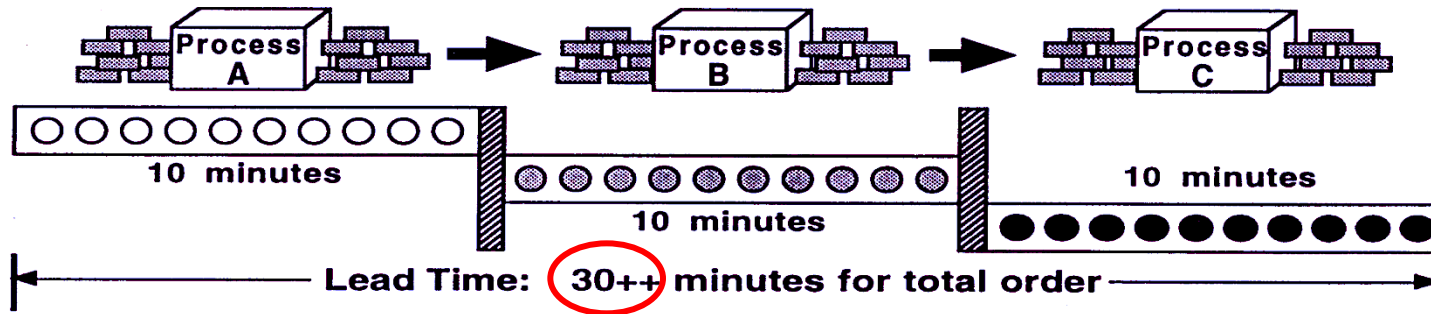




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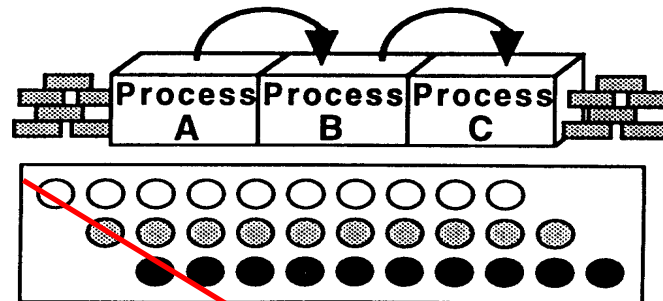
# Simple Process Flow & Small Lots

## Batch & Push Processing



21 minutes for first piece

## Continuous Flow “make one, move one”



3 Minutes for first piece

12 Minutes for total order

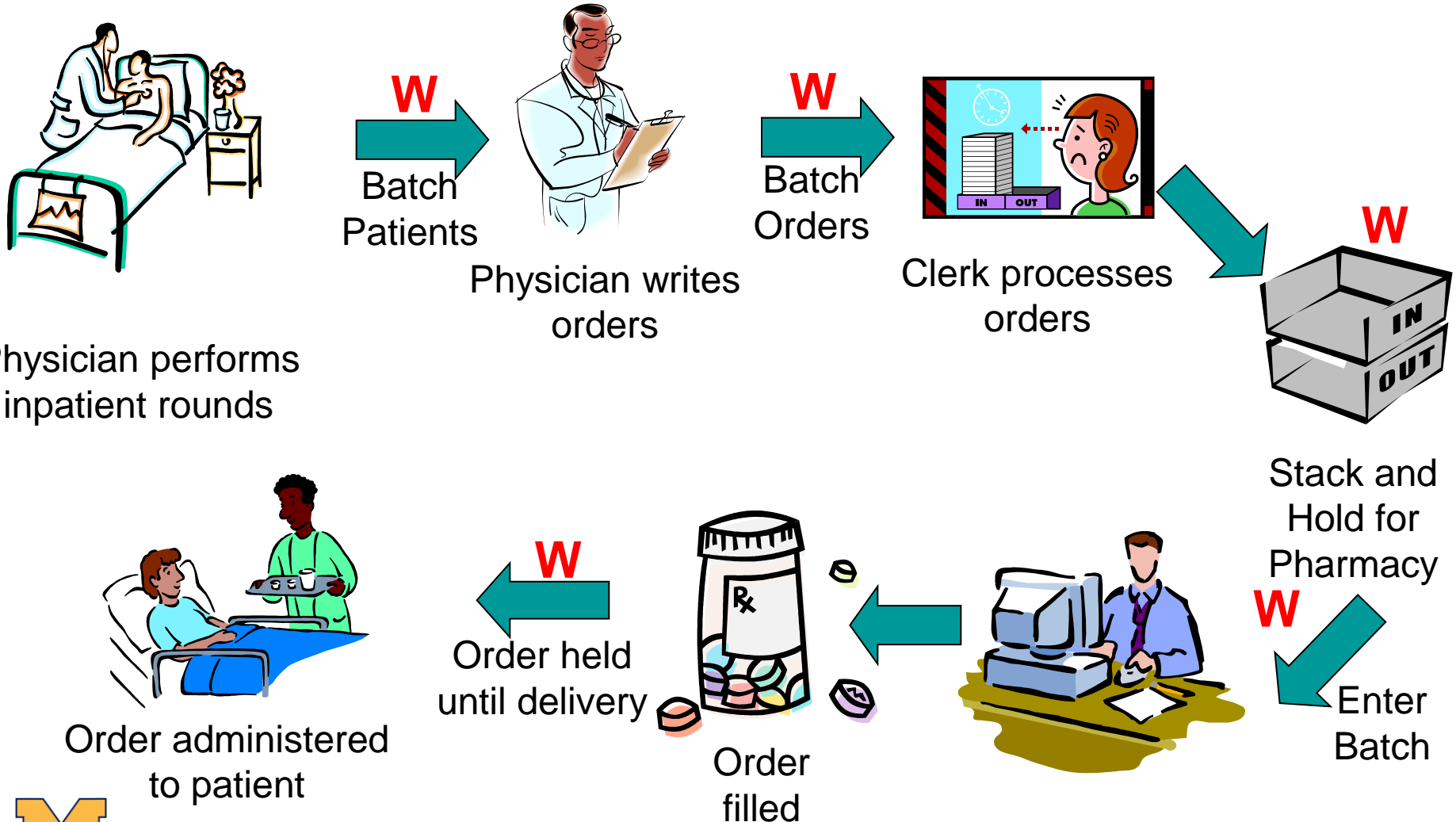


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# Example: Batching & Multiple Handoffs



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**Incorporate Lean Principles When Planning Your Future State**

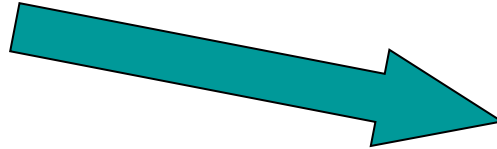


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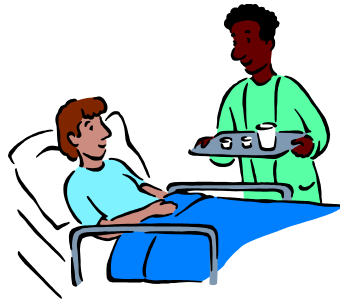
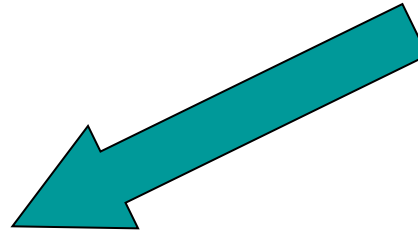
# One Piece Flow – One Touch



Physician examines  
patient & enters electronic  
order



Order  
filled



Order administered  
to patient



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# Signature Exercise

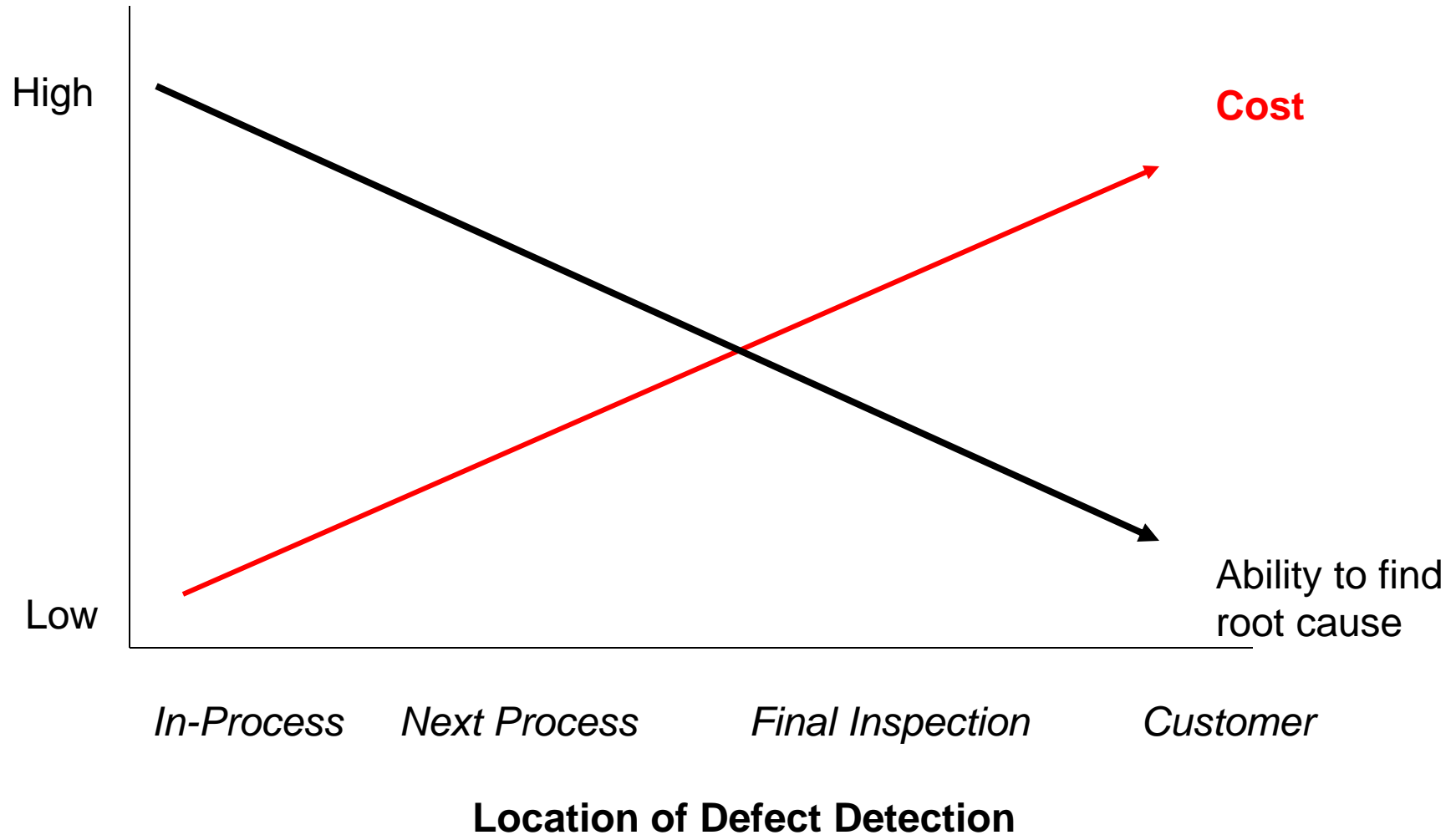
If one-piece flow is so superior, why is batching so prevalent?

Think river and rocks analogy (pg. 153 in Lean Hospitals)



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# Quality At The Source



# Signature Exercise Summary

## **Batch Environment:**

- Batch processing creates a longer lead time
- Quality issues are buried in the batch and do not surface until after work is completed

## **One-piece Flow:**

- One piece flow processing significantly reduces lead time.
- Quality problems are identified close to the point of occurrence and are corrected at the point of occurrence.

# **Overview of the Lean In Daily Work Model**

**(also referred to as the LIT Model)**

**UMHS' Standard Work  
for Daily Problem Solving**



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## The Lean In Daily Work Model: Standard Work for Daily Problem Solving

### Key Metrics: Define, Measure, & Display

\*Links to strategic deployment

### Routine Interactions to Identify Problems

\*Part of daily standard work

### Assessment of Problem Complexity

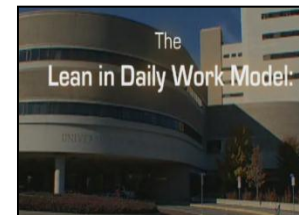
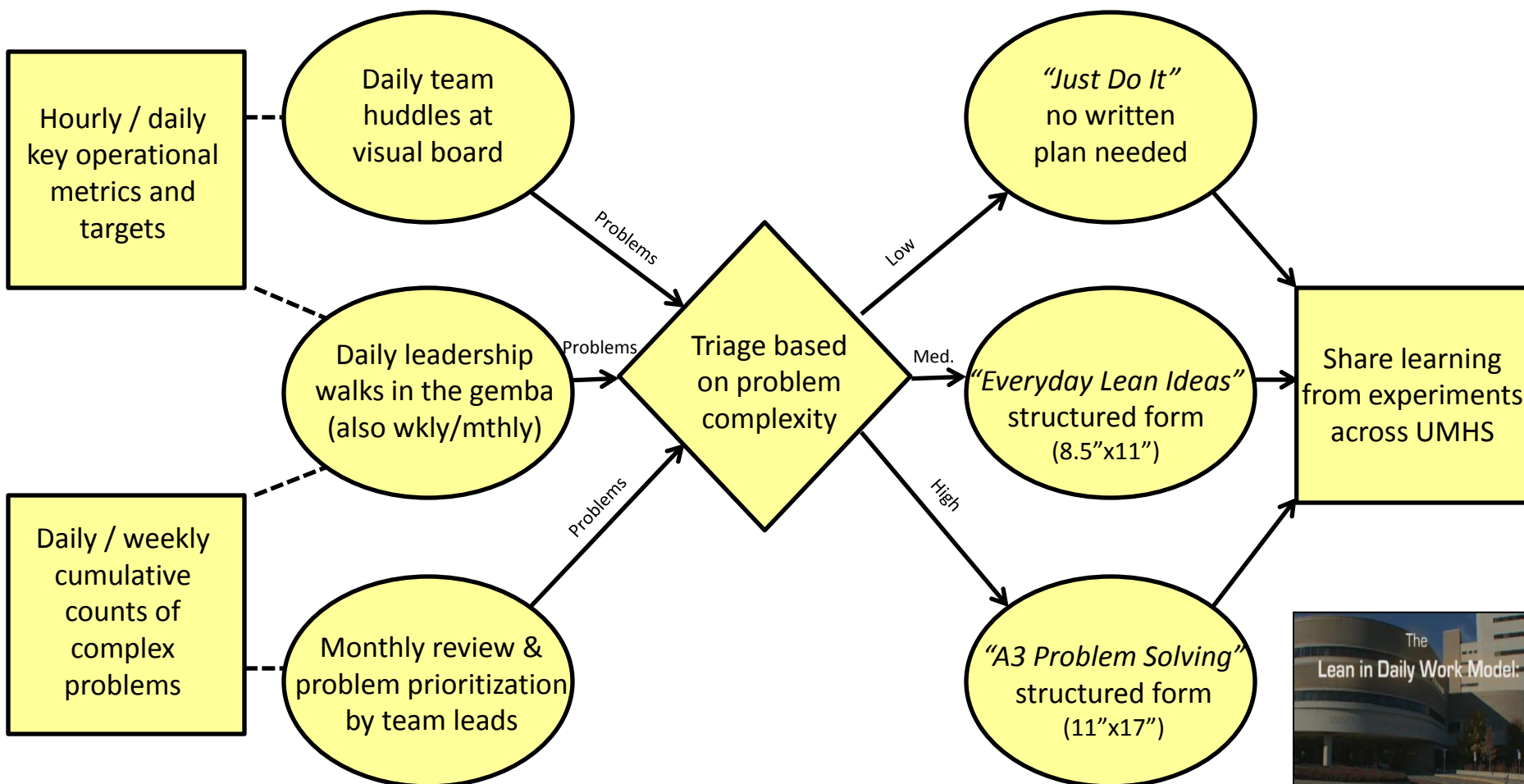
\*Takes place in the gemba

### Problem Solving Approaches

\*Design and run experiments

### Transfer Knowledge for Shared Learning

\*Share across organization





## Summary of the main Lean In Daily Work Elements

- Visual **Value Metrics**
- Daily **Team Huddles**
- Daily Problem Solving through the **Everyday Lean Idea Process**
- Daily & Weekly **Leadership Gemba Walks**
- Documenting Lean Solutions in **Confluence** for Knowledge Transfer
- Developing a **Visual Problem Prioritization Process**
- **Structured A3 Problem Solving** built into existing Team meetings

**LEADERSHIP N.**

*EMBEDDING THE CAPACITY FOR GREATNESS IN THE PEOPLE AND PRACTICES OF AN ORGANIZATION,  
AND DECOUPLING IT FROM THE PERSONALITY OF THE LEADER.*

Click for 9 minute video

## Key Measures of Success / Strategic Alignment

Primary Goals	Key Measures of Success	UMHS Strategic Alignment
Lean In Daily Work Process Sustained	Monthly audits taking place in each Pilot area, surfacing necessary corrective actions	Sustaining Gains
Continuous Problem Solving on Relevant Issues	400+ Everyday Lean Ideas Implemented (Many more in queue!!!)	People Development, Process Improvement, Service Excellence & Lateral Spread
Improvement & Sustaining of Value Metrics	In excess of 80% Improvement to team's Value Metrics	Strategic Deployment, Process Improvement & Service Excellence
Improvement in Lean Culture Survey Score	51% Improvement In Overall Score 115% Improvement In "Willingness to Recommend"	People Development & Service Excellence
Mentoring / Evidence of Model Spread	Yes - Evidence of active Mentoring of new LIT areas	Lateral Spread



# The Lean In Daily Work Model is a System

- Visual Metrics in the Absence of Team Huddles & Leadership Gemba Walks Quickly Becomes Wallpaper...



- Team Huddles & Leadership Gemba Walks in the Absence of Visual Metrics Quickly Becomes a Social Event...





## *Lean Enablers.....*

- Value / Non Value Add Exercise on your recurring meetings
  - Look for redundant meetings
  - Delegate for professional development
  - Remove when able
- Resources in Lean Thinking Confluence Folder:  
(<http://bit.ly/KsASq2>)
  - Lean Coach Office Hours (Two hours every week)
  - Lean Resources for Lean in Daily Work, Structured A3 Problem Solving, and Value Stream Mapping
  - Knowledge Transfer Repository



# *Questions / Comments*

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