

Faster Turnaround Times for Troponin and Other Essential Tests:

How We used Real-Time Analytics and Process Improvement to Support Improved ED Outcomes

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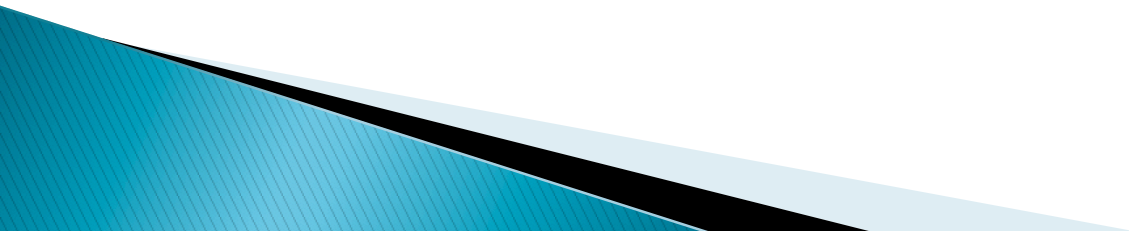
Day 2 – Wednesday, October 2, 2:10PM–3:00PM



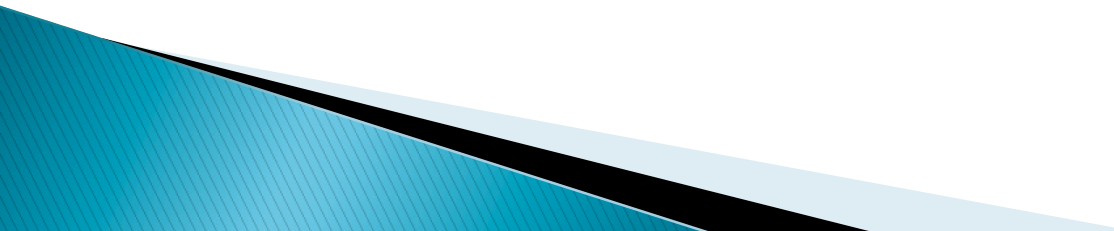
Problem statement:

Turnaround time (TAT) is the most recognized indicator of laboratory performance and service

How do you make and sustain real improvement in TAT of STAT tests?



Seton Healthcare Family

- ▶ Seton Healthcare Family is a not for profit organization that is the leading provider of healthcare in central Texas. There are 10 hospitals in the system including a level 1 adult trauma center and a dedicated level 1 trauma children's hospital
 - ▶ There are 320FTE's working in the laboratory across the network running approximately 3 million tests a year system wide
 - ▶ The laboratories are equipped with Beckman Coulter chemistry analyzers (DXC, DXI and Access 2 analyzers connected to the LIS using Remisol middleware), Sysmex hematology analyzers and IL coagulation analyzers
 - ▶ We utilize the Sunquest Laboratory information system (LIS)
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Background on Troponin

- ▶ Seton runs Troponin on the Beckman Coulter Access analyzers which have a run time from aspiration to completion of about 16 minutes
- ▶ Troponin: A marker of cardiac cell death (elevated in AMI, acute myocardial infarction) utilized in the Emergency Department (ED) and is almost always urgent (i.e. ordered STAT)

The saying in the ED is that “time is muscle”; the reality is that for every minute wasted in making a decision to treat AMI, more heart muscle dies

Definition of TAT intervals

- ▶ Collect (documented time of collection)
- ▶ Receipt (time received in lab computer)
- ▶ Result (time result was released)

Our focus was on the Receipt to Result interval



Previous system of reporting

- 2 business days to produce reports utilizing Excel
- Monthly summary of laboratory results
- Analysis by shift, by department, by test – not by individual
- Emphasis on Mean/Mode results
- No outlier reporting, typically large SD/CV

**Spring of 2012 – Average TAT for Troponin was
45 minutes and the SD was >10 minutes**

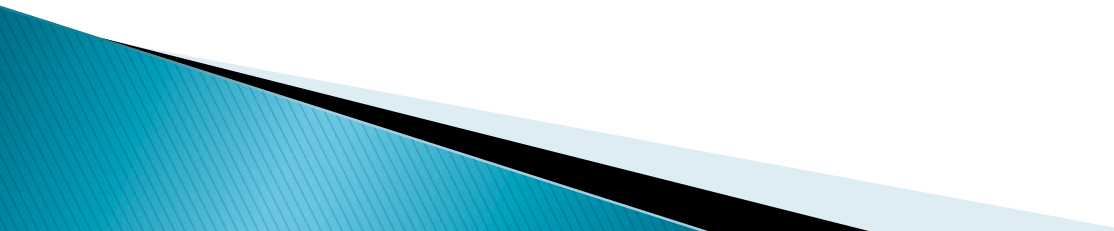
Experience with TAT improvement efforts

- Auto-validation and real-time pending log monitors had resulted in some improvement
- Reports and efforts focused on average, not the number of outliers
- Lack of timely or specific feedback meant very little changed
- Emergency Department accustomed to a lack of sustained improvement in Lab
- Point of care cardiac testing “threat” – estimated to be 250k per year in additional costs at the largest site

**May, 2012 – Average TAT for Troponin was
40 minutes and the SD >10 minutes**



Around the Spring of 2012

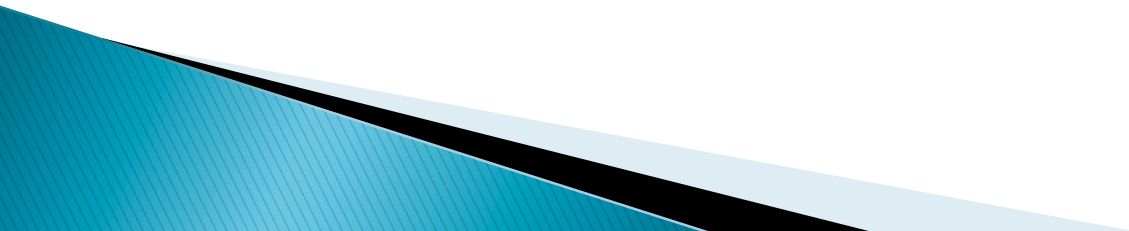
- ▶ Lab had implemented auto-validation and installed monitors in the automated departments to list (real-time) pending tests and their TAT
 - ▶ Seton implemented new Chemistry/Immunoassay analyzers and needed to maximize their performance
 - ▶ Early results of auto-validation were showing some improvement, but variability in performance was still a major issue
 - ▶ Leadership frustrations with current system and lack of reductions in variance
 - ▶ Poor relationship with emergency departments; perception was that laboratory lacked interest in making and sustaining improvements
 - ▶ Potential Joint Commission Core Measure related to Acute Myocardial Infarction (AMI) and the need for faster TAT on cardiac testing
 - ▶ The real potential of more costly point of care troponin testing being implemented in the emergency room
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Visiun (formerly Management Insight Analytics)

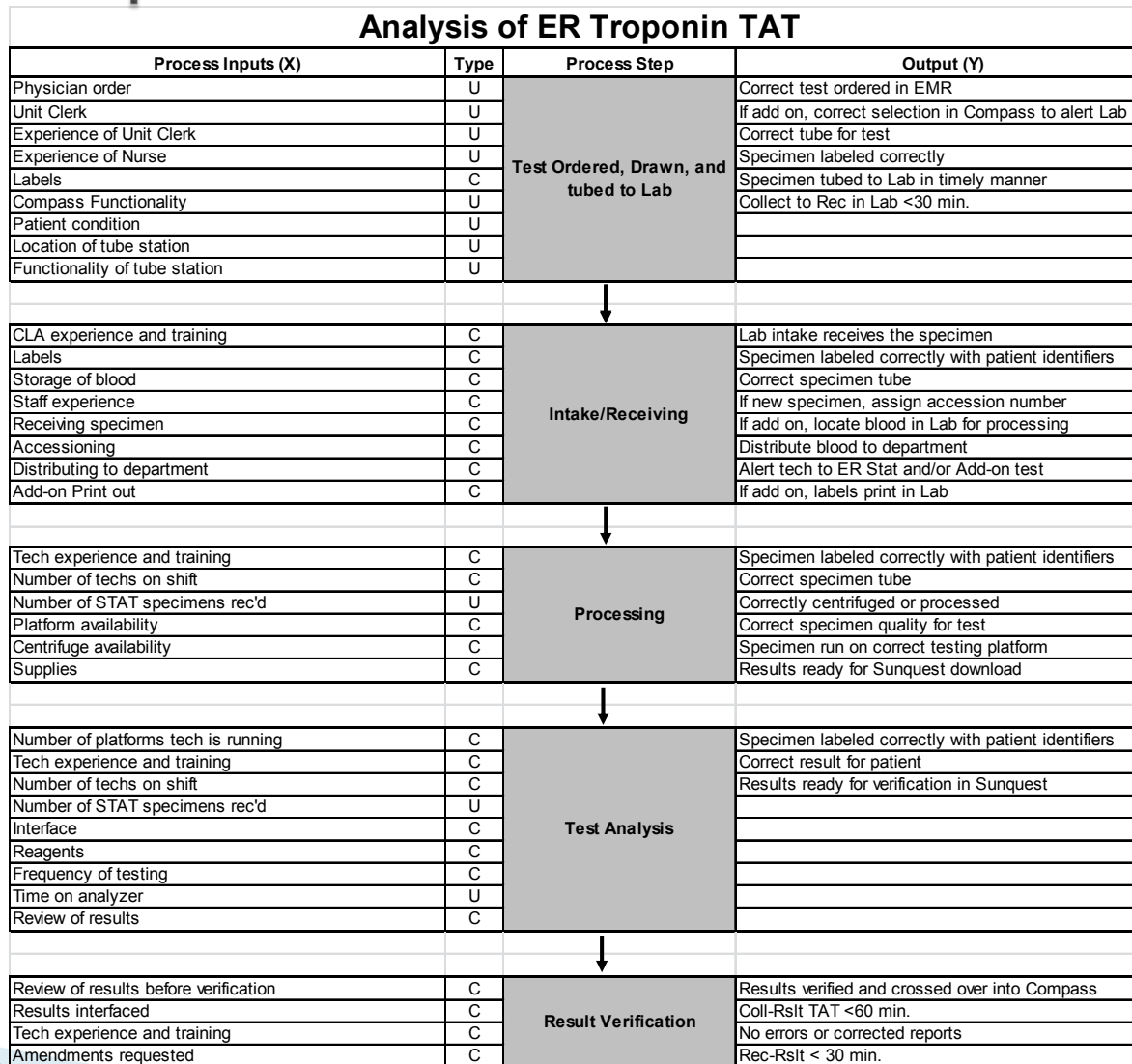
www.visiun.com

- ▶ Because of Beckman Coulter's partnership with Visiun, Seton was able to implement their "performance insights" reporting system
- ▶ Visiun's system provided Seton with *next day* reporting capabilities without creating any system overhead for the Laboratory Information System (LIS)
- ▶ Easy to use "canned" reports for TAT by shift, site, department and test
- ▶ All reports are generated using data from one Crystal report extracted by the LIS each night
- ▶ A scheduled report batch generates all reports and email/print to multiple destinations without any interaction
- ▶ Ad hoc report writer functionality, including benchmarking against peers
- ▶ *Turnaround time reporting is only one feature of the system, there is more functionality, which Seton continues to explore and utilize*

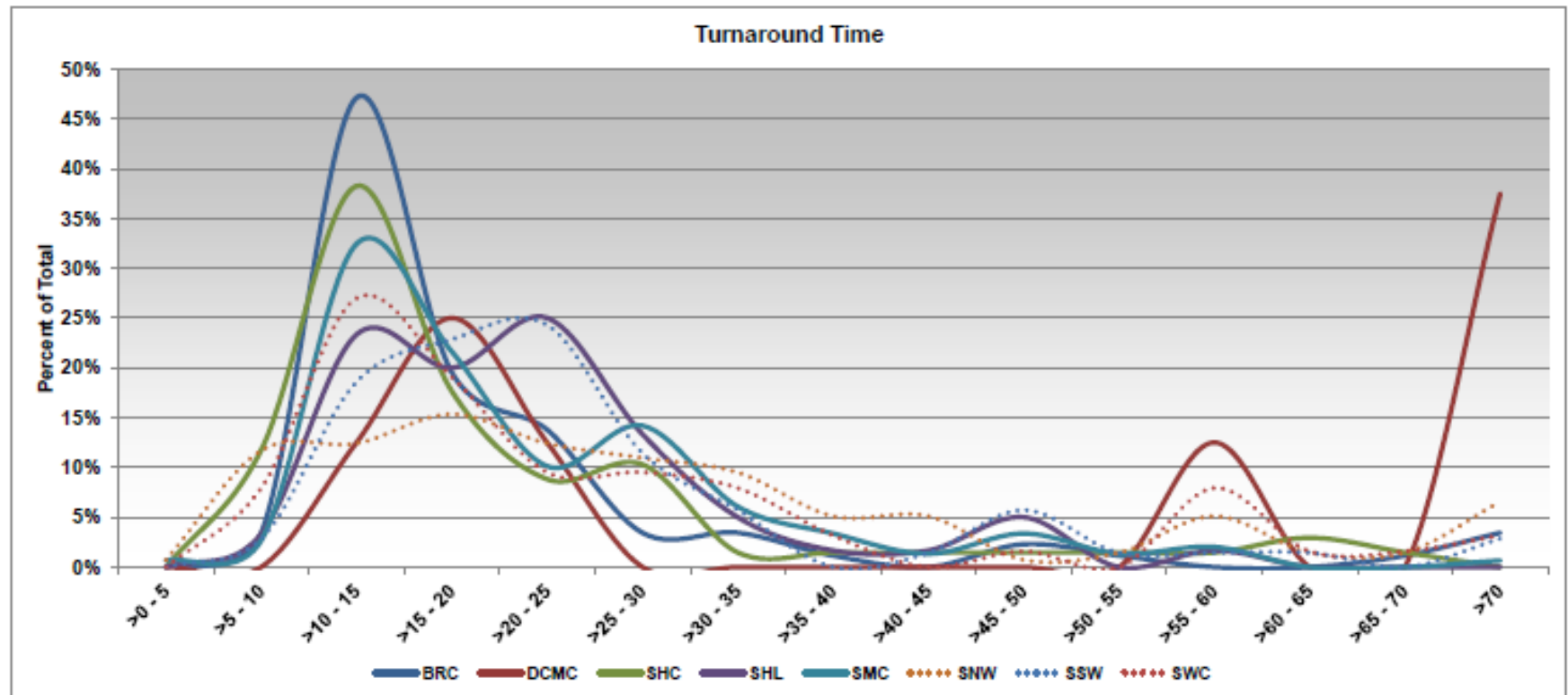
The Tools



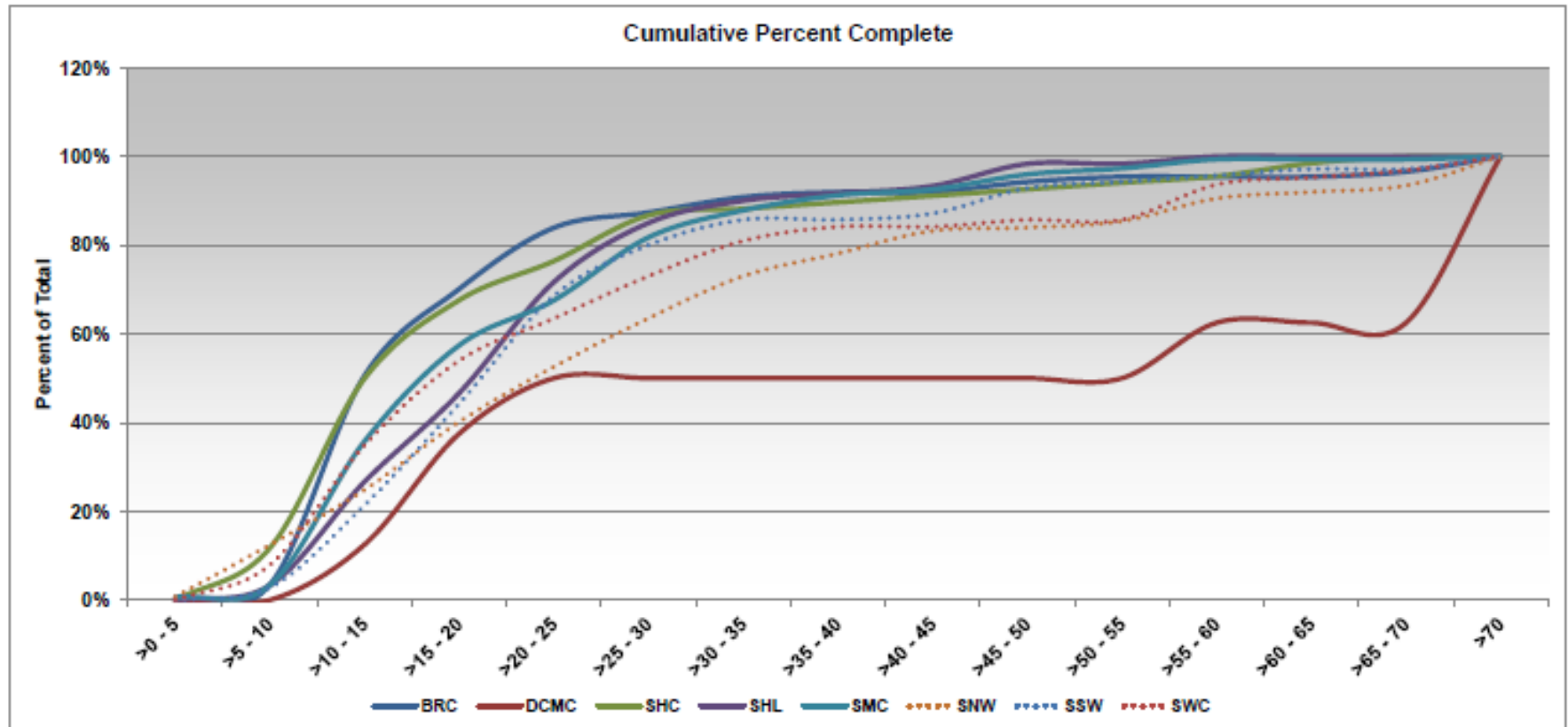
Process Map



Turnaround Time – distribution



Turnaround Time – % completion

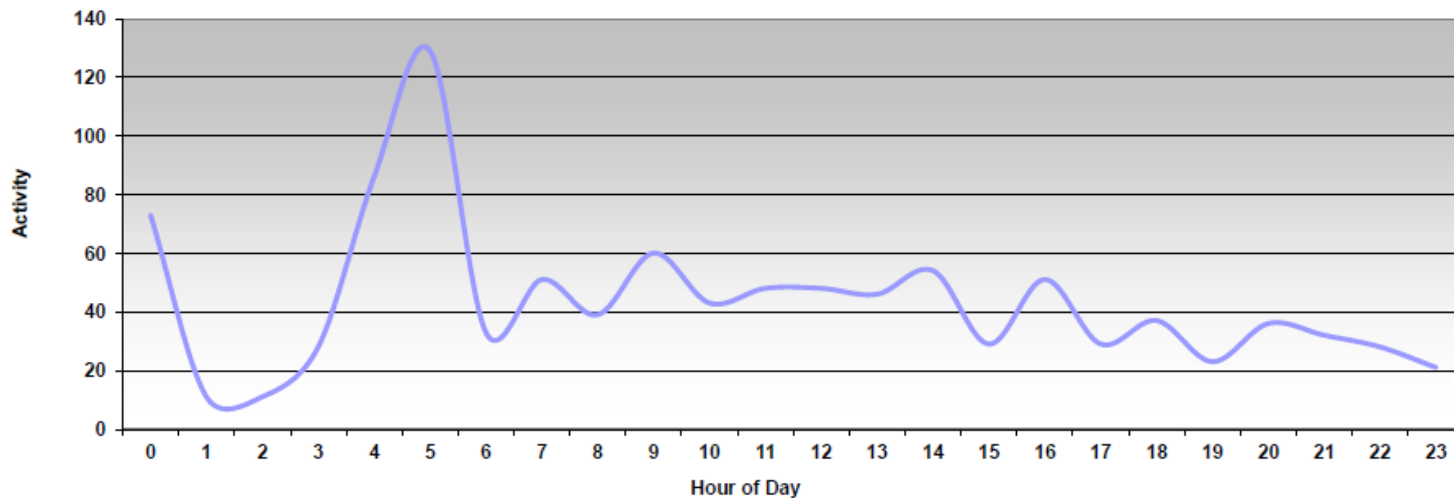


Volume bv hour and tech code

Summary

	All TechIDs
Total (per Period)	1,046
Maximum (per Hour)	143
90th Percentile (per Hour)	86
Median (per Hour)	38
Average (per Hour)	46
Average (per Hour per Tech)	4.7

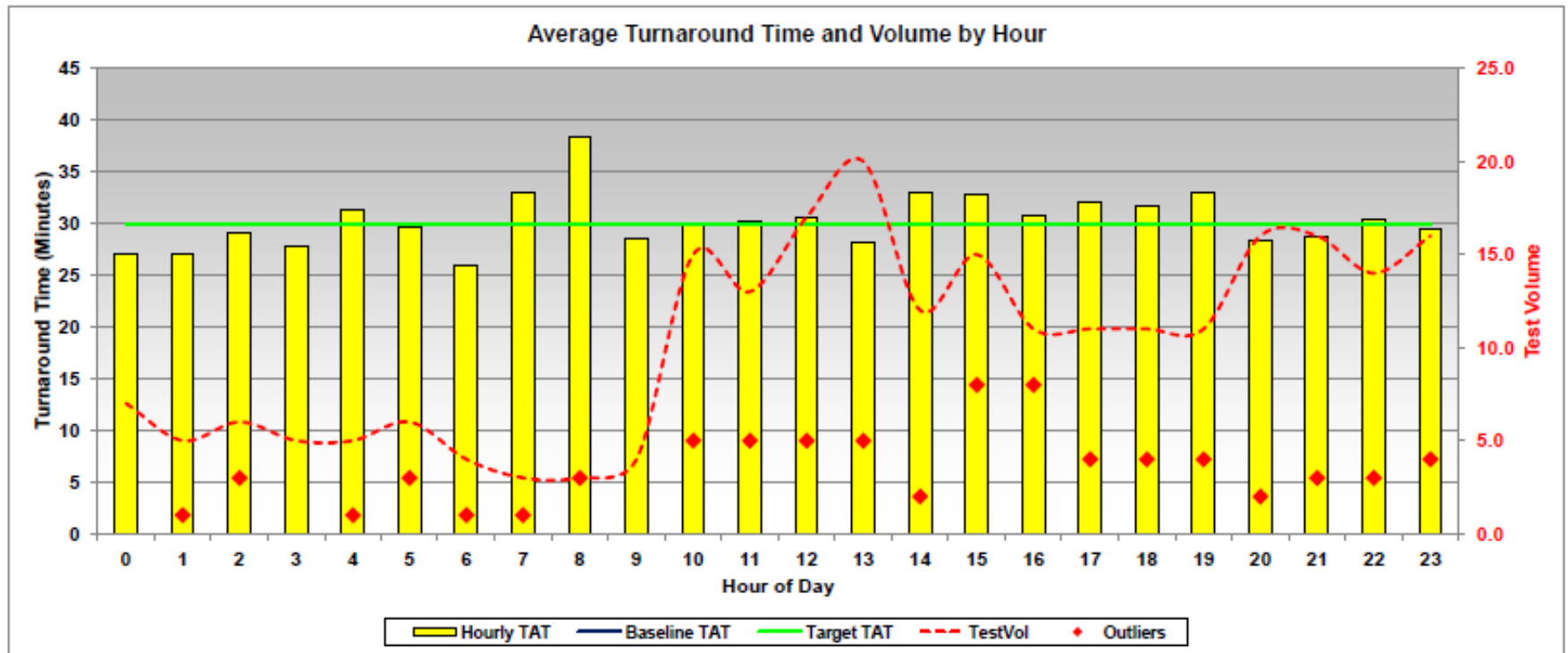
Activity by Hour



Tech ID	Name	Period	per Hour			
		Total	Max	90th Pctile	Average	Pct Total
9999-A	n/a	641	118	38.6	26.7	61.3%
7151-A	n/a	34	4	3.2	1.8	3.3%
4647	GARZ	32	6	6.0	3.2	3.1%
4542	LOYD	28	6	6.0	3.5	2.7%
7047	REYN	27	22	18.4	9.0	2.6%
4724	STEF	26	8	4.8	2.9	2.5%
4685	BRAN	25	5	5.0	3.1	2.4%
4686	MENDE	24	14	10.4	4.8	2.3%

Tech ID	Name	Period	per Hour			
		Total	Max	90th Pctile	Average	Pct Total
4705	MILLS	2	1	1.0	1.0	0.2%
5107	FAZII	2	2	2.0	2.0	0.2%
7138	GUZM	2	2	2.0	2.0	0.2%
8078	GARG	2	2	2.0	2.0	0.2%
1730	JUSIN	1	1	1.0	1.0	0.1%
4427	BART	1	1	1.0	1.0	0.1%
4668-468	n/a	1	1	1.0	1.0	0.1%
4670	REFIL	1	1	1.0	1.0	0.1%

Histogram of TAT/Volume



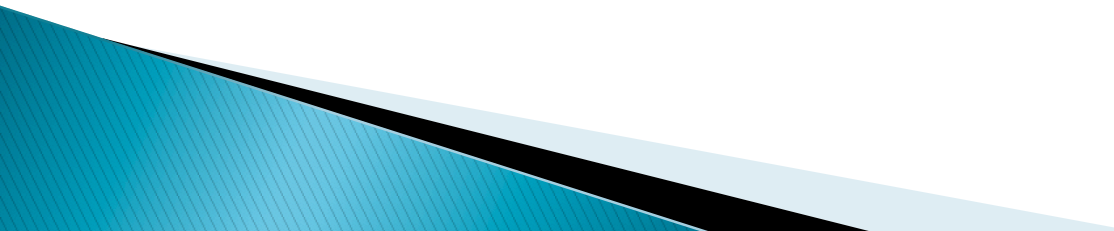
Outlier Report

Date	Test	Spec #	Minutes to Report Results	Code #	Further Explanation	INT

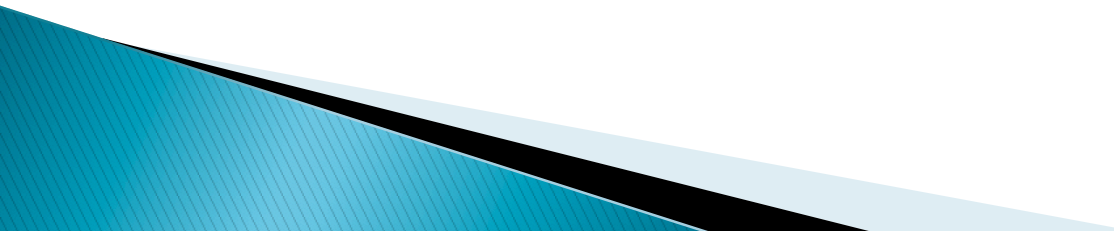
Code

- | | |
|--|--|
| 1. Instrument Down for maintenance or PM | 9. Critical results/Repeat test |
| 2. Computer Down | 10. Manual verified tests/Delta/Hung results |
| 3. Running Controls | 11. AM run delays |
| 4. Left in Centrifuge/Processing delay | 12. Shift change delays |
| 5. Specimen Not Received | 13. Working alone |
| 6. Unacceptable Specimen | 14. Called away from the lab (code, BB draw) |
| 7. Probe Obstruction/Sampling Error | 15. Lunch break delays |
| 8. Dilution Required | 16. Other |

Pointers for TAT improvement effort (1)

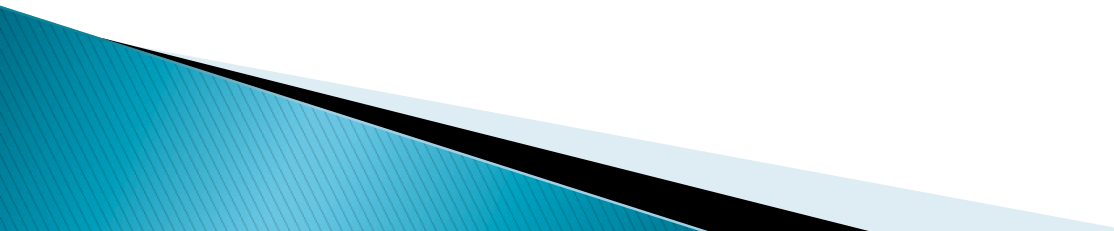
- ▶ Develop a common understanding of the process – map every step and time how long each took (1m labeling, 2m receiving, 8m centrifugation, etc.)
 - ▶ Focus on wasted motion such as walking, waiting, redundant steps, etc.
 - ▶ Share example reports and explain how they will form the basis of an effort to improve TAT performance
 - ▶ Meet with staff, management, stakeholders and leadership – create a “common vision” of what the reports are for, how they will be used and what can be expected
 - ▶ Consider the question of accountability; what will be done if staff members are shown not to be improving while others are, or managerial consequences if sites are shown not to be improving
 - ▶ Ask leadership and stakeholders to reinforce the importance and recognize the efforts and improvements as they happen
 - ▶ Set a start date, be prepared for a few days of “pushback in the form of questions”
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Pointers for TAT improvement effort (2)

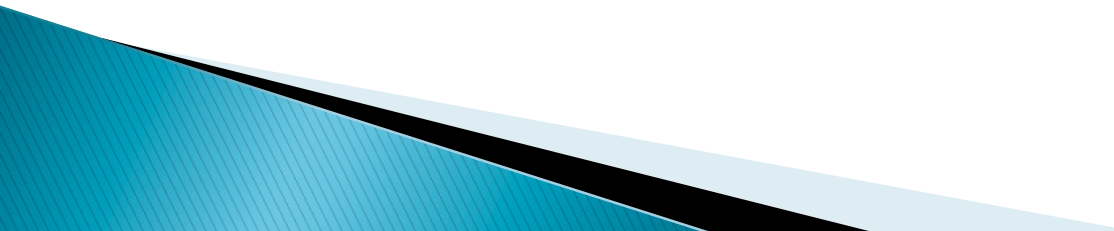
- ▶ Give staff their results, have regular discussions about results and require sharing of ideas
 - ▶ Look for variances in performance between sites, shifts and individuals
 - ▶ Involve leadership AND the people who “do it every day” at the bench
 - ▶ Each individual had to investigate and explain their outlier(s) on their next shift
 - ▶ Early on, turn attention to individual performance – make it the expectation that all staff are to improve
 - ▶ Be ready to work around or through lots of “small” issues – differentiate between what problems will be solved and what will need to be managed but keep re-evaluating
 - ▶ Make the best performers talk with the worst performers
 - ▶ Celebrate improvements but don’t get cocky or too satisfied – old habits die hard
 - ▶ Watch for upstream changes that can help and ask for help from the other departments
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Our Experience

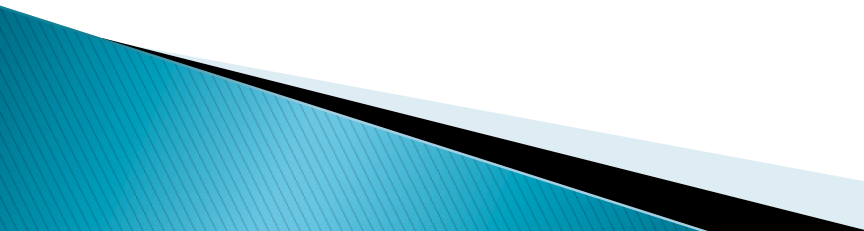
Processes / People

- ▶ Retrained the staff to separate the stat specimens and process them first – this included all areas from specimen intake to the testing areas
 - ▶ Held staff accountable to meet the expectations of the deadlines – including counseling staff for poor performance
 - ▶ Created a quick “investigative” form to be able to collect and aggregate information by using a consistent format with standardized responses
 - ▶ Held the staff/shifts accountable for prompt investigation and reporting of outlier causes
 - ▶ We created a process improvement team with several managers and staff members from different hospitals to review the data
 - ▶ The sites that were performing at a higher level shared their processes with the expectation that others try it and report back
 - ▶ We sent bench staff to other sites to see the processes that were implemented at the more successful sites
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Communications

- ▶ We were consistent and transparent in sharing our successes and failures
 - ▶ We share Visiun reports internally and externally, everyone can see the data
 - ▶ We report the information in our daily huddles that were established at each facility in support of our High Reliability Organizational (HRO) goals
 - ▶ Consistently shared and discussed the reports with the staff
 - ▶ We discussed the outliers with the ED doctors and nursing clinical managers
 - ▶ We eventually created and started emailing the collect to receive reports to the ED physicians and clinical managers so they could help improve pre-analytic performance
 - ▶ We reiterated proper labeling with the nursing staff
 - ▶ We celebrate our days of no outliers
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Equipment / Staffing

- ▶ Purchased Stat Spin centrifuges to reduce “spin” time (3 minute spin)
 - ▶ Made sure backup instruments were available for stat testing when volumes increased
 - ▶ Located the Stat Spins by intake personnel workstations to decrease extra steps
 - ▶ Re-evaluated who should answer phones
 - ▶ Review of pending log monitors to ensure they were focusing attention on stat requests
 - ▶ Revision of work schedules – matched manpower to workload
 - ▶ Management of break/lunch times to maintain appropriate workforce in the laboratory
 - ▶ Some sites placed timers on their centrifuges to alert when centrifuging was soon to be complete
 - ▶ We changed the rules for the auto-validation of results so that individual test results were released as they were completed instead of when ALL tests were complete
 - ▶ We benchmarked our performance against other peers in the Visiun database
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Our Results

June '12 – August '12 comparison (1)

The Performance Insight™ Dashboard Process Change Assessment - Detailed Performance Comparison

Pilot Period: Mon, Aug 27, 2012: 3:48 AM -- Mon, Sep 3, 2012: 3:48 AM

Criteria

Test: TROP I TROPONIN I
Priority: S

Count: 1,161

Jun'12

Aug'12

Measurement: Receive to Verify

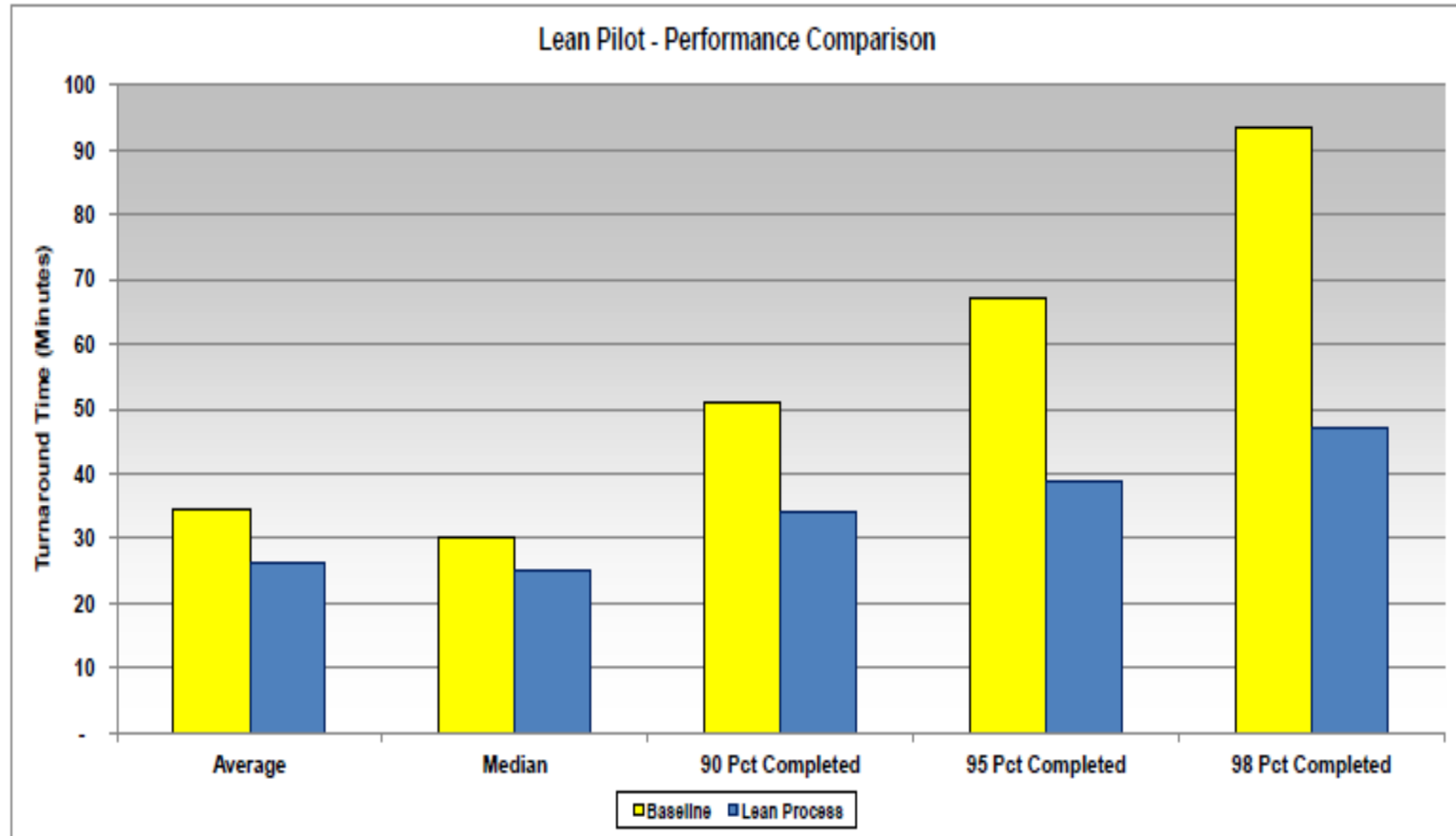
Process Change Summary

	Turnaround Time (minutes)		Pct Change
	Baseline	Lean Process	
Target	30	30	
Average	34	26	-23.4%
Median	30	25	-16.7%
90 Pct Completed	51	34	-33.3%
95 Pct Completed	67	39	-41.8%
98 Pct Completed	94	47	-49.8%
Outliers (above Target)	52.00%	21.19%	-59.3%

Performance
improvement

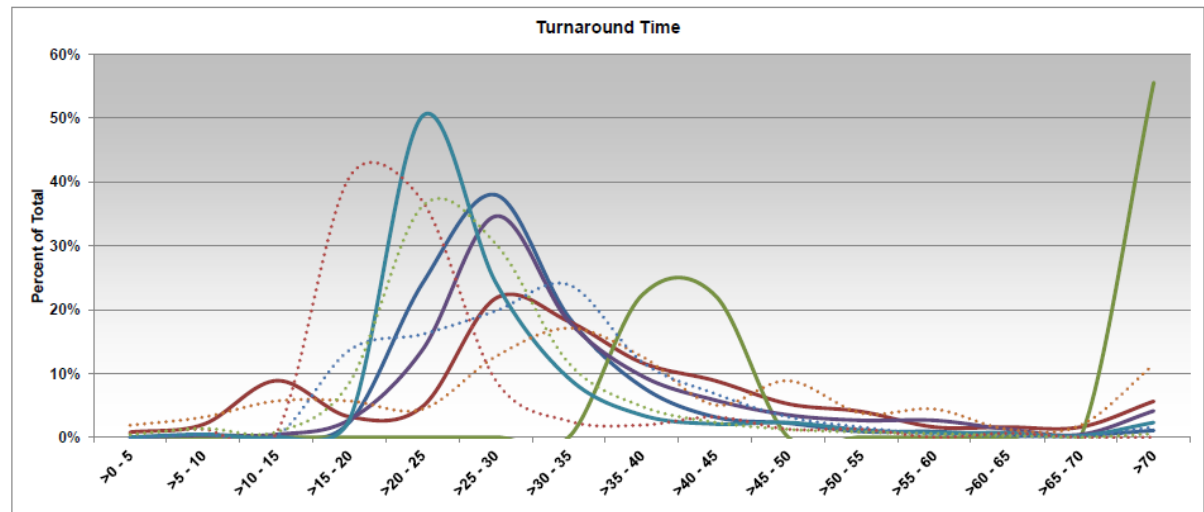
Reduction in
variability

June '12 – August '12 comparison (2)

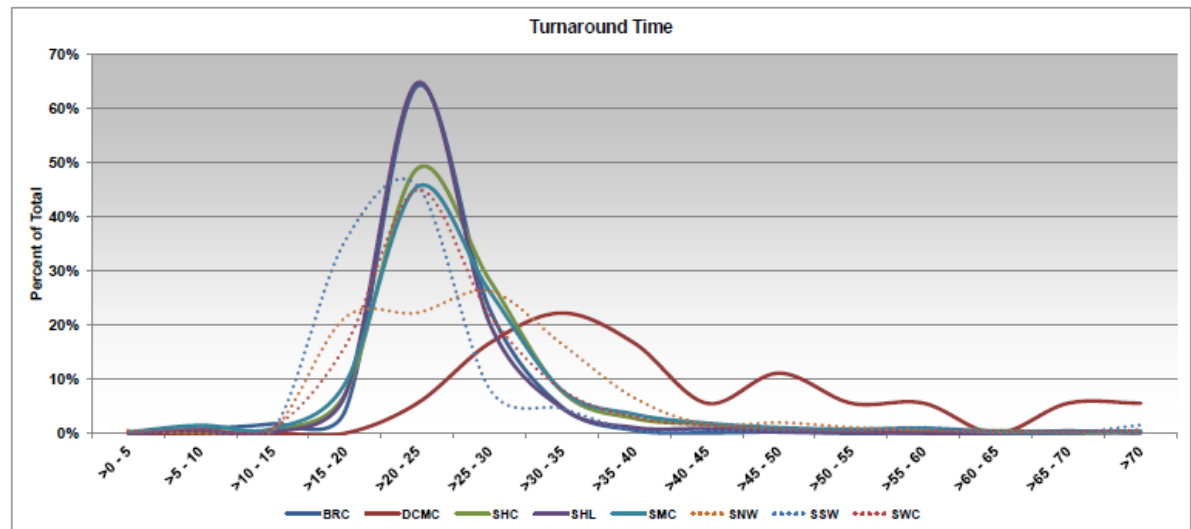


June '12 – August '12 comparison (3)

June '12
Results:



August '12
Results:



Feedback from the Emergency Department

- ▶ ED Medical Director requested that we include the collection to receipt interval in the monitoring reports so he could see how the ED was performing when sending specimens to lab
- ▶ Based on laboratory's reported performance, AMI core measures group and ED medical director concluded there was no need to pursue the point of care testing option

The Emergency department is able to rely on laboratory's consistent performance now ; the almost 15minutes of TAT improvement and significant reduction in outliers has meant faster decision making on AMI patients

Current Performance – August 2013



The Performance Insight™ Dashboard Performance Summary

Report Type: 04

Set #14: BRC Month - The Month of August 2013

Summary Criteria (not exhaustive)					Target		Count		Status
Pat Type/Loc	Test/Priority	Test Loc/Other	Statistic	Other Info	(<=)	% Achv	Actual	Pass	
BRCER	ABC;S		Mean	Receive to Verify	20 min		6.4	2,109	28 Pass
BRCER	BMPNL;S		Mean	Receive to Verify	20 min		12.7	546	21 Pass
BRCER	CMPNL;S		Mean	Receive to Verify	40 min		20.7	1,645	13 Pass
BRCER	POCTRP;S		Mean	Receive to Verify	30 min		.0	-	-
BRCER	TROPI;S		Mean	Receive to Verify	30 min		25.4	856	58 Pass
BRCER	PROTIM;S		Mean	Receive to Verify	20 min		12.3	509	22 Pass
BRCER	HDIMER;S		Mean	Receive to Verify	30 min		16.3	82	3 Pass
IP	ABC;S		Mean	Receive to Verify	20 min		7.5	450	11 Pass
IP	BMPNL;S		Mean	Receive to Verify	20 min		14.5	209	15 Pass
IP	CMPNL;S		Mean	Receive to Verify	40 min		20.9	88	1 Pass
IP	TROPI;S		Mean	Receive to Verify	30 min		24.0	241	9 Pass
IP	PROTIM;S		Mean	Receive to Verify	20 min		13.4	129	6 Pass
IP	HDIMER;S		Mean	Receive to Verify	30 min		16.2	6	- Pass

Current Performance – August 2013

