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# Impact of COVID-19 on Radiology Trainee Safety, Education, and Wellness: Challenges Experienced and Proposed Solutions for the Future

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## INTRODUCTION

Before the coronavirus disease 2019 (COVID-19) pandemic, radiology training programs were already struggling to address trainee wellness. Studies show that up to 50% of radiology trainees report symptoms of burnout [1]. Financial debt and female gender have both been linked to higher rates of burnout among trainees [2]. These stressors, plus others specific to trainees that predated the pandemic, were compounded by the pandemic. As a result, issues of workplace safety, quality of education, and trainee well-being have increased in salience. We describe problems faced by radiology trainees during COVID-19, as well as new policies that programs adopted in response, many of which can be implemented in daily practice after the pandemic has ended (Table 1).

## WORKPLACE SAFETY

During the height of the initial pandemic in early 2020, ensuring the personal safety of trainees and all staff members was of utmost importance. Adequate access to personal protective equipment and proper training in personal protective equipment

donning and doffing were essential, as was subsequent access to COVID-19 testing and vaccination. Regular, closed-loop communication, which in different departments took place via e-mail, department Internet and intranet pages, virtual workspaces (such as Microsoft Teams or Zoom), or virtual town halls, served an important role in educating and reassuring staff members and providing a forum for answering questions and addressing concerns.

Specific changes were made to radiology staffing and workflow to minimize the risk for virus transmission. Many reading rooms were decentralized. Trainees were asked to read studies either from home or in office spaces outside the main reading areas to reduce person-to-person contact. To further decrease risk for transmission, schedules were staggered to reduce the number of people in a reading room at any one time. Within the reading room, gloves and disinfectant wipes were readily available to clean work areas between users. The creation of dedicated eating areas was also a challenge faced by many departments, because before COVID-19, trainees often ate together in a

cafeteria or a conference room while attending an educational talk.

The pandemic has highlighted the essential value of masking, handwashing, and workplace cleanliness. Perhaps more attention in the past should have been paid to workstation cleanliness, particularly in light of high rates of bacterial colonization of computer mice and microphones [3]. The value of handwashing and workstation cleanliness are lessons we have learned.

## EDUCATION

The COVID-19 pandemic posed challenges to academic medical centers in fulfilling their educational missions. There was a significant drop nationwide in radiology volumes [4]. Traditional side-by-side readout and in-person lectures were halted at many academic centers for social distancing purposes. Some radiology trainees were deployed out of radiology to serve on COVID-19 inpatient overflow care floors [5].

To maintain high-quality educational standards, programs required creative solutions. HIPAA-compliant software that enabled screen sharing allowed synchronous remote readout.

**Table 1.** Solutions to challenges faced by radiology trainees during the COVID-19 pandemic

| Topic                    | Trainee Safety, Education, and Wellness Toolkit   |
|--------------------------|---|
| Workplace safety         | <ul style="list-style-type: none"> <li>■ Access to PPE</li> <li>■ Offer training on use of PPE</li> <li>■ Ensure workspace cleanliness</li> <li>■ Provide clear departmental communication</li> <li>■ Create dedicated dining areas</li> </ul>  |
| Education                | <ul style="list-style-type: none"> <li>■ Provide synchronous and/or asynchronous readouts</li> <li>■ Build repository of interesting cases</li> <li>■ Offer virtual and recorded lectures (locally, regionally, and nationally)</li> <li>■ Consider competency based milestones</li> <li>■ Ensure short duration of redeployments, if needed</li> </ul> |
| Equity                   | <ul style="list-style-type: none"> <li>■ Create strong diversity, equity, and inclusion leadership</li> <li>■ Ensure support programs for underrepresented in medicine trainees</li> <li>■ Offer financial hardship grants</li> <li>■ Offer financial advice classes</li> </ul>   |
| Challenges of daily life | <ul style="list-style-type: none"> <li>■ Create parenting groups</li> <li>■ Incorporate flexible or remote scheduling for caregivers</li> <li>■ Provide increased backup childcare options</li> </ul>   |
| Social isolation         | <ul style="list-style-type: none"> <li>■ Arrange virtual hangouts</li> <li>■ Create buddy system, particularly for new trainees</li> <li>■ Organize outdoor activities</li> <li>■ Continue masked in-person social interactions</li> </ul>  |
| Interviews               | <ul style="list-style-type: none"> <li>■ Provide informational videos on residency/fellowship program and site</li> <li>■ Create large and small breakout groups during interview day</li> </ul>  |

Note: PPE = personal protective equipment.

Matalon et al [6] found that both synchronous and asynchronous remote readouts could be successfully implemented. Similarly, lectures and conferences that used remote software made universal participation possible despite dispersed locations. National societies (such as the Association of Program Directors in Radiology) offered virtual conferences to augment training experience. Grand rounds speakers could collaborate with multiple institutions simultaneously to increase the number of participants. To compensate for reduced case volumes, a collection of high-yield cases on PACS and the use of educational PowerPoint presentations or daily interesting case conferences were helpful to ensure consistent case variety and exposure.

Radiology programs should work with their respective graduate medical education offices to ensure that trainees can meet the graduation requirements despite changes to the work environment. Given the fluctuating volume, competency-based milestones rather than time- or volume-based milestones can be considered. Furthermore, if radiology trainees are required for future deployment to medicine inpatient units, the duration of the deployment should be kept brief (ideally 1 week or less) to ensure that trainees can meet the requirements of their programs.

Going forward, a hybrid of both in-person and remote meetings will likely be beneficial. In-person readout remains critical and will likely be reimplemented as the pandemic wanes. Remote multidisciplinary

meetings allow collaboration with local and regional academic centers and promote a sharing of expertise. Educationally, residents, fellows, and junior faculty members can now participate in learning opportunities at other institutions where previously distance was a barrier. While radiology volumes normalize, the teaching repositories prepared during the pandemic will continue to provide invaluable resources for trainees.

## EQUITY

Unsurprisingly, the COVID-19 pandemic affected populations differently, both within and outside hospitals. The pandemic disproportionately affected underrepresented ethnic and racial groups [7]. Trainees may fall into these vulnerable groups, and

special attention should be paid to those who need extra support that may affect learning, including those facing financial hardship, housing instability, racism, and social isolation, as well as those serving as caregivers.

Beyond the pandemic, supporting diversity, equity, and inclusion initiatives is essential. This includes strong leadership that prioritizes the representation of diverse faculty members and trainees. Additionally, an active and supported diversity, equity, and inclusion committee will help promote initiatives within the department to support underrepresented groups. Financial hardship grants and financial advice classes can help address issues of economic disparities.

## CHALLENGES TO DAILY LIFE OUTSIDE THE HOSPITAL

The pandemic not only changed trainees' lives inside the hospital but also greatly altered their lives outside of it. As a result of the mandated shutdown of daycare facilities, limited grocery store hours, and reduced public transportation, daily life outside the hospital became significantly harder to navigate. With limits placed on hospital visitors during the pandemic, giving trainees access to hospital parking ameliorated transportation challenges. Offering groceries and other household staples for sale at our hospital cafeteria enabled trainees to obtain basic food items for home during the workday without leaving the hospital.

A parenting group was created within our radiology department. Flexible or remote scheduling is paramount for caregivers. Allowing flexible scheduling of diagnostic radiology work (facilitated by asynchronous readout capabilities) around childcare and increasing the availability of backup childcare will help offset the burden of reduced childcare options.

## SOCIAL ISOLATION

With the implementation of social distancing, trainees experienced significant social isolation. New residents and fellows were particularly vulnerable because of a lack of established social support. To increase social connectivity, virtual "hangouts" and outdoor socially distanced group activities such as workout classes brought together trainees while adhering to COVID-19 guidelines. Creating a buddy or mentoring system with regular touch points provided additional connections between trainees at different training levels.

The buddy system will continue beyond the pandemic. Outdoor events, such as nature walks or apple picking, are excellent opportunities to spend time together in low-risk situations. It is important for trainee morale to celebrate trainee milestones (eg, passing the core examination, graduation) insofar as is possible despite restrictions on social gatherings. Going forward, working while masked helps facilitate important social interactions during side-by-side readouts, as well as challenging conversations and constructive feedback that are more appropriate in person.

## INTERVIEWS

In response to travel restrictions and social distancing guidelines, all residency and fellowship interviews transitioned to a virtual format for the 2020-2021 admission cycle. Challenges included scheduling, adapting to remote technology, and creating informational videos. In addition, applicants who had never visited a program's city previously likely encountered difficulties familiarizing themselves with both the city and the radiology program in the virtual setting, potentially leading to enhanced selection of programs in applicants' home cities or other familiar areas. Although there are some

hurdles to implementing these changes, the transition to a virtual format can also present opportunities to applicants whose travel options may be limited by financial hardship or logistic challenges.

Going forward with remote interviews, there will be a continued emphasis on informational videos, focusing on the trainee experience and life in a new location. Our interview schedules will include both larger and smaller breakout groups as part of the interview day, so that applicants can ask questions and network in a more informal fashion than is possible during the more formal one-on-one portion of the interview day. Innovating virtual gatherings, as opposed to a traditional dinner, will also be important. Looking beyond the pandemic, if the interview season returns in person, programs can consider travel stipends for those experiencing financial difficulties.

## CONCLUSIONS

Training programs have faced substantial challenges to ensuring trainee wellness, safety, and education during the pandemic. With these challenges come an opportunity to change and improve the norm for training programs, with enhanced preparedness for future disaster scenarios.

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