

# Letters

## RESEARCH LETTER

### Patient Access to Electronic Health Records During Hospitalization

In 2001, the Institute of Medicine<sup>1</sup> recommended improving patient engagement by providing continuous care, allowing patients to be the source of control and fostering transparency with patients and families. Electronic health records (EHRs) facilitate these objectives via the use of patient portals.<sup>2</sup> Giving outpatients direct access to their health information helps clinicians find errors and improves patient satisfaction, although the implications of this type of access have not been well studied in the inpatient setting.<sup>3-5</sup> This hospital-based study evaluates the experiences of patients, clinicians (including physicians and advanced practice providers), and nurses with immediate (real-time) release of test results and other EHR information through a patient portal.

**Methods** | This prospective cohort study was performed on a medical unit of the University of Colorado Hospital, Aurora, a 412-bed academic tertiary care hospital, from October 1, 2012, through March 31, 2013. Approval was obtained from the Colorado Multiple Institutional Review Board and the University of Colorado Hospital Research Review Committee. Partici-

pants provided oral informed consent, and all data were de-identified. Participants included hospital clinicians, nurses, and patients. Patient participants were enrolled by convenience sampling and used a study-provided electronic tablet to access parts of their EHR, including the medication schedule and test results (intervention). Patients, clinicians, and nurses completed surveys before and after the intervention. The survey evaluated the domains of caregiver workload, patient confusion and worry, patient empowerment, errors detected, and discharge planning. We performed the McNemar test to analyze binary data between paired responses on surveys for all 3 groups.

**Results** | Participants completing the preintervention and post-intervention surveys included all 50 patients (response rate, 100%), 28 of 30 clinicians (response rate, 93%), and 14 of 16 nurses (response rate, 88%). Demographics and baseline opinions about technology are shown in **Table 1**. Mean patient portal use was 15.6 (SD, 16.2; median, 11.2; range, 0.3-86.8) clicks per day, and time logged on ranged from 2 to 1331 minutes. We did not assess the use of the tablet for other purposes or by other users. **Table 2** shows the preintervention and postintervention survey results. Thirty-three of 42 clinicians and nurses (79%) were concerned that giving patients immediate access

Table 1. Patient, Clinician, and Nurse Demographics

Demographics	Respondents <sup>a</sup>		
	Patients (n = 50)	Clinicians (n = 28) <sup>b</sup>	Nurses (n = 14)
Age, mean (SD), y	42.1 (14.5)	35.2 (6.4)	33.3 (8.8)
Male sex	17 (34)	8 (29)	2 (14)
Race			
White	30 (60)	NA	NA
Hispanic	3 (6)	NA	NA
Black	11 (22)	NA	NA
Asian	3 (6)	NA	NA
Native American	3 (6)	NA	NA
Annual household income, \$			
≤45 000	37 (74)	NA	NA
>45 000	13 (26)	NA	NA
Have ever used the Internet	50 (100)	NA	NA
Have a computer at home	45 (90)	NA	NA
Own a smartphone	32 (64)	NA	NA
Have a laptop/smartphone in hospital	30 (60)	NA	NA
Time since training, mean (SD), y	NA	6.1 (4.9)	7.2 (9.6)
Compared with colleagues, likelihood of adopting new technology for use in work			
Hold out as long as possible	NA	1 (4)	0
Late adopter	NA	5 (18)	0
Early adopter	NA	20 (71)	12 (86)
First to adopt new technology	NA	2 (7)	2 (14)

Abbreviation: NA, not applicable.

<sup>a</sup> Unless otherwise indicated, data are expressed as number (percentage) of respondents.

<sup>b</sup> Includes physicians and advanced practice providers.

Table 2. Preintervention and Postintervention Survey Results for Patients, Clinicians, and Nurses

Survey Item	Response, No. (%) of Participants								
	Patients (n = 50)			Clinicians (n = 28) <sup>a</sup>			Nurses (n = 14)		
	Preintervention	Postintervention	P Value	Preintervention	Postintervention	P Value	Preintervention	Postintervention	P Value
Ask for nurse more	22 (44)	9 (18)	.007	21 (75)	15 (54)	.07	14 (100)	7 (50)	<sup>b</sup>
Ask for physician more	27 (55) <sup>c</sup>	18 (37) <sup>c</sup>	.08	19 (68)	10 (36)	.004	11 (85) <sup>c</sup>	7 (54) <sup>c</sup>	.22
Worry more	21 (42)	9 (18)	.008	24 (86)	19 (68)	.06	13 (93)	7 (50)	.07
Confused	26 (52)	16 (32)	.04	26 (93)	24 (86)	.63	14 (100)	11 (79)	<sup>b</sup>
Feel in control	45 (90)	43 (86)	.69	26 (93)	27 (96)	>.99	14 (100)	10 (71)	<sup>b</sup>
Understand medical condition	46 (92)	41 (82)	.23	15 (54)	17 (61)	.69	9 (64)	7 (50)	.69
Reassured	44 (90) <sup>c</sup>	39 (80) <sup>c</sup>	.27	21 (75)	23 (82)	.63	9 (64)	8 (57)	>.99
Understand physician instructions	40 (80)	30 (60)	.02	7 (28) <sup>d</sup>	8 (32) <sup>d</sup>	>.99	7 (50)	8 (57)	>.99
Follow recommendations	42 (84)	25 (50)	<.001	13 (46)	13 (46)	>.99	7 (50)	7 (50)	>.99
Trust physician more	35 (70)	21 (42)	.001	22 (79)	22 (79)	>.99	12 (92) <sup>c</sup>	5 (38) <sup>c</sup>	.02
Find errors in medication	22 (44)	3 (6)	<.001	25 (96) <sup>e</sup>	17 (65) <sup>e</sup>	.008	13 (93)	7 (50)	.03
Find errors in laboratory test results	14 (28)	1 (2)	<.001	6 (21)	5 (18)	>.99	6 (43)	3 (21)	.45
Find errors in radiologic test results	10 (20)	2 (4)	.02	4 (14)	3 (11)	>.99	3 (21)	3 (21)	>.99
Understand discharge timing	33 (67) <sup>c</sup>	12 (24) <sup>c</sup>	<.001	11 (39)	12 (43)	>.99	6 (43)	7 (50)	>.99

<sup>a</sup> Includes physicians and advanced practice providers.

<sup>d</sup> Data were missing for 3 participants (left blank on the survey).

<sup>b</sup> No P value was calculated if 100% of the respondents answered yes.

<sup>e</sup> Data were missing for 2 participants (left blank on the survey).

<sup>c</sup> Data were missing for 1 participant (left blank on the survey).

to their test results would increase their workload, but this sentiment decreased in both groups after the intervention. Concerns that seeing test results would cause patient worry were high among clinicians and nurses (24 of 28 [86%] and 13 of 14 [93%], respectively) and greater than among patients before the intervention, but these concerns decreased in all groups. Most patients endorsed empowerment items, including control, understanding, reassurance, and following recommendations both before and after the intervention.

Clinicians (25 of 26 [96%]) and nurses (13 of 14 [93%]) were more optimistic than patients (22 of 50 [44%]) that patient access to their medication lists would help them find errors, and this optimism decreased significantly across all groups after the intervention (patients, 3 of 50 [−38%;  $P < .001$ ]; clinicians, 17 of 26 [−31%;  $P = .008$ ]; and nurses, 7 of 14 [−43%;  $P = .03$ ]). Before the intervention, 33 of 49 patients (67%) indicated that they would better understand when they would be discharged; after the intervention, the number of patients endorsing this item fell significantly (to 12 of 49 [−43%;  $P < .001$ ]).

**Discussion** | The suspected risks of giving inpatients direct access to their EHR did not bear out, with no increase in workload reported by the nurses or the clinicians and no increase in confusion or worry reported by the patients. Consistent with outpatient studies, patients answered more positively to empowerment questions after being given EHR access. Despite supporting patient empowerment, the promise of patients finding errors in their medications or knowing when they were being discharged never materialized. This study is, to our knowledge, the first published evaluation of the experience

of a large sample of inpatients and their frontline health care practitioners with real-time inpatient EHR access, although it involved patients and practitioners on a single hospital unit. Federal programs recommend that patients be able to access results from their hospitalization within 36 hours of discharge.<sup>6</sup> Based on our results, we believe that this requirement still misses an opportunity for patient engagement through better transparency, and future policies should consider real-time EHR access for inpatients.

**Jonathan Michael Pell, MD**

**Mary Mancuso, MA**

**Shelly Limon, BSN, MS, CNRN**

**Kathy Oman, RN, PhD**

**Chen-Tan Lin, MD**

**Author Affiliations:** Division of General Internal Medicine, Department of Internal Medicine, University of Colorado School of Medicine, Aurora (Pell, Lin); Professional Resources, University of Colorado Hospital, Aurora (Mancuso); Neuroscience Unit, University of Colorado Hospital, Aurora (Limon); College of Nursing, University of Colorado Denver, Aurora (Oman); Division of General Internal Medicine, Department of Internal Medicine, University of Colorado Health, Aurora (Lin).

**Corresponding Author:** Jonathan Michael Pell, MD, Division of General Internal Medicine, Department of Internal Medicine, University of Colorado School of Medicine, 12401 E 17th Ave, Mail Stop F782, Aurora, CO 80045 (jonathan.pell@ucdenver.edu).

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*Study concept and design:* Pell, Limon, Lin.

*Acquisition, analysis, or interpretation of data:* Pell, Mancuso, Oman, Lin.

*Drafting of the manuscript:* Pell, Mancuso, Oman, Lin.

*Critical revision of the manuscript for important intellectual content:* All authors.

*Statistical analysis:* Pell, Mancuso, Oman, Lin.

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