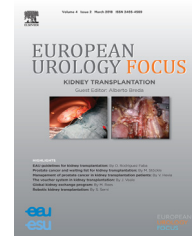




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Urothelial Cancer

Telehealth in Uro-oncology Beyond the Pandemic: Toll or Lifesaver?

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Abstract

Background: Telehealth services are rapidly embraced in uro-oncology due to the current coronavirus disease 2019 (COVID-19) pandemic.

Objective: To determine patients' perspective on adoption of telehealth as a response to the pandemic and its sustainability in the future.

Design, setting, and participants: Following a COVID-19 outbreak, 101 patients with advanced genitourinary cancers are currently managed “virtually” for therapy administration at our tertiary care unit. They were surveyed about the current situation, and current and long-term employment of telehealth.

Intervention: Rapid implementation of virtual patient management.

Outcome measurements and statistical analysis: Patients' perception of anxiety of COVID-19 and cancer, perspective on telehealth measures as a reaction to the current COVID-19 pandemic, and long-term acceptance were used as outcomes. Wilcoxon matched-pair signed rank test, chi-square test, and Mann-Whitney U test were performed.

Results and limitations: Of 101 patients, 92 answered the questionnaire, with 71 (77.2%) responding virtually by e-mail or phone call. Anxiety of cancer (6/10, interquartile range [IQR] 3–8) superseded that of COVID-19 (four/10, IQR 2–5.25, $p < 0.001$), and patients oppose temporary treatment interruption. Of the patients, 66.0% perceive their susceptibility to COVID-19 as equal to or lower than the general population and 52.2% believe that COVID-19 will not affect their therapy. In future, patients (62.6%) prefer to maintain in-person appointments as opposed to complete remote care, but accept remote care during the pandemic (eight/10, IQR 5–9). Beyond the crisis, maintaining telehealth has low preference rates (four/10, IQR 2–7), with high acceptance for external laboratory controls (60.9%) and online visit management (48.9%), but lower acceptance for remote treatment planning including staging discussions (44.6%) and for referral to secondary care oncologists (17.4%).

Conclusions: Despite the pandemic, cancer remains the key concern and patients are not willing to compromise on their treatment. Rapid implementation of telehealth is tolerated well during the need of social distancing, with a clear “red line” concerning changes in existing patient-physician relationships. Balancing future implementation of telehealth while considering patients' demand for personal relationships will ensure human dignity in uro-oncology.

Patient summary: We queried patients with genitourinary cancers treated in an almost virtual setting following a local coronavirus outbreak. Acceptance of telehealth during the current situation is high; however, long-term implementation of the adapted services is less favored. We deduce that patient-physician relationship is crucial for cancer patients and needs to be balanced against measures for social distancing to forge the future management.

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1. Introduction

On March 20, 2020, the World Health Organization declared the novel coronavirus disease-19 (COVID-19), caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), a pandemic [1]. While the spread of SARS-CoV-2 and the extent of the emergency health care situation developed differently in the regions of the world, the outbreak has influenced cancer care dramatically worldwide. The general assumption is that patients during or after systemic treatment might be at an increased risk of severe course and death related to COVID-19 [2,3].

Advancement of the pandemic has raised the question how cancer treatment should be adapted in order to avoid exposure and vulnerability to the novel virus [4]. Reallocation of resources to the treatment of COVID-19 cases has led to practice changes in the management of malignant diseases, with deintensification, delay, or cancellation of treatments [5]. Current recommendations of leading oncology societies plead to guarantee the timing of treatment with curative intent and, when possible, also for patients with metastatic disease in the safest and most feasible way [6,7]. Precautions include prevention of contact with potentially contagious people, thus reducing contact to health care personnel. Telehealth has thereby emerged as a crucial tool to provide care in times of social and physician distancing [8]. However, embracing telehealth may be challenging for health care workers and for patients due to lack of equipment and low adherence toward new technologies [9].

We previously focused on the perception of digital technologies in uro-oncology patients in order to understand user behavior and to generate sustainable telehealth solutions [10]. An early widespread outbreak of SARS-CoV-2 among the medical personnel in our uro-oncology unit has recently activated the rapid adoption of telehealth in our outpatient clinic [11]. Patient's vulnerability to SARS-CoV-2 and the need to prevent infections are major interests that have to be addressed in this crisis by implementation of telehealth. To provide excellent cancer treatment, we need to know what fears drive our patients and how we can support their right for safety and cancer therapy. Further, while telehealth is being depicted as one of the major pandemic-related changes that will retain after the current situation, it is crucial to assess whether this type of interaction is accepted by patients and also favored for the future.

As we are now entering a more chronic phase of the pandemic [12], with potential peaks arriving in the future, it is mandatory to balance between virtual medicine and safe environment for in-person visits to deliver high-quality care for cancer patients. To do so, we need to address the perceptions and expectations of our patients to forge the future management.

2. Patients and methods

We queried patients with advanced genitourinary cancers currently under medical treatment and surveillance at the uro-oncology outpatient unit in the tertiary care hospital of the Ludwig Maximilian University in Munich (LMU).

Owing to the current COVID-19 pandemic, regimen changes and broad application of telehealth services were implemented in order to limit exposure to potential risk situations without compromising effective therapies. A network of secondary care oncologists, radiologists, and primary care physicians was established with the uro-oncology team overseeing patient monitoring and treatment decisions. Patients are discussed in virtual multidisciplinary tumor boards via video conference to reduce the risk for health care personnel. Where possible, patients are mostly managed virtually, including staging imaging scans at the secondary care radiologist, patient consultations and discussion of test results via phone or video conference, and regular digital symptom monitoring. Visits at our site have been limited to therapy application and, when possible, spaced out to minimize contact in waiting and treating rooms. Where applicable, intervals for immunotherapies are prolonged with increased doses. For metastatic prostate cancer, secondary androgen deprivation therapy is preferred to chemotherapy regimens if efficacy is comparable. Patients with complex chemotherapies are mostly referred to secondary care oncologists or urologists in order to provide less exposure to other patients (Fig. 1). All patients are prospectively enrolled in a database to assess follow-up and treatment response and related side effects. Prior to initiation of the study, the institutional review board granted its approval of the project design (reference number: 19-942).

During 1 wk, all patients were surveyed with a questionnaire via e-mail or phone call, or during in-person visits. The present COVID-19 pandemic was evaluated with respect to the source of information on COVID-19, perceived influence on their disease course, evaluation of adapted telehealth solutions and its sustainability, and long-term expectations (Supplementary material). Anxiety, perceptions, and expectations were assessed on 10-item Likert scales. Rankings 0–3 were classified as low, 4–6 as medium, and 7–10 as high. Acceptance of future telehealth applications was classified from 0 to 5 as low intent and from 6 to 10 as high intent.

Statistical analyses were performed by Wilcoxon matched-pair signed rank test, Mann-Whitney *U* test and chi square test with Prism 8 software (GraphPad Software, San Diego, CA, USA).

3. Results

Out of 101 patients currently under therapy or surveillance in the uro-oncology unit, 92 (91.1%) responded to the survey via e-mail, phone call, or in person (88.7% [$n = 47$], 96.0% [$n = 24$], and 91.3% [$n = 21$] of the cases, respectively). Patients are currently treated for advanced cancer of the prostate ($n = 30$), kidney ($n = 25$), and bladder ($n = 37$) with immune checkpoint inhibitors ($n = 45$), chemotherapy ($n = 34$), androgen deprivation therapy ($n = 5$), tyrosine kinase inhibitors ($n = 5$), or other therapies ($n = 3$). Demographic characteristics are enlisted in Table 1.

3.1. Anxiety of COVID-19 and cancer

Overall anxiety from COVID-19 is at a median of 4 (interquartile range [IQR] 2–5.25), while median anxiety of the current cancer situation is at a median of 6 (IQR 3–8; $p < 0.001$). Perception of anxiety allows the identification of four categories of patients: “vulnerable and scared” (37%), “cancer dominated” (28.3%), “COVID-19 dominated” (7.6%), and “fearless fighters” (27.2%; Fig. 2A). Of the patients, 56.5% are more anxious about their malignant disease than about COVID-19, whereas 26.1% are more anxious about COVID-19 ($p < 0.001$; Fig. 2B).

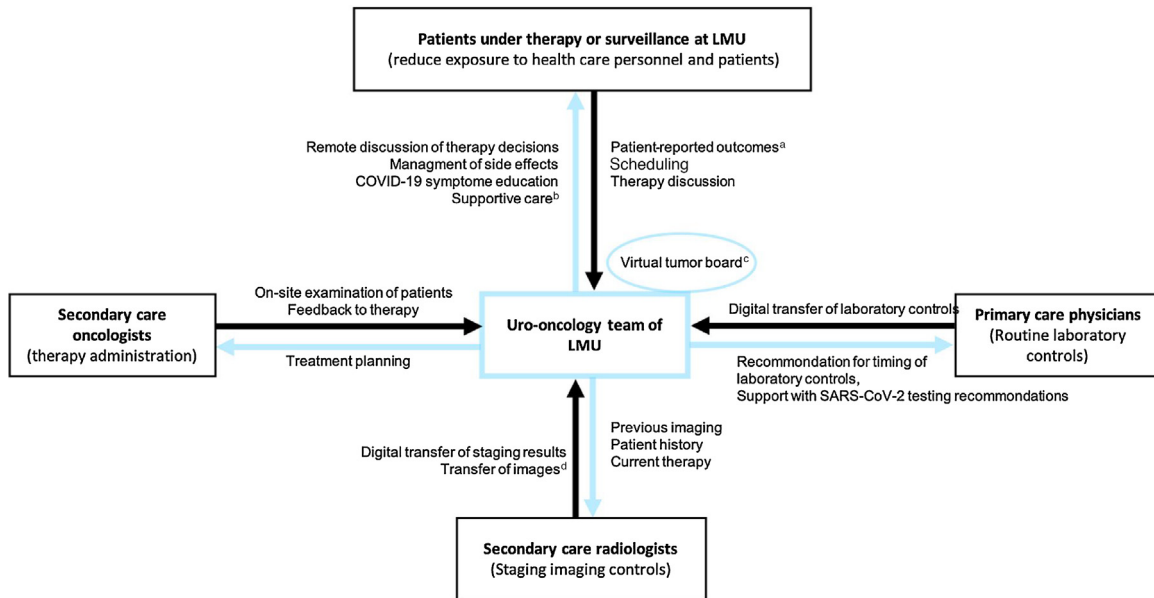


Fig. 1 – LMU remote cancer patient care model. Our uro-oncology team has implemented an almost virtual patient management approach in order to minimize exposure of patients and health care personnel as previously published [11]. COVID-19 = coronavirus disease-19; CT = computed tomography; LMU = Ludwig Maximilian University in Munich; SARS-CoV-2 = severe acute respiratory syndrome corona virus 2. ^a Virtual tumor boards are conducted via video conference, as in-person meetings are currently prohibited. ^b Currently collected via e-mail or phone by assessing treatment-related side effects and potential symptoms of COVID-19. Set-up for patient-reported outcome app is ongoing. ^c Transfer of CT scans is currently not possible due to regulation and incompatibility of imaging software, and is therefore performed via hard copy. ^d Supportive care including counseling with nutrition therapists, psycho-oncologists, and social workers is currently offered remotely.

3.2. Susceptibility to COVID-19 and its impact on therapy

Of the patients, 88.0% perceive preparedness of the German health care system to be superior to international comparators (Supplementary Fig. 1). Our respondents estimated their risk of infection to be lower (26.4%), equal (39.6%),

Table 1 – Patient characteristics

		n = 92	
Age			
Median		69	
Range		33–88	
		<i>n</i>	<i>%</i>
Sex			
Male	74	80.4	
Female	18	19.6	
Cancer			
Prostate	30	32.6	
Bladder	37	40.2	
Kidney	25	27.2	
Therapy			
Immunotherapy	45	48.9	
Chemotherapy	34	37.0	
Tyrosine kinase inhibitor therapy	5	5.4	
Androgen deprivation therapy	5	5.4	
Other	3	3.3	
Chronic underlying condition			
Hypertension	53	57.6	
Cardiac disease	27	29.3	
Diabetes	18	19.6	
Renal disease	12	13.0	
Obesity	11	12.0	
Pulmonary disease	6	6.5	
Compromised immune system	3	3.3	

or higher (34.1%) than the general population. There is no significant difference between patients on chemotherapy or immunotherapy (Fig. 3A). Of the patients, 25.0% suspect that COVID-19 will have a significant impact on their cancer treatment (Fig. 3B); the majority of the patients value continuation of their therapy higher than the prevention measures against COVID-19 and 77.2% of them are unwilling to postpone a staging examination (Fig. 3B). Of the cohort, 44.6% is afraid of progression and does not want to interrupt or delay cancer treatment due to the outbreak. Patients on chemotherapy are significantly less willing to interrupt or delay their therapy (61.8%) than patients on immunotherapy (33.3%, $p = 0.021$; Supplementary Fig. 2).

3.3. Perspective on telehealth efforts implemented during the pandemic

The majority of our patients are directly or indirectly able to communicate via e-mail; the rest is reachable on the phone. A small percentage of patients were queried during in-patient visits.

Regarding the reduction of in-person visits in light of the current pandemic, patients prefer to pursue visits to the hospital at a median of 7 (IQR 4.5–9) even if no treatment administration is planned. Patients on chemotherapy prefer on-site visits significantly more than immunotherapy patients ($p = 0.042$; Fig. 4).

Virtual discussion of staging results and therapy decisions is generally accepted at a median of 8 (IQR 5–9) as is outsourcing of external routine controls at a median of 8.5 (IQR 6–10). However, referral to secondary care oncologists

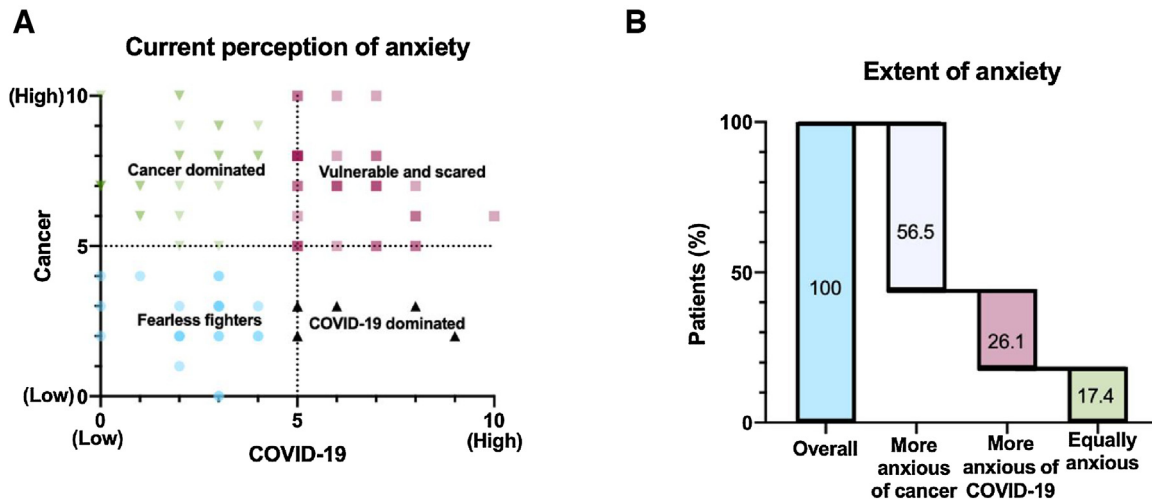


Fig. 2 – Anxiety of COVID-19 and cancer. (A) Current perception of anxiety is ranked from 0 (no anxiety) to 10 (extreme anxiety). Patients with anxiety levels for COVID-19 and cancer of <5 were classified as fearless fighters and those with anxiety levels of at least 5 as vulnerable and scared. Patients with anxiety level of either COVID-19 or cancer of at least 5 were classified as COVID-19 dominated or cancer dominated. (B) Anxiety was ranked accordingly and patients with higher levels of anxiety of their cancer were classified as more anxious about cancer, whereas those with higher levels of anxiety of COVID-19 were classified as more anxious of COVID-19. Patients with equally high levels were ranked as equally anxious. COVID-19 = coronavirus disease-19.

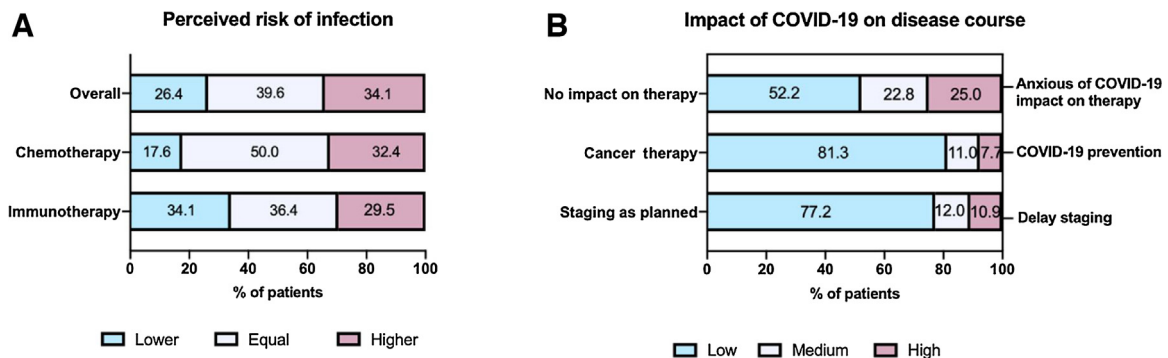


Fig. 3 – Susceptibility to cancer and impact on therapy. (A) Risk for infection compared with the overall population was assessed as lower, equal, or higher by patients. (B) Patients’ preference is ranked as low (0–3), medium (4–6), or high (7–10) depending on their answers for the three respective questions. Percentages may not total 100 because of rounding. COVID-19 = coronavirus disease-19.

for therapy administration is at a median of 2.5 (IQR 0–6.75; Supplementary Fig. 3A–C).

3.4. Acceptance of telehealth beyond the pandemic

The queries regarding preference of the telehealth services to maintain beyond the pandemic show that preservation of current measures in order to reduce outpatient clinic visits is at 4 (IQR 2–7; Fig. 5A); patients on immunotherapy are less willing to continue with current measures (median 3; IQR 1–6) than patients on chemotherapy (median 5; IQR 3–7.75; $p = 0.045$).

Approval of future maintenance of the services provided is 60.9% for external laboratory controls and digital transfer, 48.9% for digital appointment management, 44.6% for virtual discussion of staging results and therapy decisions, and

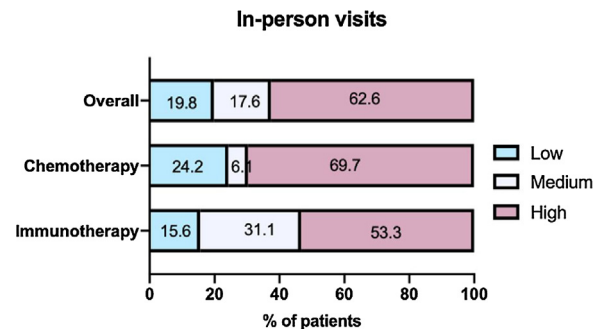


Fig. 4 – Perspective on in-person visits during pandemic. Patients’ perspective on in-person visits during the COVID-19 pandemic is asked. Willingness is ranked from low (0–3), medium (4–6), to high (7–10). Percentages may not total 100 because of rounding. COVID-19 = coronavirus disease-19.

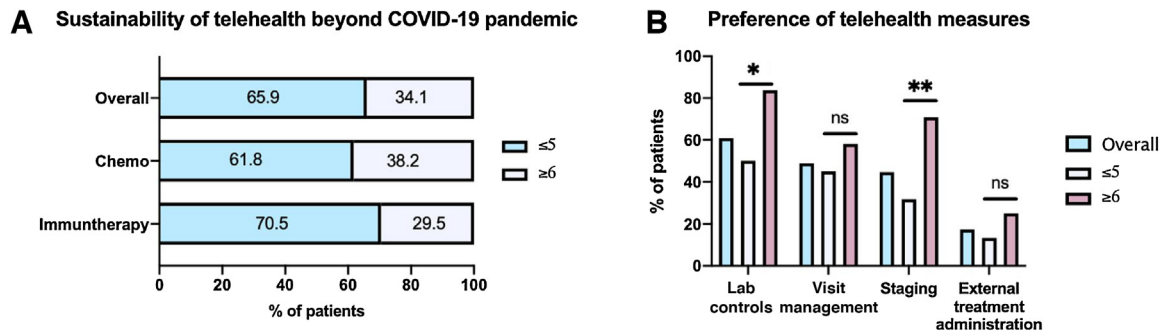


Fig. 5 – Acceptance of future telehealth management. (A) Patients ranked whether to continue the implemented telehealth changes on a scale from 0 (strongly disagree) to 10 (strongly agree). (B) Ratings for preferred telehealth application were collected by binary questions (yes/no) for all telehealth measures. Patients are stratified by their choice of implementation of telehealth. Percentages may not total 100% because of rounding. COVID-19 = coronavirus disease-19; Chemo = chemotherapy; ns = not significant. * $p < 0.01$. ** $p < 0.001$.

17.4% for referral of external oncologists with virtual therapy planning at LMU (Fig. 5B).

Patients generally appreciating current telehealth efforts rank all measures higher than the other patients. The largest difference in approval is for virtual staging discussion and therapy planning ($p < 0.001$; Fig. 5B). The preferred medium for digital communication is phone (76.9%), e-mail (56.7%), patient-reported outcome applications (22.0%), and video call (14.3%; Supplementary Fig. 4).

4. Discussion

Based on our reaction to the SARS-CoV-2 pandemic, we present the first study evaluating the balance between adopted telehealth measures and on-site visits for uro-oncology patients.

4.1. Implementation of telehealth to sustain cancer care during COVID-19 pandemic

Given the current need for social and patient-physician distancing, telehealth can provide protection for cancer patients and health care workers to avoid infections during in-person visits. Telehealth has experienced a rapid growth in the past month, in particular since reimbursement and data privacy issues have been alleviated by governments [13] in response to the pandemic. However, having probably overcome the peak of new infections [12], we are now at the forefront to determine the long-term impact and sustainability of telehealth from the point of view of cancer patients. Early in this pandemic, we have been affected by SARS-CoV-2 infections of several health care workers in our multidisciplinary oncologic outpatient clinic and implemented telehealth in response to the crisis. All patients actively treated or followed by our uro-oncology team were contacted by e-mail or phone calls to explain the upcoming preventive measure and to establish the “virtual communication.” We reduced on-site visits that did not require testing or treatment to prevent cancer patients from exposure in a tertiary care center in the frontline of the COVID-19 response. Interestingly, the vast majority of

patients are equipped to respond to the changes and are reached by e-mail or phone calls, as represented by the high portion of virtual responses to the presented survey. Further, to avoid crowds, patients were partially outsourced to primary and secondary care practices without compromising effectiveness of treatment regimens [11].

4.2. Demand for therapy continuation as anxiety of cancer outweighs COVID-19

Cancer patients undergoing systemic treatment are putatively at an increased risk of a severe course of COVID-19 due to immunosuppression and frequent routine hospital visits [3]. However, patients queried in our uro-oncology unit are currently more anxious about their metastatic disease than about the worldwide pandemic. The results contradict the assumption that COVID-19 may represent a dread risk, but there is still paucity of data about the perception of fear of SARS-CoV-2 in cancer patients. Recently, the Kidney Cancer Research Alliance conducted a survey among kidney cancer patients in the USA, and revealed a high level of anxiety for both COVID-19 and renal cell carcinoma [14]. This different view may arise from the more severe extent of the outbreak in the USA and the affection of cancer patients [15]. In fact, our patients perceive the situation in Germany as safer than in other countries and discern their susceptibility to SARS-CoV-2 infection to be comparable with the overall population. This leads to the strong determination to continue the systemic cancer treatment, despite adaptation to the preventive measures induced by the current situation.

4.3. Acceptance of telehealth during acute pandemic and beyond

The strength of our study is represented by the broad availability and rapid acceptance of telehealth services by our patients despite the difficulties of their applicability in an aging population, for example, without e-mail access or with hearing impairment. Virtual communication was established quickly directly or through aiding relatives or partners. The efforts are apparent in the high response rates.

Patients reveal high endorsement of completely virtual discussion of staging results and further therapy planning. Further, patients are willing to perform external laboratory and imaging controls, report side effects and symptoms virtually, and adapt to virtual supportive care delivered by e-mail or phone. Referral to secondary care oncologists is accepted, if necessary, as a measure to reduce contact to patients and physicians in the acute situation.

However, the majority of patients are not inclined to continue the telehealth measures employed beyond the acute crisis, in particular staging results and highly sensitive treatment decisions should not be discussed further virtually. Moreover, they stressed the wish to return to unrestricted in-person visits without facial masks and social distancing. The responses and discussions originated from our survey have pinpointed that personal interaction has a crucial value to patients and is greatly desired following the social and physician distancing during the current crisis.

For that matter, concerns have been raised that the current COVID-19 pandemic and implementation of telehealth with fewer face-to-face interactions might lead to a less humane practice of medicine [16]. Humanity is critical in cancer care, where patient-physician interaction based on empathy, trust, and collaboration is fundamental to cope with the disease [17].

4.4. *Creating sustainable telehealth solutions to face upcoming pandemics*

Our findings highlight the importance to create a sustainable telehealth solution to protect health care personnel and extend their reach. An efficient increase of telehealth measures is mandatory as a reaction to acute crises to prevent the health system from collapsing due to uncontrolled outbreaks. We might be expecting a second or even more peaks of SARS-CoV-2 infections [18], and in future, globalization is going to allow for the spread of further contagious pandemics [19]. Physicians should be trained in the confident use of remote technologies within their clinical workflow. For instance, monitoring of proactive cancer patients can be enabled by patient-reported outcome tools [20].

A robust infrastructure is necessary to interact with colleagues, for instance, within virtual tumor boards and to enhance adherence and expertise. Laboratory or imaging results should be shared easily and securely between various health care players. However, more importantly, the daily workflow of clinicians should include time slots dedicated to remote communication between patients and primary care physicians to ensure optimal treatment management. A solution can be provided by the balance of synchronous and asynchronous communication [21]. To achieve acceptance of telehealth in our health systems, regulatory hurdles regarding data protection and reimbursement laws need to be addressed and ruled beyond the acute crisis [22].

4.5. *Balancing telehealth between protection and patients' perception*

As we are now entering a more chronic phase of the pandemic [12], it is mandatory to ensure effective cancer

care that incorporates both prevention from infection and humane and individualized patient assistance.

The study has taught us that patients value greatly the interaction with their doctors involving facial expressions and physical presence. Human distancing to prevent infection during the crisis has relevantly affected this vulnerable population, which has been perceived as an emotional toll to cancer patients [23].

A patient pinpointed the situation during the discussion of the survey. He had spent 3 wk in quarantine following the contact with a positive health care worker in our unit. During that time, we reached out to him every 2 d with phone calls and e-mails. However, when we asked whether he would want to continue specific telehealth solutions for the future, he said: "Telehealth is helpful and may save me from COVID-19, but it aggravates the suppressing isolation I feel without the personal contact to my cancer doctors." Often, signs of emotional expression, and gestures like a handshake or a hug [24] can outweigh words and make the real difference in cancer care.

We, therefore, believe that a balance between virtual medicine and safe environment for physical visits is the key to deliver the best care for cancer patients.

5. Conclusions

Rapid adoption of telehealth solutions ensures reciprocal protection for health care personnel and vulnerable cancer patients. However, sustainability of "going virtual" needs to be re-evaluated for a potentially chronic phase of the pandemic. The key concern of our patients is their cancer disease, and they value personal interactions with their treating physicians greatly. Patient-physician distancing can be perceived as a bigger toll than the risk of COVID-19; therefore, to shape the future of telehealth in oncology, we need to balance between in-person interactions and virtual offers in order to respect human dignity in cancer care.

Author contributions: Severin Rodler had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Rodler, Casuscelli.

Acquisition of data: Rodler, Apfelbeck, Casuscelli.

Analysis and interpretation of data: Rodler, Casuscelli.

Drafting of the manuscript: Apfelbeck, Schulz, Ivanova.

Critical revision of the manuscript for important intellectual content: Heinemann, Staehler, Stief, Buchner, Ivanova, Schulz, Apfelbeck.

Statistical analysis: Rodler.

Obtaining funding: None.

Administrative, technical, or material support: Rodler, Casuscelli, Apfelbeck.

Supervision: Heinemann, Staehler, Stief, Buchner.

Other: None.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.euf.2020.05.010>.

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