

When going Lean, Waste is the Enemy

Eric S. Kastango, MBA, RPh, FASHP

Clinical IQ, LLC

March 31, 2009

Objectives

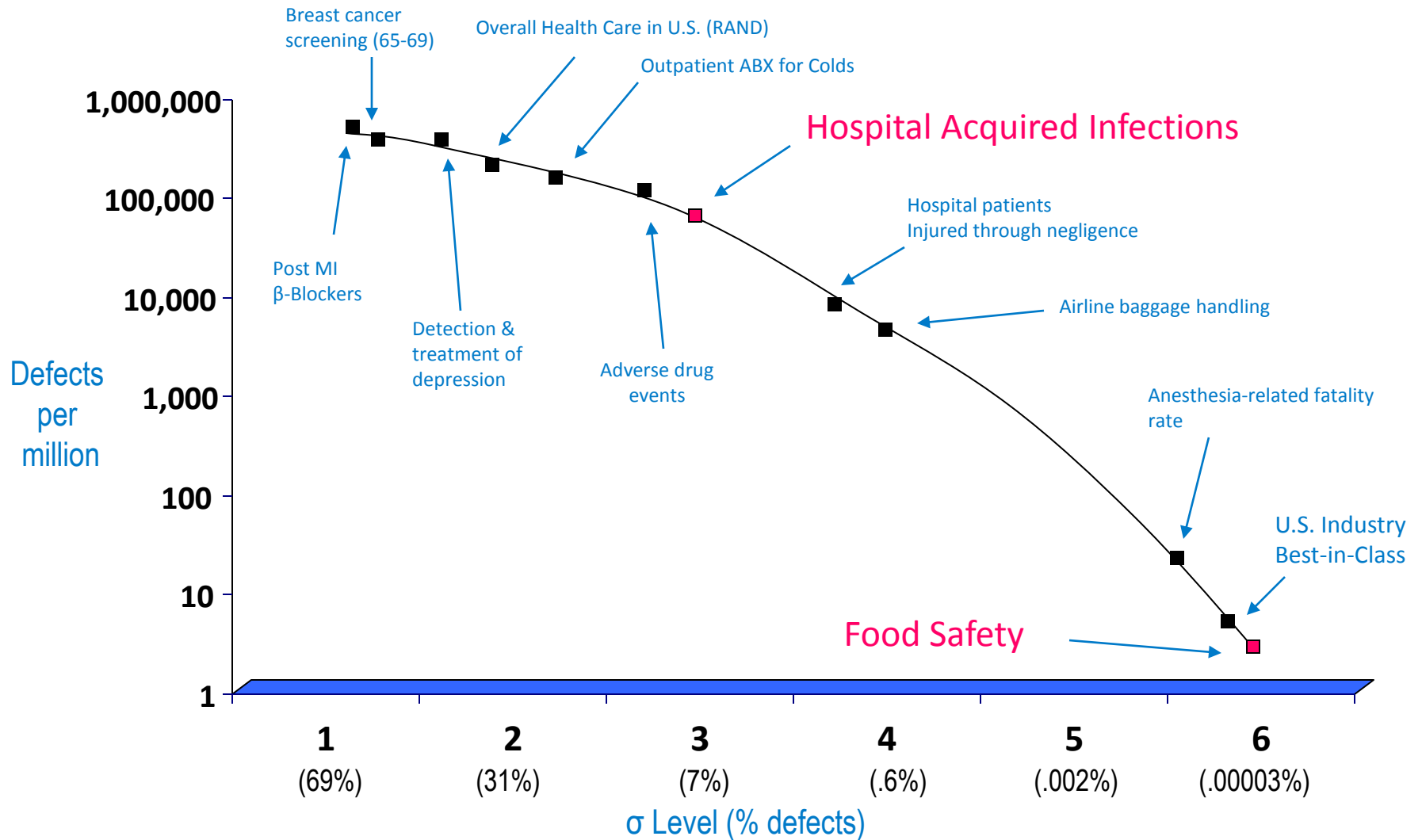
- Review the definition, elements and wastes of Lean
- Review the difference between Six Sigma and Lean
 - When combined, the sum can be greater the separate parts
- Review a starter framework to begin a Lean project

Lean and Six Sigma

- Two powerful generic business improvement philosophies:
 - Lean is a manifestation of the Toyota Production System (TPS)
 - A holistic approach that uses less of everything to give you more
 - Improves speed and identifies and eliminates non-value added (NVA) steps
 - Dependent on people who focuses on the “cradle to grave” processes
 - Six Sigma pioneered by Motorola
 - Improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes.
 - Discrete projects for specific problems
- Together, they eliminate NVAs, reduce waste, and decrease the defect rate and variability within a process
 - Don't forgot about the people and the everyday kaizen ← IMPORTANT!

Health Care Quality Defects Occur at Alarming Rates

Source: 1999 IOM Report: "To Err is Human"



What is Lean?

- Principles, concepts, & techniques used for **elimination of waste**.
- Create a process that gives customers:
 - **exactly** what they need,
 - **when** they need it,
 - in the **quantity** they need,
 - in the right **sequence**,
 - **defect free**, and
 - at **lowest possible cost**.



Five Fundamentals of Lean Thinking

1. **Define value** from the point of view of the customer.
2. **Map the value stream**, eliminate waste streams.
 - Current state
 - Ideal state
3. Make and maintain value **flow**.
4. Control stream by customer **pull**.
5. Continuously pursue **perfection**.

Principles of Lean Thinking



Define Value: Medication Processing and Delivery

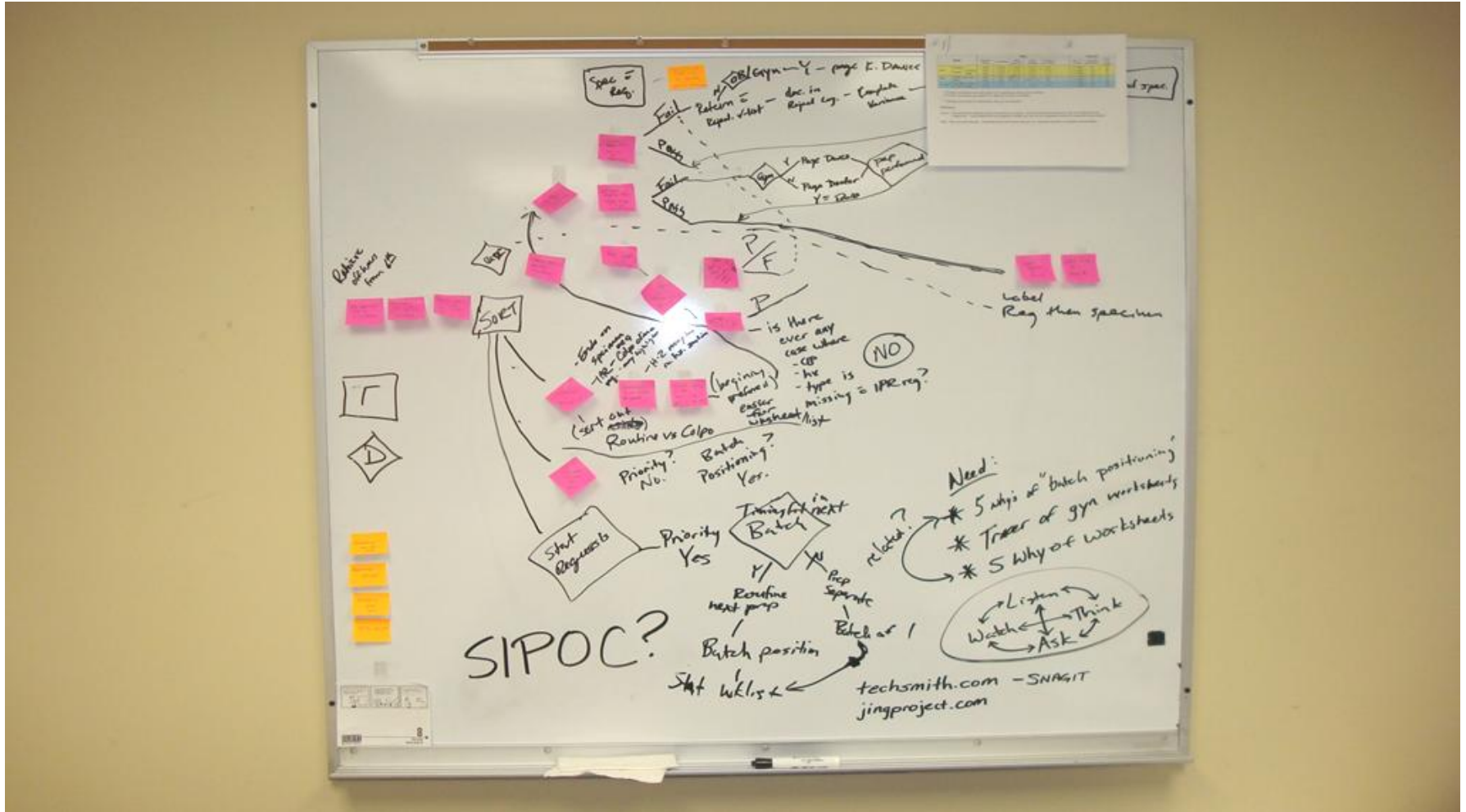
- **Hypothetical issue:**
 - Not having the medication available when the nurse needs/wants them for the patient.
- **Customer:**
 - To do a good job for the patient, we need to work with the nurse.



Value Stream Mapping

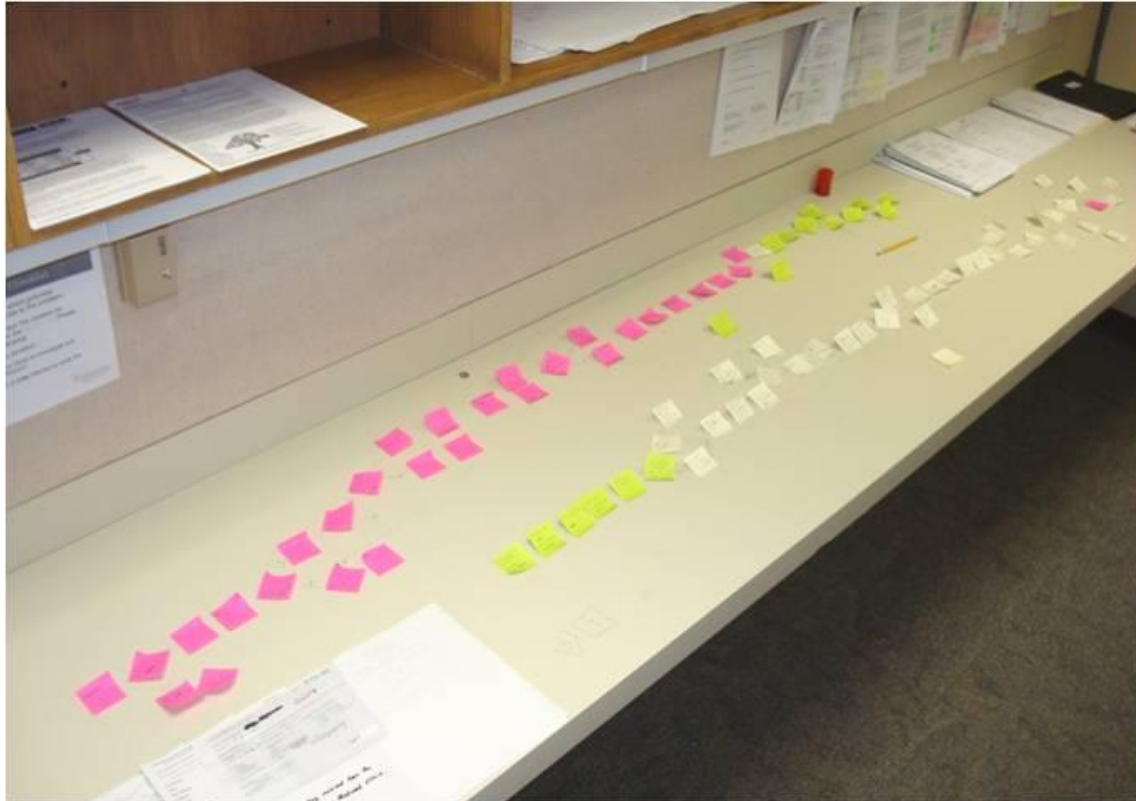
- Value flows through the transfer of
 - Materials, Services, Information
- Processes can be broken into steps
- A value stream map graphically displays the flow of materials, services and information through the steps of a process
- Allows for identification of wastes within a process and its causes
- Two views:
 - “Current state” and “Desired state”

Map the Value Stream



<http://www.labqualityconfab.com/pdfs/08posters/Poster%20-%20GynCyto%20PI%20Project.ppt>

Map the Value Stream



<http://www.labqualityconfab.com/pdfs/08posters/Poster%20-%20GynCyto%20PI%20Project.ppt>

VSM Tips

- Build using Post-It Notes
- Map the typical process
- Create on whiteboard or butcher paper
- Take pictures of the map at various stages
- Not perfect, just useful
- Improvement is the goal, not this diagram

Value

- Value Added Activity: _____
 - Physically changes the product
 - Customer is willing to pay for it
 - Done right the first time
- Business Value Added: _____
 - Add no value to the product
 - Required by regulations, laws or business practice
- Non-Value Added: _____
 - Does not add value to the product

Value Stream Manager

- Process Owner
- Has responsibility and authority to make change happen within the value stream
- Responsible for implementing the future state
- Team must be multidisciplinary
 - Nurses, pharmacists, technicians, physicians, lab personnel, central supply, infection control and risk management

Map the Value Stream: Medication Processing and Delivery

- Orders written (MD, LIP)
- Orders processed on the units
 - Electronic order, CPOE
- Orders received in pharmacy (WIP)
- Orders processed by pharmacist
- Labels generated
- **Medication picked and staged for compounding (order)**
- **Order checked**
- **CSPs compounded**
- **CSPs checked**
- CSPs sorted for distribution or storage
- **CSPs delivered to unit**
 - Pneumatic tube, dumb-waiter, tech or courier

Analyze

- Review all steps for value
- Look for any DOWNTIME wastes
- Determine bottleneck(s)
- Capture all improvement ideas as they come up
- Make an “ideal state” map with 0 waste
 - Look for ways to get close to the ideal

Poka-yoke



Definition : Poka-yoke is the Japanese approach to 'mistake proofing' in all aspects of manufacturing, customer service, procurement, etc. It uses visual signals that make mistakes clearly stand out from the rest, or devices that stop an assembly line or process if a part or step is missed.

Map Desired Future State

- Consistent with project goals - Be clear about what you want to accomplish
- Remember, SAFETY is not negotiable
- Allocate (TAKT) times to achieve the targeted overall cycle time
- Determine every change that must be made to go from “as is” to “future state”

Calculate Takt Time

- The pace of production needed to meet customer demand
 - What is the turnaround time from receipt of order to medication being at a location that the nurse will be looking for it and at the time she needs to give it to the patient.



Identify Wastes

Acronym: DOWNTIME

- D-defects
 - Clear SOPs for all activities to reduce/eliminate variation and chance of error-Standard Work
- O-overproduction
 - Medication dispensing, CSP preparation and batch times
 - How many batch runs done daily?(Two, three, four, five?)
 - Two batch runs:
 - » 7:00am batch – doses due from 12:00pm through 11:59pm
 - » 1:00pm batch – doses due from 12:00am through 11:59am
 - Problem: some doses may be prepared up to 18 hours in advance of anticipated administration
 - Resending missing doses-restocking

Identify Wastes

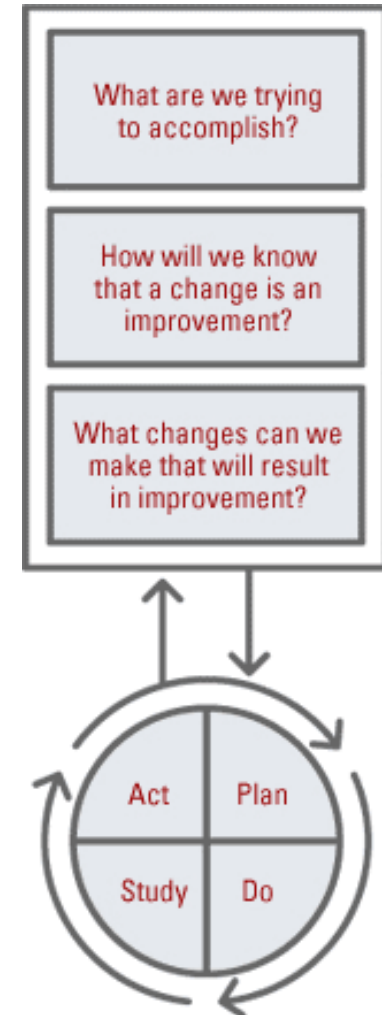
- W-waiting
 - Orders, medications processed and/or compounding, D/C'd CSPs to be returned to pharmacy
- N-non-utilized talent
 - Engage staff to identify opportunities to smooth the work out
- T-transportation
 - Time it takes to deliver medications
 - Stat vs. routine delivery times
 - Pneumatic tubes
 - Dumbwaiter
 - Courier, tech or volunteer
 - Where are the medications being delivered?
 - Do the nurses know to look there?
 - Missing dose calls

Identify Wastes

- I-inventory
 - On-hand supplies and cost of goods
- M-motion
 - Staff spends time looking for orders, labels, leaving the IV room to get labels printed outside of room
- E-extra processing
 - Handling missing doses (labels, picking, compounding)

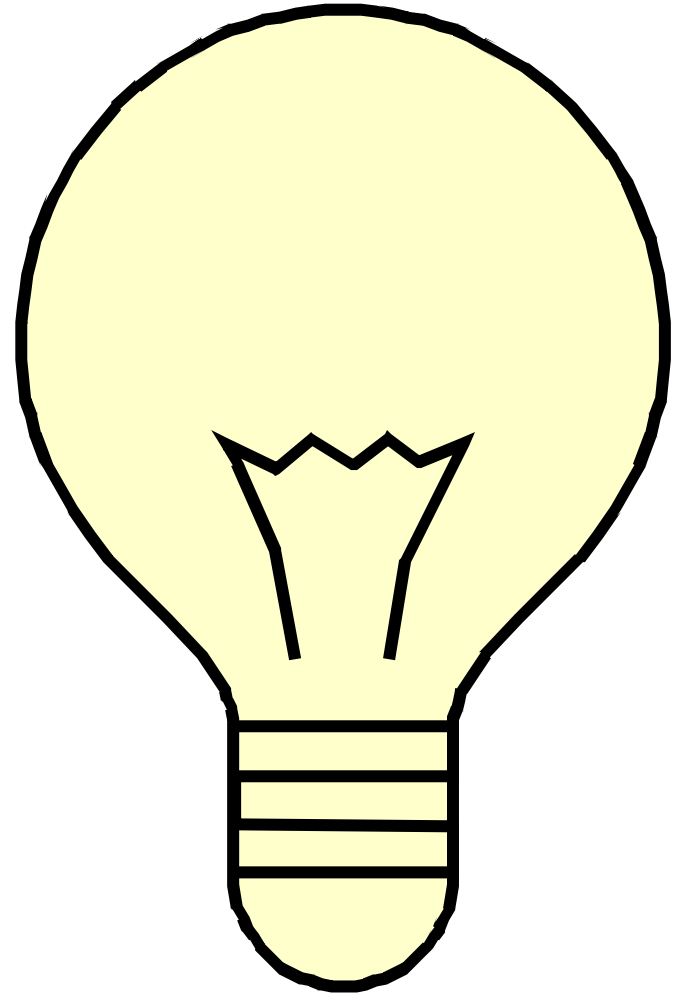
Create Plan and Implement

- Use an rapid action items list (RAIL)
 - Prioritize based on
 - Cost
 - Difficulty
 - Leverage
 - Timeliness
- Work the plan
- Kaizen Blitz
 - Short, sustained activity around process improvement
 - The results are immediate, dramatic and satisfying



Make Waste Visible

- Use 5-S
- Create Visual Controls



5 - S

- **Sort:** Separate old and outdated from currently in use
- **Straighten:** Arrange materials to ensure availability and ease of location
- **Scrub:** Polish the work area
- **Standardize:** Minimize “1 of” activities
- **Sustain:** Make this ongoing

Five W's and One H

I keep six honest serving-men:

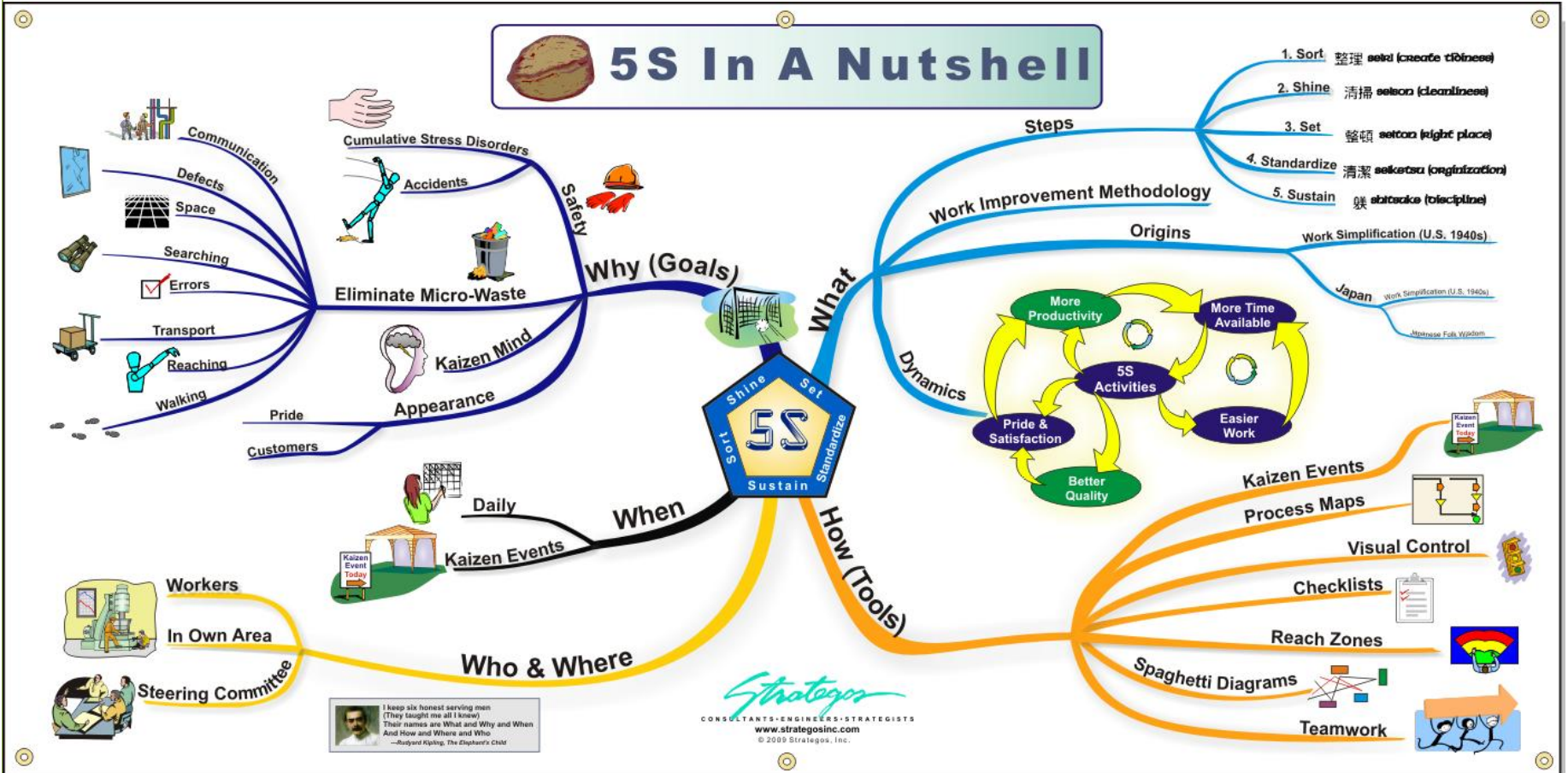
(They taught me all I knew)

Their names are What and Where and When and
How and Why and Who. I send them over land
and sea, I send them east and west; But after
they have worked for me, I give them all a rest.

Rudyard Kipling

“The Elephant's Child”

5-S Work Environment

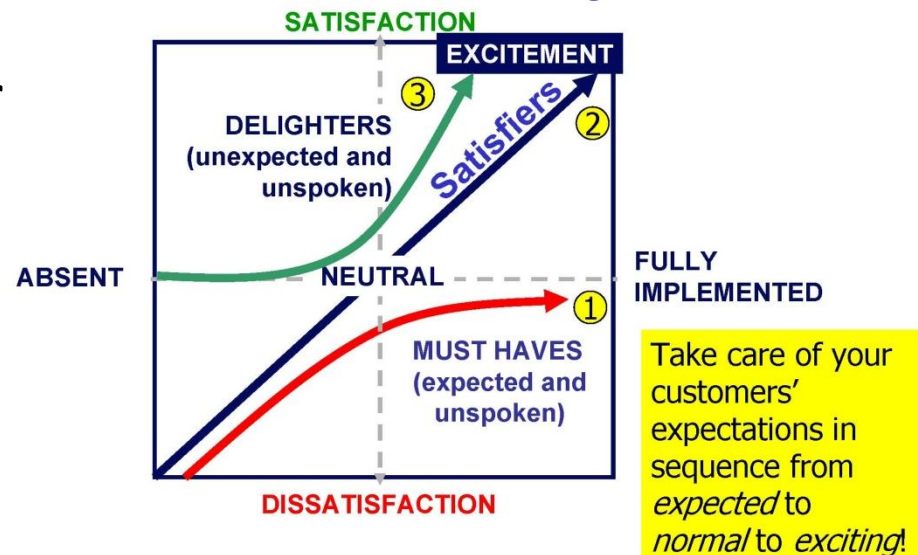


http://www.strategosinc.com/5s_in_a_nutshell.htm

Pick the Right Tool

- Customer Focused Tools
 - Voice of the Customer (VOC)
 - Kano Modeling
 - Benchmarking

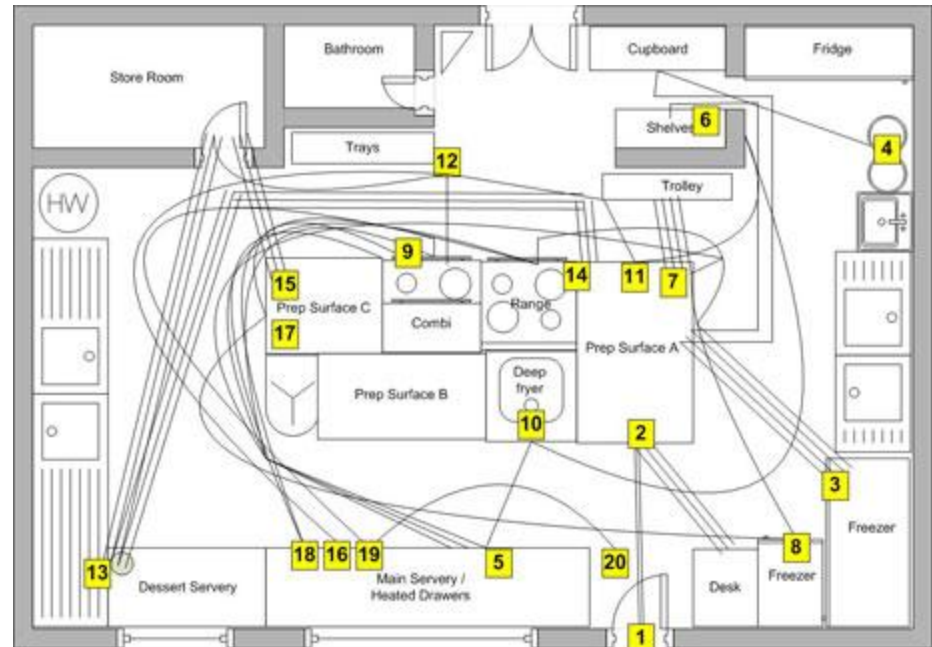
Kano Model of Quality



<http://characterandexcellence.files.wordpress.com/2009/02/kano-model-for-customer-satisfaction-61.jpg>

Pick the Right Tool

- Value-stream Tools
 - The 5 Ws and 1H
 - Spaghetti Diagrams



http://www.schoolfoodtrust.org.uk/UploadDocs/Library/Image/cherbourg_spaghetti_diagram_barbara.jpg

Pick the Right Tool

- Flow and Pull Tools
 - Kanban: Take one, make one
 - 5 S
 - Sort
 - Straighten
 - Scrub
 - Systematize
 - Standardize



Pharmacy Success Stories

- Davis J. Use of Lean Production to Reduce Waste When Compounding Sterile Pharmaceuticals Products, Hosp Pharm 2009;(11) 44:974-977
 - Rework and waste reduced by 64%
 - Pharmaceutical expenditures reduced by \$60,000
- Yamamoto J, Abraham D and Malatestinic B. Improving Insulin Distribution and Administration Safety Using Lean Six Sigma Methodologies , Hosp Pharm 2010;45(3): 212-224
 - Demonstrated position, validated outcomes in improving insulin safety and patient care
- Nationwide Children's Hospital, Columbus, OH-publication pending
 - 12% waste of doses wasted daily
 - Implemented lean tools
 - Improved staff efficiency
 - Reduced waste by 48%
 - Realized annual savings of \$426,000

Lean Overview Summary

- Lean is the elimination of waste
- Lean methods deliver
 - Value faster, better and cheaper
- Value Stream Mapping
 - Visualize waste
 - Generate change plans
- The goal is improvement
- Lean is a system and not just a set of tools!

Resources

- Google, Safari, IE, or any search engine
 - Pick any key word in this presentation
- Lean Enterprise Institute
 - www.lean.org
- American Society for Quality (ASQ)
 - www.asq.org
- Blogs
 - Paul Levy (Beth Israel Medical Center, Boston) blog called "Running A Hospital "
 - <http://runningahospital.blogspot.com/>

Thank you



My contact information:

Eric S. Kastango, MBA, RPh, FASHP

Clinical IQ, LLC

184 Columbia Turnpike, Suite 4, #282

Florham Park, NJ 07932

973.765.9393

eric.kastango@clinicaliq.com