Back To The Future: Improving Reading of Screening Mammograms With a Batched Workflow Utilizing a Live Reading Room Transcriptionist

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Background

• Screening mammograms contribute to a large workload in the breast imaging department
  - Approximately 500-600 mammograms are performed each week

• Timely issuance of the final radiology report is important to provider and patient satisfaction

• An efficient and sustainable workflow that avoids burnout is necessary to facilitate prompt completion of screening mammography reports and decrease distraction to minimize error and improve patient safety.

• Improved efficiency and decreased distraction and fatigue may reduce errors and improve patient safety

• **PROBLEM:** At our institution there was an accumulation of unread screening mammograms and delayed reporting resulting in peak weekly mean report turnaround time of 198 hours (8.25 days)
### Root Causes & Quality Interventions

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<th>Root Cause</th>
<th>Quality Intervention</th>
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<td>1. Interruptions and distractions during the workday</td>
<td>“S” Assignment (Uninterrupted, batch reading with live transcriptionist)</td>
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<td>2. Inefficient paper chart-based workflow</td>
<td>Conversion to paperless, all digital workflow</td>
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<td>3. Cumbersome report dictation software workflow</td>
<td>Efficient updates to dictation process</td>
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### Traditional Workflow States:

**N** - Interrupted reading of screening mammograms while performing breast procedures **without** a trainee or transcriptionist

**T** - Interrupted reading of screening mammograms while performing breast procedures **with** a trainee but no transcriptionist

### QI Initiative:

**S** - Creation of new assignment with uninterrupted batch reading of screening mammograms with a live transcriptionist
Metrics & Goals

- Total number of studies read per assignment
  - Digital mammogram = 1 point
  - Digital breast tomosynthesis = 2 points

- Study Interpretation Time (minutes/point)

- Report Turnaround Time (TAT, hours)
  - Goal to reduce to < 72 hours

- Survey data on radiologist ratings of fatigue and distraction in the quality initiative (S) vs. traditional assignments (N, T)
  - Goal was to reduce radiologist fatigue and distraction to a rating < 3

- Cost analysis

- GOAL - Reduce TAT, fatigue and distraction, and interpretation time after 4 months of implementing QI initiatives

Example of survey administered to radiologists
MiChart Report TAT


Quality Initiatives to Address Root Causes:

1. “S” Assignment (Uninterrupted, batch reading with live transcriptionist)
2. Paperless, all digital workflow
3. Efficient updates to dictation process

Radiologist Surveys

(14 radiologists completed daily surveys in each workflow setting rating fatigue and distraction on a 10-point scale (10 = high))
Turnaround Time Improvements

**Mean Weekly Report TAT Improvement**

- Pre-QI: 83.3 ± 11.3
- Post-S: 50.3 ± 20.4
- Post-Digital: 63.0 ± 33.2
- Post-Dictation: 51.0 ± 4.1

**Relative TAT/ Number of Screens**

- Pre-QI: 0.14
- Post-S: 0.09
- Post-Digital: 0.11
- Post-Dictation: 0.10

*Average weekly turnaround time was significantly decreased after the 3rd QI Initiative compared to the pre-QI state.*
Average radiologist fatigue and distraction rating was significantly lower in the new S setting compared to the traditional workflows (N, T).
Association of Administrators in Academic Radiology (AAARAD) reported payroll expense for live transcriptionist:
$53,893.50/ year = $207.28/day

Given interpretation times, over an 8-hour shift, total points that can be read per assignment:
165.5 points in traditional N and T setting
192.0 points in S setting

26.5 additional points can be read per day in S
(Equates to approximately 26 2D digital screening mammograms or 13 screening digital breast tomosynthesis studies)

Institutional hospital charge for digital screening mammogram (1 point) = $725

This results in an additional daily charge of $19,200.00 for screening mammography services with a daily cost of $207.28.

Net additional charges generated = $18,992.72/ day

Limitation - Missed trainee teaching opportunities in S
Conclusions

• QI Initiatives for reading offline screening mammography resulted in
  - Decreased report turnaround time
  - Decreased radiologist fatigue and distraction
  - Improved ease of interpretation
  - An efficient and sustainable solution to providing timely reads on large volumes of offline screening mammograms

• Limitations
  - Differences in work settings in the traditional vs new S workflow limit direct comparison
    • Traditional workflow entailed interrupted reading of screening mammograms while performing procedures while in the S setting there was uninterrupted batch reading
    • This was accounted for by comparing interpretation times for screening mammography only
  - Variability of radiologist assignment to S vs traditional workflow
  - New S assignment produced improved productivity and revenue, but eliminates a teaching opportunity for trainees
  - Surveys- Variable response rates, self reported data including interpretation time
Keys to Success and Future Directions

• Keys to Success
  - Goal was to improve ease of work to reduce burnout, which is a welcomed change to staff
  - Periodic implementation of QI-initiatives helps avoid overburdening staff
  - Open communication regarding changes allowed for easier implementation
  - Support from leadership and staff

• Future Directions
  - Expand digitization and improved safety and efficiency to other divisional workflows
  - Reduce burdensome tasks to allow radiologists to focus on image interpretation to improve safety and reduce errors