



Enhancing Diagnostic Efficiency: The Impact of an Outside Image Retrieval Center (OSIRC) on Prior Imaging Availability in A Breast Imaging Practice

Megan Kalambo¹*, Keyiara Ridyolph², Adam Dido²

¹Department of Breast Imaging, The University of Texas MD Anderson Cancer Center, Clinical Medical Director, Breast Imaging Houston Area Locations, United States

²Division of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, Manager Diagnostic Imaging Operations, DI Outside Image Retrieval Center, United States

Corresponding Author: **Megan Kalambo** [ORCID iD](#)

Address: Department of Breast Imaging, The University of Texas MD Anderson Cancer Center, Clinical Medical Director, Breast Imaging Houston Area Locations, 1155 Pressler, Unit 1350, Houston, Texas 77030, United States; Tel: +1 8322483488; Email: MKalambo@mdanderson.org

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Abstract

The timely availability of prior mammograms is critical for enhancing diagnostic accuracy, reducing recall rates, and improving patient care. However, obtaining prior images from external facilities often proves challenging, leading to delays and suboptimal outcomes. This study examines the implementation of an Outside Image Retrieval Center (OSIRC) within a breast imaging department to streamline the process of retrieving prior imaging. Prior to the OSIRC's establishment, only 56% of new diagnostic patients arrived with outside imaging (OSI) available before check-in. The OSIRC intervention, aimed at centralizing and improving the retrieval process, successfully increased OSI availability to 74.3% by 2024. This 32.7% improvement, validated by a chi-squared test ($p < 0.001$), demonstrates the efficacy of the OSIRC in enhancing operational efficiency, reducing delays, and improving patient care. The study also discusses challenges beyond OSIRC's control, such as patient non-responsiveness, facility closures, and international image retrieval. This initiative offers a model that can be adapted for other medical disciplines to enhance clinical workflow and improve patient outcomes through efficient image management systems.

Keywords

Image Retrieval, Radiology, Patient Satisfaction, Clinical Workflow Enhancement

Introduction

The availability of prior mammograms is crucial for radiologists, as it significantly reduces recall rates, false positive rates, and abnormal interpretation rates while

increasing specificity without compromising sensitivity or cancer detection rates [1]. However, obtaining previous mammograms from external facilities is often time-consuming and costly [2]. Studies have

consistently demonstrated that access to prior images enhances the accuracy of radiologic interpretations. For instance, a 2016 study analyzing recall rates found that patients with no prior images had a recall rate of 16.6%, while those with a single prior had a rate of 7.8%, and those with multiple priors had the lowest recall rate at 6.3% [3].

In 2023, our institution identified that only 56% of new diagnostic patients arrived with outside imaging (OSI) available before check-in (5,703 patients), leaving 44% without prior images at the time of their appointment. This inefficiency in the OSI retrieval process introduced potential delays in patient care and diagnostic accuracy. A review of existing operations revealed that image retrieval was managed by nurse navigators, whose responsibilities extended beyond this task and into their broader clinical duties.

To improve OSI retrieval rates and enable nurse navigators to work at the top of their licenses, our institution proposed the establishment of an Outside Image Retrieval Center (OSIRC) within the Diagnostic Imaging (DI) Support Services department. This dedicated team would be responsible for requesting, tracking, and uploading prior images, ensuring more patients arrive with the necessary imaging on file. The primary goal of OSIRC is to enhance the availability of outside breast images before patient appointments, ultimately improving workflow efficiency and diagnostic accuracy.

Methods

Institutional Review Board (IRB) approval was not required for this study, as it involved retrospective analysis of operational workflow data without patient identifiers or direct patient interaction. Per our institution's guidelines, studies of this nature are exempt from IRB review. Following budgeting approval of the OSIRC by the Diagnostic Imaging Executive Leadership Team, breast imaging administration and physician leadership collaborated with support services leadership to enhance the retrieval of prior diagnostic mammograms before patient check-in. The OSIRC was established to assume these retrieval duties from breast imaging nurse navigators and support image retrieval for diagnostic imaging patient access. Given the limited

team size (three coordinators and one manager), it was critical to ensure that other institutional departments maintained their existing retrieval processes.

Implementation & Training

Breast imaging managers trained OSIRC leadership on navigating patient charts in EPIC to identify OSI status, locating prior imaging facility notes completed by patient access staff, sending MyChart messages to request prior imaging locations or confirm baseline mammogram status, and utilizing the breast imaging appointments and prior imaging report to identify patients lacking a prior mammogram within the past three years. The OSIRC team used this report daily to prioritize retrieval efforts.

To track the performance of OSIRC, a Webi report, originally designed for Breast Imaging Administration, was adapted. This report categorizes prior image retrieval timing as follows:

1. **Prior to check-in** – prior images are available before the patient arrives, preventing delays;
2. **Prior to end exam** – images become available before the imaging appointment concludes;
3. **Prior to final report** – images are retrieved before the radiologist finalizes the report;
4. **After final report** – images arrive after report finalization, possibly requiring addendums;
5. **No prior on file** – includes baseline mammograms, patients without imaging in the past three years, and cases where retrieval was unsuccessful due to external factors.

To provide a more accurate assessment of OSIRC performance, leadership added a filter to exclude "No Prior on File" cases, enabling a more focused analysis on retrievable cases (see **Table-1** for detailed data on retrieval timing and case outcomes). Several factors outside OSIRC's control prevent successful prior image retrieval, including purged images due to outside facilities removing old records, facility closures where prior imaging locations no longer exist, patient non-responsiveness to multiple MyChart messages and phone calls, refusal to sign authorization forms, patient forgetfulness regarding prior imaging locations, international imaging that cannot be obtained, and last-minute scheduling that leaves insufficient time for

retrieval. Conversely, OSIRC-controlled factors for optimizing retrieval include timely submission of requests—typically within 24 business hours—prioritization of electronic image sharing through PowerShare, Ambra, or email-based transfers for faster turnaround, daily follow-ups to check request statuses with facilities, monitoring FedEx shipments, and tracking electronic transfers, as well as the prompt uploading of received images to ensure their timely availability in patient charts (see **Table-2** for a breakdown of retrieval success rates based on OSIRC-controlled versus external factors).

Results

The intervention demonstrated notable success in improving key outcomes for our breast imaging stakeholders. In 2024, following the implementation of the intervention, 74.3% of new diagnostic patients (5,793 patients) had their OSI available prior to check-in, compared to only 56% in 2023. This represents a

significant improvement of 32.7%, which was validated through a chi-squared test, confirming the statistical significance of this change ($p < 0.001$). These results underscore the positive impact of the OSIRC on several important metrics, including imaging availability, patient safety, and diagnostic efficiency. As seen in **Fig-1**, the month-to-month data indicates a clear improvement in OSI availability following the OSIRC launch.

One of the most striking outcomes of this intervention was the marked increase in the availability of OSI before patient check-in, which ultimately contributed to a more streamlined process for both imaging and diagnosis. In turn, this reduction in delays enhanced the overall patient experience by accelerating diagnostic timelines and improving clinical decision-making. As illustrated in **Fig-2**, the annual imaging availability rates for 2023 and 2024 demonstrate a significant increase post-OSIRC intervention."

Table-1: Timing of Prior Mammogram Image Availability (2024)

Timing of Prior Mammogram Image Availability	Feb 2024	March 2024	April 2024	May 2024	June 2024	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Overall (Avg)	Variance (compared to FY23)
Prior to Check In	67.13%	71.31%	76.21%	74.22%	77.25%	79.01%	78.83%	75%	77.44%	76.70%	84.87%	76.18%	↑ 21.99%
Prior to End Exam	6.50%	4.78%	3.16%	3.29%	4.05%	2.72%	2.52%	3.60%	4.21%	1.30%	2.13%	3.48%	↓ 12.71%
Prior to Final	3.94%	1.04%	0.93%	2.13%	1.13%	0.49%	1.05%	1.20%	2.29%	1.36%	0.47%	1.46%	↓ 2.29%
After Final	6.10%	7.69%	6.88%	4.07%	1.80%	3.70%	3.98%	4.60%	2.87%	2.71%	2.84%	4.29%	↓ 3.85%

Data shows a month-by-month comparison of prior imaging availability with respect to the patient's appointment schedule

Table-2: Reasons for Inability to Obtain Prior Imaging (Month Over Month, April to December 2024)

Factors Outside of OSIRC Control	April 2024	May 2024	June 2024	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Overall (Avg)
Outside Facility Purged Patient Images	0%	2%	3%	2%	0%	0%	0%	3%	0%	1%
Outside Facility Permanently Closed	1%	0%	0%	2%	0%	1%	0%	0%	2%	1%
Outside Facility Unknown • Unable to reach patient for outside facility information • Patient refused to sign required authorization form • Patient does not recall outside facility	9%	8%	4%	12%	3%	8%	3%	8%	0%	6%
Unable to reach patient	0%	4%	4%	0%	2%	6%	9%	8%	5%	4%
Unable to obtain International Images	3%	7%	2%	5%	6%	3%	6%	0%	2%	4%
Scheduled for next day appointment	12%	5%	15%	11%	14%	13%	3%	4%	5%	9%

Factors outside OSIRC's control affecting retrieval of prior imaging

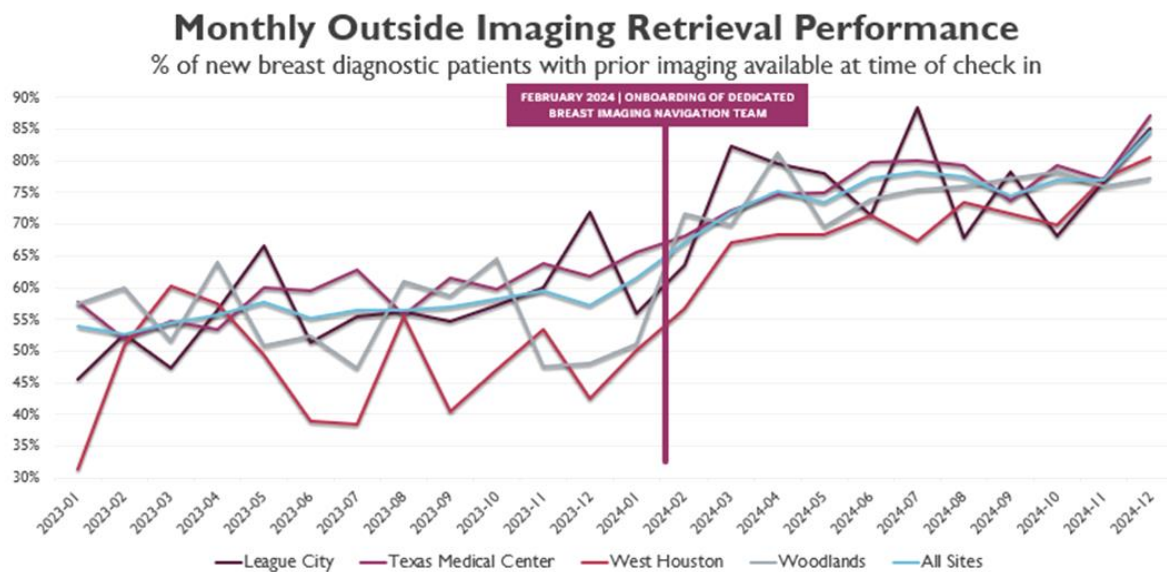


Fig-1: Monthly Imaging Availability by Location

This line graph shows monthly changes in prior imaging availability across all locations, with a dark maroon vertical line marking the OSI Navigation Team Project launch in February 2024. After implementation, prior readiness rates improved significantly.

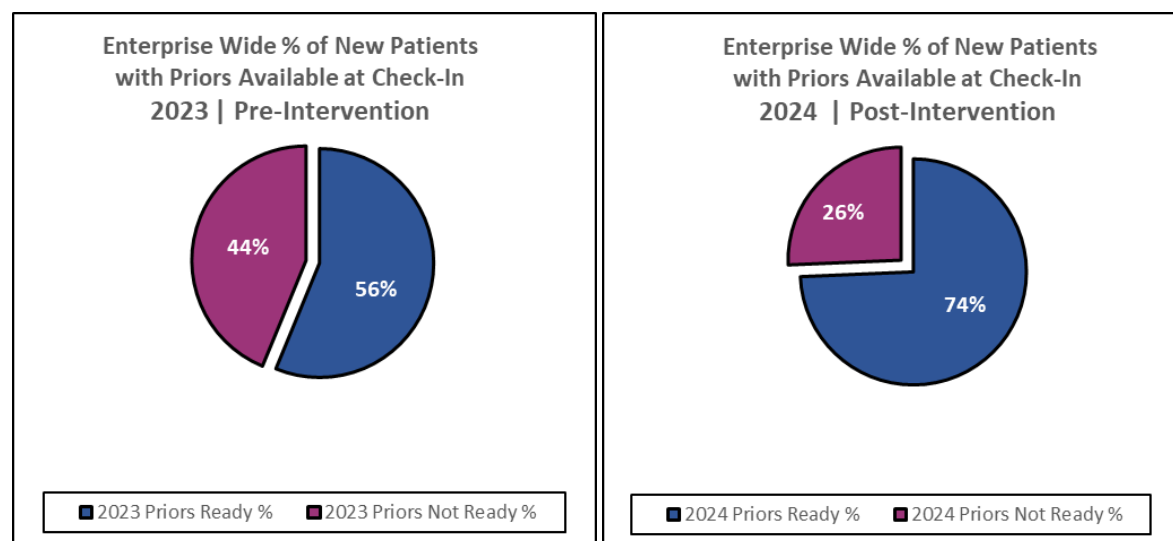


Fig-2: Observed Annual Imaging Availability Rates

Pie charts illustrating the improvement in annual prior imaging availability rates in 2023 versus 2024 pre and post OSIRC intervention, respectively.

Discussion

The Outside Image Retrieval Center (OSIRC) has played a crucial role in facilitating the retrieval of imaging for all patients scheduled for diagnostic mammograms, as well as for screening patients referred by clinical teams and patient access groups. Our process relies on a daily report from our electronic health system, combined with incoming emails, to track and manage patient requests. Staff members are assigned an alpha split based on the patient's last name,

prioritizing those with appointments closest to their scheduled date.

During the implementation of the OSIRC, several challenges were encountered that were beyond our control when attempting to retrieve prior outside imaging. In some cases, patients provided the OSIRC with the name of the outside facility from which we were to retrieve images, but we later discovered that the facility had permanently closed. Similarly, we

encountered situations where outside facilities purged their records due to factors such as the age of the images, a change in their electronic health record (EHR) systems, or loss of records during a merger. These challenges are consistent with findings in the literature, where the transfer of outside images often faces similar barriers [6].

Additionally, certain patient-related factors hindered the ability to retrieve outside images. Some patients were non-responsive to outreach attempts through phone calls or MyChart messages, while others were unable to recall where their imaging was performed or were unwilling to sign the release forms required by certain facilities. These challenges prevented the OSIRC from being able to identify or request prior imaging in advance of the scheduled mammogram appointments.

Given the wide geographical reach of our facility, we also faced the complication of patients who had prior imaging performed internationally. This introduced another layer of difficulty, as international image retrieval is outside our control. While we rely on patients to bring their images from foreign facilities, logistical issues arose, such as patients being unable to retrieve CDs from their previous locations or having the discs lost or damaged during travel.

Furthermore, the variability in turnaround times at OSI facilities significantly impacted the timing of prior image availability. Depending on the size and operational practices of the facility, images were either received immediately or within 30 days. For facilities with longer turnaround times, the OSIRC team made efforts to expedite requests, often successfully, but not always. This was particularly challenging with facilities utilizing third-party services that were difficult to contact, larger institutions with numerous requests, or facilities with staff shortages. In these cases, the absence of an electronic image-sharing system further complicated the retrieval process. Given these hurdles, initiating image retrieval well in advance proved crucial in preventing delays, ensuring that prior images were available at the time of patient appointments.

Finally, the timeliness of image requests remained a

critical factor. In some cases, patients were added to the schedule with less than five days' notice, leaving insufficient time for the retrieval of prior images. In extreme cases, patients were scheduled for next-day appointments, offering less than a day to attempt retrieval. Unfortunately, in these instances, prior images were often unavailable before the appointment, which sometimes led to delays in both the patient's appointment and the interpretation of their images by radiologists.

Conclusion

The implementation of the OSIRC to handle imaging retrieval has proven to be an effective solution to address the challenges associated with obtaining prior outside imaging within the breast imaging discipline. The intervention resulted in enhanced advance availability of imaging and streamlined the patient experience. These outcomes emphasize the critical value of dedicating resources to improve operational workflows and enhance the quality of patient care.

Although the OSIRC initiative was focused on breast imaging, the strategies and workflows employed have the potential to be scaled and adapted for use in other medical disciplines, with further refinements. It is important to note that the data presented here are specific to our facility, and while the intervention demonstrated clear success, additional work will be required to expand and optimize these efforts. Building on the current achievements, we plan to enhance training tailored to the specific needs of different areas, collaborate with data scientists to refine our analytics, and continuously monitor outcomes to make adjustments that will further optimize our resources and improve service delivery.

The implementation of the OSIRC for imaging retrieval has proven to be an effective solution to the challenges faced in our breast imaging discipline. This initiative has led to improved availability of prior images in advance and a more streamlined patient experience. These results highlight the value of investing in dedicated resources to enhance operational workflows and patient care. While the OSIRC initially focused on breast imaging operations, the workflows developed can be scaled to benefit other disciplines with

further refinement. We recognize that the data is limited to the intervention conducted at our facility. Building on the success demonstrated by this initiative, we plan to enhance training tailored to area-specific needs, advance our analytics by partnering with data scientists, and monitor outcomes while making adjustments as needed to optimize resource utilization.

Conflict of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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