Advances in Radiation Oncology
Improving Diversity and Inclusion in the Post-COVID Era through a Radiation Oncology Intensive Shadowing Experience (RISE) --Manuscript Draft--

Manuscript Number: ADVANCESRADONC-D-20-00264R1

Article Type: Research Letter

Section/Category: COVID-19

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Abstract:

Purpose

In response to the COVID-19 pandemic, current AAMC guidelines discourage away rotations, posing significant challenges for attracting students to radiation oncology (RO). This is particularly concerning for medical students underrepresented in medicine (UIM) due to the potential of widening existing disparities in applicant and workforce composition. To proactively address this, we created a Radiation Oncology Intensive Shadowing Experience (RISE) to expose UIM students to the field of radiation oncology.

Methods and Materials

Key stakeholders within the residency program, including both UIM faculty and residents with experience in health disparities and medical education designed a one-week virtual Radiation Oncology Intensive Shadowing Experience (RISE) intended for fourth year UIM students recruited through established national organizations serving UIM medical students. A one-week disease specific curriculum was developed using four components: 1) foundational exposure to radiation oncology, 2) didactic teaching, 3) mentorship opportunities, and 4) a capstone experience. Mentorship was continuously weaved through the experience by attendings, peer resident mentors and a UIM resident panel to optimize exposure.

Results

Anonymized pre- and post- clerkship surveys were administered to students, residents and faculty involved in RISE to evaluate participants’ satisfaction, resident and attending time burden, and perceptions of program effectiveness.

Conclusions

We created a unique virtual RO shadowing experience for UIM students to address a critical gap in exposure to radiation oncology, heightened by the COVID pandemic, with the goal of improving diversity, equity and inclusion in our field.
TITLE: Improving Diversity and Inclusion in the Post-COVID Era through a Radiation Oncology Intensive Shadowing Experience (RISE)

SHORT RUNNING TITLE: Improving Diversity and Inclusion Post-COVID

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Conflict of Interest: None

Funding: None
Summary

Current national guidelines prioritizing safety of medical students during the COVID-19 pandemic have inadvertently created a gap in access to exposure and education in radiation oncology (RO) for minorities underrepresented in medicine (UIM). This has the potential to widen existing disparities in applicant and workforce composition. We propose a virtual radiation oncology intensive shadowing experience (RISE) to increase exposure for UIM students, during a critical period in residency selection.
SHORT RUNNING TITLE: Improving Diversity and Inclusion Post-COVID

Abstract

Purpose: In response to the COVID-19 pandemic, current AAMC guidelines discourage away rotations, posing significant challenges for attracting students to radiation oncology (RO). This is particularly concerning for medical students underrepresented in medicine (UIM) due to the potential of widening existing disparities in applicant and workforce composition. To proactively address this, we created a Radiation Oncology Intensive Shadowing Experience (RISE) to expose UIM students to the field of radiation oncology.

Methods and Materials: Key stakeholders within the residency program, including both UIM faculty and residents with experience in health disparities and medical education designed a one-week virtual Radiation Oncology Intensive Shadowing Experience (RISE) intended for fourth year UIM students recruited through established national organizations serving UIM medical students. A one-week disease specific curriculum was developed using four components: 1) foundational exposure to radiation oncology, 2) didactic teaching, 3) mentorship opportunities, and 4) a capstone experience. Mentorship was continuously weaved through the experience by attendings, peer resident mentors and a UIM resident panel to optimize exposure.

Results: RISE was successfully initiated at two academic medical centers with twelve UIM students enrolled through August. Anonymized pre- and post- clerkship surveys were developed for students, residents and faculty involved in RISE to evaluate participants’ satisfaction, resident and attending time burden, and perceptions of program effectiveness.

Conclusions: We created a unique virtual RO shadowing experience for UIM students to address a critical gap in exposure to radiation oncology, heightened by the COVID pandemic, with the goal of improving diversity, equity and inclusion in our field.
Introduction

The novel coronavirus (COVID-19) pandemic has impacted medical education with suspension of on-site clinical rotations per the Association of American Medical Colleges (AAMC).\(^1\) In response, Radiation Oncology (RO) residency programs have created virtual clinical opportunities to address gaps in medical education.\(^2,3\) However, at the time of this publication, there were few available clerkships for medical students unaffiliated with a home residency program. Current AAMC guidelines discourage away rotations for the 2020-2021 academic year, except in circumstances where students lack access to clinical experiences within their home institution.\(^4\) These guidelines pose challenges for minority students underrepresented in medicine (UIM) as they are approximately 40% less likely than their non-Hispanic White counterparts to attend a medical school with an affiliated RO department.\(^5\) This lack of access to formal away rotations also impacts associated benefits that could strengthen an application including letters of recommendation, research opportunities, and networking.

To our knowledge, there are limited formal programs with a potential to improve workforce diversity in RO.\(^6\) Data on residency composition indicate that Black, Hispanic and American Indian/Alaska Natives/Native Hawaiians/Pacific Islanders make up 11.7% of applicants and 8.1% of RO residents.\(^7,8\) Given the interest in training a diverse and culturally competent workforce, the medical profession has advocated for deliberate efforts through pipeline recruitment.\(^9\) Herein, we describe a proactive approach to mitigate the impact of COVID-19 on senior UIM medical students through a Radiation Oncology Intensive Shadowing Experience (RISE). The goal of RISE is to provide clinical exposure, didactic teaching, mentorship and networking opportunities for UIM trainees, allowing for promotion of diversity, equity and inclusion in RO.

Methods
Using Kern’s six steps of curriculum design, key stakeholders with experience in medical education and health disparities were assembled from three Northeast academic medical centers. Members included the residency program director, medical student clerkship directors, and residents, including those from UIM groups. The group reviewed COVID-related restrictions imposed on the residency program and identified the needs of both the program and of UIM students, highlighting the current deficiencies in education, followed by a problem-centered approach to identify solutions. Due to external time constraints, an abbreviated needs assessment was undertaken by stakeholders via a focused group discussion to identify the ideal learning environment for students, review existing resources, and highlight barriers to reform. A strategic planning session was pursued to develop specific goals and objectives for a one-week virtual curriculum (Table 1).

The four key components of the RISE curriculum include: 1) exposure to RO through virtual attendance of department chart rounds and tumor boards, virtual exposure to simulations, contouring and treatment planning, and patient encounters via secure cloud-based telemedicine, 2) knowledge through didactic teaching, 3) mentorship opportunities through formal exposure to site-specific attendings and resident mentor, and via informal exposures through a UIM panel during the virtual experience, and finally, 4) a capstone presentation. These components encompass the goals and objectives of RISE, providing an intensive virtual experience to UIM students unduly impacted by rotation limitations during COVID-19; including the formation of longitudinal relationships with resident and faculty mentors. To ensure quality content, the previously validated Introductory Radiation Oncology Curriculum (IROC) was utilized for core knowledge. Participation in this one-week intensive experience was designed to be limited to senior UIM medical students based on the AAMC definition. Recruitment was through established
organizations including the Student National Medical Association (SNMA), Latino Medical Student Association (LMSA), Asian Pacific American Medical Student Association (APAMSA), and advertisement on social media platforms.

Mentorship and networking experiences with 1-2 site specific attendings, a resident, and a UIM resident panel were weaved throughout the experience. Finally, a case-based capstone presentation leveraged the students’ visibility in the department and highlighted the knowledge acquired during the week.

Results

RISE was successfully implemented at two academic medical centers, with the first UIM medical student starting within 6-weeks from program conception. There was department-wide buy in from leadership and 12 students were registered through the end of summer. Anonymized pre- and post- clerkship surveys were developed for RISE student participants with questions on demographics, exposure to and experience with RO, and objective knowledge-based questions previously validated as part of the IROC curriculum\(^{11}\) (Figure 1). A brief survey was also designed for the faculty and resident mentors to evaluate the utility and time burden.

Discussion

To our knowledge, this is the only virtual RO shadowing experience specifically targeting UIM students. This addresses a critical gap in resources, exposure, diversity and inclusion initiatives in RO. Our program, as part of a major medical cancer center, is uniquely positioned to provide students with a variety of learning opportunities and state-of-the-art technologies not widely available. One potential limitation is the short duration, condensing a traditional 4-week medical school rotation into one week. Although this is more compact, the virtual platform, intensive structure, and tailored single service mentorship allows students to spend more time with
faculty mentors and build stronger connections, while providing flexibility for filling empty time with educational experiences. Our curriculum includes educational activities previously reported by medical students as deciding factors for specialty and previously validated among RO residents for learning.\textsuperscript{14,15,16} The week-long experience, with designated faculty and peer resident mentors, aims to provide medical students the opportunity to build new career networks and establish collaborations for future projects; strengthening their residency applications.\textsuperscript{17} It also allows participants to interact with trainees of similar backgrounds and interests, shown to influence residency selection in UIM students.\textsuperscript{18}

On a national scale, the COVID-19 pandemic has revealed a long known yet under-addressed epidemic of socioeconomic and health disparities within marginalized communities.\textsuperscript{19} In medical education, COVID-19 has influenced guidelines that may impact students who have historically been underrepresented in competitive specialties and could be deterred from applying due to limited access to rotations. We have harnessed this opportunity to create a curriculum that promotes diversity and inclusion. It also has applications beyond COVID-19 and based on our experience, with institution specific adaptations, we hope other RO departments will utilize the RISE program to address similar obstacles in recruiting UIM students.
References:


Table 1. Sample medical student schedule for 1-week Radiation Oncology Intensive Shadowing Experience (RISE)

Figure 1. Sample Questions from Medical Student Survey Regarding Evaluation of 1-week Radiation Oncology Intensive Shadowing Experience (RISE)
<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00-9:00 Resident AM Conference</td>
<td>8:00-9:00 Resident AM Conference</td>
<td>8:00-9:00 Resident AM Conference</td>
<td>8:00-9:00 Resident AM Conference</td>
<td>8:00-9:00 Resident AM Conference</td>
</tr>
<tr>
<td>9:00-10:00 Virtual Panel with UIM RO Residents and Attendings</td>
<td>9:00-11:00 Peer Resident Mentor IROC Session 1 and 2 – Introduction and CT Simulation</td>
<td>9:00-10:00 Virtual Experience of CT Simulation – Introduction to the Role of Radiation Therapist</td>
<td>9:00-10:00 IROC Session 5 and 6 – Physics &amp; QA</td>
<td>9:00-10:00 IROC Session 7 – Radiation Oncology Emergencies</td>
</tr>
<tr>
<td>10:00-12:00 Virtual Meet and Greet with Attending and Didactic Teaching on Disease Site Topic.</td>
<td>11:00 – 12:00 Virtual Patient Consultation</td>
<td>10:00-11:00 IROC Session 4 – Plan Evaluation</td>
<td>10:00-11:00 Virtual Follow-Up Visits with Attending</td>
<td>10:00 – 10:30 Final Capstone Prep Resident Mentor</td>
</tr>
<tr>
<td>12:00 – 1:00 Virtual Department Chart Rounds</td>
<td>12:00 – 1:00 Disease Site Specific Tumor Board</td>
<td>11:00 – 1:00 Virtual MR-LINAC Live Treatment</td>
<td>11:00 – 12:00 Academic Time</td>
<td>12:00-12:30 Capstone Presentation &amp; Conversation - Disease Specific Topic</td>
</tr>
<tr>
<td>1:00-2:00 Pre-Consultation Virtual Patient Interview</td>
<td>1:00 – 2:00 IROC Session 3 – Contouring</td>
<td>1:00-2:00 Virtual On Treatment Visits with Attending</td>
<td>1:00-2:00 Peer Resident Meeting: Prep for Capstone Presentation</td>
<td>1:00-2:00 Meeting with Attending to Debrief the Week and Discuss Research Opportunities</td>
</tr>
<tr>
<td>2:00-3:00 Virtual Consult with Attending</td>
<td>2:00-3:00 Peer Resident Meeting: Consult Note Writing and Introduction to e-contour Platform with Contouring Practice</td>
<td>2:00-3:00 Virtual Dosimetry Session and Plan Review with Attending</td>
<td>2:00-4:00 Academic Time [Finish Power Point for Capstone Presentation on Disease Site Topic]</td>
<td>2:00-3:00 Peer Resident Meeting: Applying to Radiation Oncology &amp; Wrap-Up</td>
</tr>
</tbody>
</table>
## Figure 1.
To what extent do you agree with the following statements?

<table>
<thead>
<tr>
<th>Overall:</th>
<th>Disagree Strongly</th>
<th>Disagree Slightly</th>
<th>Neutral</th>
<th>Agree Slightly</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>The goals and objectives of this program were clearly stated</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The coursework was appropriate for my level of training</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>This course was helpful in deciding residency training</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I will utilize what I learned in my future practice</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I would recommend this course to other students</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### Circle the number that best describes your opinion

<table>
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<tr>
<th>Individual Components</th>
<th>Very Dissatisfied</th>
<th>Somewhat Dissatisfied</th>
<th>Somewhat Satisfied</th>
<th>Very Satisfied</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Patient Consult</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
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<tr>
<td>On Treatment Visit</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
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<tr>
<td>Patient Follow Up</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>URM Panel</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>IROC Sessions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Chart Rounds</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Disease Specific Tumor Board</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Morning Resident Didactics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Attending Mentor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Resident Mentor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Capstone Presentation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
<tr>
<td>Overall course</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>N/A</td>
</tr>
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