LEAN/Six Sigma – Concepts & Principles

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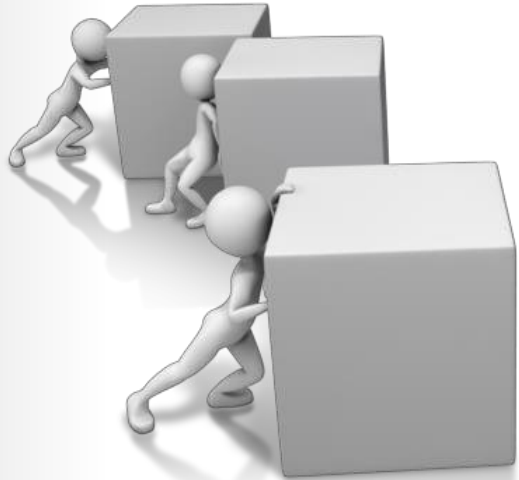
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LEAN Principles – What Does it Mean?

- The term **LEAN transformation** is used to characterize a company moving from an "old way" of thinking to "lean

- thinking".

- LEAN is about creating the most **value** for the customer while **minimizing waste**.

- A LEAN approach is about understanding what's really going on, and improving the processes by which products and services are created and delivered.

Lean Principles

5. Pursuit Perfection

1. Define Value

2. Map Value Stream

3. Create Flow

4. Establish Pull

LEAN is ---

- About "doing more with less", but that means....

- Doing more productive work with less effort and waste

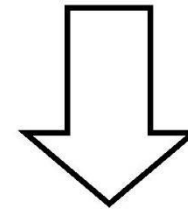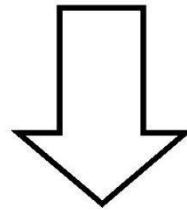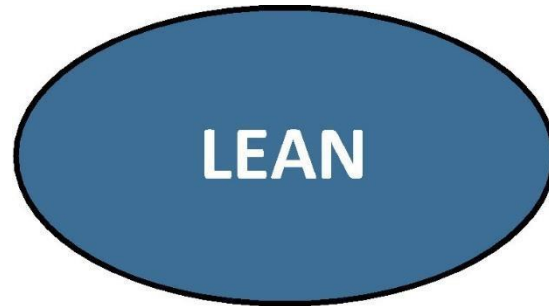- NOT about doing more work with less resources!

Six Sigma is ---

- "Six Sigma is shorthand for a discipline that allows any business to design, improve and manage its processes so that they perform at their highest possible levels.

- High levels of performance mean high volume, fast turnaround times, very few errors or defects and low cost. Effective and efficient processes also help to reduce staff turnover and increase retention by eliminating one of the main causes of high turnover – cumbersome and complex procedures and routines.

https://www.isixsigma.com/industries/healthcare/six-sigma-powerful-strategy-healthcare-providers/

LEAN + SIX SIGMA = LEAN SIX SIGMA

LEAN

SIX SIGMA

Doing the right things

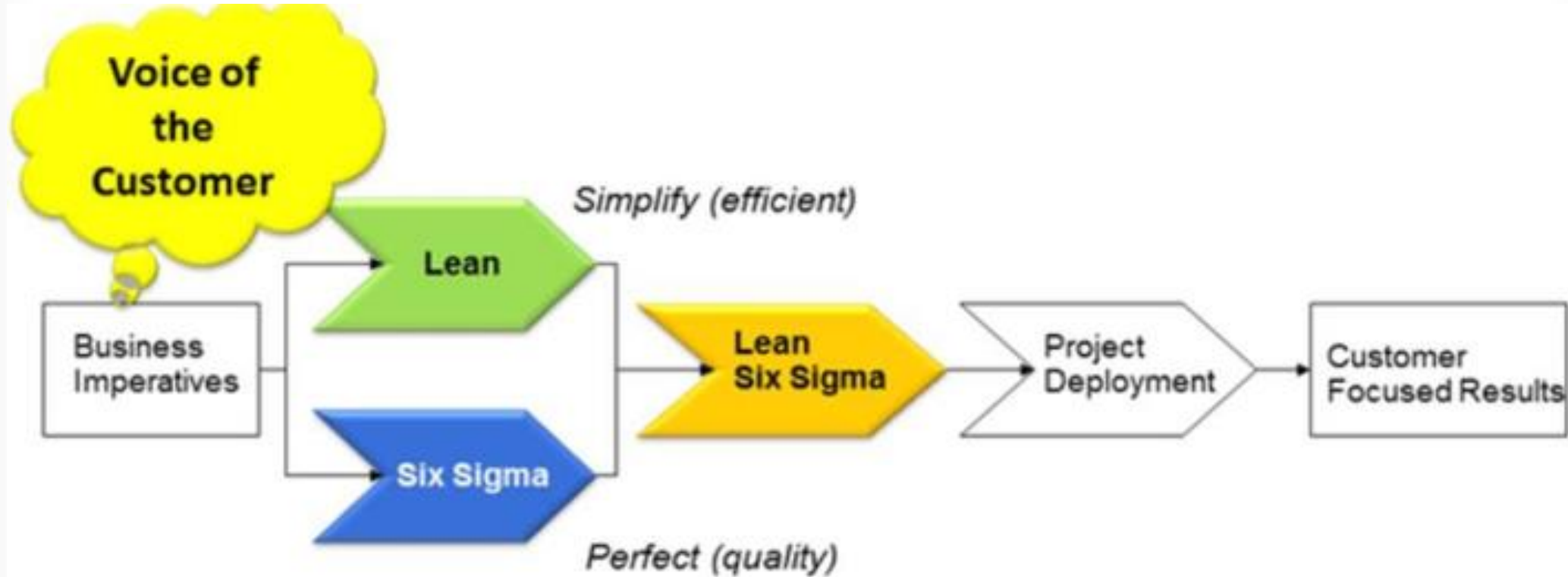**Doing things right**

Eliminate waste

Reduce variation

Improve speed
Reduce cost

Consistent quality,
accuracy, timeliness

Striking the Balance

Key Terms/Tools

- **Kaizen**: "change for better" – model of continuous improvement
- **Gemba**: "real place" – the place where value is created
- **Gemba Walk**: walking through the Gemba to perform current state assessment
- **VOC:** Voice of the Customer
- **5-S**: "organization" – sort, straighten, shine, standardize, sustain
- **5 Why's –** root cause analysis
- **A3**: a structured problem solving and continuous improvement approach/tool
- **PDSA:** tool for process improvement to incrementally test and measure change
- **DMAIC:** quality improvement methodology

Kaizen –
Part Philosophy ~
Part Action Plan

KAI   **ZEN**

改 善

Change for Good

PHILOSOPY
Developing a culture where all employees are actively engaged in improving the company

ACTION PLAN
Organizing events focused on improving specific areas within the company

Kaizen Model & Strategy

- Kaizen (Continuous Improvement) is a strategy where employees at all levels of the company work together proactively to achieve regular, incremental improvements

- Kaizen is about organizing events focused on improving specific areas within the company. These events involve teams of employees at all levels, with an especially strong emphasis on involving front line employees

- Kaizen works hand-in-hand with Standardized Work

8 Steps of the Gemba Walk

1. **Why**? – Identify the Purpose for the walk
2. **Why**? – Be sure to understand the process to be observed
3. **When**? – Identify a specific time(s) to observe
4. **Where**? – Be sure to observe in the area where the work is done and value is created
5. **Who/What**? – Focus on observing processes and take notice of the quality of the service(s) provided…. inputs & outputs/interactions

8 Steps of the Gemba Walk

6. **How**? – Take notice of how the process functions in the current state (separate people from process)

7. **What**? – Observe and identify the gap between the "ideal" state and what is occurring in current state

8. **Why**? – Identify opportunities for improvement (with the end goal being: closure of the gap between ideal & current state)

What the Gemba Walk IS & IS NOT

Gemba Walk IS to:

Observe

Understand

Focus on Process

Ask Questions

Engage People

Learn

Be Transparent

Gemba Walk is NOT to:

Judge

Place Blame

Focus on People

Make Assumptions

Define Specific Problem

Launch into

Improvement Activities

LEAN 5S

5S

SORT When in doubt, move it out

SET IN ORDER A place for everything, and return everything to its place

SHINE Clean up your work area

STANDARDIZE Set rules for use that the entire team supports and agrees to

SUSTAIN Make 5S a habit by integrating it into your daily work routines

A3 Tool

BACKGROUND

- Why are you talking about it?

- What is the business case? What business problem are you trying to solve or analyze? Be very concise – communicate WHY you are addressing this issue.

CURRENT CONDITIONS

- What is going on?
- Use facts, date,
- Be visual – use Pareto charts, pie charts, sketches
- Make the problem clear

GOAL

- State the specific target(s). State in measurable or identifiable terms.

ANALYSIS

- Use the simplest problem-analysis tool that will suffice to find the root cause of the problem: Five whys; fishbone diagram, problem or process analysis tree, 7 QC tools (old or new), tools from the Six Sigma, Kepner-Tragoe, Shainen, Taguchi, TRIZ or other toolbox of your choice.

PROPOSAL

- Your proposed countermeasures

PLAN

- Timeline with who, what, when, where, how.

FOLLOW UP

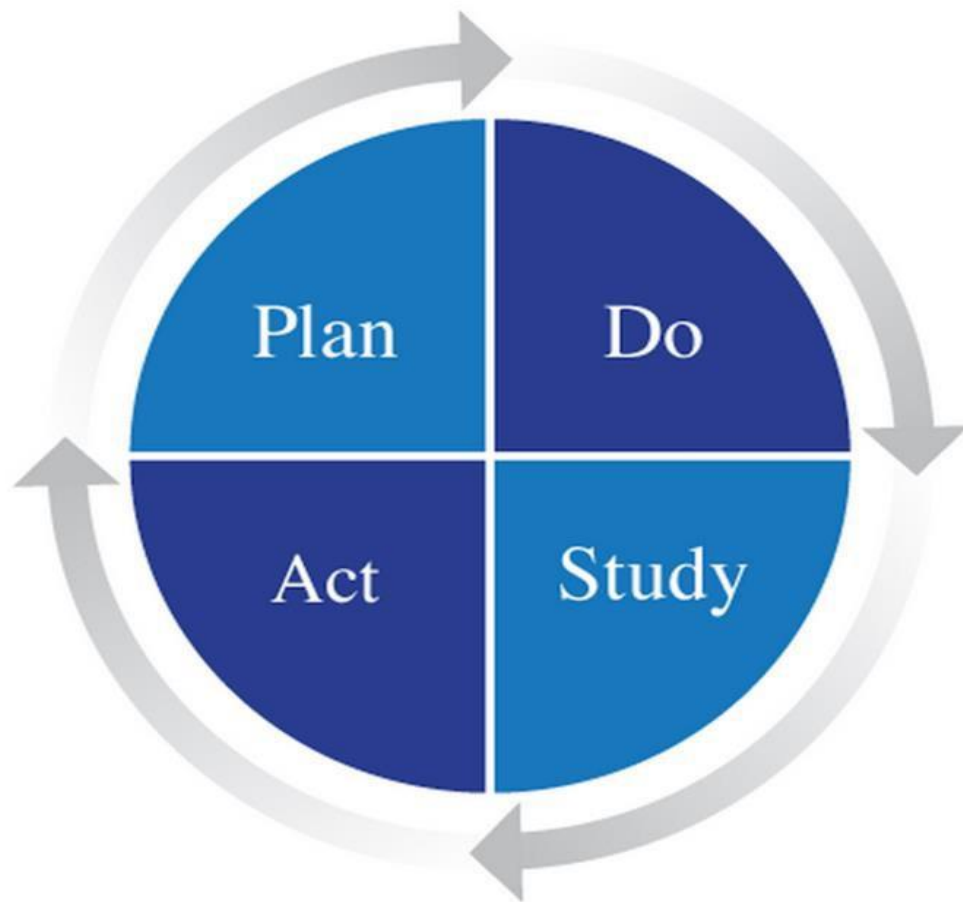- What issues or remaining problems can you anticipate?

PDSA Cycles for Improvement

- The **Plan-Do-Study-Act (PDSA)** cycle is part of the Institute for Healthcare Improvement (IHI) Model for Improvement

- Simple yet powerful tool for accelerating improvement.

- Essential to remember – if we can't measure it – we can't improve it!

- Always start with baseline measurements, decide on metrics for success, and remember to re-measure to determine course of action.

https://innovations.ahrq.gov/qualitytools/plan-do-study-act-pdsa-cycle

PDSA Example

Give Your Quality Improvement Program Definition

- We all have our own idea of what Quality Improvement is (or should be) in our organization….but has it been defined and agreed upon?

    - According to AAFP –
    "Quality improvement (QI) is a systematic, formal approach to the analysis of practice performance and efforts to improve performance."

        https://www.aafp.org/practice-management/improvement/basics.html

- To ensure its success, your QI Program should be defined through <u>methodology</u>, an <u>assessment process</u> and should incorporate an <u>accountability matrix</u>.

QUALITY IMPROVEMENT PROGRAM ASSESSMENT		
QI STRUCTURE	**Y/N**	**NOTES/COMMENTS**
1. Do you have a defined structure or model to guide your QI workflow? (i.e.: DMAIC)		
2. Do you have a purpose or goal statement for your QI Program?		
3. Who makes up your QI Team?		
4. Do you have defined Roles and Responsibilities for your QI Team?		
5. Do you have team members from across the organization able to participate and collaborate? (clinical, operational, financial, leadership, etc.)		

6. Do you have engaged members of leadership to support your team?		
7. Do you have regularly scheduled meetings at least quarterly?		
8. Do you assess quality and performance data? (ie: identify opportunity)		
9. Do you assess utilization data?		
10. Does your QI Program influence process improvement priorities?		
11. Does your QI Team maintain a patient-centered focus?		
12. Does your QI Team perform peer review activities?		

QI Methodology - DMAIC

Define

- Problems or Opportunities
- Impact to Quality
- Targets or Goals
- Scope of Work
- Metrics for Success

Measure

- Baseline Metrics
- Process Performance
- Systems or Processes
- Capacity for Change
- Potential Barriers

Analyze

- Data/Analytics
- Root Cause
- Inputs, Processes, & Outputs

Improve

- Address/Eliminate Root Cause
- Monitor Progress
- Update Processes
- Create Control Plan

Control

- Monitor Improvements
- Measure Success
- Develop Sustainability Plan for Furture Performance

Step 1 - Define

- **Define** the Problem or Opportunity
  - What do we see as the issue in need of improvement? It may be the problem – or it may be a symptom of an underlying problem. Declare it with a problem statement.
- **Define** the Impact
  - How severe is the issue? What is the impact on clinical, operational, financial or quality performance? What is the impact to our internal teams? What is the impact to our patients/customers?
- **Define** the Target or Goal
  - Declare your goal with a statement that is reflective of your problem statement. Be certain that your goals are SMART (specific, measurable, achievable, relevant, timebound).
  - Determine your Metrics for Success – what metrics will indicate success?
- **Define** the Process/Scope
  - Determine the process to be improved, the high level scope and the appropriate resources to involve
- **Define** the Customer(s)
  - Determine your customers and their needs, requirements, expectations
  - Voice of the Customer

*This step requires the team to have access to some baseline data. There will be a problem statement developed and a charter created for the scope of the project/work.

Define

- Problems or Opportunities
- Impact to Quality
- Targets or Goals
- Scope of Work
- Metrics for Success

Identify & Define the Customer

- We must define the customers of:
  - The healthcare delivery system as a whole
  - Each process being targeted for improvement

- We must identify each customer as:
  - Internal Customers
  - External Customers

We must incorporate the Voice of the Customer (VOC) into every process!!

Project Charter (Step 1 – Define)

Project Charter	Sample
Impact/ Business Case	• Why should you do this project/improvement work? • What are the anticipated benefits of doing this work?
Problem Statement	• What is the problem/issue/concern
Goal	• What are the targets/goals associated with this work?
Metrics	• What are the primary metrics to be used? • What are the secondary metrics to be used?
Scope of Work	• What processes are being included in this work? • What processes are not being included in this work?
Team	• Who is the executive sponsor? • Who is the leader? • Who are the team members? • What are the roles and responsibilities associated with each team member related to the scope of work?
Plan	• How will this project be conducted? • When will this project be completed? • REFER TO DMAIC STEPS
Communication	• When, where and how will the team meet? • How will communication be facilitated? • How often will updates be reported to leadership/exec sponsor?

Step 2 – Measure

- Measure the current state
  - (process map)
- Measure the waste associated with the process
- Measure the performance related to the process
- Measure actual and potential barriers

Measure

- Baseline Metrics
- Process Performance
- Systems or Processes
- Capacity for Change
- Potential Barriers

*This is your data collection step – once data is collected and documented, remember to continue to remeasure and refine your data throughout the process!
   *Update your charter once you have validated your baseline data!

If We Can't Measure it – We Can't Improve it!

- Essential to remember – if we can't measure it – we can't improve it!

- Always start with baseline measurement, decide on metrics for success, and remember to re-measure to determine course of action

1. Establish plans to incrementally improve working toward future state.
2. Implement strategies to improve – remeasuring along the way.
3. Sustain success, reassess, continuously improve!

FMEA Tool – Failure Mode & Effects Analysis

Identifying Barriers – Potential & Actual

Barrier to Success	Real-or-Potential	Intervention/Strategy

Step 3 – Analyze

- Analyze the problem/process
  - Root Cause Analysis – 5 Why's
- Analyze cause and effect
  - May use Fishbone Diagram

Fishbone Diagram

Cause			Effect
Equipment	Process	People	
Materials	Environment	Management	
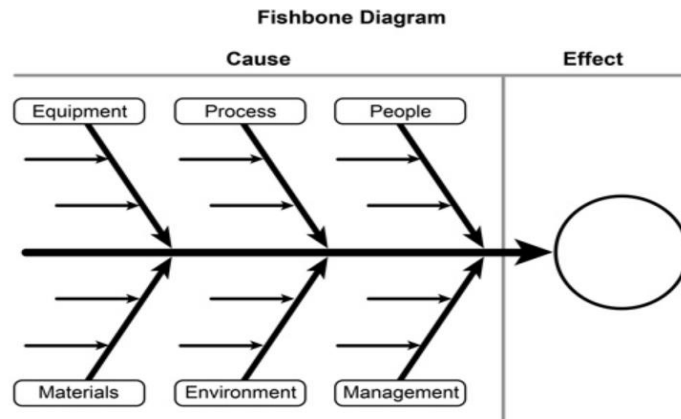
- Analyze the data
- Analyze the waste and or value stream

Analyze

- Data/Analytics
- Root Cause
- Inputs, Processes, & Outputs
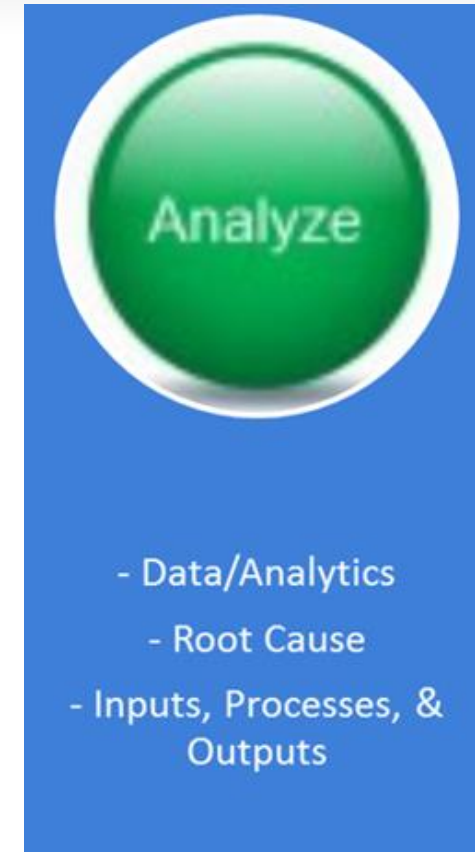
*Continue to document your progress, update your charter and remeasure as appropriate.

Step 3 – Root Cause Analysis & 5 Why's

Analyze

- Data/Analytics
- Root Cause
- Inputs, Processes, & Outputs

WHY?
→ WHY?
→ WHY?
→ WHY?
→ WHY?
Real solution is found here
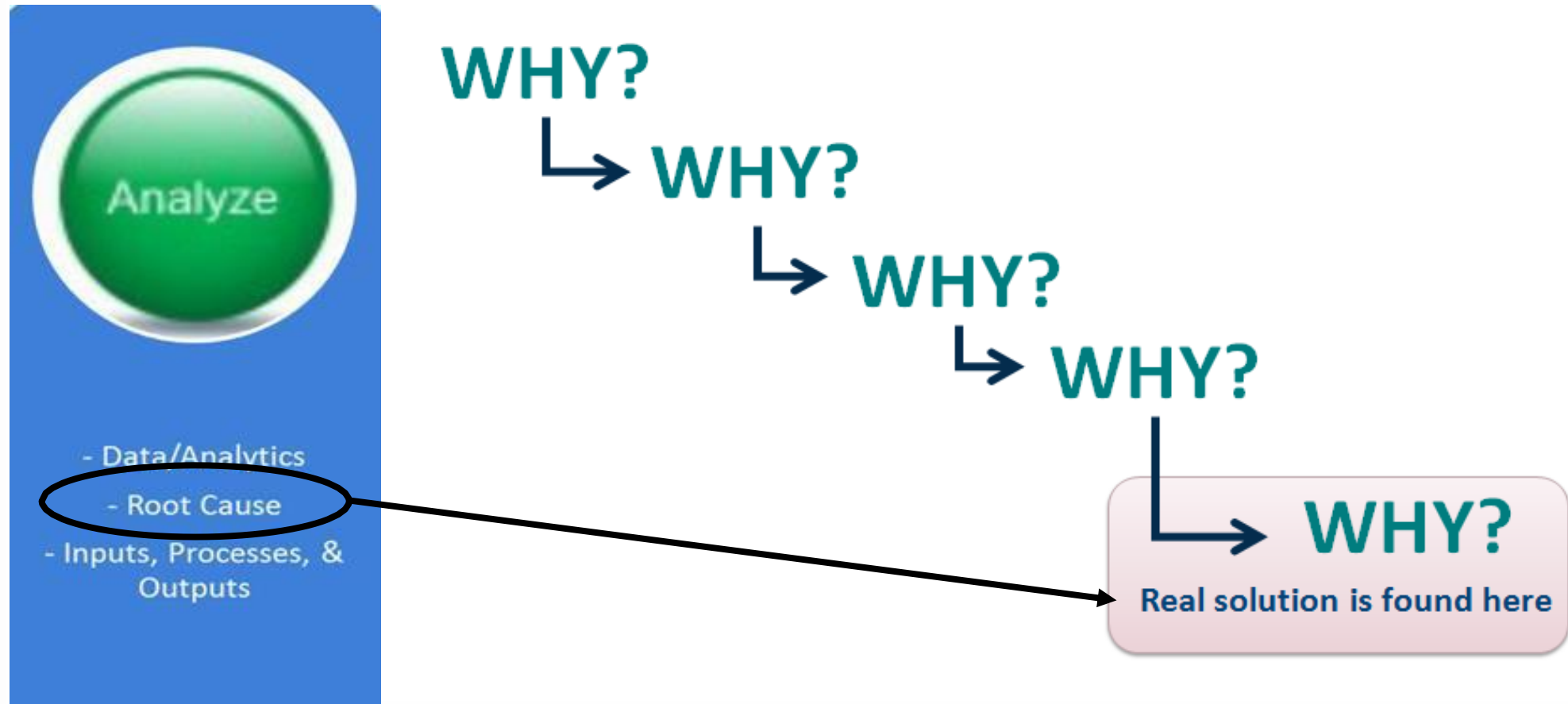
Benefits of the 5 Whys

- Help identify the root cause of a problem.
- Determine the relationship between different root causes of a problem.
- One of the simplest tools; easy to complete
- **When Is 5 Whys Most Useful?**
  - When problems involve human factors or interactions.
- **How to Complete the 5 Whys**
  - Write down the specific problem. Writing the issue helps you formalize the problem and describe it completely. It also helps a team focus on the same problem.
  - Ask Why the problem happens and write the answer down

  - below the problem.

  - If the answer you just provided doesn't identify the root cause of the problem that you wrote down in Step 1, ask Why again and write that answer down.
  - Loop back to step 3 until the team is in agreement that the problem's root cause is identified. Again, this may take fewer or more times than five Whys.

why?
why?
why?
why?
why?

Step 4 - Improve

- Improve – correlates to the "Do" in the PDSA cycle.

- Improve process by addressing the Root Cause that was detected in Step 3 – Analyze Phase.

- Improve by monitoring progress

- Improve by updating processes as progress is monitored and measured

- Improve by preparing a Control Plan for sustainability

Improve

-Address/Eliminate Root Cause
- Monitor Progress
- Update Processes
- Create Control Plan

Improve = Do

- The **Plan-Do-Study-Act (PDSA)** cycle is part of the Institute for Healthcare Improvement (IHI) Model for Improvement

- Simple yet powerful tool for accelerating improvement

- *By using the PDSA cycle to incrementally test change in an effort to improve, we are able to apply pragmatic steps of Process Improvement toward reaching the strategic level goals

https://innovations.ahrq.gov/qualitytools/plan-do-study-act-pdsa-cycle

Step 5 – Control

- Control by intentionally monitoring and measuring improvements
- Control by measuring Success according to predetermined metrics for success that were outlined in your project charter from Step 1 – Define Phase
- Control by developing sustainability plan for ongoing future performance

Control

- Monitor Improvements
- Measure Success
- Develop Sustainability Plan for Furture Performance

Sustainability Through Accountability (RACI)

Responsible
- The person who actually carries out the process or task assignment
- Responsible to get the job done

Accountable
- The person who is ultimately accountable for process or task being completed appropriately
- Responsible person(s) are accountable to this person

Consulted
- People who are not directly involved with carrying out the task, but who are consulted
- May be stakeholder or subject matter expert

Informed
- Those who receive output from the process or task, or who have a need to stay informed

Sustainability Planning

- Ask the "W-W-W" questions –
  - WHO will do WHAT by WHEN?

- WHO – What group or individual will have accountability for ongoing progress/performance?
- WHAT – What metrics/process/forum will be used to demonstrate/measure/report on the performance moving forward?
- WHEN – When or how often will the performance be reassessed, remeasured and reported out?

Achieving & Sustaining Excellence Through Organizational Alignment

- As a core strategy to Quality Improvement, there should be a focus on optimizing the impact of improvement across the organization.
- Aligning priorities across Clinical, Operational, and Quality performance will maximize resources and produce optimal output.
  - Example:
    - Selecting opportunities for intervention that will improve operational efficiency, clinical care delivery, quality performance and financial stability.
- *Can you think of some examples in your organization of ways to align priorities? Or examples of times when progress has suffered due to a lack of alignment?
- *See "Organizational Alignment Tool"
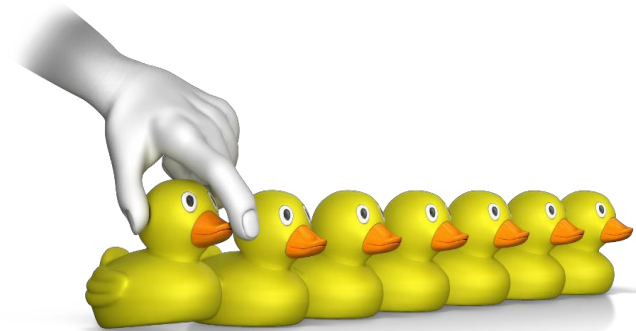
Organizational Alignment

Proposed Change	Does this change improve operational efficiency? (how?)	Departments impacted by proposed change? (positive/neg?)	Does this change drive improvement for patients? (how?)	Does this change promote improved quality performance? (how?)	Does this change potentially impact revenue/finance? (generate $ or save $)

LEAN Methodologies

- **First, let's talk about the principles of LEAN Methodology as it relates to "Improvement"….**

  - **What are LEAN Methodologies ?**
    I. The efficient use of staff, resources, and technology to provide the highest level of service and quality.
    II. Identifying areas of waste and acting to reduce or remove them through a systematic approach

STEP **1**

Efficiency

- The efficient use of:
  - Staff
  - Resources
  - Technology

- To provide the highest level of:
  - Service
  - Quality

- To the ultimate customer:
  - the PATIENT

Effectiveness

- Producing the intended or expected result
  - Identifying Waste
  - Act to reduce or remove waste through a systematic approach
  - Improve effectiveness
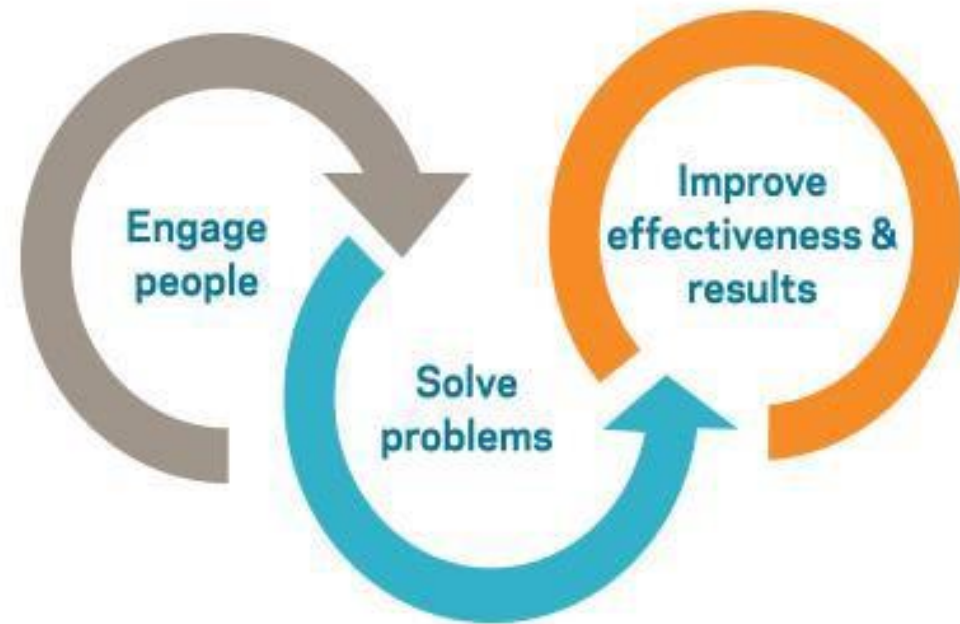
The Quality Equation

- **Efficiency:** The ability to accomplish something with the least waste of time and effort; competency in performance
- **Effectiveness:** Producing the intended or expected result

Efficiency + Effectiveness = QUALITY

Maximize Resources

- By using a <u>people-oriented</u> approach, an organization empowers its teams to take action toward achieving improvements, and therefore reducing and removing waste.

- LEAN principles support the most effective way to use any organizations most valuable resource - <u>its people</u>.

Clarity – Without it, Things are Fuzzy!

- Clearly Communicated and Clearly Defined Roles and Goals!
- There must be clearly defined roles and goals for each individual team member and for the team as a whole
  - ➤ Each care team member must receive clear communication around the function of the team as a whole, their function within the team, and the function of their team members.
- *Clearly defined roles as goals are paramount to productivity*

Productivity – Practicing at Peak of Scope!

- Each member of the care team is <u>empowered</u> and <u>expected</u> to perform at the peak of their scope of practice, training, certification or top of licensure.

- Allows for enhanced workflow, improved productivity, decreased cost of care, increased efficiency, role clarity, job satisfaction and patient experience.

*Essential to achieve Quadruple Aim!!!!

What Does That All Look Like?

- Clear mission & vision
  – it's our "why"
- Goals are measurable
  – metrics for success
- Expectations are clear
- Deliverables are concise
- Leadership and structure is clearly defined
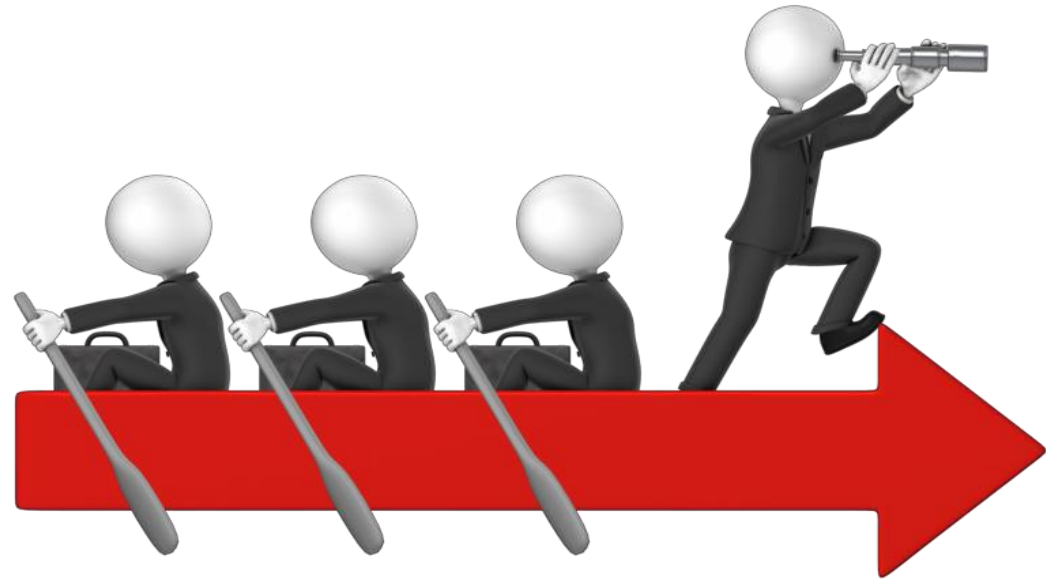
Sample: Care Coordination Pilot

- Enhancing Care Team Model with addition of clinical support staff member for each Care Team –

  - Focus placed on:
    - Ensuring Care Team Practicing at Peak of Scope/Licensure
    - Closing the Loop of Care (overdue orders, referrals, results)
    - Organizing and Facilitating Transitions of Care
    - Pre-Visit Planning
    - Patient Outreach & Engagement
    - Connecting Patients to Services
      - Care Management
      - Navigators
      - Integrated Behavioral Health

POPULATION HEALTH MANAGEMENT

CARE MANAGEMENT

CARE COORDINATION

CARE COORDINATOR - Workflow Sample

PRE-VISIT PLANNING

1 week in advance – review scheduled patient records for orders, results, referrals, transitions of care, care gaps, health maintenance data, relevant hx, Enter relevant orders, standing orders, Document and prep info in prog notes/flow sheet/etc., notify Provider as needed

PATIENT OUTREACH

Contact patients/caregivers to ascertain necessary info, coordinate necessary follow through on orders, identify barriers to care, provide instructions, info to prepare for upcoming appt with PCP, etc.

VISIT PREP

1-2 days prior to appt, review for final prep, capture & document status on any transitions of care, incomplete orders, open referrals, etc.

*Notify Provider as needed

NON ENCOUNTER FLOW

Triage, Transitions of Care (ER & Hospital F/U), Patient Scheduling, Referral F/U, Refer pts to CCM, Monitor Care Gap Reports, Overdue orders/results tracking

ENCOUNTER FLOW

Provide patient education, support discharge instructions, refer pts to CCM – as needed

CARE TEAM HUDDLE

Day of encounter – participate in Care Team Huddle, coordinate with Care Team members to facilitate smooth/efficient throughput

MEDICAL ASSISTANT – Workflow Sample

Care Team Huddle

Collaborate with Care Coordinator & Care Team to formulate plan for daily clinic flow

→

Patient Rooming

Vital Signs/Point of Care Testing

→

Note Prep

Open encounter note, capture HPI/Chief Complaint, import relevant/necessary info, results, data into note

↓

Encounter Closure/Discharge

Complete and deliver AVS, provide discharge instructions, (engage Care Coordinator as needed)

←

Order Entry/Completion

Capture/enter Provider orders, Complete Orders, Administer meds, immunizations, perform procedures, etc.

←

*Repeat Vital Signs

(if indicated)

5 Key Concepts

Pursue Perfection

Identify Customers and Specify Value

Respond to Customer Pull

MAXIMISE THE VALUE

Identify & Map the Stream

Create Flow by eliminating waste

Voice of the Customer

- "The *voice of the customer* is a process used to capture the needs/requirements/feedback from the customer (internal or external) to provide the customers with the best in class service/product quality.
- This process is all about being proactive and constantly innovative to capture the changing requirements of the customers with time."

- https://www.isixsigma.com/dictionary/voice-of-the-customer-voc/

How to Capture & Measure VOC

- It is worse to ask and do nothing with the answer than to never ask at all!

  - It is ESSENTIAL to listen & utilize VOC meaningfully!

Voice of the Customer (VOC) can be captured/measured several ways:

- Direct discussions
- Interviews
- Surveys
- Assessments

- Customer feedback/suggestion
- Customer complaints
- Observation
- Focus Groups/Advisory Groups

Identify Value & Map the Value Stream

- Value Stream –
  - The steps required to complete a process or deliver a service!

- We must determine if:
  1. a given process adds value to the customer
  2. a process adds no value to the customer, but is unavoidable
  3. a process adds no value and should be removed or eliminated

Purpose of Value Stream Mapping

- There are 3 primary purposes associated with Value Stream Mapping
  1. Evaluate Current State
     i. Intentionally assess current state
     ii. Identify the existing steps of the process
     iii. Define the associated information (flow, cycle time, etc.)
  2. Identify Waste
     i. Quantify the waste
        a. Measure and define with data.
  3. Provide direction for transformation
   i. Create the desired future state

6 Steps to Value Stream Mapping

1. Document the Customer and the customer's needs
2. Identify the main steps of the process
3. Select the standardized metrics to measure each step
   a) Time (process, lead, changeover)
   b) Completion Percentage
   c) Accuracy
4. Perform a "Gemba Walk" (walk through to assess current state)
5. Establish how steps are prioritized
6. Calculate the summary metrics

# Value Stream Map – Sample:
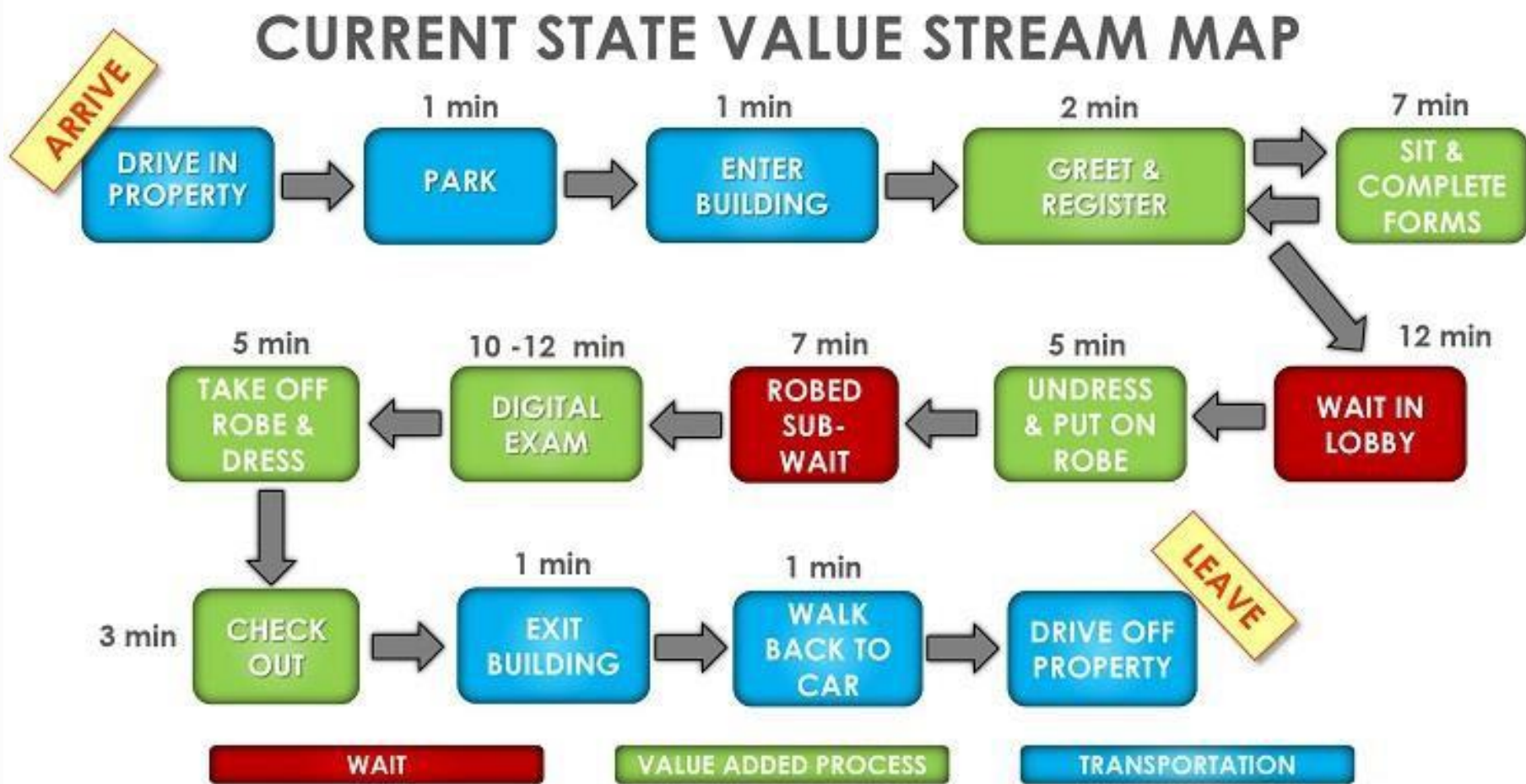
Create Flow – Eliminate Waste

- The goal of flow is to "eliminate the use of batching and queuing within a process. Processes that use batches and queues produce multiple wait times and

- interruptions."[1]

- We must ensure that a process is continuously worked on until it is complete or targeted improvement is achieved.

  ➢Tip….standardized work!

Respond to Pull

- The concept of <u>performing work in order</u>, as it is requested or needed by a step in the *value stream*.

- The avoidance of "push", which leads to steps being performed out of order – therefore compromising the quality of the product of the process
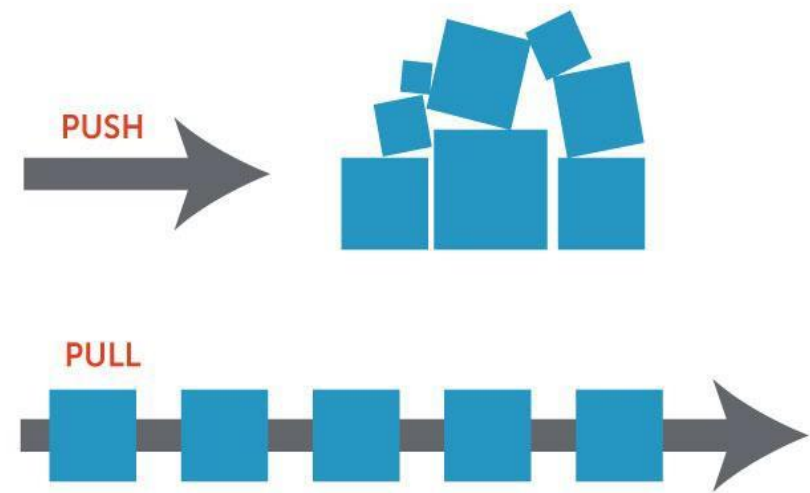
3 Primary Types of Waste in Healthcare

1. **Information Waste**
   i. Redundant input and output
   ii. Inefficient or ineffective data entry, documentation, etc
   iii. Incompatible data systems

2. **Process Waste**
   i. Process defect
   ii. Rework, workarounds
   iii. Delays

3. **Physical Environmental Waste**
   i. Safety
   ii. Workflow/Movement
   iii. Unclear Roles/Responsibilities
   iv. Lack of Training

LEAN Thinking – DOWNTIME

Defects/Mistakes (medication errors, incorrect coding, etc)

Overproduction (unnecessary medications, unnecessary lab/imaging test ordering)

Waiting (patients waiting to be seen, waiting for exam rooms, results, etc)

Non Utilized Talent (not empowering staff, performing below peak of scope,

hiding

or covering problems or issues)

Transportation (patient flow, medication flow, supply flow)

Inventory (expired meds/supplies, overstocked consumables/perishables, pre- printed forms, excess equipment)

Motion (unnecessary movement of people due to physical layout and location)

Extra Processing (more work/more complex than needed, care at higher level than needed, interventions higher level than needed, extra paperwork)
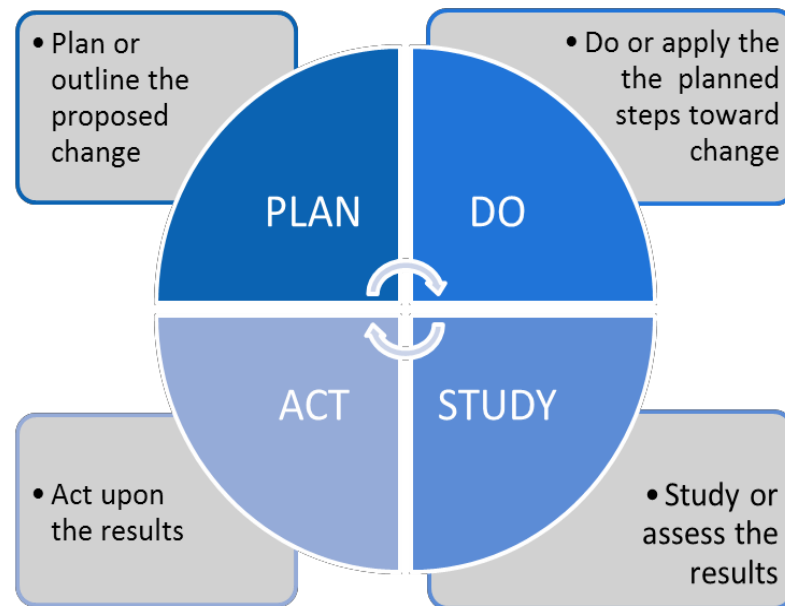
Identify, Reduce or Remove Waste –

- When waste is identified – avoid the impulse to jump in and fix it!

- Use DMAIC to guide the process!

- Don't assume you know the big picture!

- What you see as the problem may just be a symptom!

- Remember, some waste in healthcare is unavoidable and cannot be removed.

- Don't fly solo – call upon the team!

Pursue Perfection

- A "key tenet in LEAN thinking is that no matter how many times a process is improved, it can be further enhanced."[1]

- Pursuit of "perfection rests on the notion of **continuous improvement through incremental change based on outcomes**."[1]

- Plan or outline the proposed change

- Do or apply the the planned steps toward change

PLAN

DO

ACT

STUDY

- Act upon the results

- Study or assess the results

- *By using the PDSA cycle to incrementally test change in an effort to improve, we are able to apply pragmatic steps of Process Improvement toward reaching the strategic level goals
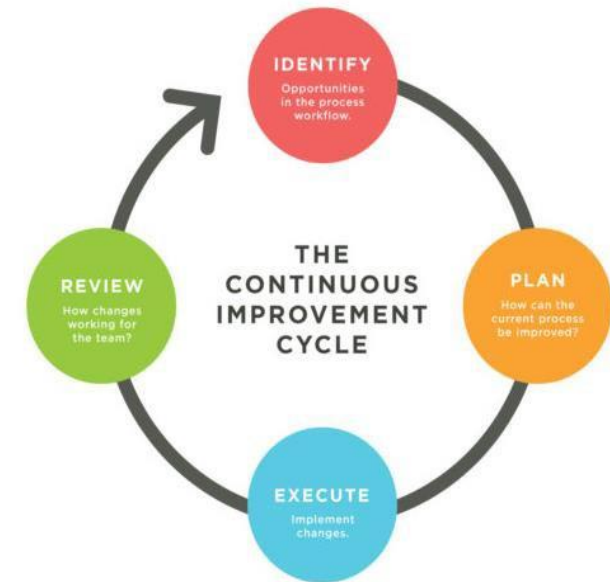
Set SMART Goals!

- SMART goal setting brings structure and accountability to your goals and objectives. SMART goal setting creates a distinct path toward an objective, with clear milestones and specific tracking of the progression toward success within a defined period of time.

S Specific **M** Measurable **A** Attainable **R** Relevant **T** Timely

Be Pragmatic & Intentional

- High performing care teams must maintain an ongoing focus on Quality Improvement and Continuous Process Improvement as a driver for all activities

- Consists of *"systematic and continuous actions that lead to measurable improvement in health care services, and the health status of targeted patient groups"* (HRSA)

- Ongoing efforts centered around the incremental improvement of processes or services provided to our customers.

IDENTIFY
Opportunities in the process workflow.

PLAN
How can the current process be improved?

EXECUTE
Implement changes.

REVIEW
How changes working for the team?

THE CONTINUOUS IMPROVEMENT CYCLE

Thank You!

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