Reducing Patient Wait Time Using a Fixed Room Nurse Practitioner Model

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Manager, Pre Surgical Testing
Center for Advanced Medicine
Northwell Health

Gloria Collura
Senior Administrative Director
Center for Advanced Medicine
Northwell Health

James Rudy
Director, Industrial Engineering
Long Island Jewish Medical Center
Northwell Health

December 10, 2018
12:30pm – 4:00pm

#IHIFORUM
Nothing to Disclose

- The presenters Virginia Hamilton Crowe, Diana Rusz, James Rudy, Michelle Williams, Gloria Collura, Gillian Smith, Lila Dinner, and Kam Kaliraj have no relevant financial or nonfinancial relationship(s) within the services described, reviewed, evaluated, or compared in this presentation.
Session Objectives

- How to develop a patient-oriented and clinical model that will sustain operational volume growth without sacrificing your patient or staffing satisfaction.
- Discuss the benefits of teaming up with industrial engineering to help identify and optimize your overall volume and operations efficiency.
- Learn how to use a structured approach to problem solving called A3 Methodology.
- Utilize advanced analytics called Queueing Theory to help decisions for staffing and scheduling.
My Vision of an Ideal Working Environment
About Northwell Health

- Hospitals
- Affiliate Hospitals
- Strategic Alliance Hospitals
  - Lenox Health Greenwich Village
- Manhattan Eye, Ear & Throat Hospital
- Nearly 600 ambulatory and physician offices, Home care, Long-term care, Hospice care
- Donald and Barbara Zucker School of Medicine at Hofstra/Northwell
- Hofstra Northwell School of Graduate Nursing and Physician Assistant Studies

#IHIFORUM
About LIJMC

- Densely Populated Outer borough of NYC
- Tertiary Academic Medical Center
- Three hospitals on campus, 700+ Beds
  - Zucker Hillside Hospital (Behavior Health)
  - Cohen Children’s Medical Center
  - Long Island Jewish Hospital
Center for Advanced Medicine

The Center for Advanced Medicine is a comprehensive, multi-disciplinary, state-of-the-art facility devoted exclusively to outpatient care. Home to world-class physicians who utilize the latest advances in medical technology and research, it is designed to offer outstanding care, one patient at a time.
PST Overview

Operations
- 11 Patient Exam Rooms within CFAM
- PST Scheduling and administrative offices are both standalone located within the PST Suite

Volume
- 21,000 Yearly Volume
- Current practice compliance with mandatory PST at 99%

Workforce
- Medical Director
- Advanced Clinical Provider Leadership
- Nurse Practitioners
- Registered Professional Nurses
- Access Service Representatives
PST Problem

- Extremely long wait times
- Exam visits could be up to 4-5 hours
- Patients getting extremely dissatisfied
What do you think vs what did the data show
What to do?

We need more rooms

We need more staffing

We need to build a new PST
A better way

We can use a structured approach to solving problems called A3 Methodology
A3 Structured Problem Solving

- 11 by 17 piece of paper
- Toyota concept: every issue an organization faces can be and should be captured on a single piece of paper
- A concise summary of the problem and solution
- A structured way of thinking
- A way for management to structure and “discipline” the improvement process
### A3 Problem Solving Template

#### Problem Statement (Plan)

*Why you are talking about it.*
- What is the business reason for choosing this issue?
- Scope

#### Background/Current Conditions (Plan)

*Where things stand today.*
- What's the problem with that, with where we stand?
- What is the actual symptom that the business feels that requires action?

*Show visually – Process maps, pareto charts, graphs, drawings, maps, etc.*

#### Target/Goal (Plan)

*The specific outcome required for the business.*
- What is the specific change you want to accomplish now?
- How will you measure success?

#### Analysis (Plan)

*The root cause(s) of the problem.*
- Why are we experiencing the symptom?
- What constraints prevent us from the goal?

*Choose the simplest problem-solving tool for this issue:*  
- Five whys, Fishbone, QC Tools, SPC, Six Sigma, etc.

#### Proposed Countermeasures (Plan)

*Your proposal to reach the future state, the target condition.*
- What alternatives could be considered?
- How will you choose among the options? What decision criteria?

*How your recommended countermeasures will impact the root cause to change the current situation and achieve target.*

#### Implementation Plan (Do)

*Actions/outcomes, timeline and responsibilities. May include details on the specific means of implementation.*
- Who will do what, when and how?
- When will the progress be reviewed and by whom?

#### Results & Reflection (Study)

*Planned vs Actual Results*
- How will we know if the actions have the impact needed
- What are the critical few, visual, most natural measures

#### Follow-up (Act)

*Remaining issues that can be anticipated.*
- Any failure modes to watch out for? Any unintended consequences? What processes will you use to enable, sustain, and share success
Form the Team

A3 Problem Solving Template

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Why you are talking about it.
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- SPC, Six Sigma, etc.

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PST Team

- PST Leadership
- PST Staff Schedulers
- PST Clinical Staff Nurses
- PST Clinical Provider (NPs)
- Industrial Engineering
- Executive Sponsor
Describe the Problem

A3 Problem Solving Template

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#IHIFORUM
The average Pre Surgical Testing Length of Stay is 130 minutes, with upwards of 4-5 hours during busy peak times.

This is important to work on because it effects:

- Patient experience
- PST cancellations
- Employee engagement
- Reimbursements
- Suboptimal patient prep for surgery
Current Conditions

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80%

20%
Lean Improvement Event

- 1.5 day improvement event
- Identified problem and goals
- Process map
- Identified problem areas
- Brainstorm solutions
- Develop action plans
Process Mapping & Swim Lane
Pre Surgical Testing Workflow

- Surgeon Diagnosis
- Surgical Case is Booked with OR Booking
- Pre Surgical Testing is requested
- PST Scheduling office contact the patient and appointment is set

- Patient enters CFAM for their PST appt.
- Patient Signs into front desk
- Patient waits for registration
- Patient Waits to enter exam room

- Patient Visit starts
- Patient Visit End
- Patient Exits CFAM
# IHIForum

## Data Collection & Observations

- Observations and Process Map
- Data Collection Timing Study
- Staffing & Appointment Methodology

### Clinical Processes

<table>
<thead>
<tr>
<th>Clinical Processes</th>
<th>Time Start</th>
<th>Time End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Patient Entered Room:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RN Start Assessment in Room:</td>
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</tr>
<tr>
<td>RN Finish Assessment in Room:</td>
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<tr>
<td>NP Start Assessment in Room:</td>
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<td>Blood Draw Start in Room:</td>
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<tr>
<td>Blood Draw Finish in Room:</td>
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<td></td>
</tr>
<tr>
<td>Other Start in Room:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Finish in Room:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Patient Exits Room:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Issues

- Interpreter Services
- Developmentally Disabled
- Came from Nursing Home
- Hearing & Speech
- Dementia
- Social Issues
- Limited Mobility / Wheelchair
- Other
- Other
Patient Experience

% Surveyed Answered as Very Satisfied

- Scheduling Process: 89%
- Ease of obtaining appointment: 78%
- Appointment day and time: 85%
- Registration Process: 86%
- Registration Wait Time: 73%
- Registration Completion Time: 78%
- Exam Room Waiting Time: 67%
- Exam Room Time: 87%

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PST Observations for Lean Event

Value Added Time = 67 minutes (46%)
Wait Time = 79 minutes (54%)
Total Time = 146 minutes
Data Collection & Observations

**Appointments Per Hour**

- 7:00 AM - 12:00 PM: 12 appointments per hour
- 12:00 PM - 5:00 PM: 10 appointments per hour

**PST Wait Times by Hour of Day (min)**

- 6:00 AM - 9:00 AM: Registration Wait (10 min), Wait for Exam Room (50 min)
- 10:00 AM - 3:00 PM: Registration Wait (20 min), Wait for Exam Room (70 min)

**Ideal Schedule**

- 7:00 AM - 11:00 AM: 10 appointments per hour
### Goals

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PST Goal & Aim Statement

- Reduce the Total PST Visit LOS from 130 minutes to 104 minutes (20%) by March 2017
- To improve the flow of patients receiving Pre Surgical Testing at CFAM to reduce the wait times and increase patient experience
- A focus was placed on the following 4 areas

- Patient Satisfaction
- Pre Surgical Testing Patient Friendly Scheduling
- Clinical Staffing Schedule and Staffing
- Clinical Workflow Models
Analysis & Root Cause

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Root Cause Analysis
Analyzing the Problem

Pre Surgical Testing

Average Length of Stay is 130 minutes

Marries vs Maiden

Duplicate MR #

Name different on DL vs Insurance

Wrong time booked

Incorrect info from Physician Office

Too many add ons

Pt Acuity

Not ideal for patients desired time

No max appt built in booking

Appointments scheduled all at same time (batching)

Underbook beginning of day

Under book

Breaks/Lunch coverage

Printers Not Working

Staff coverage during meeting

Not enough staff start of day

Computers not working

Printers not working

Roles not standardized across RN, Tech, NP

Not streamlined across surgical departments, LS, and PST

Communication

Equipment

People
Analyzing the Problem

- Inaccurate demographics causing delays at registration
- Concerns about collaboration and communication across the surgical departments, and PST to LIJ
- PST schedule, staff, and capacity is not aligned or maximized causing wait times
- Patient’s scheduled time does not match actual exam time
- Lack of standard roles and responsibilities causing lack of communication and inefficient use of resources
### A3 Problem Solving Template

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#### Team Name

#### Team Members

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---

**80%**

---

**20%**

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Next Steps
Solution Identification
Minimize External Factors

What are your external factors?
OR Booking Solutions

- Coordination of care between PST, the surgical offices, and OR Booking
- PST representative/Road show to surgeon offices to identify needs and requirements
- Improved capturing and accuracy of demographics at the time of booking
- Surgical offices to book cases earlier when possible
- The patients were seen and evaluated earlier in PST decreased the same day surgery cancellation percentages
Take Control of Inner Factors

- Aim to increase patient experience
- Increase your Clinical Provider Productivity
- Make room for more volume
Scheduling & Registration

- Utilize Queuing Theory for
  - Registration
  - Nurse Practitioners

- Schedule the patient visit using the clinical provider schedule and room availability – Implementing Fixed Room Nurse Practitioner Model

- Aligned scheduling, staffing, and room capacity
  - Stagger appointments
  - Level Load (earlier, later appointments)

- Create scheduling methodology for all patient visits including add on cases using the – Newly Modified Patient Friendly Scheduling Template
Modified Patient Friendly Scheduling

Purpose
- To promote Patient autonomy

Focus
- The patient’s needs

Outcomes
- Sustain low patient no show rate
- Increase the overall number of visit reimbursements
% of Patients < 72 Hours

Total percentage of patients <72 hours by year

- 2015: 38%
- 2016: 38%
- 2017: 21%
- 2018: 20%

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Increased Reimbursements
Two Scenarios

**Scenario 1**
- 5 Patients/Hour
- 5 Rooms
- 1 Staff Member for Each Room
- Appointment time of 55 min

**Scenario 2**
- 10 Patients/Hour
- 10 Rooms
- 1 Staff Member for Each Room
- Appointment time of 55 min

Do they have the same waiting time to get into a room?
The Answer Is…

Scenario 1
Wait Time = 53 min

Scenario 2
Wait Time = 25 min

Factors such as arrival rate, variability, number of servers, variation in processing time play in a role in wait time. Queuing Theory is a tool to help plan for this
### Queuing Theory

- Staggered appointments in 15 min increments
- Level Load of Schedule
- Optimization of staff schedules using Queuing Theory
  - Registration, Nurses, and Nurse Practitioners

<table>
<thead>
<tr>
<th>Hour of Day</th>
<th>Patient Arrivals</th>
<th>Total Staff</th>
<th>Staff Available with Lunches</th>
<th>Avg NP Time</th>
<th>Estimated Wait Time</th>
<th>Staff Utilization</th>
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<tr>
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<td>7.7</td>
<td>83%</td>
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</tbody>
</table>
NP Fixed Room Concept

Before

- No Room assignment and all patients were randomly placed in an open room
- Each NP waited their turn to enter a room when it is made available
- Some patients were pre triages others were not
- NP productivity at 5-6 patients seen in a 10 hour day (0.5 per hour)
NP Fixed Room Concept

After

- Each exam room opened and closed to match the NP assigned to the room
- Each room was pre-booked, setting each appointment to accommodate registration and actual exam time
- No more waiting for an open room to start their work
- Increased accountability
- NP Production was increased to 10 patients seen in 11 hours
# IHIFORM

## Results & Reflections

### A3 Problem Solving Template

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- 80%
- 20%
Results

**Wait to Register**

- Before: 23
- After: 15

**Wait for Exam Room**

- Before: 36
- After: 12

**Exam Room Visit**

- Before: 56
- After: 50

**Total Wait Time**

- Before: 69
- After: 29
Results

**Total PST LOS**

<table>
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<tr>
<th></th>
<th>Before</th>
<th>After</th>
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<tr>
<td></td>
<td>130</td>
<td>95</td>
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**Total PST LOS During Peak Times**

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<th></th>
<th>Before</th>
<th>After</th>
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<tbody>
<tr>
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<td>100</td>
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**NP Productivity per Hour**

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<th>After</th>
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<tbody>
<tr>
<td></td>
<td>0.50</td>
<td>0.90</td>
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**% Scheduled < 72 Hours of Surgery**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>38%</td>
<td>20%</td>
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</table>
Follow Up

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#### Follow-up (Act)
- Remaining issues that can be anticipated.
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  - What processes will you use to enable, sustain, and share success.

---

#IHIFORUM
Follow Up

Rule of

30

60

90
Conclusion

- Utilizing a structured approach called A3 methodology helped us engage a cross functional team and identify root causes to the problem.

- Key strategies to help improve efficiency included:
  - Fixed Room Nurse Practitioner Model
  - Utilizing Queuing Theory to optimize appointment and staffing methodology
  - Patient Friendly scheduling
Intro to Problem Solving

“As soon as we solve one problem, another one appears. So let’s keep this problem going for as long as we can!”

© Randy Glasbergen / glasbergen.com
Recap A3

- 11 by 17 piece of paper
- Toyota concept: every issue an organization faces can be and should be captured on a single piece of paper
- A concise summary of the problem and solution
- A structured way of thinking
- A way for management to structure and “discipline” the improvement process
A3 Problem Solving Template

**Problem Statement (Plan)**

Why you are talking about it.
- What is the business reason for choosing this issue?
- Scope

**Background/Current Conditions (Plan)**

Where things stand today.
- What’s the problem with that, with where we stand?
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Show visually – Process maps, pareto charts, graphs, drawings, maps, etc.

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**Follow-up (Act)**

Remaining issues that can be anticipated.
- Any failure modes to watch out for? Any unintended consequences? What processes will you use to enable, sustain, and share success
Activity 1: Problem Statement

- Determine a problem area / project that you would like to work on
- You will use this to practice building an A3 today
Form the Team

A3 Problem Solving Template

**Problem Statement (Plan)**
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  - What is the business reason for choosing this issue?
  - Scope

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#IHIFORUM
# Who Should be on Team?

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<th>Role</th>
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<tr>
<td>A3 Lead</td>
<td>Accountable for efficiently and effectively leading a team through the scientific problem solving process. The first step in this process is to clearly understand the problem to be improved and ends when there is proof that the root causes for this problem have been eliminated.</td>
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<td>A3 Team Members</td>
<td>Crucial to overall success. They must be active champions of process change and continuous improvement. They agree to: Being enthusiastic and committed to solving the problem(s). Team Spirit! Action!</td>
</tr>
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<td>Coach / Mentor</td>
<td>Supports, teaches, coaches, and mentors the process owner, A3 owner, A3 team members and staff. Helps guide team discussions and stays true to the method.</td>
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<tr>
<td>Scribe</td>
<td>Captures meeting minutes, sends progress report as agreed / highlights follow ups</td>
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<tr>
<td>Sponsor</td>
<td>Defines high level team, links team mission to hospital objectives, sets expectations for report outs and readouts,</td>
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Describe the Problem

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80%  | 20%
Describe a Problem

- What is a problem: Gap between what is actually happening and your ideal condition

- Briefly state the problem in one or two sentences. The problem statement includes what is being effected and where it is occurring
  - Be clear, concise, and measurable

A Problem Clearly Defined is Half Solved
Activity 2: Problem Statement

- Write a Problem Statement
- List appropriate team members who can work to solve this problem
Current Conditions

A3 Problem Solving Template

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Follow-up (Act)
Remaining issues that can be anticipated.
- Any failure modes to watch out for? Any unintended consequences?
- What processes will you use to enable, sustain, and share success

20%

#IHIFORUM
Background & Current Conditions

- Observe the process
- Process Map
- Use Data
  - Pareto, Trends
- Other tools
  - Pictures, layouts, spaghetti diagram
Activity 3: Process Map

- Create a process map
- Include major steps and process tasks
Activity 4: Current Conditions

- Brainstorm on what information should be collected as background and current conditions. Write it out.
- Include a description of the data that might be helpful to quantify the problem.
Goals

A3 Problem Solving Template

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Goal Statement

- Clear
- Concise
- Measureable
  - Same metric as Problem Statement
- Completion Date

SMART

- Specific
- Measurable
- Attainable
- Relevant
- Time Based
Activity 5: Goal Statement

- Establish a goal statement and estimated timeline for your A3
#IHIFORUM

## Analysis & Root Cause

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**Team Name**

**Team Members**

---

50% 20%
5 Whys

- What is the real problem? What is the root cause?
- Ask Why 5 Times
- Purpose: to discover the root cause
- To not jump to solutions

“Why save your brainstorming creativity for solutions that may solve the wrong problem? First brainstorm the cause of the problem”
5 Whys

Define the Problem:
Long patient wait times during the middle of the day

Why is this happening?
1. Many patients arrive at the same time
2. Because we place all our Add On PST appointments during the middle of the day
3. Because there is no max number of appointment slots
4. We never developed a standard for how many appointments could be booked by hour
5. We did not understand the capacity based on our rooms and staffing
Activity 6: 5 Why

Perform a 5 Why Analysis of your problem you are working on

Define the Problem:

Why is this happening?
1.  
2.  
3.  
4.  
5.  

Why is that
Proposed Countermeasures
Countermeasures

- What is proposal to reach future state
- How will your recommended countermeasures effect the root cause
- Types of countermeasures
  - Containments vs short term vs long term
- How do we develop: Brainstorm
- Examples of the best countermeasures
  - Direct impact on causes
  - Low Cost
  - Easy Buy in
  - Fast implementation
  - Sustainable
**PICK Diagram**

- **Possible**: Ideas that are easy to implement but have a low payoff
- **Implement**: Ideas that are easy to implement and have a high payoff
- **Challenge**: Ideas that are hard to implement and have a higher payoff
- **Kick Out**: Ideas are hard to implement and have low payoff
Implementation Plan

A3 Problem Solving Template

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#IHIFORUM
Activity 7: Countermeasures & Plan

- Develop countermeasures
- Each countermeasure should be linked to a root cause
- Place them on a pick diagram
- Create the implementation plan (Who, What, When)
Results & Reflections

A3 Problem Solving Template

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20%
Results & Reflections

- What happened during the trial – study the positive and negative aspects
- Confirm effectiveness of countermeasures
- Compare results against the original condition, standard, and goal statement
- Use graphs, ensure trends are significant
Follow Up

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Follow Up

- Accept, reject, or modify aspects of the trial
- What related issues or unintended consequences do you anticipate and what are the contingencies
- What processes will you use to enable, sustain, and share success
- Standardize and train all team members
- Audit processes for standardized work
- Celebrate success
The A3 Process as a Tool For...

- Problem solving
- Proposing solutions
- Standardizing
- Planning
- Reporting
- Reflection
- Project Management
- Change Management
- Alignment and Agreement
- Organizational Development
- Developing People

All based on PDSA
“A good A3 is a reflection of the dialogue that created it”

John Shook