QI BASICS:

With Deming Dictums

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July 28, 2017

4th Friday Series

UAB MEDICINE
PEDIATRICS

Children's of Alabama

- I have no conflicts of interest, financial or otherwise.
- I have nothing to disclose.

QI Basics

- QI v Performance v Research
- Required improvement components
- Aim statement components
- 3 types of measures
- Use of run chart
- PDSAs
- Types of changes that result in improvement
- Implementation

NICHQ Quality Iprovemment 101 http://www.nichq.org/QI_101/story_html5.html?lms=1

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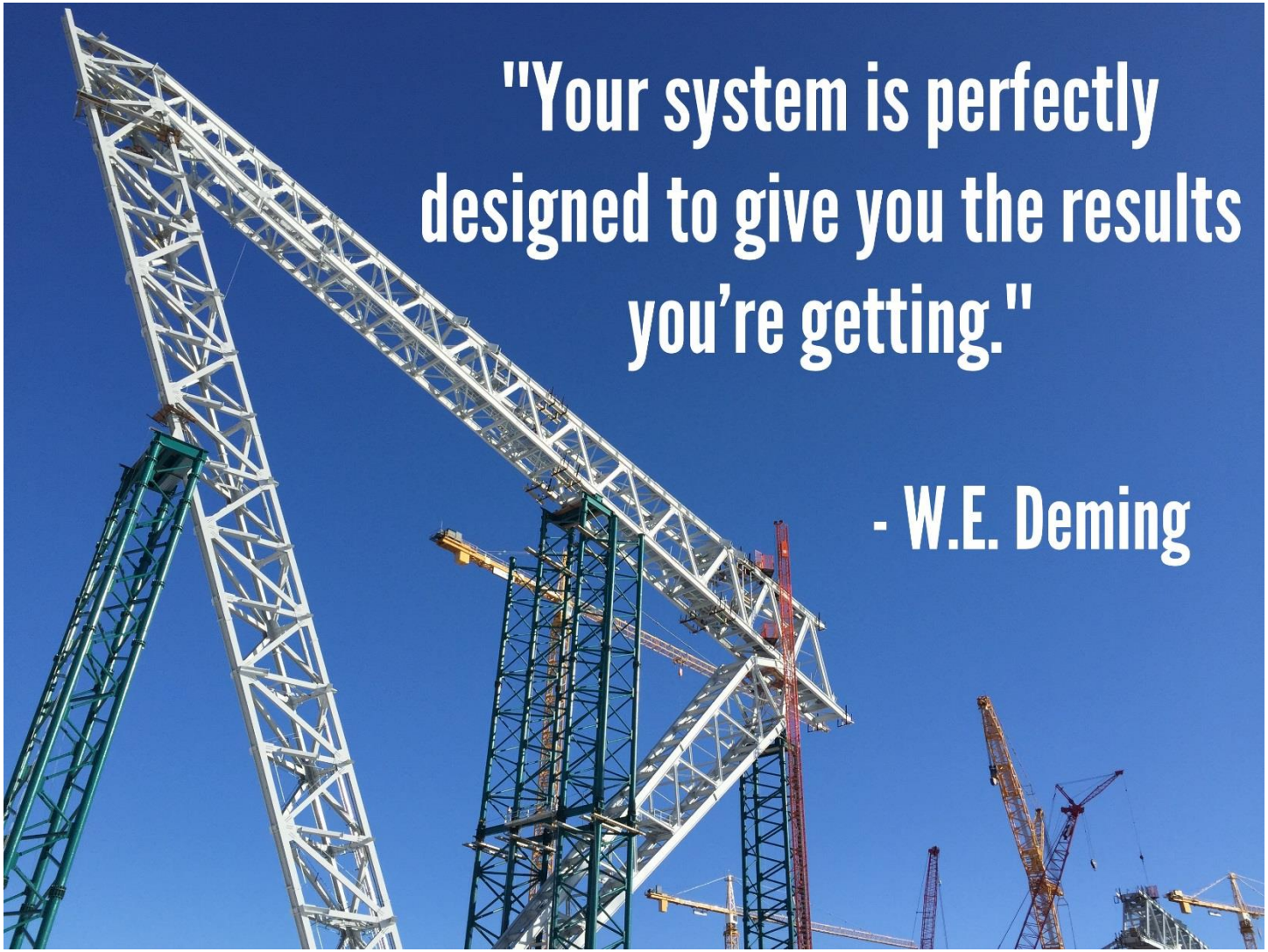

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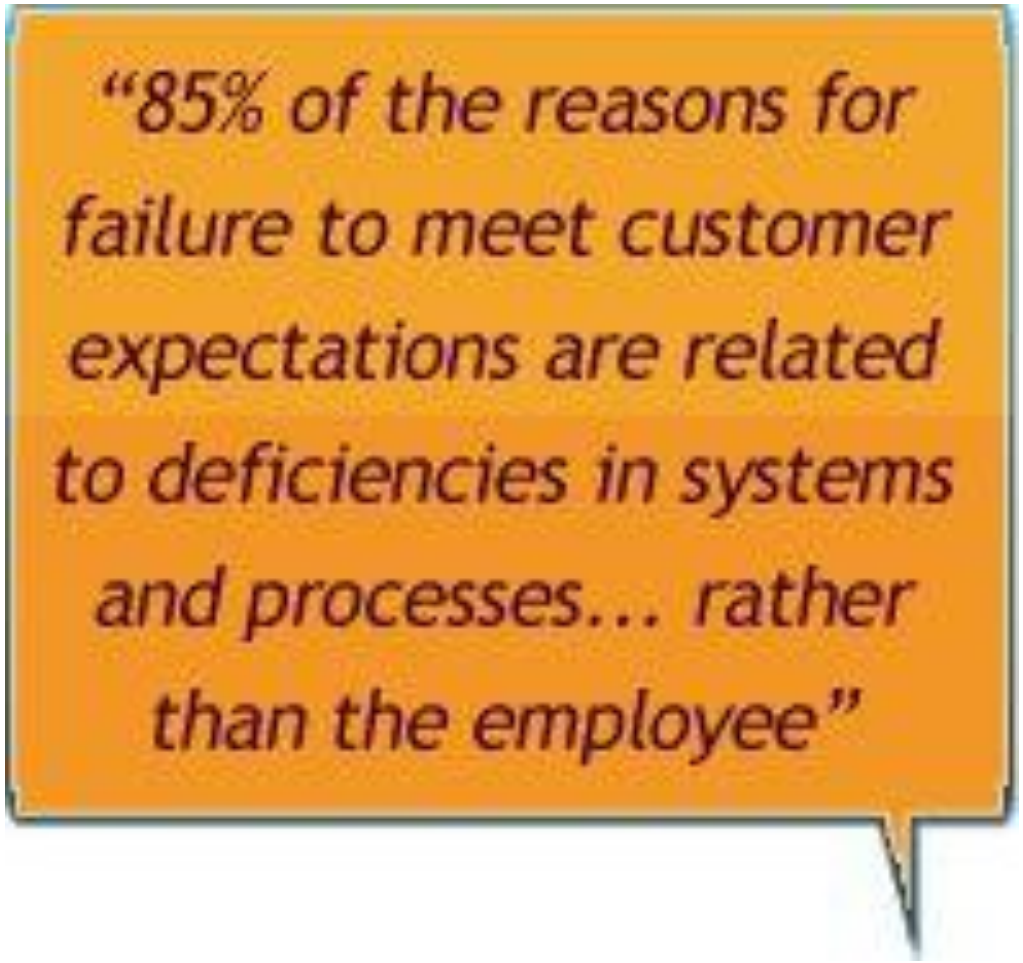

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Aspect	Improvement	Accountability	Research
Aim	Improvement of care (efficiency & effectiveness)	Comparison, choice, reassurance, motivation for change	New knowledge (efficacy)
Methods: • Test Observability	Test observable	No test, evaluate current performance	Test blinded or controlled
• Bias	Accept consistent bias	Measure and adjust to reduce bias	Design to eliminate bias
• Sample Size	"Just enough" data, small sequential samples	Obtain 100% of available, relevant data	"Just in case" data
• Flexibility of Hypothesis	Flexible hypotheses, changes as learning takes place	No hypothesis	Fixed hypothesis (null hypothesis)
• Testing Strategy	Sequential tests	No tests	One large test
• Determining if a change is an improvement	Run charts or Shewhart control charts (statistical process control)	No change focus (maybe compute a percent change or rank order the results)	Hypothesis, statistical tests (t-test, F-test, chi square), p-values
• Confidentiality of the data	Data used only by those involved with improvement	Data available for public consumption and review	Research subjects' identities protected

Better Quality Through Better Measurement Worksheets. Accessed July 23, 2017. http://www.ihi.org/education/conferences/APACForum2012/Documents/I5_Handouts.pdf

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Improvement Components

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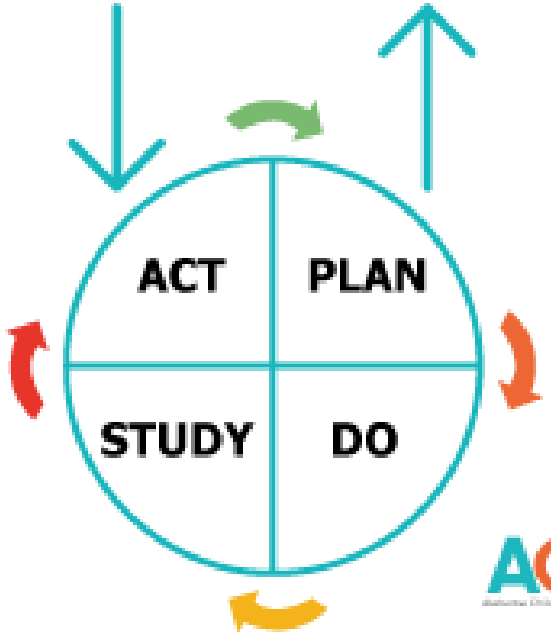
MODEL FOR IMPROVEMENT

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?



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What to Accomplish? = Aim Statement

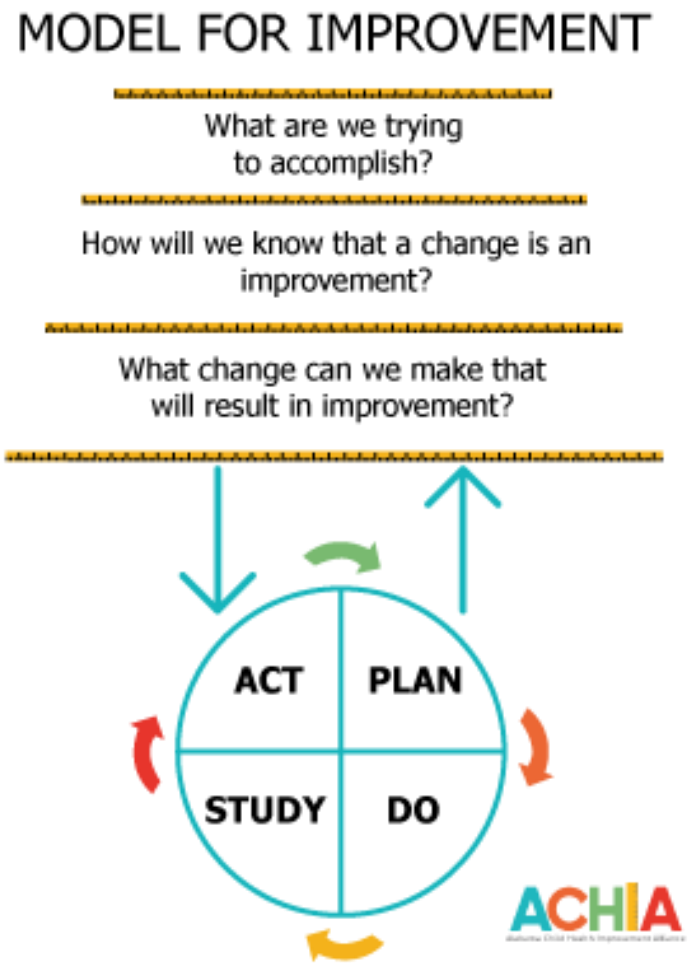
Describes what team is trying to do

Creates shared vision

Provides basis for developing the rest of the project

Empowers individuals to change systems

Clarifies magnitude and timeframe for improvement



Take Home - S.M.A.R.T Aim

- SPECIFIC The aim is well-defined and clear, and has a better chance of being reached than a general aim.
  - Who are the target population and the persons doing the activity?
  - What is the action or activity?
- MEASURABLE Objectives should have a benchmark and target, to help determine when objectives are achieved.
  - How much change are you expecting to see?
  - Will there be an increase or decrease?
  - How can you measure it?
- ACHIEVABLE The aim is something that can actually be reached.
  - Can it be done?
  - Is your measure realistic?
  - Can you accomplish it in the timeframe identified?
  - Do you have the resources?
- RELEVANT The aim is relevant to your program's mission, vision, and goals, and is agreed-upon by stakeholders.
  - Does the action relate to what you want to accomplish?
  - Is it important and meaningful?
  - Does it relate to broader program or organizational goals?
- TIMELY The aim has a set time-frame to be met.
  - What is the timeline for change?
  - When will this be accomplished? Months? Days? Years?

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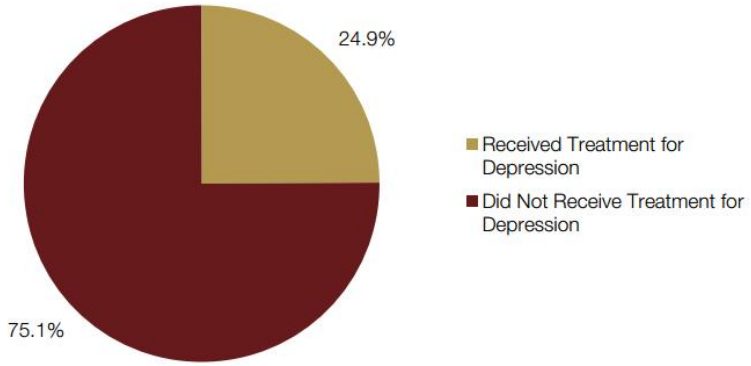
Adolescent Depression

Past-Year Depression Treatment Among Adolescents Aged 12–17 with Major Depressive Episode (MDE) in Alabama (2009–2013)[2,3]

Alabama's percentage of treatment for depression among adolescents with MDE was lower than the national percentage in 2009–2013.



- Lifetime prevalence of MDE among adolescents is 20%. MDE is associated with increased risk of death by suicide, as well as with early pregnancy and decreased school performance.
- The Primary Care Clinic (PCC) is a pediatric resident clinic and, although recommended by the American Academy of Pediatrics, does not currently screen or treat adolescent depression.
- Primary care preventive care visits for adolescents present an opportunity to screen for depression and, if positive, develop a follow up plan.

Aim statement

- What do you want to happen
- For whom: target population
- By when: deadline when aim achieved
- How much: measurable goals

We will increase the percentage of clinic patients 12-18 years of age appropriately screened for adolescent depression* at well child visits from 0% to 90% by June 1, 2017

Appropriately screened depression:

1. Screen tool completed and scored
2. If positive, follow up documented

Decrease infant mortality by educating pregnant women about safe sleep by December 2017

- What
  - Decrease infant mortality by educating about safe sleep
- Whom
  - pregnant women
- By When
  - December 2017
- How Much
  - ?

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By December 2018, increase by 20% over 2016 levels the proportion of children age 5 or under receiving vision screening in Alabama

- What
  - increase the proportion of children receiving vision screening
- Whom
  - children age 5 or under
- How much
  - increase by 20% over 2016 levels
- When
  - By December 2018

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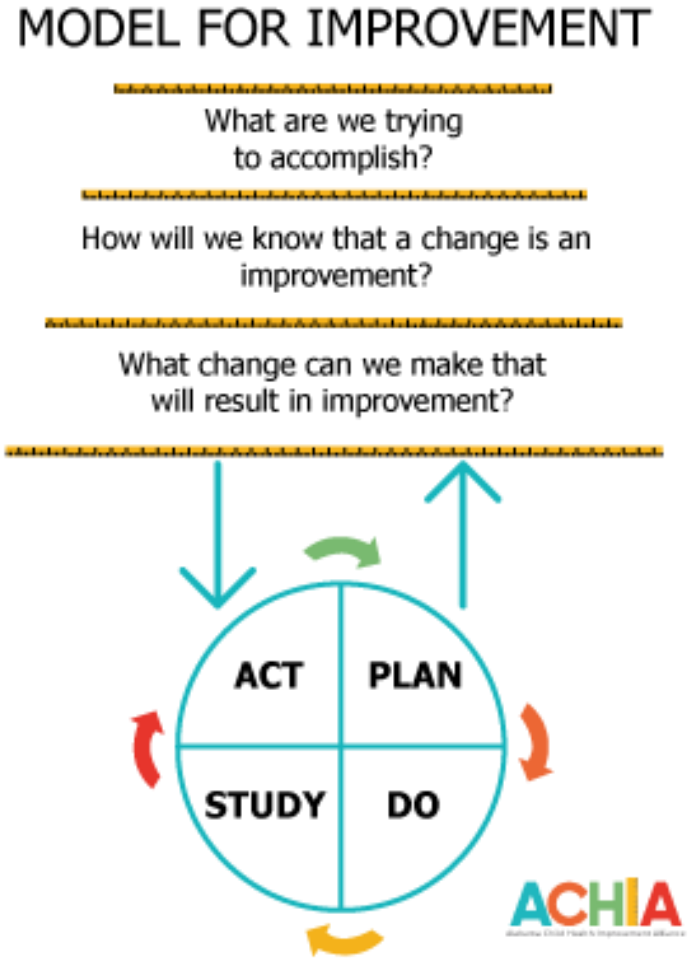
How will we know if change is improvement? = Data



"Without data you're just another person with an opinion"

- W. Edwards Deming

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Just because you can measure everything doesn't mean that you should.

- W. Edwards Deming

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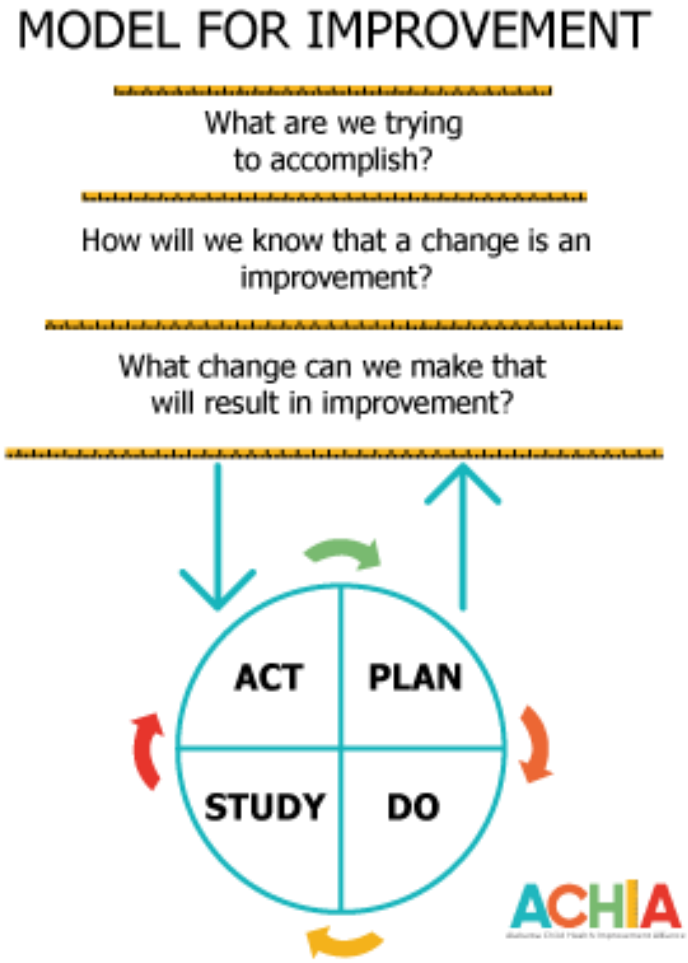
How will we know if change is improvement? = Data

- Measures
  - Guidelines
  - Operational Definition
  - Measure Types
- Run Charts
  - Shifts/trends
  - Take Home Run Chart
- Interpreting Data
  - Variation



Guidelines for Measure Development

- Mix of measures types
- Useful
- Easy collection
- Collect frequently
- Operational definition
- Need useful variation to guide improvement
- Use existing measures

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NIPN Measures

- Adolescent and Young Adult Health
- Healthy Weight (Obesity)
- Asthma

http://www.med.uvm.edu/nipn/resources

Operational Definition

MEASUREMENT:

- Description, Rationale and Evidence
- Population - Inclusions/Exclusions
- Data - Source, Frequency, Format – manual or EHR
- Reporting – chart type, how often, where - especially after ‘project’
- Revision History

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Measure Types

- Outcome – the ‘what’
- Process – the ‘how’
- Balancing – improvement in one area doesn’t impact another
- All or None – all steps must be present to get ‘credit’

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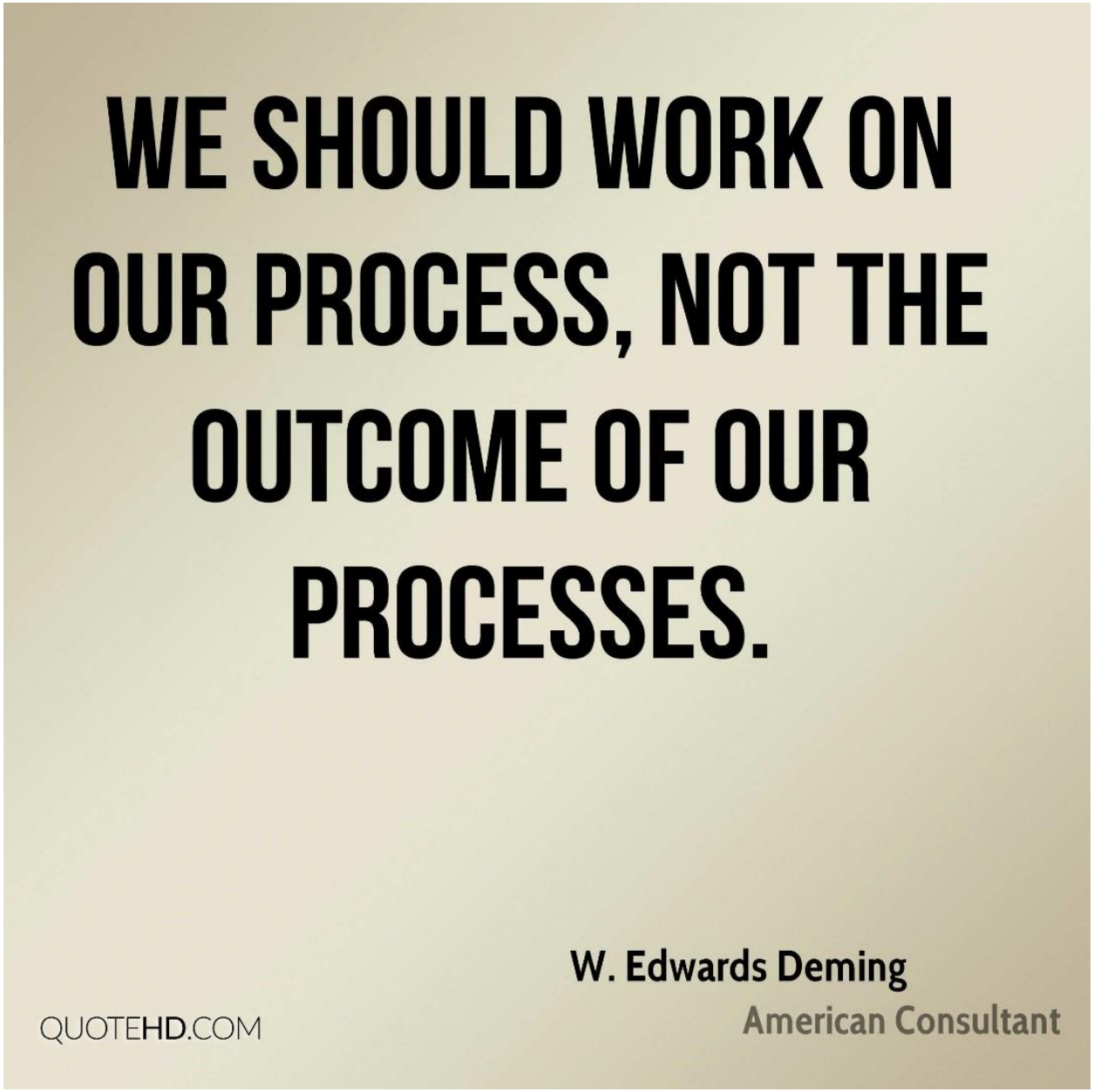

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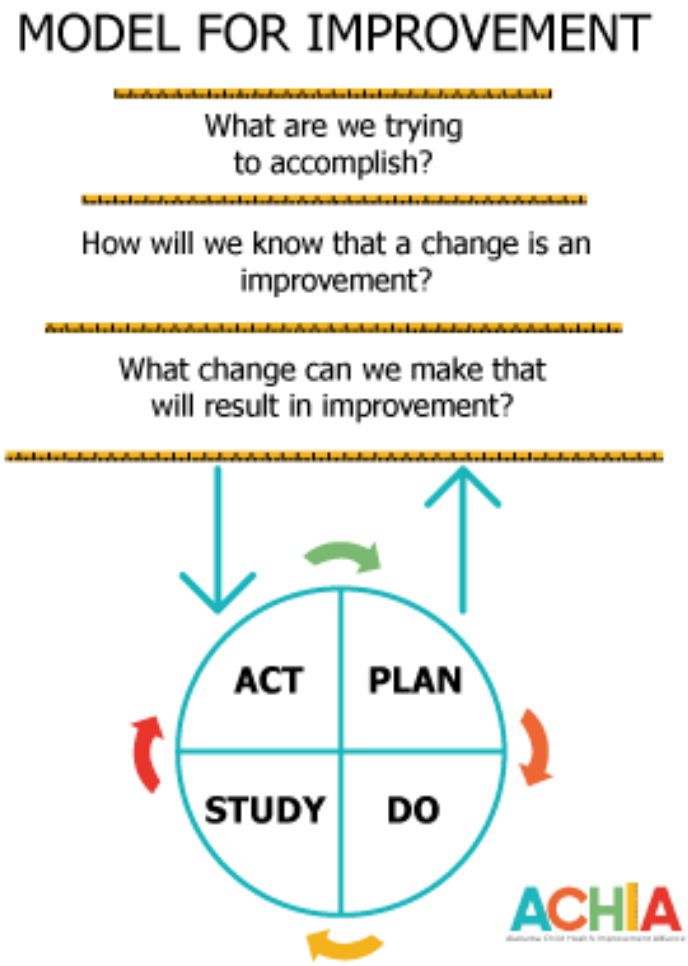

Run charts

- Understand data over time
- Understand variation
- See if improvements are maintained

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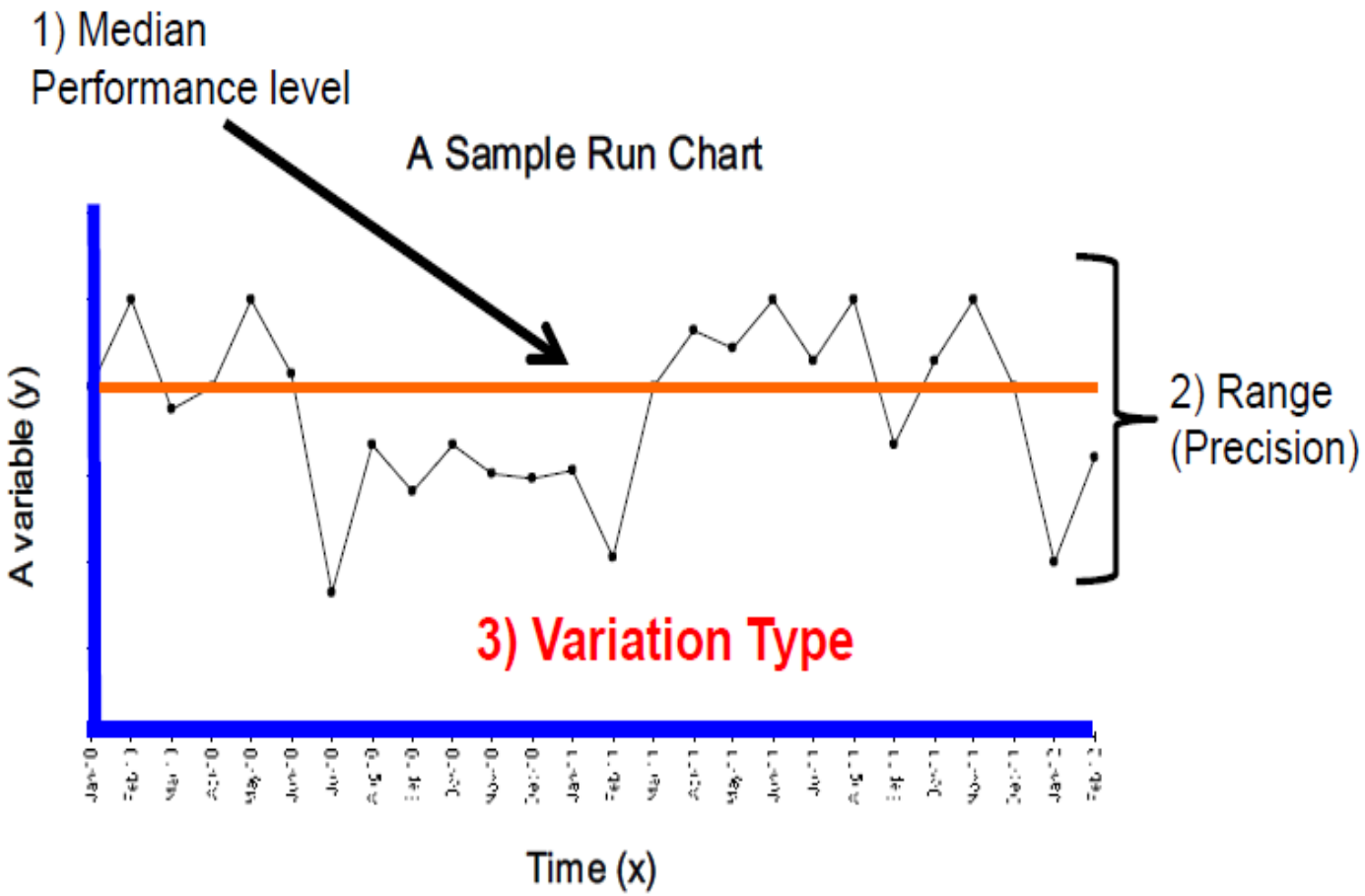

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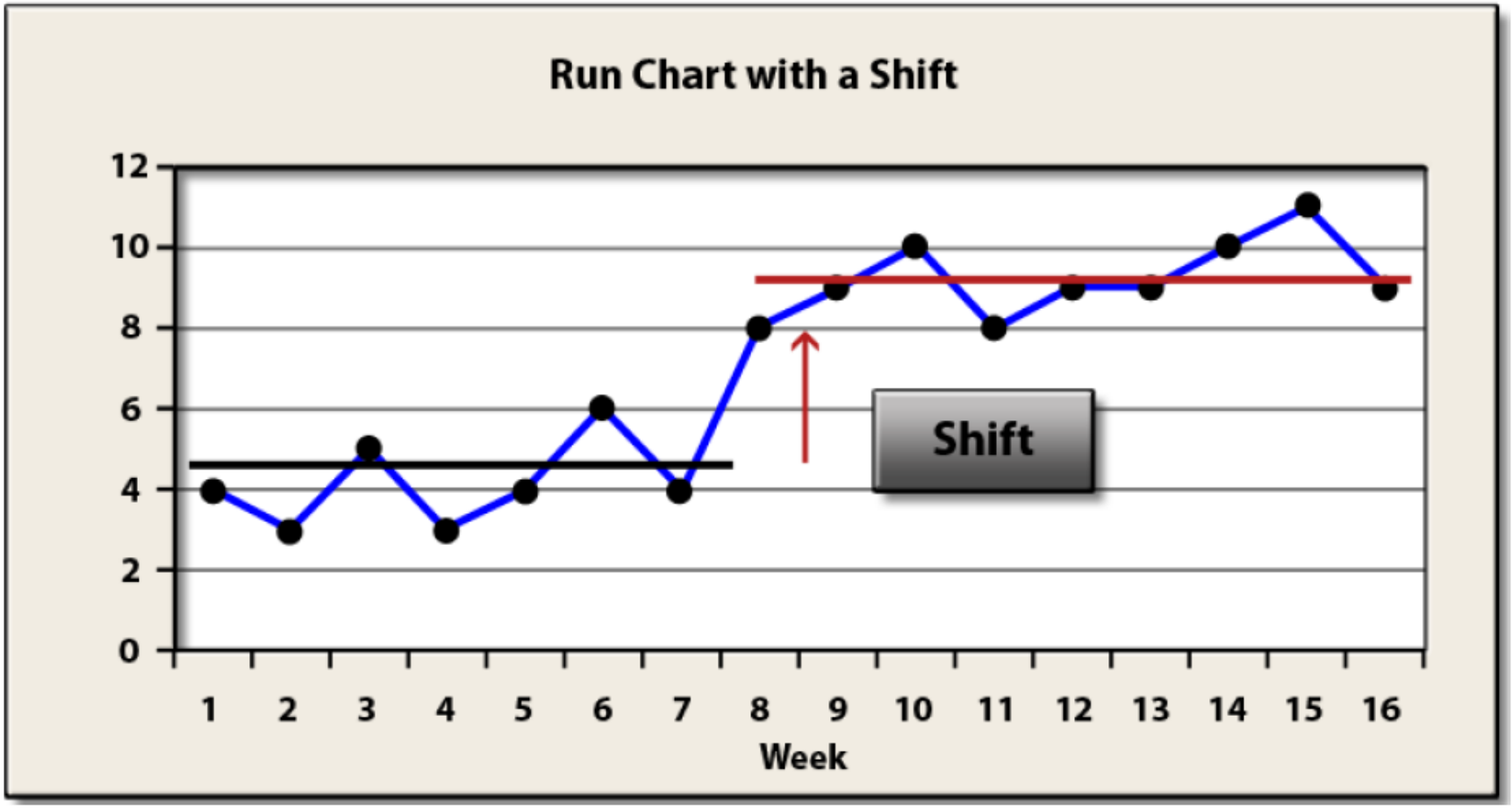
Run Chart - Shift - 8



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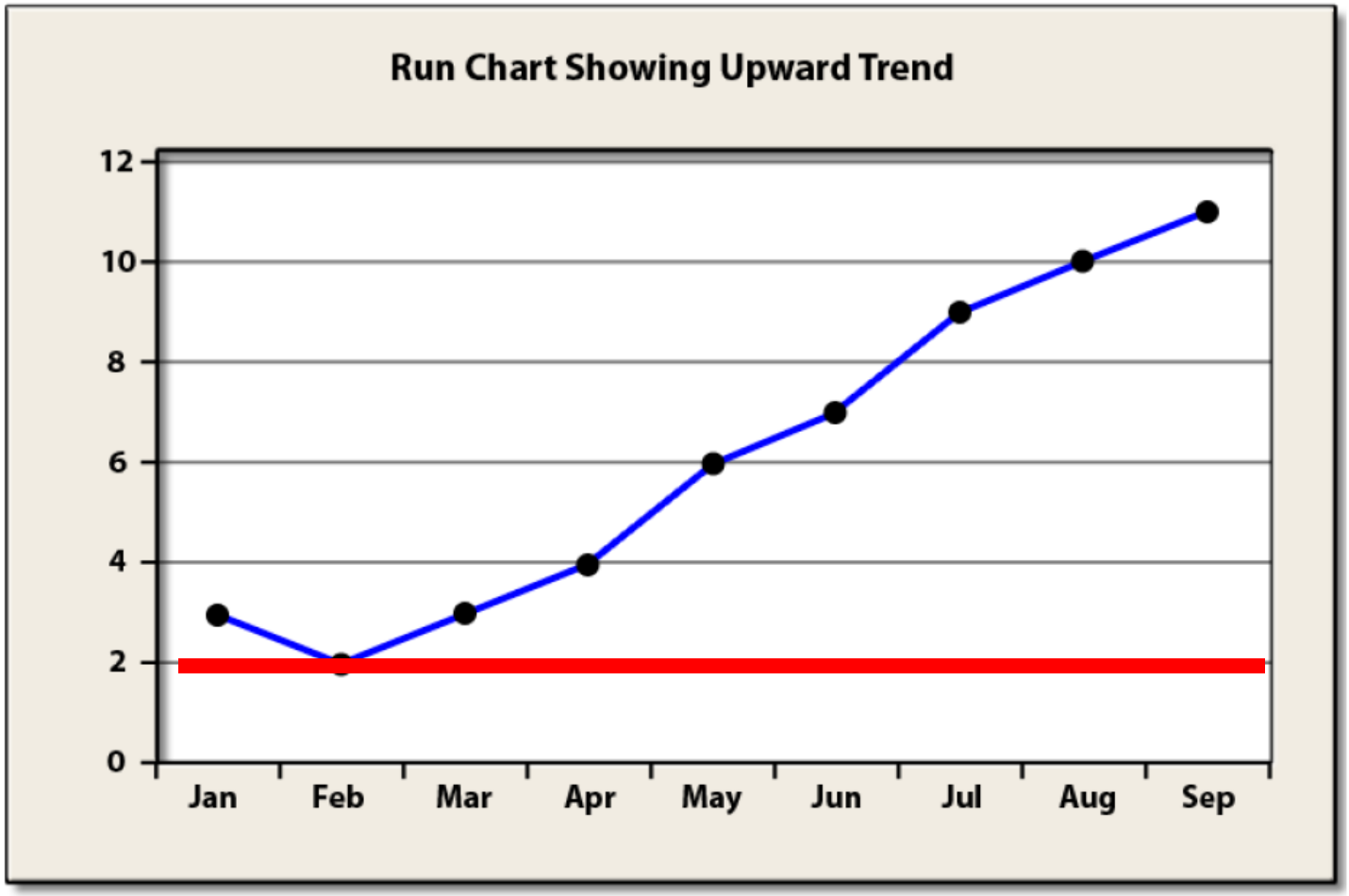
Run Chart- Trend - 6



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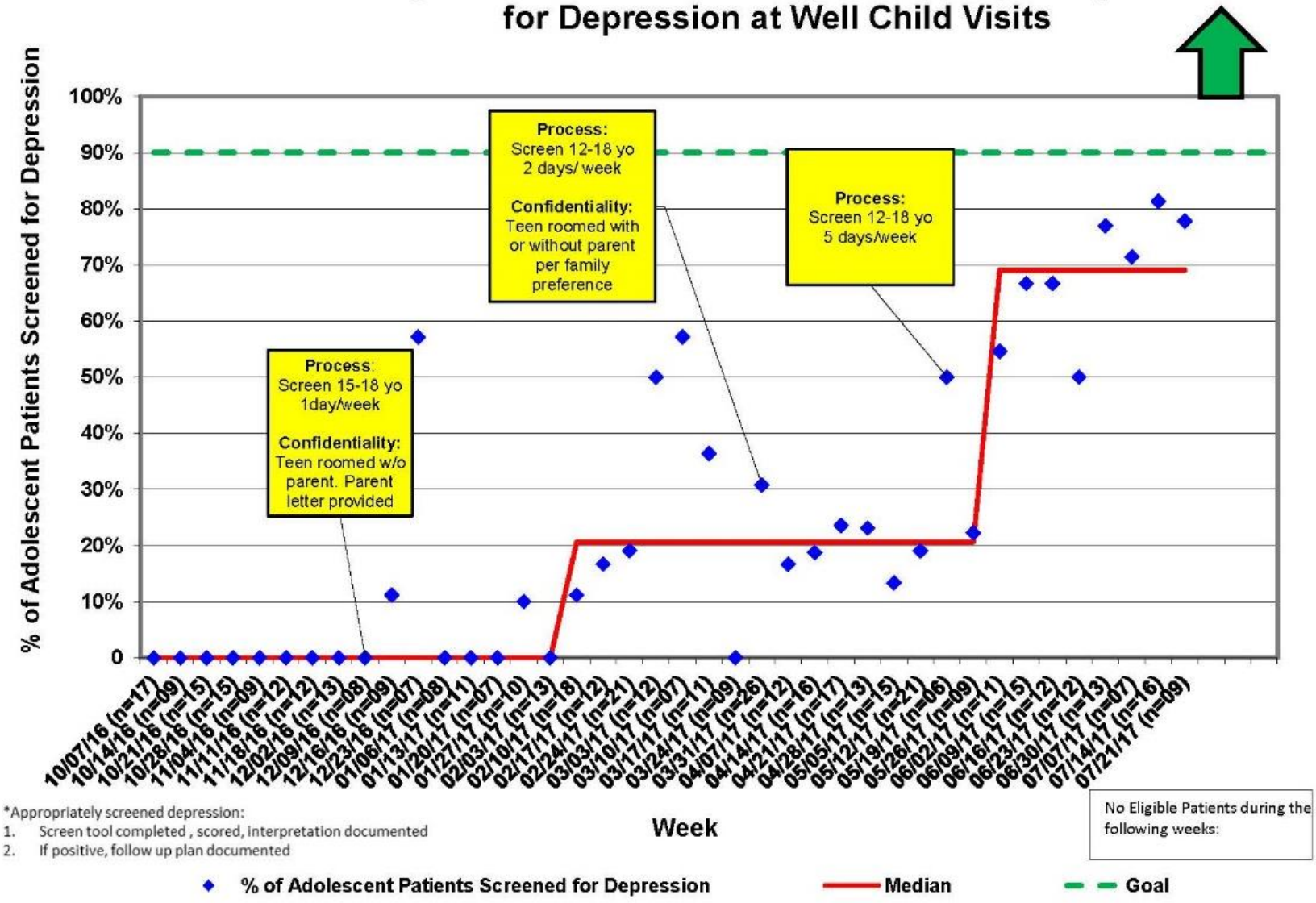
Percentage of Adolescents 13-17 years Appropriately Screened* for Depression at Well Child Visits



*Appropriately screened depression:
1. Screen tool completed , scored, interpretation documented
2. If positive, follow up plan documented

No Eligible Patients during the following weeks:

Take Home – Run Chart

Run Chart Template

Developed by Richard Scoville, PhD. (richard@rscoville.net)

Graph Label	Graph Title
Y Axis Label	Y Axis Label
X Axis Label	X Axis Label

Enter dates or observation numbers into the green cells at right. (clear the sample data before you begin)

Enter your data values into the blue cells. Goal values are optional.

Don't leave any blank cells in the Date/Observation column.

Enter an 'X' into the End Median column to mark the last row to be included in the median

Enter your graph title, x axis, and y axis label into the cells provided.

Use the boxes below the graph to annotate where interventions were introduced. Drag the box to the data point on the graph. (Note: This may require some formatting adjustments.)

Use regular Excel commands to configure the graph.

See sheet 'Rules for Interpreting Charts' for information about interpreting charts

Date / Observation	Value	Median	Goal	End Median
1	10	10	11	
2	12	10	11	
3	8	10	11	
4	13	10	11	
5	9	10	11	X
			11	
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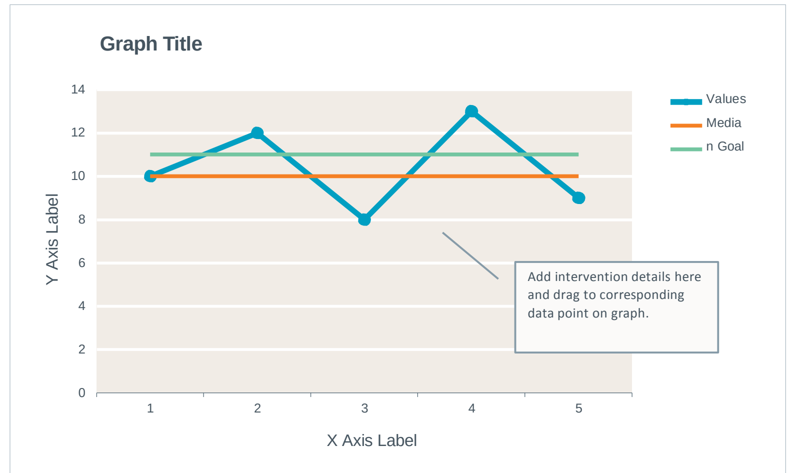

Add intervention details here and drag to corresponding data point on graph.

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http://www.ihi.org/education/IHIOpenSchool/Courses/documents/practicumdocuments/run%20chart%20template.pdf

http://www.ihi.org/resources/Pages/Tools/RunChart.aspx

How will we know if change is improvement = Data

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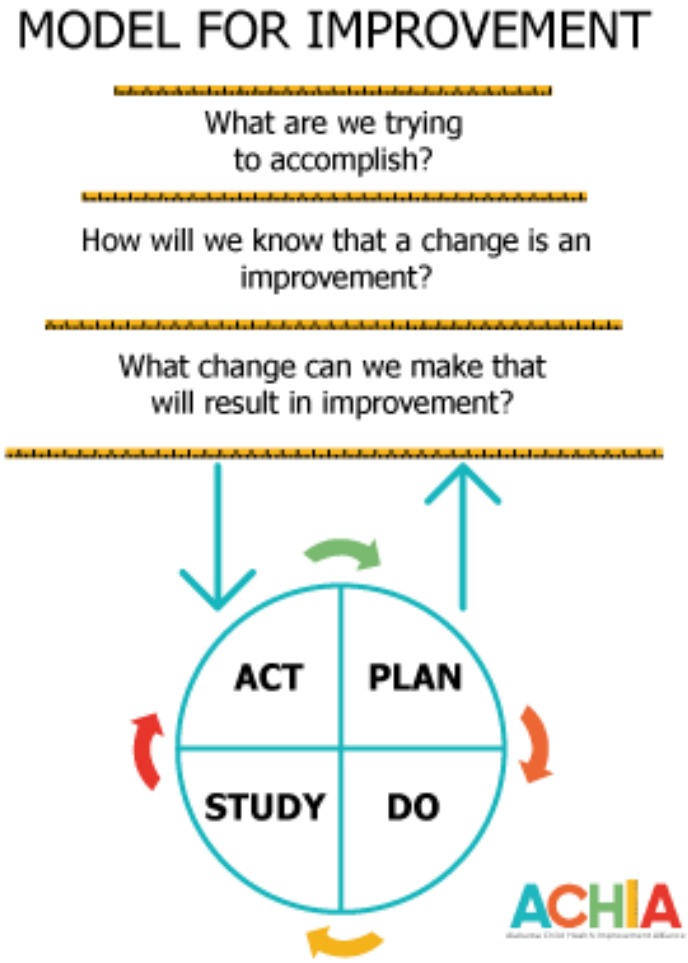
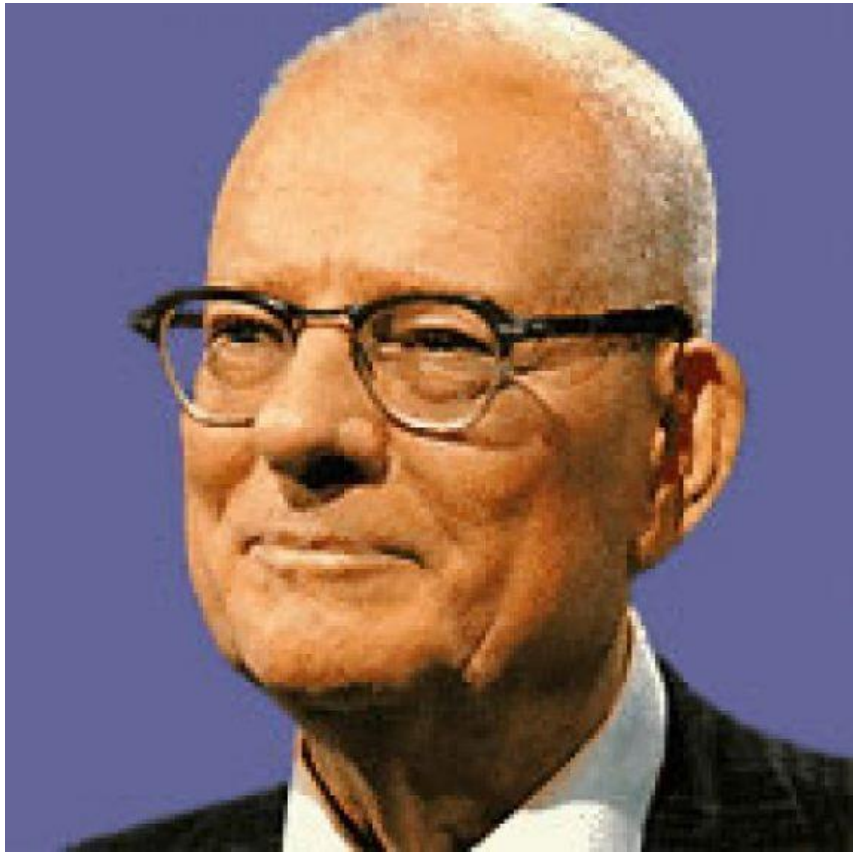


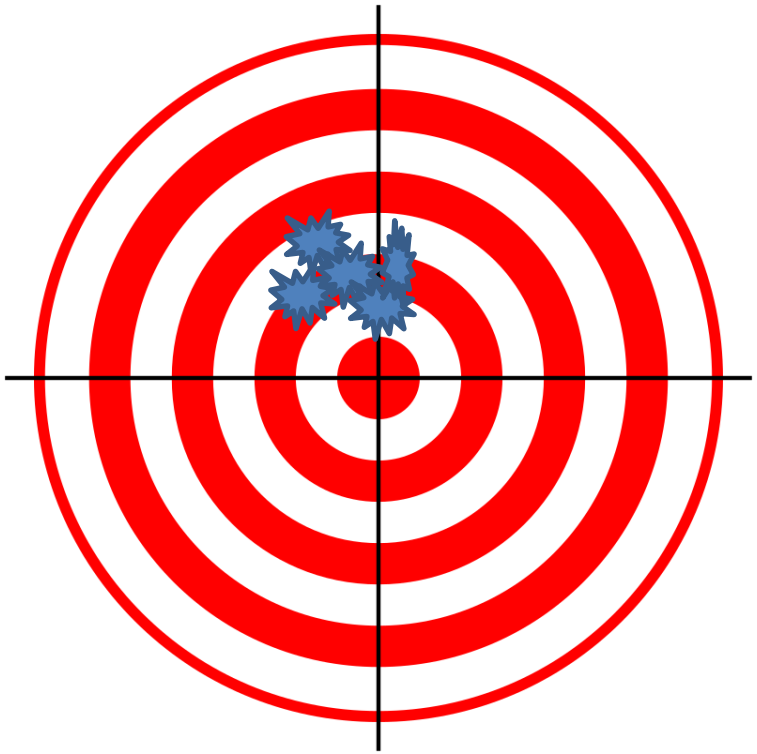
Variation

- “If I had to reduce my message for management to just a few words, I’d say it all had to do with reducing variation.”
  - W. Edwards Deming

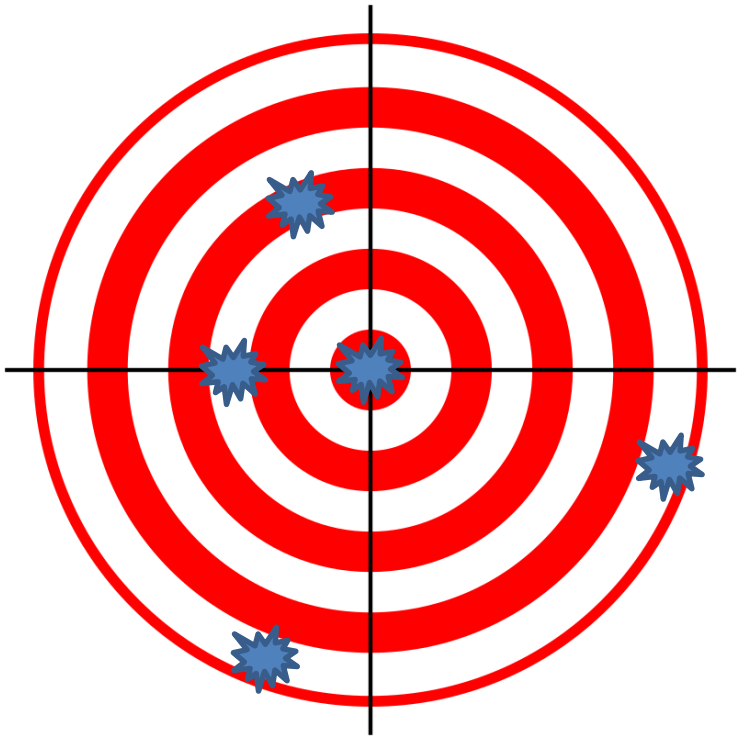


Customers: Variation is the Enemy

Who is better archer?



Tina



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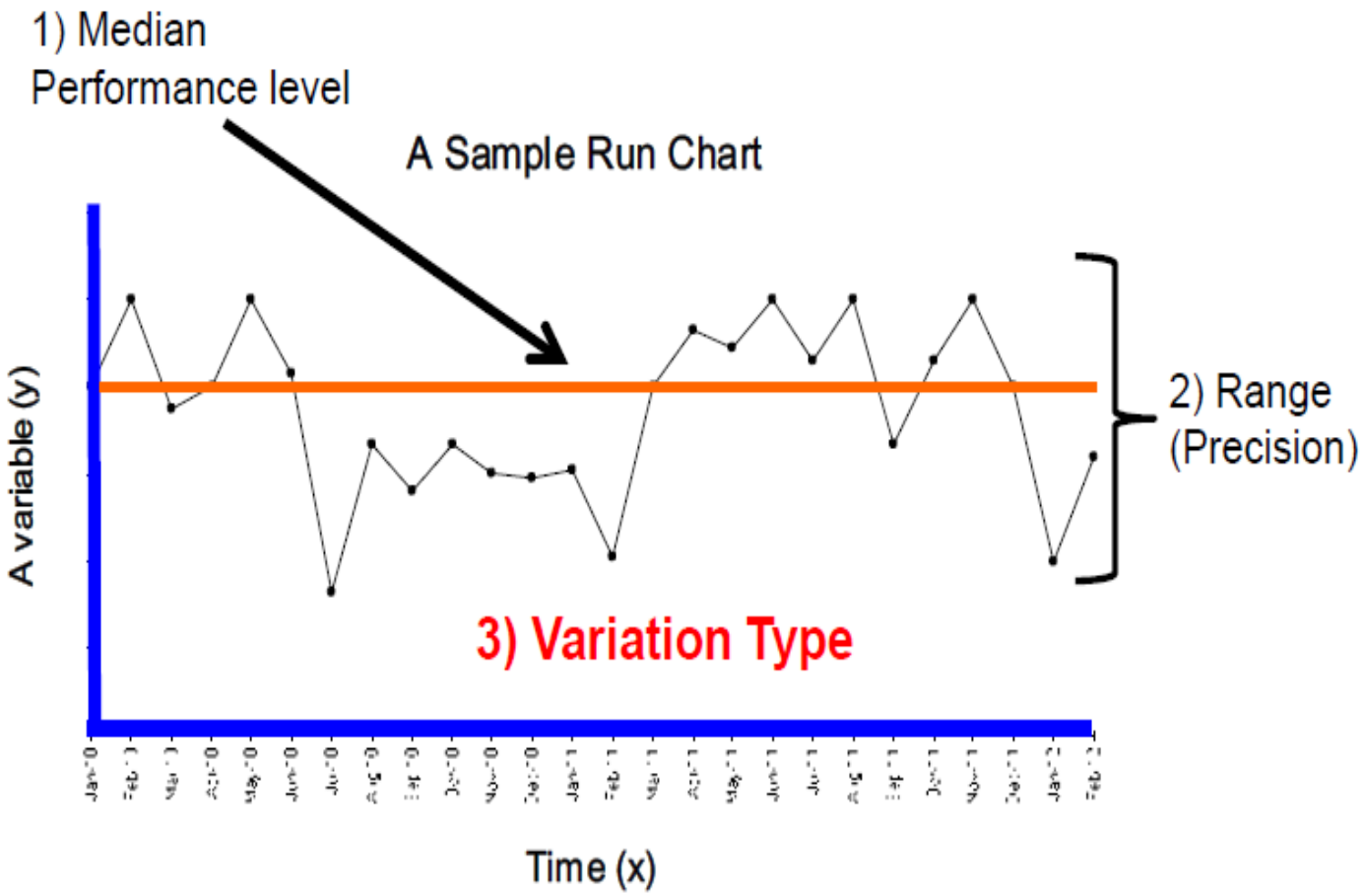
1) Median
Performance level
A Sample Run Chart
A variable (y)
2) Range
(Precision)
3) Variation Type
Time (x)

Variation:

How do results vary from time to time?

Common cause variation

- Due to factors inherent in the system (the noise in the system)
- Accounts for most of the variation
- Predictable

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Variation:

How do results vary from time to time?

Common cause variation

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Variation (continued)

Special cause variation

- Due to unexpected factors outside the system
- Accounts for little of the variation
- Unpredictable

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Variation (continued)

Special cause variation

- Due to unexpected factors outside the system
- Accounts for little of the variation
- Unpredictable

Why do we care about differentiating between these causes of variation?

- Understand the pattern before making changes in order to address the problems inherent to the system.

- Analyze the data to be sure that the change resulted in improvement and is part of the (new) system

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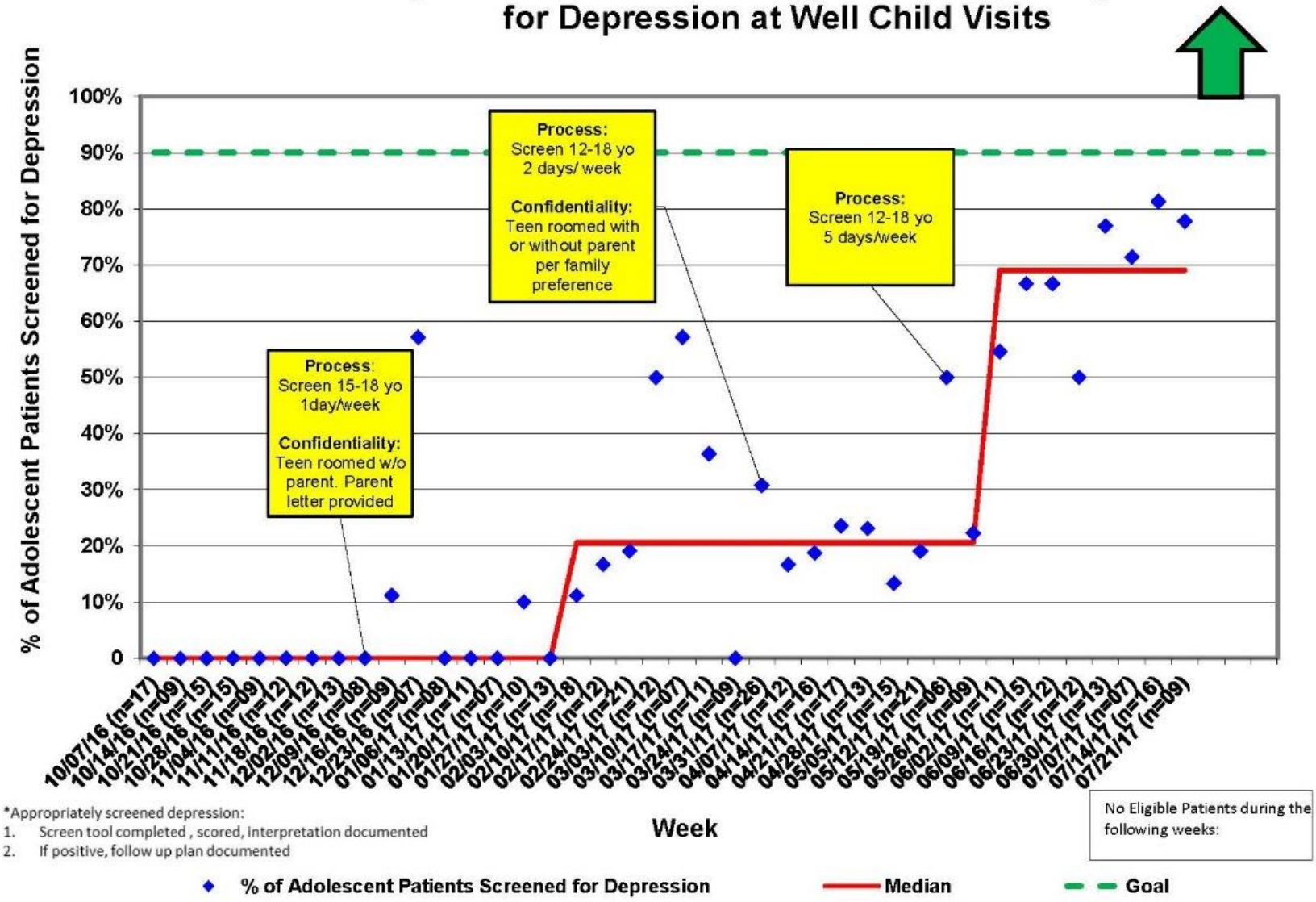
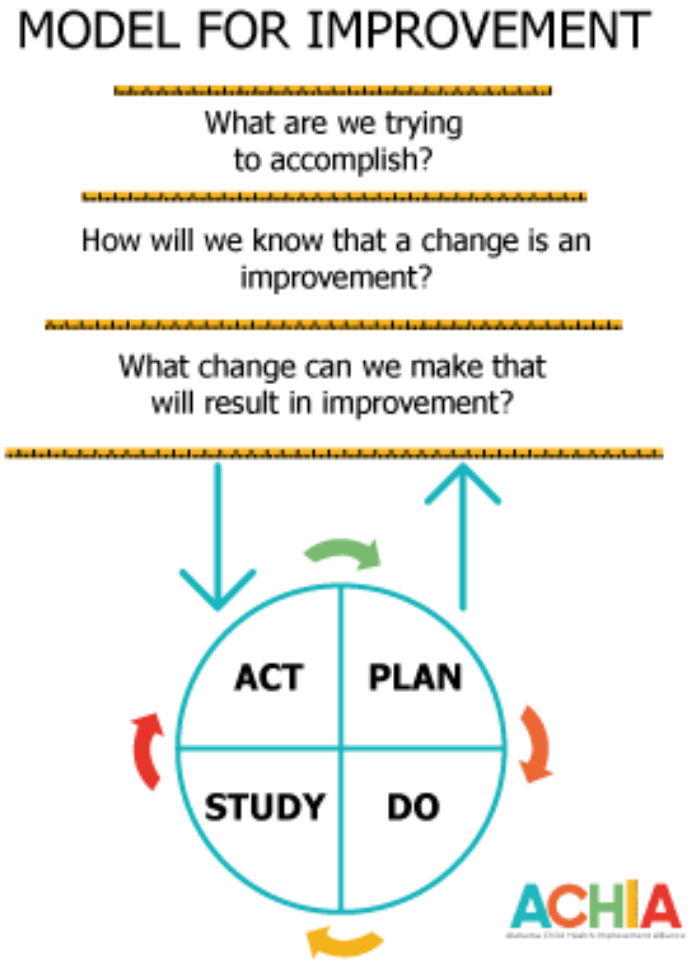


*Appropriately screened depression:
1. Screen tool completed , scored, interpretation documented
2. If positive, follow up plan documented

No Eligible Patients during the following weeks:

What change can we make that results in improvement= PDSA

- PDSA and PDSA Ramps
- Understand system
  - sFMEA and Post It Flow diagrams
  - Driver diagrams
- Integrate experience/creativity
  - Patients
  - 4 corners
- Use change concepts



Plan Do Study Act

- Plan- choose an intervention to test and predict the change
- Do – carry out the test
- Study – did your ‘Do’ = ‘Plan’ prediction
- Act - Adapt - Adopt - Abandon

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PDSA Ramp

- Iterative
- 1 patient/1 day/ 1 provider
- Multiple patients/ providers
- Variety Conditions
  - other languages
- Moving from testing to implementing
  - job description/policies/data tracking

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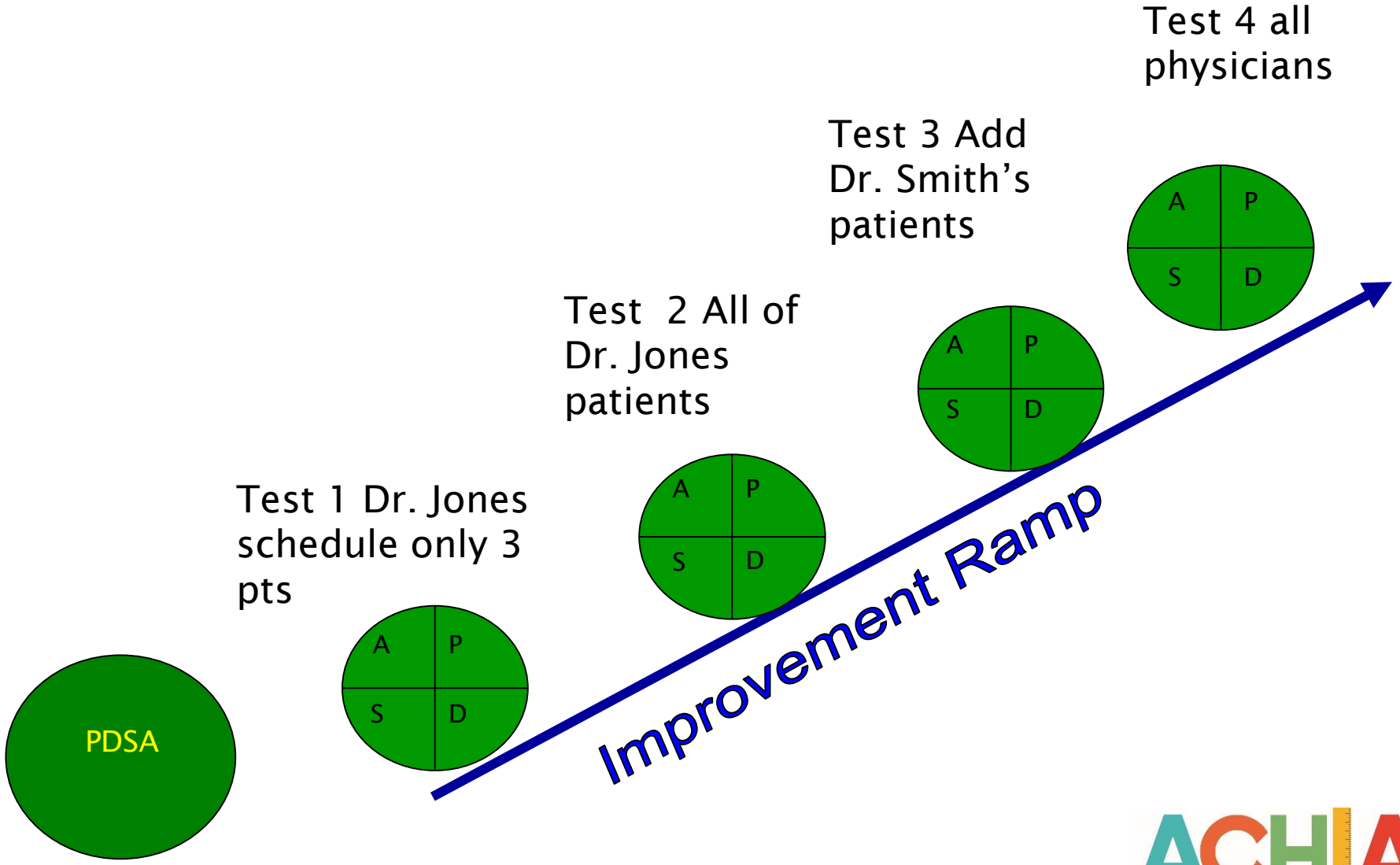

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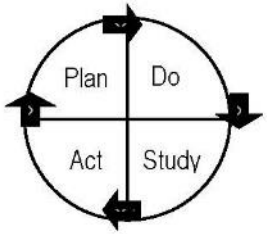

PDSA WORKSHEET

Team Name:	Date of test:	Test Completion Date:
Overall team/project aim:		
What is the objective of the test?		
What 90 day goal does the change impact?		

PLAN:

Briefly describe the test:

How will you know that the change is an improvement?

What driver does the change impact?

What do you predict will happen?

PLAN

List the tasks necessary to complete this test (what)	Person responsible (who)	When	Where
1.			
2.			
3.			
4.			
5.			
6.			

Plan for collection of data:

DO: Test the changes.

Was the cycle carried out as planned? ☐ Yes ☐ No

Record data and observations.

What did you observe that was not part of our plan?

STUDY:

Did the results match your predictions? ☐ Yes ☐ No

Compare the result of your test to your previous performance:

What did you learn?

ACT: Decide to Adopt, Adapt, or Abandon.

☐ Adapt: Improve the change and continue testing plan.
Plans/changes for next test:

☐ Adopt: Select changes to implement on a larger scale and develop an implementation plan and plan for sustainability

☐ Abandon: Discard this change idea and try a different one

What change can we make that results in improvement?

- Don’t reinvent wheel
- PDSA and PDSA Ramps
- Integrate experience/creativity
  - Patients
  - 4 corners
- Understand system
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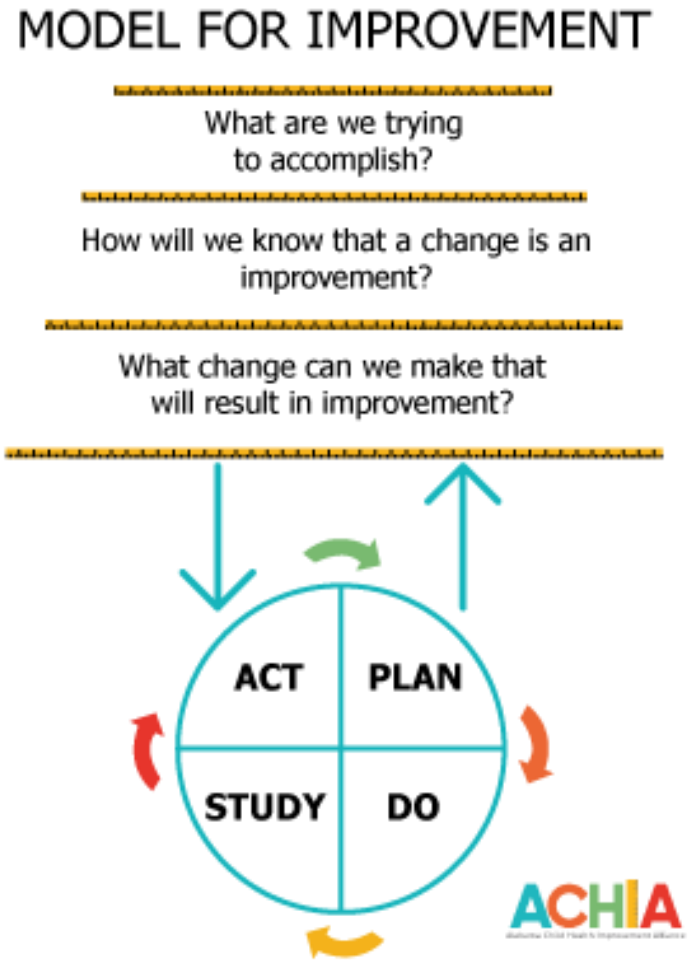

Integrate Experience/Creativity-Patients

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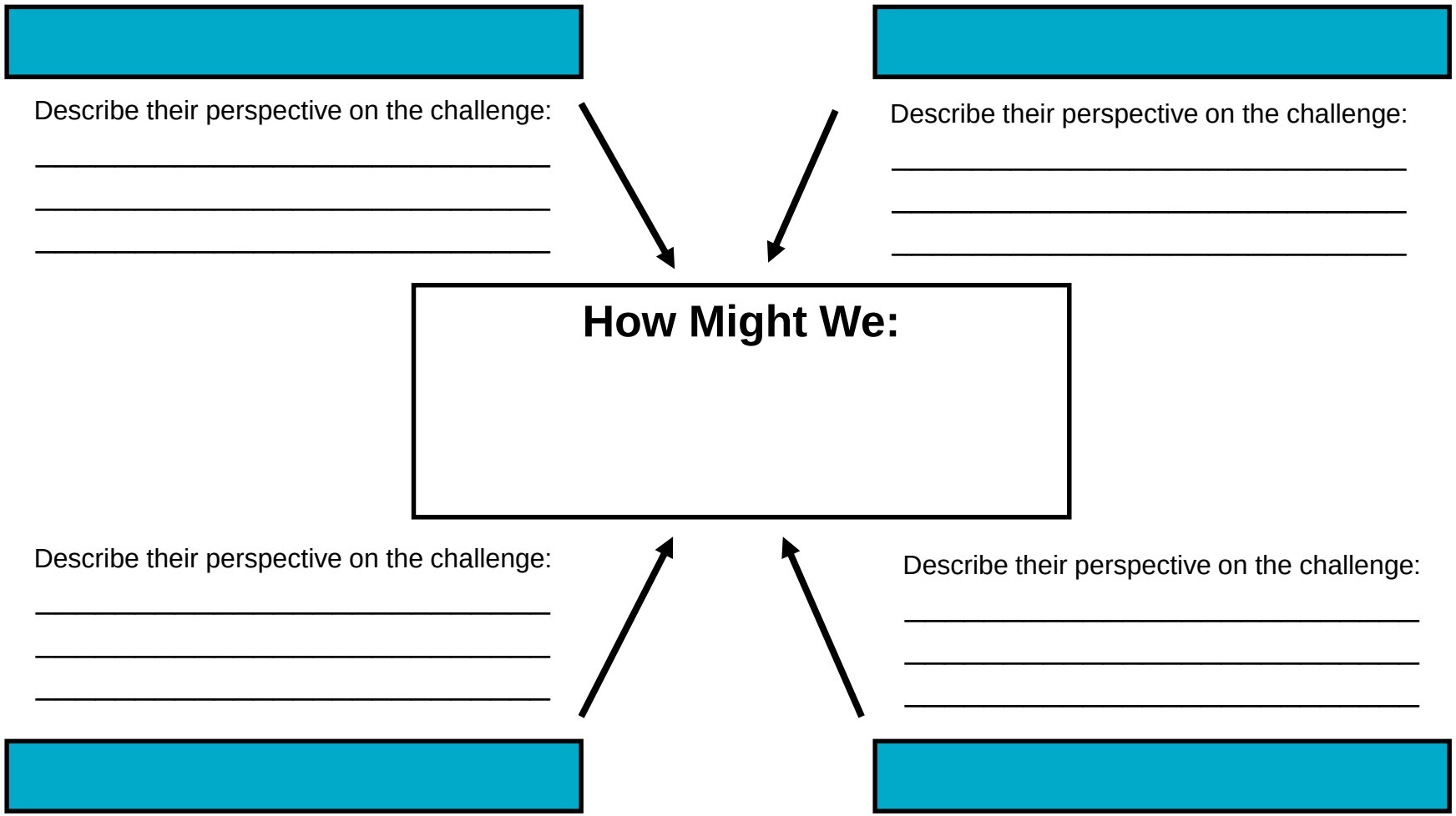
Four Corners: Seeing the Others POV, Part 1

Consider your challenge from multiple perspectives. How do these different perspectives impact the way you think?
First, write your challenge in the center of the page, then write a stakeholder in each blue box. Finally, try writing your challenge from the perspective of these other stakeholders.



Integrate Experience

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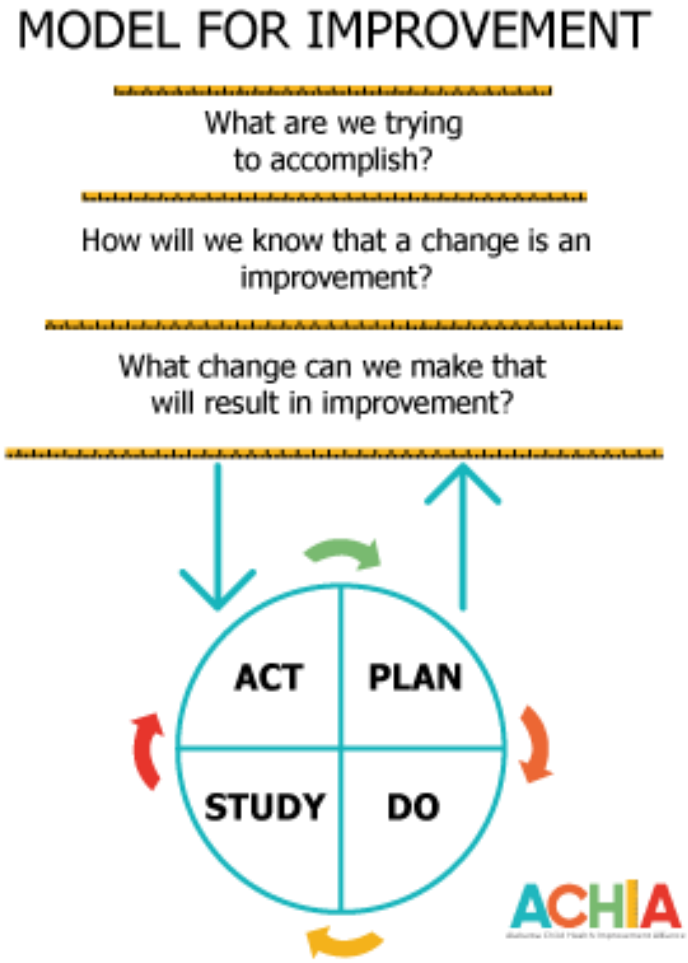
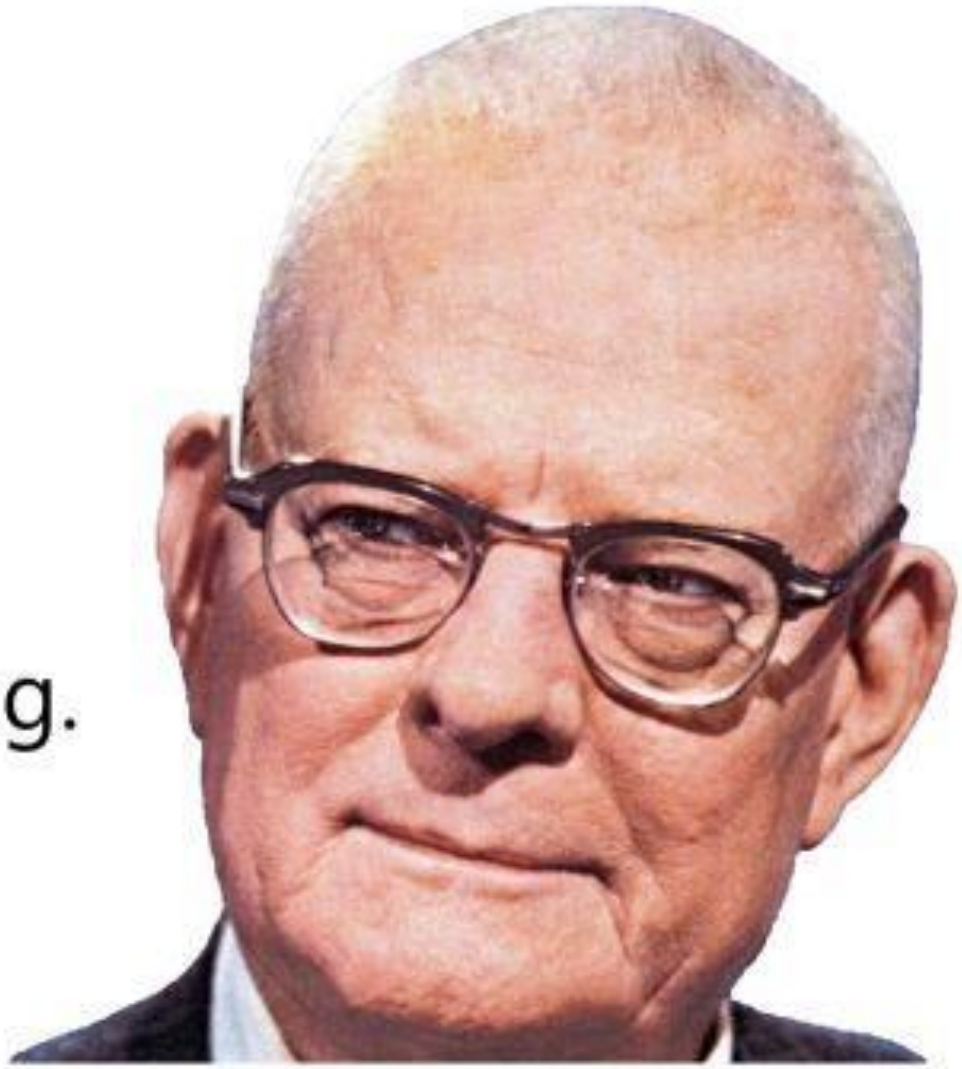


If you can't describe what you are doing as a process, you don't know what you're doing.

William Edwards Deming



Simplified Failure Mode Effect Analysis

INTERVENTION

CURRENT PROCESS

FAILURE MODES

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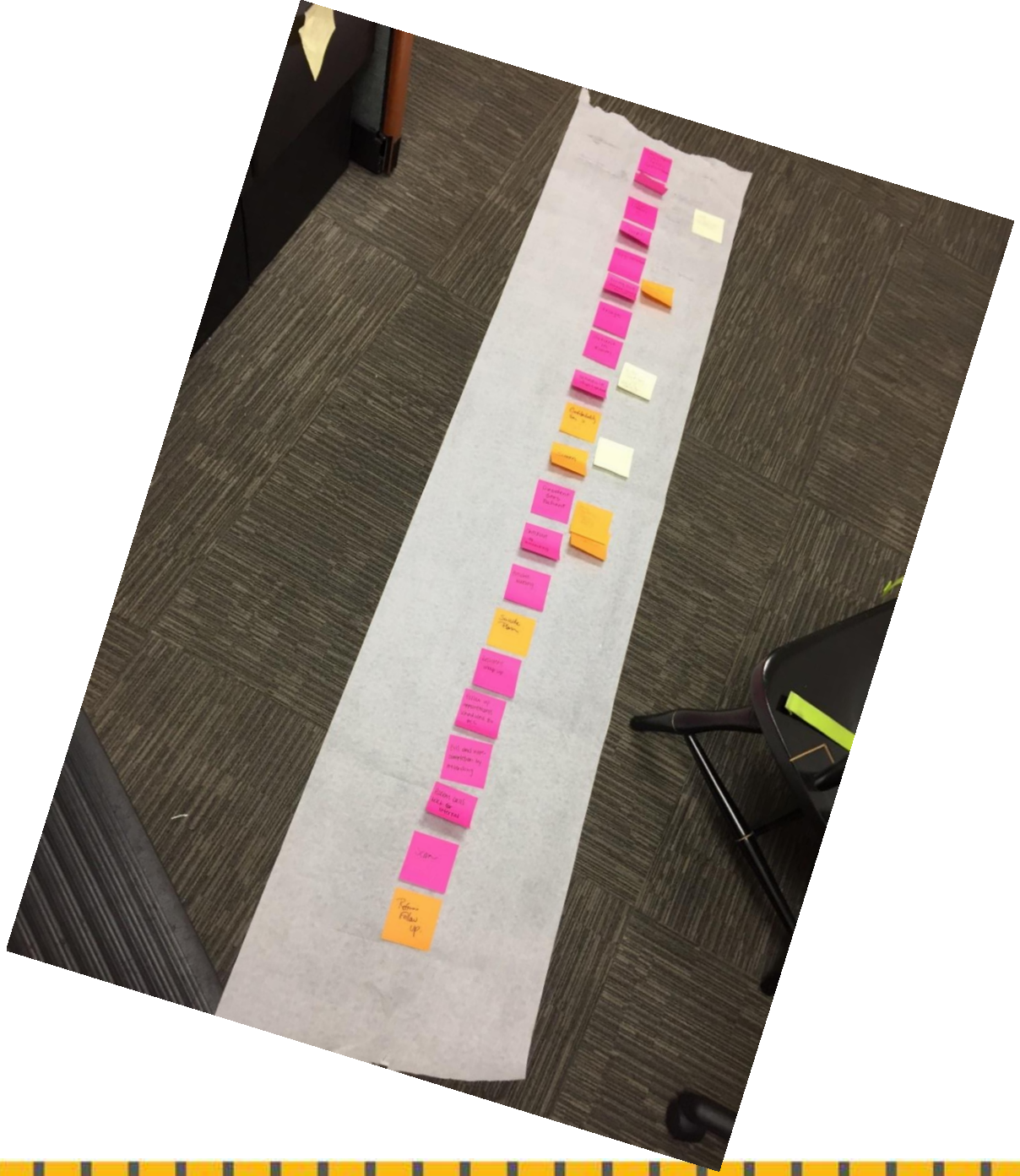
Process Name: STANDARDIZE PROCESS FOR SCREEN AND FOLLOW UP

Cincinnati Children's change the outcome

INTERVENTIONS	Script for scheduling staff Reminder in pilot phase of which patients need script **Parking lot**: -Calls not made -inability to reach families	Workflow checklist for staff Daily feedback in pilot phase re: workflow from staff and parent/patient	Staff list of which patients need rooming script in pilot phase Feedback from parents re: workflow	Pilot in English add other languages as pilot expands per Chart prep standards Condense forms **Parking lot** Online forms	Assess resident competency and comfort with clinical post-tests after educational intervention Feedback re: screen review	Develop clinical algorithm with MI included Track attending awareness and assess agreement with algorithm Review cases w Psych weekly	Decrease stigma w clinic messaging Staff f/u in 2 weeks to assess adherence and barriers
CURRENT PROCESS	Scheduling and Reminder calls	Chart Prep and Registration	Triage and Room patient	Patient Completes Screens	Resident Reviews Screen	Assessment And Plan	Follow Up
FAILURE MODES	Parent and patient not prepared for confidential visit Phone calls not made Unable to reach patient or parent by phone **Why:** Staff not aware of need to prepare patient/parent Short staffed Phone # incorrect	Screen not provided. Screen completed by Parent Screen completed by teen but not with confidentiality **Why** Staff not aware which patients need forms or how to have patient start visit without parent	Parents decline teen starting visit alone Triage staff don't explain confidentiality **Why** Staff not aware which patients need to complete screens or what to say	Form not Completed b/c -Low Literacy-language and health -Form in wrong language To many screens to complete: -Sports SE -Pre-visit -PHQ-9 **Why** Correct language not available	Resident not prepared to talk about confidentiality or know what how to score/ interpret Pre-visit Questionnaire and PHQ-9 Screen not reviewed Patient doesn't think screen is confidential or to share info **Why** Resident not familiar with screen or confidentiality	Positive screen not managed per guidelines Patient not interested In treatment **Why** Lack of awareness of EB management for A/P and for Follow Up Lack of consensus of management Stigma around depression	Patient not adherent to med or counseling recommendations **Why** **P**atient lack of agreement with Plan Inability to secure timely counseling appointment Inability to get to Appointment Medication SE MH stigma



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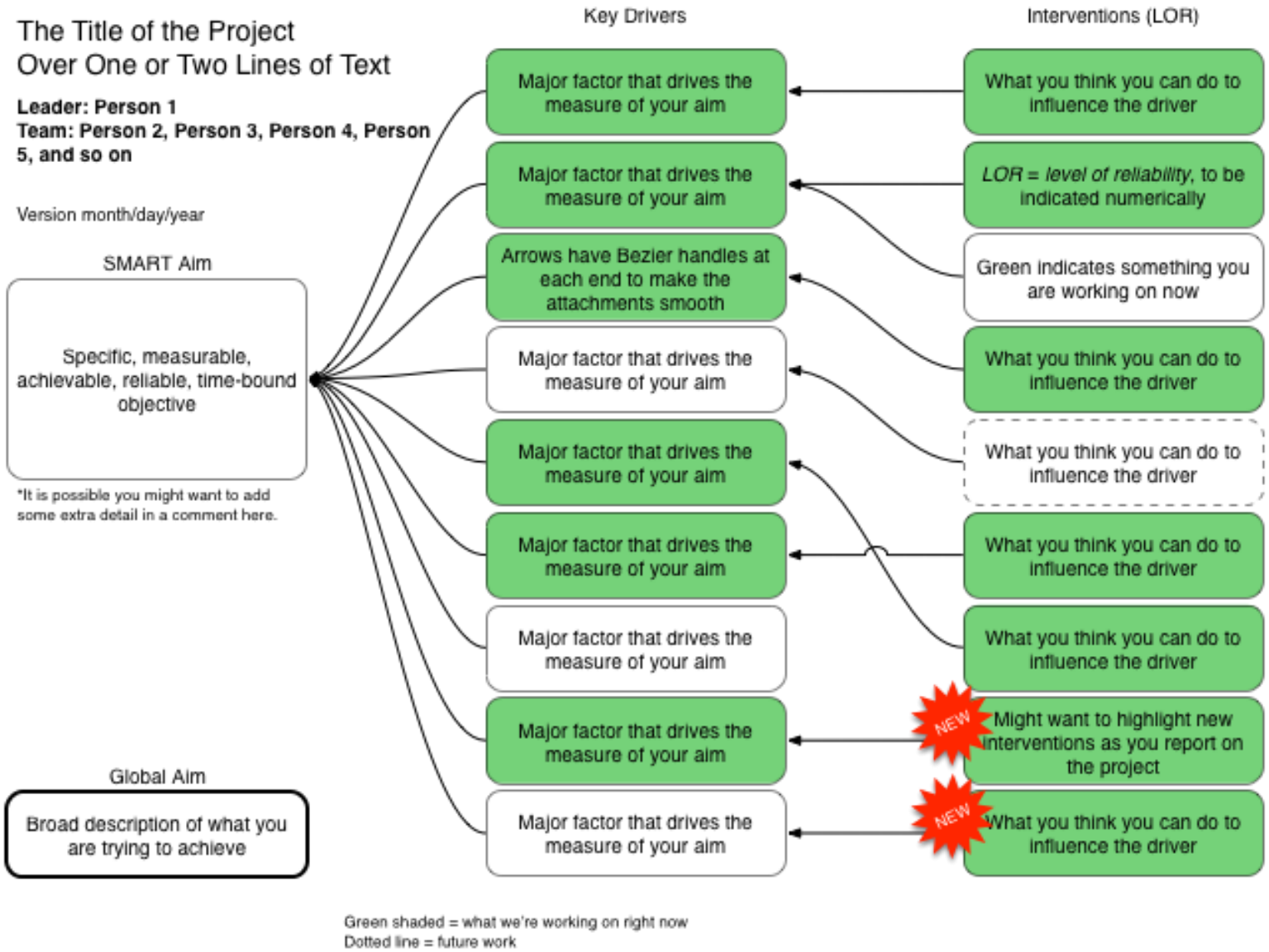


KEY DRIVER Andy Spooner 2103 https://www.graffletopia.com/stencils/1109

<Adolescent Depression Screening in Primary Care>

Key Driver Diagram (KDD)

Project Leader(s): Cason Benton

Revision Date: ***6/1/2017***

SMART Aim

We will increase the percentage of clinic patients 12-18 years of age appropriately screened for adolescent depression* at well child visits from 0% to 90% by June 30, 2017.

*Appropriately screened depression:
1. Screen tool completed , scored, interpretation documented
2. If positive, follow up plan documented

Global Aim

Achieve depression remission.

Key Drivers

- Establish Confidential Screening
- Standardize process for screen, management and follow-up
- Staff and MD engaged in depression screen and follow up
- Provider Accountability for Screening
- Patients/Families engaged in screen and follow up
- Reduce mental illness stigma for patients/families/staff/providers
- Adequate Clinic and Referral Resources

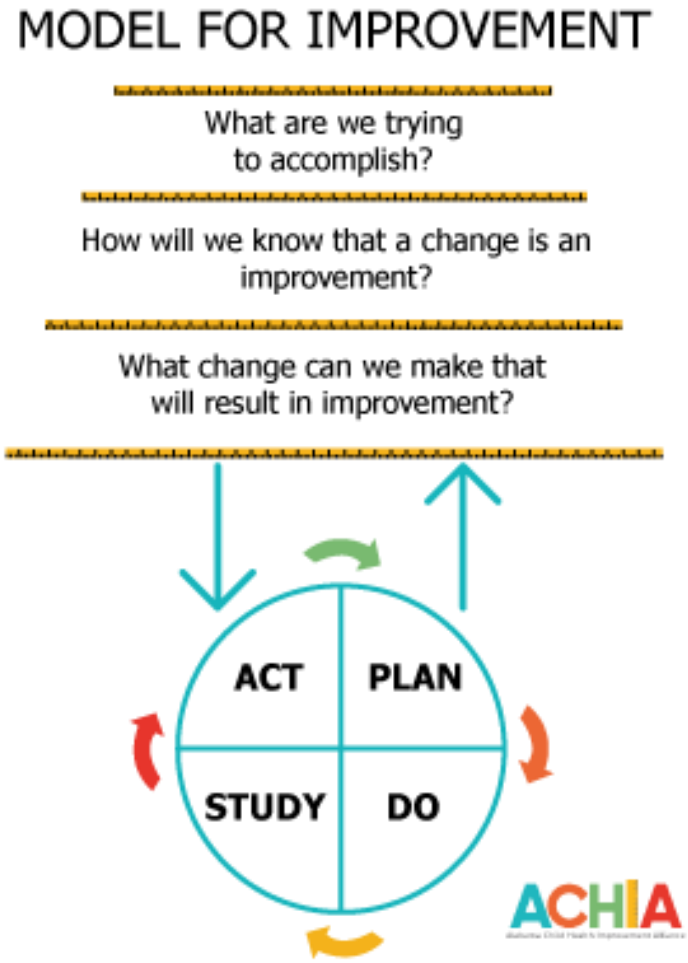
Interventions (LOR #)

- Select standardized depression screen (LOR 1)
- Revise workflow to complete screen confidentially (LOR 1)
- Establish evidence informed depression management pathway (LOR1)
- Educate attendings, staff, residents on pathway and evidence behind pathway (LOR 1)
- Provider Performance Feedback (LOR 1)
- Strengthen counseling and psychiatric referrals(LOR 1)
- Secure Patient Resources – handouts, shared plans and referral partners (LOR 1)

Key
Gray shaded box = completed intervention
Green shaded box = what we're working on right now
LOR # = Level of Reliability Number, e.g., LOR 1

What change can we make that results in improvement?

- Don’t reinvent wheel
- PDSA and PDSA Ramps
- Integrate experience/creativity
  - Patients
  - 4 corners
- Understand system
  - sFMEA and Post It Flow diagrams
  - Driver diagrams
- Use change concepts



Change concepts

- Eliminate waste
- Improve flow
- Optimize inventory
- Change work environment
- Customer interface
- Focus on time
- Focus on variation
- Mistake proofing
- Focus on product/service
- Source: improvement guide

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Change Concepts

MANAGE VARIATION	Standardization (formal process)
ELIMINATE WASTE	Remove steps needed to complete task
IMPROVE WORKFLOW	Reduce duplication
ENHANCE CUSTOMER RELATIONSHIP	Reduce Wait Time

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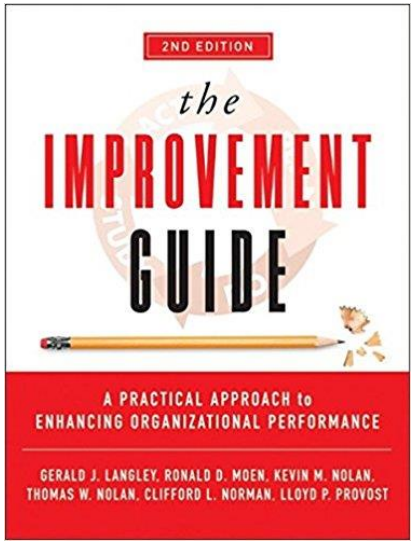

Appendix A Change Concepts[9]

Eliminate Waste

- Eliminate things that are not used
- Eliminate duplicate entries
- Reduce or eliminate overkill
- Reduce controls on the system
- Recycle or reuse
- Use substitution
- Reduce classifications
- Remove intermediaries
- Match the amount to the need
- Use sampling
- Change targets or set points

Improve Work Flow

- Synchronize
- Schedule into multiple processes
- Minimize handoffs
- Move steps in the process close together
- Find and remove bottlenecks
- Use automation
- Smooth workflow
- Do tasks in parallel
- Consider people as in the same system
- Use multiple processing units
- Adjust to peak demand

Optimize Inventory

- Match inventory to predicted demand
- Use pull systems
- Reduce choice of features
- Reduce multiple brands of same item

Change the Work Environment

- Give people access to information
- Use proper measurements
- Take care of basics
- Reduce demotivating aspects of pay system
- Conduct training
- Implement cross-training
- Invest more resources in improvement

Focus on core processes and purpose

- Share risks
- Emphasize natural and logical consequences
- Develop alliance/cooperative relationships

Enhance the Producer/Customer Relationship

- Listen to customers
- Coach customers to use product/service
- Focus on the outcome to a customer
- Use a coordinator
- Reach agreement on expectations
- Outsource for "free"
- Optimize level of inspection
- Work with suppliers

Manage Time

- Reduce setup or startup time
- Set up timing to use discounts
- Optimize maintenance
- Extend specialist's time
- Reduce wait time

Manage Variation

- Standardization (create a formal process)
- Stop tampering
- Develop operational definitions
- Improve predictions
- Develop contingency plans
- Sort product into grades
- Desensitize
- Exploit variation
- Design Systems to Avoid Mistakes
- Use reminders
- Use differentiation
- Use constraints
- Use affordances

Focus on the Product or Service

- Mass customize
- Offer product/service anytime
- Offer product/service anyplace
- Emphasize intangibles
- Take advantage of fashion trends
- Reduce the number of components
- Disguise defects of problems
- Differentiate product using quality dimensions

Implement when…….

- Increased belief change results in improvement
- PDSA predictions are accurate
- Data improving
- Tested under variety of conditions
- Costs and side effects (balancing) understood

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SHIFT HAPPENS

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Selected Resources

- **The Improvement Guide**, 2nd Edition, by Gerald J. Langley, Ronald Moen, Kevin M. Nolan, Thomas W. Nolan, Clifford L. Norman, Lloyd P. Provost
- **Understanding Variation: The Key to Managing Chaos** 2 Revised Edition by Donald J. Wheeler

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More QI

- NICHQ QI 101 http://nichq.org/QI_101/story_html5.html?lms=1
- Institute for Healthcare Improvement
  - Online (Department has account)
- UAB Healthcare Quality and Safety
  - Executive Masters and Certificate

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MOC Part 4

- AAP
  - Individual projects
  - Resident ‘bank’ MOC
  - Online Modules (individual or group)
  - Posters/Presentations/Publications
- ACHIA
  - Participate in collaborative
  - Faculty expert