Vanderbilt University Medical Center Core Lab Kaizen

Helping You Make the Right Work Easier To Do
February 11th – February 13th, 2014
Meet the Event Team

Standing (left to right): Julia Hernandez, Kara Newton, Gail Baxter, Steve Myers, Kristy Petrie and Misty Smith; Seated (left to right): Darla Emberton and Micah Leach.
Event Focus & Objectives

**Problem:** Turnaround times for core lab (Chemistry, Hematology, UA, Coag) are too long for both routine and STAT requests.

**Objectives:**
- Identify opportunities to reduce turnaround times without negatively impacting quality

**Scope:** Specimen receipt in lab to resulted.

**Indicators of Success:**
- Routine turn-around times for Chemistry, UA, Hematology, Coag
- STAT turn-around times for Chemistry, UA, Hematology, Coag
Team Observes Current State

Team goes to “Gemba” to observe and document current state
Team Identifies Current State Wastes

- Samples sorted multiple times before getting on track
- Samples wait for extended times at central drop
- Up to 4 different locations to process samples (causing confusion)
- Accessioners frequently transporting specimens
- Med Techs walking to retrieve samples

44 issues identified during observations!
Current State Map

Issues/waste included for each process step

Process mapped from specimen receipt in lab to resulted
IDEAL Conditions

- STAT and Routine = Same (both processed in equally timely manner)
- Work is performed the same way across shifts
- Less congestion and organized work spaces
- Fewer people handling specimens
- Fewer holding areas
- Properly trained staff
Future State Map

Building on concepts from IDEAL, the team brainstormed for potential improvements.

Improvement opportunities identified for process steps.
Concept Generation

Multiple Design Concepts Generated
# Concepts Prioritized – insert design criteria & priority matrix

<table>
<thead>
<tr>
<th>Customer Priority</th>
<th>Process Design</th>
<th>Central Processing</th>
<th>Decentralized</th>
<th>Combo (STAT)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 9 9 9 1 9 5 5 5 5 9</td>
<td>9 1 9 9 1 5 1 9 9 9 5</td>
<td>1 9 1 9 5 9 1 9 9 9 5</td>
<td>1 5 5 9 9 9 1 1 5 5 1</td>
<td>463</td>
<td></td>
</tr>
</tbody>
</table>
Elements of Final Design

- Spin all STATs offline during accessioning
- One designated processing area for Routines
- Specimens delivered to departments
- Defined transporter job functions & route
- Tube station distribute work to accessioners
Benefits of Final Design

• One designated processing area for routines
• Specimens delivered to departments by transporter
• Reduced congestion
• More uninterrupted time on the bench
• Analyzer ready specimens
• Lead accessioner responsible for all problem solving
• Reduced # racks in chemistry receiving area (from 9 to 3)
• Reduced touchpoints for STATs
Trial Thursday

Preparing “Ready” Racks

STAT accessioning/processing area set-up
# Trial Results

## Received in Lab to Final Result (BMP)

### Metric | Baseline | Trialled
--- | --- | ---
Routine Chemistry (BMP) % Meeting Goal of 120 min | 74% | 91%  
Routine Median (BMP) | 81 min | 55 min  
Routine 90%'ile (BMP) | 169 min | 116 min  
STAT Chemistry (BMP) % Meeting Goal of 60 min | 55% | 58%  
STAT Median (BMP) | 58 min | 55 min  
STAT 90%'ile (BMP) | 100 min | 86 min  

- Baseline – December 2013 & January 2014
- Trial Sample Size
  - Routine (n=275)
  - STAT (n=69)

STATs accounted for 20% of volume during trial period
## Trial Results

<table>
<thead>
<tr>
<th>Activity</th>
<th>Baseline (Jan 30, 2014)</th>
<th>Trialed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessioner out of chair (frequency)</td>
<td>8 occurrences/hour</td>
<td>2</td>
</tr>
<tr>
<td>Accessioner out of chair (total time)</td>
<td>3.6 min/hour avg</td>
<td>24 sec</td>
</tr>
<tr>
<td>Med Tech Walk to central drop or SR (frequency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Coag</td>
<td>10x/hr</td>
<td>0</td>
</tr>
<tr>
<td>- Heme</td>
<td>4x/hr</td>
<td></td>
</tr>
<tr>
<td>- UA</td>
<td>2x/hr</td>
<td></td>
</tr>
<tr>
<td>Med Tech Walk to central drop (time)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Coag (34 steps round trip)</td>
<td>10 sec/trip</td>
<td>0</td>
</tr>
<tr>
<td>- Heme (30 steps round trip)</td>
<td>30 sec/trip</td>
<td></td>
</tr>
<tr>
<td>- UA (40 steps round trip)</td>
<td>40 sec/trip</td>
<td></td>
</tr>
</tbody>
</table>
# Trial Results

<table>
<thead>
<tr>
<th>Activity</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessioner out of chair (8hr shift, 6 accessioners, 2.5 shifts)</td>
<td>384 minutes additional accessioning time</td>
</tr>
<tr>
<td>Med Tech walking to central drop (8hr shift)</td>
<td></td>
</tr>
<tr>
<td>- Coag</td>
<td>Additional bench time per shift:</td>
</tr>
<tr>
<td>- Heme</td>
<td>13min/tech (Coag)</td>
</tr>
<tr>
<td>- UA</td>
<td>16 min/tech (Heme)</td>
</tr>
<tr>
<td></td>
<td>11 min/tech (UA)</td>
</tr>
</tbody>
</table>
Dotplot of Track to Final in min K Pilot
## Trial Staffing

<table>
<thead>
<tr>
<th>TRIAL</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat Accessioning</td>
<td>No Change</td>
</tr>
<tr>
<td></td>
<td>Team member began to accession STATs when volume increased mid-morning</td>
</tr>
<tr>
<td></td>
<td>Chemistry – 41% STAT during trial</td>
</tr>
<tr>
<td></td>
<td>CBC – 22% STAT during trial</td>
</tr>
<tr>
<td>RT Accessioning</td>
<td>No Change</td>
</tr>
<tr>
<td></td>
<td>During 18 observed transporter cycles, 33/627 routine tubes required processing at “central processing” area (note that Immunopath processing occurs after 4:00pm and Reference after 8:30pm)</td>
</tr>
<tr>
<td>Transporter</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Current transporter on PTO, position filled by team member</td>
</tr>
<tr>
<td>Messenger</td>
<td>No Change</td>
</tr>
</tbody>
</table>
Observations during Trial

- STAT placed in rack while Track Master on break, remained until Track Master returned from break
- Labels don’t always reflect the correct routing (i.e. - some therapeutics indicate CH on label but are tested in ES)
- Routine samples come in STAT bags, so tube station has to spend time sorting all samples
- Routines and STATs come in same bag for log-ins
- Need to determine which ES samples are aliquotted in processing area vs on automation line
- Visual aid for central processing to clarify when specimen is a short sample
Additional Actions

• Automation line maintenance/QC
  – Evaluate running maintenance/QC at low volume times
  – Evaluate frequency of QC
  – Determine capacity of aliquotting online

• Running out of reagent
  – Develop standard work for core lab
  – Develop stock list with quantities

• Align shift-to-shift scheduling with demand for Track Master/Dry Tech, Stat Bench

• Develop standard work to shift-to-shift hand-off
Recommendations/Next Steps

• Move forward with reducing the number of racks at chemistry drop-off
• Move forward with transporter
• Maintain temporaries at tube station to distribute work
• Continue spinning STATs (requires smaller centrifuges)