Original Article

Pharmacy-Initiated Transitions of Care Services: An Opportunity to Impact Patient Satisfaction

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ABSTRACT

Purpose: A transitions of care program at an academic teaching hospital was designed to reengineer the fragmented discharge process. The team included a pharmacy technician, called a transition specialist, who coordinated the medication needs of discharging patients. This study intends to assess the impact of the transitions of care program on patient satisfaction scores.

Methods: Two datasets of Press Ganey and Hospital Consumer Assessment of Healthcare Providers (HCAHPS) were analyzed. Patients eligible for inclusion were age 18 years or older and successfully discharged from the study facility. All participants received usual care by a service-based pharmacist, medication counseling by a nurse prior to discharge, and other standard of care services by the inpatient medical team. The intervention group received the previously stated usual care plus services by the transitions of care program.

Results: The results from HCAHPS scores proved inconclusive. The results from the Press Ganey dataset found that the surgery transplant service demonstrated statistically significant improvement for satisfaction scores, and they warrant further review.

Conclusions: Results demonstrate that HCAHPS metrics do not correlate with the successes or lack thereof of the transitions of care program. Press Ganey might be a potential surrogate marker for assessing the impact of this program. This study is the first to qualitatively evaluate pharmacy transitions of care service using patient satisfaction scores.

Key Words—hospital pharmacy, patient satisfaction, transitions of care

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The American Geriatrics Society defines transitional care as the “actions designed to ensure the coordination and continuity of healthcare as patients transfer between different locations or different levels of care within the same location.”¹ The National Transitions of Care Coalition further explains, “Patients require actively managed continuity of care... to alleviate the heavy burden of responsibility placed on patients and their families and caregivers, who are ill-equipped or unqualified.”² A system of fragmented

care, inadequate patient education, and a lack of information exchange has been shown, especially in high-risk populations, to result in poor clinical outcomes, financial burdens on the patient and health system, and increasing rates of hospital readmissions.^{3–10}

An academic teaching hospital organized a patient engagement program, called Carolina care at home (CCAH), to coordinate patient access, case management, physicians and physician-extenders, and pharmacy services (Figure 1). Each patient’s

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medical service has a dedicated team to support CCAH on their unit. The team is comprised of a nurse manager or assistant manager, staff nurses, nursing assistants/technicians, clinical support staff, physicians, a hospital unit clerk, a unit clinical pharmacist, an ambulatory discharge pharmacist, and a transition specialist who is a pharmacy technician. This team was constructed from members of the existing health care delivery system and utilizes the high-quality services that were previously segmented. CCAH pharmacy services provide newly prescribed medications and self-care products to patients upon their discharge from inpatient stay. The transition specialist monitors and coordinates the daily discharges and specific goals relevant to the patients receiving discharge medications and

self-care management requirements/products prior to their discharge. Medications and self-care products are picked up by the transition specialist and delivered to the patients. Appropriate level of counseling for newly prescribed medications is provided by the unit-based clinical pharmacist.

The transition specialist concentrates on the patients' medication needs as they cross from the acute care setting to various destinations within and outside of the health care system. The transition specialist enables high-quality, continuous transitional care experiences with the goal of preventing negative medication outcomes for patients and their families. This program focuses on 3 domains: destination (eg, coordination of benefits, arrangement of prescriptions), information (eg, transition of medication list,

Figure 1. Patient workflow for discharge prescriptions. Auth = authorization; CM = case management; COP = central outpatient pharmacy; Det = determine; Disch = discharge; DO = Doctor of Osteopathic Medicine; Elig = eligibility; MAP = medication assistance program; MD = physician; NP = nurse practitioner; PA = physician assistant; PBM = pharmacy benefit manager; Pt = patient; Rx = prescription; TS = transitions specialist.

provider communication), and education (eg, patient/family education, discharge medication counseling).

The solid organ transplant and cardiology medical services, beginning in July and October 2011, respectively, served as the initial pilots for CCAH pharmacy services. Soon thereafter, the CCAH pharmacy services expanded into other general medicine and surgery unit services. **Table 1** displays the initial deployment of CCAH pharmacy services across the institution at the time of the study. As of November 2, 2013, the academic medical center had full deployment of CCAH pharmacy services for all adult patient services; the dates of deployment to women's and children's inpatient services and many of the outpatient clinics have yet to be determined.

Researchers have invested in patient experience studies to validate the relationship between patient satisfaction and hospital care. A study demonstrated that overall patient satisfaction with discharge planning was negatively and significantly correlated with higher 30-day risk-standardized readmission rates for specific conditions.¹¹ Patient satisfaction was correlated with certain hospital conditions that are prevalent in institutions.¹² Jaipaul and colleagues¹³ found that hospitals with higher patient satisfaction tended to have lower severity-adjusted mortality and fewer readmissions and hospital days. Patient satisfaction scores were also associated with lower readmission rates for heart failure and pneumonia patients.¹¹

Table 1. Deployment of CCAH pharmacy services at The University of North Carolina Hospitals and Clinics

UNCH location	UNCH medical service	Date of deployment
5 West	Surgery Transplant	10/15/2011
3 Anderson	Coronary Care	10/15/2011
3 Anderson	Medicine	11/15/2011
3 Anderson	Medicine Cardiology	11/15/2011
4 Anderson	Thoracic Surgery	12/12/2011
4 Anderson	Cardiac Surgery	12/15/2011
Rehabilitation	Rehabilitation	1/29/2012
4 Oncology	Medicine Oncology	2/29/2012
Bone Marrow Transplant	Bone Marrow Transplant	3/14/2012
5 Anderson	Vascular Surgery	6/22/2012
5 West	Plastic Surgery	6/26/2012
3 West	Family Medicine	6/28/2012

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) was created to serve 3 central functions: (1) provide data about patients' perspectives of care to allow comparison of hospitals on topics that are important to consumers, (2) create incentives for hospitals to improve quality of care, and (3) enhance accountability by increasing transparency of hospital care.¹⁴ Prior to the release of this survey in 2008, there was no standardized survey instrument and data collection to measure patients' perspectives on their recent care.¹⁴ This standardized nationwide survey of hospitalized patients contains 27 questions and is divided into 8 dimensions: communication with nurses, communication with doctors, responsiveness of hospital staff, pain management, communication about medicines, cleanliness and quietness of hospital environment, discharge information, and overall rating of hospital.

Press Ganey is another methodology that serves a similar function to HCAHPS. However, this information is not publically reported, largely serves as internal information, and allows for benchmarking against peer institutions. A third party administers and is responsible for collecting surveys from patients and then relaying information back to the institution. There are 2 questions that specifically relate to medications and CCAH services: (1) standard discharge, and (2) instructions given about how to care for yourself at home.

A recent study demonstrated a positive relationship between patient satisfaction and adherence to medications.¹⁵ Explanation of medications prior to administration and with discharge planning activities was positively correlated with patient satisfaction.¹⁶ However, even with these emerging data, the effect of pharmacy transitional services on patient satisfaction has not been studied to date. The following research seeks to determine whether a relationship exists between CCAH pharmacy services and patient satisfaction scores.

METHODS

Press Ganey and HCAHPS scores were used as surrogate markers for patient satisfaction. This study was submitted and reviewed by the Office of Human Research Ethics, which determined that the study did not require institutional review board approval. Patients eligible for inclusion were 18 years or older and successfully discharged. All participants received usual care by a service-based pharmacist, medication counseling by a nurse prior to discharge, and other standard of care services by the inpatient medical

team. The intervention group included study participants who were admitted to services and locations after the deployment of CCAH pharmacy services and received the previously stated usual care plus CCAH pharmacy services.

Press Ganey surveys were mailed to 100% of the inpatient census. The survey results were filtered by discharge date, and medical service was the unit of analysis. Two Press Ganey questions were analyzed: (1) standard discharge, and (2) instructions given about how to care for yourself at home.

Each data point included the total number of surveys collected, mean score, and standard deviation per month before and after the launch of the program for each question. Five months before and after launch were the standard comparison time points, except for the medicine oncology, bone marrow transplant, rehabilitation services for which 6 months of data were available to the investigators. Summary statistics (eg, sample mean, sample size, and sample standard deviation) were calculated with a 2-sample *t* test. For all results, unequal variances were assumed, as it was hypothesized that the before and after groups would have different variances. We determined a priori level of $P = .05$ for significance.

The HCAHPS survey is conducted 48 hours to 6 weeks after discharge for patients. Hospital inpatient location was the unit of analysis. Two HCAHPS questions were analyzed for each hospital location: (1) Before giving you any new medicine, how often did hospital staff tell you what the medicine was for; (2) During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital. For the HCAHPS dataset, we evaluated for 3 comparison cases:

- Case I: Before the CCAH launch versus after the CCAH launch
- Case II: Two months before the CCAH launch versus months after the CCAH launch (excluding the month after launch) to the end of the study period
- Case III: Before the CCAH launch versus 3 months after the CCAH launch to the end of the study period

These cases were chosen to enhance our evaluation of specific segments of the intervention arm of this study.

Each data point for HCAHPS question 1 was categorized by a 4-point scale: never, sometimes, usually, and always. Summary statistics (eg, sample mean and sample standard deviation) were calculated with

a 2-sample *t* test for before and after launch groups for the 3 cases. To perform a 2-sample *t*-test for HCAHPS question 1, the investigators converted categorical data into a 0 to 3 numerical scale by coding (eg, 0 = *never*, 1 = *sometimes*, 2 = *usually*, and 3 = *always*). Statistical significance was set at $P = .05$ a priori. This was performed due to low survey response for nursing units.

To perform a 2-sample binomial test for HCAHPS questions 1 and 2, the dataset was converted into a dichotomous scale by splitting the 4 categories (eg, never, sometimes, usually, and always). Two splits were analyzed, where p_1 and p_2 denote the probabilities of YES group for the before and after groups, respectively, in each split and each of the 3 cases: Split I, YES group (usually and always) versus NO group (never and sometimes); Split II, YES group (always) versus NO group (never, sometimes, and usually).

RESULTS

For the Press Ganey question 1 (standard discharge), there was not a significant increase in scores for any service following the launch of CCAH pharmacy services (Table 2). The rehabilitation service showed a statistical significant decrease following the launch of CCAH ($P = .0234$). For Press Ganey question 2 (instructions given about how to care for

Table 2. UNCH Press Ganey scores for the question “standard discharge” to compare before and after launch of transition of care program

Service	$\mu_1 < \mu_2$	$\mu_1 > \mu_2$
Family Medicine	.6221	.3779
Medicine Oncology	.2602	.7398
Medicine	.4325	.5675
Surgery Vascular	.3794	.6206
Surgery Transplant	.1998	.8002
Medicine Cardiology	.3453	.6547
Rehabilitation	.9766	.0234
Plastic Surgery	.3277	.6723
Thoracic Surgery	.5059	.4941
Coronary Care	.3941	.6059
Bone Marrow Transplant	.8295	.1705
Cardiac Surgery	.9276	.0724

Note: All results are 2-sample *t* test *P* values for each service and assume unequal variances. Significance at $P < .05$. μ_1 and μ_2 denote means for before launch and after launch groups, respectively. UNCH = The University of North Carolina Hospitals and Clinics.

yourself at home), there was a significant increase for the surgery transplant service following the launch of CCAH pharmacy services ($P = .0426$) (Table 3). Rehabilitation service showed evidence ($P = .0081$) that scores decreased after the launch. For the remaining services, we could not reject the null hypotheses.

For HCAHPS question 1 (Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?), we cannot reject any null hypothesis at the .05 level using the 2-sample binomial test. When using the 2-sample t test, one hospital location (5 Anderson) did show a statistical significant decrease following the launch of CCAH (Table 4). For HCAHPS question 2 (During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?), we cannot reject any null hypothesis at the .05 level using the 2-sample binomial test for HCAHPS.

DISCUSSION

Discharging a patient is a complex process, as patients continue to experience adverse events and treatment failures.^{3,5,17} These facts have led to trials of multiple transitional care models to assist in the coordination of patient care and to impact patient engagement.^{7,18,19} CCAH pharmacy services provide a bundled transitions of care service to discharging patients and assist patients to overcome recognized barriers. The intent of this research study was to validate whether these satisfaction metrics provide information from one of pharmacy's key customers about the value and impact of CCAH.

Table 3. UNCH Press Ganey scores for question "Instructions about how to care at home" to compare before and after launch of transition of care program

Service	$\mu_1 < \mu_2$	$\mu_1 > \mu_2$
Family Medicine	.6532	.3468
Medicine Oncology	.0702	.9298
Medicine	.3917	.6083
Surgery Vascular	.2854	.7146
Surgery Transplant	.0426	.9574
Medicine Cardiology	.2133	.7867
Rehabilitation	.9919	.0081
Plastic Surgery	.3504	.6496
Thoracic Surgery	.3560	.6440
Coronary Care	.7112	.2888
Bone Marrow Transplant	.8855	.1145
Cardiac Surgery	.7845	.2155

Note: All results are the 2-sample t test P values for each service and assume unequal variances. Significance at $P < .05$. μ_1 and μ_2 denote means for before launch and after launch groups, respectively. UNCH = The University of North Carolina Hospitals and Clinics.

Within the Press Ganey results, surgery transplant demonstrated statistically significant improvement for satisfaction scores following the launch of CCAH and medicine oncology had a positive trend toward significance. The other significant results were found with the rehabilitation service that demonstrated negative scores following the launch of

Table 4. HCAHPS information about medications

Location	Medical specialty	Case I		Case II		Case III	
		$P_1 < P_2$	$P_1 > P_2$	$P_1 < P_2$	$P_1 > P_2$	$P_1 < P_2$	$P_1 > P_2$
3 Anderson	Coronary Care	.9214	.0786	.8897	.1103	.9026	.0974
4 Anderson N	Thoracic Surgery	.9480	.0520	.9002	.0998	.8924	.1076
4 Oncology	Medicine Oncology	N/A	N/A	N/A	N/A	N/A	N/A
5 West	Plastic Surgery	.8130	.1870	.8130	.1870	.7500	.2500
3 West	Family Medicine	.7766	.2234	.9148	.8520	.6673	.3327
4 Anderson S	Cardiac Surgery	N/A	N/A	N/A	N/A	N/A	N/A
5 Anderson	Vascular Surgery	.9594	.0406	.9609	.0391	.9622	.0378
Bone Marrow	Bone Marrow Transplant	N/A	N/A	N/A	N/A	N/A	N/A

Note: All results are the 2-sample t test P values for each service and assume unequal variances. For HCAHPS question 1 (Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?), the investigators converted categorical data into a 0-3 scale by coding 0 = *never*, 1 = *sometimes*, 2 = *usually*, and 3 = *always*. Significance at $P < .05$. p_1 and p_2 denote means for before launch and after launch groups, respectively. HCAHPS = Hospital Consumer Assessment of Healthcare Providers; N/A = not applicable.

CCAH pharmacy services. We are not sure why this result was observed, unless something was changed in the discharge process that was perceived negatively.

HCAHPS question 1 (Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?), was not impacted by the launch of CCAH pharmacy services when analyzed using the 2-sample binomial test. However, when the same question was analyzed using the 2-sample *t* test, it resulted in a significant decrease for one hospital location for all 3 cases. These services were already being provided, so the launch of CCAH may not have resulted in a difference. It is important to note that this question is likely more representative of inpatient care service than transition of care activities.

The HCAHPS question 2 (During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?) was not impacted by the launch of CCAH pharmacy services when using the 2-sample binomial test.

There were significant limitations identified for this study. First, CCAH pharmacy services were recently deployed at the academic medical center. To ensure appropriate study statistical methodology, the investigators were limited in their capacity to evaluate months before and after deployment. This lack of data availability likely contributed to the negative result found in our analysis. For example, the rehabilitation service had 4 of 12 months in which no surveys were reported. It will be important to reevaluate once the services are further integrated into daily patient care activities and more data and a longer time period are available for analysis.

Second, using individual medical services and hospital locations resulted in a low survey response rates and potential for a nonresponse bias.^{11,12} The average number of Press Ganey surveys per month ranged from 29 (medicine coronary care) to 1.4 (rehabilitation). Results for the rehabilitation service were clearly impacted due to poor survey response. The average number of HCAHPS surveys per month ranged from 4.5 (medicine coronary care) to 0.4 (bone marrow transplant unit). The difference between Press Ganey surveys per month per question (8.45 and 8.31) and HCAHPS surveys per month per questions (1.4 and 2.21) was the single largest reason for inconclusive results in the HCAHPS analysis.

The average mean score per service was 85.2 and 88.6 for Press Ganey questions 1 and 2, respectively. These high scores likely limit the intervention group

impact through new services offered, such as seen in cardiac surgery.²⁰ Surgery transplant had average means scores of 84.9 and 88.4 for Press Ganey questions 1 and 2, respectively. The data are limited as they cannot be linked to an individual patient's care and outcomes; instead, they are representative of the overall perceived care per the discharging service or location. Feedback by a separate survey may be a more direct mechanism to capture specific "pharmacy" aspects of patient satisfaction.

Third, these metrics are not specific to services offered by CCAH pharmacy services, as they do not own all aspects surrounding the patient experience for these questions. These metrics may exclude interactions that are most strongly correlated with patient experience outcomes. Additionally, patients could have been ineligible for CCAH pharmacy services based on inclusion criteria. For those ineligible, the investigators were unable to remove these specific patient's scores from the analyzed results.

Given these limitations, the results demonstrate that Press Ganey might be a potential surrogate marker for pharmacy transitions of care services as it relates to patient satisfaction. The results demonstrate that HCAHPS metrics do not correlate to the successes or lack thereof for CCAH pharmacy services. However, these services have been viewed as a success within the organization, as they have led to increased revenue because prescriptions are being filled in the pharmacy as opposed to the community. The investigators recommend repeating this study after a longer deployment of the services, using the same methodology to ensure the opportunity to evaluate the impact of the shortened time interval.

This study is the first to qualitatively evaluate pharmacy services using patient satisfaction scores. Physician and nursing services have been previously evaluated using this methodology.^{13,21} As the profession moves forward with the transitions of care program, pharmacy struggles to find the optimal role for pharmacists, technicians, residents, and support staff around the transitional experience.^{8,19,22} The importance of pharmacy services for medication reconciliation, discharge counseling, and follow-up during the transitions of care has been proven.^{8,19,23,24} This is especially important given the results of a recent study demonstrating a lack of ownership for nursing and physicians over medication teaching and changes to medication regimen.²⁵

Although the entirety of this study is inconclusive, positive trends have been highlighted to enhance comprehensive transitions of care system across the continuum of care. The investigators will seek feedback from the teams associated with demonstrated higher Press Ganey scores after launch to further enhance services to other areas provided by CCAH pharmacy services.

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