

**Banner Estrella Medical Center  
Phoenix, Arizona  
Banner Health System**



Banner Estrella Medical Center opened in 2005, as a full-service, acute care hospital on a 50-acre medical campus.

- Lean “Be the Tube”:**  
**Slashing Pre-Analytical TAT**
- The Organization
  - The Approach
  - DMAIIC Methodology
  - Synergy, Talents, Creativity
  - A New Philosophy
  - Deployment & Training
  - Learning & Control Plans
  - Sharing
  - Challenges

- **The Organization**
- The Approach
- DMAIIC Methodology
- Synergy, Talents, Creativity
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- Challenges

Banner Health is one of the largest nonprofit health care systems in the country serving patients across seven states

- 22 hospitals
- Six long term care centers
- Family clinics
- Home care services
- Medical equipment services



# Banner Health Arizona



Banner Desert



Banner Gateway



Banner Boswell



Banner Del Web



Banner Estrella



Banner Good Samaritan



Banner Thunderbird



Page Hospital



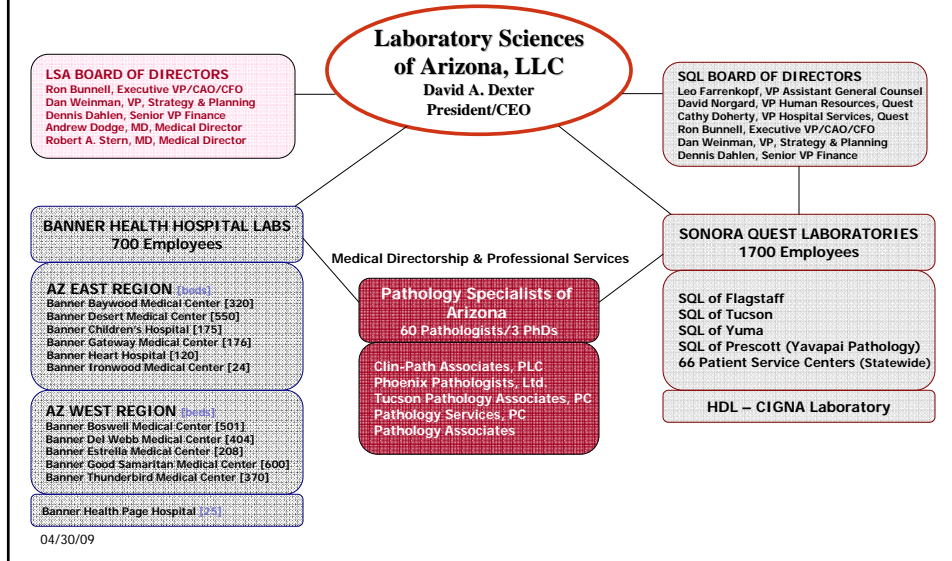
Banner Heart Hospital



## Laboratory Sciences of Arizona Sonora Quest Laboratories LSA/SQL

- LSA/SQL was formed by an integration of the hospital laboratories of Banner Health and Sonora Quest Laboratories
- 51% is owned by Banner Health System
- 49% is owned by Quest Diagnostics
- LSA/SQL manages Banner Health Arizona clinical laboratories

# LSA/SQL Arizona Integrated Laboratory Network



- The Organization
- **The Approach**
- DMAIIC Methodology
- Synergy, Talents, Creativity
- A New Philosophy
- Deployment & Training
- Learning & Control Plans
- Sharing
- Challenges

# Welcome to..... Lean Be the Tube



Presented by:  
Laboratory Sciences of Arizona at  
Banner Estrella Medical Center

DMAI<sup>2</sup>C Phase: **Control**

Project Start Date: 8/20/08

Status: **Green**

Project ID: 13758

Financial Impact: no direct savings



**Champion:** Salene Slader

**Black Belt:** Kathy Williams

**Green Belts:** Shelley Hanson

**BU/Function:**

**Process Owners:** Test Management Coordinators

**Team Members:**

Amanda Jones

Kathy Cienfuegos

Aja Sahhar

LaDonya Hinson

Diane Sosa

Marisol Morera, CM, ED

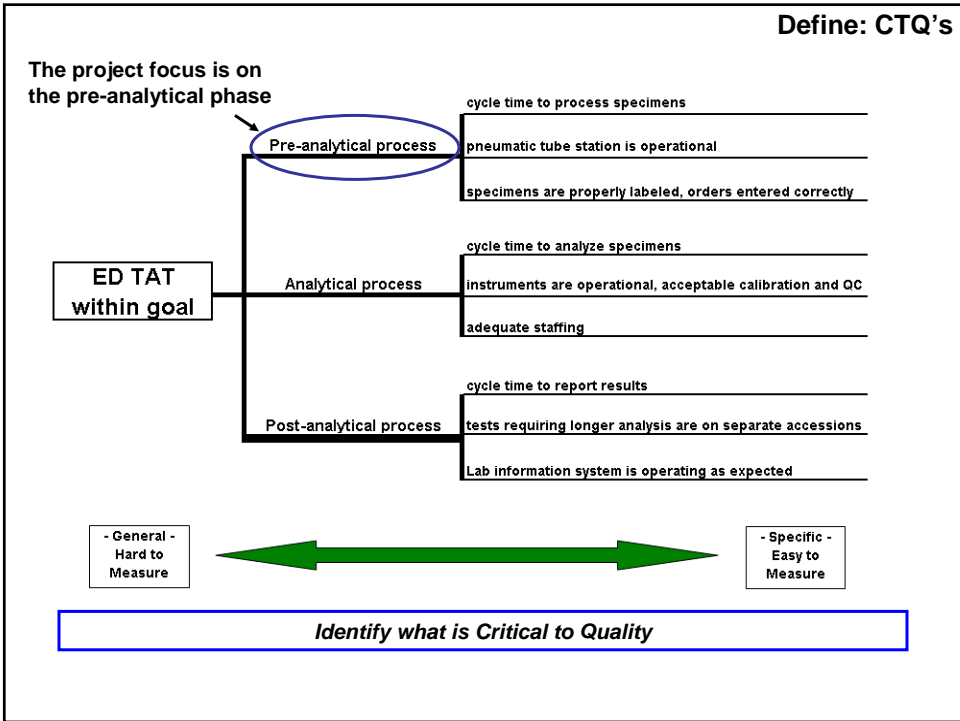
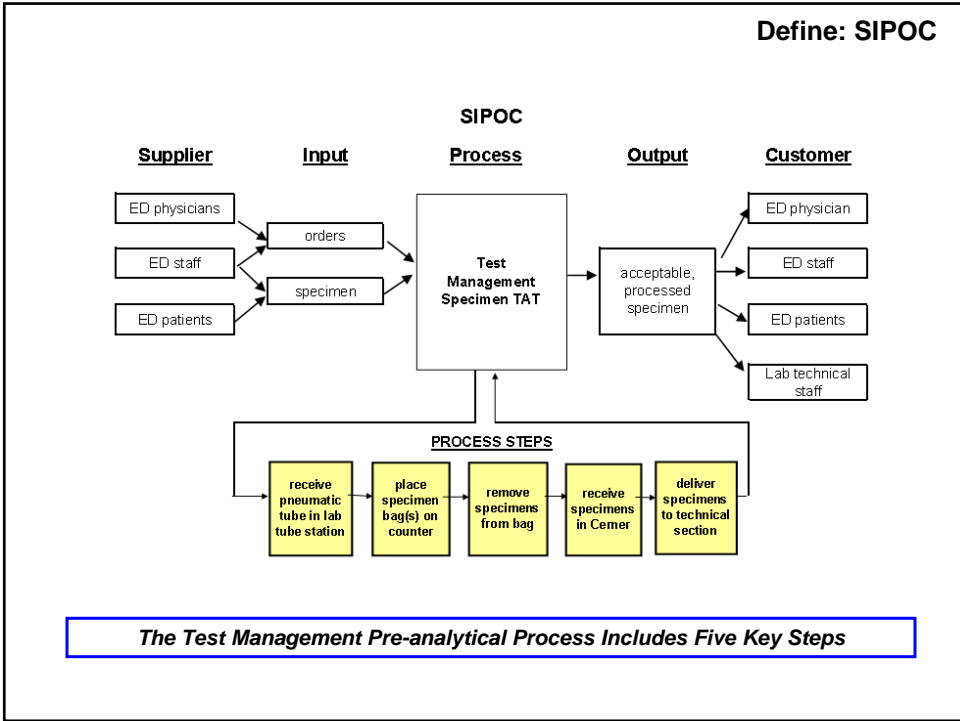
Angie Mitchell, RN, ED

Travis Snowberger (ad hoc)

Patty Selendic (ad hoc)

<b>Charter</b>					
<p><b>Business Case</b></p> <p>Banner Health System 2008 Initiative 02: Increase capacity and optimize throughput.</p> <p>Lab turn-around-time (TAT) impacts physical capacity and throughput to better serve the community and meet physician and customer expectations.</p> <p>LSA/SQL 2008 Roadmap:</p> <ul style="list-style-type: none"> <li>▪ Critical Success Factor for Quality: Improve organizational performance with Lean projects</li> <li>▪ Critical Success Factor for Process Excellence: Deploy process improvement projects</li> <li>▪ Critical success Factor for Customer Satisfaction: Achieve laboratory turn-around-time performance goals.</li> </ul>	<p><b>Scope</b></p> <p>Start: ED specimen receipt in pneumatic tube station</p> <p>Stop: ED specimen delivered to technical area.</p> <p>Exclude: Anatomic Pathology, Microbiology, and inpatient specimens</p>				
<p><b>Problem Statement</b></p> <p>Customer satisfaction is dependent on TAT and Lab is not meeting ED TAT expectations. Lab associates who perform testing express concern that delays in receiving specimens for analysis affect their TAT and they have to answer calls from nurses and physicians looking for results. Delays in pre-analytical processing of STAT specimens contribute to delays in overall turn-around-time</p> <p>The overall ED TAT for lab is 84.3% in goal. The goal is that 90% of CBC, BMP, and UA are completed in 30 minutes and Troponin and CKMB are completed in 40 minutes from the time specimens are received in lab.</p>	<p><b>Goal</b></p> <p>Improve pre-analytical processing of STAT ED specimens through Lean methods as demonstrated by Value Stream Maps and flowcharts.</p> <p>The goal is to reduce overall DPMO by 30%.</p> <table border="0"> <tr> <td>Baseline DPMO</td> <td>159,100</td> </tr> <tr> <td>Goal DPMO</td> <td>111,370</td> </tr> </table>	Baseline DPMO	159,100	Goal DPMO	111,370
Baseline DPMO	159,100				
Goal DPMO	111,370				

<ul style="list-style-type: none"> <li>- The Organization</li> <li>- The Approach</li> <li>- <b>DMAIC Methodology</b></li> <li>- Synergy, Talents, Creativity</li> <li>- A New Philosophy</li> <li>- Deployment &amp; Training</li> <li>- Learning &amp; Control Plans</li> <li>- Sharing</li> <li>- Challenges</li> </ul>	<p>DEFINE</p> <p>MEASURE</p> <p>ANALYZE</p> <p>INNOVATIVE IMPROVEMENT</p> <p>CONTROL</p>
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Define: VOC

### Voice of the Customer

**Lab Technologists:**

What is your expectation for time that an ED specimen takes from when it is rec'd in the tube station until you receive it in your dept?

tech	assigned dept	shift	answer
Jessica	Hematology	days / nights	5-10 min
Larry	Chemistry	days	5 min
Barb G	Blood Bank	days	5 min
Mandy	Hematology	days	5 min
Marion	Chemistry	days	3 min
Salene	Laboratory	n/a	5 min
Sheri	Chemistry	days	2 min
Nancy	Hematology	days	5 min
Alyssa	Urinalysis	nights	5 min
Cyra	Chemistry	nights	5 min
Basilla	Chemistry	nights	5 min

Physicians, our primary customers, expect a 30-minute TAT for CBC, BMP, and UA.

Lab technical staff who perform testing are customers of the pre-analytical process and were asked for time they expect to receive samples after arrival in the lab.

*Testing Associates, as Customers of the Process, Would Like Specimens to be Delivered to Testing Area in 5 minutes after Receipt*

Define: CTQ's

*CTQ Definition: ED TAT meets goal 90% of the time*

**Unit: Specimen bag containing one ED patient's specimens**

**Defect: Greater than 5 minute preanalytical cycle time**

**Defect Opportunity: One defect opportunities per unit**

*TAT will be Measured to Assess Effectiveness*





## Measure: Cycle Time

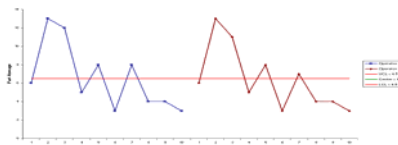
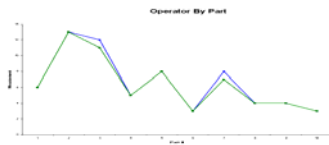
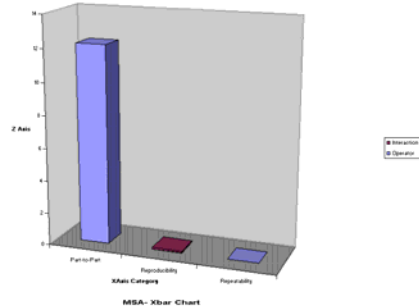
### MSA ANOVA Method Results

Source	Variance	Standard Deviation	% Contribution	p Value
Total Measurement (Gage)	0.11	0.315227766	0.91%	
Reproducibility	0.11	0.315227766	0.81%	
Operator	0.011111111	0.105429255	0.09%	
Operator * Part Interaction	0.000000000	0.000000000	0.00%	
Product (Part-to-Part)	12.17777778	3.489667200	99.19%	
Total	12.27777778	3.509666007	100.00%	

USL	
LSL	
Precision to Tolerance Ratio	0.00024953
Precision to Total Ratio	0.00024953
Resolution	16.0

BIAS ANALYSIS	
Reference	Bias
6	0
13	0
12	0.5
5	0
8	0
3	0
8	0.5
4	0
4	0
3	0

### Measurement System Variance Components



**Measure System Analysis was Performed  
Several Methods of Time Measurement were Evaluated  
The Time on Computer Terminals was Selected**

## Measure: MSA

**The measurement system analysis assesses  
repeatability and reproducibility of the measure.**

Measurement System Analysis	
Data Type:	Continuous
Data Source:	Data Collection Form
Data Collection System Description:	Measure the number of cycle time minutes from the time the pneumatic tube delivers ED specimens to the time the specimens are delivered to
Measurement Process description:	ED specimens arrive in pneumatic tube station, specimen bags are removed from pneumatic tube, specimens are removed from specimen bags, specimens are received in LIS, specimens are delivered to testing area.
Tools Used:	Data Collection Form. Time measurements were taken from standard time on computer screen.
Known Measurement Errors:	None
Suspected Measurement Problems:	None
Results of performing an MSA:	Measure system is adequate.

**Measure System is Adequate**

**Measure: Preliminary Stratification**  
**Sample of 1 week on**  
**Data Collection Log**

**What defects delay the process?**

**ED SPECIMENS DATA COLLECTION LOG**  
 We are collecting data on ED specimens for the LEAN "BE THE TUBE" project. Please complete the information for all ED specimens for one week. THANK YOU!!

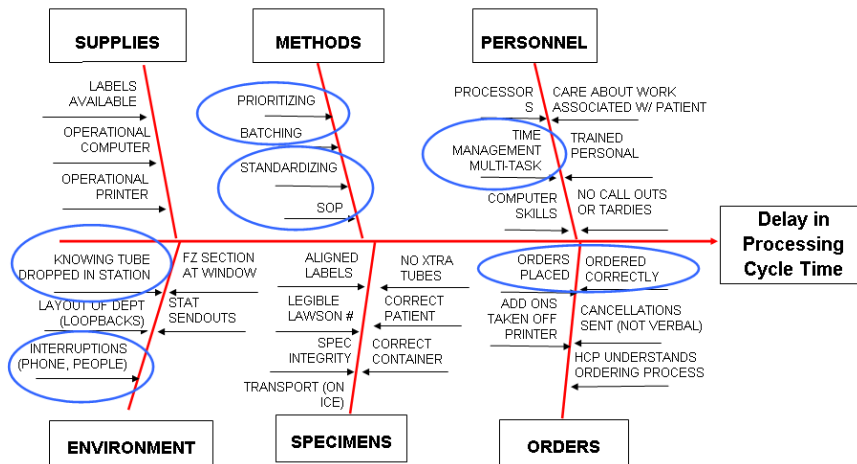
Patient Last Name	Accession#	ED Specimen	Lab	Order	Specimen	Label	Order	Specimen	Label	Order	Specimen	Label	Order	Specimen	Label
		BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP	BED LAB CIP
		Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #	Order #
		Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen
		Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label
		Order	Order	Order	Order	Order	Order	Order	Order	Order	Order	Order	Order	Order	Order
		Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen	Specimen
		Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label	Label

**Results:**

Cerner Label on Specimen	66%
Yellow Cerner Label Used	68%
Orders in Computer	93%
Ordered Correctly	91%
Right Cerner Label on the Right Tube? (CBC label on LAV tube, BMP on GRN)	69%
Lawson Number Legible?	96%
Had to call for lawson#?	82%
Did Lawson Number include Letters? (EN, ET)	46%
% rec'd with extra specimens to process	56%

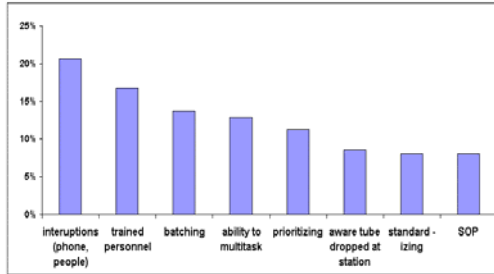
**ED Specimens were Received in Lab Without Cerner Labels, Without Orders Placed and Without Complete Employee Numbers**

**Analyze: Cause-and-Effect**



**Key Factors were Determined**  
**Circled Factors were Selected to be Worked On for the XY Matrix**

## Analyze: XY Matrix



**Interruptions from phone and people trained to prioritize, and batching specimens ranked highest**

Project: **BE THE TUBE**

Date: 10/8/2008

Output Variables (Y's)	1	2	3	4	5	6	7	8	9	10	Rank
reduce batches	10	10	7	10	7	10	10	10	10	10	291
reduce WIP, prioritize, FFP	10	10	7	10	7	10	10	10	10	10	354
eliminate logbacks	10	10	7	10	7	10	10	10	10	10	208
valid order	10	10	7	10	7	10	10	10	10	10	208
reduce interruptions, manage phone	10	10	7	10	7	10	10	10	10	10	333
correctly labeled specimens	10	10	7	10	7	10	10	10	10	10	434
trained test mgr staff	10	10	7	10	7	10	10	10	10	10	220
computers and printers	10	10	7	10	7	10	10	10	10	10	534
supplies	10	10	7	10	7	10	10	10	10	10	534

Input Variables (X's)	1	2	3	4	5	6	7	8	9	10	Rank
prioritizing	9	9	0	0	3	0	9	0	0	0	291
batching	9	9	9	0	3	0	9	0	0	0	354
standardizing	3	3	1	1	3	1	9	1	0	0	208
SOP	3	3	1	1	3	1	9	1	0	0	208
ability to multitask	9	9	9	0	0	0	9	0	0	0	333
trained personnel	3	9	9	1	3	9	9	3	1	1	434
know tube dropped at station	3	9	1	0	9	0	3	0	0	0	220
interruptions (phone, people)	9	9	3	9	9	9	9	0	0	0	534

**Prioritization Matrix Formulated Theories about Causes and Effects**

## Analyze: Process Steps

A	A	A	A	A	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	E	E	E	E	E	
assoc in area	# in batch	cycle time	# in batch	type of intrpt	assoc in area	# in batch	cycle time	type of intrpt	assoc in area	# in batch	cycle time	type of intrpt	assoc in area	# in batch	cycle time	type of intrpt	assoc in area	# in batch	cycle time	type of intrpt	assoc in area	# in batch	cycle time	type of intrpt	
17	2	2004	1	start	2	2005	1	1	2	2006	1	0	2	2006	1	1	2	2009	1	3					
18	1	1959	1	start	1	1902	1	3	1	1902	1	0	1	1902	1	0	1	1911	1	9					
19	1	1904	1	start	1	1906	1	2	1	1906	1	0	1	1907	1	1	1	1911	1	4					
20	1	1743	1	start	1	1743	1	0	1	1744	1	1	1	1744	1	0	2	1749	1	5					
21	1	1827	1	start	1	1828	1	1	1	1831	1	3	1	1831	1	0	1	1833	1	2					
22	1	1914	1	start	1	1917	1	3	1	1918	1	1	1	1918	1	0	1	1922	1	4					
23	2	2303	2	start	2	2303	2	0	4	2323	2	20	4	2324	2	1	3	2340	2	16					
24	3	2121	1	start	3	2129	8		3	2129	8	0		2129	8	0		2159	6						
25	2	2245	1	start	2	2248	1	3	2	2250	1	2	2	2251	1	1	2	2258	1	7					
26	2	1530	3	start	2	1537	2	7	2	1541	2	4	2	1543	3	2	2	1544	1	1					
27	2	1530	3	start	2	1537	2	7	2	1541	2	4	2	1543	3	2	2	1544	1	1					
28	5	914	1	start	5	915	1	1	5	916	1	1	4	916	1	0	4	921	1	6					
29	2	1530	2	start	2	1535	2	5	2	1536	2	1	2	1536	2	1	2	1601	2	25					
30	1	1534	2	start	1	1534	0		1	1536	1	1		1536	1	1		1532	1						
31	3	1016	1	start	3	1016	1	0		1017	1	1		1017	1	1		1017	1						
32	2	1727	4	start		1727	1	0		1728	4	1		1731	3			1732	2	1					
33	2	1454	2	start		1454	0	0		1454	2	0	1	1459	4		1	1500	2	2					
34	2	1507	1	start		1507	3	0	1	1507	3	0		1509	2			1510	2	1					
35	1	1510	1	start		1510	0			1511	2	1		1511	0			1512	2	1					
36	2	1441	1	start		1441	0	0		1441	2	0	1	1442	1			1444	2	1					
37	3	1026	1	start		1026	1	0		1027	1	1	0	1027	0			1029	1						
38	3	1031	1	start		1031	1	0		1031	1	0		1031	1	0		1032	1	1					
39	3	1044	1	start		1044	1	0		1045	1	1		1045	1	0	3	1045	1	0					
40	2	1734	1	start		1734	1	0		1735	1	1		1735	0			1735	0	0					
49	2	2129	2	start		2129	2	0		2129	2	0		2129	2	1		2131	2	0					
50	2	2129	2	start		2129	2	0		2129	2	0		2130	2	1		2131	2	1					

Time specimen bags dropped in pneumatic tube station

Time pneumatic tube dropped to time specimen bags were placed on workbench

Time specimens placed on bench to time removed from bag

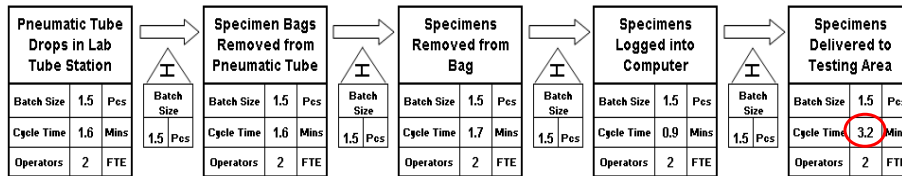
Time removed from bag to time logged in computer

Time logged in computer to time delivered to techs

**Lab Moved ED Specimens through 5 Process Steps that were Analyzed Cycle time, Number of Associates, Number in Batch, and Interruptions**

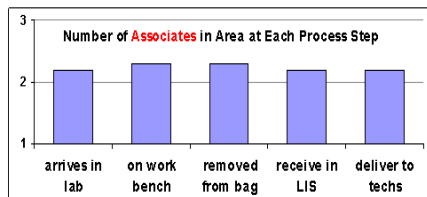
## Measure: Value Stream Map

### What happens to the tube? GEMBA – “Go See”

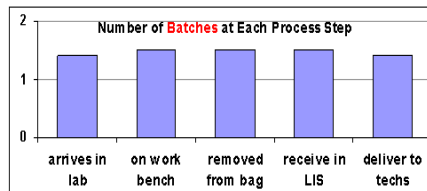


Cycle Time was Longest in Delivering the Specimens to the Testing Areas after they were Logged into the Computer

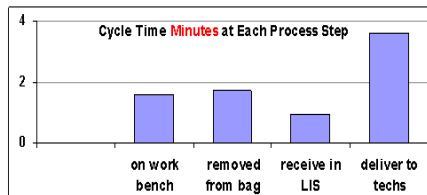
## Analyze: Elements of the Process



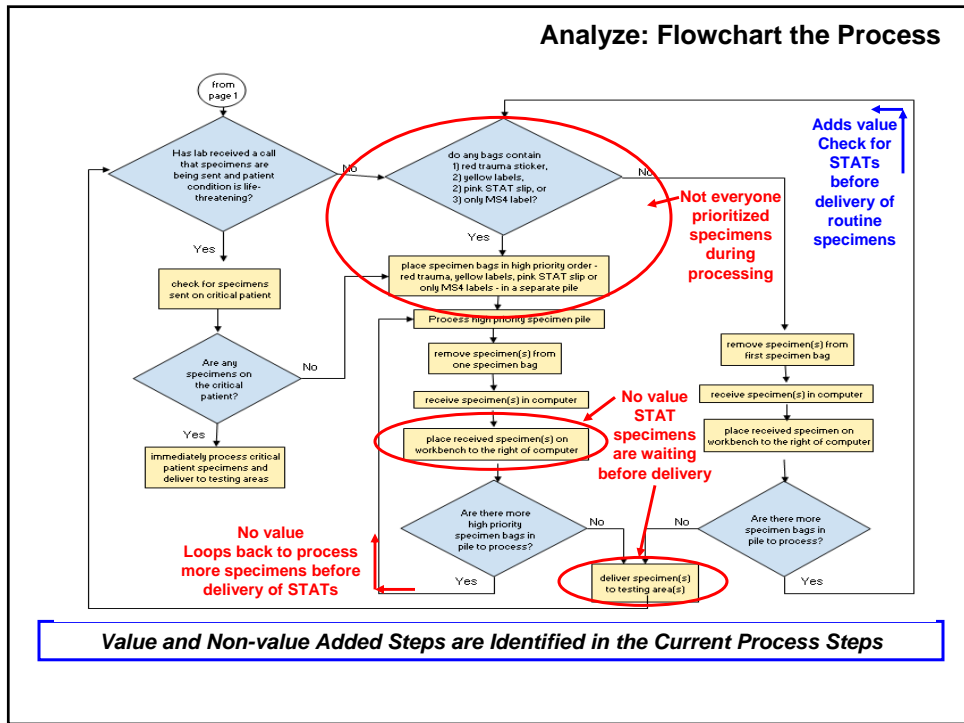
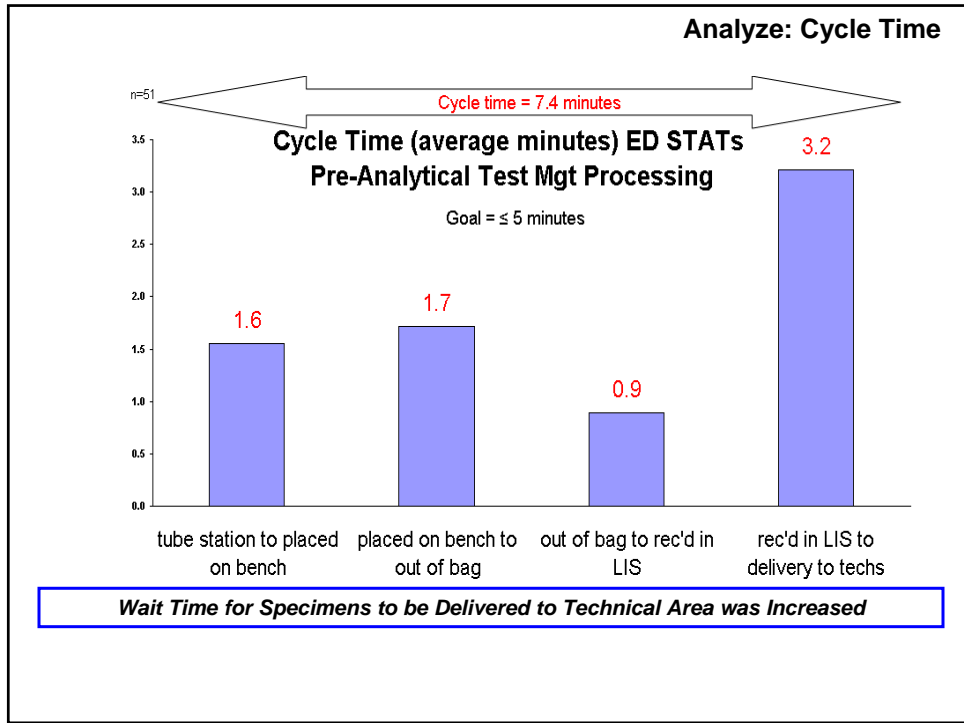
The number of associates available was consistent at each step of the process

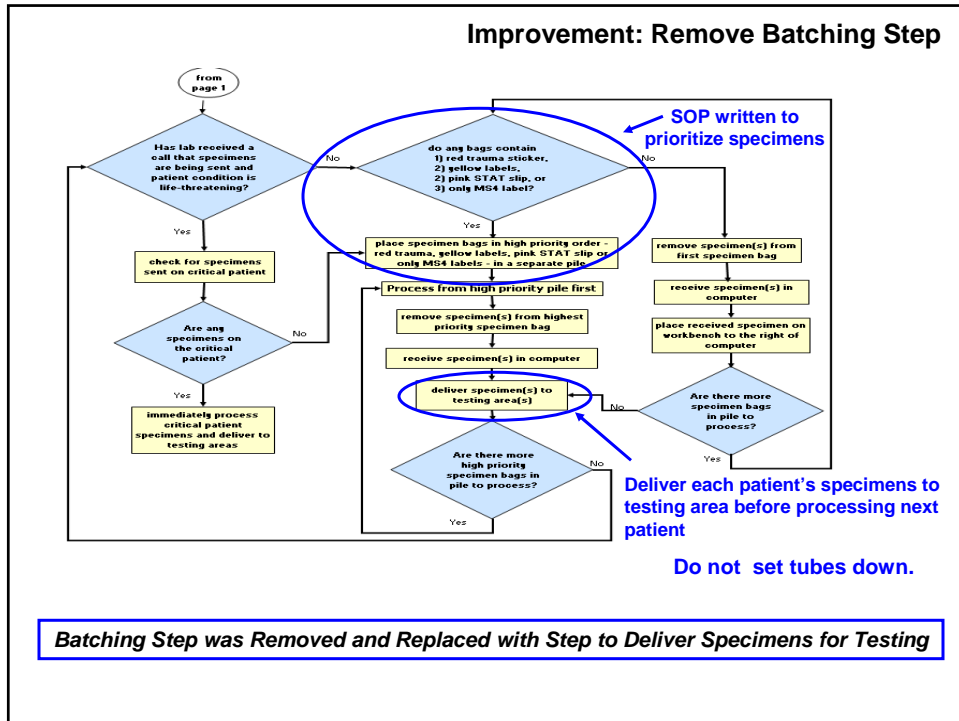


The batch size was consistent at each step in the process



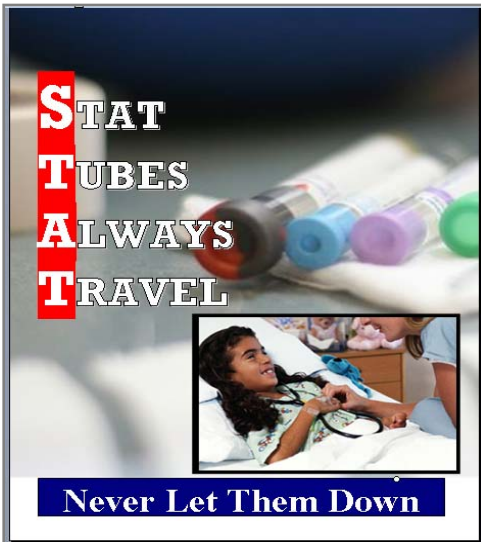
The cycle time was not consistent at each step in the process





- The Organization
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- DMAIC Methodology
- **Synergy, Talents, Creativity**
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**Improvement: Test Management Area**



Lab focused on prioritizing and standardizing processes. All Test Management associates were trained on new process November 1 to November 7.

Team member made a poster to demonstrate our connection to patients.

**STAT Tubes Always Travel.**

**We never set them down because when we set the tubes down, we let the patient down.**

November was "Be the Tube" Month for Lab Test Management Training began November 1<sup>st</sup> and was completed November 7<sup>th</sup>

**Improvement: Testing Areas**

**Cerner TAT Monitor Flags for Technical Area**



When	What
At 1 minute <i>Notification</i>	Specimen should be in testing area
At 15 minutes <i>Caution</i>	Testing should be in process
At 25 minutes <i>High Alert</i>	Techs should be reporting or investigate reason for delay in reporting

Techs print-screen TAT monitor to follow-up with Test Management for any specimens not received in testing area within 5 minutes.

Ongoing Monitor for Timely Receipt of Specimens was Put into Place



## Improvement: Monitor the Process

For continual monitoring of the improved step in the pre-analytical process, testing staff were trained on expectations for specimen delivery to testing area.

**BEMC TECH STAFF Expectations for ED TAT**

- ◊ TAT monitor must be used
- ◊ Settings for ED BMP, UA, ABC, H&H, PLT
  - ◊ 15 min NOTIFICATION - specimen is being delivered to you
  - ◊ 45 min CAUTION - should be in process of reporting
  - ◊ 25 min ALERT - result immediately
- ◊ Inform coordinator of TAT problems
  - Print screen TAT monitor if specimen is received in lab but not delivered to you (shows received time and current time on computer). Leave for Quality Coordinator.
  - Make a note of TAT delays on communication log.
- ◊ Thank you!

Name	Lawson #	SIGNATURE	DATE
Alquire, Cora Leigh	233219		
	229055		

Technical staff to use Cerner TAT monitor at all times.

When specimens are not received in testing area within 5 minutes of being logged into lab, testing associates:

- make a print screen of the Cerner TAT monitor
- locate the specimen
- leave print screen for follow-up

November was "Be the Tube" Month for Lab Technical Associates  
Training began in November and was completed in December

## Improvement: Lab Processes

### Summary of Lab Improvements

- November "Be the Tube Campaign" focus on expectations for processing STAT specimen.
- Standard Operating Procedure and flowchart developed to prioritize samples and standardize processing steps.
- Train on SOP and flowchart, purpose for STAT Tubes Always Travel, and ways to handle interruptions.
- Train technical staff on Cerner TAT Monitor and the steps to take for delays in receiving specimen.
- Asked lab staff to reprint requested labels to ED printer rather than printing on lab printer and sending in pneumatic tube system.

**PRIORITY PROCESSING OF INCOMING LABORATORY SPECIMENS  
TEST MANAGEMENT PROCESSING MANUAL**  
LABORATORY SCIENCES OF ARIZONA / SONORA QUEST LABORATORIES  
BEMC

**PRINCIPLE/PURPOSE**  
Rapid processing of specimens received from the Emergency Department (ED) contributes to improved turn-around-times, customer service, optimized ED throughput and patient treatment.

**SCOPE**  
This procedure applies to pre-analytical lab.

**RESPONSIBILITIES**  
Lab associates who process incoming specimens. All lab associates who process incoming specimens. All lab associates who process incoming specimens. All lab associates who process incoming specimens.

**PROCESS**  
A. Follow attached flowchart.  
B. Communicate problems and involve Management Supervisor.

**FORMS/ATTACHMENTS**  
Priority Processing Pre-Analytical

**Training for Priority Processing of Laboratory Specimens**

**Objectives:** Demonstrate knowledge of specimen priority in a simulated lab environment. Demonstrate ability to prioritize specimens.

**Requirements:** Participants must attend. Participants must attend. Participants must attend.

**Materials:** Complete the following activities with your instructor. Complete the following activities with your instructor. Complete the following activities with your instructor.

**Activity 1: Prioritize Specimens**

**Activity 2: Prioritize Specimens**

**Activity 3: Prioritize Specimens**

**Activity 4: Prioritize Specimens**

**Activity 5: Prioritize Specimens**

**Activity 6: Prioritize Specimens**

**Activity 7: Prioritize Specimens**

**Activity 8: Prioritize Specimens**

**Activity 9: Prioritize Specimens**

**Activity 10: Prioritize Specimens**

**Activity 11: Prioritize Specimens**

**Activity 12: Prioritize Specimens**

**Activity 13: Prioritize Specimens**

**Activity 14: Prioritize Specimens**

**Activity 15: Prioritize Specimens**

**Activity 16: Prioritize Specimens**

**Activity 17: Prioritize Specimens**

**Activity 18: Prioritize Specimens**

**Activity 19: Prioritize Specimens**

**Activity 20: Prioritize Specimens**

**Activity 21: Prioritize Specimens**

**Activity 22: Prioritize Specimens**

**Activity 23: Prioritize Specimens**

**Activity 24: Prioritize Specimens**

**Activity 25: Prioritize Specimens**

**Activity 26: Prioritize Specimens**

**Activity 27: Prioritize Specimens**

**Activity 28: Prioritize Specimens**

**Activity 29: Prioritize Specimens**

**Activity 30: Prioritize Specimens**

**Activity 31: Prioritize Specimens**

**Activity 32: Prioritize Specimens**

**Activity 33: Prioritize Specimens**

**Activity 34: Prioritize Specimens**

**Activity 35: Prioritize Specimens**

**Activity 36: Prioritize Specimens**

**Activity 37: Prioritize Specimens**

**Activity 38: Prioritize Specimens**

**Activity 39: Prioritize Specimens**

**Activity 40: Prioritize Specimens**

**Activity 41: Prioritize Specimens**

**Activity 42: Prioritize Specimens**

**Activity 43: Prioritize Specimens**

**Activity 44: Prioritize Specimens**

**Activity 45: Prioritize Specimens**

**Activity 46: Prioritize Specimens**

**Activity 47: Prioritize Specimens**

**Activity 48: Prioritize Specimens**

**Activity 49: Prioritize Specimens**

**Activity 50: Prioritize Specimens**

**Activity 51: Prioritize Specimens**

**Activity 52: Prioritize Specimens**

**Activity 53: Prioritize Specimens**

**Activity 54: Prioritize Specimens**

**Activity 55: Prioritize Specimens**

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**Activity 85: Prioritize Specimens**

**Activity 86: Prioritize Specimens**

**Activity 87: Prioritize Specimens**

**Activity 88: Prioritize Specimens**

**Activity 89: Prioritize Specimens**

**Activity 90: Prioritize Specimens**

**Activity 91: Prioritize Specimens**

**Activity 92: Prioritize Specimens**

**Activity 93: Prioritize Specimens**

**Activity 94: Prioritize Specimens**

**Activity 95: Prioritize Specimens**

**Activity 96: Prioritize Specimens**

**Activity 97: Prioritize Specimens**

**Activity 98: Prioritize Specimens**

**Activity 99: Prioritize Specimens**

**Activity 100: Prioritize Specimens**

ED reviewed processes for specimen labeling, transport, and orders.  
Changes began in October and were completed in November.

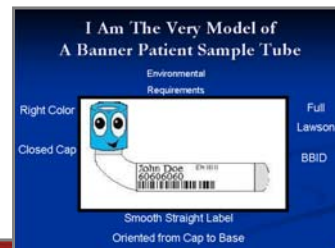
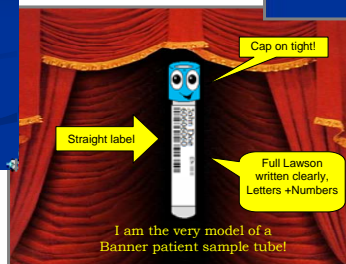
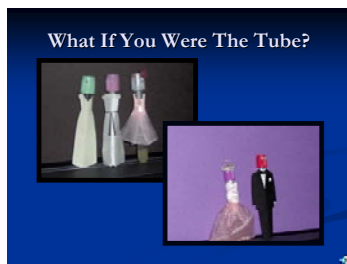
- The Organization
- The Approach
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- Sharing
- Challenges

Lab Sample Labeling PowerPoint.ppt

### Improvement: Emergency Dept

ED focused on expectations for sample tubes.

Team member wrote a song and created a presentation for ED associates.



November was "Be the Tube" Month in ED

## Improvement: ED Processes

### Summary of ED Improvements:

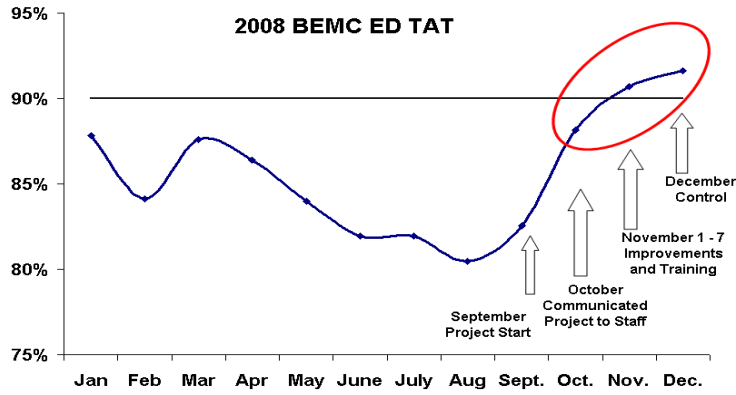
- November “Be the Tube Campaign” focus on expectations for sample labels. Future associates will view presentation.
- ED will use yellow Cerner labels to expedite processing of specimens in lab.
- ED programmed pneumatic tube station to place lab transport code on ‘speed dial’
- ED ordered and will use padding in pneumatic tubes to reduce specimen integrity issues and rework.
- ED-Lab Pilot: Discontinue using “Nurse to Collect” orders for lab specimens so Cerner label prints prior to collection of non-blood specimens
- Nurse Educator working with I.T. to print all ‘nurse collect’ labels to the floor.
- ED to manage Cerner labels printed in ED; the patient will carry their own labels so that labels follow patient when moving to a different room.
- If label reprint is needed, provide lab with ED printer number and lab will send label to printer
- ED Nurse Educator working with I.T. to reprint lab labels from Power Chart
- ED will use their “huddles” to communicate needs for improved TAT.



ED reviewed processes for specimen labeling, transport, and orders.  
Changes began in October and were completed in November.

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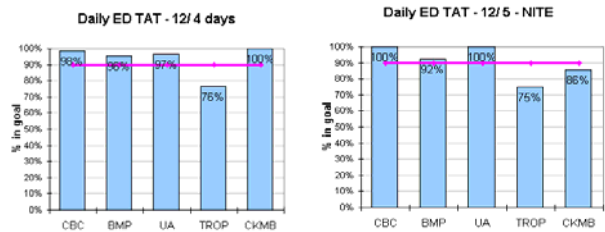
**Control: How did we sustain gains?**



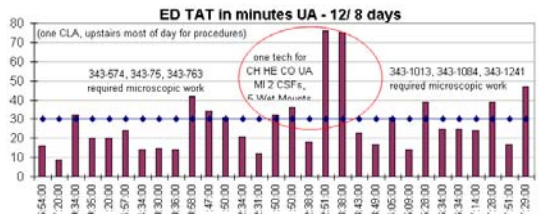
**Overall ED TAT started to improve in October when project was communicated to staff in ED and Lab**

**Overall ED TAT Improved**

**Control: How did we sustain gains?**



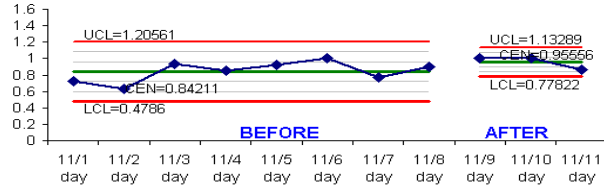
**To confirm that our improvements were continually monitored, ED TAT was checked daily by 12 hour shift and outliers were investigated.**



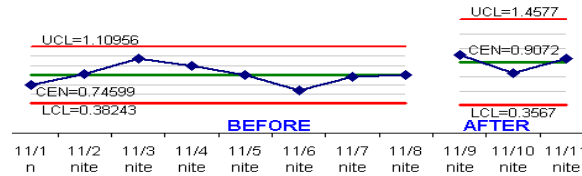
**TAT Information was Provided Daily to Lab Associates**

## Improvement: Daily ED TAT BMP

### BMP ED TAT Day shift



### BMP ED TAT Night Shift



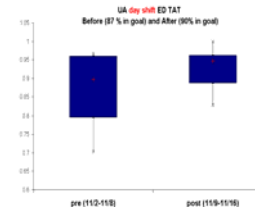
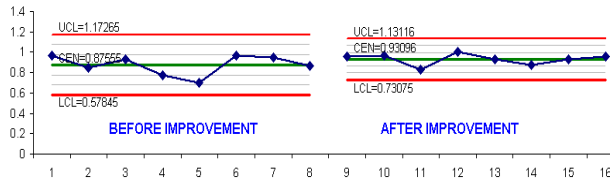
**Daily**      **BMP ED TAT Improved on Day and Night Shifts**

Day Shift BMP ED TAT:    Before 84%    After 95%

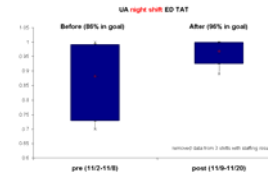
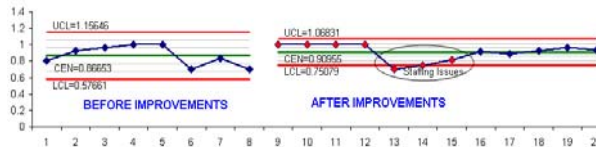
Night Shift BMP ED TAT:    Before 75%    After 91%

## Improvement: Daily ED UA - TAT

### UA ED TAT - day shift - Nov 2008 Individuals Chart



### UA ED TAT - Night shift - Nov 2008 Individuals Chart



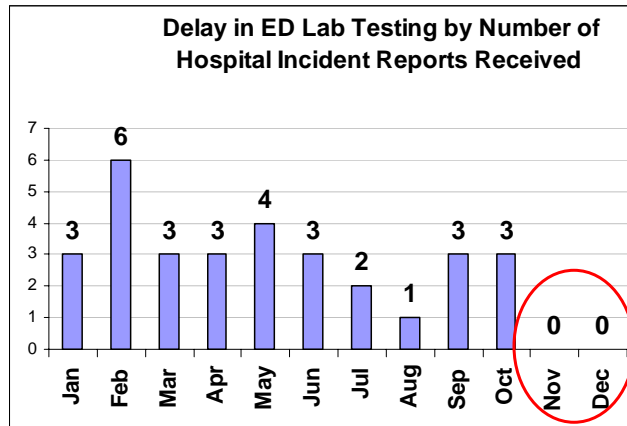
**Daily**      **UA ED TAT Improved on Day and Night Shifts**

Day Shift UA ED TAT:      Before 87%    After 93%

Night Shift UA ED TAT:    Before 87%    After 97%



**Control: Customer Satisfaction**



**Customers Noticed Results of Improved TAT**  
**No Hospital Incident Reports were Received for Delays after Improvements**

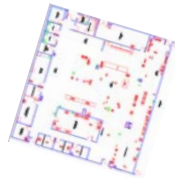
**Key Root Causes / Solutions:**

- Stat specimens were batched for delivery to testing area
- Defects in labels and orders slowed down the process
- Specimens were not consistently prioritized for processing
- First-in-first-out concept was not followed when processing specimens
- Cerner TAT monitor was not consistently used to pull specimens to testing area

**Key Root Causes were Identified**

## Key Learnings

- Pre-analytical cycle time is difficult to capture. Team brainstormed for alternate ways to monitor cycle time.
- Face-to-face training in small groups actively involved employees and facilitated understanding of purpose and quicker adoption.
- User involvement is critical for sustaining results
- As a result of our project, inpatient STAT TAT improved from 91% to 94%.
- Incident reports from ED decreased.
- Lean concepts introduced in the department stimulated ideas for future projects.
- Spaghetti map was completed for future improvements in lab layout



## Team Recognition



**Salene Slader**  
**Project Champion**

Shelley Hanson, Diane Sosa, Amanda Jones, Ajia Sahhar, LaDonya Hinson  
Kathy Cienfuegos, Marisol Morera

**The Team went out for Lunch to Celebrate Success!**



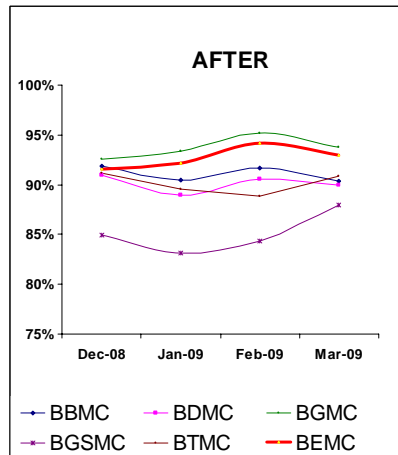
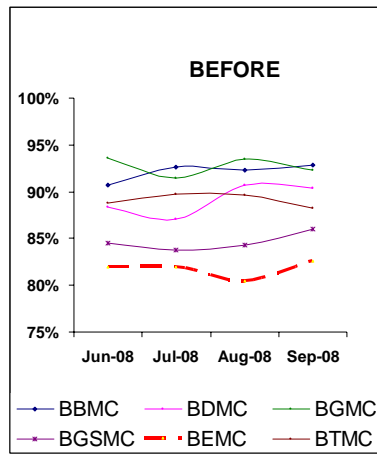
## Team Recognition

Team Member Mandy was Recognized by Banner Estrella Medical Center as a STAR of the MONTH for her Contribution to the Lean Be the Tube Project

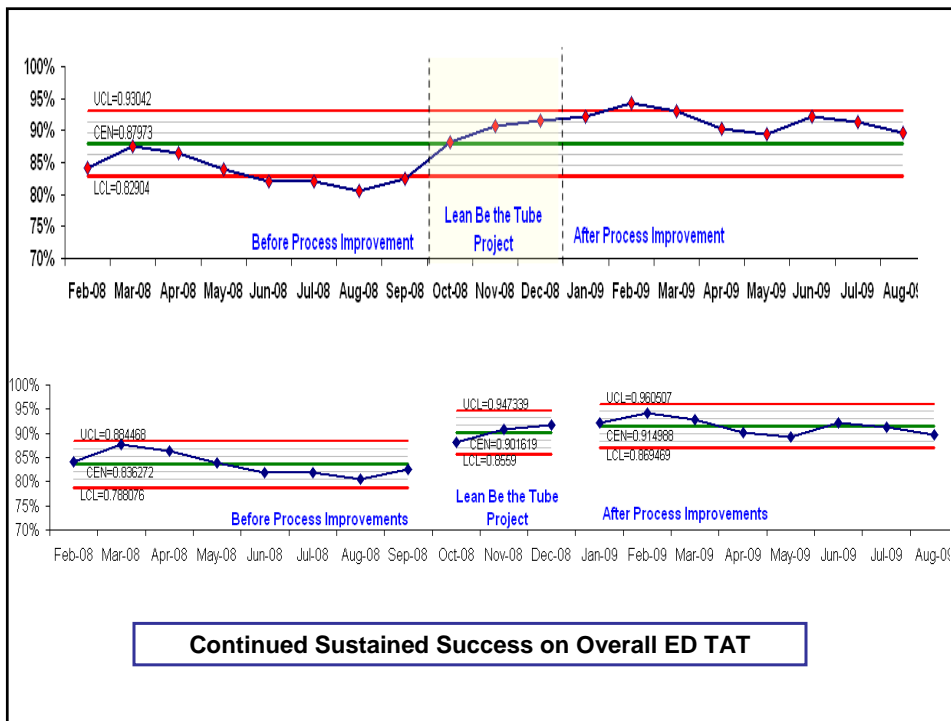


Lean Team was Recognized as STAR Team of the Month in January (picture not available at time of project closure)

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- Challenges

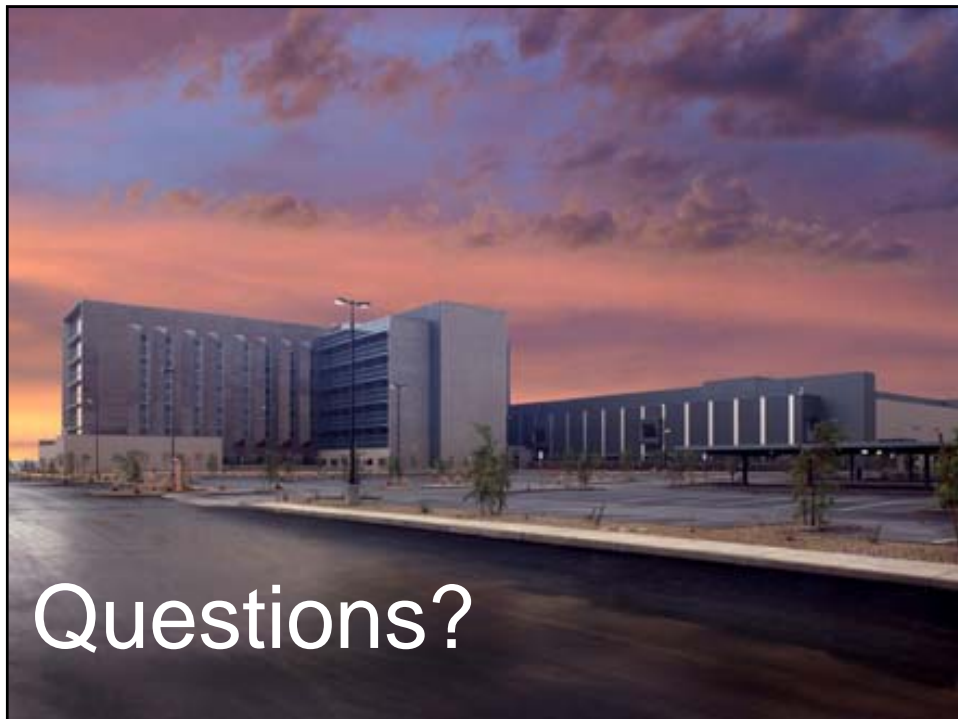


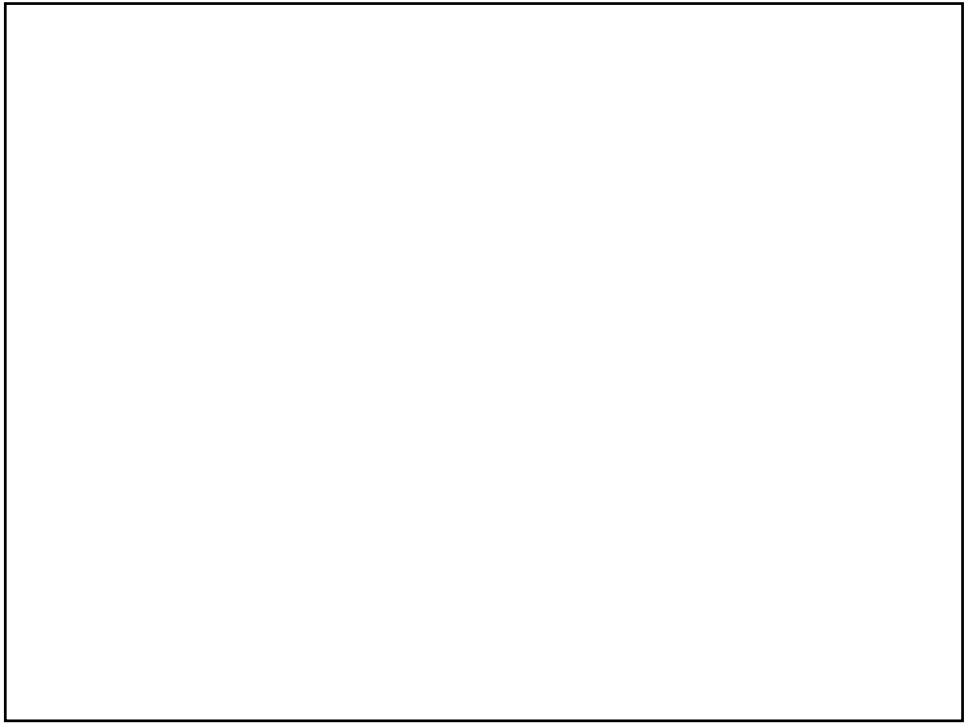
**Overall ED TAT was previously worst among our sister hospitals moved up to be second best**



**Continued Sustained Success on Overall ED TAT**

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- Sharing
- **Challenges**





**Projects align with BEMC and LSA/SQL business objectives**

**Perform error free work, on time, every time**

2008 LSA/ SQL ROADMAP

•2008 BHS Operational Initiative: Increase capacity and optimize throughput

- **Strive for Six Sigma Quality**

- Improve Organizational Performance
  - -Lean Projects /Eliminate Rework
  - -Deploy to Employee Level

- **Improve Work Processes**

- Deploy Anatomic Pathology Initiatives
- Deploy Process Improvement Strategies

PROJECT STORYBOARD →