

## Inpatient Portals: The Questions that Remain

Michael Shoffeitt, MD, Holly Lanham, PhD

University of Texas Health Science Center at San Antonio, San Antonio, Texas.

Personal health records (PHRs) are a broad group of applications “through which individuals can access, manage, and share their health information,” and are intended as a means to increase consumer health awareness, activation, safety, and self-efficacy.<sup>1</sup> Patient portals—PHRs that are tethered to an electronic health record (EHR)—have expanded over the past decade, driven in part by the “Meaningful Use” EHR Incentive Program of the Centers for Medicare and Medicaid Services.<sup>2</sup> This has been particularly true in the outpatient setting. Unfortunately, despite increased adoption and a large number of research studies, it is not clear whether outpatient portal use is associated with improved clinical outcomes.<sup>3</sup>

Both the use of portals in the inpatient setting and the research thereof are at a more nascent stage. In this issue of the *Journal of Hospital Medicine*, Kelly et al.<sup>4</sup> provide a systematic review of the existing research on the implementation of inpatient portals. The authors identified 17 studies and categorized the papers’ findings into the following 3 themes: design, use and usability, and impact. Most of the studies elicited feedback from patients, caregivers, and/or providers – sometimes in multiple phases as portals were redesigned – allowing the authors to offer the following recommendations for inpatient portal design: portals should present timely information, include the care plan in ways patients can understand, and facilitate identification and communication with the care team.<sup>4</sup> Most of the included studies focused on portal design and use, thereby limiting knowledge regarding impact on the outcomes portals are intended to target. All findings should be interpreted with caution, as many of the included studies were small and qualitative, most of them used convenience samples and subject-reported outcomes, and all were conducted at a single center. Many sites also used customized portals, thus limiting generalizability.

Participants often found portals to be useful, but this finding is of uncertain value in the absence of robust evidence on outcomes. In addition, providers included in the reviewed studies expressed concerns that have not yet been well studied, such as the potential impact of portals on workload and on patient anxiety. Some studies reported that provider concerns lessened following a portal rollout, but few studies evaluated physician input on features such as direct communication

and test result reporting in active use. The outpatient portal literature suggests potential harm related to how results are delivered, thus placing importance on conducting additional inpatient studies. Patients value online access to their health information<sup>5</sup> and in previous literature have indicated a preference for immediate access to results even if abnormal results would then be given without explanation.<sup>6</sup> However, in a recent study, even normal findings delivered without context were a cause of negative emotions and increased calls to physicians.<sup>7</sup> This effect could be more pronounced in inpatient settings, given the large volume of tests and abnormal results, the rapidly evolving treatment plans, and generally higher acuity and medical uncertainty.

This review and other current literature highlight challenges for vendors and hospitals. Vendors must ensure that patient health information is contextualized and delivered in a manner that meets individual learning styles.<sup>8</sup> Patients and caregivers need clinical decision support to process today’s large amount of data, just as providers do. We must be careful not to implement patient portals in ways that increase cognitive load and generate anxiety and confusion. Hospitals have infrastructural challenges if portals are to be successful. Care provider information must be accurately registered in the EHR to route patient-to-provider communications, a difficult task across frequent handoffs and staffing changes.

We now have the beginnings of an informed vision for inpatient portal design. Future research and industry directions include greater exploration of recognized concerns and how to best reconcile these concerns with the benefits of portals espoused by consumer health advocates and experienced by patients, caregivers, and providers in the reviewed studies. Specifically, we need a better understanding of how best to incorporate inpatient portals into routine care delivery in ways that are useful to both patients and providers. We also need a better understanding of why patients opt out of portal use. Most of the studies to date report on the set of patients who decided to use the portals, leaving a knowledge gap in design and use implications for patients who opted out. Studies should include comparisons of patient outcomes between users and nonusers. Although inpatient portals show promise, many questions remain.

**\*Address for correspondence:** Michael Shoffeitt, MD, University of Texas Health Science Center at San Antonio, San Antonio, Texas; Telephone: 210-743-6000; Fax: 210-358-0647; E-mail: Shoffeitt@uthscsa.edu

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