Reducing Wait Times for Ultrasound Examinations

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Disclosure

The authors have no actual or potential conflict of interest in relation to this poster/presentation.
Introduction

A radiology department satisfaction survey was conducted with 543 respondents. Results were broken down by modality, revealing that the Ultrasound department had the poorest performance for taking in patients on time for scheduled appointments. With 36% percent of scheduled ultrasound exams being taken in late, compared against 12% department wide.

These factors contribute to decreased patient satisfaction, patients leaving without being seen, delays in patient care and reduced staff morale. To fix this problem a quality improvement initiative was undertaken to reduce wait times for patients undergoing an ultrasound.
Background

To get a better understanding of the problem two weeks of sample data was analyzed. This 600 exam data set looked at the time of arrival, the scheduled start time of the examination, and the actual start time of the examination.

Analyzing this data revealed:

- 80% of patients arrive on time or earlier than their scheduled appointment time.
- 39% of patient's arrived 30 minutes or more before their scheduled appointment. This fact likely contributes to the patient perception of long wait times.
- Outpatients are exceeding a 25 minute wait time for their scheduled appointment 44% of the time.
Methods

Goals for reducing outpatient wait times by 10% and ED patient wait times by 5% were established. A root cause analysis was performed at a staff meeting to help focus the team on the task at hand (see the Ishikawa diagram on the next page). Idea Board huddles and staff meetings were used to both brainstorm and subsequently select the following improvements to the ultrasound workflow:

• Each ultrasound technologist was assigned a specific type of examination for the day (i.e., Inpatient Adult, Outpatient Adult, ED) and would be responsible for all scheduled examinations in that category. In contrast to the prior system of having a pool of technologists pulling the next available patient once their room had been turned over.
• Standardized work was created for Urgent Schedulers to prevent unnecessary phone calls to technologists throughout the day.
• Using tools built into the pacs for more effective and reliable communication across shifts.
• Overnight technologists now schedules appointments for all patients that were unable to be scanned during their shift.
• ED patients are to be scanned in the ED Ultrasound room to eliminate delays caused by transport.

Staff feedback at bi-monthly staff meetings was instrumental in implementing continued improvements using a PDSA cycle.
ED patients are being seen in the outpatient area (transport delays).

Cause:

- Man
  - Radiologists often ask for repeat images
  - Not all staff are qualified to do all exams

- Methods
  - Patients are not taken in the order in which they were scheduled
  - ED and inpatients are being called down randomly with no plan
  - Ineffective communication between shifts
  - Ineffective communication between front desk and technologists

- Materials
  - New infection control requirements for US equipment can lead to room turnover delays
  - Probes needed for a specific exams often not in room

- Machines
  - Older US machines
  - IT issues lead to delays

Effect: Patients are waiting too long.
Results

Pilot results were above goal, with average outpatient wait times dropping from 14 minutes to 11 minutes (21% improvement, (p < .05)) and average ED patient wait times dropping from 93 minutes to 67 minutes (28% improvement(p < .05)). The inpatient group saw the least improvement with wait time dropping from 452 minutes to 382 minutes (15% improvement(p < .05)).

When the staff was informed that the wait times had been successfully reduced, most technologists felt that the improvement were due to a “slump” in the volume of cases, rather than the implemented changes. Interestingly the volume of cases was actually 5% higher than it had been in the two months prior to the pilot. One explanation for this is that the changes decreased the perception of effort and fatigue amongst technologists.

The improvements also appear to be durable, as wait time reductions have persisted beyond the Pilot Phase (“Post Pilot”).
### Pre-Pilot (3/20/17 - 3/31/2017)

<table>
<thead>
<tr>
<th></th>
<th>Exams (n)</th>
<th>Ave. Wait Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatients</td>
<td>340</td>
<td>14.2 min</td>
</tr>
<tr>
<td>Inpatients</td>
<td>110</td>
<td>452.5 min</td>
</tr>
<tr>
<td>ED Patients</td>
<td>150</td>
<td>93.3 min</td>
</tr>
</tbody>
</table>

### Pilot Phase (4/3/17 - 6/3/17)

<table>
<thead>
<tr>
<th></th>
<th>Exams (n)</th>
<th>Ave. Wait Times</th>
<th>Change</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatients</td>
<td>1363</td>
<td>11.4 min</td>
<td>21.4%</td>
<td>0.022274</td>
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<tr>
<td>Inpatients</td>
<td>426</td>
<td>374.5 min</td>
<td>17.1%</td>
<td>0.002547</td>
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<tr>
<td>ED Patients</td>
<td>581</td>
<td>65.3 min</td>
<td>29.8%</td>
<td>0.000011</td>
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### Post Pilot (6/4/17 - 9/30/17)

<table>
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<tr>
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<th>Change</th>
<th>P-Value</th>
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</thead>
<tbody>
<tr>
<td>Outpatients</td>
<td>2784</td>
<td>11.9 min</td>
<td>15.3%</td>
<td>0.008447</td>
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<tr>
<td>Inpatients</td>
<td>900</td>
<td>342.7 min</td>
<td>24.2%</td>
<td>&lt; 0.00001</td>
</tr>
<tr>
<td>ED Patients</td>
<td>1483</td>
<td>71.0 min</td>
<td>23.7%</td>
<td>&lt; 0.00001</td>
</tr>
</tbody>
</table>
Discussion

With the current marketplace and payment models it is not enough to only provide patients with high quality examinations and interpretations. Improving the overall patient experience is essential. Although our quality improvement initiative focused on and successfully improved ultrasound wait times, the methodologies used can be applied broadly.

Using ideas from the individuals who provide direct patient care, not only improves relevance, but serves to establish “buy in” essential for the success of any systems change.