Short Communication

What happens next: Radiation oncology after COVID?

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Early in the COVID-19 crisis we published a commentary [1] on departmental planning needs as the COVID crisis began to unfold. Therein we stressed the need for appropriate risk/benefit analysis in the care for patients across our subsites, and the need to respond nimbly, innovatively, and responsibly as the crisis unfolded. Now as we take stock of the situation, we reflect on lessons learned to date, current needs, and planning for the new reality that awaits us.

One thing is certain: the ineffable selflessness displayed by Radiation Oncology community throughout this crisis cannot be overstated. In some regions, redeployments were met with volunteerism and bravery by trainees and attendings alike. In other regions, just showing up to work was an act of heroism, as the kinetics of the pandemic and its epidemiological features were unknown; many of our therapist, nurse, and physician colleagues worked to enable the care of their patients even when the true risk to self and each other was just becoming known. As many research projects were put on hold, in many cases irrevocably, teams of researchers took to social media to collaborate on collaborative endeavors and to contribute to COVID research where feasible. In many ways the spirit of service, collaboration, and innovation displayed constituted our field's finest hour.

But there were challenges too: trainees sent home or to the front lines, thoughtful but parsimonious guidelines for the use and omission of radiation during COVID, departments successfully operating with less as technical staff operated remotely. And as telemedicine initiatives were successfully deployed on short notice, we started, necessarily, distancing ourselves from patients and families. Conferences and exams were cancelled or rescheduled. In the process of deciding what was essential during the crisis, did we get a glimpse into what truly is "essential" in the long run?

So what happens next? Here we describe planning for the back half of the COVID crisis, and what awaits our departments as we envision our collective future within Radiation Oncology.

1. Covid planning

It is becoming clearer that COVID-related concerns are likely to persist until a vaccine is available, and then until it is truly confirmed that long lasting herd immunity is in place. Departments

will need to develop robust staffing plans that can be acted upon swiftly, accurately, and displaying alacrity. Within our department, we have begun devising such a framework. (See Table 1) This iterative approach consists of defining three levels of operation. Robust triggers for bi-directional shifting between these levels are to be developed locally. Within our department, we will use institutional and local triggers, as well as specific cut points for staff or patient infection burden, to consider a change. A COVID response unit should meet frequently, at least weekly, until the pandemic has cleared. Accompanying such an approach will be continued rigorous attention to infection control, ready use of testing, and implementation of new data and best practices as they become available.

2. Future opportunities

The crisis prompted many of our departments to roll out new telemedicine platforms – many of which had already been envisioned but slow to be implemented – in short order so as to minimize patient contact. Reimbursement and licensing rules were relaxed for the crisis. We've seen how such platforms can be useful in many patient care encounters, but what is the future state? We would suggest that such platforms not take the place of high value encounters such as the initial consult and many on treatment visits where physical connection (and examination) is critical to high quality patient care and the doctor-patient relationship. But we know that many of our patients are burdened from the demands of cancer care: functional status impairments, need to work or difficulties with transportation, limited life expectancy, to name a few. A future approach, keeping the patient's needs paramount, might transition certain on treatment visits or follow ups to the remote setting. Indeed, such an approach might lower the barrier to even longer and more granular follow-up of patients by radiation oncologists, deepening our role on the cancer care team, promoting good citizenship, and allow for the recognition and study of side effects. Moreover, when leveraged appropriately, such platforms could allow departments to reach a wider catchment of patients, for remote opinions, and as part of care where patients would travel into the facility for treatment but be managed more remotely.

Another boon has been the recognition that many of our technical and support staff can work remotely or across distributed systems. Not only does this approach free up already congested

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Table 1
One Approach to Departmental Operations.

Operations Tier	Description	Trigger to Implement
Green	Normal staffing levels, patient triage	Minimal to no staff illness/quarantine
Yellow	Use of priority staff, few to no delays of high and medium risk patients; delay some but not all low risk patients (70–85% of normal volume)	Less than 20% staff illness/quarantine
Red	Emergency operations; minimal onsite staff, planned delays/shortened treatments, only highest need patients treated (50–65% of normal volume)	Greater than 20% staff illness/quarantine or local/state/federal directives

A COVID committee should meet at least weekly; triggers for change in operations include institutional/state operations directives, staff or patient COVID infections as above.

Risk levels described elsewhere

Models assume rigorous infection control, creative staffing approaches to minimize exposure, and frequent testing

departments in terms of office space and other resources, a distributed approach could allow technical staff from high volume centers to widen their reach to assist other centers (including their own satellite facilities) with the implementation of safe and contemporary radiation methods. Admittedly such an approach might prompt departments to reconsider their staffing levels in these domains, or use this time to develop new workflow paradigms for staff that involve more patient care, treatment planning, or research.

Last minute cancellations of conferences and exams was a significant frustration to many during COVID, but what opportunities exist for a future state? Could American Board of Radiology and other exams be conducted virtually in the future, to minimize time away and expense? Could conferences and educational events include a virtual component to allow those who have to stay behind “to cover” to participate, yet maintain some of the social gathering benefits that meeting offers? What about resident training? It has been described how the cost of “away” rotations and other clinical experiences adds yet another cost to an already expensive residency applications process [2]; might more virtual experiences allow us to reach more students and provide greater opportunities for interaction? At our institution, we have pioneered a virtual radiation medicine elective for our medical students, consisting of both synchronous and asynchronous opportunities, as well as hands on experiences like contouring and oral presentations. Though such experiences can’t replace formal in person experiences, could they be used to augment how we educate students?

Finally, the spirit of cooperation and innovation has been on full display as individuals worked to devise new areas for research, new paradigms for infection control, and even new types of inpatient service. Though Twitter served as a means for conversation, we hope that this experience prompts the development of new virtual ways for us to connect and collaborate. As well, seeing us alongside other colleagues in the hospital should only improve our images as physicians first, radiation oncologists second; how might a future state where we are more involved in inpatient and other types of care be fashioned? [3]

3. Headwinds

The development of responsible guidelines for caring for patients in the time of COVID brought renewed emphasis on frac-

tionation, risk/benefit, and the selective delay and/or omission of radiotherapy. Some argued that only patients where an overall survival benefit was to be realized should be treated; this highlighted the subset of our indications where this is so and the others where it isn’t. Hypofractionated and ultrahypofractionated regimens were advocated and selectively implemented, sometimes with early or still maturing data. Systemic or endocrine therapy was favored over radiation in other cases. Where do we go from here?

The challenge now is to make clear that the risk/benefit ratio has started to normalize and many of our old considerations should still apply, otherwise we risk being further “written out” of the equation in many disease sites. Lessons learned should be reported and implemented, yes, but in an orderly and responsible way. Should we return to the fractionation patterns of the pre COVID era, we would argue yes, for now. Should the COVID era prompt us to adopt new fractionation with greater comfort in the future, yes.

Yet at the same time our hospitals are reeling from financial loss, and many of our radiation colleagues in community and hospital practice are facing difficult financial situations due to loss of clinical revenue. Radiation Oncology is not practiced solely within academia, but within a comity of practices. Indeed even within our centers Radiation Oncology was one of the few bright spots on an otherwise bleak balance sheet; our clinical revenue supports our staffs and funds other critical missions, including the education and research enterprise. It is important to be mindful of cost and clearly communicate ways to shorten or omit our treatments for the benefit of patients and the system as a whole, but these efforts must be joined with a renewed emphasis on expanding indications and casting a vision for the future role of the radiation oncologist as a central, not peripheral, member of the care team. We can no longer be seen by others as a flaneur within the topography of cancer care. This is especially important for our trainees and partners within oncology to expand our collective specialty oeuvre as we recalibrate to a new post-COVID normal.

4. Concluding thoughts

This unplanned inflection point posits that the best days of our field lie ahead. To be able to develop ex-nihilo frameworks and processes is both challenging and instructive. The spirit of camaraderie that this crisis highlighted is what will gird us in the days ahead. Let’s use what we’ve learned to emerge stronger, more united, and self-directed as we head into our future.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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