

Appendix E1

Qualitative Interview Guide

Introduction

Thank you for agreeing to participate in this 20-30 minute interview about telemedicine in radiation oncology. We are asking participants for their consent to audio record the interview. Your responses will be kept confidential and deidentified to the extent possible. You may stop the interview at any time or refuse to answer any single question. Do I have your permission to start audio recording our conversation now?

Part 0: Provider Clinical Information

1. Do you treat patients in main campus, a regional clinic, or both?
2. How many disease sites do you treat?
3. What is your primary disease site?
4. What are the other disease sites you treat?

Part 1: General Questions on Telemedicine Practices

1. [SURVEY] What types of appointments are you conducting via telemedicine now?
 - A. PROBE: If “simulation” not mentioned: Are you going in-person to the simulation? If yes, for what types of patients? Why? Is this necessary?
2. [SURVEY] How are you conducting most of these telemedicine appointments?
3. Do you prefer phone or audiovisual? Why?
4. What is your preferred digital platform for audiovisual visits? Why is that your preferred platform?

Part 2: Impact on Patient Care

1. Can you walk me through a typical telemedicine consultation?
2. [SURVEY] Overall, what percentage of consultation visits are you comfortable conducting entirely remotely? If you treat multiple disease sites, please estimate this for each disease site.
3. What are the disease types or subpopulation of patients you are more comfortable making informed treatment decisions with telemedicine only?
4. What are disease types or subpopulation of patients are you less comfortable making informed treatment decisions with telemedicine only?
 - A. PROBE: What patients could have a telemedicine consult with an exam at the simulation? (i.e. exam needed only for treatment planning)
 - B. PROBE: What patients should routinely be scheduled for in-person consults first? (i.e. typically exam needed to make recommendation)
5. [SURVEY] Would it be beneficial to triage patients for in-person vs telemedicine before the consult?
6. [SURVEY] Would it be possible to identify the patients that need an in-person consult visit?
7. How do you build rapport with your patients via telemedicine? What are your techniques to connect with the patient?
8. [SURVEY] Compared to office visits, how confident are you that you will be able to treat the patient’s cancer appropriately?
9. [SURVEY] Compared to office visits, how would you rate the personal connection you feel with the patients?
10. [SURVEY] Compared to office visits, how would you rate how comfortable patients are with sharing their personal information?
11. [SURVEY] Compared to office visits, how would you rate the amount of time you spend with the patient?
12. [SURVEY] Compared to office visits, how would you rate the overall quality of the visits?

Part 3: Impact on Physician Workflow

1. Are there certain factors (e.g. patient factors, disease characteristics) that impact how much time is required for a telemedicine visit?

2. In what ways has documenting the interaction with the patient changed?
3. [SURVEY] Compared to office visits, how would you rate your overall workload for patient visits?
4. [SURVEY] Compared to office visits, how would you rate the ease of accessing patient records during the visit?
5. [SURVEY] Compared to office visits, how would you rate the amount of time spent on documentation in the EMR?
6. [SURVEY] Compared to office visits, how much time are you spending coordinating care?

Part 4: Barriers, Concerns, and Improvement

1. Have you encountered any problems using the phone/computer?
2. Are there populations that would particularly benefit from using telemedicine?
3. Are there any special considerations that need to be made for certain populations (e.g. language, age)?
4. What barriers, if any, limit you from using telemedicine in your practice? (e.g. skills/training, technical issues, billing policies)
5. How could any of the barriers be addressed?

Part 5: Future Use

1. [SURVEY] Based on your overall experience, was using telemedicine better or worse than you thought it would be for this purpose?
2. Is there a role for telemedicine in radiation oncology beyond this current pandemic?
 - A. If yes, what would that look like?
 - B. If no, What would need to change before this became a viable option?
3. [SURVEY] If telemedicine becomes part of your practice post COVID, what percentage of patients would you still want to see in person for personal job satisfaction and fulfillment?
4. Are there any other ways that telemedicine has changed your practice that we have not yet discussed?

Wrap-Up

Thank you for participating. We have 3 optional demographic questions.

- A. What is your birth year?
- B. What is your race/ethnicity?
- C. Do you have a second language that you use when speaking to patients? If so, what is it?

We have come to the end of the interview. We're extremely grateful for your help and for your honesty in answering these questions. Thank you for your time! If you have any questions or would like to discuss the topic further at any point, please feel free to contact us.

Appendix E2

Radiation Oncology Telemedicine Survey

General Telemedicine Practices

1. What types of appointments are you conducting via telemedicine? (*Check all that apply*)

- Consultation
- Subsequent New Visit
- Status Check
- Follow-up Visit
- Simulation
- Inpatient Consultation
- Consent Only
- Other: _____

2. How are you conducting these telemedicine visits? (*Select one*)

- Telephone (audio only)
- Audiovisual
- Both

3. Do you prefer telephone or audiovisual (*Select one*)

- Telephone is better
- Audiovisual is better
- No preference

4. What is your preferred platform for audiovisual visits? (*Check all that apply*)

- Cisco Jabber
- Doximity Dialer
- FaceTime
- WhatsApp
- Google Hangouts
- Skype
- Other: _____

5. [OPTIONAL] Why is the above answer choice(s) your preferred platform for audiovisual visits?

Disease Site-Specific Questions

6. What is your primary disease site? (*Select one*)

- Breast
- CNS
- GI
- GU
- GYN
- Head and Neck
- Lung/Thoracic
- Lymphoma/Hematologic
- Metastatic
- Pediatrics
- Sarcoma
- Skin
- Spine
- Other: _____

7. For the majority of these patients, do you need a physical exam prior to providing treatment recommendations? (*Select one*)

- Yes, I would like to do a physical exam in person before making treatment recommendations

- Yes, but I can rely on physical exam performed by other providers to make my treatment recommendations
- No, visually inspecting and assessing the patient through video suffices
- No, I can defer physical exam to the day of simulation for treatment planning
- No, I can mostly rely on updated and good quality imaging

8. [OPTIONAL] Why might a physical exam be helpful for this disease site?
9. For this disease site, what percentage of consultation visits are you comfortable conducting entirely remotely?
10. Would it be beneficial to triage patients for an in-person vs telemedicine visit before the consult?
(Select one)
- Yes
 - No
 - It depends
11. Would it be possible to identify patients that need an in-person consult from a pre-consult chart review? (Select one)
- Yes
 - No
 - It depends
12. If you answered "it depends" for either of those 2 questions above, please elaborate.

Secondary Disease Site

13. What is your secondary disease site? (If applicable - select one)
- Breast
 - CNS
 - GI
 - GU
 - GYN
 - Head and Neck
 - Lung/Thoracic
 - Lymphoma/Hematologic
 - Metastatic
 - Pediatrics
 - Sarcoma
 - Skin
 - Spine
 - NOT APPLICABLE
 - Other: _____
14. For the majority of these patients, do you need a physical exam prior to providing treatment recommendations? (Select one)
- Yes, I would like to do a physical exam in person before making treatment recommendations
 - Yes, but I can rely on physical exam performed by other providers to make my treatment recommendations
 - No, visually inspecting and assessing the patient through video suffices
 - No, I can defer physical exam to the day of simulation for treatment planning
 - No, I can mostly rely on updated and good quality imaging
15. [OPTIONAL] Why might a physical exam be helpful for this disease site?
16. For this disease site, what percentage of consultation visits are you comfortable conducting entirely remotely?

17. Would it be beneficial to triage patients for an in-person vs telemedicine visit before the consult?

(Select one)

- Yes
- No
- It depends

18. Would it be possible to identify patients that need an in-person consult from a pre-consult chart review? (Select one)

- Yes
- No
- It depends

19. If you answered "it depends" for either of those 2 questions above, please elaborate.

Impact of Telemedicine on Patient Care

20. Compared to office visits, how confident are you that you will be able to treat the patient's cancer appropriately? (Select one)

- Telemedicine is better
- No difference
- Office visit is better
- Does not apply to me

21. Compared to office visits, how would you rate the personal connection you feel with the patients?

(Select one)

- Telemedicine is better
- No difference
- Office visit is better
- Does not apply to me

22. Compared to office visits, how would you rate how comfortable patients are with sharing their personal information? (Select one)

- Telemedicine is better
- No difference
- Office visit is better
- Does not apply to me

23. Compared to office visits, how much time do you spend with the patient? (Select one)

- More time with telemedicine
- About the same
- Less time with telemedicine

24. Compared to office visits, how would you rate the amount of time you spend with the patient? (Select one)

- Telemedicine is better
- No difference
- Office visit is better
- Does not apply to me

25. Compared to office visits, how would you rate the overall quality of the visits? (Select one)

- Telemedicine is better
- No difference
- Office visit is better
- Does not apply to me

Impact of Telemedicine on Provider Workflow

26. Compared to office visits, how would you rate your overall workload for patient visits? (*Select one*)
- Telemedicine is better
 - No difference
 - Office visit is better
 - Does not apply to me
27. Compared to office visits, how would you rate the ease of accessing patient records during the visit? (*Select one*)
- Telemedicine is better
 - No difference
 - Office visit is better
 - Does not apply to me
28. Compared to office visits, how would you rate the amount of time spent on documentation in the EMR? (*Select one*)
- Telemedicine is better
 - No difference
 - Office visit is better
 - Does not apply to me
29. Compared to office visits, how much time are you spending coordinating care? (*Select one*)
- Telemedicine is better
 - No difference
 - Office visit is better
 - Does not apply to me

Future Use of Telemedicine in Radiation Oncology

30. Was using telemedicine better or worse than you thought it would be for this purpose? (*Select one*)
- Better
 - Worse
 - Same as expected
31. Do you think telemedicine will play a role in radiation oncology beyond this current pandemic? (*Select one*)
- Yes
 - No
 - I'm not sure
32. [OPTIONAL] What role will telemedicine play in radiation oncology post-COVID-19? How would you incorporate telemedicine into your practice?
33. If telemedicine becomes part of your practice post COVID, what percentage of patients would you still prefer to see in person?
34. How do you think telemedicine use could affect physician burnout? (*Select one*)
- Reduce
 - Increase
 - Neither
35. [OPTIONAL] How would telemedicine reduce or increase physician burnout?
36. [OPTIONAL] Any additional comments you'd like to share regarding your experience of using telemedicine?

Appendix E3

Methodology - Rapid Qualitative Analysis

Rapid analysis (RA) was conducted in two phases: a “vertical” phase and a “horizontal” phase. In the vertical phase, individual interview summaries were reviewed, and significant statements were coded based on *a priori* constructs from the interview guide as well as novel concepts that emerged from the interviews themselves. These coded statements were then sorted into categories relating to telemedicine practice, experience, implementation (i.e. facilitators and barriers), and future directions. In the horizontal phase, the team reviewed the statements grouped within each category, across participants, to identify primary themes. To facilitate this phase, the team created a data matrix, with each row representing an individual participant, and each column representing an analytic category. Matrices are a common data visualization technique used in qualitative health research to identify common responses, as well as significant divergences, across participants; they enable the researcher to move beyond description to interpreting meaning and context behind themes. Themes were identified based on frequency, as well as attributes (i.e. interpreting comments in the context of telemedicine platform, and patient population), and triangulated with descriptive statistics from the quantitative survey in a joint display.

Table C.1 Joint Display of Thematic Results

Themes	Qualitative Investigation	Quantitative Investigation
<p>Perceived Overall Experience</p>	<ul style="list-style-type: none"> - Physicians were able to meaningfully interact with patients, and many were “surprised” by patient receptivity to telemedicine. <p style="margin-left: 20px;"><i>“I did not realize how much a lot of my patients would like it. I was really unsure how certain patients would feel about it, not having a face-to-face visit. I thought they would be emailing and calling me more, but I haven’t had a problem with that.”</i></p> - Given the pandemic, physicians saw telemedicine as a “good enough” replacement for in-person care. <p style="margin-left: 20px;"><i>“I think for purposes of mitigating factors surrounding a pandemic, it’s been good. It had to be implemented fairly quickly without planning and strategy. It hasn’t been seamless, so it could be better. It’s a valuable component to our ability to take care of patients, so I do see the value in it”</i></p> 	<p>“Was telemedicine better or worse than you thought it would be?”</p> <ul style="list-style-type: none"> - 88% (n=45) reported it was better than expected - 10% (n=5) reported it was as expected - 2% (n=1) reported it was worse than expected

Themes	Qualitative Investigation	Quantitative Investigation
<p>Quality of Visits</p> <p>Given its current necessity, physicians felt that telemedicine visits were of good quality. However, many felt that it was difficult to fully replace the “human connection” experienced with in-person visits.</p>	<p><u>Negative Impacts of Telemedicine</u></p> <ul style="list-style-type: none"> - In-person visits give patients the added benefit of interacting with the full clinical team (e.g. nurses and residents). <ul style="list-style-type: none"> <i>“From my point of view, something is lost there. I think there is a benefit in interaction with the whole team, particularly with the residents. A new patient spends more time on average with the resident than with the attending. Part of the rewarding experience is that the patients feel very satisfied and get a lot of information from the resident.”</i> - Some aspects of patient connection were lost, and providers found the interactions less satisfying. <ul style="list-style-type: none"> <i>“Sometimes I do think the ‘old way’ is better. For me personally, there is something to be said about human connection and responding to nonverbal cues in person.”</i> - Some providers felt that patients were less inclined to bring up questions over video, or were less comfortable disclosing sensitive information. <ul style="list-style-type: none"> <i>“There’s a countervailing force. I do think there’s also a mitigating tendency on video chat. I’m speculating that from a patient’s point of view, they may not feel inclined to bring up a lot of questions.”</i> <p><u>Positive Impacts of Telemedicine</u></p> <ul style="list-style-type: none"> - Some providers mentioned the unanticipated benefit of telemedicine giving insight into patients’ social/functional environments. <ul style="list-style-type: none"> <i>“[Telemedicine] provides a different perspective of [the patient’s] social situation. With radiation, we must take into consideration [the] patient’s ability to commute for daily treatment or getting on/off the table. Clinic is an artificial environment. Especially for metastatic patients: by seeing them at home in a wheelchair or lying in bed, we get a fuller picture of what their quality of life is like.”</i> - Physicians generally felt that they spent more time with patients via telemedicine because patients are not initially prepped by a resident or nurses (as traditionally done in clinic). However, this did not necessarily mean the <i>quality</i> of interactions increased. 	<p>“How would you rate overall quality of the visits?”</p> <ul style="list-style-type: none"> - 45% (n=23) reported office visit is better - 47% (n=24) reported no difference - 8% (n=4) reported telemedicine is better <p>“How confident are you that you will be able to treat the patient’s cancer appropriately?”</p> <ul style="list-style-type: none"> - 71% (n=36) reported no difference - 27% (n=14) reported office visit is better <p>“How would you rate the personal connection you feel with the patients?”</p> <ul style="list-style-type: none"> - 67% (n=34) reported office visit is better - 33% (n=17) reported no difference <p>“How would you rate how comfortable patients are with sharing their personal information?”</p> <ul style="list-style-type: none"> - 72% (n=36) reported no difference - 28% (n=14) reported office visit is better <p>“How would you rate the amount of time you spend with the patient?”</p> <ul style="list-style-type: none"> - 25% (n=13) reported office visit is better - 45% (n=23) reported no difference - 29% (n=15) reported telemedicine is better

Themes	Qualitative Investigation	Quantitative Investigation
<p>Workflow and Workload</p> <p>Physicians felt that their workflow was more efficient. However, opinions varied on changes in the amount of work.</p>	<p><u>Workflow</u></p> <ul style="list-style-type: none"> - Telemedicine means less waiting time. <ul style="list-style-type: none"> <i>"I think workflow is better, there are few working parts. All I have to do is call the patient, there are no delays due to physically getting there. A big part of workflow in reality is patients being late for whatever reason, clinic rooms being unavailable, delays in patient filling out paperwork, etc. On average, the punctuality and flow of clinic is much better with telemedicine."</i> <p><u>Workload</u></p> <ul style="list-style-type: none"> - Some physicians felt that they had to devote more time to notes and prep work in the absence of other clinical staff. <ul style="list-style-type: none"> <i>"I would say that, I think actually there's a little more work involved for the physicians through the telehealth visits. I'm more responsible for some of the tasks which clinical staff otherwise would be performing."</i> - Physicians did not feel that EMR documentation burden increased with telemedicine. Some actually perceived documentation to be faster. <ul style="list-style-type: none"> <i>"When I'm talking to patient face to face with the camera, I can type my notes in real time and do it in a way that I don't have my back to the patient"</i> - Providers felt that care coordination took slightly longer with telemedicine, especially for patients requiring multidisciplinary care (e.g. metastatic patients). - Multiple providers suggested incorporating a virtual "team huddle" at the end of the day to improve coordination. 	<p>"How would you rate your overall workload for patient visits?"</p> <ul style="list-style-type: none"> - 38% (n=19) reported office visit is better - 34% (n=17) reported no difference - 28% (n=14) reported telemedicine is better <p>"How would you rate the ease of accessing patient records during the visit?"</p> <ul style="list-style-type: none"> - 47% (n=23) reported no difference - 41% (n=20) reported telemedicine is better - 12% (n=6) reported office visit is better <p>"How much time are you spending coordinating care?"</p> <ul style="list-style-type: none"> - 48% (n=24) reported office visit is better - 46% (n=23) reported no difference - 6% (n=3) reported no difference <p>"How would you rate the amount of time spent on documentation in the EMR?"</p> <ul style="list-style-type: none"> - 66% (n=33) reported no difference - 26% (n=13) reported office visit is better - 8% (n=4) reported telemedicine is better

Themes	Qualitative Investigation	Quantitative Investigation
<p>Job Satisfaction and Burnout</p> <p>While telemedicine has the potential to increase patient access to care, a “balance” is needed for human contact.</p>	<ul style="list-style-type: none"> - Providers derive job satisfaction from interpersonal interactions with patients, and wonder what might be lost with a complete switch to telemedicine. <ul style="list-style-type: none"> <i>“To me, it's meaningful and rewarding to see the patient in person. I want to be able to offer it to patients who prefer it. In terms of work-life balance, there's an advantage to having flexibility and to be able to work remotely, at least for some days. I'd like to see there be a mix.”</i> - Providers noted that telemedicine changes their dynamic with the care team. These team interactions are rewarding/useful for both patients and healthcare providers. - Providers felt that telemedicine supported a positive work-life balance. A few telemedicine days per week could help reduce physician burnout. <ul style="list-style-type: none"> <i>“If telehealth enables some physicians not needing to come into the office as often or for as long hours, it could be beneficial. If you could improve physician's quality of care that would mitigate burnout.”</i> 	<p>“How do you think telemedicine could affect physician burnout?”</p> <ul style="list-style-type: none"> - 35% (n=9) anticipated increase in burnout - 38% (n=10) anticipated reduction in burnout - 27% (n=7) anticipated no effect
<p>Future of Telemedicine in Radiation Oncology</p> <p>Physicians saw telemedicine as a useful supplement (but not a total replacement) for in-person visits</p>	<p><u>Appropriate scenarios for telemedicine use</u></p> <ul style="list-style-type: none"> - Patients who would have difficulties coming for an in-person visit (long-distance travel, medical conditions, cost) <ul style="list-style-type: none"> <i>“There’s a financial aspect to coming for an in-person visit. They may be coming from far away, which may require paying tolls and gas. Often a family member comes with them, and that family member has to take off work and find childcare - all of that goes away with telehealth.”</i> <i>“Financial toxicity is independent of the pandemic.”</i> - Palliative patients - Follow-up or status checks that only involve general discussions - Pediatric patients (esp. those who are nervous about hospitals) <ul style="list-style-type: none"> <i>“The kids love being at home with their toys and not having to come to the scary doctor in the scary hospital. The more you can minimize the child's trips to the medical center, the better for their psychological health. So for that sense, it's never occurred to me, it's a really nice silver lining.”</i> 	<p>“Do you think telemedicine will play a role in radiation oncology beyond this pandemic?”</p> <ul style="list-style-type: none"> - 96% (n=25) foresaw a role for telemedicine - 4% (n=1) was unsure

Themes	Qualitative Investigation	Quantitative Investigation
<p>Modality and Platform</p> <p>Physicians preferred technology that best approximate a “normal” experience for the patient.</p>	<p><u>Foundation of Normalcy</u></p> <ul style="list-style-type: none"> - Some providers have residents or nurses call the patient first, to mimic in-office workflows. <p><u>Modality</u></p> <ul style="list-style-type: none"> - Audiovisual visits make it easier to build rapport with patients. <ul style="list-style-type: none"> <i>“I prefer audiovisual because seeing the patient – the person you’re talking to – the interaction is better. I think you get more from the interview when you activate all your senses.”</i> - Providers resort to audio-only visits when a patient does not have access to compatible audiovisual tools (~10% of total visits). - Telephone is preferred for quick check-ins, less tech-savvy populations (e.g. elderly), or situations with limited connectivity. <ul style="list-style-type: none"> <i>“Video is more cumbersome. From the perspective of ease (both for the patients and myself), audio is preferable.”</i> <p><u>Audiovisual Platforms</u></p> <ul style="list-style-type: none"> - Doximity is preferred for its privacy protection. - FaceTime is seen as more user-friendly and convenient. - WhatsApp is preferred for its multi-user feature, allowing providers to include others care team members (e.g. residents) on the call. 	<p><u>Modality Use</u></p> <ul style="list-style-type: none"> - 75% (n=38) used both audiovisual & audio-only - 25% (n=13) used audiovisual only <p><u>Modality Preference</u></p> <ul style="list-style-type: none"> - 75% (n=38) preferred audiovisual - 10% (n=5) preferred audio-only - 16% (n=8) had no preference <p><u>Prevalence of Audiovisual Platform Use</u></p> <ul style="list-style-type: none"> - Doximity Dialer: n=28 - FaceTime: n=28 - WhatsApp: n=10 - Cisco Jabber: n=3 - Skype: n=1 - Google Hangouts: n=1 - <u>doxy.me</u>: n=1