Laboratory Turnaround Time

Challenges Encountered in Workflow

Arielle Fisher and Lia Petrose

Discussion

Why?
- improve overall performance of laboratory testing
- reduced delays in test testing cycle
- help to quantify analysis of turnaround time

Flowchart Image
Why?

- improve overall performance of laboratory testing
- understand delays in total testing cycle
- require quantitative analysis of turn around time
T1

Time of Order

Documented by research assistant rounding with medical team
T2

Time arrived at lab

Documented using electronic time stamp in reception area of lab
T3

Time Results Available

Documented using an electronic time stamp with black ink in reception at lab
T4

Time Results Reviewed

Documented by research assistant rounding with medical team
The original goal...

- round with doctors for 12 days
- assess tests ordered and results reviewed
- manually record T1 and T4
Dry Run

- test data collection tools
- test the study protocol
- refine protocol for future study
Findings

- ~50 ordered test over 4 days
- 5 'complete' data points

<table>
<thead>
<tr>
<th>Ward</th>
<th>Test Ordered</th>
<th>Ordered (T1)</th>
<th>Received (T2)</th>
<th>Results Available (T3)</th>
<th>Results Reviewed (T4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4B</td>
<td>U &amp; E</td>
<td>(5/26) 10:07 a</td>
<td>(5/26) 10:43 a</td>
<td>(5/28) 9:05 a</td>
<td>(5/28) 9:02 a</td>
</tr>
<tr>
<td>4A</td>
<td>FBC</td>
<td>(5/26) 10:45 a</td>
<td>(5/26) 2:44 p</td>
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Challenges Encountered

- difficult to collect *complete* data points
  - unable to round with all teams
- various lab test ordering processes
- different doctors = different processes
- several challenges in overall workflow
Doctor decides to order test
Lab order form is written

- not enough forms, no central location, incorrect departments
- multiple processes regarding filling out of form
  - (1) Dr. fills out form at point-of-care and attaches it to patient's chart
  - (2) Dr. fills out form at point-of-care and draws sample
  - (3) Dr. fills out lab form following completion of rounds
  - (4) Nurse fills out lab form when sample is drawn
- Redundancy in transcription
  - written on patient chart, lab order form, specimen tube
Samples are drawn

- confusion: who draws samples?
  - doctors: draw samples during rounds
  - nurses: draw samples that are ordered in patient's chart
  - medical students: draw samples while rounding with doctors
- spatial issues
  - specimen tubes, gloves, and syringes not readily available
  - students/interns travel to nurses station to collect materials
- unshaken vials led to clotted blood
Order form and sample are coupled; brought back to designated location

- designated location: the table in front of the nurse's station
  - table is cluttered with other papers, tubes, and supplies
  - order forms slip under supplies, fly off the table, get lost
- samples and forms once again separated and stored
- box is periodically checked to see if samples are ready for transport
Porter transports samples to lab

- samples are sorted on the desk in front of the nurses station
  - several lab forms per one sample (for multiple tests) causes confusion with porter
  - porter matches samples with 1:1 ratio so any lab forms without a sample are discarded
- process occurs several times throughout the morning
  - samples are batched
    - then taken down once in the morning and once after rounds
- doctors sometimes choose to transport the samples themselves to expedite the process
Samples arrive at lab

- porter gives samples and lab order forms to the reception desk
  - sort and record all samples
  - mismatched order forms are discarded
  - clotted samples are either returned to porter or processed then rejected
  - the rest are sorted by department and sent out
- departments conduct tests and send the results back to reception
- reception records results and puts them in pigeon holes for collection
Porter picks up results and returns them to the ward

- porter finds previous results and picks them up after dropping off new samples
- brings the results back to the ward and places them in the results box in the nurse's station
  - box is full of old results, hard to tell which are new
  - new results are just added on top of the pile
Ward clerk returns results to patients' charts

- ward clerk retrieves results from the result box
- goes from room to room and says the name of the patient
- once patient is found, clerk staples result to patient chart
  - some patients are asleep/away from bed and do not hear the ward clerk
  - usually done after rounds so doctors miss the results that arrive that morning
- doctor reviews the results the next day, during rounds
Discussion

- Observations revealed possible areas for system strengthening
- Confusion and consistency of processes are primary barriers
  - *Suggestions for improvement*

(1) [Image]

(2) [Image]

(3) Specified time points for porter to check for samples ready for transport
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Why?
- Improve overall performance of laboratory testing
- Reduced delays in test testing cycle
- Real-time quantitative analysis of turn-around time

Why?