

A Systems Approach to Quality Improvement: Lean Six Sigma and Beyond

Carolyn Pexton, GE Healthcare
Susan McGann, RN, Virtua
Health
August 22, 2006



Agenda

- Introductions/Expectations
- Some elements of a systems approach
 - Change Acceleration Process
 - Work-Out
 - Lean
 - Six Sigma
 - Management and leadership systems
- Summary & Questions

Time cover story - May 1,
2006
Q: What Scares Doctors?

A: Being the Patient



“To a large extent, health care systems were not designed with any scientific approaches in mind. Too often there are long waits, high levels of waste, frustration for patients and clinicians alike, and unsafe care. A bold effort to design health care scheduling systems, process flows, safety procedures, and even physical space will pay off in better, less expensive, safer experiences for patients and staff alike.” – Don Berwick. IHI

Synergistic tools and processes

- **Change Acceleration Process (CAP)**

- is a process that proactively plans for change acceptance for successful implementation

- **Work-Out**

- is a process that promotes rapid problem solving via involvement and accountability

- **Lean**

- an improvement methodology focused on eliminating waste through detailed analysis of workflow in relation to time

- **Six Sigma**

- an improvement methodology driven by the statistical analysis of data to identify causes of unwanted variation and defects

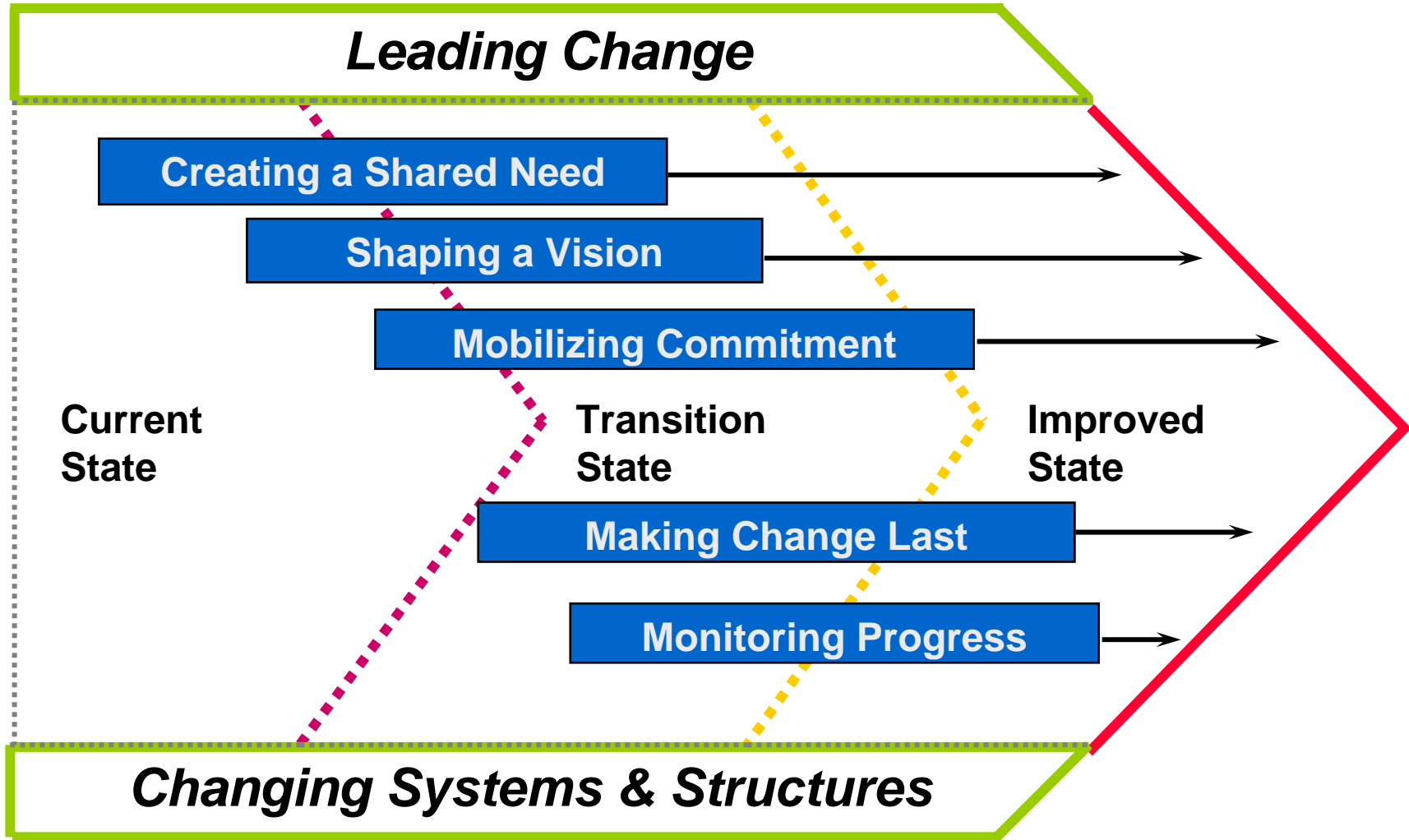


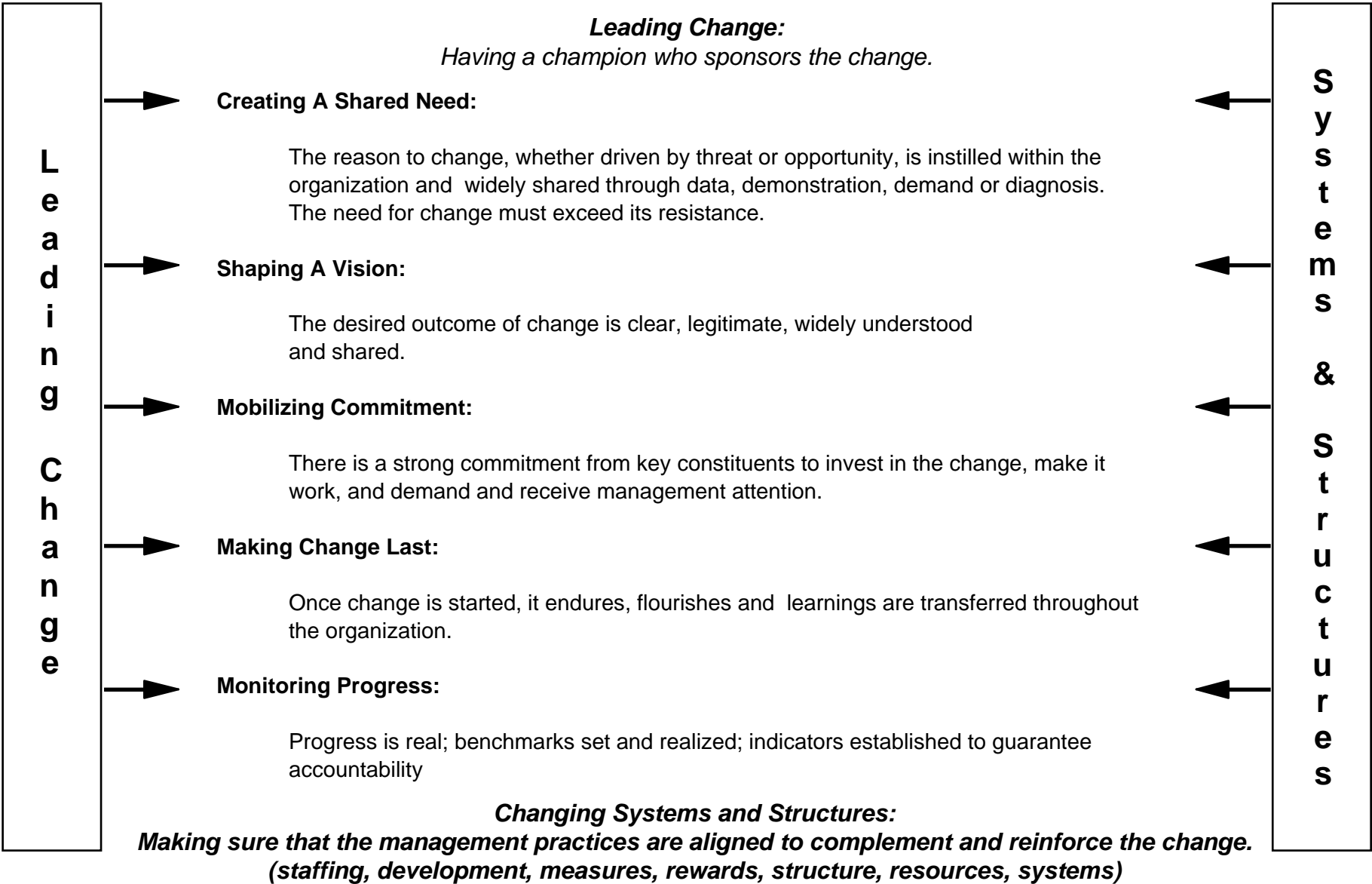
Change Management (CAP and Work-Out)

Change Acceleration Process (CAP)

*If we all know change is hard, why
does resistance to change keep
sneaking up on us???*

Change Acceleration Process





Work-Out

"I know the results I want but how do I get my staff involved? Wouldn't it be great if they could get all their ideas out, organize and prioritize them and implement the solution???
But that could never happen...."

Work-Out: MedSurg Supply Costs

What the Team Did ...

- Six teams of 8-10 people each met for two days to reduce supply costs by \$821,000
- Quantified challenge as per-patient reduction
- Used numerous strategies to communicate costs and waste to peers

Why They Did It ...



- Six Sigma project on Supply Cost was terminated – wrong tool!
- Focused team on high volume low cost items
- Spread the awareness, recruited support



Total savings? You decide!

- WorkOut on Feb 10, 2003
- Challenge: \$347,000 removed from budget with no plan for achieving
- Came in under budget by \$121,000
- Total hard savings \$468,000 by 12/31/03
- Projected over spending: \$473,000
- ? Total benefit of \$941,000

- Teams from OR, Amb Surg, EndoCysto, MedSurg, ICU, ER all worked together
- Learned from each other
- No “victim” mentality
- A true team success for the facility

Extraordinary financial impact, gratifying cultural change, from two days work (and a year of implementation!!!)



The Value of Work-Out

What it is...

- Well planned and facilitated working session
- Where the right people are empowered to develop solutions/actions
- Leadership responds with immediate decisions
- While assigning accountability and follow up to ensure implementation

What it achieves...

- Speed, simplicity and self-confidence
- Connection to winning in the marketplace
- Reengineer processes, take out extraneous work

**Acceptance Through Involvement of
People Closest to the Process**

Lean Healthcare

Lean ...

**...the relentless pursuit of
the perfect process
through waste elimination**

...

The 8 wastes in healthcare

Defects: Re-sticks, med errors

Overproduction: Blood draws done early to accommodate lab

Inventories: Patients waiting for bed assignments, lab samples batched, dictation waiting for transcription

Movement: Looking for patients, missing meds, missing charts or equipment

Excessive Processing: Multiple bed moves, re testing

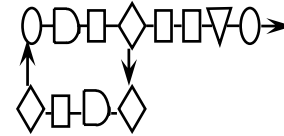
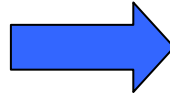
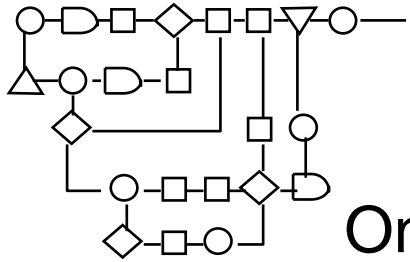
Transportation: Moving patients to tests

Waiting: Inpatients waiting in ED, patients waiting for discharge, physicians waiting for results

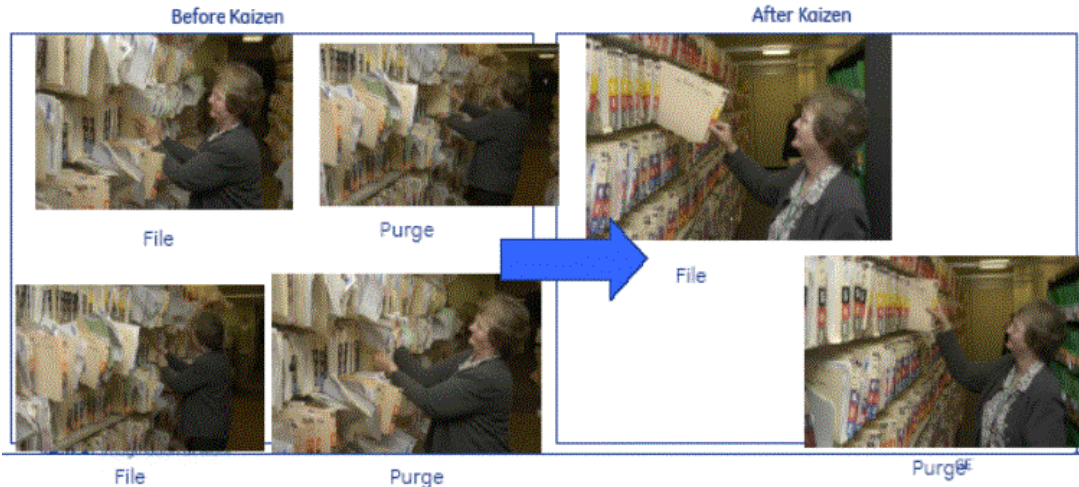
Under-utilization: Physicians transporting patients



Lean: Making the Very Best use of the Resources We Have



Only the right work....
Only the right way....



Everywhere....All of the Time!

Elements of a Kaizen event

Weeks 1 - 3

Pre-work



Week 4

Kaizen



Weeks 5 - 9

Follow-up

- Lean overview
 - Stakeholder analysis
 - **Observations**
 - Kaizen planning
 - ✓ Changes are owned by department staff
 - ✓ Quick & simple better than slow & elegant!
 - ✓ 20% planning ... 40% doing .. 40% re-doing
 - ✓ Kaizens are iterative ... strive for perfection daily
- Validate observations
 - **Determine targets**
 - Brainstorm solutions
 - **Trystorm solutions**
 - Validate improvements

- Validate new process
- Tweak final changes
- Sustain new process
- **Continuously improve through Kaizens**

Kaizen priorities

Safety

Quality

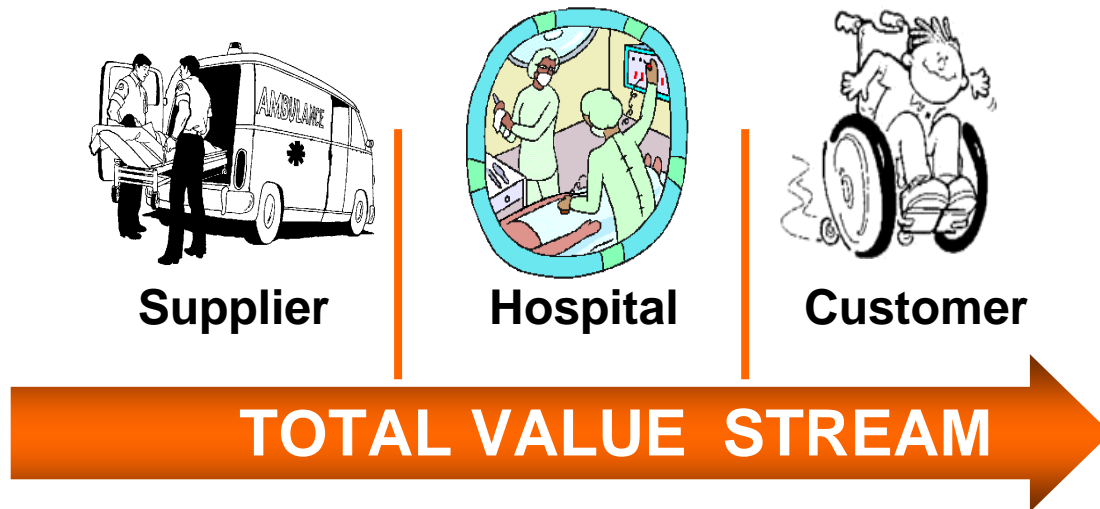
Delivery

Cost

Value streams

Time series of all activities & steps (both value add and non-value add) required to bring a product, service or capability to the customer

Value streams cut across functional boundaries



Most value streams have 2-5% value add time

Six Sigma

How good are we today?

Statistically...

Six Sigma refers to a process that produces only 3.4 Defects Per Million Opportunities

Sigma Level	DPMO
2	308,537
3	66,807
4	6,210
5	233
6	3.4

← ~93.3%
“Good”

← 99.99966%
“Good”

How good do we need to be?

The Classical View of Quality

"99% Good" ($Z = 3.8\sigma$)

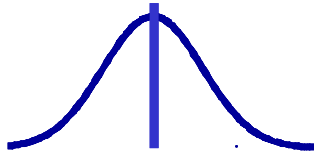
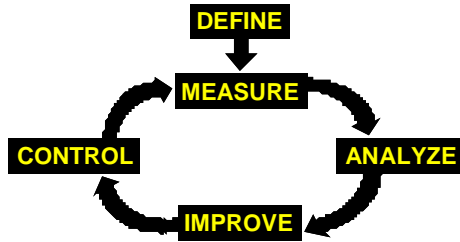
- ➔ **20,000 lost articles of mail per hour**
- ➔ **Unsafe drinking water almost 15 minutes each day**
- ➔ **5,000 incorrect surgical operations per week**
- ➔ **2 short or long landings at most major airports daily**
- ➔ **200,000 wrong drug prescriptions each year**
- ➔ **No electricity for almost 7 hours each month**

The Six Sigma View of Quality

"99.99966% Good" ($Z = 6\sigma$)

- ➔ **Seven lost articles of mail per hour**
- ➔ **One minute of unsafe drinking water every seven months**
- ➔ **1.7 incorrect surgical operations per week**
- ➔ **One short or long landing at most major airports every five years**
- ➔ **68 wrong drug prescriptions each year**
- ➔ **One hour without electricity every 34 years**

Six Sigma



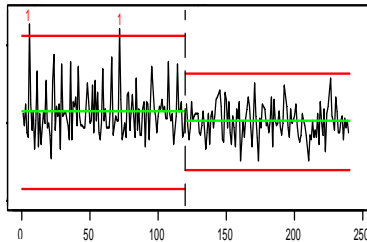
$$Y=f(X1,X2,X3...)$$

Systematic, data driven, defines success from the customers' perspective

Deals with Variation in the customer experience

All process outcomes have causes that can be identified

We can improve complex processes and sustain the gains!



Lean and Six Sigma

Six Sigma

Goal: Reduce defects... improve the mean & reduce the variation of CTQ's

Method: DMAIC, DFSS, CAP, WO

Problem Characteristics: X's not clear, process needs tuning or optimization, project requires measurable evidence of improvement.

Training: Class-room heavy, application light → 25 days training + 2 projects

Projects: 4-6 months

Deployment: Centralized → changes led by Tool-kit experts

Lean

Goal: Increase process speed... reduce process waste

Method: Value Stream maps, Kaizen events

Problem Characteristics: X's are pretty clear, process is chaotic, high overtime, need for immediate improvement

Training: Class-room light – learn by doing → 1 day training, competency is experiential

Projects: 6-8 weeks

Deployment: De-centralized – Change led by process-experts - by the people for the people → facilitated by tool-kit experts

Integrating Tools and Techniques

Types of projects that drive benefits

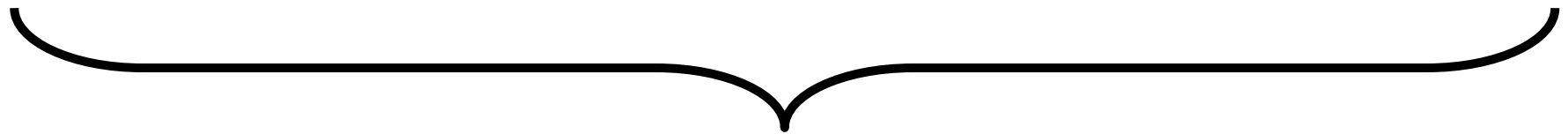
Lean Kaizens
(Lean Leaders, BBs)



Lean Six Sigma Projects
(MBBs, BBs, GBs)



Work-Outs™
(MCAs, CAs)



Variety of Projects driving benefits

Differentiation of projects

Six Sigma	Work-Out™	Lean
<ul style="list-style-type: none">• Data Driven• Cause Unknown• Solution Unknown• Large & Complex Issue• Implemented 4-6 months	<ul style="list-style-type: none">• Expert Driven• Cause Known• Solution Unknown• Smaller in Scope• Implemented 30-60 days	<ul style="list-style-type: none">• Expert Driven, observations needed• Cause may be Known• Solution Unknown• Small to medium scope• Implemented in 6-8 weeks

Combining Strategies for Success

Effective Results are equal to the Quality (Q) of the solution times the Acceptance (A) and Accountability (A) of the idea

$$Q \times A^2 = E$$



Large scale
improvement
initiatives require
precise
coordination and a
common
“cadence”
to advance
smoothly



62% of initiatives
fail due to lack of
attention to the
“A” side

Which Tool to Use?

	CAP	WorkOut	Lean	Six Sigma
Problem	I know the answer but I'm going to meet a lot of resistance	I have a rough idea of where we need to go. I want my team to work together to improve the process quickly.	I have to do more, faster with less. I want to be sure my team is as productive as possible	The process is important and it isn't working. I'm not sure why. I need to understand my process better and pick the right
Deliverable	<ul style="list-style-type: none"> - Change management - Dealing with resistance - Maintaining the gains 	<ul style="list-style-type: none"> - Helping those who do the work come up with and own great solutions 	<ul style="list-style-type: none"> - Speed - Efficiency - Productivity - Removing waste 	<ul style="list-style-type: none"> - Meeting customer expectations - Eliminating defects
Catch phrase	"Why are we always surprised by resistance"	"The people who do the work know it best"	"We need to do more with less... and faster too!"	"We need to get it really right for our customers!"
Turnaround	≤ 1 day	1 - 2 days	3.5 - 5 days	6 - 9 months
Facilitator	CAP/WorkOut Coach	CAP/WorkOut Coach	Informaticist	Black Belt

Summary and Q&A

10 Keys to Successful Transformation

1. **Know your current state** and **define a vision** for the future
2. **Create a communication plan** to reach all levels of the organization.
3. **Visibly champion the cause** with strong leadership involvement.
4. **Build internal skills** to solve problems and lead change.
5. **Seek early, measurable wins** to drive momentum and overcome skepticism.
6. **Take a balanced, holistic approach** so gains in one area don't cause problems in another.
7. **Learn from others** who have embarked on similar initiatives.
8. **Establish alignment and accountability**, linking major goals and core business metrics to projects and performance.
9. **Create monitoring mechanisms** to ensure results are maintained.
10. **Recognize, reward and celebrate success** on a regular basis!

For more information contact:

Carolyn Pexton

925-275-0726

Carolyn.Pexton@med.ge.com

Susan McGann

856-355-0073

Smcgann@virtua.org