



Lean in Health Care using A3 Problem Solving

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What are Lean and Key Principles?

- Lean thinking was introduced by Toyota in the 1960s as a systematic approach to identifying and eliminating waste or non-value-add activities in an organization through continuous improvement with the goal of creating value.
- The key principles of lean are based on identifying 'waste' from the customer perspective, and determining how to eliminate it
 - Waste is defined as the activity or activities that a customer would not want to pay for, and that do not add value to the product or service from the customer's perspective

Lean Thinking as Applied to Health Care Is to:

- Eliminate waste through understanding the value to the patient and how to deliver that value
- Create an efficient and waste-free continuous flow system built on a pull vs. batch-and-queue approach
- Continually pursue a perfect system

Kinds of Waste

Targeted in the TPS

1. Waiting (of operator or machine)
2. Transporting
3. Processing itself
4. Inventory (raw material)
5. Motion (of operator or machine)
6. Defects (rework & scrap)
7. Overproduction

Targeted in Health Care

1. Waiting (employee, patient, machine, and information)
2. Material movement
3. Processing
4. Inventory (material, or patient)
5. Motion (unnecessary staff movement)
6. Correction
7. Overproduction (unnecessary labs/visit)
8. Underutilization

Factory Efficiency Comes to the Hospital



Susanne Matthews, a nurse at Seattle Children's Hospital, uses a supply system ***based on factory methods***. In the past, nurses had makeshift stockpiles.

The New York Times, Published: July 9, 2010, By Julie Weed

Two Bin System used in Hospital Setting



- There are two bins of each item; when one bin is empty, the second is pulled forward. Empty bins go to the central supply office and the bar codes are scanned to generate a new order. The hospital storeroom is now half its original size, and fewer supplies are discarded for exceeding their expiration dates.

The New York Times. Published: Julv 9. 2010. Bv Julie Weed

Factory Efficiency Comes to the Hospital – cont'd.

- The system is just one example of how Seattle Children's Hospital says it has improved patient care, and its bottom line, by using practices made famous by [Toyota](#) and others. **The main goals of the approach, known as kaizen, are to reduce waste and to increase value for customers through continuous small improvements.**
- Manufacturers, particularly in the auto and aerospace industries, have been using these methods for many years. And while a sick child isn't a Camry, Seattle Children's Hospital has found that **checklists, standardization, and nonstop brainstorming with front-line staff and customers can pay off.**



A3 Problem Solving

A Disciplined, Systematic,
Repeatable Approach to
Performance Improvement

What is This A3 Thing?

- Why is the method called A3? In Europe, the nearest metric equivalent to 11" x 17" paper is designated "A3."
- The method confines a team to what will fit on that size sheet of paper, forcing simplicity and quick communication.
 - This assures the work can be realistically completed within this constraint.
 - It demonstrates successful change and motivates workers to do even more problem solving.

What is A3 Thinking?

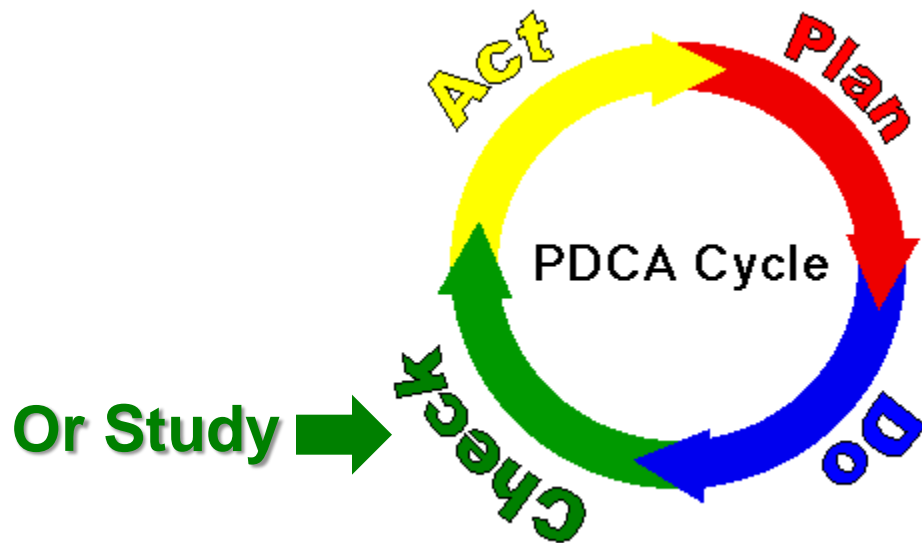
- A ***structured problem-solving approach*** that uses a tool called the A3 Problem-Solving Report.
- The A3 problem-solving method and document borrowed from practices of the **Toyota Motor Company** offers a ***standardized approach*** to solving problems.

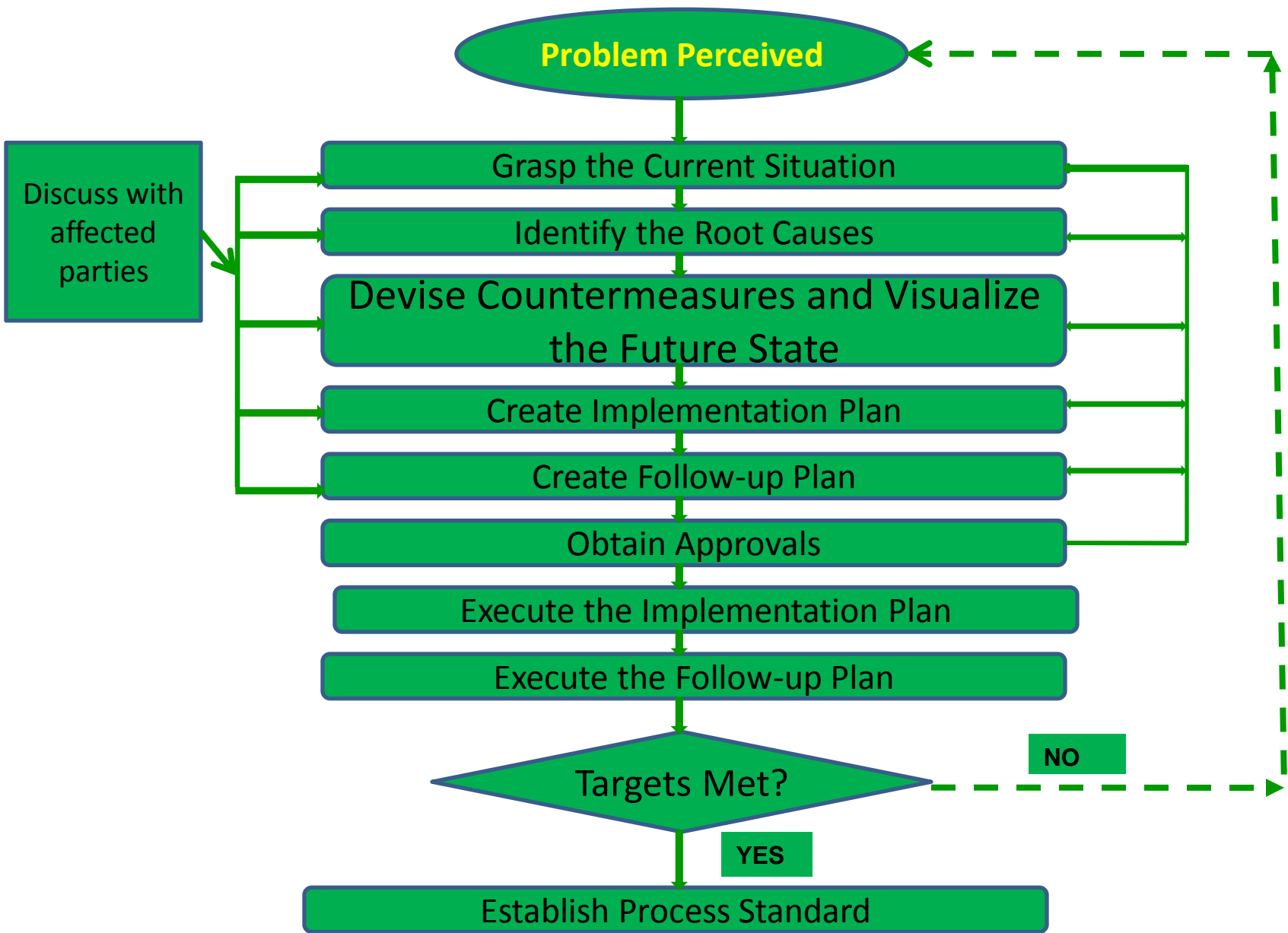
PDCA

The scientific method is the

FOUNDATION

for A3 thinking.







AMA PI CME Stages

PI CME Stages

- Stage A – Practice Assessment: Comparison to selected measures
 - Assess current practice using identified performance measures, either through chart reviews, analysis of registry data, or some other appropriate mechanism. (real patients in a real practices).
- Stage B – Intervention: Learning from application to patient care
 - Implement countermeasures in practice based on performance measures selected in Stage A utilizing suitable tracking tools (flow sheet, checklist, run chart, control chart, etc.)

PI CME Stages

- Stage C: Learning from the evaluation of the PI effort
 - Re-evaluate and reflect on performance in practice (Stage B) by comparing to the assessment done in Stage A.
 - Utilize the same measures used in original assessment.
 - Summarize any practice, process, and/or outcome changes that resulted from conducting the PI activity.



Awarding AMA PRA Category 1 Credits

For PI CME Activities

Incremental credit for PI activities should be awarded as follows:

- Five (5) AMA PRA Category 1 Credits can be awarded for the completion of each of the three stages (A,B, and C).
- Physicians completing, in sequence, all three stages (A-C) of a structured PI activity may receive an additional five (5) AMA PRA Category 1 Credits, for a maximum of **twenty (20)** AMA PRA Category 1 Credits.

$$5+5+5=20$$

Using the A3 Problem Solving Report

to

***Guide Your Performance
Improvement Initiatives***



Tools That Have Been Used to Eliminate Waste and Streamline Efficient Services in Healthcare

- Process maps
- Value stream maps
- 5S methods/visual controls
- Kaizen activities—rapid cycle
- Mistake proofing
- Control charts
- Standardized work
- Quick hand-off/changeover
- Cellular layout (batch sizing and facility layout)
- Kanban
- Fishbone diagrams
- Brainstorming

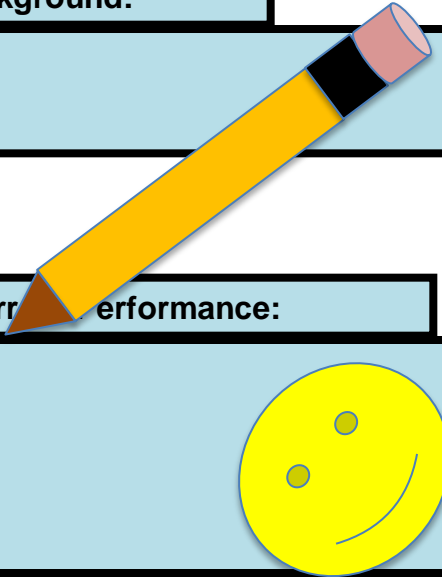
What Do You Need To Get Started?

Improvement Focus:

Background:

Current Performance:

Root Cause Analysis:



To: _____
By: _____
Date: _____

Target Condition:

Implementation Plan:

What?	Who?	When?	Notes

Cost:

Follow-Up:

Plan	Actual Results

The Elements of the A3 Report for Knowledge Sharing

Improvement Focus: What are we trying to do?

Background:

- Background of problem
- Context required for full understanding
- Importance of the problem

Assessment Measure(s) Utilized?

Current Performance/Process:

- Diagram of current situation (or process)
- Highlight problem(s) with storm bursts
- What about the system is not ideal?
- Extent of the problems(s), i.e., measures

Root Cause Analysis:

- List problems
- Fishbone Diagram
- Most likely (or root) cause

Why? Why? Why? Why? Why?

Root Cause(s) Selected for Improvement:

Date: _____

PI Team Leader _____

Desired Performance Process:

- Diagram of proposed new process
- Countermeasures noted as fluffy clouds
- Measurable targets (quantity, time, etc.)

Countermeasure(s) Selected to Improvement Process:

Desired Outcome(s):

Implementation Plan

What?	Who?	When?	Notes
Actions to be taken	Responsible person	Times, dates	

Cost:

Actual Outcomes:

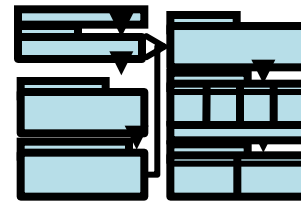
Follow-up Plan (Standardization)

- How will you check the effects?
- When will you check them?
- In red ink/pencil
- Date the check was done
- Results compared to the predicted

Identify a problem or need—

The Improvement Focus

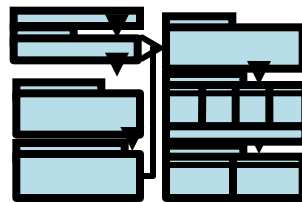
- The Improvement Focus of your A3 report is a concise statement of the issue being addressed.
- It should answer the question, “What are we trying to do here?”
- **Really understanding how the delivery (performance) of the process currently happens is essential before trying to improve it! Developing this understanding is the first part of every PI activity.**
- Record on the A3 report



Next, the **Background:** You Might

- Briefly describe the setting for the improvement focus. (e.g. office, department, etc.)
- Identify all of those involved in the process
- Provide all of the background information about the improvement focus that those affected by the process need to know before going forward.
- Explain why this effort is important.
- Include any other information, such as historical data, comparative data, dates, names, etc. that might help those involved to understand the importance of the effort.

- Record on the A3 report



Current Condition:

What's Actually Going ON?

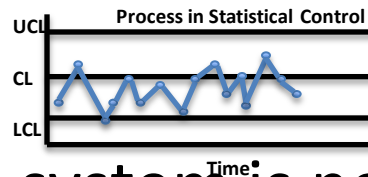
- Every system is perfectly designed to get the results it gets.
- If you want to get different results you have to change the system.
- To change the system requires that you know what the system is and how it is performing.
- There are several ways to gain this understanding but two of the most effective ways are doing a control chart and “mapping” the process.

The Current Condition

- Hold a meeting of the PI team and brainstorm the process they think is used. Be sure to include everybody in the process and listen to what everybody says actually occurs in the process.

- Determine if the system is “in control”

- Use a control chart



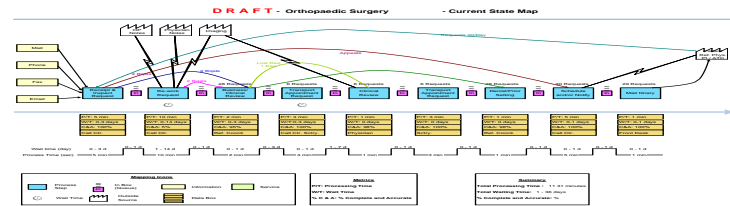
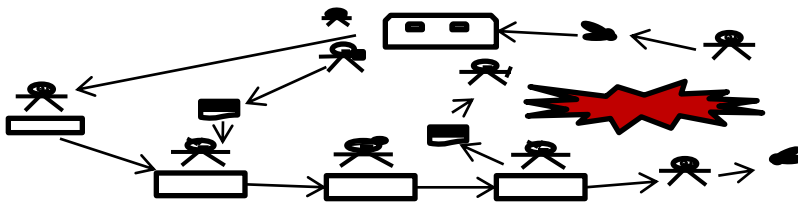
- Identify what about the system is not acceptable or desirable
- Determine the extent of the problem(s), i.e., measures

Ways to Understand the *Current Condition*

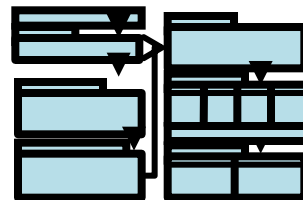
- If time allows, have the team actually walk the process and record what you see. (go to GEMBA)



- Do a process or value stream map.



- Whatever they do, record the results in the A3 report.

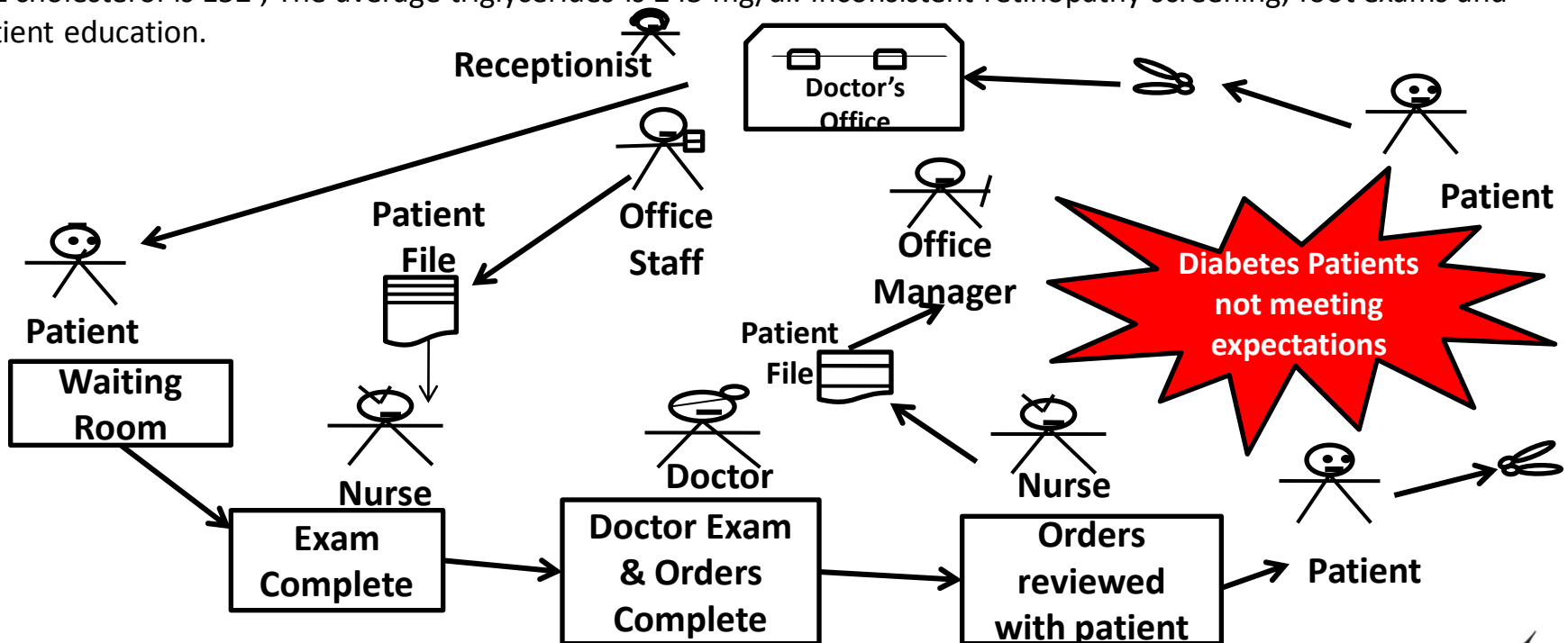


The A3 Report for Knowledge Sharing

Improvement Focus: Fasting Blood Sugar Control

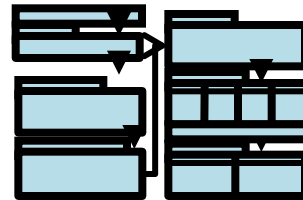
Background: Four person internal medicine practice. A Junior partner noticed that the health status of the adult diabetes patients in the practice was not meeting expectations and shared this information, including the data, with the senior physician partner in the practice. The senior partner says he is skeptical about the data. Junior partner is asked to direct office staff to pull a sample of 60 charts from their adult diabetes patient encounters during the past six months and check the values for Hb A1c and lipid profiles.

Current Performance/Process: The average Hb A1c is 10.5% , The average total cholesterol is 237 mg/dl , The average LDL cholesterol is 152 , The average triglycerides is 245 mg/dl. Inconsistent retinopathy screening, foot exams and patient education.



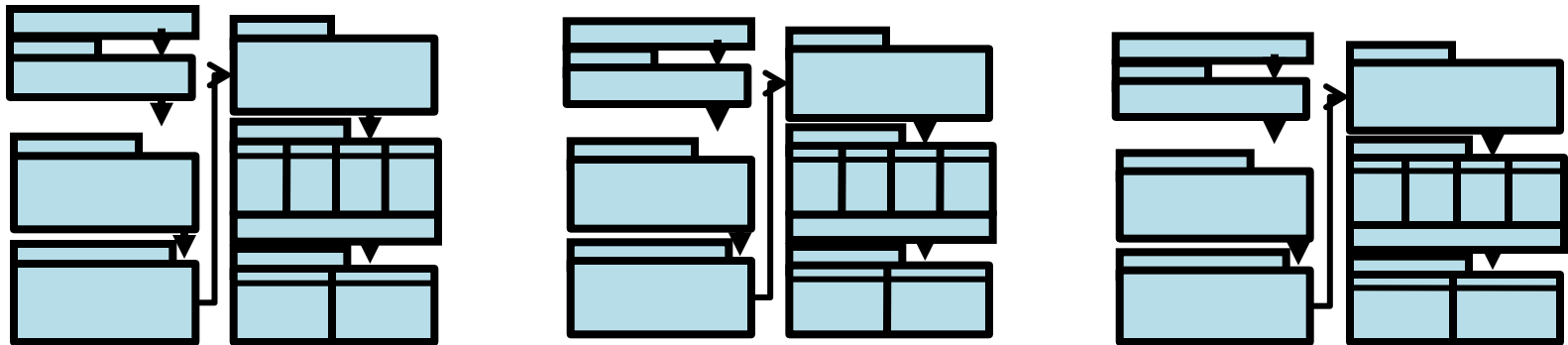
Next *The Root Cause Analysis*

- List problem(s)
- Most likely (or root) cause
- To start your root cause analysis, make a list of the main problem(s). Next, ask the appropriate “why?” questions until you reach the root cause. A good rule of thumb is that you haven’t reached the root cause until you’ve asked “why?” at least five times.
- Use a fishbone diagram
- Record on the A3 report.



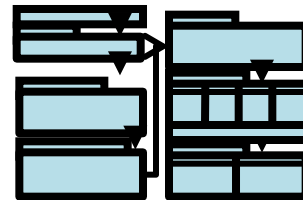
What to Improve?

You may have multiple root causes, each requiring its own A3 report.



Root Cause(s) Selected for Improvement

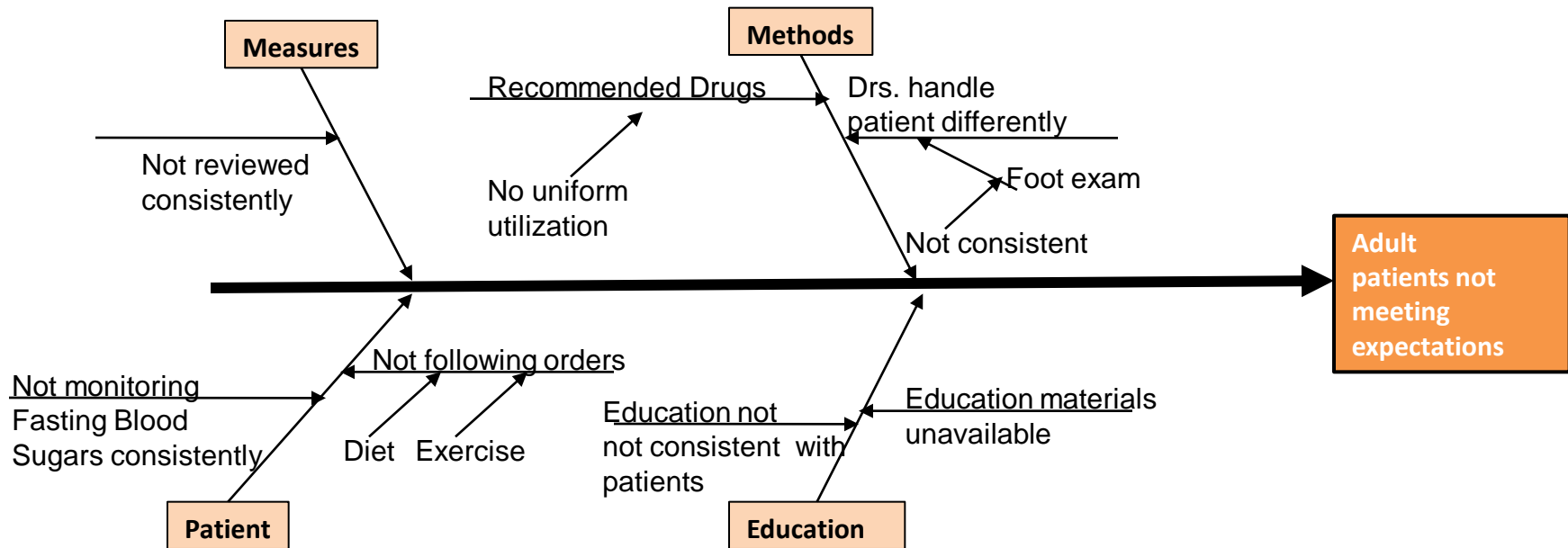
- Be confident that the improvement initiative selected can have a positive impact on the current condition.
- Make sure you have the resources to implement what is required to carry out the initiative.
- Using a Process or Value Stream Map if you can, describe the desired process you envision if you effectively address the root cause selected.
- Record on the A3 report.



The A3 Report for Knowledge Sharing

Root Cause Analysis:

- Different partners handled similar patients in very different ways.
- No uniform utilization of current recommended drugs.
- Hit and miss patient education.
- Little patient monitoring of their own self care.



Root Cause(s) Selected for Improvement:

Patient Involvement in monitoring Fasting Blood Sugar

The Analysis Phase is Complete

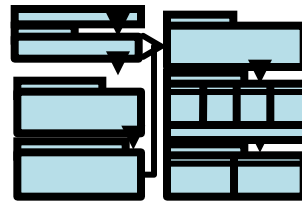
- The left side of the A3 report is now complete and we move on to the improvement phase of our performance improvement activity.

Devise *Countermeasures* to Address Each Root Cause

- Countermeasures are the improvements to be made to the work or care processes that will move the process closer to the desired condition or make the process more efficient by addressing root causes.
- Develop or list the specific countermeasures that will address the root cause(s).
 - They should be designed to prevent recurrence of the problem.
 - **No work around allowed.**

Selecting *Countermeasures*

- Seriously consider how the changes will operate when the countermeasures are implemented.
- Make your prediction about how much of the problem will be alleviated with the proposed changes.
- Get buy-in from the affected parties and key stakeholders.
- Record on the A3 report



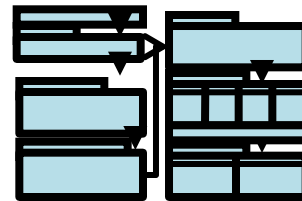
Develop a *Desired Condition*

- Diagram of proposed new process
- Countermeasures noted as fluffy clouds
- Measurable targets (quantity, time)

Similar to the current condition, the desired condition diagram should illustrate how the proposed process will work with the countermeasures in place, with appropriate labels. It's also important to note or list the specific countermeasures that will address the root cause(s).

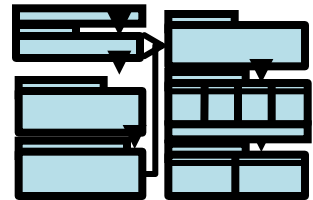
Finally, the problem-solver (or team) should predict the outcome specifically and quantitatively, and note it.

- Record on the A3 report



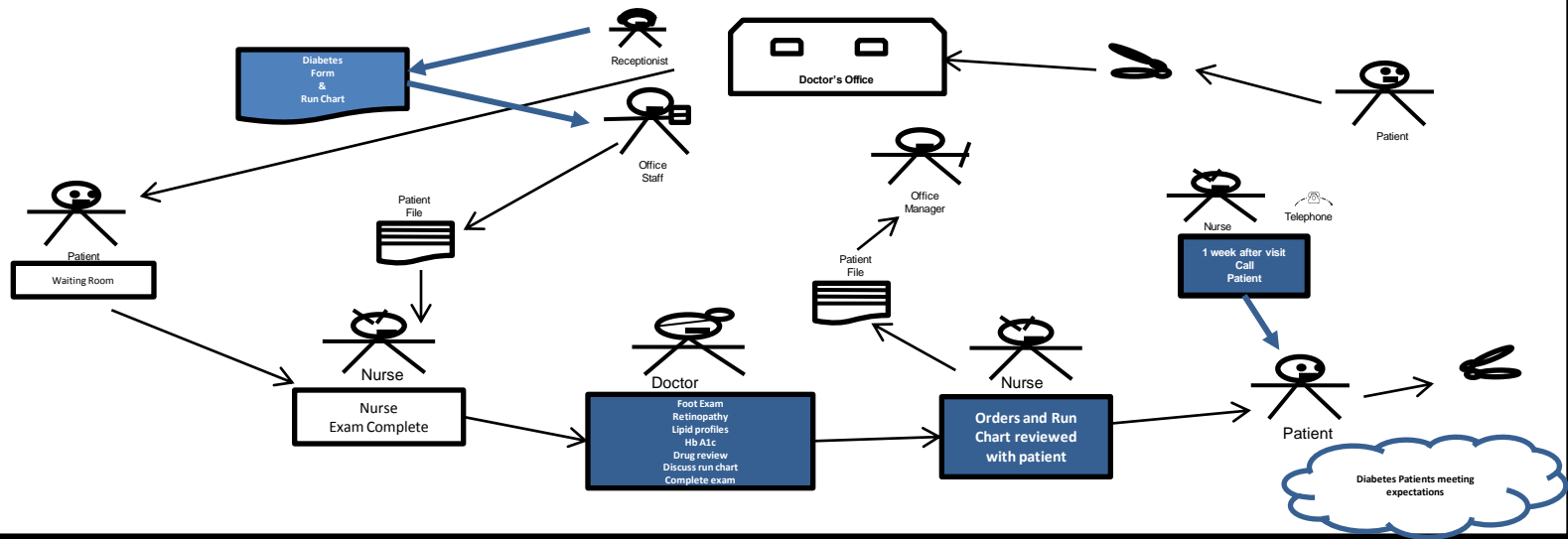
Desired Outcomes

- Revise your desired outcome(s) statement as a result of your root cause analysis if necessary.
- You may have to go back and revise the earlier parts of your A3 form if you have significantly narrowed your focus.
- Have a clear goal with agreement from the key players.
- Determine the measure of performance you will use to show the desired results?
- Make the desired outcomes(s) public.
- Record on A3 report



The A3 Report for Knowledge Sharing

Desired Condition/Performance Process: Physician introduction of run chart to patient. Nurse training in run chart. Follow-up call to patients re: questions in run chart.



Countermeasure(s) Selected to Improvement Process: Patient training in use of run chart to record Fasting Blood Sugar

Desired Outcome(s):

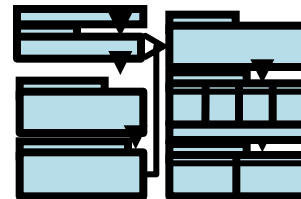
75% patient compliance in monitoring of FBS utilizing run chart

Physician review of data with patient at each patient visit.

10% improvement in average HB A1c levels in diabetes patient population

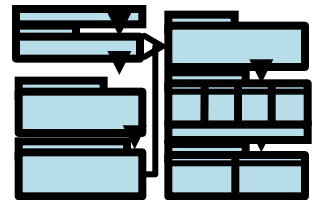
Create an *Implementation Plan*

- The plan should include:
 - What actions are to be taken
 - Who is the responsible person
 - When should steps be done, times, and dates
 - What is the expected outcome
- Record on the A3 report



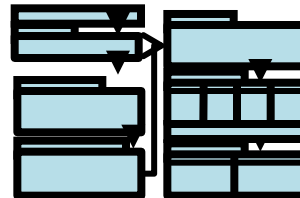
Remember to Consider *Costs*

- Develop a clear understanding of the direct and indirect cost of the actions to be taken.
- Do a brief budget.
- Gain agreement that the costs are worth the effort.
- Record the costs on the A3 report.



Evaluate the *Actual Outcomes*

- Process improvement should not end with implementation. It is very important to measure the actual results and compare to predicted.
- If the actual results differ from the predicted ones, research needs to be conducted to figure out why, modify the process and repeat implementation and follow up (i.e., repeat the A3 process) until the goal is met.
- Record on the A3 report



The A3 Report for Knowledge Sharing

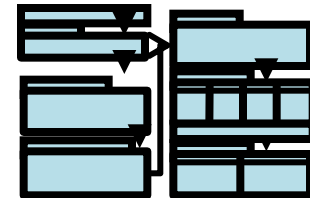
Implementation Plan			
What	Who	When	Notes
Develop and print run charts	Office Manager	Week 1	
Train receptionist and nurse	Griswold	Week 2	
Receptionist & nurse pilot with 5 patients	Nurse	Week 3	
Train patients and follow-up call	Nurse	Months 2-9	
Re-measure patient population from months 2-6	Griswold	Month 10	
Report results to CME Office	Office Manager	Month 11	
Cost: minimal—printing, training time			
Actual Outcomes: 90% patient compliance. 15% reduction HB A1c at month 9 in 20 of original 30 patients			

Develop a *Follow-up Plan* with Predicted Outcomes

- In the left-hand side, record the plan to measure the effectiveness of the proposed change: what will be measured, when, and who will do the measuring.
- Leave the right-hand side blank for recording the actual results.
- Then, after implementation, complete the follow-up plan and record the results of implementation and dates of the actual follow-up.

Follow-up

- Standardize the work for the activity to ensure that current performance is sustained.
- Look for another area for improvement and start over with a new A3 improvement effort.
- At a minimum record this on the A3 report in the section on follow-up plan.



The A3 Report for Knowledge Sharing

Follow-up Plan (Standardization):	Results:
Mandate run chart protocol for all diabetes patients.	
Start A3 on common care protocol.	
Plan for A3 on use of medication in all Diabetes patients.	

The Completed A3 Report

PI CME A3 Implementation Plan

Date: Anytime

PI Team Leader: Dr. Griswold

Improvement Focus: Fasting Blood Sugar Control

Background: Four person internal medicine practice. Junior partner advocate for standardizing diabetes patient care. Junior partner directs office staff to pull a sample of 30 charts from their adult diabetes patient encounters during the past six months and check the values for HbA1c, lipid profiles, foot and eye exam.

Desired Performance/Process: PICTURE OF new Sub Process. Physician introduction of run chart to patient. Nurse training in run chart. Follow-up call to patients re: questions in run chart.

Assessment Measure(s) Utilized? 30 Medical Records Reviewed Utilizing AMA Consortium Guidelines



Current Performance/Process:

Countermeasures Selected to Improvement Process:

Patient training in use of run chart to record FBS

Desired Outcome(s):

- 75% patient compliance in monitoring of FBS utilizing run chart
- Physician review of data with patient at each patient visit.
- 10% improvement in average HB A1c levels in diabetes patient population

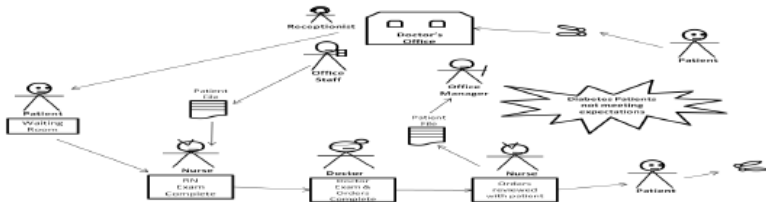
Implementation Plan

What	Who	When	Notes
Develop and print run charts	Office Manager	Week 1	
Train receptionist and nurse	Griswold	Week 2	
Receptionist & Nurse pilot with 5 patients	Nurse	Week 3	
Train patients and follow-up call	Nurse	Months 2-9	
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Actual Outcomes: 90% pt compl. 15% reduction HB A1c at month 9 in 20 of original 30 patients

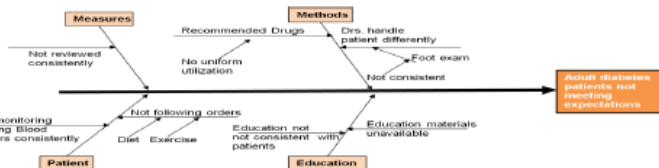
Follow-up Plan: Mandate run chart protocol for all diabetes patients. Start A3 on common care protocol. Plan for A3 on use of medication in all diabetes patients.

- The average HbA1c is 10.5%, The average total cholesterol is 237 mg/dL. The average LDL cholesterol is 152. The average triglycerides is 245 mg/dL. Inconsistent retinopathy screening, foot exams and patient education.



Root Cause Analysis

- Different partners handled similar patients in very different ways. For example one did foot exams on every visit while the others did them when they remembered they should take a look at the patient's feet.
- No uniform utilization of current recommended drugs.
- Hit and miss patient education.
- Little patient monitoring of their own self care.



Root Cause(s) Selected for Improvement: Patient Involvement in monitoring FBS

Why Use A3s?

- Most problems that arise in organizations are addressed in superficial ways, what some call "first-order problem-solving." That is, we work around the problem to accomplish our immediate objective, but do not address the root causes of the problem so as to prevent its recurrence.
- By not addressing the root cause, we face the same problem or same type of problem again and again, and performance does not improve.

Why Use A3's?

- The A3 process helps people in the work setting engage in collaborative, in-depth problem-solving.
- It drives problem-solvers to address the root causes of problems which surface in day-to-day work routines.
- The A3 Process can be used for almost any situation, and research has found that, when used properly (i.e., all of the steps are followed and completed), the chances of success improve dramatically.

Good Books to Read

- Understanding A3 Thinking
 - Durward K. Sorbek II & Art Smalley
- A3 Problem Solving for Healthcare – A Practical Method for Eliminating Waste
 - Cindy Jimmerson
- Improving Healthcare Using Toyota Lean Production Methods
 - Robert Chalice

Good Books to Read

- **The Nun and the Bureaucrat** - How They Found an Unlikely Cure for America's Sick Hospitals
 - Louis M. Savary & Clare Crawford-Mason
- **Managing to Learn** — Using the A3 management process to solve problems, gain agreement, mentor, and lead
 - John Shook
- **A Lean Guide to Transforming Healthcare** — How to implement Lean Principles in Hospitals, Medical Offices, Clinics, and Other Healthcare Organizations
 - Thomas G. Zidel

