Quality Tools in Radiology

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Potter Stewart
U.S. Supreme Court Justice

Jacobellis v. Ohio

- 1964
- Ban the showing of the French film called *The Lovers (Les Amants).*
- U.S. Supreme court overturned and ruled not obscene
- “I know it when I see it”

Quality

- “Know it when I see it”
- Quality v. Value
  - It’s all about the $$
  - If cost is considered, they are very similar
  - Value-based purchasing
- Whose definition?

Quality

- Mayo Clinic
  - Clinical quality- outcomes (appropriateness)
  - Service quality- patient experience and satisfaction
  - Economic quality- cost (including waste)


Quality = A * (Outcomes + Service)
Waste

Metrics, Measures, and Indicators

- Commonly described as *process metrics*, *clinical quality metrics*, *quality indicators*.
- Intermediate measures
- Tools to help obtain higher quality (in theory)
  - Do Quality Measures have Quality Measures ?
- Requirements from external regulators (e.g. Joint Commission, CMS, ABR)

Clinical Quality Measures

- Attest for meaningful use
  - Record BP in patients over 18
  - Calculated BMI
  - Tobacco screening and ‘intervention’
- How do these measures solve a problem?
- This is not quality health care.

PQRS Measure for IR

- Record Fluoroscopy time
  - Time dose not equal radiation dose.
  - Dose correlates with exposures (DSA acquisitions)
  - Inaccurate representation of the problem
  - Low fluoroscopy time dose not mean low risk and in NO WAY reflects high quality.

What quality is not.


BUD
MAC TOOLS
FEATHERLITE
LUCAS
BUD
Bud King
LUCAS
OIL PRODUCTS
MAC
TOOLS
98
BUDWEISER
MAC TOOLS
LUCAS OIL
BUD

Think different.

Quality in imaging is about building systems that provide better care, and not about fulfilling metrics.

Quality Tools and Methods

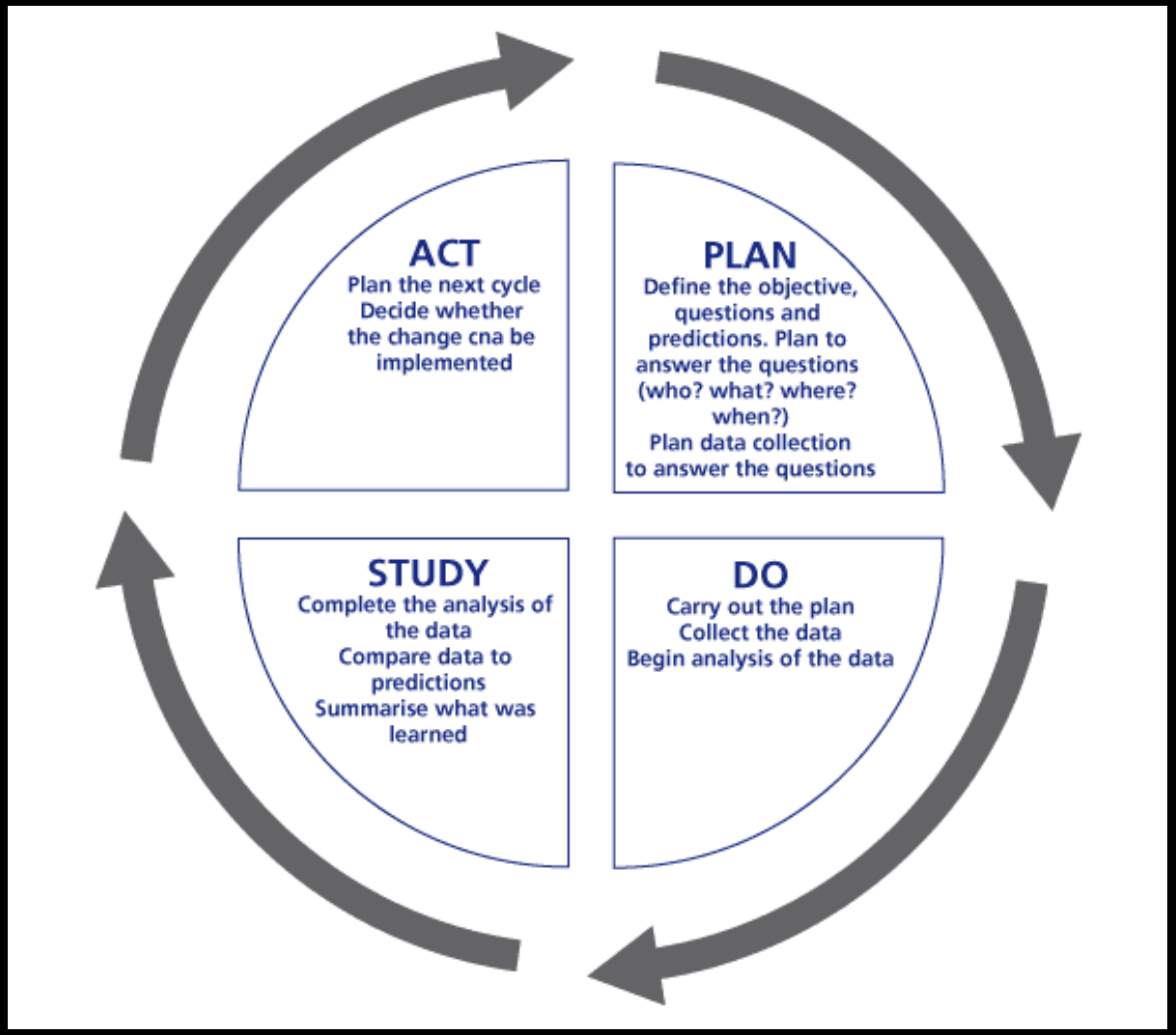
- PDSA
- Lean
- Six Sigma
- RCA

PDA

PDSA

- Plan-Do-Study-Act
  - Same as PDCA
- Made popular by W. Edwards Deming (who called it the “Shewhart cycle”)
- Based on scientific method and the fundamental principle of iteration.
- JUST DO IT
  - Avoid analysis paralysis
- As simple as it sounds. Great for less complex problems.

PDSA


ACT
Plan the next cycle
Decide whether the change cna be implemented
PLAN
Define the objective, questions and predictions. Plan to answer the questions (who? what? where? when?)
Plan data collection to answer the questions
STUDY
Complete the analysis of the data
Compare data to predictions
Summarise what was learned
DO
Carry out the plan
Collect the data
Begin analysis of the data

PDSA Worksheet for Testing Change

Institute for Healthcare Improvement

Aim: (overall goal you wish to achieve)

Every goal will require multiple smaller tests of change

Describe your first (or next) test of change:	Person responsible	When to be done	Where to be done

Plan

List the tasks needed to set up this test of change	Person responsible	When to be done	Where to be done

Predict what will happen when the test is carried out	Measures to determine if prediction succeeds

Do

Describe what actually happened when you ran the test

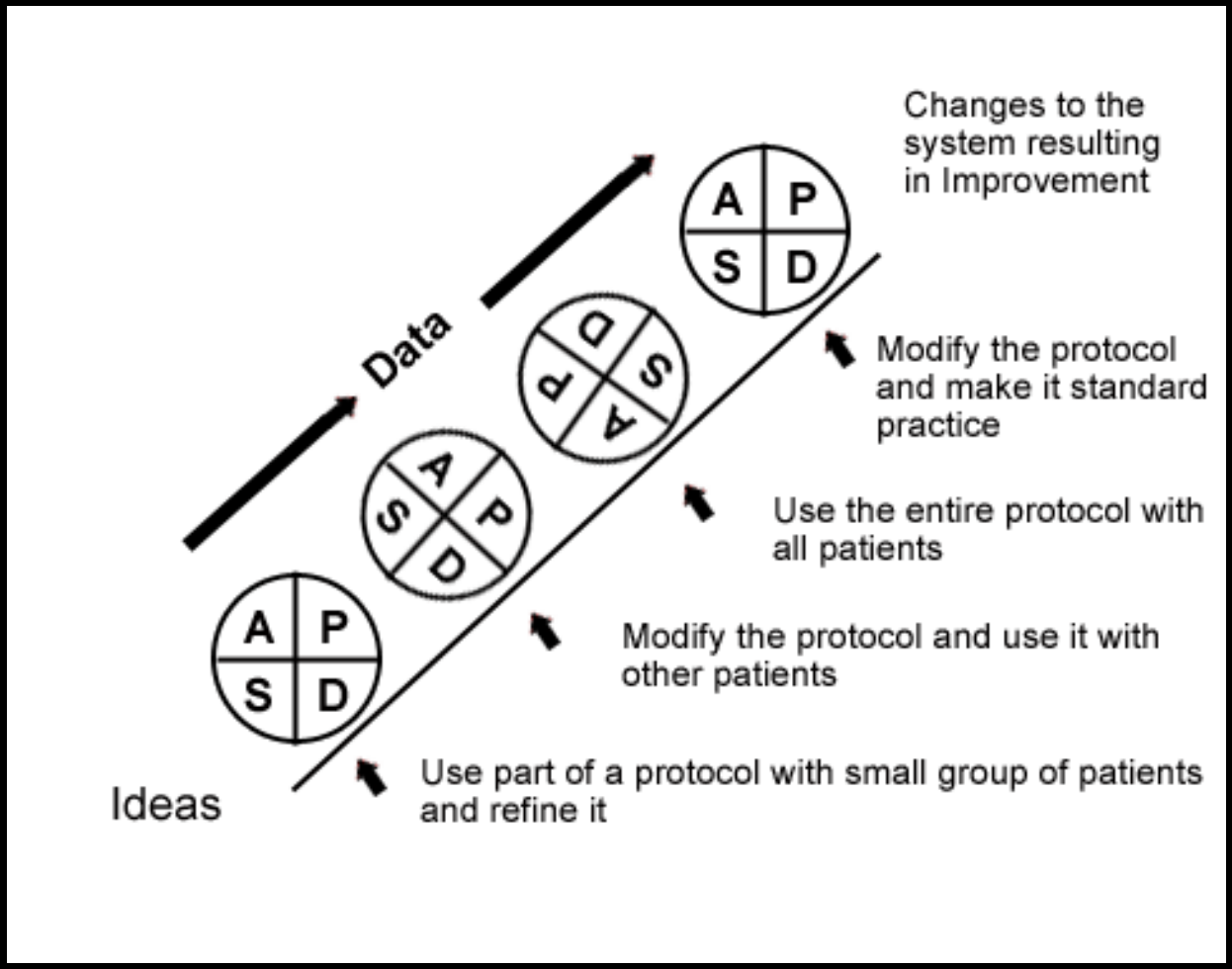
Study

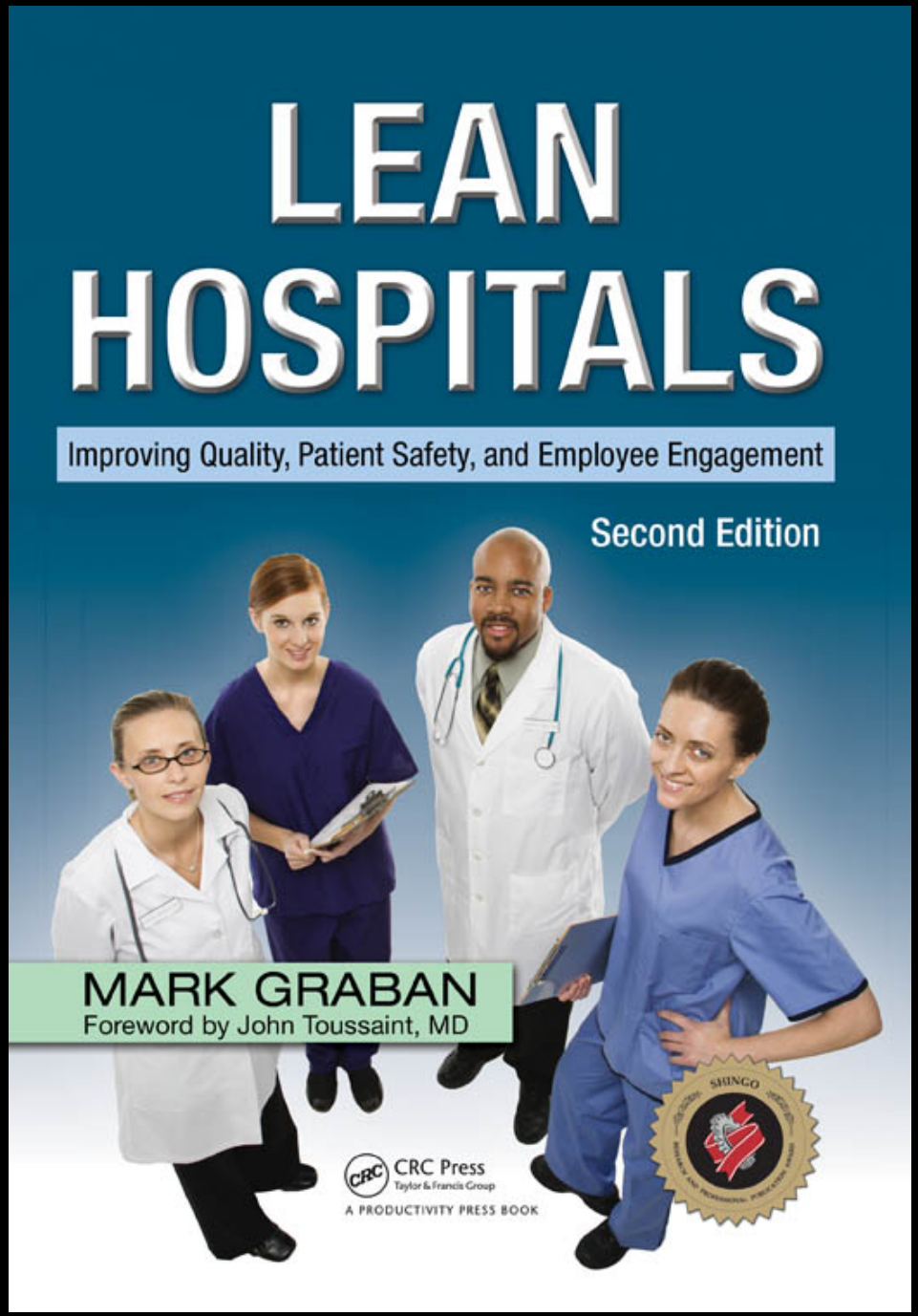
Describe the measured results and how they compared to the predictions

Act

Describe what modifications to the plan will be made for the next cycle from what you learned

PDSA: Ongoing Cycle



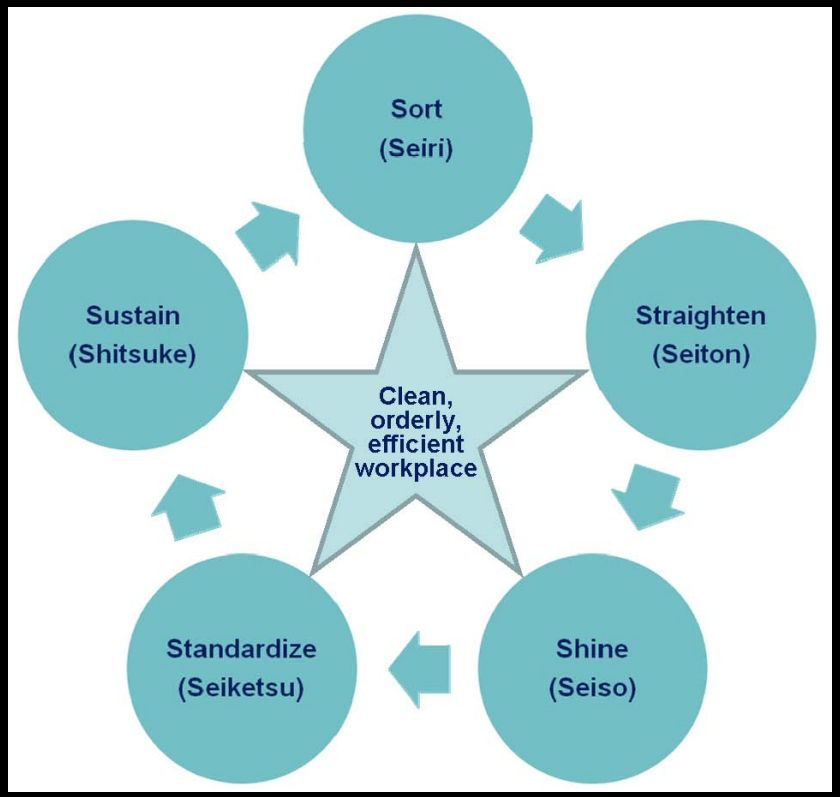

LEAN
HOSPITALS
Improving Quality, Patient Safety, and Employee Engagement
Second Edition
MARK GRABAN
Foreword by John Toussaint, MD
SHINGO
CRC Press
Taylor & Francis Group
A PRODUCTIVITY PRESS BOOK

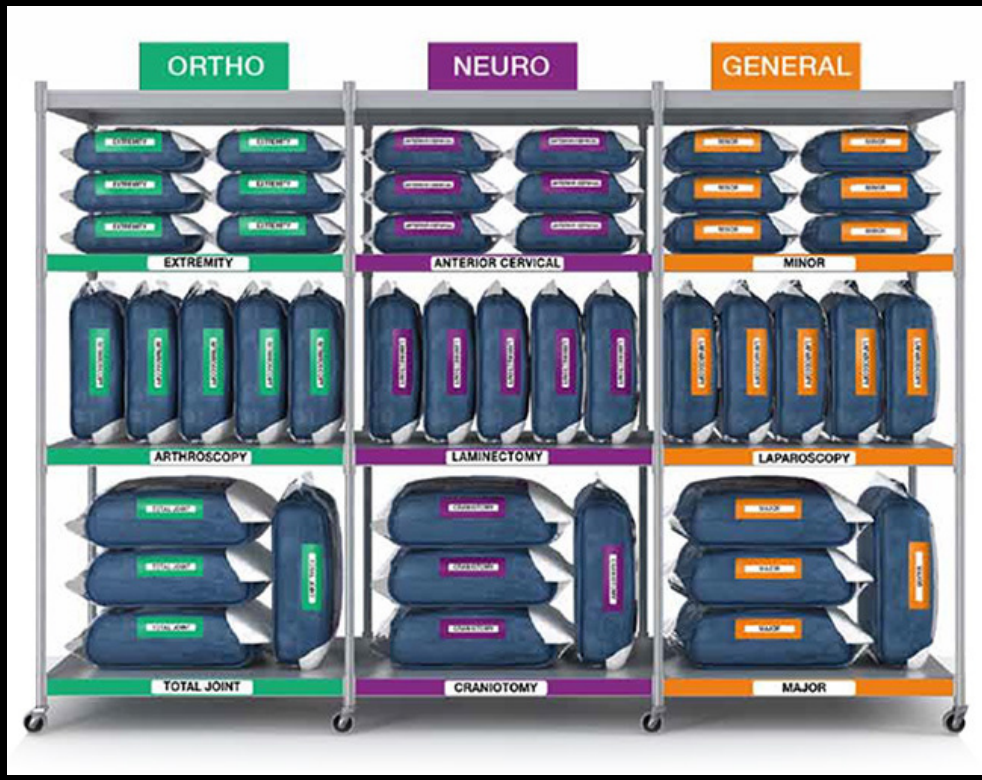
NOT LEAN

Lean Concepts

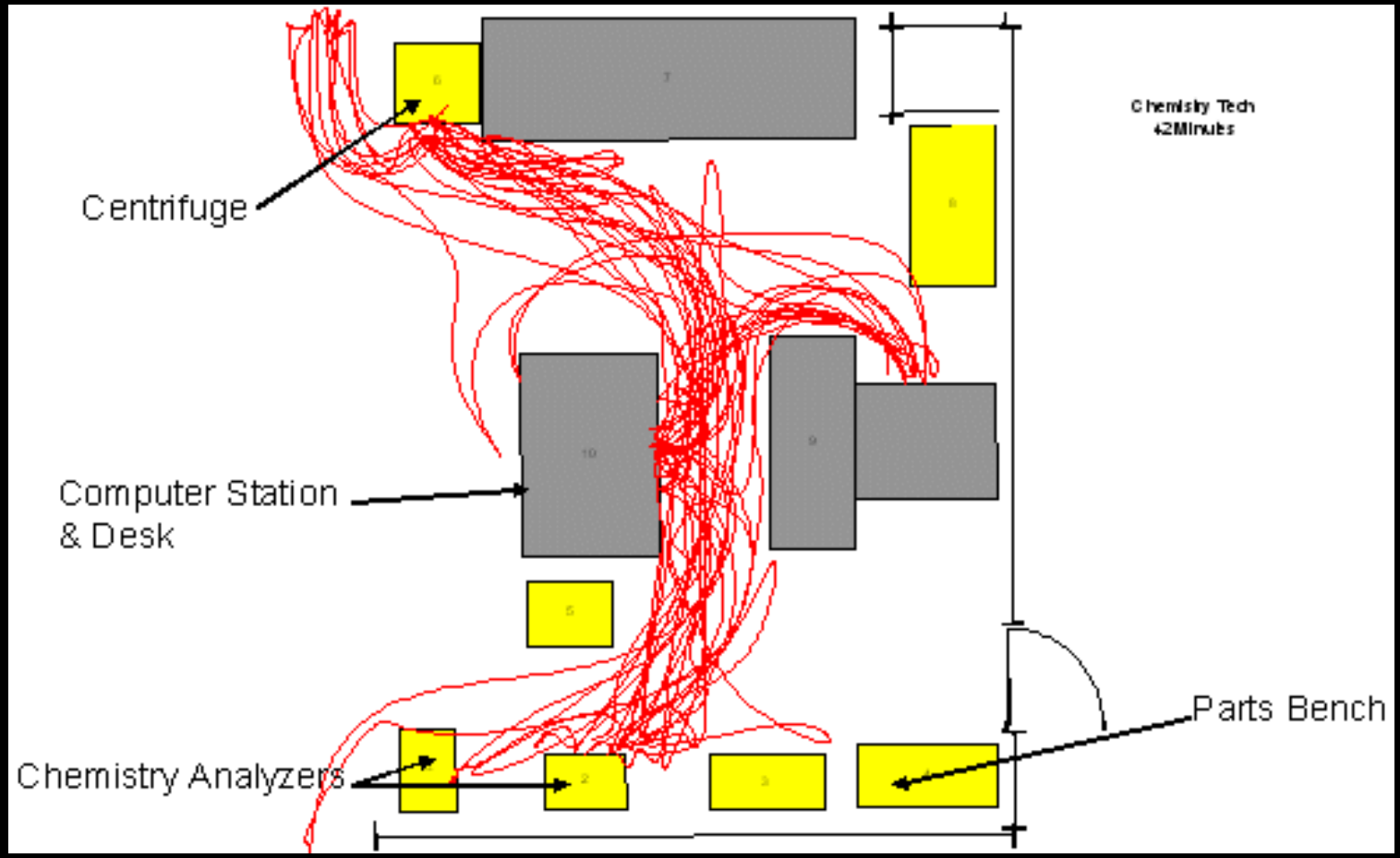
- Doing more with less- less effort, less waste, less time, less space while continuously improving the product to the customer.
- Decrease waste (muda)
- Focus on flow (standard work and pull)
- Continuous improvement through rapid experimentation (kaizen)

Lean 5s

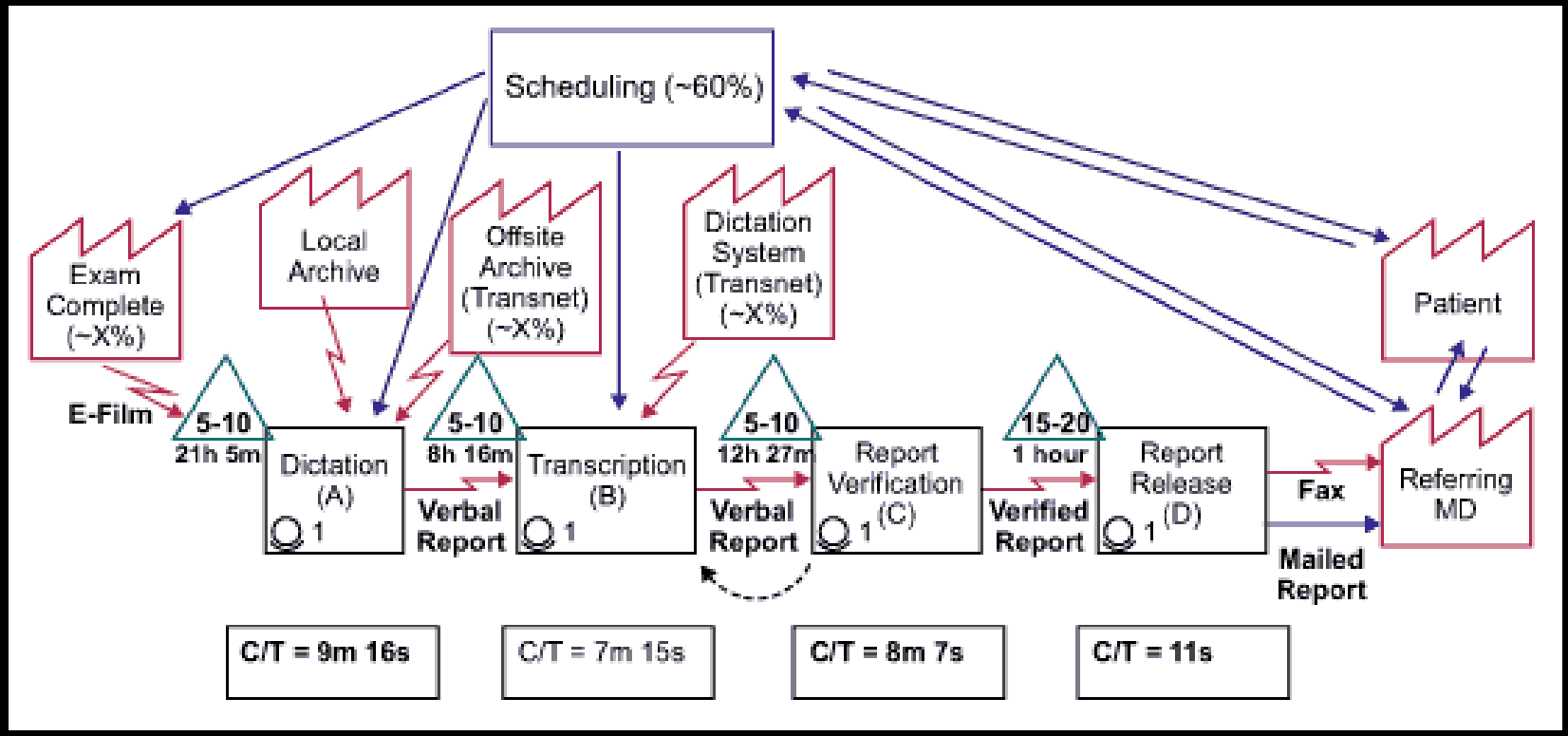

Sort
(Seiri)
Straighten
(Seiton)
Shine
(Seiso)
Standardize
(Seiketsu)
Sustain
(Shitsuke)
Clean,
orderly,
efficient
workplace


ORTHO
NEURO
GENERAL
EXTREMITY
ANTERIOR CERVICAL
MINOR
ARTHROSCOPY
LAMINECTOMY
LAPAROSCOPY
TOTAL JOINT
CRANIOTOMY
MAJOR

Lean Spaghetti Diagram

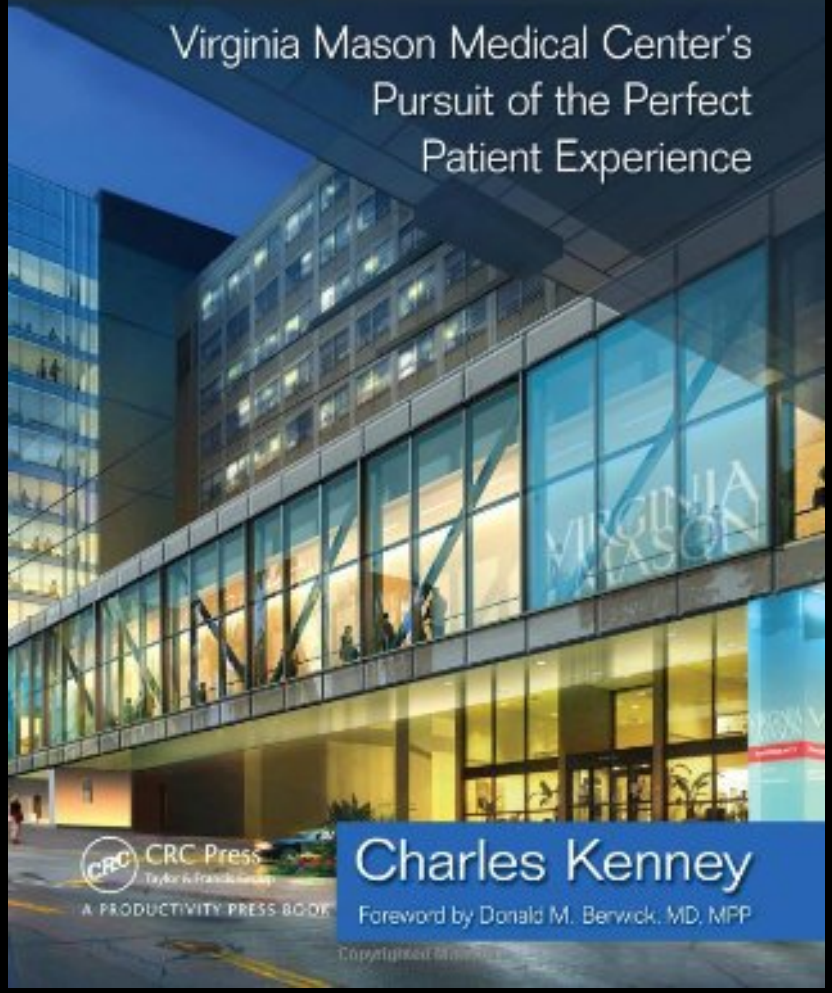


Value Stream Map



Transforming Health Care

Virginia Mason Medical Center's Pursuit of the Perfect Patient Experience

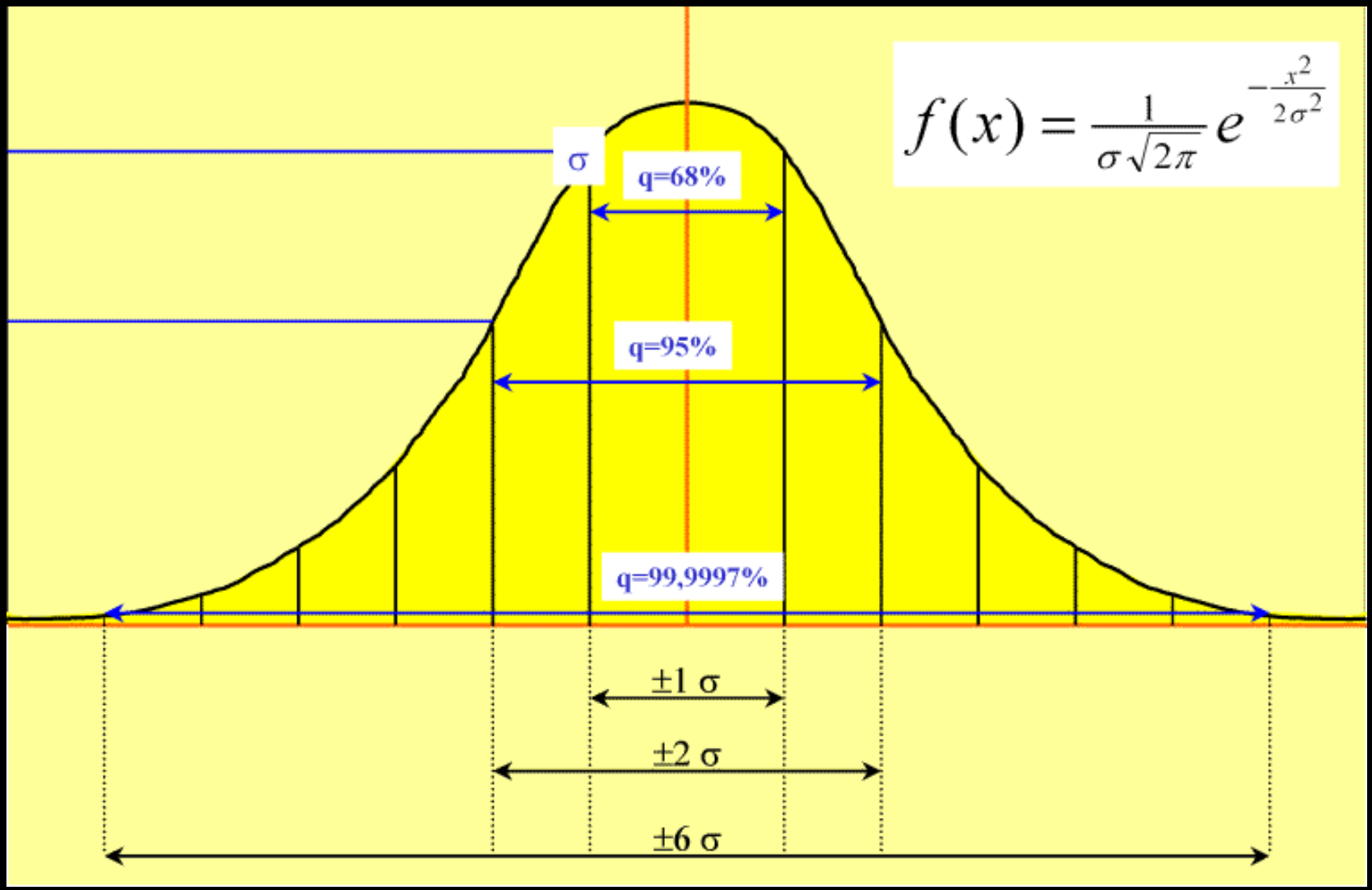


CRC Press
Taylor & Francis Group
A PRODUCTIVITY PRESS BOOK

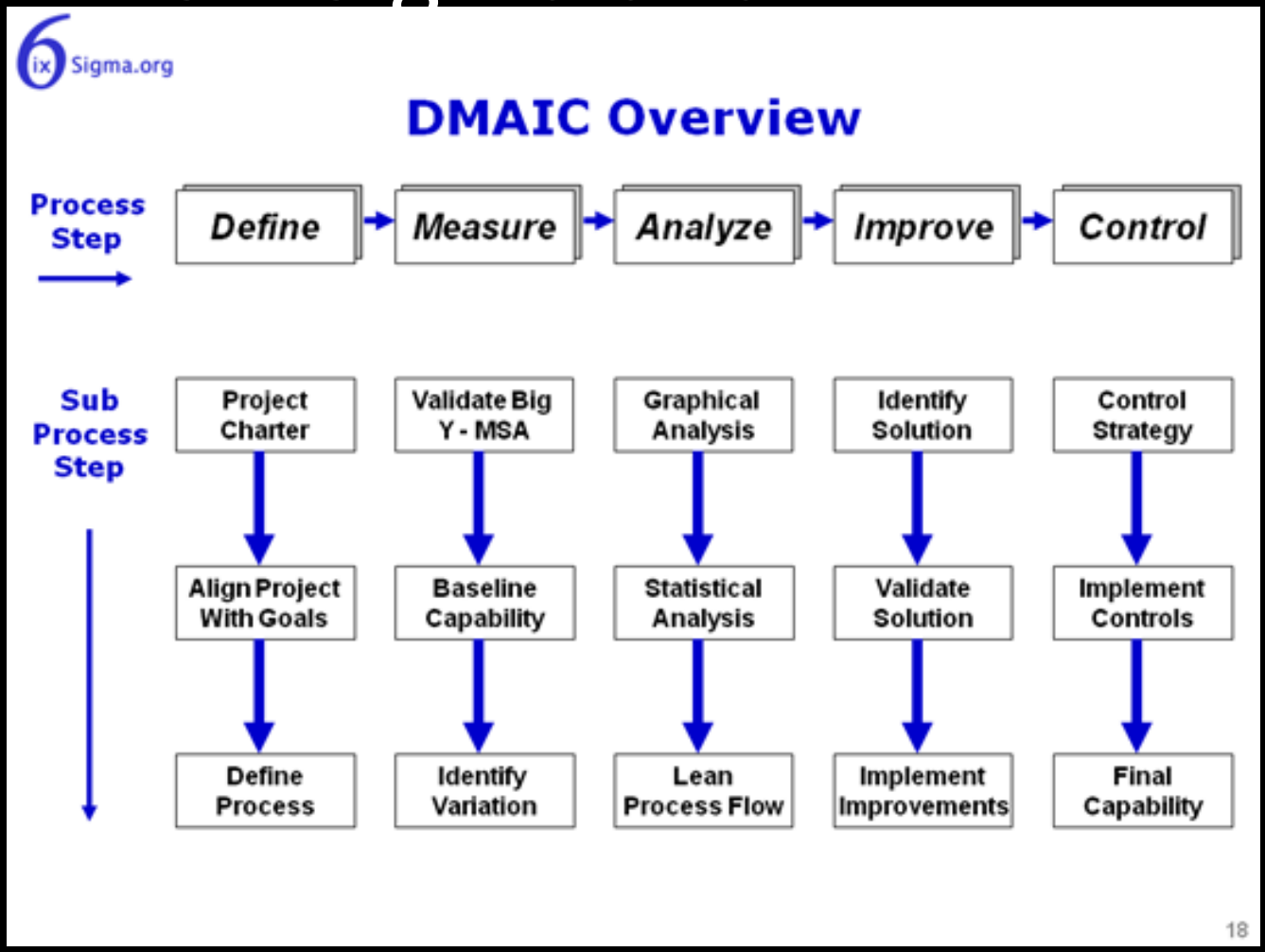
Charles Kenney
Foreword by Donald M. Berwick, MD, MPP

Six Sigma

- Set of PI tools and strategies developed by Motorola in 1986.
- Central focus of GE in 1995
- Minimizing defects to one in 6 SD
- Methodology : DMAIC
- Great for complex or large problems
- Time consuming
- Requires Karate lessons


$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{x^2}{2\sigma^2}}$
σ
q=68%
q=95%
q=99,9997%
±1 σ
±2 σ
±6 σ

Six Sigma and DMAIC



Radiol Manage. 2002 Sep-Oct;24(5):26-35; quiz 36-8.

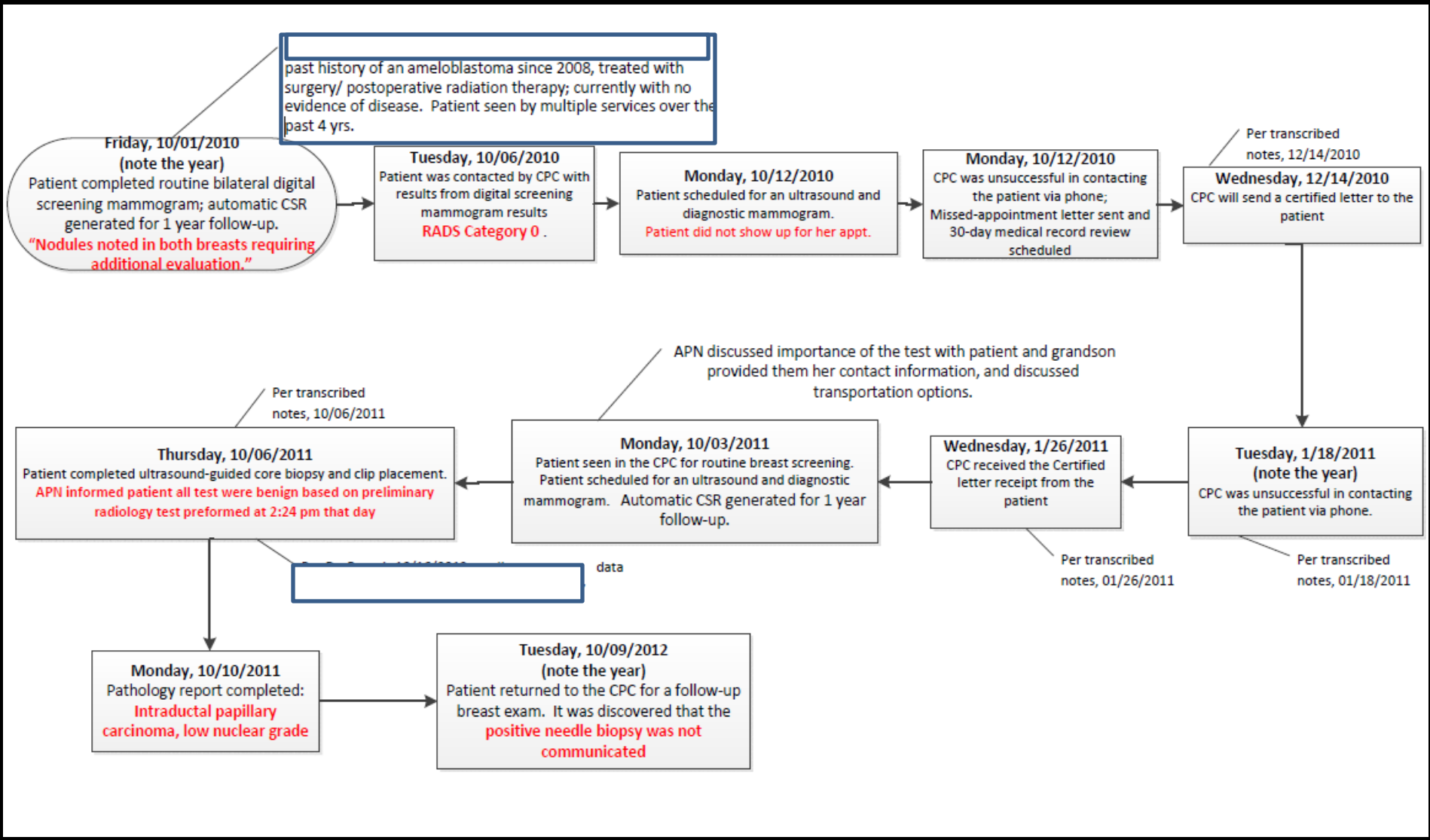
Using Six Sigma to improve the film library.

Benedetto AR[1], Dunnington JS, Oxford-Zelenske D.

- Nine mini project teams plus a steering committee
- ‘data collection methods were burdensome’
- ‘we had to invest many hours to insure data integrity’
- Significant education effort is required for all involved with the project

RCA

- Root Cause Analysis
- Solve problem by identifying and correcting the cause of problems, not symptoms
- A structure to evaluate complications or adverse events


past history of an ameloblastoma since 2008, treated with surgery/ postoperative radiation therapy; currently with no evidence of disease. Patient seen by multiple services over the past 4 yrs.
Friday, 10/01/2010 (note the year)
Patient completed routine bilateral digital screening mammogram; automatic CSR generated for 1 year follow-up.
"Nodules noted in both breasts requiring additional evaluation."
Tuesday, 10/06/2010
Patient was contacted by CPC with results from digital screening mammogram results
RADS Category 0 .
Monday, 10/12/2010
Patient scheduled for an ultrasound and diagnostic mammogram.
Patient did not show up for her appt.
Monday, 10/12/2010
CPC was unsuccessful in contacting the patient via phone;
Missed-appointment letter sent and 30-day medical record review scheduled
Per transcribed notes, 12/14/2010
Wednesday, 12/14/2010
CPC will send a certified letter to the patient
Tuesday, 1/18/2011 (note the year)
CPC was unsuccessful in contacting the patient via phone.
Per transcribed notes, 01/18/2011
Wednesday, 1/26/2011
CPC received the Certified letter receipt from the patient
Per transcribed notes, 01/26/2011
Monday, 10/03/2011
Patient seen in the CPC for routine breast screening.
Patient scheduled for an ultrasound and diagnostic mammogram. Automatic CSR generated for 1 year follow-up.
APN discussed importance of the test with patient and grandson provided them her contact information, and discussed transportation options.
Thursday, 10/06/2011
Patient completed ultrasound-guided core biopsy and clip placement.
APN informed patient all test were benign based on preliminary radiology test preformed at 2:24 pm that day
Per transcribed notes, 10/06/2011
data
Monday, 10/10/2011
Pathology report completed:
Intraductal papillary carcinoma, low nuclear grade
Tuesday, 10/09/2012 (note the year)
Patient returned to the CPC for a follow-up breast exam. It was discovered that the positive needle biopsy was not communicated

The University of Texas

MD Anderson Cancer Center*

RCA

Location of incident: Prevention Center **Tracking number:** 479 **Event type:** Notification of results

Patient information: [redacted]

Participants [redacted]

Doctors involved: [redacted]

PSA Staff participating: [redacted]

Event Date: 10/9 /2012 **RCA date:** 11/5 /2012

Event Description: Patient did not receive notification of postive needle biopsy results for over a year

Event details Refer to timeline at the end of this report.

Issues:

☑ People

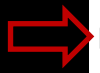
-Provider was not alerted and did not view the positive pathology results posted in Clinic Station on 10/10/2011.

☐ Place

☑ Policy and/or Procedure

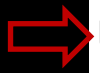
-An abbreviation for the word biopsy, "w/bx", was misinterepreted by database staff for the word benign, written as,"B9". Therefore, patient test results were documented incorrectly as being benign in the Cancer Prevention database. This database generates a pending test list for the practitioners and the error caused the test to drop off the pending list which the practitioners use as a trigger for checking results.
-Daily audit process for the Cancer Prevention database was not performed

-Three-day followup imaging addendum which serves as documentation for the communication between the radiologist and the clinician for positve biopsy results were not posted by the Breast Imaging Radiologist per policy.
-Clinical Service Requestition for the patient's result follow-up appointment were generated; however, final results were not available. Only annual one year breast screening requestions were auto-generated and were independent of the diagnostic evaluation done on the patient during that timeframe.



☑ Equipment/provisions

-Patient information documented in the Cancer Prevention database can not be seen in Clinic Station or any other institution-wide application.

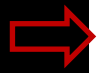


☑ Patron (patient/family)

-Patient and family member(s) have limited understanding of patient's disease condition despite many attempts to inform and educate the patient and family.
-Patient was actively being seen in another clinic

☑ Communication

-Patient did not comprehend the level of importance in her follow-up care or the complexity of test result information received from her providers. Multiple attempts were made to contact the patient with her initial breast screening results from 10/01/2010.
-Patient was informed that her test results were benign based on preliminary imaging results performed on a Thursday afternoon (2:46pm); final positive pathology results were posted on Monday morning.
-Pending test results needing to be communicated to the patient, fell off the pending worklist after 10/06/2011 due to a transcription error.



☑ Organizational influence

-Patient information needed for the result follow-up appointment (pending path results w/bx) was documented outside the medical record in the Cancer Prevention database. Electronic applications/systems that do not interface across the institution continue to be a contributing factor

in patient events.		
Actions:	***Responsible Party or Parties***	***Action Item Due Da and Status***
1. Cancer Prevention has implemented the following documentation guidelines for the CPC database: 1. No abbreviation for the word benign will be used in the Pending Test Results 2. Audit process will be performed daily by another staff who did not enter the information. 4. Decrease the number of test results noted on the Pending Test Results Form will be limited.		1/1/2013 Complete
2. Communication between Radiologist and Clinician on anything other than benign results will be documented as an addendum in the radiology report		1/1/2013 In Progress
3. Audit process will be implemented for positive radiology results, specifically for ultrasound results for breast imaging.		1/1/2013 In Progress
4. Education regarding the test result follow-up and double-checking process of patient test results will be provided for all Cancer Prevention Center staff, including licensed and non-licensed providers.		1/1/2013 Complete
5. Patient reminder will be created and used as a reminder for patients to follow-up on their results and myMD Anderson		1/1/2013 In Progress
6. Additional database staff hired to maintain and audit CPC database		1/1/2013 Complete

Now what?

- Use QI tools to provide better quality (clinical and service)
- Move toward measuring outcomes.
  - Yes, it will be difficult.
- Measure the impact of imaging.
  - Does imaging the patient change care?
    - How? What are the clinical and financial impacts?
- Comparative effectiveness research
  - Which modality is better for what clinical indication?
  - Compare costs!

PDSA, DMAIC, RCA…not just for breakfast anymore!