editorials

COVID-19 Emergency and the Need to Speed Up the Adoption of Electronic Patient-Reported Outcomes in Cancer Clinical Practice

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With > 1.5 million confirmed cases and > 100,000 deaths as of mid-April 2020,[1] the novel coronavirus disease 2019 (COVID-19) pandemic is challenging health care systems worldwide. In the most severely affected countries, hospitals have been suddenly required to revisit the entire organizational process, to make the journey of the patient with COVID-19 as streamlined and effortless as possible. Consequently, during the emergency, assuring the timely and optimal care of patients affected by other diseases has become increasingly difficult. Moreover, as expected, chronic conditions, such as cardiovascular disease, diabetes, chronic respiratory disease, hypertension, and cancer, often simultaneously present in the same patient, have been associated with an increased COVID-19 case fatality rate.[2]

Patients with cancer are uniformly considered a fragile population in this pandemic, owing to several potentially concomitant factors (age, comorbidities, immunosuppressive effect related to the tumor itself and/or to anticancer treatments),[3-6] and even more special precautions are required for them. The oncologic community is making a great effort to ensure optimal assistance to patients with cancer, despite the need to reduce as much as possible the number of required hospital visits.[6] For instance, in Italy, specific instructions were issued on March 11, 2020 to all members of Italian Association of Medical Oncology.[7] In this period of emergency, the number of hospital visits has been reduced and limited to the days corresponding to drug infusion. Intermediate control visits between treatment administrations are avoided, and patients on oral treatment are often receiving their drug at home to cover a longer period of treatment without hospital access. Although this conduct has been demanded to effectively reduce the risk of contagion, it could significantly increase the patient's perception of inefficacious or incomplete communications by the clinicians. On the other hand, from clinicians' standpoint, reduction of patients' visits to the hospital increase the fear of a suboptimal clinical management of symptoms and treatment-emergent adverse events, raising the risk of preventable hospital visits.

It is well known that an active monitoring of patients by clinicians is fundamental to allow the prompt management of symptoms and consequently the optimization of patients' quality of life (QoL).[8] To optimize patient assistance during this COVID-19 emergency, the American Medical Association has encouraged the use of telemedicine and technology, which are considered crucial ways to deliver care and to keep health care workers, patients, and vulnerable populations safe.[9] Among the continuum of technologies that can help improve an effective and useful communication between patients with cancer and clinicians, the use of patient-reported outcomes (PROs) has repeatedly proven their potential.[10,11] PROs, which are outcomes evaluated directly by patients themselves, are currently considered the standard assessment of patient experience of the disease and its treatment.[12] In clinical research, PROs are now recognized as a key aspect in the evaluation of the value of a new anticancer treatment, but their utility should not be confined merely to the research context. The adoption of tools and questionnaires aimed at symptom description by patients with cancer has already been invoked for clinical practice,[11] and in this unexpected COVID-19 emergency the use of electronic PROs (ePROs) could represent a smart strategy to pursue in clinical practice. A number of tools measuring PROs could be adopted, some of which are generic and others specific for different types of tumors or different types of treatment.[13,14] Many apps have been recently created based on contents of validated QoL and PRO tools.[15-17] As a companion to the Common Terminology Criteria for Adverse Events (CTCAE), traditionally used for description and categorization of toxicities by clinicians, the National Cancer Institute has developed a PRO version of CTCAE (PRO-CTCAE).[18] In recent years, several studies have described the feasibility of electronic patient reporting of symptomatic side effects of cancer treatment and have shown high acceptability of self-reporting and high satisfaction with the use of this system.[19-22]

The urgent adoption of ePROs could have many advantages (Table 1). First, a nonsystematic evaluation (for example, through occasional e-mails or telephone

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TABLE 1. Adoption of Electronic Patient-Reported Outcomes in Cancer Clinical Practice During COVID-19 Emergency: Advantages, Challenges, and Possible Solutions

Advantages
Systematic check of the clinical trend of important symptoms and side effects
Prevention of the occurrence of severe adverse events needing ER access and hospitalization
Efficient screening of patients who need further phone assistance or direct medical intervention
Prompt management of medical needs
Positive psychological impact on patients
Increased patient satisfaction with health care services

Challenges	**Possible Solutions**
Lack of awareness among clinicians of the cost-effectiveness of ePRO adoption and use	Education for nurses and doctors during clinical practice and through web seminars
Choice of the best questionnaire/tool among those available	Involvement of experts in PRO research, also through collaboration among different institutions
Distribution of electronic questionnaires/tools to patients	Installation of mobile phone apps during the visit/link to Web site sent by e-mail/text message
Patient education to fill in ePROs/caregiver education to help patients fill in ePROs	Instructions sent with the electronic questionnaires/education by clinicians during the clinical visit or by phone/e-mail
Education for clinicians on how to manage ePROs	Training of nurses and doctors during clinical practice and through web seminars
Lack of awareness by hospital management of the importance of incorporation of ePROs into medical health records	Discussion with health management and hospital IT services about technical issues of incorporation of ePROs into medical health records

Abbreviations: COVID-19, coronavirus disease 2019; ePRO, electronic patient-reported outcome; ER, emergency room; IT, information technology.

interviews) could result in loss of some important information about patients' symptoms and toxicity. Regular discussion of PRO questionnaires, filled out electronically by patients and received by nurses or doctors, during periodical proactive phone calls, could allow a systematic check of the clinical trend of important symptoms and side effects. This would imply coordination with prompt management of medical needs. In the absence of this check, many patients could experience a worsening of symptoms, with related QoL deterioration.

Second, the early, proactive identification of worsening symptoms and toxicities could help prevent the occurrence of severe adverse events needing emergency room (ER) access and hospitalization.[21,22] This is always useful, but particularly in this moment, given the vital importance of reducing hospital contacts.

Third, during the emergency many cancer centers are working with reduced personnel because of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) positivity of the medical staff or the need to assign personnel and supporting staff to emergency tasks. In this situation, all the procedures that can optimize time are welcome, and discussion of PROs is theoretically useful to perform an efficient screening of patients who need additional phone assistance or direct medical intervention. This could be rapidly deployed with monitoring by staff working even remotely from home, as systems have rapidly made use of telehealth tools across organizations to reduce in-person visits and exposures.[23] To allow effective work also by members of the staff (clinicians or nurses) who during pandemic could be quarantined at home, hospital practices can set up virtual private networks, and the operators can log into and work in a secured internet space.

Last, but not least, adoption and discussion of PROs would reasonably have a positive psychological impact on patients, increasing their satisfaction with health care services.[9] As oncologists, we all want to avoid having our patients feel abandoned or neglected during this difficult period. Quarantine, which is an unavoidable measure in this context, is known to cause negative psychological effects,[24] which can be amplified in people who were are already fighting a disease before the COVID-19 emergency. Even in the absence of physical contact, a phone call with the discussion of symptoms, functional domains, well-being, and global health status could help patients feel cared for with the same quality we adopted before the emergency. A possible model for ePRO adoption into clinical practice, to reduce hospital visits and improve remote management of patients, even using remote working of staff, is illustrated in Figure 1.

Of course, use of ePROs could be potentially more complicated for older patients and those with less confidence with modern technology.[25] However, in the seminal randomized trial conducted by Basch et al,[21] even subjects who professed to be inexperienced with technology were able to regularly report their symptoms via the Web

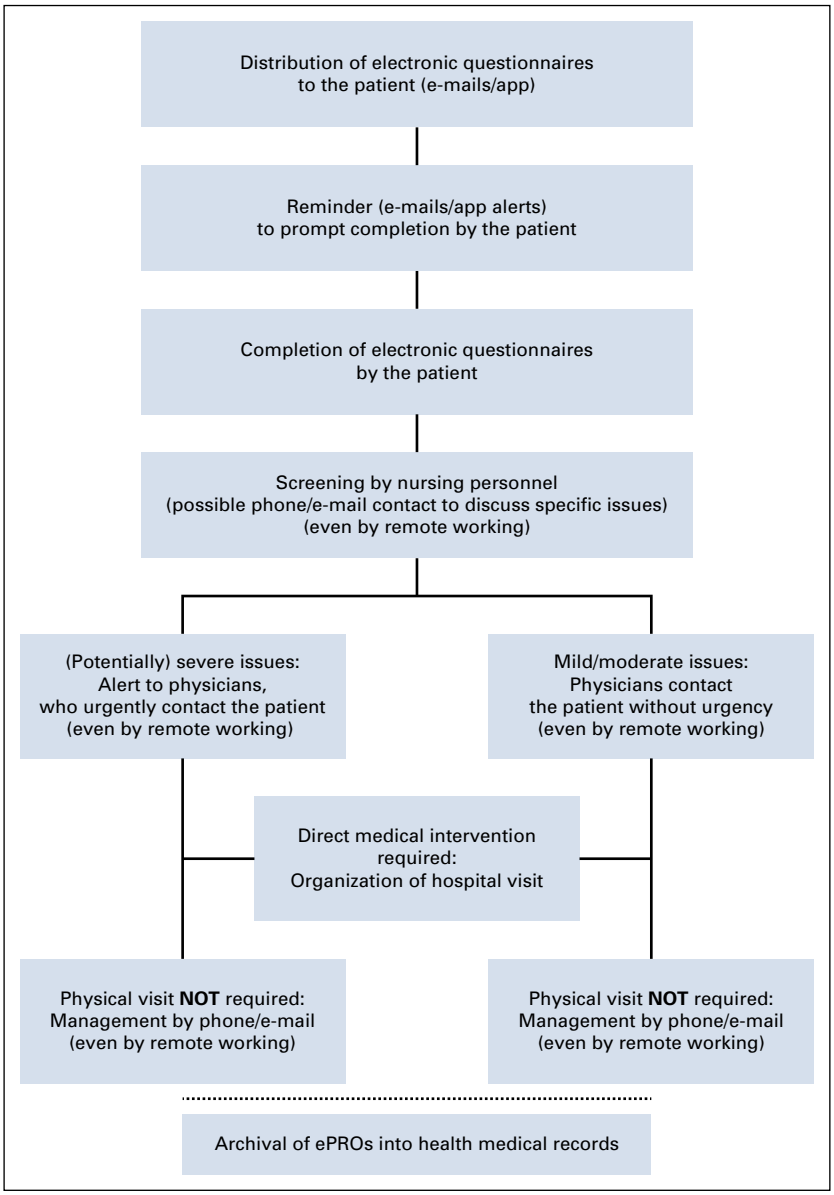

FIG 1. Model for electronic patient-reported outcome (ePRO) adoption into clinical practice to reduce hospital visits and improve remote management of patients.

throughout the course of their anticancer treatment. When the study results were analyzed according to patients' age, although older patients did not show the same benefit that was apparent in younger patients in terms of reduction of ER visits or in terms of survival, no moderation effect was demonstrated based on age for QoL improvement and reduced risk of hospitalizations.[26]

As technology is showing its usefulness in several fields during this critical period, its application in aid of patients and clinicians should be encouraged. Although the diffusion of ePROs could initially appear as a challenging organizational effort, the benefits of a systematic plan will definitely be evident in the long term.[11,21] In health care, as in other areas, rapid change can be stimulated by crises. With the medical crises of the COVID-19 pandemic and our imperative to provide high-quality care to our patients with cancer, a rapid implementation of ePROs in clinical practice is a critical change to assist oncologists and patients.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST AND DATA AVAILABILITY STATEMENT

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REFERENCES

1. World Health Organization: Coronavirus disease (COVID-19) pandemic. https://www.who.int/emergencies/diseases/novel-coronavirus-2019
2. Wu Z, McGoogan JM: Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. JAMA 10.1001/jama.2020.2648 [epub ahead of print on February 24, 2020]
3. Liang W, Guan W, Chen R, et al: Cancer patients in SARS-CoV-2 infection: A nationwide analysis in China. Lancet Oncol 21:335-337, 2020
4. Yu J, Ouyang W, Chua MLK, et al: SARS-CoV-2 transmission in patients with cancer at a tertiary care hospital in Wuhan, China. JAMA Oncol 10.1001/jamaoncol.2020.0980. [epub ahead of print on March 25, 2020]
5. Zhang L, Zhu F, Xie L, et al: Clinical characteristics of COVID-19-infected cancer patients: A retrospective case study in three hospitals within Wuhan, China. Ann Oncol 10.1016/j.annonc.2020.03.296. [epub ahead of print on March 26, 2020]
6. Lambertini M, Toss A, Passaro A, et al: Cancer care during the spread of coronavirus disease 2019 (COVID-19) in Italy: Young oncologists' perspective. ESMO Open 5:e000759, 2020
7. Beretta G, Cinieri S, Blasi L, et al: Rischio infettivo da Coronavirus COVID 19: Indicazioni per l'Oncologia da parte del Presidente AIOM, del Presidente eletto AIOM, del Presidente CIPOMO e del Presidente COMU. https://www.aiom.it/wp-content/uploads/2020/03/20200313_COVID-19_indicazioni_AIOM-CIPOMO-COMU.pdf
8. Baratelli C, Turco CGC, Lacidogna G, et al: The role of patient-reported outcomes in outpatients receiving active anti-cancer treatment: Impact on patients' quality of life. Support Care Cancer 27:4697-4704, 2019
9. American Medical Association: AMA quick guide to telemedicine in practice. https://www.ama-assn.org/practice-management/digital/ama-quick-guide-telemedicine-practice
10. Yang LY, Manhas DS, Howard AF, et al: Patient-reported outcome use in oncology: A systematic review of the impact on patient-clinician communication. Support Care Cancer 26:41-60, 2018
11. Di Maio M, Basch E, Bryce J, et al: Patient-reported outcomes in the evaluation of toxicity of anticancer treatments. Nat Rev Clin Oncol 13:319-325, 2016
12. European Medicines Agency: Reflection paper on the use of patient reported outcome measure in oncology studies. June 17, 2014. https://www.ema.europa.eu/en/documents/scientific-guideline/draft-reflection-paper-use-patient-reported-outcome-pro-measures-oncology-studies_en.pdf
13. Luckett T, King MT: Choosing patient-reported outcome measures for cancer clinical research--practical principles and an algorithm to assist non-specialist researchers. Eur J Cancer 46:3149-3157, 2010
14. Lipscomb J, Gotay CC, Snyder CF: Patient-reported outcomes in cancer: A review of recent research and policy initiatives. CA Cancer J Clin 57:278-300, 2007
15. Fjell M, Langius-Eklöf A, Nilsson M, et al: Reduced symptom burden with the support of an interactive app during neoadjuvant chemotherapy for breast cancer - A randomized controlled trial. Breast 51:85-93, 2020
16. Greer JA, Jacobs JM, Pensak N, et al: Randomized trial of a smartphone mobile app to improve symptoms and adherence to oral therapy for cancer. J Natl Compr Canc Netw 18:133-141, 2020
17. Ciani O, Cucciniello M, Petracca F, et al: Lung Cancer App (LuCApp) study protocol: A randomised controlled trial to evaluate a mobile supportive care app for patients with metastatic lung cancer. BMJ Open 9:e025483, 2019
18. Basch E, Reeve BB, Mitchell SA, et al: Development of the National Cancer Institute's patient-reported outcomes version of the common terminology criteria for adverse events (PRO-CTCAE). J Natl Cancer Inst 106:dju244, 2014
19. Basch E, Iasonos A, Barz A, et al: Long-term toxicity monitoring via electronic patient-reported outcomes in patients receiving chemotherapy. J Clin Oncol 25:5374-5380, 2007
20. Snyder CF, Blackford AL, Wolff AC, et al: Feasibility and value of PatientViewpoint: A web system for patient-reported outcomes assessment in clinical practice. Psychooncology 22:895-901, 2013
21. Basch E, Deal AM, Kris MG, et al: Symptom monitoring with patient-reported outcomes during routine cancer treatment: A randomized controlled trial. J Clin Oncol 34:557-565, 2016
22. LeBlanc TW, Abernethy AP: Patient-reported outcomes in cancer care– hearing the patient voice at greater volume. Nat Rev Clin Oncol 14:763-772, 2017
23. Moazzami B, Razavi-Khorasani N, Dooghaie Moghadam A, et al: COVID-19 and telemedicine: Immediate action required for maintaining healthcare providers well-being. J Clin Virol 126:104345; 2020
24. Brooks SK, Webster RK, Smith LE, et al: The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. Lancet 395:912-920, 2020
25. Sperti E, Di Maio M: Outcomes research: Integrating PROs into the clinic– overall survival benefit or not, it's worth the trouble. Nat Rev Clin Oncol 14:529-530, 2017
26. Nipp RD, Horick NK, Deal AM, et al: Differential effects of an electronic symptom monitoring intervention based on the age of patients with advanced cancer. Ann Oncol 31:123-130, 2020

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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