



CSC Quality Management Made Real:

Establishing Interdisciplinary Ownership for Continuous Improvement

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LEADING CAUSE OF DEATH IN THE U.S.

1. Heart disease
2. Cancer
3. Chronic lower respiratory disease
4. **STROKE**
5. Accidents (unintentional injuries)
6. **PREVENTABLE MEDICAL ERRORS**

OBJECTIVES

- Briefly orient to quality improvement (QI) theory and goals
- Describe application of QI tools when preparing for CSC certification
- Discuss importance of team leadership and composition
- Apply CSC projects to QI methodologies

GOALS OF QI

- Use **Data** and **Facts** to Create Solutions
- Create **Standardized** Work
- **Reduce Variation**
- **Reduce Defects** and **Rework**
- **Eliminate Waste** and Non-Value Add Activities
- **Sustain** the Gains
- **Optimize Revenue**
- Focus on **Metrics** and **Positive** Movement
- **Increase** Patient and Employee **Satisfaction**



MEET DR. W. EDWARDS DEMING



"Quality is everyone's responsibility."

SYSTEM OF PROFOUND KNOWLEDGE

1. Appreciation of a System
2. Knowledge of Variation
3. Theory of Knowledge
4. Understanding Psychology



All 4 components are essential

1. APPRECIATION OF A SYSTEM

“A system is a network of interdependent components that work together to accomplish an aim.”

- No Aim, no System
- Interdependent means the component parts of the system must be worked on collectively to make a change in the outcome
- Systems generally have a surface that we interact with and a substructure that we don't easily perceive

2. KNOWLEDGE OF VARIATION

“**Life is variation.** Variation there will always be, between people, in output, in service, in product. What is the variation trying to tell us about the process and the people that work in it?”



3. THEORY OF KNOWLEDGE

“Without theory, there is no knowledge”

Application of the scientific method is key to improving processes.

1. Formulate the hypothesis and a method of testing it (PLAN)
2. Test the hypothesis (DO)
3. Determine if sufficient or in need of revision (STUDY)
4. Adopt or revise and retest (ACT)



4. UNDERSTANDING PSYCHOLOGY

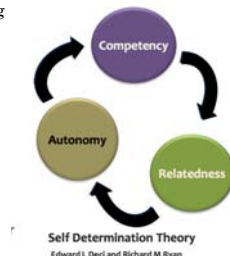
“People are born with a natural inclination to learn. Learning is a source of innovation. Good management helps us to nurture and preserve these positive innate attributes of people.”

PSYCHOLOGY

Basics of Self Determination Theory

I feel best when:

- I am part of a team, part of something bigger than myself - **Relatedness Driven**
- I am doing a really good job, at peak performance - **Competency Driven**
- I am in control of my own destiny, a decision maker - **Autonomy Driven**



AND SO...

“Understanding of profound knowledge will lead to transformation of management. Transformation in any organization will take place under a leader. How may he accomplish transformation? First, he has a theory. Second, he feels compelled to accomplish the transformation. Third, he is a practical man. He has a plan, step by step.”

Let's move on to the plan

CSC PREPARATION



Gap Analysis

IDENTIFYING QI PROJECTS

- Data collection & analysis
- Dashboards:
 - Ischemic and Hemorrhagic Stroke
 - Target Stroke
- Peer review
- Public Reporting

THE CURRENT STROKE IR LANDSCAPE

- Era of CSC
- New Guidelines
- 3 Landmark RCTs



NEW GUIDELINES

Stroke

RECOMMENDATION BY THE AMERICAN HEART ASSOCIATION


Guidelines for the Early Management of Patients With Acute Ischemic Stroke : A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

As with intravenous fibrinolytic therapy, reduced time from symptom onset to reperfusion with intra-arterial therapies is highly correlated with better clinical outcomes, and all efforts must be undertaken to minimize delays to definitive therapy (**Class I; Level of Evidence B₁**). (New recommendation)

NEW IA QI CONSENSUS GUIDELINES



STANDARDS OF PRACTICE

Multisociety Consensus Quality Improvement Guidelines for Intraarterial Catheter-directed Treatment of Acute Ischemic Stroke, from the American Society of Neuroradiology, Canadian Interventional Radiology Association, Cardiovascular and Interventional Radiological Society of Europe, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of NeuroInterventional Surgery, European Society of Minimally Invasive Neurological Therapy, and Society of Vascular and Interventional Neurology

David Sacks, MD, Carl M. Black, MD, Christophe Cognard, MD, John J. Connors III, MD, Donald Frei, MD, Rishi Gupta, MD, Tudor G. Jovin, MD, Bryan Kluck, MD, Philip M. Meyers, MD, Kieran J. Murphy, MD, Stephen Ramzes, MD, Daniel A. Rufenacht, MD, M.J. Bernadette Stallmeyer, MD, PhD, and Dirk Vorwerk, MD

NEW IA QI CONSENSUS GUIDELINES



STANDARDS OF PRACTICE

- Key endovascular time metrics
 - Door to puncture ≤ 2 hours in 75% of pts
 - Groin to first pass ≤ 45 min in 50% of pts
 - TICI 2+ revascularization ≤ 90 min in 50% of pts
 - Final recanalization TICI 2+ in $\geq 60\%$ of patients



TIME IS BRAIN

- Estimated rate of neuronal loss in untreated large vessel stroke¹
 - 1.9 million neurons/minute
- 30 min delay → 10% decrease in functional outcome at 90 days (mRs ≤ 2)²
- TRUE FOR ANY THERAPY**

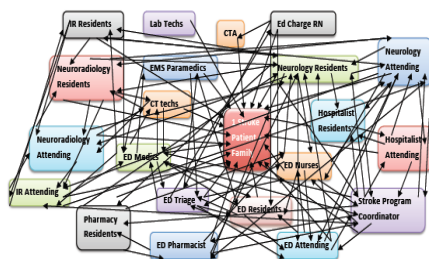
¹Saver, Stroke 2006;37:263-266
²IMS I/IMS II Trial Data

IMS III, SYNTHESIS, & MR RESCUE

CONCLUSIONS

- IV TPA < 4.5 hours is first line therapy
- “Bridging” therapy not recommended
- **Role for Endovascular therapy**
 - IV tPA contraindication
 - IV tPA failure with LVO
 - Esp ICA occlusion
- Use of penumbral imaging for patient selection remains unproven
- Endovascular strategies need further study
 - Pre-randomization confirmation of LVO
 - Enrollment must be faster than historical trials to keep conclusions relevant
- **Time to initiate endovascular therapy is critical for outcome**

WHO IS COORDINATING THE CHAOS??



- There are many lines of communication and coordination that must be connected before a decision can be made regarding treatment (IV and/or IA).
- Facilitating direct and efficient communication is key for improving process and speed.

DIFFERENCE BETWEEN RESEARCH AND QI

Research

- Slow
- Blind
- Extensive data collection
- Seeks to create new knowledge

Quality Improvement

- Fast
- Continuous feedback
- Targets information to answer utilitarian questions
- Seeks to change outcomes in a specific institution

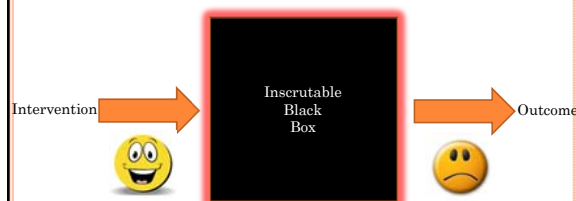
INTRODUCTION TO PROCESS IMPROVEMENT

LEAN METHODOLOGY

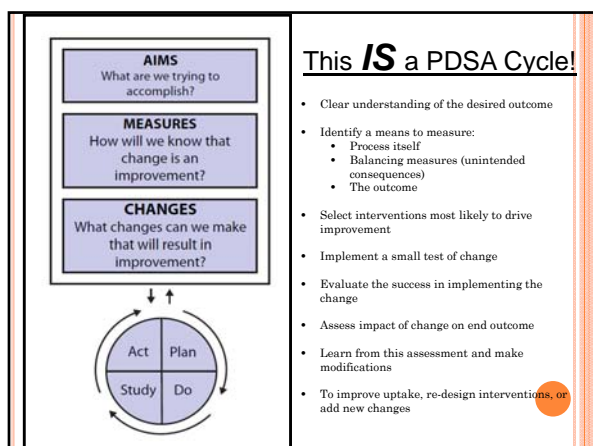
- Derived from the “Toyota Production Method”
- Uses front line providers to generate ideas for change
- Focus on eliminating steps which do not “add value” to the end beneficiary of the process
- Seeks to achieve a natural and consistent flow to the pattern of events where needs match resources

➤ Goal is to do less in order to achieve **MORE**

This is **NOT** a PDSA Cycle!

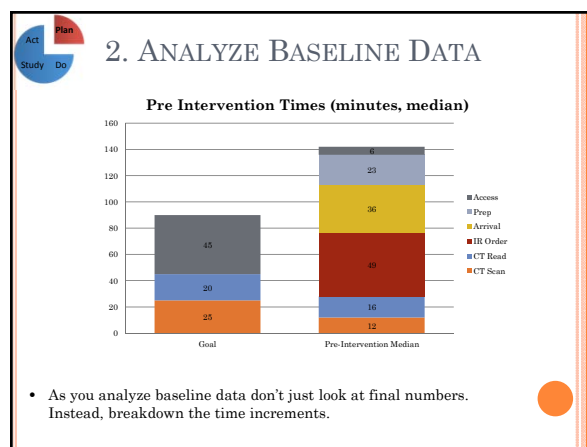
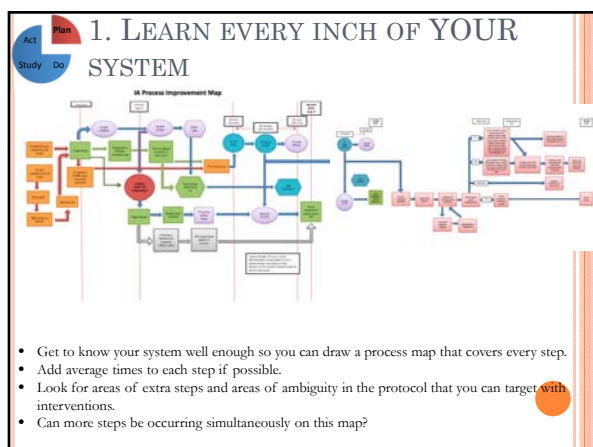


- You must have “Profound knowledge” of the process you are changing
- You have to understand how effectively your intervention was adopted
- These steps are necessary to learn from either success or failure
- They inform your next cycle



WHERE IS THE PROBLEM?

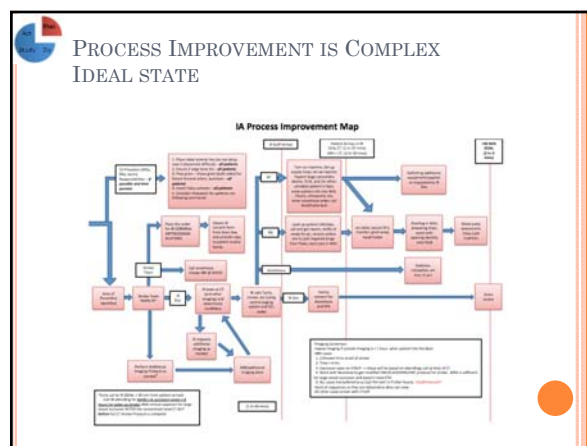
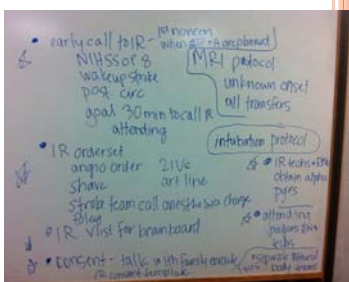
1. Learn the complexity of the process and team.
 - Direct observation of stroke alerts
 - Interview frontline providers
 - Map every step of the process
2. Look for variation. What happens the same every time vs what steps are different?
3. Focus on discrepancies of how providers think the process should go – expected vs observed.
4. Identify steps that occur in series instead of parallel.
5. Finally, hone in on *unreliable steps* and *reliably slow steps*.



3. BRAINSTORMING SESSION

IR QI team

- Neuro IR MD
- IR RN
- IR tech
- IR Educator
- Neurohospitalist
- Stroke Fellow
- Stroke NP/coordinator
- Stroke Data Analyst
- Medical Student



PROPOSED INTERVENTIONS

- After brainstorming a long list of interventions, you may quickly realize the you have 2 lists.
- The 2 lists give you a hunch that you will likely have more than 1 PDSA cycle!

Hard to implement.
Met resistance.

Easy to implement.
Met little resistance.

STAKE-HOLDER BUY-IN

- Who are your stakeholders when you want to achieve change in stroke response systems?
- What is your mechanism to reach them?
- Do they believe change is needed?
- Are they threatened by change?

POSITIVE DEVIANCE METHODOLOGY

- Has been applied to issues as diverse as reducing time to cath for ST-elevation myocardial infarction to reducing childhood malnutrition in rural Asia
- Examines individuals or groups who share a common challenge
- Identifies those outliers who are remarkable for their success
- Attempts to understand what makes them “positive deviants”



4. COMPLIANCE WITH BEST PRACTICES

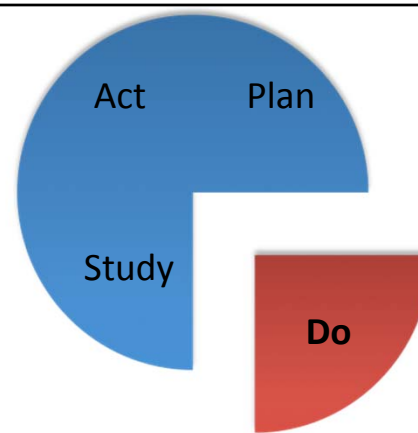
IA tPA Questionnaire:

1. Who is a candidate?
2. What are the things that you do to help meet your time goal?
3. Details about the procedure
4. Do you receive transfer pts?
5. What else makes IA successful at your institution?
6. Are you planning on becoming a CSC?
7. Do you currently report complication/mortality rates?
8. Do you have a checklist of pre-IR steps?
9. Any other feedback or advice?



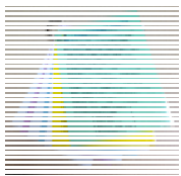
5. DEFINE WHAT'S MISSING TO DRIVE INTERVENTIONS

- **Uniformity** in our protocol
- **Consistency** in our treatment times
 - Conserve resources
- **Urgency: Time is Brain!**
 - Stroke = Trauma
- Healthy **Competition**
- **Communication** between departments
- **Real time** data collection and reporting



ROUND 1 OF INTERVENTIONS

- Determined an early call to Neuro IR
Attending even if ALL our pt data is not back yet
 - NIHSS >8 and suspect large vessel occlusion
- Stroke Team to call board runner and anesthesia. Also start prepping the pt for consent
 - Board runner holds/clears room
- ED MD to place arterial line and consider intubation
 - If time allows
- ED RNs and techs to ensure 2 IVs, prep groin, and place foley catheter
 - If time allows



IA IPA Checklist:

Stroke Team Responsibilities:

- 1. Call for Neuro IR attending physician (stroke) and stroke team (stroke) for large vessel occlusion
- 2. Call for Neuro IR attending physician (stroke) and stroke team (stroke) for large vessel occlusion
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- 9. Call for Neuro IR attending physician (stroke) and stroke team (stroke) for large vessel occlusion
- 10. Call for Neuro IR attending physician (stroke) and stroke team (stroke) for large vessel occlusion


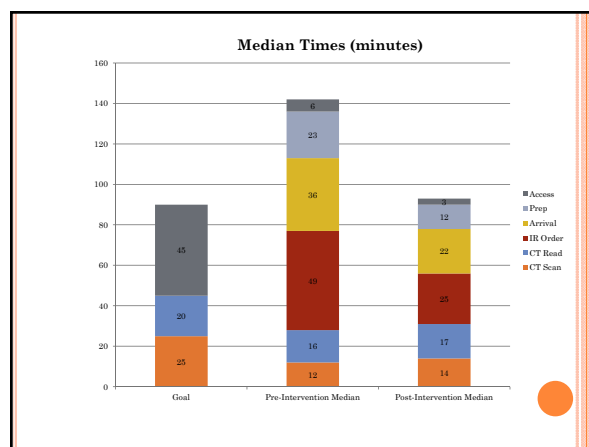
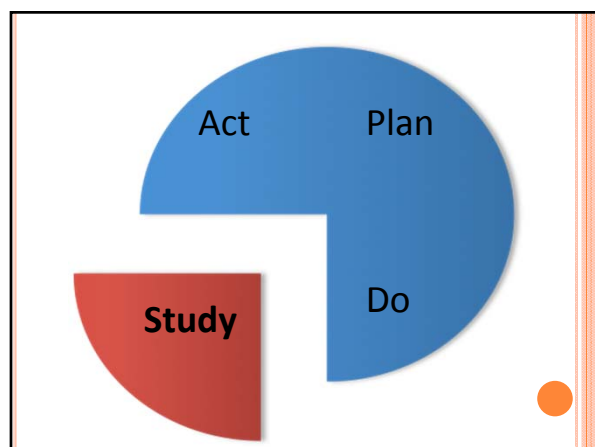
ED Providers (MDs, RNs, techs) Responsibilities: (assess and time pressure)

- 1. Assess patient for stroke
- 2. Assess patient for stroke
- 3. Assess patient for stroke
- 4. Assess patient for stroke
- 5. Assess patient for stroke
- 6. Assess patient for stroke
- 7. Assess patient for stroke
- 8. Assess patient for stroke
- 9. Assess patient for stroke
- 10. Assess patient for stroke

GOAL – PATIENT ARRIVAL TO FEMORAL ARTERY PUNCTURE in ≤ 90 MIN

ROUND 2 & 3 OF INTERVENTIONS

- IR group page created
 - Streamline activation for Stroke IR cases
- Streamline IR stroke tray set-up
- Team debriefs – what went right and areas for improvement
- Streamlining imaging protocol
 - MRI vs CT
- Creation of IR log and immediate debriefs with IR staff involved
- Revise IR stroke tray set-up and standardized drip lines

IMPACT

- 2012: 31% tx in <90
- 2013: 62% tx in <90 min
- 2012: 131 minutes (median)
- 2013: 91 minutes (median)

