

Decreasing Wait Times for Ultrasound- Only Exams in a High-Volume Academic Breast Imaging Center

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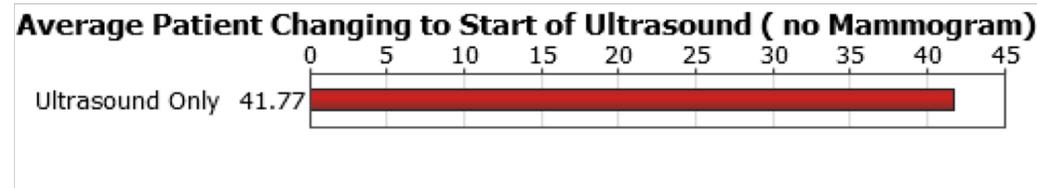
Purpose:

- The primary goal is to improve time from arrival to start of examination for patients scheduled only for targeted diagnostic breast ultrasound at The Kirklin Clinic Breast Center from an average of approximately 40 minutes to an average of approximately 15 minutes within the next 12 months.
- A secondary goal is to increase ultrasound technologist independence and ownership of cases through improved familiarity of cases/patients prior to the examinations.

Purpose:

- In order to identify potential areas for improvement, a tertiary goal is to assess ultrasound technologists' skill in acquiring technically adequate images which would decrease time spent by a physician in the ultrasound suite.

Background:

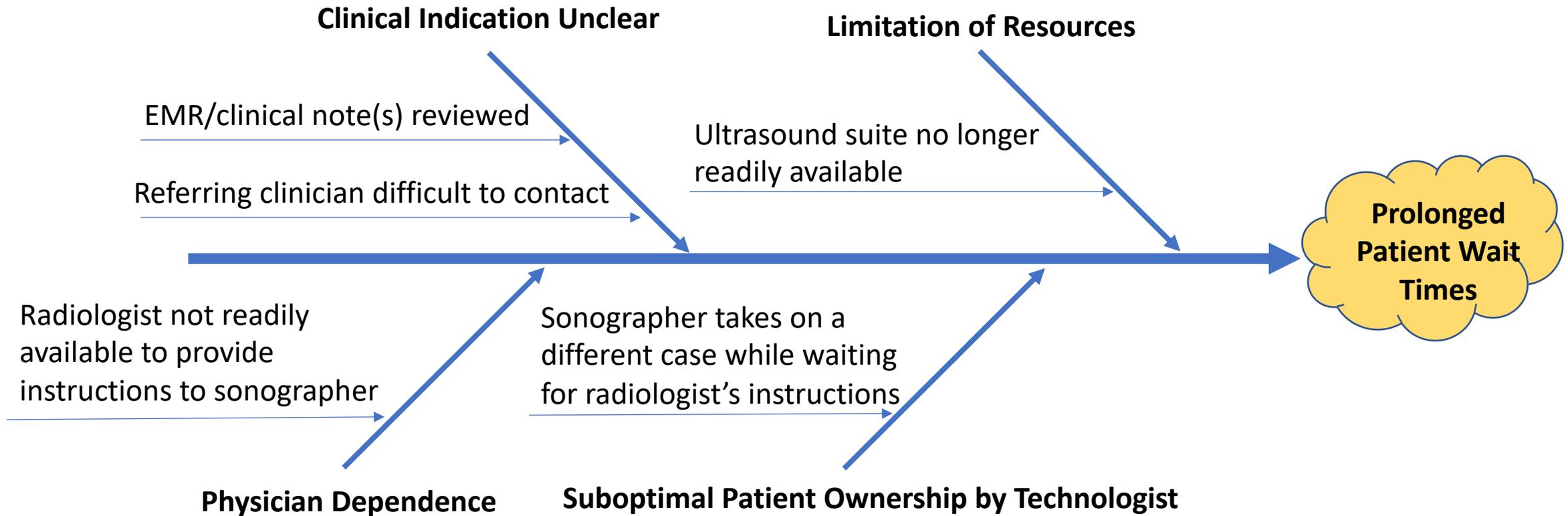


- The Kirklin Clinic Breast Center is a high-volume academic center performing over 6,500 diagnostic breast ultrasound examinations per year.
- The average patient wait time prior to the start of an ultrasound-only breast exam was approximately 41.8 minutes the past year.
- Workflow Protocol:
 - Creation of patient jacket by technologist/support staff at the time of patient arrival/check-in including patient demographical information, breast history, and general information regarding indication for the examination
 - Patient jacket is then provided to radiologist or left at radiologist's workstation by technologist/support staff.
 - Radiologist reviews the case, determines actual indication and identifies the area in the breast or axilla of clinical interest(s), and directs sonographer.
 - Once an ultrasound suite is available, sonographer takes patient for the examination.
 - Radiologist is notified by sonographer once images have been obtained.
 - Radiologist examines the patient in the ultrasound suite, reviews images, and acquires additional images as necessary.

Background:

- Factors increasing patient wait times for ultrasound-only breast examinations include:
 - Radiologist not readily available to review case and direct technologist
 - Pre-occupied with other diagnostic exams and/or not at workstation when patient jacket is provided
 - Clinical indication not provided or available (symptom, location, i.e., laterality, clock position, distance from nipple) in patient jacket
 - EMR/clinical notes need to be reviewed.
 - Referring clinician may need to be contacted.
 - Assigned technologist takes on another case while waiting for instructions from radiologist.
 - Ultrasound suite no longer readily available

Background:



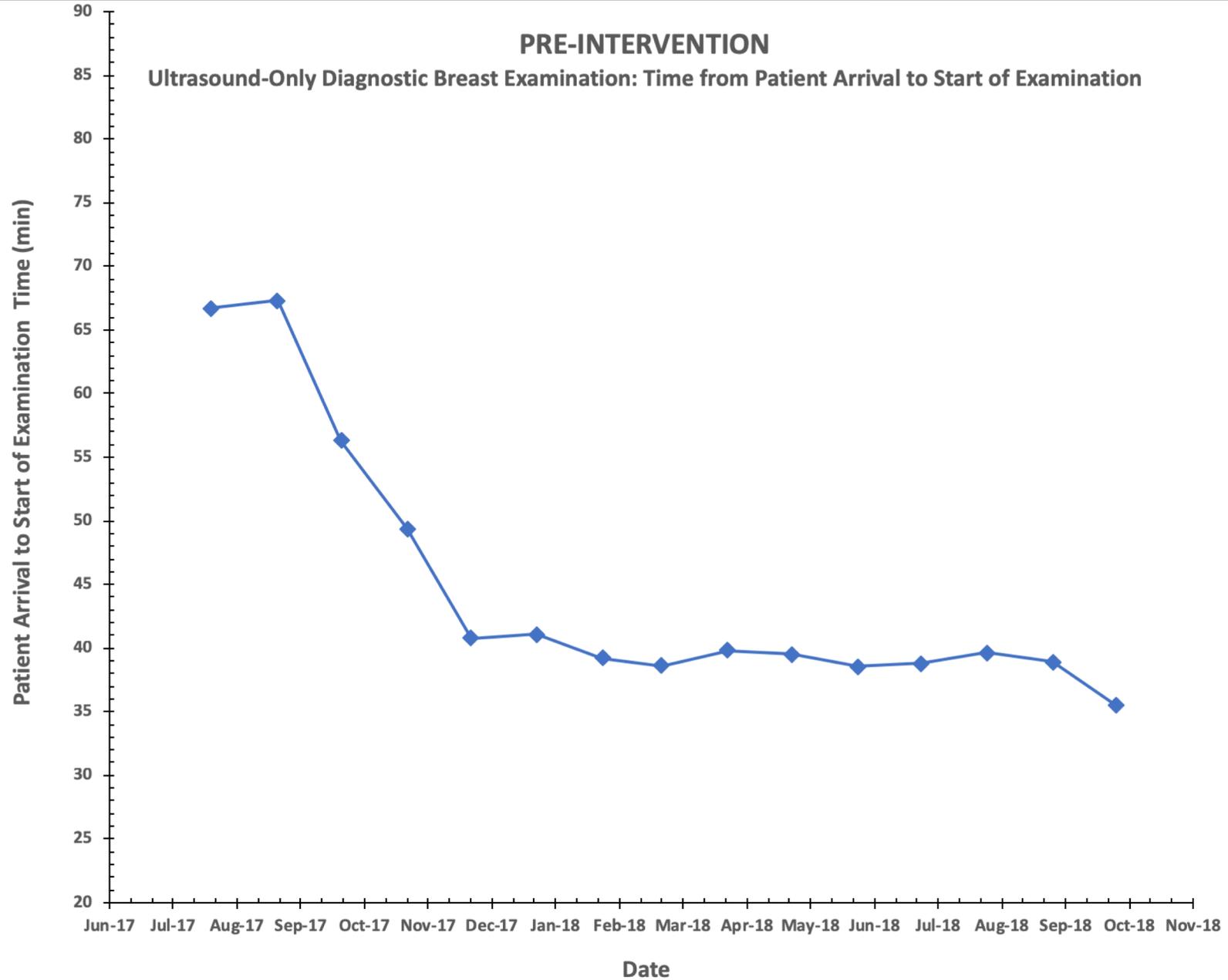
Materials and Methods:

- Plan-Do-Study-Act (PDSA) Cycle(s) was utilized for this quality improvement initiative.
 - **Plan:**
 1. Obtain times from patient arrival to start of examination and times from patient arrival to examination completion prior to intervention and calculate mean time.
 2. Evaluate technologist's ability to accurately identify the indication for the examination, the site of clinical question in the breast, and obtain accurate diagnostic images.
 - A worksheet was created (see Appendix A). Radiologists scored the technologists' performances based on a scale of 0-2.
 - **Do:**
 - Two Board Certified Breast Imaging radiologists with > 6 years experience and two ASRT/ARDMS certified ultrasound technologists were involved.

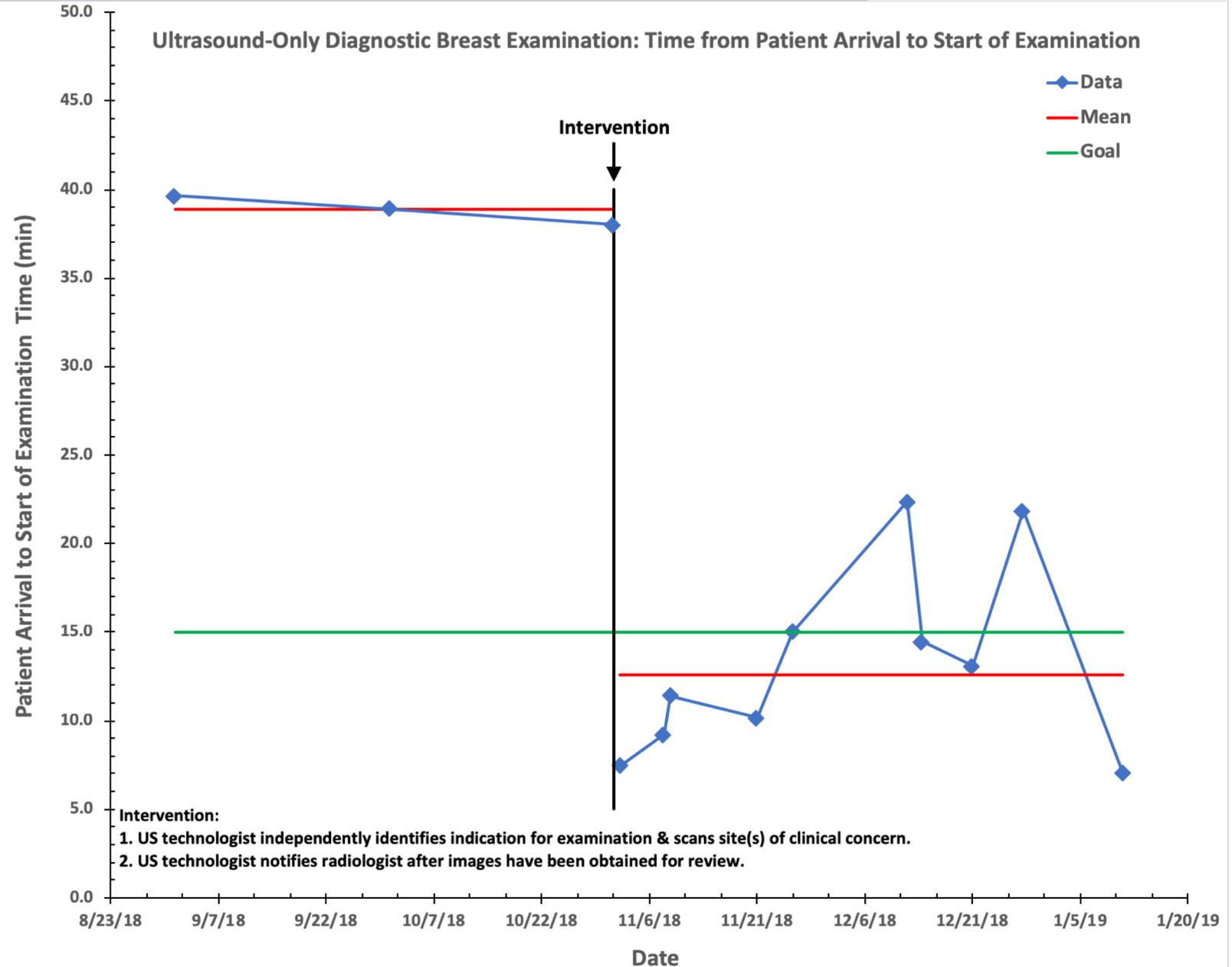
Materials and Methods:

- Plan-Do-Study-Act (PDSA) Cycle(s) cont.
 - **Study:**
 - Performance was analyzed at an individual and mean level through the use of a run chart. The mean examination times for both technologists combined were plotted. The examination times prior to commencement of this project were also plotted to assess for significant improvement in ultrasound-only exam times.
 - **Act:**
 - Expecting to observe improved workflow efficiency and decreased examination and patient waiting times for ultrasound-only cases, the two technologists and radiologists in the project would then recruit more techs and radiologists for subsequent PDSA cycles. Should data prove no significant improvement in examination times, additional contributing factor(s) will be identified, accounted, and the project will re-commence.

Results:



Results:



Results:

- Results from this first PDSA cycle for exams performed 11/1/2018 through 1/11/2019 show a mean patient arrival to start of examination time of **12.5 ± 7.3** minutes (range of 3 – 27.2 minutes, median of 9.8 minutes), a drastic improvement from the past year's average of approximately 40 minutes, and thus meeting our goal mean time of 15 minutes.
- Mean patient arrival to examination completion time of 35.5 minutes
 - Range of 10 – 55 minutes
- Ultrasound technologist average score of 1.8 (based on a scale of 0-2)

Discussion:

- The first PDSA cycle proved successful in meeting the goal of a mean patient arrival to start of examination time of 15 minutes.
- Examination quality and duration was not compromised by increased sonographer independence.
 - Technologist's average score of 1.8 (scale of 0-2)
 - Mean patient arrival – examination completion time of 35.5 minutes
- Additional technologists and radiologists will be involved to assess for the potential for wide-scale improvement.
 - Data will be analyzed.
 - Continued success would lead to implementation in the entire Breast Imaging Section.
 - Factors limiting success will be studied and addressed.
- Upon successful section-wide implementation, data will be collected quarterly to ensure sustenance.

Limitations:

- Some cases may still require radiologist-sonographer review prior to ultrasound examination, for example:
 - Lesion(s) identified on MRI for which sonographic correlation is desired
 - Patients who may need mammogram prior to the ultrasound exam
 - Clinical scenarios where there is no clear indication for the examination
 - Technologist/clerk instead of radiologist may take initiative in contacting referring clinician and/or talking to the patient.
- The two sonographers who participated in this study were the most skilled/experienced in the breast imaging section.
 - Sonographers with lesser experience will require more supervision and instruction to reach the desired efficiency level. More time may be required initially.

Conclusion:

- Increasing technologists' independence/ownership of patients lead to drastic improvement in patient arrival to exam start time for ultrasound-only breast diagnostic cases in our high-volume academic center, thus improving patient satisfaction and workflow efficiency.

Appendix A (Materials and Methods):

The document to the right shows the worksheet designed to integrate into our workflow.

Patient information is provided at the top for tracking purposes.

The ultrasound technologist completes the top half of the worksheet and the radiologist completes the bottom half, including the scoring.

Our Mammography Manager calculates the arrival to start time using information from our patient scheduling software to ensure consistency.

Patient Sticker

TECH ONLY:

Reason for Visit (Circle all that apply):

Palp/Lump Pain F/u BIRADS 3 mass/finding Abscess Mastitis Nipple Discharge
 F/u Biopsy Chemo Response and/or Known Cancer 2nd Look US MRI finding

Other reason/additional info: _____

Evaluate (Specify clock face; specify cm from nipple if more than one finding in same location; if more than 3 findings total list top 3 and say "and others"):

1. ____ Breast:
 2. ____ Breast:
 3. ____ Breast:

RADIOLOGIST ONLY:

Did tech correctly identify reason for visit? Yes No
 If No, please explain: _____

Did tech correctly identify locations in breast to evaluate? Yes No
 (Tech must identify ALL locations, not omit major findings; please use judgment in accounting for differences in technique, measurement style and accuracy of history provided by patient especially in cases of "pain/palpable")
 If No, please explain: _____

For Administrative Purposes:

Score (0-2): _____ Time: (Arrival to Start): _____ min