Using Teamwork to Improve Turnaround Time in an Automated Transfusion Service

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Transfusion Services

• CLS Training Program with
  • San Jose State University
  • San Francisco State University

• AABB Accredited
• CAP Accredited
• Magnet Recognized
Transfusion Services Serves...

Stanford Health Care
- 613 beds
- > 55,000 transfusions in 2015
- Specializing in rare & complex disorders
- New facility to come 2018

Lucile Packard Children’s Hospital
- 311 beds
- > 17,000 transfusions in 2015
- Specializing in pediatric and obstetric care
- New facility addition to come 2017
For Today’s Discussion

• Brief history on Stanford TS automation implementation
• Summary of issues related to automation and discovery of new issues
• Overview of the process that helped us solve these issues
2005: Galileo Implementation

• Switched from Manual to Automated
• Initially running both routine and Stat type and screens
• Results?
  • Not meeting TAT
2010: Echo Implementation

- Additional Automation
- Added Stats to Echo
- Galileo eventually retired
- Results?
  - TAT still not met
2011: Removed Manual Serology

- Workflow changed to remove:
  - Basic serological XM
  - Antigen typing
  - Elution studies

- Results?
  - TAT still not met
2014: Neo Implementation

- Placed Neo alone, close to specimen processing
- Ran all stats on Neo
- Ran all routines on Echoes

Results?
  - TAT still not met
2015: Change the Process with Neo/Echoes

- Moved the Neo to the front line linear with Echoes
- 3rd Echo reserved for ABID, and backup for stats
- Results?
  - TAT still not met
A3 Problem Solving for TAT and Serology

1. Identify Problem
2. Identify Causes
3. Prioritize Causes
4. Form Solutions

<table>
<thead>
<tr>
<th>1. What is the problem/GAP that needs improvement?</th>
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<td>Process:</td>
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<td>1) Dataflow, Statics, Unassigned, Routines (no run stats)</td>
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<td>Communication hierarchy violating, Documentation lacking (why state TAT not met)</td>
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Identify Problem - Gap Analysis

Problem Summary
• Type and Screen TAT not met
• Manual serological skills declining
• Reference duties increased

Problem Examples
• CLS roles and duties unclear for:
  • Transfusion reactions
  • Cord blood
  • BMT ABO Rh
• ‘Paper trail’ distracting
• Undocumented failed TAT
• Minimal structured communication
Identifying Causes

People (CLS)
- Competency being lost
- Lack of organization and teamwork
- No communication hierarchy

Process
- Stats: Unassigned and grouped with routines
- Routines: Unassigned and run as they come
- No documentation for missed TATs

Communication

Documentation
Previous Workflows

• We only looked at the specimen as the problem
• We tried to address specimen flow, but not how to handle the specimens
• Personnel roles were not addressed
• We didn’t consider other variables
• We were trying the same thing over and over, expecting a better TAT
Summary of What We Have Done

- Multitude of different workflows
- Altered where the specimen ran
- Increased paperwork that accompanied the specimens
How Did We Approach the Solution?

• Trying the same thing over and over and expecting a different outcome
Based on A3

We needed to look at:
• Staff roles
• Communication
• Document failures
• Skills

To address:
• Teamwork roles impacting the automated line
• How communication is vital to processes and organization
• Tracking and trending with documentation
• Reintroduction of manual tasks
• How too many rules at work keep you from getting things done
• Yves Morieux – Senior Partner and Managing Director of Boston Consulting Group (https://bcg.com)
Yves’ Key Analogy

- 2003 Women’s USA sprint team
  - USA had the fastest individual sprinters in the world
  - Predicted to win
- Why didn’t they win?
  - Lacking Teamwork
  - Inefficient baton handoff
“When people don’t cooperate, don’t blame their mindsets, their mentalities, their personality—look at the work situations”

– Yves Morieux
Interested in Yves’ TED Talk?

http://www.ted.com/talks/yves_morieux_how_too_many_rules_at_work_keep_you_from_getting_things_done
A3 Causes: Analysis and Prioritization

• Asked staff:
  • What are the problem areas
  • What is works best for you

• Staff defined problem areas differently

• Staff using their own process

• Routine and stat specimens processed similarly
A3 Solutions

• Teamwork:
  • Define roles

• Process:
  • Organize how type and screens are handled
  • Add manual serology
  • Define communication responsibilities

• Documentation:
  • Use defined specimen path and communication
  • Document failures

• Skills:
  • Retrain CLS manual serology
  • Reference continues to do more complicated crossmatches
1. What is the problem/GAP that needs improvement?

1) TAT of 90% for Type and Screen not met
2) CLS are losing serological crossmatching skills
3) Reference needs time to maintain SCARF and Chemicals

2. What are the causes preventing reaching the target(s)? What is the root cause?

Human
1) Competency being lost
2) Organize & teamwork

Process
Workflow
1) Stats: Unassigned
Routines: ran as stats

Communication hierarchy missing

Documentation lacking (why stat TAT not met)

Communication

Documentation

3. Based on the data, what are the causes in order of importance?

i. Human – missing defined roles, organization and teamwork, competency
ii. Process /Communication – Stats: grouped in pairs, Routines: no defined time to perform
iii. Documentation – not defined
iv. Reference doing majority of serology

4. What actions will address the most important causes?

1) Teamwork: emphasis on communication and retraining
2) Process: Organize how Type and Screens are handled, add serology. Communication vital
3) Documentation: use defined specimen path and communication. Document failures
4) Reference: continue complicated crossmatch
A3 Actions

Teamwork

Streamline

Document

Skills
Implementing A3 Solutions

Roles

Duties

Recovery

Kaizen
Defining Direct Roles and Duties

Neo
Echo
Serology
EXM
Defining Indirect Roles and Duties

Specimen Processing

Charge LA

LA

EXM
Address Extraneous Duties in Automated Line

- Orphan Orders
- Pairs
- Recovery
- Kaizen
Address Extraneous Duties in Processing

- Orphan Orders
- Charge LA
- Recovery
- Kaizen

Kai
Zen

Change
Good

改
善

Pull The Cord
Tech 1: “Neo”

- Automated line conductor
  - In charge of stat type and screens
  - In charge of routine testing
  - No manual testing
  - Responsible for two instruments:
    - Neo
    - Echo
- Monitor where the stat is along the TAT timeline
- When needed, they will communicate with “Echo” CLS for help
Tech 2: “Echo”

- Lead for routine manual testing
  - Blood type verification
  - Transfusion Reaction
  - Short draw specimens
  - DAT
  - Instrument equivocal and NTD reactions
  - Specimen conversions
- Responsible for
  - Echo 14 Automation

- Back up to Neo CLS
- If help is needed, will communicate with Serology CLS
Tech 3: “Serology”

- Responsible for:
  - Manual testing
    - Manual ABID R/O
    - Serological XM
    - Elution studies*
  - Performs Echo ABID
  - Echo 29
- Backup to Echo CLS
- If help is needed will hand off manual serology to Reference and work on stats
Tech 4: “EXM”

• Lead of electronic cross matching
• Responsible for:
  • Orphan RBC orders
  • Electronic crossmatch
• Covers breaks for Neo, Echo, and Serology Techs
Last, but not Least

- Anyone can pull the cord
- When?
  - Instrument down
  - QC fail
  - Unexpected workload
  - Unexpected emergency
- What?
  - Regroup
  - Form a plan for the situation
  - Execute
  - Will incorporate supervisor if needed
Early Stage Results?
• **Efficiency increased:**
  • First Month:
    • >1500 stat type and screens performed
    • TAT Goal of 90% met (actual TAT = 94%)
  • Second Month
    • >1400 stat type and screens performed
    • TAT Goal of 90% met (actual TAT = 94%)

• **Productivity increased:**
  • Basic serology, ABID, and serologic XM added back to the automated line (Serology CLS)
Significance for the Future

Stanford 2018

LPCH 2017
“Coming together is a beginning; keeping together is progress; working together is success.”

Henry Ford, Lean Process Pioneer
“...employees are offering a very important part of their life to us. If we don’t use their time effectively, we are wasting their lives.”

Eiji Toyoda, former Toyota president and cousin of Kiichiro Toyoda