



An unexpected upheaval: pediatric radiology fellows' experience during COVID-19

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic has introduced a multitude of disruptions to daily life. The professional and personal lives of all types of health care workers have been affected, with both aspects often blending together. The purpose of this piece is to highlight the specific challenges faced by pediatric radiology trainees. Where relevant, anonymous quotes from trainees around the world, expressly obtained for use in this manuscript, are included. The professional challenges emphasized in this article are centered on changes in education, daily workflow and career development. We also present insight regarding more personal aspects, such as physical and mental wellness, relationships and family life. Writing from the trainees' viewpoints, we hope to provide a deeper understanding of the obstacles encountered by trainees during this pandemic

From in-person to online education

“Online conferences spiked, and this is very helpful to us as we are learning ... from many consultants all over the world.”

As the number of COVID-19 cases increases worldwide, so do the opportunities for trainees to participate in online learning. The Society for Pediatric Radiology (SPR) showcases a variety

of current and future on-demand courses that have been initiated as part of the transition from in-person conferences to virtual education. Current avenues for online learning range from short (15–20 min), high-yield monthly lectures called “First Fridays with SPR” to detailed remote learning curricula, released weekly, on different pediatric radiology topics. Another initiative piloted during the pandemic — the Multi-Institutional Curriculum for pediatric radiology trainees — promotes a collaborative virtual learning environment through weekly lectures. Additional subspecialty learning is available through the International Pediatric Neuroradiology Teaching Network from the American Society of Pediatric Neuroradiology (ASPNR) — currently offering weekly hour-long didactics given by experts from all over the world. Upcoming virtual courses provided by the SPR include recurring weekly webinars devoted to cardiac imaging (“Third Thursdays with Cardiac”) and monthly unknown case presentations (“Case Master Mondays”). Promotion of these resources has come through the usual means of emails; however, social media have played a large role in developing a strong presence for various institutions and programs [1]. Each of these efforts promotes education during the ongoing pandemic, and pediatric radiology trainees across the world have eagerly participated.

The face of education within individual institutions has also transformed. Prior to the need for social or physical distancing, many pediatric radiology educational programs included daily conferences. Since these regulations have been in place, virtual educational initiatives including didactics, journal clubs, radiology–pathology lectures and case conferences have been peppered into the daily workflow for trainees. While these create occasional interruptions in clinical duties, the convenience and accessibility of logging on from the workstation is more often appreciated.

There is at least one major downside to the transition from in-person learning to virtual learning. Reading out — or staffing — a study with an attending radiologist, a vital part of learning for trainees, has been disturbed by the need for social distancing. In addition to correcting errors of search or

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interpretation, face-to-face readouts between a trainee and an attending radiologist promote a deeper understanding of radiologic interpretation and reporting. The nuances learned from these sessions allow trainees to develop our own style of communication. Since radiologist relocation to home or remote workstations became a necessity, virtual readouts, if any at all, have served as the sole source of “viewbox learning.” While virtual readouts provide educational value, it is often at the cost of efficiency and convenience. First, these readouts must be coordinated between the attending and trainee, both of whom might be separately distracted by phone calls from consultants, imaging protocols for arrived patients, or other clinical responsibilities. Second, there are still frequent technical difficulties such as lost signals, weak connections and inadequate audio. Some individuals might be also less quick to adapt to various aspects of virtual teaching and learning. Despite these challenges, findings and explanations can still be readily referenced by series and image numbers over audio and phone, and there are several methods of screen-sharing or shared screen control available to ease and clarify communication. The latter options offer the closest simulation to side-by-side readouts and, in many instances, might be a sufficient enough solution. Still, it is generally agreed that much about the in-person experience remains lost over virtual readouts.

Changes in daily workflow

A key part of clinical training is achieved through experiential learning, which allows the learner to immediately apply his or her knowledge and receive real-time feedback and guidance. As a result of the COVID-19 pandemic, the overall decrease in imaging case volume is estimated to be 50–70%, which is undeniably detrimental to trainee education [2]. As trainees encounter fewer pathologies and clinical scenarios in daily work, our active experiential learning has become more creative and must be supplemented with more passive didactic learning [3]. This is evident by the abundance of virtual and remote learning opportunities already mentioned. Additionally, because of the dramatic decrease in imaging workload, the daily schedules of trainees have been capsized. Many programs have adapted a shiftwork model to reserve a backup pool of trainees should members of the onsite team become ill, quarantined or redeployed to another field [4]. It is expected that individuals who are offsite remain engaged academically through virtual learning opportunities. While experiential and didactic learning might complement each other, they are certainly not substitutes for each other.

One aspect of pediatric radiology that absolutely demands hands-on practice is, of course, the procedural aspect. Because of the postponement of routine elective procedures, bread-and-butter cases have become less frequent and the prospects

of refining technical skills might be hindered. Interruptions to the normal daily procedural workflow are also being observed, particularly at centers where screening all patients for COVID-19 prior to any procedure is mandated. For instance, unexpected add-on procedures are sometimes delayed secondary to waiting for the COVID-19 test results. In general, the diminished volume of radiologic studies and procedures represents a negative influence on trainee education during the COVID-19 pandemic.

Career development

“[There is] difficulty in securing job interviews as many facilities are struggling to make payrolls due to reduced patient numbers.”

Immediately prior to the pandemic, radiologists-in-training harbored relatively little anxiety about the job market that would greet them after graduation [5]. More than 70 postings were listed on the SPR job board in the early months of 2020. However, with the profound economic toll of the COVID-19 pandemic still being calculated, a long-term effect on the radiology job market is expected. For example, in addition to fewer overall job prospects, the types of jobs available are likely to change, given the relatively favorable conditions for corporatization of private radiology groups and decreased revenue [2].

Although dire predictions abound, radiologists-in-training can find cause for solace. For instance, at the time of this writing, the SPR job board still had had 54 postings. Additionally, many departments find themselves quickly refocusing their attention on the incipient resurgence in imaging volume, with some even experiencing subspecialty radiologist staffing shortages [6]. Some predict that it will not be long before departments change focus to hiring extra staff and negotiating overtime pay schedules [7]. Beyond the task of merely finding a job is the challenge of how one can truly get the feel of a new city, the people or the institution when travel restrictions and social distancing guidelines hinder on-site interviews. The obstacle is equally present for employers, who must try to determine whether an applicant is a good fit for their environment and position. Out of necessity, the trend seems to favor virtual recruitment with video or phone interviews and webcam tours, online inclusion in town hall meetings/huddles, and even virtual social happy hours, luncheons or dinners as a way for employers and applicants to learn about each other. Despite these measures, it would not be surprising to see an increase in more local employment — that is, fellows staying at the home institution where they completed their training because both applicant and employer are familiar with the other in the workplace environment.

An aspect of career development that straddles both the professional and personal realms is the opportunity for academic pursuits, research and even self-improvement. In the early days of the pandemic, the gift of time was available because of staggered work shifts and lower imaging volumes. If one could keep the overhanging stresses of the pandemic at bay, this time could have been used productively to work on research projects or other scholarly activities. Overall, the number of journal submissions from fellows has likely increased, not only because of increased time but also because of the opportunity to share new data and perspectives offered by COVID-19 itself. Within the personal realms, many trainees took the opportunity for self-enrichment, perhaps with pursuit of a new hobby, skill, language or passion through various online courses and subscriptions, such as MasterClass and EdX.

Physical and mental wellness

Physician wellness has become a hot topic in recent years, particularly in the setting of graduate medical education. A holistic definition of physician wellness, incorporating both physical and mental well-being, is required to understand the true ramifications of the virus on trainees. Merely describing wellness as “the opposite of burnout” does not do justice to the gravity of the problem because every element of physician wellness has been irrevocably altered in the pandemic, and physicians-in-training are among the greatest affected.

Pediatric radiology trainees are largely expected to be physically present in the reading room, with home workstations in short supply and mostly reserved for faculty; this exacerbates stresses related to exposure to the virus while being at the hospital. In the April release of the morbidity and mortality report from the United States Centers for Disease Control and Prevention, 19% of new COVID-19 cases from February to April were identified as health care professionals. Programs have made special efforts to mitigate this risk, including keeping trainees to a shiftwork schedule (e.g., 1–2 weeks on with 1 week off) [8]. In some circumstances, radiology trainees have even been deployed to non-radiology clinical duties at their institutions. Anecdotally, this has instigated new stressors related to learning a different clinical skill set or re-training for one that might now be a distant memory from intern year.

Although not uniquely affecting pediatric radiology trainees, the impact on physical health has been significant from sudden gym closures, rescheduled routine elective medical and dental appointments, and limited forms of outdoor exercise in light of social distancing regulations. Given that pediatric radiology is typically a 1-year fellowship, there is an added challenge of not only establishing care with a new clinical provider in a new city, but also doing so with already

limited appointment availability and largely telemedicine communication. Regarding decreased access to gyms and fitness studios, home workouts have grown in popularity and a multitude of downloadable workout apps have been created in response, both of which may help temporize stresses on physical health.

The uncertainty of the pandemic has had massive effects on trainee mental health. While trainees are conditioned to be flexible and tolerate delayed gratification, the added strain of the pandemic leaves no predictable end to these new challenges. Counseling services through institutional employee assistance programs have been a welcome source of support, although they are often restricted to business hours. Endless mobile apps have been developed with resources for guided meditation, breathing exercises and sleepcasts, some of which offer free subscriptions for health care professionals. Others offer convenient access to online counselors, which are adaptable to physician work hours.

Finally, the loss of typical milestones and celebrations remains a challenge. For example, many residents and fellows have lost the opportunity to celebrate their graduations into attendingship. Replacements with online gatherings have been a novel solution to the problem, but disappointment still lingers with many.

As one stage of training ends and the next begins, many trainees face relocation during a pandemic, which might be cross-country or even across the world. There is now added anxiety of moving from a city with low infectivity to a viral hotspot or even moving from one hotspot to another. Regarding driving, especially for long distances needing 2 or more days of road travel, the uncertainties include whether staying in rentals or with friends/family along the way poses the least risk. Flying during the pandemic carries its own challenges associated with increased risk of exposure, decreased flight availability, and mandated testing and self-quarantines prior to and following international travel. However, there are some fortunate perks to relocating during a pandemic, such as decreased traffic from stay-at-home mandates and increased availability and affordability of rental accommodations.

Relationships

The pandemic stifled conventional relationships and relationship-building for pediatric radiologists-in-training. Social-distancing rules mean that trainees face significant barriers to maintaining or forming new relationships. Trainees completing their fellowship year away from their loved ones were particularly affected by domestic and international travel restrictions. Workplace relationships and relationship-building also take on a complex dimension, leaving many trainees fostering relationships with referring clinicians over videoconferencing software or behind a protective face

covering. While the use of videoconferencing soared in many departments, the lack of interpersonal interaction has the potential to significantly decrease workplace satisfaction, especially in light of recent work highlighting the importance of workplace relationship-building in pediatric radiology [9].

Aspects of family life — child care/homeschooling

In addition to managing the difficulties of becoming a pediatric radiologist during a pandemic, a subset of trainees also care for family, particularly children. The pandemic abruptly upended an already-tenuous work–life balance in these family settings. For those with young children, stress increased as conventional child care options quickly dwindled. For those with school-age children, parents filled multi-faceted new roles as teachers and counselors. Efforts to support health care workers with children have included local support groups, child care resources via email, and even free child care services. Regardless of each individual situation, many trainees have expressed a similar set of sentiments: angst around expanding responsibilities at home, renewed appreciation for their partners' support and anxiety about what lies ahead. As the uncertainty of the COVID-19 pandemic continues, so does the division of time and attention between fellowship training and family for trainees.

Conclusion

The pandemic has demanded resilience in pediatric radiology trainees, who not only share challenges presented to all health care workers but also experience stressors that are unique to our specialty. These major challenges center on trainee education, professional and personal development, and wellness. The ever-evolving solutions that have come from this

pandemic are likely to be incorporated into our daily lives for years to come, and embracing these changes should allow trainees to adapt during difficult times and also promote a culture of innovation.

Compliance with ethical standards

Conflicts of interest None

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