

# Radiology Learners and COVID-19: Now and After



Canadian Association of Radiologists  
L'Association canadienne des radiologistes

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Publication date: May 22, 2020. Ottawa, Ontario

## Abbreviations

AARS: American Roentgen Ray Society  
ACR: American College of Radiology  
CAR: Canadian Association of Radiologists  
CHAR: Canadian Heads of Academic Radiology  
COVID-19: Coronavirus disease of 2019  
OCSE: Objective Structured Clinical Examination  
PGY: Post-Graduate Year  
PPE: Personal Protective Equipment  
RFS: Residents and Fellows Section of the CAR  
RSNA: Radiological Society of North America  
SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2

## Introduction

The SARS-CoV-2 (COVID-19) pandemic is causing significant repercussions in all aspects of radiology training programs. The Canadian Association of Radiologists (CAR), Resident and Fellow Section (RFS) of the CAR and Canadian Heads of Academic Radiology (CHAR) recognize that additional guidance is required to ensure all aspects of a future radiologist's education are considered. The goal of this paper is to identify the changes to teaching that have taken place because of COVID-19. Furthermore, we propose a list of actions to augment learner's education within the new COVID-19 landscape.

The COVID-19 pandemic will cause enduring changes to healthcare and will challenge the status-quo of education (1). Radiology leaders as well as learners have the opportunity to define a new future for radiology practice and education at undergraduate and postgraduate levels.

## Undergraduate

In many hospitals, medical students have been temporarily removed from the hospital environment for their own protection. Adoption of virtual platforms for teaching are under-way, given that traditional in-person learning and evaluation are currently not feasible. The pace of adoption of virtual technologies is governed by many factors, including compliance with university and local offices regarding medical education guidelines. Fortunately, there is no evidence that traditional classroom (offline) learning is superior to online learning (2). Many faculty and students are rightfully concerned over the education of current and future medical students. Accordingly, the following can serve to ensure a continuity of quality education.

- Use virtual platforms rather than standard classrooms.
- Create peer-learning groups – using virtual platforms. Ideas generated in the smaller groups can be shared with the larger class.
- Enquire with medical schools about learning opportunities around crisis management.
- Volunteer with organizations that help those most at risk of suffering adversely from COVID-19.

- Enquire with medical schools regarding other online/virtual opportunities to give back to the community and learn in the process.
- Explore non-traditional classes which can augment your medical education such as additional languages, statistics, or programming languages for Artificial Intelligence (AI).

## Residents and Fellows

COVID-19 has resulted in a significant drop in elective imaging; clinical loads in radiology have been reduced by 50% in most academic centers (3). This decrease in clinical volume has minimized the need for on-site residents at most centers and fellows have been similarly affected. Some Canadian academic radiology programs have limited on-site trainee activities to on-call duties. One scheduling method being utilized to ensure capacity and reduce risk of transmission between team members is to divide residents into two groups alternating every other week (one week on, one week off) between clinical services and home/distance learning (4–6). We encourage program directors to facilitate such flexible scheduling. With the eventual slow resumptions of elective radiology services, we anticipate a gradual return of trainees to on-site activities. Specific training on COVID-19 management (workflow, PPE, imaging findings and prioritization) should be available to guide trainees in these early days.

Radiology residents in academic centers may have been redeployed to other areas where their help is needed during the pandemic. Redeployment to a non-radiology setting should be performed on a voluntary basis when possible (4,5). Consultation with the post-graduate medical education office administration responsible for such decisions is mandatory.

Trainees' one-on-one teaching as well as daily teaching rounds have either decreased or have been modified to virtual versions during the pandemic. Loss of one-on-one teaching is very significant in terms of the apprenticeship experience in radiology. Again, in a manner compatible with social distancing and institutional PPE recommendations, one-on-one teaching should be progressively reintroduced.

This includes readout sessions with masks used by the radiologist and the resident as well as cleaning the keyboard and station area before and after the one-on-one session. Other options still include use of Personal Information Protection and Electronic Documents Act (PIPEDA) approved virtual platforms (e.g. MS teams) where the PACS screen with patient images can be shared and controlled by either the staff radiologist or the resident during the virtual review.

Final-year residents have had their Royal College of Physicians and Surgeons of Canada (Royal College) exam delayed and modified. The traditional comprehensive exam consisting of a separate multiple-choice exam as well as a combined Objective Structured Clinical Examination (OSCE) and an oral component, has been altered to a single session multiple-choice examination. The oral/OSCE component of the exam is felt by many, including the Royal College, to be central in the final comprehensive examination. The Royal College has stated that the complete comprehensive exam (written, oral/OSCE) will resume for the 2021 cohort.

To ensure learners at all stages are given the best possible education, we have provided a list of activities which can serve to augment the current educational environment for residents and fellows.

- Access live radiology webinars – offered through many universities and radiology societies (e.g. CAR, ACR, RSNA, etc.).
- Facilitate rapid adoption of virtual technologies by assigning one or two tech-savvy residents to support faculty with virtual platforms (1).
- Utilize interactive learning tools such as audience polling (e.g. polleverywhere.com, RSNA Diagnosis Live).
- Create small online groups amongst learners to collaborate.
- Utilize PIPEDA approved platforms such as Microsoft Teams to review cases with staff and allow screen sharing.
- Access previously recorded webinars and other online learning materials (e.g. CAR, ACR, RSNA, AARS and more, etc.).
- Redeploy workstations on campus to achieve the recommended physical distancing (6).
- Host “virtual rounds” with clinicians and surgeons (1).

- Leverage real-time communication tools within PACS between learner and staff radiologists (6).
- Create case(s)-of-the-day to be shared amongst fellows and staff followed up with email/virtual discussions and include residents in the discussions as appropriate.

For learners looking for non-clinical opportunities we recommend the following:

- Active onsite involvement to learn about organization, leadership, teamwork and crisis management (4).
- Explore financial planning and business management related education materials.

## Fellowship Opportunities

In many centers, fellows are international medical graduates. Some countries have recalled their fellows due to projected person-power needs. The loss of fellows might significantly affect some academic radiology programs in terms of being able to cover on-call services in addition to some daytime services, especially once the workload begins to increase.

CHAR is currently building an inventory to estimate the potential unfilled fellowship positions in Canada for July 2020. This could be an opportunity to match unfilled positions with Canadian graduating PGY5 residents who might have difficulty travelling abroad or securing necessary paperwork to begin their previously planned fellowships. The current inventory of fellowship positions is available at [www.car.ca](http://www.car.ca) within the CAR members portal.

## Research

Non-essential research activities in imaging have been suspended at most academic centers (7). Only Level 1 research status (critical research activities) approved on campus are allowed in most research centres with exemptions available at some centres for COVID-related investigations. Fellows are often in training for 1-2 years and the suspension of non-essential research will negatively affect their ability to complete the research component of their learning objectives. Trainees conducting retrospective clinical research are less affected, though, even they may face difficulties if requiring research support services. There is also a potential that a trainee’s ability to graduate and receive their final certificate is in jeopardy as a result of the

suspension of research activities. Plans for the resumption of research activities are being prepared across academic centers. It is important to comply with the published guidelines of each university, local offices of medical education and research institutes before resuming on-site research.

The following research activities can be further explored by imaging trainees.

- Research opportunities related to COVID-19 including imaging, quality assurance and AI applications.
- Trainees who have not completed all their data collection can still be mentored and encouraged by their supervisors to start writing a manuscript including the introduction, methods section, and complete the full literature search.
- For trainees who have not started a project, the reduced clinical volume provides them an opportunity to connect with potential supervisors, create a research project idea, plan, and even complete the application for future Research Ethics approval.
- There are also research projects which do not require patient contact or hospital access which could still be considered. This would include systematic reviews, PICO (patient/population, Intervention, Comparison, Outcome) projects and on-line surveys, if supervisors with the relevant expertise and experience are available as mentors.
- Online/virtual platforms (e.g. Slack) can allow various threads to be created for different areas of research. On these threads, researchers can share ideas, collaborate, and learn from others. Multiple threads can be joined by trainees to expand their pool of ideas or narrow their involvement if their area of research is specific.

## Safety and Mental Health

With the eventual resumption of elective medical imaging, we anticipate a gradual return of our medical students, residents, and fellows to on site activities. Prompt and open channels of communication should be available to address the concerns of the learners, including education on PPE usage, testing indications, self-quarantine, and return to work after illness (5).

All learners must be appropriately trained on how to properly use PPE, as a significant number of medical professionals use their PPE improperly (8) and now is the time to start good habits. Program directors must also advocate for appropriate PPE to be available for all learners to ensure they are suitably protected.

This period of uncertainty due to the pandemic has been stressful for our learners as delays may impact their credentialing and their future professional life. Trainee wellness is closely associated with the clarity, adequacy, and reliability of relevant information (5). Communication and collaboration are essential during the pandemic and it is important that trainees remain connected to their faculty members and peers. Program Directors should also ensure they are clearly communicating expectations to trainees. The Resident and Fellow Section (RFS) of the CAR can play a significant role in maintaining connections between trainees, and with faculty members.

## Notes for the Educators

Continuity of learning through innovative approaches will be key to meeting the education needs of residents and fellows without unduly burdening staff radiologists (1). As the demand for radiology services escalate, it will be increasingly important to monitor the workload on staff radiologists.

Systems can be put in place, during the time when workloads are still reduced, to ensure a smooth transition to a new “normal”. Institutions could update their teaching files and accessible databases of existing cases for trainee review (1). For example, this type of activity could allow trainees to quickly learn to identify COVID-19 cases.

Residents and fellows also have the potential to leverage virtual platforms to play a prominent role in teaching. One example, would be to use imaging to teach anatomy and disease pathology in an interdisciplinary setting (1).

Finally, many trainees may feel isolated during this difficult time. Hosting virtual town halls as well as virtual social events to allow everyone to connect and be informed could be a valuable reminder that we are together during this time.

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