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Topic Discussion

Virtual Away Rotations Increase Access to Radiation Oncology

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Abstract The COVID-19 pandemic altered the workplace for medical education. As restrictions ease, the opportunities provided by virtual rotations remain. Radiation oncology rotations based on virtual participation with patients (consultations, follow-ups, and brachytherapy), contouring and reviewing external beam plans, didactics, and unstructured office hours have been well received at multiple institutions. Virtual rotations decrease barriers to access including lack of a radiation oncology department at one's home institute and the high cost of travel and housing. Furthermore, rotations can be adapted to preclinical students and those with prior radiation oncology rotation experience. However, the virtual format creates and exacerbates several challenges including technical difficulties with electronic medical record or treatment planning software, lack of the spontaneous interactions common to in-person rotations, and unexpected delays in the clinic. We recommend early scheduled time with information technology services to troubleshoot any potential issues, scheduled office hours with faculty and videoconferencing with nonphysician team members to mitigate omission of in-person introductions, and provision of complete contact information for all staff scheduled to meet with students to facilitate communication when unexpected clinic issues arise. Although we are all excited for quarantine restrictions to safely be lifted, we support the continued development of virtual away rotations as a flexible, more affordable option to increase exposure to the field.

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The COVID-19 pandemic altered the landscape for medical care and education. With restrictions on entering clinics, adaptation was imperative, prompting increasing use of telehealth and the rapid development of virtual rotations for medical student in multiple fields.¹⁻⁴ Virtual rotations are an ideal vehicle to introduce outpatient oncology, increase access for international students, and decrease barriers for the 21% of medical students at institutions without a radiation oncology department.⁵ There are, however, several challenges with implementation and drawbacks compared with in-person rotations.

Despite these limitations, we advocate for the continued development of virtual rotations as an additional tool to increase access and exposure to the field.

We created a virtual 2-week elective similar to that of Kahn et al¹ that enrolled 6 away rotators before the 2020 residency interview cycle. The backbone of the course included 1 attending and resident pair per week, with telehealth and video engagement during in-person visits and brachytherapy with patient consent. Students also spent time in virtual office hours with residents and faculty, allowing for unstructured discussions that mimicked in-person downtime. The deliverables for the rotation were 3 contouring projects and an end-of-rotation presentation. Students were asked to contour organs at risk and target volumes for intact prostate cancer, a liver metastasis, and

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3 brain metastases. Magnetic resonance imaging scans were already fused to planning computed tomography scans for the students. Students used RapidPlan to generate treatment plans, which they reviewed with faculty using the Contours, Beam Arrangement, Coverage, Heterogeneity/Hotspots, Organs at Risk, and Prescription framework.⁶ Similar to in-person rotators, virtual away rotators created an end-of-rotation presentation about an oncology topic of their interest that was presented after weekly chart rounds. Pre-recorded institutional and web-based open access lectures such as those from Radiation Oncology Virtual Education Rotation⁷ were provided to add depth to disease subsites. On exit interviews, students uniformly reported that the highlights were patient visits, which made the lecture material more tangible, and they all reported that the contouring projects were useful, including 2 students who were neither interested in nor applying into radiation oncology.

The virtual format provides numerous benefits. First, it increases accessibility to a clinical experience often lacking in many medical schools, particularly for students of minority populations underrepresented in medicine.^{5,8} Whereas 21% of medical students train at institutions without a radiation oncology department,⁵ students of minority populations are even more likely to attend a medical school without a radiation oncology department.⁸ By increasing access to students around the country, virtual away rotations remove one of many barriers to a career in radiation oncology. Second, virtual away rotations are less expensive, more flexible, and easier to navigate than in-person rotations, which require travel, housing, and work in a foreign environment. For students with significant debt or who work during medical school, these costs can be prohibitive. Third, virtual rotations ease participation in educational activities. Trainees can be seamlessly incorporated into treatment planning and offline review via screen-sharing. Toggling between patient visits and tumor boards is easier virtually, as is balancing work with faculty in different clinics. Fourth, a virtual rotation can be tailored to the student's level of training or different curricular needs. For example, virtual radiation oncology electives could fill longitudinal patient experiences or complement radiographic anatomy teaching for preclinical medical students. Components of virtual electives could be incorporated into teaching about communicating difficult diagnoses or managing chronic illness. Advanced electives could be designed for postclerkship students interested in surgical or medical oncology who want a more in-depth cancer experience. Alternatively, the curricular components could be incorporated into a mixed educational and research opportunity for students during the summer between the first and second year of medical school.

There are opportunities for improvement with the virtual format. Ensuring all students have adequate privileges and can navigate the electronic medical records

before starting the rotation is crucial to optimize the remote learning experience. Troubleshooting problems is significantly more challenging virtually. After our first set of students, we dedicated time on the first morning of the rotation to review access and use of the electronic medical record and contouring software with an information services technician. In addition, spontaneous interactions common with nurses, radiation therapists, dosimetrists, physicists, residents, referring physicians, and other faculty are difficult to replicate. Scheduled office hours with residents or faculty and participation in tumor boards helped mitigate this loss. However, in the future, scheduled time videoconferencing with other members of the treatment team, screen-sharing with a dosimetrist developing a plan, or watching physicists calibrate machines at the end of the day could help highlight the collaborative nature of the field. Unexpected delays owing to patient care are a challenge universal to medical training. To ameliorate the anxiety caused by staff not logging in at scheduled times, we provided students with full contact information for everyone they would be meeting and encouraged them to text or call if they did not have an update within 5 minutes of the start time.

Although we are eager to resume in-person rotations, we call on the radiation oncology community to deploy virtual rotations as another method to provide exposure to the field of radiation oncology. The benefits of rotating in-person are not questioned, but there are also significant downsides including cost and lack of access for many students. Virtual away rotations have challenges, technical and social, but also provide opportunities that can be easily adapted to students at multiple levels of training around the world. Further work is warranted to improve virtual rotations, including optimizing the balance of interactions, lectures, and treatment planning, exploring different formats and timelines (ie, 1-week vs 2-week rotations or 1 day per week for a month), and reform through continuous needs assessment and program evaluation.

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