

Title: Trainee Perspectives on Breast Imaging Training during COVID-19: Where We Are Now

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Introduction

Key points:

1. Radiology volumes dropped significantly during the peak of the pandemic, with a prominent impact on breast screening volume.
2. In general, the number of breast imaging appointments is increasing since the beginning of the pandemic, however there are still thousands of backlogged imaging appointments to complete.
3. Despite the alteration of training workflows in 2020, respondents indicated that residents and trainees were able to meet the American Board of Radiology and Mammography Quality Standards Act requirements.
4. With social distancing, programs had to rapidly shift to virtual learning and training, which have introduced educational and learning gaps.

The first documented case of SARS-CoV-2 in the United States occurred in January of 2020 [1], and by March of 2020 the World Health Organization declared a global pandemic [2]. Hospitals and facilities deferred elective patient visits to reduce exposure and virus transmission and to conserve medical resources including personal protective equipment. Position statements from multiple societies suggested to “postpone all breast screening exams (to include screening mammography, ultrasound, and MRI) effective immediately” [3, 4]. Diagnostic breast imaging cases were triaged and were often deferred, delayed, or cancelled, depending on the pre-test probability of disease, institution guidelines, and patient preference. A predictive model from the National Cancer Institute following the effect of COVID-19 on screening showed that an anticipated 10,000 excess deaths could be expected from breast and colorectal cancers, with the majority of these deaths occurring within two years [5]. As we work towards recovery and reestablishing screening, we will also need to be mindful of the effect of pandemic on our radiology trainees.

COVID-19 has undoubtedly affected the way that curriculum is taught and received with many programs relegated to a virtual curriculum [6]. The reported effects of this shift in education style varied greatly with those residents closer to certifying exams and transition to practice being most affected. To counteract this change, the Accreditation Council for Graduate Medical Education set out a framework to prioritize learning based on different levels of restrictions imposed [7]. These frameworks consisted of three stages; stage 1 – “Business as Usual”, 2 – “Increased Clinical Demands” and 3 – “Pandemic Emergency Status” [7], to provide guidance and resources in maintaining resident education while balancing ongoing disaster preparedness and safety of trainees.

As on-site personnel decreased to provide social distancing, institutions shifted to remote work and training. These changes, while met with enthusiasm [6], may have had a negative impact on education as compared with traditional face-to-face teaching and procedural skills training. Programs were required to rapidly integrate with new technology to continue to teach, sometimes without necessarily providing adequate training in use of videoconference software. While online learning may be more feasible in certain specialties, we wonder if others, such as breast imaging, will be more detrimentally affected, due to the requirements for case volume and hands-on training in procedural skills.

The significant volume drop in imaging resulted in a considerable decrease in opportunities for learners. The altered training experience is multi-factorial, affecting many facets of resident training. We wanted to look at the potential learning and training gaps that occurred over 2020. As such, we surveyed our various trainee editorial boards at the Radiological Society of North America (*Radiology*, *Radiology: Imaging Cancer*, *Radiology: Artificial Intelligence*, and *RadioGraphics*) from academic programs across the United States, Canada, and

Brazil to assess the impact of COVID-19 on their respective breast radiology rotations and measures to compensate for this. We write this piece in December 2020, to bring together a snapshot of how the pandemic has impacted breast imaging and trainees based on responses to the following questions.

How has COVID affected the breast rotations at your institutions?

Impacts on volume of screening, diagnosis, and intervention

Most institutions experienced a significant volume drop in screening with some institutions eliminating screening at the height of COVID-19 from March to June 2020. In addition to cancellations of screening exams, numbers of studies decreased because of patient reluctance to come into hospital or clinics. Diagnostic breast exam volumes were heterogenous across institutions. Some reported mildly reduced volumes while others reported a significant decrease in volumes of up to 80%. The drop in interventions was much less dramatic. However, learning experiences changed, as many institutions did not allow learners to participate in performing biopsies to limit exposure.

Impacts on the number of learners onsite

In terms of learners, many residents worked at home instead of physically coming onsite. Most programs had only one to two residents per month working on the breast rotation during the peak months, ranging from a reduction of 20-50% of learners allowed onsite. Some programs did not allow any learners on service. Patient volumes decreased such that breast rotation residents would often read imaging from other body systems. To add educational value, some programs tasked learners with projects such as creating teaching presentations on specific topics to present to other residents in a virtual case-based conference. Fellows remained on rotation except in the cases of biopsies, which were often performed by staff to limit exposure.

Impacts on the number of graduating residents or fellows able to complete American Board of Radiology and Mammography Quality Standards Act requirements

In regard to the American Board of Radiology and the Mammography Quality Standard Act, we found that all the programs we surveyed reported their residents and fellows met requirements for graduation. There had been consideration of contingency plans if residents were not able to meet case volume requirements with the possibility of some requirements waived on a case-by-case basis. Many programs used previously created files of screening cases provided to learners to self-review as unknowns.

How has COVID-19 affected breast cancer screening, diagnosis, and treatment? What delays were experienced and what modifications, if any, were implemented to address backlogs?

Respondents had varying thoughts with regard to patient attitudes toward screening. Some survey responders theorized patients will likely return to normal screening intervals and there would be little impact, while others expressed concern that delaying screening during COVID-19 may send a message that screening is not an “essential” exam and there would be long-term consequences in terms of more advanced breast cancers. Some centers reported at least a three-month delay in screening, resulting in thousands of delayed exams. Most trainee respondents felt that volumes had recovered by Fall 2020, although some centers are still below pre-pandemic volumes. There is ongoing assessment of the proportion of patients that returned to screening and those who have chosen to delay or skip screening exams. There are likely patients who have not returned to screening at this point, and the impact of patients opting out of screening mammography in the short term or longer will not be clear immediately. In addition, with the significant economic decline during COVID-19, many patients may have lost employment and health insurance, which may contribute to decreased volumes depending on geographical location.

Use of telemedicine soared throughout the pandemic, which led to decreased in-person physician visits. This online transition likely resulted in a significant decrease in breast exams. Combined with delayed screening, this may result in delayed presentations of breast cancer with more advanced disease. One respondent wondered how management of lower risk lesions (such as BI-RADS 3 Probably Benign lesions) were impacted at this time, as many patients will have opted to skip interval exams.

Treatment timelines, in terms of surgery or adjuvant therapy, were affected throughout institutions, however, specific delays varied on a patient-to-patient basis. Treatment strategies also changed, with shorter courses of fractionation such as partial breast or stereotactic body radiation therapy used whenever feasible. At the peak of the first wave, patients often received neoadjuvant chemotherapy or hormonal therapy to delay interventions, flipping the traditional paradigm. If a patient met criteria for omission of breast irradiation, clinicians presented a stronger argument for omitting this treatment. Some centers reported at least a three-month delay in screening, resulting in thousands of delayed exams. To address backlog and to conform to social distancing guidelines, facilities implemented expanded imaging hours to allow for additional time for sanitization procedures and to accommodate more patients.

Do you have feedback or ideas about how trainees feel about their competence in breast imaging and procedures?

This question generated mixed responses. Some trainees indicated less competency in breast imaging due to both the decreased hands-on experience and overall decreased teaching due to the pandemic. Other trainees indicated primarily reduced exposure to screening

mammography. The limited number of procedures and workups still performed during the pandemic and overall exposure to breast imaging remained adequate. After the peak of the pandemic, most programs reported increased screening, diagnostic workups, and interventional breast volumes with expected numbers of studies and exposure since then. Trainees were encouraged to attend various multidisciplinary breast rounds during the peak of the pandemic to increase exposure and teaching, with good effect reported by residents. With the lack of exposure to breast training due to the pandemic, there may have been loss of potential future subspecialty breast radiologists.

Are circumstances different with the current wave at the end of 2020 versus the spring?

Yes, respondents indicated that their institutions had both higher patient volume and more teaching opportunities during the winter 2020 wave compared to the spring. Most programs are currently attempting to maintain outpatient procedures and appointments, while keeping learners on rotation safely. Institutions are much better equipped and experienced now with providing a safe environment for patients and physicians. Social distancing measures, personal protective equipment, and virtual reviewing have all evolved and are now better implemented. Restrictions with the current wave are also less severe, especially with screening mammography volumes increased compared to last spring when they were at an all-time low. In some programs, trainees were still provided older archived cases to self-review and supplement learning as volumes recover.

As a trainee, do you feel any sense of isolation or disconnect to the program? In what ways do you think well-being can be improved?

All trainees reported decreased morale and interpersonal connections. Respondents experienced a sense of isolation and disconnection, both interpersonal among trainees and between the trainees and the program. The typical socialization at case conferences have been largely eliminated by remote, web-based conferences. In-person social events ended with some programs attempting to replace these with limited events over online video platforms. Interestingly, some trainees report the new web-based delivery of conferences and lectures increased accessibility for trainees with content delivered equally if not more effectively in the new format, especially since trainees can control how they view online teaching formats. In addition, some trainees reported higher attendance and participation at virtual formatted educational events than traditional in-person conferences.

Do you feel the learning experience for breast training for residents has returned to the same state as prior to the beginning of the pandemic?

Most trainees reported that learning experiences have nearly normalized. However, the pandemic still presents challenges. These include maintaining social distancing in the workplace, learning from decreased overall volumes, and lack of full on-site staff. Virtual readouts are being continually improved, with robust business and chat programs offering increased interaction during readouts between the trainee and the attending. Virtual teaching and conferences are better integrated now into the curriculum, with increased training in how to best effectively employ these new technologies.

Conclusion

The COVID-19 pandemic has significantly affected breast imaging volume, resulting in an altered training experience in breast radiology. In the coming months, institutions will need to continue to balance a return to screening and diagnostic workups while utilizing protective measures as case rates increase. With the integration of virtual teaching and conferences, programs are now adapting to a new era of learning and supplementing education in light of the decreased volumes. Trainee well-being and interpersonal connections will need to be continually addressed as the sense of isolation continues with social distancing measures. Throughout these trying times, programs and trainees have done an excellent job to continue to provide patient care and keep educational programs on track. Moving forward, we must do our utmost to make up for the lost time in training and imaging volumes, providing the best services to all our patients safely.

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