Information Transparency with Immediate Release: Oncology Clinician and Patient Perceptions

Elizabeth O’Brien (elizabeth.obrien@colorado.edu)
University of Colorado System

Sudheer Vemuru
University of Colorado System

Laura Leonard
University of Colorado System

Ben Himelhoch
University of Colorado System

Nancy Taft
University of Colorado System

Kshama Jaiswal
University of Colorado System

Ethan Cumbler
University of Colorado System

Sharon Sams
University of Colorado System

Dulcy Wolverton
University of Colorado System

Gretchen Ahrendt
University of Colorado System

Jeniann Yi
University of Colorado System

Chen-Tan Lin
University of Colorado System

Randy Miles
University of Colorado System

Karen Hampanda
University of Colorado System

Sarah Tevis
University of Colorado System

Research Article
Abstract

Introduction:

As part of the 21st Century Cures Act, beginning April 2021, electronic health information (EHI) must be immediately released to patients. This change poses challenges for both oncology clinicians and patients whose priorities and experiences may differ. In this study, we sought to evaluate clinician and patient perspectives regarding the immediate release of EHI.

Methods:

Semi-structured interviews were conducted with a group of 8 clinicians and 12 patients using purposeful sampling to capture a diverse array of participants. Open-ended questions explored clinicians' and patients' perceptions of the immediate release of patient health information and how they adjusted to this change. Interviews were recorded, transcribed verbatim, and de-identified. Transcripts were thematically analyzed, reviewed to develop a coding rubric, and independently coded until thematic saturation was achieved.

Results:

Forty unique codes were identified, which were then mapped to 10 themes. These themes included Interpreting Results, Strategies for Patient Interaction, Patient Experiences, Communication Strategies, and Provider Limitations, among others. Clinicians and patients demonstrated varying levels of confidence in patient understanding of results and differences in perceived patient distress emphasizing the impersonal nature of electronic release and necessity for therapeutic clinician-patient communication. Unique recommendations to support patients receiving complex results reports were found.

Conclusions:

Clinicians and patients have varying insights on the role of immediate release of medical information in cancer care. Understanding these perspectives may be helpful for devising ways to improve communication between clinicians and patients and in developing patient-centered tools (glossaries, summary pages, additional resources, and more) to aid in understanding complex medical information.

Introduction

As part of the 21st Century Cures Act, beginning in April 2021, electronic health information (EHI) must now be immediately released to patients [1, 2]. While the use of electronic medical records in the last decade has enabled patients to have easier access to their EHI, the immediate release of health information, including complex pathology and radiology reports, represents a significant change with vast implications in oncology for both patients and clinicians [3, 4].

Clinicians have demonstrated mixed attitudes towards the immediate release of labs, pathology, and radiology reports [3]. Some felt that these reports may be confusing and distressing for patients to view
before they received other contextual information from their provider that may better facilitate interpretation of results [5, 6]. Clinicians are less likely to be confident that their patients can interpret the medical results, particularly pathology results, on their own, whereas patients are more likely to be confident in their ability to correctly interpret medical results [3]. However, recent data suggest patients may lack the ability to comprehend basic medical terminology present within breast pathology reports and often err in interpreting the connotations of these terms [7]. Thus, the benefits of improving access to EHI through its immediate release may be counterbalanced by the negative effects of impaired ability to understand that information and added stress that may follow [6].

Given the sensitive and complex nature of cancer diagnoses, oncology clinicians and cancer patients may have differing perceptions regarding the potential benefits and pitfalls of immediate access to patient health information. In this study, we aimed to characterize the attitudes of oncology clinicians and patients toward the immediate release of EHI to inform next steps in designing solutions to improve their experiences with immediately available complex medical information.

Methods

Design

This project was designated as a quality improvement initiative and deemed exempt from review by the Institutional Review Board. Semi-structured interviews were conducted with both oncology clinician and patients who had been treated for cancer at a single National Cancer Institute designed Comprehensive Cancer Center. Clinicians who regularly interfaced with oncology patients including dermatologists, surgical oncologists, medical oncologists, pathologists, and diagnostic radiologists were invited to participate. Patients were recruited from the breast cancer and pancreatic cancer multi-disciplinary clinics. Interviews were conducted between November 2020 and February 2021. In the interviews, participants were asked open-ended questions about methods of communicating between patients and clinicians, changes they have encountered with the immediate release of EHI, patients’ barriers to understanding medical results, and preferred resources to help patients understand their medical results and diagnoses. Patients were also asked to interpret radiology findings in the context of a clinical vignette. Two interviewers (BH and LL) conducted all interviews. Verbal consent was obtained for audio recording of the semi-structured interviews for publication and future research if personal identifying information was removed. Transcripts were coded verbatim, and patient identifiers were redacted by the interviewers. Two researchers (EO and SV) reviewed the first six interview transcripts to develop a preliminary coding rubric based on themes brought up in interviews. Two researchers (EO and SV) then used this coding rubric to identify recurrent themes in interviews and coded transcripts independently for thematic elements. The coding rubric was revised as subsequent interview transcripts were reviewed and new themes were identified. Interviews were conducted until thematic saturation, which was defined as three consecutive interviews with zero new themes per interview, was achieved.
Results

Study Population

A total of 8 clinicians were interviewed. All 8 (100%) were practicing physicians who interface consistently with oncology patients. The physician subspecialties include breast surgical oncology (25%), medical oncology (25%), endocrine surgery (12.5%), dermatology (12.5%), pathology (12.5%), and surgical oncology (12.5%). (Table 1).

A total of 12 patients were interviewed. This cohort of patients was selected through purposeful sampling after recruitment from the multi-disciplinary clinics. The majority of patients that were interviewed were over the age of 62 (66.7%), while 1 patient (8.3%) was under the age of 45, and 3 patients (25%) were between 45 and 62 years old. Seven (58.3%) of the patients were female and 5 (41.7%) were male. The majority of patients reported their race as white (91.7%), while 1 interviewed patient identified as black (8.3%). Of those interviewed, the highest level of education achieved was master's degree (41.7%), followed by bachelor's degree (16.7%), professional degree (16.7%), and trade/technical school, some college or doctorate degree (8.3%). (Table 2).

A total of 44 unique codes were identified upon reviewing the interview transcripts and these codes were further mapped into 10 themes. Thematic saturation was achieved as we did not identify any new themes after the final 10 patient interviews and after the final 7 provider interviews (Figure 1).

Comparison of Perspectives

Interviews revealed both the converging and diverging opinions of clinicians and patients surrounding the immediate release of their medical records. Table 3 summarizes where similar perspectives between these groups for themes including Interpreting Results, Patient Experience, Strategies for Patient Interaction, and Changes due to Immediate Release while Table 4 explores the contrasting perspectives in the themes of Interpreting Results, Patient Experience, Communication Strategies, and Provider Limitations.

Interpreting Results

Clinicians and patients demonstrated varying levels of confidence in patients to correctly interpret medical results. Clinicians frequently referenced concerns about the complexity of medical results and the difficulty this complexity poses for laypersons attempting to interpret their own results. Further, clinicians often emphasized their own role in explaining the significance of medical results. “The path results require clinical interpretation and patients don't have clinical -like that's what they're coming to see me for -is my clinical interpretation.” They viewed one of their key roles to be providing context with which to interpret results that may not be clear or evident to the patients. Clinicians suggested that patients have increased difficulty interpreting radiology and pathology reports. "I don't think any patient reading a pathology report can make that leap without the provider making that interpretation for them."
The majority of patients preferred to have access to their medical information as soon as it was available so that they could advocate for themselves and begin asking questions of their providers. “I knew that they were taking, doing this scan to look for that and so I just wanted to know right away.” In some instances, patients preferred to hear unexpected or potentially distressing results directly from their provider rather than to receive this information through the portal. "I mean, I don't think I would want that much to be fed. I rather have gone back to [my doctor] and let her tell me.” Both clinicians and patients agreed that patients generally rely on clinicians to provide context, help interpret their results, and plan for next steps.

**Patient Experiences**

Clinicians and patients alike were concerned by the distress immediately released results may cause. Clinicians tended to think that they could alleviate distress by being reassuring and empathetic towards patients about results, addressing questions, and planning next steps. Some clinicians have mentioned that they have been surprised by the relatively low number of patients calling for an explanation of immediately released results and the overall ability of patients to understand their health information.

“When we learned about the legislation and the timeline for implementation, I think many of us in oncology had a fair bit of angst that patients would be very anxious and stressed when they got these results and didn't have immediate access to an explanation. But the number of patients who have been calling requesting an explanation are very few and far between, which I'm actually quite surprised.”

Many patients emphasized the anxiety they may feel if they received negative or unexpected news. “I'm worried about like the psychological welfare somebody might learn that they have something horrible and then they're sitting home around for, you know, X amount of hours.” Patients were divided about whether hearing results from the doctor would be more beneficial than viewing results immediately from the portal without clinical interpretation or the possibility of reassurance. Some patients appreciated the relationships that they had with their provider and preferred the personal touch of a clinician disclosing their results. “I would feel under the care of somebody you know that somebody's got my back and we're working through this together and there's somebody there, and the provider knows what's going on and has a plan, as opposed to just some, you know, some random report coming through; it's impersonal.”

Other patients described a desire to have access to results immediately, and in this group, self-advocacy emerged as a common thread. Patients felt that having the information as soon as possible allowed them to fine tune their questions for their provider and led to them feel less overwhelmed during their appointments. Additionally, some patients thought that having their information right away enabled them to research treatment options and gave them the ability to seek out a second opinion.

**Strategies for Patient Interaction**

Throughout the interviews, respondents proposed several tools to improve patient and clinician experiences with the federal mandate. Clinicians had differing opinions about how to best prepare
patients for the immediate release of their records. Some clinicians reported that they advise patients who might have higher anxiety about their results to turn off their patient portal messages when they anticipated new results would become available for access. Some mentioned giving guidance to patients for all potential results they could see and discuss the possible next steps prior to ordering a new test. “Here's the what the pathology report will include. Here's how that information will be used to plan what happens after surgery.” Other tools that were suggested by clinicians included incorporating flagged messages to further emphasize important/unexpected results, automated reminder messages if results had not been viewed by the clinician within 24 hours, and an indicator on the clinician's portal to indicate if a patient had already read the report.

The most common tool patients suggested was a glossary of terms to be included with complex medical results. Patients also recommended a page of additional follow-up information and resources, a summary or interpretation in layman's terms of the report, and a frequently asked questions page. “Well, you know how some reports have a summary? Well, I enjoy reading those. Maybe they could be more extensive to help patients understand.” A notification that the clinician saw the results and clear written expectations for the timeline when the clinician would get back to them were other strategies discussion by patients.

Changes Due to Immediate Release

Clinicians ranged from having initial hesitation regarding immediate release to being more accepting of this requirement. From their personal experiences, some thought it could be distressing to find out about such life-altering results on the patient portal before they have a chance to discuss and reassure the patient.

“I had breast cancer so if I opened [my patient portal] and saw my diagnosis like, I mean, I just think that there's no... I think it's a horrible thing to do to patients to force them to like get this information with no context and no ability to know that they're going to be able to talk to someone about it. And I think that it's just really unfair to the patients. I don't really worry so much as a provider, like I can check my in basket more, but I think causing patients so much distress by getting these results that they don't have the capacity to interpret or really know what it means... I mean, I'm a doctor and if I opened my results and saw those, like, that would be devastating. So I think it's awful personally.”

Clinicians did recognize that how patients receive results depends on both circumstance of the results and preferences of the receiver. Some clinicians appreciated the agency that this information can provide to patients despite the distress that may be associated with it.

Patients frequently referenced a desire to control the modality in which they might receive unanticipated findings, and that ideally, patients would be able to anticipate how they could react to the type of result in order to make a choice. While many acknowledged a potential for distress, they felt that in their personal experiences with cancer, they preferred to have immediate access to their medical results.
“I think, I think that's a huge value to me, because, you know, it's like when I got a diagnosis of cancer again I was just like, what, what did you just say to me, you leave. And, you know, and it's kind of like, I don't know what just happened and I don't know where to go. And then, you know, by the time you get to your oncologist or whatever. It's kind of like, I felt I felt really behind, and not prepared. Now it's overwhelming.”

**Communication Strategies**

Patients and clinicians described their preferences regarding communication via telephone, patient portal messages, and face to face appointments, noting different priorities for each method. Clinicians described incorporating each communication method into their clinical workflow. Clinicians frequently acknowledged the complexity in making decisions about whether to discuss results on the portal, by phone, or in-person with the patients and the timing which would be ideal to do so. Clinicians prioritized effective communication of these results knowing their personal workflow.

“Currently, I'm just trying to come and see these patients, who get the result they cannot understand and try to access, not only their provider, but everybody in clinic. That creates a zillion communications. And not only that, at the end of the day it's really the provider who order the tests, who needs to answer the question, and that cannot be a phone call. That should be a face-to-face conversation.”

Patients reinforced their preferences to maintain personal choice in deciding how to receive medical results. Some appreciated not having to wait for a call from a clinician, but others saw the benefit in being able to speak directly to their clinician after results to lessen their anxiety, answer their questions, and begin planning for next steps. "Oh, I think I think I'd probably like it better if my provider would call me because I would probably - It would also allow us to speed up ordering the follow up CT if we talked about it directly. It would be nice to get my questions answered right then." Those that wanted results beforehand reported that when they wanted additional context, they reached out to their providers for clarification.

**Clinician Limitations**

The limitations of the clinician were frequently mentioned by the clinician and much less by the patient. Clinicians mentioned busy schedules and the time-consuming nature of phone calls made it challenging to call their patients promptly with each new result. “So, I can see a problem happening, especially for very busy surgeons, because you can't just, it's hard to drop everything you're doing that minute and try to find that patient.” Some clinicians have tried to follow up patient questions about results with a scheduled appointment to make sure that all questions are being adequately addressed. Patients indirectly described the limitations of their providers when discussing their preferences regarding communication and timeliness of responses from their providers. “But I guess I prefer to have that be in that position than sort of just wondering waiting till somebody had time to call me back or have an appointment and all that kind of stuff.”
Discussion

Throughout these interviews, much was learned about how to best support both clinicians and patients with the requirement that all medical results must be immediately released to patients. Our work adds to the growing body of literature discussing information transparency within our healthcare system and the changes that are now federally mandated.

Clear differences emerged due to the priorities, values, and experiences of our participants. Patients were more likely to want their immediately released information quickly despite the potential for distress of these results. Patients referenced their autonomy and preferred greater involvement in shared decision making alongside their clinicians after receiving results. They emphasized their ability to choose their role in information gathering and decision-making in order to best meet their communication and self-advocacy preferences [8]. Patients generally viewed immediate release of medical information as a positive change rather than a hassle to deal with. However, prior studies suggest patients tend to overestimate their own understanding of results even when the results are put into layman's terms, as prior studies have demonstrated with mammography results [9]. Online portals are not designed to present all results in a meaningful way toward the patients, and challenges in interpreting results may be accentuated in written reports with unfamiliar terms such as radiology and pathology reports [10]. Indeed, both patients and clinicians reported that patients may have challenges interpreting radiology and pathology results but may be more comfortable interpreting laboratory results.

The potential for distress when reviewing potentially life-changing results was a major consideration for patients and clinicians despite the perceived positives [11]. In a sample about patient preference with over 8000 respondents, 41% of patients said that they would wait to discuss cancer test results with their provider but would not mind automatic release for other less serious tests [12]. One of the strengths clinicians saw in their role is their ability to contextualize impactful medical results and add the human touch needed to alleviate distress. Clinicians in oncology spend much time having difficult conversations with patients, offering support, and reassuring patients and this is often a critical skill they possess in addition to interpreting results and formulating plans for next steps [13]. The impersonal nature of receiving results electronically and the time gap between patients’ receipt of distressing results and communication from their clinicians have been shown to leave patients dissatisfied by the communication of results and may lead to unnecessary emotional, physical, and psychological pain [14, 15]. Patients described their tremendous respect for the care of their providers and reported placing high value in being able to talk through complex medical results with clinicians though this human interaction in the clinician-patient relationship is not replicated when information is received electronically.

Patients valued prompt communication from clinicians in addressing their questions and clarifying next steps. However, clinicians emphasized their busy schedules and the difficulty in promptly addressing patients’ questions and concerns. These delays, whether avoidable, systemic, clinician, or patient delays, can also contribute to mental distress and the possibility of worsened prognosis and thus it is generally accepted that a timelier discussion of the treatment plan is beneficial [16, 17]. In a study by Winget et. al.,
87% of oncologists agreed that patient online access to abnormal radiology/pathology results had negative consequences, and almost half reported that sharing these online results had worsened their communication with patients [18]. Furthermore, one prior study revealed physicians’ concerns that patients could be anxious, confused, and lacking in the necessary expertise to interpret their results provided directly to them [19]. However, there are ways to mitigate these negative effects when patients receive their results such as setting patient expectations and providing resources like a website for additional information, both of which were indicated as tools for patient understanding by clinicians and patients alike [20].

The perceived challenges and benefits with the immediate release of pathology and radiology reports can be understood both in the context of patient autonomy and patient-clinician relationality. Patients want to know that their preferences matter and that they have autonomy in choosing the amount of information they receive and how to use their shared decision-making power [21, 22]. Clinicians want to support patients in clarifying results, planning out treatment options, and mitigating possible distress for abnormal or negative results [23]. These goals relate in the way that both parties desire a patient-clinician relationship that supports, empowers, and enables oncology patients to have the best quality care at all stages from initial testing to post-treatment [24]. To build on the findings of this study, we plan to consider these important perspectives in the development of patient-centered tools that our study cohort believed may be beneficial in facilitating patients’ understanding of complex medical results and fostering better patient-clinician communication.

This study has its limitations. Although purposeful sampling was used to capture a diverse group of patients, our clinic population was relatively homogenous consisting of mostly white, college educated, and older patients. This may limit the generalizability of our findings to a broader audience. In addition, only English speakers were invited to be interviewed. Expanding this study to a population with more educational, socioeconomic, and linguistic diversity may provide better insight into the perspectives of a more representative population.

In conclusion, clinicians and patients demonstrate varying levels of confidence in patients interpreting results, differences in perceived patient anxiety with immediate release, and unique recommendations for how to support patients receiving complex results reports. Understanding patient and clinician perspectives regarding the adoption of immediate release of records may inform next steps in developing patient-centered tools to facilitate patients’ understanding of complex medical results and foster better patient-clinician communication.

Declarations

Ethics approval and consent to participate

This project was deemed a quality improvement initiative and deemed exempt from the Institutional Review Board. All clinicians and patients gave verbal consent prior to being interviewed and agree to the release of their statements if identifying information has been removed.
Consent for publication

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to confidentiality in interview, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare they have no competing interests.

Funding

The funding sources for this research include: University of Colorado Cancer Center NCI grant 1R25CA240122, University of Colorado Department of Surgery Academic Enrichment Fund Seed Grant, Grant 2020141 from the Doris Duke Charitable Foundation and University of Colorado School of Medicine, and the Shared Resource of the Colorado Cancer Center Support Grant P30CA046934.

Authors’ contributions

E.O. transcribed patient interviews, qualitatively coded interviews, performed literature search, wrote manuscript, edited, and finalized manuscript. S.V. developed the overall methods for project, qualitatively coded interviews, edited, and finalized manuscript. L.L. developed overall methods for project and project implementation, performed patient interviews, edited, and finalized manuscript. B.H. performed patient interviews, edited, and finalized manuscript. S.T. provided funding for research (including grant submissions), planned and oversaw research project, edited, and finalized manuscript. All additional authors edited and finalized manuscript.

Acknowledgements

No acknowledgements to declare.

References


Tables
### Table 1: Clinician Demographics

<table>
<thead>
<tr>
<th>Physician Specialty</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast Surgical Oncologist</td>
<td>2 (25.0%)</td>
</tr>
<tr>
<td>Medical Oncologist</td>
<td>2 (25.0%)</td>
</tr>
<tr>
<td>Endocrine/Trauma Surgeon</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>Dermatologist</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>Pathologist</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>Surgical Oncologist</td>
<td>1 (12.5%)</td>
</tr>
</tbody>
</table>

### Table 2: Patient Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cohort (N=12) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>Young (&lt;45)</td>
<td>1 (8.3%)</td>
</tr>
<tr>
<td>Middle (45-62)</td>
<td>3 (25.0%)</td>
</tr>
<tr>
<td>Elderly (&gt;62)</td>
<td>8 (66.7%)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>7 (58.3%)</td>
</tr>
<tr>
<td>Male</td>
<td>5 (41.7%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>11 (91.7%)</td>
</tr>
<tr>
<td>Black</td>
<td>1 (8.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Highest Level of Education</strong></td>
<td></td>
</tr>
<tr>
<td>Trade/technical</td>
<td>1 (8.3%)</td>
</tr>
<tr>
<td>Some college</td>
<td>1 (8.3%)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>2 (16.7%)</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>5 (41.7%)</td>
</tr>
<tr>
<td>Professional degree</td>
<td>2 (16.7%)</td>
</tr>
<tr>
<td>Doctorate degree</td>
<td>1 (8.3%)</td>
</tr>
</tbody>
</table>

### Table 3: Similar Themes Patient and Clinician
<table>
<thead>
<tr>
<th>Subgroup Theme</th>
<th>Clinician</th>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpreting Results</td>
<td>“I think they appreciate just having things placed into context, in terms of, you know, what does this result mean? And, you know, how worried should I be about this result? You know, knowing that there’s a plan in place for next steps.” (6)</td>
<td>“Sometimes the reports just include an overwhelming amount of information and what the finding could mean and what the next step is. It can be hard to understand it all.” (4)</td>
</tr>
<tr>
<td></td>
<td>“So I think that’s just the complexity of cancer care. It’s just hard for them to fully understand what every single line means on the pathology report.” (1)</td>
<td></td>
</tr>
<tr>
<td>Patient Experiences</td>
<td>“I can usually be more reassuring that this is something they shouldn’t worry about, or I can be more emphatic about how concerned we need to be about something and that we need to do something extra.” (1)</td>
<td>“Yeah, whenever you get news that might not be good it can be pretty hard to tone down the anxiety, even if you’re telling yourself ‘it will be okay and we still need to do more testing’... I think it always is a little easier to take if your provider is the one to talk to you about the findings and offer reassurance.” (2)</td>
</tr>
<tr>
<td>Strategies for Patient Interaction</td>
<td>“I also give the patient the option to turn off notifications and say “some of my patients, would prefer to have me call them and be the first person to tell them about the results. So, you can turn off your notifications for ‘my health connection’ if you would like me to be the person that gives you the information”. (3)</td>
<td>“So, if you could give people a choice and say do you always want to see it. The minute it’s available or do you want to wait until your providers had a chance to see it.” (8)</td>
</tr>
<tr>
<td>Changes due to Immediate Release</td>
<td>“I would guess that I think a result that was unexpected would perhaps the most disconcerting for a patient.” (4)</td>
<td>“I just think everything should go to the provider I would be pretty appalled and mortified if nobody called me and I saw that I had a recurrence in the portal.” (5)</td>
</tr>
<tr>
<td></td>
<td>“I think it’s a horrible thing to do to patients to force them to like get this information with no context and no ability to know that they’re going to be able to talk to someone about it. And I think that it’s just really unfair to the patients.” (6)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Different Themes Patient and Clinician**
<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Theme</th>
<th>Clinician</th>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interpreting</strong></td>
<td><strong>Results</strong></td>
<td>&quot;I think on the pathology, I've actually been fairly impressed that by the time I call them to review the pathology, they have distilled the key elements. But I will say that many asked for clarification for specific line items in the report. But I think that I've been very impressed that they get the gestalt of the report.&quot; (5)</td>
<td>&quot;I mean, I don't think I would want that much to be fed. I rather have gone back to her and let her tell me.&quot; (4)</td>
</tr>
<tr>
<td><strong>Patient</strong></td>
<td><strong>Experience</strong></td>
<td>&quot;I'm very worried about how much distress, for the patients, it creates. The indiscriminate release of results, many of whom have no meaning, and can create a lot of anxiety.&quot; (7)</td>
<td>&quot;I think, I think that's a huge value to me, because, you know, it's like when I got a diagnosis of cancer again, I was just like, what, what did you just say to me, you leave. And, you know, and it's kind of like, I don't know what just happened and I don't know where to go. And then, you know, by the time you get to your oncologist or whatever. It's kind of like, I felt I felt really behind, and not prepared. Now it's overwhelming&quot; (7)</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td><strong>Strategies</strong></td>
<td>“So, I always found like the discussion in clinic when they come for their post-operative appointment is the most appropriate time to talk about that, but I also recognize that some patients want to know beforehand, even if it doesn't change anything. So, it's a difficult decision and I think it's, again, it's individual.” (1)</td>
<td>&quot;I'm perfectly happy with the portal and the information I get so I would vote for not having to go through another step. Let it be my choice to contact a provider.&quot; (9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Currently, I’m just trying to come and see these patients, who get the result they cannot understand and try to access, not only their provider, but everybody in clinic. That creates a zillion communication. And not only that, at the end of the day it’s really the provider who order the tests, who needs to answer the question, and that cannot be a phone call. That should be a face-to-face conversation.&quot; (7)</td>
<td>&quot;I mean, I was looking at it on the portal by myself isn't that's what I would my reaction would be we'll wait and see what they say, you know, yeah, I know I'll hear from them, and if I don't hear from them within a day or so I'll reach out. But if they were to call me and then we could discuss it right then and there.&quot; (8)</td>
</tr>
<tr>
<td><strong>Clinician</strong></td>
<td><strong>Limitations</strong></td>
<td>“I try to reply to the patient messages in a pretty timely manner. I can't say that I'm always the best at it because of the, you know, the various things that I'm trying to accomplish- so sometimes I look at them and might not immediately reply to them because the priority of that is on the lower side of the scale for everything else that I got to get done today. But, you know, so I don't know of</td>
<td>“But I guess I prefer to have that be in that position then sort of just wondering waiting till somebody had time to call me back or have an appointment and all that kind of stuff.” (10)</td>
</tr>
</tbody>
</table>
any patient complaints that I’ve been unresponsive using the portal.” (2)

Figures

Figure 1

Thematic Saturation based on themes