Potential Technology Development for Palliative Care

Jennifer D. Portz, PhD, MSW,^{1,2} Stephen Coggnetta,³ and David B. Bekelman, MD, MPH^{1,4}

Dear Editor:

Technology has widespread use in the general population and is increasingly used in healthcare for service delivery, health monitoring, transmission of health information, and clinical communication. In palliative care, there is interest in telemonitoring, digital communications, and mobile applications^{1–3} for symptom palliation and end-of-life care. Podcasts and social media are used to provide palliative care education and social support.⁴ Technology offers a unique opportunity to support patients with serious illness, their families, and clinicians with symptom assessment, self-management, and communication, among others.

Despite current uses in palliative care, we believe technology is underutilized and has great potential to improve the quality of palliative care and patient and family outcomes. Research is needed to understand benefits, risks, barriers, and facilitators to the adoption and use of technologies in palliative care. As an initial step toward this long-term goal, we conducted a brainstorming session with palliative care providers to identify promising ideas for the use of technology in palliative care.

The brainstorming session was led by a palliative care physician researcher (D.B.B.) and a technology-computing expert (S.C.). Palliative care providers ($n=24$) included physicians, medical students and residents, clinical and research fellows, nurses, chaplains, social workers, and an art therapist from inpatient, outpatient, and community (i.e., hospice) settings. The leaders described the goals of the brainstorming session and then requested participants to write down technology solutions that they believed to be potentially beneficial for patients, families, or providers (10 minutes). Participants then assembled into groups of four to five people. Each group was given 15 minutes to discuss and list their ideas on poster paper. Each group presented their suggestions to the larger group for discussion and further idea generation. The authors assembled the final lists of ideas and, through a team-based analytic process, consolidated, defined, and refined the ideas.

The palliative care and technology ideas are described in Table 1. Participants identified current popular technologies (referring to platforms such as *Match.com* and *Nextdoor*) that could be applied to the interests and needs of palliative care

patients and caregivers. They also suggested creating new smart and voice command technologies. There was interest in digitalizing (via apps or websites) well-known palliative care interventions such as dignity therapy and meditation. Tools and outlets through social media, networking programs, and coordinating centers for caregivers and family members were highlighted.

Expanding and studying technology applicability and effectiveness among patients with serious illness, their families, and caregivers have potential. We offer some ideas and suspect there are many more. There are opportunities for industry–academic partnerships to create and study these technologies.

Acknowledgments

Dr. Portz is funded by the National Institute on Aging (5T32AG044296). Dr. Bekelman is funded by VA HSR&D IIR 14-346.

References

1. Meghani SH, MacKenzie MA, Morgan B, et al.: Clinician-targeted mobile apps in palliative care: A systematic review. *J Palliat Med* 2017;20:1139–1147.
2. Osther K, Killoran P, Shegog R, Bruera E: Death in the digital age: A systematic review of information and communication technologies in end-of-life care. *J Palliat Med* 2016;19:408–420.
3. Pinto S, Caldeira S, Martins JC: e-Health in palliative care: Review of literature, Google Play and App Store. *Int J Palliat Nurs* 2017;23:394–401.
4. Casañas I, Comabella C, Wanat M: Using social media in supportive and palliative care research. *BMJ Support Palliat Care* 2015;5:138–145.

Address correspondence to:
Jennifer D. Portz, PhD, MSW
School of Social Work
College of Health and Human Sciences
Colorado State University
1586 Campus Delivery
Fort Collins, CO 80523-1586

E-mail: jennifer.portz@colostate.edu

¹Division of General Internal Medicine, Department of Medicine, School of Medicine, University of Colorado Anschutz Medical Campus, Aurora, Colorado.

²School of Social Work, College of Health and Human Sciences, Colorado State University, Fort Collins, Colorado.

³HackMentalHealth.

⁴Department of Veterans Affairs, Eastern Colorado Healthcare System, Denver, Colorado.

TABLE 1. TECHNOLOGY FOR PALLIATIVE CARE IDEAS

<i>Idea</i>	<i>Description</i>
Patient-controlled environment through voice command	Allow patient to control the environment, whether it is a hospital room or their own room, regardless of physical ability. Variables could include music, lighting, creative outlets, or limiting bells and alarms.
Smart Home for palliative care	Examples include the following: A timed medicine dispenser Quick diagnostic information and simple actions to respond to symptoms User: “Ok [smart home], I’m experiencing a lot of nausea.” [Smart home]: “It sounds like you’re experiencing nausea. You should take your XX medication, listen to music, or try a relaxation technique. Ask me about any of these and I can provide further help.” Interpreter services to speak with caregivers through an automated voice assistant.
Online dignity therapy ^a	A hologram for telehealth visits. Help patients “fill in the blank” in a technology-guided process similar to enable enhanced dignity therapy
Coordinating among caretakers and family	A centralized system for coordinating care either through an online platform or artificial intelligence-assisted chat platform.
Match.com for patients and providers	Patients could seek local medical providers and filter by insurance coverage, quality ratings, or other criteria.
Improve accessibility and engagement for social media apps	Snapchat is popular for social connection among younger generations, but is challenging to use for older adults. How can we redesign new trends and apps to be easily used by older ill adults?
Meditation app for palliative care	Meditation app that specifically addresses coping with existential issues and includes meditations for palliative care populations.
Storytelling for palliative care patients, families, and caregivers	Enable people with serious illnesses to tell their stories through a variety of online media (voice, video, and writing, etc.) and feel a sense of purposefulness
Nextdoor for caregiving	Nextdoor has success in engaging the community and fostering local connection. Can we leverage this success to enable local people to provide caregiving services for their neighbors?
MDPOA/AD availability	Make it easy to locate AD form—a voice-activated assistant that can assist with online completion, say where it is located, or add to the section for emergency contacts on phones.
Tech-assisted nonverbal communication	Many patients are unable to verbally speak. Use technology to allow creative and rich nonverbal expression.
Social media support network for caregivers	Provide a social network for wellness and support for caregivers.
Value clarification	Technological version to help people clarify values in the context of serious illness.

^aChochinov HM. *Dignity Therapy: Final Words for Final Days*. Oxford, NY: Oxford University Press, 2012.

MDPOA/AD, medical durable power of attorney/advance directive.