

Improving Provisioning of an Inpatient Portal: Perspectives from Nursing Staff

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Abstract

Background Inpatient portals are recognized to provide benefits for both patients and providers, yet the process of provisioning tablets to patients by staff has been difficult for many hospitals.

Objective Our study aimed to identify and describe practices important for provisioning an inpatient portal from the perspectives of nursing staff and provide insight to enable hospitals to address challenges related to provisioning workflow for the inpatient portal accessible on a tablet.

Methods Qualitative interviews were conducted with 210 nursing staff members across 26 inpatient units in six hospitals within The Ohio State University Wexner Medical Center (OSUWMC) following the introduction of tablets providing access to an inpatient portal, MyChart Bedside (MCB). Interviews asked questions focused on nursing staffs' experiences relative to MCB tablet provisioning. Verbatim interview transcripts were coded using thematic analysis to identify factors associated with tablet provisioning. Unit provisioning performance was established using data stored in the OSUWMC electronic health record about provisioning status. Provisioning rates were divided into tertiles to create three levels of provisioning performance: (1) higher; (2) average; and (3) lower.

Results Three themes emerged as critical strategies contributing to MCB tablet provisioning success on higher-performing units: (1) establishing a feasible process for MCB provisioning; (2) having persistent unit-level MCB tablet champions; and (3) having unit managers actively promote MCB tablets. These strategies were described differently by staff from the higher-performing units when compared with characterizations of the provisioning process by staff from lower-performing units.

Conclusion As inpatient portals are recognized as a powerful tool that can increase patients' access to information and enhance their care experience, implementing the strategies we identified may help hospitals' efforts to improve provisioning and increase their patients' engagement in their health care.

Keywords

- ▶ patient portals
- ▶ electronic health record
- ▶ inpatient portal

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Background and Significance

The widespread adoption of inpatient portals by hospitals has provided many benefits for both patients and health care teams. Inpatient portals may help improve patient engagement for hospitalized patients, as previous studies show feelings of relief and reduced stress and anxiety as a result of timely access to test results and knowing when their laboratories will be drawn. Patient use of inpatient portals may also improve health literacy through access to custom education models related to patients' diagnoses and conditions.^{1–3} Furthermore, inpatient portals have been reported to enhance the patient experience⁴ as well as improve patient safety and quality of care by providing personalized health information.¹

Studies also suggest that patients' access to an inpatient portal can improve nursing care team members' workflows by reducing the time they spend on activities such as ordering patient meals and responding to call lights.² Moreover, inpatient portal access can help patients be “better patients” by improving their ability to be informed about their health and by enabling them to be more involved in the care process.^{5–7} Despite these benefits, use of inpatient portals in hospital settings can be difficult, with problems such as lost tablets, the need to address patient and family questions, and trouble integrating patient portals into clinical workflow reported as barriers.^{8,9} To address these challenges, practices such as allowing patients to access portals on their own devices, offering portal training, and keeping portals updated with easy-to-understand content have been suggested as ways to facilitate inpatient portal use.^{10–13} Yet, in the face of multiple competing priorities for care team members, integrating portal provisioning into nursing care team members' workflows continues to be a challenge.^{8,9,11,12} Current published reports offer minimal specific guidance for hospitals seeking to develop or improve their provisioning process—referring to the assignment of a hospital-provided tablet to patients by hospital nursing staff and enrollment of patients in the inpatient portal for use during the hospital stay. Thus, although inpatient portals provide benefits for both patients and health care teams, hospitals continue to face difficulties with tablet provisioning by their staff.

Objectives

Our study aimed to understand the practices that nursing staff members perceived as important to increase the provisioning rates across hospitals to provide insight that could enable hospitals to address challenges related to provisioning workflow for tablets equipped with an inpatient portal. Improving care team workflow is more important during the unprecedented challenges and changes brought on by the coronavirus disease 2019 (COVID-19) pandemic. Results of this study will improve our understanding of how we might increase adoption and use of inpatient portals within hospitals and provide guidance for organizations and providers attempting to leverage this important technology.

Methods

Study Setting and Design

Between January and December 2018, we conducted a large qualitative study consisting of interviews with nursing staff providing bedside care across six hospitals within The Ohio State University Wexner Medical Center (OSUWMC). These six adult hospitals were in an urban setting and include three general acute-care hospitals, a rehabilitation hospital, a brain and spine specialty hospital, and a heart specialty hospital; all but one hospital (one of the general acute-care hospitals) were co-located on a single medical campus. Nursing staff members included nurses, nurse managers, nurse assistants, and unit clerks. Registered nurses employed at the OSUWMC were represented by state and local units of the American Nurses Association (ANA).

In 2016, OSUWMC introduced tablet computers for patients that provided access to the inpatient portal, Epic's MyChart Bedside (MCB).^{14,15} At the time of the study, MCB offered patients 10 functions: Home Screen (i.e., vitals and daily schedule); Tutorial (i.e., instructional materials for the MCB application); Dining-on-Demand (i.e., food ordering); To Learn (i.e., patient education materials); Happening Soon (i.e., schedule of care activities); Taking Care of Me (i.e., names of care team members); Messages (i.e., non-urgent secure messages with care team); My Health (i.e., vitals and laboratory test results); I Would Like (i.e., requests from pastoral services or gift shop); MyChart Signup (i.e., creation of account or access to the patient's outpatient portal, their MyChart account). Tablets were provisioned to patients by frontline staff, and provisioning status was recorded in the OSUWMC electronic health record (EHR).

Patients were ineligible to receive a tablet if they were under age 18, prisoners, or had a documented preferred language other than English. OSUWMC's MCB tablet provisioning process involved unit nursing staff approaching the patient and asking them if they would like the tablet. If the patient was interested, the unit nursing staff would first assign the patient their tablet by entering the tablet bar code into the patient's EHR, and then guide the patient to the MCB “Terms and Conditions” page. There, the patient would complete both the enrollment of their tablet and activation of the MCB account. Hospitalized patients were also given the option to use MyChart Bedside on their own tablet but these patients were not included in our study. At the time of the study, very few patients utilized this option and many interviewees acknowledged being unfamiliar with how to set up the patient's own tablet. The Institutional Review Board of the Ohio State University approved this study.

Data Collection

Unit nursing staff from inpatient units within the OSUWMC where MCB tablets were offered to patients were recruited to participate in a semi-structured interview by a research team member who visited the unit. Given the novelty of a hospital providing patients with technological devices, we felt that the most appropriate data source for our study was qualitative interviews rather than structured surveys or

observation, as interviews offer the opportunities to capture the emergence of innovative work processes and to probe respondents' comments for greater clarity. We applied a purposeful sampling approach where we aimed to interview nursing staff members working the day shift during the work week from each unit across OSUWMC.¹⁶ Units were categorized based on the predominant services provided on the unit: progressive, inpatient, or rehabilitation care. Physicians and hospital administrators were excluded from our sampling approach to focus on the perspectives of nursing care team members engaged in the provisioning process. Using a semi-structured interview guide, we asked questions primarily focused on participants' experiences with the MCB tablets on their units, including their provisioning processes, reasons for variation, and challenges with provisioning the MCB tablets. Interviews were held during the day shift hours in the unit break rooms to accommodate available unit nursing staff in one-on-one or group interviews. All of the interviews were audio-recorded, transcribed verbatim, and de-identified. Interviews lasted from 5 to 20 minutes, with an average length of 10 minutes.

Unit provisioning performance was established using hospital-collected data stored in the EHR about provisioning status. This data are aggregated to the unit level to determine the percentage of eligible patients on each unit being provisioned with an MCB tablet over the study time period. The provisioning rates were divided into tertiles, creating three levels of provisioning performance: (1) higher (>36%); (2) average (24–36%); or (3) lower (<24%).

Study Subjects

As part of a larger study,² we interviewed a total of 214 nursing staff members including managers and non-managers across 26 inpatient units. Managers ($n=47$) included nurse managers, assistant nurse managers (ANM), and charge nurses 12 and 18 months after the introduction of MCB tablets across OSUWMC. Non-managers ($n=163$) included floor nurses, nurse specialists, patient care associates (PCA), and unit clerical associates (UCA). Given that the provisioning process was not standardized across units and could often involve several individuals, staff members in these roles were included regardless of their direct involvement in the provisioning process. Four interviewees—three information technology trainers and one physical therapy assistant—were not assigned to a specific unit and thus were excluded from the analysis. In **Table 1**, we present a

Table 1 Summary of interviewees across MCB provisioning categories

Unit MCB provisioning performance	Interviewees	
	Manager	Non-manager
Lower	13	36
Average	22	73
Higher	12	54

summary of the number of interviewees across units within the three MCB provisioning performance categories.

Data Analysis

Verbatim interview transcripts were coded and analyzed using thematic analysis. This approach combines both inductive and deductive processes and allows for categorization of data as well as identification of emergent themes, consistent with rigorous qualitative methods.^{17–19} Our initial framework included broad themes derived from the Inpatient Portal Evaluation Framework adapted from the Safety Engineering in Patient Safety 2.0 model.¹² Four research team members (A.G., J.V., L.S., T.W.) coded a common set of four transcripts to discuss emergent themes and refine the preliminary codebook. Subcoding was then conducted to further classify themes related to the provisioning process. The final codebook was then applied by two coders (A.G., T.W.) to complete coding of all transcripts. The coding team met regularly throughout the coding process to discuss discrepancies and resolve any inconsistencies. This process revealed thematic saturation. We used the ATLAS.ti software (version 8.3.1) to support the coding and analysis process.²⁰

After qualitative analysis of the interviews, we compared thematic results across units with different provisioning performance levels. We then characterized strategies perceived as important for those higher-performing units, defining this performance as better success in provisioning of MCB tablets.

Results

Provisioning Performance

Across the units we studied, tablet provisioning rates ranged from 18 to 89%, with a total of 11,587 patients provisioned a tablet out of 33,253 (35%) of the eligible patients (preferred language of English, non-prisoners, age >18) discharged over the study time period. The average unit MCB provisioning rate was 36% and the median rate was 30%. The average rate across units was the middle category of 24 to 36%, making the higher-performing category the top tertile with provisioning rates above 36%. We present provisioning data along with performance classification by unit as lower ($n=8$), average ($n=9$), or higher ($n=9$) in **Table 2**.

Strategies Contributing to Higher Performance with MCB Tablet Provisioning

We identified three strategies contributing to higher MCB tablet provisioning rates on higher-performing units: (1) establishing MCB provisioning processes; (2) having persistent unit-level champions; and (3) having unit managers actively promote MCB tablets. Notably, we found that these strategies were characterized differently in the higher-performing units when compared with descriptions of the provisioning process by nursing staff from the lower-performing units. Below we explain each of these strategies in greater detail, and in **Table 3** we present verbatim comments highlighting how these strategies were differently characterized on the higher- and lower-performing units.

Table 2 Summary of MCB provisioning performance on individual units

Performance category	Unit type	Provisioned tablets (n = 11,587)	Discharged patients (n = 33,253)	Provisioning rate (Mean [SD])	Provisioning rate range (Min–Max)
Lower (n = 8)	Progressive care (n = 3)	410	2,264	18.6% (4.0)	15–23
	Inpatient care (n = 5)	1,763	8,333	20.2% (0.9)	19–21
	Rehabilitation care (n = 0)	0	0	n/a	n/a
Average (n = 9)	Progressive care (n = 2)	520	1,961	26.5% (3.5)	24–29
	Inpatient care (n = 7)	2,950	9,863	30.3% (3.9)	24–34
	Rehabilitation care (n = 0)	0	0	n/a	n/a
Higher (n = 9)	Progressive care (n = 0)	0	0	n/a	n/a
	Inpatient care (n = 7)	5,298	9,747	56.8% (21.3)	38–89
	Rehabilitation care (n = 2)	646	1,085	59.5% (7.8)	54–65

Note: Max, maximum; Min, minimum; n/a, not applicable; SD, standard deviation.

Prioritization of MCB Provisioning

Based on interviewees' descriptions, the way in which MCB provisioning was established and standardized appeared to differ on the higher- versus lower-performing units. On higher-performing units, nursing staff were more likely to comply with the organization's guidance to provide the MCB tablet for every eligible patient at admission. As one nurse from a higher-performing unit explained, "So the policy is to ask, is to provide a tablet to all of the patients on admission. We are to offer it to them if they are competent and if they are not, we ask if the family member wants to see it so we provide it." In contrast, nursing staff on lower-performing units acknowledged gaps in the process and were less committed to provide MCB tablets as part of their workflow. One nurse manager expressed uncertainty about the nursing staff on their lower-performing unit provisioning MCB for every patient:

I think our latest numbers... 29 people that were deemed eligible to receive MyChart bedside. But only six of them were actually provisioned...and you look at the other units in [hospital], we are the lowest. So, I think we can do a better job at explaining the uses and functionality. And, that kind of shows me that we have some area to grow as far as staff buy-in as well.

Persistence of Unit-Level Champions

Comparing comments from interviewees on higher- and lower-performing units, we also found differences in how they described the persistence of their MCB champions. Across higher-performing units, interviewees referenced proactive team members who made sure that all patients received a tablet. These champions were identified by the unit leadership and expectations were set by shift. A nurse on a higher-performing unit shared, "I know that our clinical coordinator, she was really on top of making sure that every patient has been offered one, and that its charted. So sometimes if it hasn't happened [at] this admission, she will call you and say, 'Can you go in there and offer one?' It helps keeps us on task."

In contrast, nursing staff on lower-performing units would passively check on the status of MCB provisioning but only described "trying" to follow-up rather than taking consistent action. A nurse mentioned a lack of focus on MCB tablet provisioning by sharing, "Yeah, we're not super great about asking people if they want that [MCB tablet]. We just have to make sure that the tablets are offered to the patients." Across the lower-performing units, only one charge nurse mentioned assuming responsibility for MCB tablet provisioning on her unit by explaining, "I'm in charge so I go around. And I know if they're on Bedside. I try to ask them if they want one. If they have any family members I try to ask if they want a tablet. Some of them I don't think truly understand what it would be, but I try to explain it to them."

Promotion of MCB Tablets on Units

While interviewees across units noted recognizing that they might be expected to provision MCB tablets to patients, we found unit managers had different approaches to emphasizing that provisioning was an important part of the unit's work. On higher-performing units, managers actively reinforced this expectation directly and frequently with their nursing staff. As one unit manager noted, "Our unit does really well at getting them [tablets] out and getting them activated, but it's a daily deal. I am being the person that tells them we have to do it."

On the lowest-performing units, however, information about MCB tablet provisioning rates and problems with provisioning were presented passively, mainly through emails and in written reports. As one nurse explained, "We get an email every... I don't know, almost every week, saying how we did. Maybe, like, in our meeting. But it's not, like, touched on, like, a lot." Interestingly, the more active approach was reportedly recognized as important on some of these lower-performing units, as one nurse manager made reference to trying to improve provisioning rates on her unit by moving beyond passive reports: "So we talked at staff meetings on the unit, followed up with people, really to get that buy-in. And, also for people to feel like this is a team thing it's

Table 3 Strategies for MCB provisioning, compared across higher- and lower-performing units

Strategy	Higher-performing units	Lower-performing units
<i>Establishing MCB provisioning processes</i>	<p>So, when we get a new admission, I always offer MyChart Bedside to patients. -nurse</p> <p>We're always talking about tablets. I mean every morning: did we get all the tablets out to the new admissions? -nurse</p> <p>As soon as the patient gets here. Doesn't matter whether they like it or not...we have to stop everything and go to their room to offer it. And if they say no, we can turn it back. -patient care associate</p>	<p>So, on our floor, we try to make sure everyone at least gets asked [about MCB]. And we can document that. -unit clerical associate</p> <p>I can see who has been at least offered one, or who has one, or who doesn't have one, who hasn't been offered. So, I can see all those things. And if there's someone who doesn't have one, I can kind of mention to a PCA or a nurse "Hey have you offered Mr. Jones in Room 2 a tablet yet?" -unit clerical associate</p> <p>When the patient gets here, we offer if they need it. Or as needed. -nurse</p>
<i>Having persistent unit-level MCB tablet champions</i>	<p>Our coordinator up here..., usually she'll let me know if someone still needs set-up with the tablet. So, I'll go in, you know, I'll kind of ask them if they would be interested. -patient care associate</p> <p>I go through in the morning and see which patients have them, which patients have codes in them and have activated them. And if they haven't done that then I try to make sure that it gets done for the day. Then, in addition to that, when I'm rounding, I make sure that the patients have their tablets and know how to use them. -charge nurse</p> <p>The manager is kind of on top of everything. And during the change of shifts, sometimes they tell us which patients have gotten tablets. That kind of makes it easier for us to like narrow it down and try as much as possible to get those tablets to them as soon as possible. And, if you don't do that, the manager will come down to ask you. -patient care associate</p>	<p>Not discussed by interviewees.</p>
<i>Having unit managers actively promote MCB tablets</i>	<p>I talked to all the UCAs and I said, "hey guys this is SUPER important. I don't care for the most part, you know I want you to answer call lights and help with your call and stuff like that, but other than that, if you could go above and beyond for this." -nurse manager</p> <p>I've tried to think of ways we could do small huddles in our morning huddles and be like, "Here's things we need to do with this [MCB tablet]. Remind your patients to ask questions. Here's information they can get with that. And, this is bedside. It's right here for them, so why not utilize that? It can help you." -charge nurse</p> <p>I mean it is everyone's responsibility. A lot of the ANMs in [the hospital] are kind of spearheading a lot of the MyChart education and everything. So, I just make it a point if I don't see one around, I will ask if they would like one. -assistant nurse manager</p> <p>I mean typically our management will let us know... we typically get emails saying, "Hey, people have forgotten to ask patients on admission," or, "You didn't document." One or the other. Maybe that patient has a tablet, but you didn't document you gave them a tablet. So, we get feedback either way. -nurse</p>	<p>We get emails sent out about those things. So, our MyChart has been very good. The percentage-wise from what I've seen, what has been sent out to the unit as a whole. - patient care associate</p> <p>I think we've gotten it [reports on MCB tablet provisioning rates] once or twice. I've heard of it, but I know she sends out a lot of emails, so I don't know. -nurse</p> <p>I personally send out our weekly report, our compliance reports. Which we have done great documenting-wise, but still trying to. I know they're being offered, but I don't know to the extent. I think the speech could be better, you know what I mean? -nurse manager</p> <p>I don't, no. I don't think so [receive reports on MCB tablet provisioning rates]. We are not told best strategy. We're just told we have to do it. -nurse</p>

not just for the PCAs to do or the nurses to do. It's a team effort because there is value in it."

Discussion

Inpatient portals are potentially powerful tools that can empower and engage patients in their health care.^{1,2,21} Yet getting portals into the hands of hospitalized patients in a reliable manner remains a challenge for many hospitals.^{8,11,12} Our findings suggested that the three strategies of establishing provisioning processes, having persistent unit-level champions, and actively promoting the distribution and use of MCB tablets can make a difference in unit provisioning performance.

Notably, our study results suggest the need to further add to the list of work-related tasks falling to nursing staff who should prioritize, champion, and promote tablet provisioning. Increases in demands placed on nursing staff, especially seen during the COVID-19 pandemic, have made burnout a major concern for hospitals.²² Comments from nursing staff from the lower-performing units in our study suggested that many unit staff members may not perceive tablet provisioning as a priority. Evidence suggests that inpatient portals can improve the patient experience and increase patient engagement.^{5,6,23,24} More evidence is needed on how tablet provisioning can benefit nursing staff.

Our findings may also have implications for how hospitals can promote the use of technologies that allow patients to connect with others, access information, and receive health care. Unit staff-driven promotion of MCB tablets can enable patients an opportunity to feel connected to their providers and family members, especially at times when visitation rules such as those introduced as a result of the COVID-19 pandemic may limit the number of visitors in a patient room. In addition, related research has shown that proxy users, such as spouses and family members, can play a critical role in supporting use of MCB, suggesting that these individuals may be another important group to target for provisioning.²

Recent advances in providing patients with access to their health information have taken place since the data collection and analysis in this study, such as the 21st Century Cures Act Information Blocking Rule that requires hospitals to provide patients' access to their information. This rule is a significant step forward for patients who have their own devices, yet many patients lack the technological skills and resources to access this information.²⁵⁻²⁹ Our findings offer important insight for hospitals that seek to develop processes to provide access to real-time data for their patients. Moreover, while the Cures Act provides a regulatory requirement for hospitals to provide specific information to patients, it fails to offer an operational approach to achieving this milestone. These three strategies to improve provisioning performance can provide actionable guidance to address this issue.

More broadly, our findings provide systematic guidance for provisioning technology that may help overcome persistent disparities in technology use in the inpatient setting based on age and race.³⁰ Overcoming implicit bias that may contribute to differences in who is offered and how they are

offered tablets will benefit from embedded provisioning processes.³¹ However, while these tactics may be helpful in advancing equity and inclusion, existing patient portals are typically not available with languages other than English. This deficit leaves considerable opportunities to support patients' use of patient-facing technology whose primary language is not English.

With Epic's development over the last couple of years focused on incorporating MCB features into the MyChart mobile app, there will likely be less investment into hospital-managed devices and more of a focus on encouraging patients to use their own tablets or phones. Hospitals managing a fleet of devices is not only expensive but requires significant maintenance year to year. As soon as there is full parity between MCB and the MyChart mobile app, we anticipate hospitals will move away from the current approach of providing devices to their patients.

Clearly, our study is not without limitations that include our study of only a single academic medical center using a single inpatient portal platform, thus potentially limiting the reach of our findings. Our study, however, included nursing care teams across six hospitals with different types of patients, thus providing a variety of perspectives across those multiple inpatient environments. Furthermore, as the inpatient portal platform we studied has many features shared by other portal platforms, we are confident that our results can be broadly applied. Another limitation is that our interviews did not include the perspectives of nursing staff who work weekends or night shifts, although few tablets were provisioned during these times. We also acknowledge that different units have different patient populations, and this could be a confounder in our provisioning performance data. However, our comparison of themes across the higher-versus lower-performing units showed clear differences, giving us confidence in the internal reliability of our findings.

Conclusion

Inpatient portals are recognized as a powerful tool that hospitals can use to enhance patients' engagement in their health care. Our study examined the process of portal provisioning and identified strategies important for hospitals to consider to ensure that their patients receive access to an available inpatient portal. Specifically, hospitals should have a clear policy establishing expectations for every patient to receive the technology, as well as prioritize portal distribution and promotion by unit managers and nursing staff. As tablets can also provide patients with a tool to connect with family members and friends, which has become a particularly important consideration during the COVID-19 pandemic, implementing these strategies may be key to helping hospitals to both support their patients and promote patients' engagement in their health care.

Clinical Relevance Statement

While the increasing adoption of inpatient portals by hospitals has provided benefits for both patients and

providers, the process of provisioning tablets to all patients has been a major challenge for many organizations. Increasing access to MCB tablets can help improve the care experience for hospitalized patients as they can enable connections with both providers and family members, especially at a time when the COVID-19 pandemic has highlighted the need to consider the use of technologies that allow patients to connect with others, access information, and receive health care.

Multiple Choice Questions

1. Hospitals can improve provisioning rates of inpatient portals by:
 - a. Designing more useful features on the inpatient portal for staff.
 - b. Addressing grievances from patients about inpatient portals.
 - c. Designating unit-level champions for inpatient portals.
 - d. Assigning the responsibility of tablet provisioning to a physician.

Correct Answer: The correct answer is option c. Our study found that across higher-performing units, champions for the inpatient portal had been identified by the unit leadership. These proactive team members made sure that all patients received a tablet.

2. Units with high provisioning rates of inpatient portals demonstrate which behaviors (s):
 - a. Unit staff offer the inpatient portal to all eligible patients.
 - b. Unit managers continually remind staff of the importance of provisioning.
 - c. A process is in place for reviewing why patients do not have a tablet with an inpatient portal.
 - d. All of the above.

Correct Answer: The correct answer is option d. Our study found that across units with high provisioning rates of inpatient portals, unit managers and staff prioritize getting inpatient portals to all eligible patients. This includes reviewing reasons why patients may not have received one.

Protection of Human and Animal Subjects

The study was performed in compliance with the World Medical Association Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects, and was reviewed by the Ohio State University Institutional Review Board.

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Conflict of Interest

None declared.

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