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Improving Medication Information Transfer between Hospitals, Skilled-Nursing Facilities, and Long-Term-Care Pharmacies for Hospital Discharge Transitions of Care: A Targeted Needs Assessment Using the Intervention Mapping Framework

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Abstract

Introduction—Patients transitioning from the hospital to a skilled nursing home (SNF) are susceptible to medication-related errors resulting from fragmented communication between facilities. Through continuous process improvement efforts at the hospital, a targeted needs assessment was performed to understand the extent of medication-related issues when patients

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transition from the hospital into a SNF, and the gaps between the hospital's discharge process and the needs of the SNF and long-term care (LTC) pharmacy. We report on the development of a logic model that will be used to explore methods for minimizing patient care medication delays and errors while further improving handoff communication to SNF and LTC pharmacy staff.

Methods—Applying the Intervention Mapping (IM) framework, a targeted needs assessment was performed using quantitative and qualitative methods. Using the hospital discharge medication list as reference, medication discrepancies in the SNF and LTC pharmacy lists were identified. SNF and LTC pharmacy staffs were also interviewed regarding the continuity of medication information post-discharge from the hospital.

Results—At least one medication discrepancy was discovered in 77.6% (n=45/58) of SNF and 76.0% (n=19/25) of LTC pharmacy medication lists. A total of 191 medication discrepancies were identified across all SNF and LTC pharmacy records. Of the 69 SNF staff interviewed, 20.3% (n=14) reported patient care delays due to omitted documents during the hospital-to-SNF transition. During interviews, communication between the SNF/LTC pharmacy and the discharging hospital was described by facility staff as unidirectional with little opportunity for feedback on patient care concerns.

Conclusions—The targeted needs assessment guided by the IM framework has lent to several planned process improvements initiatives to help reduce medication discrepancies during the hospital-to-SNF transition as well as improve communication between healthcare entities. Opening lines of communication along with aligning healthcare entity goals may help prevent medication-related errors.

Introduction

A patient's transition from a hospital to a skilled nursing facility (SNF) introduces the possibility for medication-related problems.¹⁻⁵ Previous research has documented that at least one medication discrepancy, such as medication omissions or inconsistencies, occurs in three-fourths of hospital-to-SNF admissions.⁶ Freestanding SNFs have higher rates of hospital readmissions than hospital-based SNFs, demonstrating the importance of proximity to providers for communication during care transitions.⁷ Fragmented inter-setting communication has been found to underlie many of these challenges highlighting the critical need of examining the mechanisms by which SNFs receive medication information when patients are discharged from the hospital.^{2,6} Most SNFs do not supply their own medications and therefore have contracts with long-term care (LTC) pharmacies for their medication needs.⁸ Upon hospital discharge, the necessity of information to flow not only to the SNF but also to the LTC pharmacy further exposes the transition process to errors. Waiting to obtain medications from remote-site LTC pharmacies may further result in delayed patient care, especially for after-hours discharges and prescribed controlled substance medications which often require a signed hard copy prescription for dispensing.^{2,6,9} Despite these documented medication-related issues, there is a paucity of research that includes LTC pharmacies when examining the communication between healthcare settings when patients transition from the hospital to SNF post-discharge.

Hospitals often have no means for freestanding SNF or LTC pharmacy follow-up post-discharge and are unaware to the hardships these facilities face upon patient transfer.² SNF staff expressed frustration about “blindly” delivering care due to not only unclear medication orders, but also inadequate communication of patients’ psychosocial or functional health status.² Furthermore, variability in skill level and services offered among different facilities result in inconsistent information requirements after an inpatient stay.² There is little guidance for hospitals with what information needs to be communicated to an off-site SNF or LTC pharmacy. In order to safely transition a patient from the hospital back to a SNF, hospital discharge teams must ensure to meet the SNF and LTC pharmacy’s needs.

Through our continuous process improvement efforts, we sought to improve the quality of care for patients transitioning from hospital to SNF post-discharge. We performed a targeted needs assessment at our hospital using quantitative and qualitative methods guided by the Intervention Mapping (IM) framework.¹⁰ The purpose of our needs assessment was to understand the extent of medication-related issues when patients transition from the hospital into a SNF and the gaps between the hospital’s discharge process and the needs of the SNF and LTC pharmacy. Our large academic Midwest hospital is a level one trauma center that annually discharges over 3300 patients to regional SNFs; no SNF is owned by the health system. Communication handoff for patients discharging to SNFs is an interdisciplinary effort between providers, nurses, pharmacists, and social workers/case managers. Case managers communicate with SNFs to obtain acceptance, insurance coverage and arrange transportation. Providers place discharge medication orders and are required to complete a discharge summary prior to SNF acceptance. Pharmacists reconcile medications and prepare a chart with the medication orders. Inpatient nurses communicate with SNF nurses via telephone as well as sign out and educate patients on discharge. However, healthcare team members have their own expectations for SNF and LTC pharmacy handoff communication, and this process has never been standardized across disciplines. The main product of the needs assessment was a logic model so we may explore methods for minimizing patient care medication delays and errors while further improving handoff communication to SNF and LTC pharmacy providers.

To assist in the development of a needs assessment logic model, the specific aims of this study were to: 1) identify and characterize medication discrepancies that occur between our hospital’s medication discharge list compared to SNF and LTC pharmacy medication lists, and 2) examine barriers and facilitators of medication information communication between our hospital, SNFs, and LTC pharmacies.

Methods

This needs assessment was guided by the IM framework, a widely utilized framework for implementing health programs. IM focuses on pre-implementation research and program evaluation to improve the likelihood of successful implementation.¹⁰ As outlined in the IM framework to perform the needs assessment, a working group was established. The working group members were selected for their expertise in transitional care, medication safety, and familiarity of the hospital discharge process: an inpatient hospital pharmacy manager, a second-year pharmacy resident with a focus on ambulatory care and transitions of care, a

PhD-trained pharmacist scientist, and two pharmacy student interns. This work was determined to be Quality Improvement by the hospital's Institutional Review Board (IRB) Committee.

The logic model was organized by the PRECEDE component of the PRECEDE-PROCEED model,¹¹ a commonly used framework within IM. The PRECEDE-PROCEED model posits that the diagnosis and description of the problem (PRECEDE component) is essential before developing and implementing the intervention (PROCEED component).¹² Further, it is flexible and serves as a structure for applying concepts systematically. Key elements of the logic model included *Patient and Societal Outcomes, Prevalence, and Conditions*. *Patient and Societal Outcomes* were defined as the medication problems and needs of patients who transition from the hospital to a SNF. *Prevalence* referred to the medication-related issues and patient care delays between the hospital, SNFs, and LTC pharmacies. *Conditions* were defined as factors that influence the consistency of medication information between healthcare settings. This study integrated both quantitative and qualitative data collection methods as well as literature reviews and brainstorming sessions to inform key elements as outlined below. Data collection and analyses occurred from January 2016 to July 2016.

Literature reviews, brainstorming sessions, and maintaining audit trail

The literature review was not intended to provide a foundation for the working group regarding the documented medication communication issues between the hospital, SNF, and LTC pharmacy facilities. Articles were identified through PubMed and Google Scholar using search terms: transition, medication reconciliation, skilled nursing facility, nursing homes, long-term care pharmacies, medication discrepancies, medication continuity, communication, and controlled substance diversion. Relevant articles were placed into a standardized data abstraction forms that were created by the research team.

Throughout the study period, the working group met monthly to discuss findings and barriers with data collection. An audit trail was kept throughout the study duration to document all decisions made with regards to data analyses and study protocol. Any changes to study protocol were agreed upon by the entire working group, documented, and provided electronically to the team.

Quantitative approach

Medication discrepancies were quantified by comparing the hospital discharge medication list with the SNF medication administration records and LTC pharmacy profile one day after the patient was discharged from the hospital. All adult patients who were discharged from our hospital to a SNF were identified through a report generated from an electronic health information database. The patient list was restricted to discharge dates ranging within one day preceding the day of data collection to ensure sufficient time for the patient to be properly admitted to the respective SNF facility and allowing medications to be reconciled at the SNF and LTC pharmacy. The patients' electronic health records documented to which SNF the patient transitioned post-hospitalization as well as the associated LTC pharmacy. Each SNF and LTC pharmacy was contacted via telephone to request study patient medication records. Once these records were received at the hospital (i.e., secure facsimile),

they were reconciled with the reference medication list, the patient's hospital discharge medication list. Both "as needed" and "routine" dosing schedules as well as "prescription" and "over-the-counter" labeling were included in the analysis. All discrepancies were categorized according to the standardized approach presented by Kennelty et al. (2016)¹³ and then documented using a secure electronic message access protocol tool. Frequencies were reported for discrepancy categories: omission of medication, addition of medication, discrepant dose, discrepant frequency, and duplicate medication.¹³

Qualitative approach

SNF and LTC pharmacy staff were interviewed regarding the continuity of medication information from the hospital and their respective facility and their perceived behavioral control of medication-related issues for recently discharged patients. Interviewees were informed that they were part of a project determined to quality improvement by the IRB. During the telephone call to request medication information from SNF and LTC pharmacies, the pharmacy student interns requested to speak to the staff member who was involved in the patient's care upon SNF admission. Interviewers would attempt to call unavailable staff up to three times. If contacted, the provider was interviewed regarding their experience with the specific patient's admission to the SNF or LTC pharmacy and then asked general questions regarding hospital-to-SNF transitions. Interview questions were guided using the perceived behavioral control construct from the Theory of Planned Behavior¹⁴ (Table 1). SNF and LTC pharmacy staff were probed throughout the phone interview, and questions evolved from the staff's responses from unanticipated content discovered during the interview; a method common when examining a new process or phenomena. Interviews lasted up to 15 minutes. Provider responses were documented using the secure electronic message access protocol tool. Provider narratives were reviewed by the study team for common themes. Factors discovered during the interviews were then included in the logic model. All providers contacted and interviewed were included in the analyses.

Results

The main product of the needs assessment was the development of a logic model (Figure 1) so areas in the early post-acute care period could be targeted for process improvement. Results of each key element are presented below in separated by the literature review, quantitative, and qualitative analyses:

Literature Review

Prevalence & Outcomes—Our literature review revealed that medication discrepancies were common when patients transitioned between healthcare settings. Particular to the hospital-to-SNF transition, Tjia et al. (2009) reported that over 70% of SNF study admissions (n=142/199) had at least one medication discrepancy between the SNF admitting order and the hospital discharge medication list.⁶ Ruiz et al. (2008) examined factors associated with hospital admission and found that polypharmacy was predictive of unplanned rehospitalizations as well as commonly prescribed anti-hypertensive diuretics.¹⁵ According to the Institute of Medicine's Preventing Medication Errors, patients are subjected to at least one medication error per day in the hospital.^{16,17} According to the

report, medication errors are responsible for 1.5 million adverse drug events (ADEs) annually, costing the U.S. healthcare system over \$3.5 billion.¹⁶ Approximately 40% of medication errors are thought to be a result from inadequate medication reconciliation procedures during transitions, and 20% of these errors are believed to cause patient harm.^{18,19}

Conditions—Literature reviews and brainstorming sessions revealed multiple factors contributing to fragmented inter-setting communication. *Patient Behavioral* factors included but were not limited to: lack of patient and caregiver medication discharge counseling, lack of transportation standardization between the hospital and SNF, and inadequate hospital follow-up orders post-discharge.^{2,6,9,20–23} *Determinants* were perceived underlying personal and organizational factors that contributed to respective environmental and patient behaviors. Refer to Figure 1 for examples of determinants.

Quantitative Analysis

Prevalence: Medication Discrepancies—Medication discrepancies among the healthcare entities are depicted in Figure 2. A total of 71 patient records were included in the analyses. The average patient age was 70 years old (range 23–90), 57.7% (n=41) were female, and 97.2% (n=69) were white. Patients were discharged to one of 54 different SNFs representing three Midwest states. A total 25 different LTC pharmacies, four of which were on-site at the SNF, located in two different states contracted with the SNFs that were included in the analysis. Fifty-eight medication administration records were obtained from the SNFs, and 25 medication profile records were obtained from the LTC pharmacies. An additional 24 LTC pharmacy medication records were attempted to be collected but failed, with 87.5% (n=21/24) of these failed attempts coming from large corporate LTC pharmacies and 12.5% (n=3/24) of these failed attempts coming from community LTC pharmacies. During the middle of data collection, one large LTC pharmacy service provider declined to further participate in the study. Of the 58 SNF records collected, 45 (77.6%) records had at least one medication discrepancy when compared to the hospital discharge medication list. Medication discrepancy categories included: mismatch of frequency or dosage (42.2%, n=19/45); omission of “as needed” medications on SNF records (95.6%, n=43/45) and “routine” medications (11.1%, n=5/45); addition of a medication at the SNF (35.6%, n=16/45); and formulary change (6.7%, n=3).

Of the 25 LTC pharmacy records collected, 19 (76.0%) had at least one medication discrepancy when compared to the hospital discharge medication list. The most prevalent medication discrepancy categories were: omission of “as needed” medications (48%, n=12/25); mismatch frequency or dosage (36%, n= 9/25); and addition of a medication (20%, n=5/25).

A total of 191 medication discrepancies were identified across all SNF and LTC pharmacy records and are classified by medication class in Table 2. The most common discrepant labeling was “over-the-counter” (56.5%, n=108/191). Discrepancies in “as needed” dosing schedules (50.8%, n=97/191) were nearly the same as “routine” (49.2%, n=94/191). Overall, the most common discrepant medication class was gastrointestinal agents (27.7%), which

included bowel regimens and anti-reflux agents, followed by topical agents (14.7%), vitamins/supplements (8.9%), and non-opioid analgesics (8.4%). Discrepancies were also noted in high-risk medications such as antimicrobials (6.8%), anticoagulants (6.8%), hypoglycemics (5.2%), and opioid analgesics (4.7%).

Qualitative Analysis

Prevalence: Reported Delay in Patient Care—A total of 69 SNF staff (i.e., nurses and case coordinators) who identified themselves as familiar with the patient were interviewed and all were asked about delays in patient care due to fragmented communication. Fourteen (20.3%) of the SNF staff reported that patient care activities often were delayed due to omitted documents, medication orders, or other patient care information from the hospital discharge packet upon patient SNF admission.

Determinants: Healthcare Professional and Patient/Caregiver—In addition to the 69 SNF staff, 50 LTC pharmacy pharmacists also completed interviews. Figure 3 depicts the perceived communication of SNF and LTC pharmacy staff among their healthcare entities for recently discharge patients. Overall, SNF and LTC pharmacy staff routinely reported a disconnect between their facility and the discharging hospital. SNF staff described the usual workflow, in which the discharging hospital directly communicated discharge information to the SNF, who then sent the medication information to the LTC pharmacy. Both the SNF and LTC pharmacy had an open line of communication if either entity had questions. However, both SNF and LTC pharmacy staff felt the communication between the hospital and SNF/LTC pharmacy was fragmented and inefficient when problems arose. A LTC pharmacy staff member expressed concern that “[discharge procedures] aren’t standardized,” and was willing to formally meet with discharging hospital to discuss standardization of the hospital discharge process.

Communication disconnect continually was seen when the interviewers tried to contact large corporate LTC pharmacies. Problems encountered when trying to reach these entities included no designated points of contact, inability to reach a pharmacist (extended phone on-hold times, transferring multiple times in a single phone call), and mistrust with the hospital in providing information pertinent to patient care. One LTC pharmacy staff member stated, “we are a closed network and only deal directly with the skilled nursing facility.”

Environmental & Patient Behaviors: Fragmented Coordination of Care and Poor Communication—A common theme among SNF and LTC pharmacy staff was unidirectional discharge communication with little opportunity for feedback on patient care concerns. A SNF staff member stated, “trying to get ahold of someone [at the hospital] was difficult and time-consuming.” Subsequently, SNF and LTC pharmacy staff would contact the patient’s primary care provider (PCP) for clarifications or prescriptions for missing medications because hospital discharge teams were not available to answer questions. The PCP was expected to answer patient care questions without having interacted with the patient since hospital admission. A SNF staff member further commented that patients upon SNF admission were “unaware of the medications they are currently taking or seemed surprised when asked about their medications.” The SNF staff member felt that the

discharging hospital did not include the patient in conversations during the discharge process, decreasing in the patient's ability to help identify discrepancies upon SNF admission. Several SNF staff members also recounted times when the SNF did not receive the patient's discharge packet from the hospital. Since no information was received at the admitting facility, the patient was placed back on pre-admission medications.

Another common theme among SNF staff members' comments was missing prescriptions for controlled substances when patients were admitted to their facilities. One SNF staff member commented about the "considerable amount of trouble" with hard copy controlled substance prescriptions not being included in the hospital discharge packet. Another SNF staff member stated that missing hard copy prescriptions caused a "huge delay" in patient care. When a prescription is missing, SNF staff members often would not contact the discharging hospital but rather the patient's PCP for a new hard copy controlled substance prescription. This was because the hospital would often refer the SNF provider to a case manager who was not perceived as helpful. Similarly, LTC pharmacy staff members experienced problems with controlled substance prescriptions. One LTC pharmacy staff member stated that "it is very difficult to track down hard copies of controlled prescriptions when they are not faxed directly to the pharmacy." Other LTC pharmacy staff members also commented on missing controlled substance prescriptions as a general problem with the transition of care process. One LTC staff member mentioned the preference for facsimile over hard copies of controlled substance prescriptions because it was "cumbersome to keep track" of hard copy prescriptions which led to misplacement of prescriptions.

Discussion

Nearly five million patients transition to and from hospitals and SNFs each year.¹ Requiring higher levels of care, these complex patients are particularly vulnerable to poor management.^{2–5} From a SNF perspective, transition problems stem from inadequate hospital discharge handoff communication such as missing information, medication order problems, or misleading behavioral status information.^{2,5,21,24}

Our analysis has demonstrated discrepancy findings consistent with Tija et al. (2009).⁶ Both found that medication discrepancies occur in three-fourths of hospital-to-SNF admissions. When comparing medication classes, gastrointestinal agents are consistently the most discrepant in both studies. Discrepancies among gastrointestinal agents are relatively low risk – the majority involves over-the-counter bowel regimens. However, both studies have found that high-alert medications classes such as anticoagulants, hypoglycemic agents, and opioid analgesics²⁵ compose 5–12% of discrepancies, which can cause significant adverse events if inappropriately dosed or omitted. When medication discrepancies are averaged across all records reviewed, both studies have demonstrated 2.5–3 medication discrepancies per patient.

Furthermore, three-fourths of patient medication lists were found to have discrepancies in the LTC pharmacy setting, further introducing the potential for medication-related errors. The majority of LTC pharmacy discrepancies were medication omissions, which are especially dangerous because the LTC pharmacy is unable to perform a thorough drug

utilization review, particularly examining drug-drug interactions. To our knowledge, this is the first study to uncover these omissions as a result of comparing medication lists from the three entities responsible for SNF transitions: the hospital, SNF, and LTC pharmacy.

Our analysis also demonstrated that diverted or missing controlled substance hard copy prescriptions occur during the transition from hospital to SNF resulting in delayed patient care. SNF staff legally relies on hospital discharge hard-copy controlled substance prescriptions for acute issues such as pain or anxiety among other issues upon patient admission; however, these scripts often are missing or incomplete amidst the shuffle of the transfer.^{2,6,9} SNF staff are not available at all times, and it may take hours to contact the patient's PCP to reorder the needed medications.² Furthermore, the lost hospital prescription is not accounted for as SNF staff assumes the hospital omitted this information. Opioid analgesics composed 12.3% of the discrepancies in Tija et al. but only 4.7% in this study. Given anecdotal and qualitative interview data, it is highly likely that opioid analgesic discrepancies were underestimated in our study. Although opioid hard-copy omissions were commonly reported by SNF staff, such delay in pain management may have been resolved by the time our medication record reviews occurred 24 hours post-SNF admission. Alternatively, an opioid analgesic may have been added to the medication list although the hard-copy was missing based on written discharge lists from the hospital. With 1.9 million annual opioid abusers nationally,²⁶ the risk of drug diversion cannot be overlooked. It is concerning that some prescriptions are unexplainably not reaching their intended location. Therefore, misplaced hard-copy controlled substance prescriptions from the hospital not only delay patient care, but also increase societal harm due to drug diversion.^{2,6,9,13}

Hospitals often are unaware of transitions of care issues with SNF patients as there is no systematic feedback loop.² As depicted in our post-discharge transitions of care communication model (Figure 3), certain lines of communication are expected to occur as normal workflow while some only occur if clarifications are necessary. For example, the SNF communicates medication changes to the LTC pharmacy after a patient is transitioned from the hospital. However, issues arise when there is no formal communication process back to the hospital to close the communication loop. When the need for clarification of patient orders arises, there is no standard process to resolve concerns with a provider knowledgeable of the inpatient stay and recent patient condition. A point-of-contact at the hospital has been suggested as a solution²; however, if inconsistently identified, the SNF or LTC pharmacy may abandon this communication process as a result of failed attempts. The SNF subsequently relies upon the PCP, who often is unaware of the patient's hospitalization, for care decisions and medication orders.²⁷

Another issue that perpetuates fragmented communication is the misalignment of goals. The healthcare entities throughout a patient's care continuum have varying goals: the hospital institution has traditionally been driven by bed turnover and length of stay, while the SNF targets patient retention.^{28,29} Although the LTC pharmacy goals are presumably driven by prescription volume, the incentives vary between large corporate and independent LTC pharmacies. That is, the large corporate LTC pharmacies have cost-saving structures in place to increase revenue that may disrupt patient care, while independent LTC pharmacies are inclined to be flexible to meet patient needs. Driven by Medicare reform, Accountable Care

Organizations (ACOs) that have partnered with SNFs to improve care quality have demonstrated higher Centers for Medicare and Medicaid Services (CMS) Five Star scores.³⁰ Such programs have exemplified that collaboration and accountability between hospitals, SNFs, and ACOs elevates patient care and results in improved patient outcomes such as reduced readmissions.^{7,30,31} The increased ACO involvement in transitions of care would ideally facilitate the alignment of healthcare entities' goals. Projected to start in 2019, CMS will initiate the Skilled-Nursing Facility Value-Based Purchasing Program (SNFVBP) to incentivize SNFs to provide quality services through payment rewards, further increasing the essentiality for healthcare partnerships.²⁹ Additionally, collaboration with the LTC pharmacy is essential to further reduce medication-related discrepancies.

Our targeted needs assessment guided by the IM framework has lent to several planned process improvements initiatives to help reduce medication discrepancies during the hospital-to-SNF transition as well as improve communication between healthcare entities. In efforts to minimize risk for diversion and reduce patient care delays, controlled substance prescriptions will be faxed directly to the LTC pharmacy. The contents of the discharge packet also will be standardized and placed in tamper-evident packets.^{22,23} The discharge handoff process for hospital discharge teams will be formalized and documentation of who received the hospital discharge packet at the SNF will be documented. The admitting SNF will receive handoff education about the contents of the hospital discharge packet. In efforts to open channels of communication between healthcare entities, the inpatient pharmacist will be responsible for faxing medication-related information – in addition to the provider's discharge summary – to both the SNF and its corresponding LTC pharmacy on every SNF discharge. Faxes to the SNF and LTC pharmacy will include information such as a brief summary of inpatient stay, discharge medication list, medication due times, a central call-back telephone number, and a description of how controlled substance prescriptions were sent at discharge. It is the expectation that the LTC pharmacy will continue to receive the updated hospital medication list from the SNF after formulary changes are made. Inpatient pharmacists will educate patients during hospital discharge counseling about the process for filling prescriptions in order to decrease confusion and improve healthcare trust. All planned process improvement initiatives will be conducted using the IM framework as a guide to ensure key stakeholder involvement as well as intervention objectives and outcomes align. With these improvements, we will strive to open communication channels between the hospital pharmacist, SNF, and LTC pharmacy.

The results of this study should be considered in light of limitations. Two pharmacy students were responsible for data collection, limiting the available times for contacting SNFs and LTC pharmacies. The data being collected were highly time-sensitive. The patient needed to be discharged for long enough to be admitted to the facility and complete the necessary admission paperwork, but not so long that the admission staff was either gone or no longer remembered the specific patient encounter. Once SNF or LTC pharmacy staff were contacted, interviewers were transferred within the different facilities to find someone who could complete the survey questions. The staff member answering interview questions may have been an unreliable historian of the patient admission. There also were difficulties contacting larger, corporate LTC pharmacies, as the calls were filtered through automated customer service lines that often never resulted in talking to a person qualified to answer the

questions. Further, this study was only conducted with patients being discharged from one hospital facility. Future research is needed with additional hospitals and providers to examine if these effects still hold. Lastly, several SNF facilities had in-house pharmacies, meaning they do not use an outside LTC pharmacy to provide medications for their patients. In this situation, it was difficult to interview the SNF and LTC pharmacy separately, since both had access to the same electronic medication record. However, we believe this study had several strengths as well. We used a validated IM framework to help guide the needs assessment which ultimately provided future process improvements for our hospital's discharge process. Further, continuous feedback was received from the research team throughout the study so we may build upon and improve our methods. Lastly, the involvement of LTC pharmacies in the needs assessment was helpful for targeting fragmentation in the communication of medication information when patients transfer from the hospital to a SNF setting, a setting missing in previous published literature.

Conclusion

The IM framework provided a systematic approach for performing a targeted needs assessment and identifying gaps in the hospital discharge process when patients transition from the hospital to SNF. We found a disconnect exists in communication between the hospital, SNFs, and LTC pharmacies. Opening lines of communication along with aligning healthcare entity goals may help prevent medication-related errors.

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Highlights

- Three-fourths of the medication records analyzed had at least one medication discrepancy between the hospital and skilled nursing facility (SNF) and long-term care (LTC) pharmacy.
- Communication between the SNF/LTC pharmacy and the discharging hospital was described by SNF and LTC staff as unidirectional with little opportunity for feedback on patient care concerns.
- The Intervention Mapping framework was useful for guiding the targeted needs assessment and identifying areas for process improvements.

Figure 1.
Targeted Needs Assessment Logic Model of Contributing Factors and Outcomes of
Fragmented Medication Information Communication between Hospital, Skilled Nursing
Facility, and Long-Term Care Pharmacy for Recently Discharged Patients*

SNF = skilled nursing facility; LTC = long-term care; PRN = as needed

Figure 2.
Medication Discrepancy Categories by Skilled Nursing Facility and Long-Term Care Pharmacy Medication Records Compared to Hospital Discharge Medication List.

Figure 3.
Skilled Nursing Facility and Long-Term Care Pharmacy Perceived Post-Discharge
Transitions of Care Communication Model

Table 1

Skilled Nursing Facility and Long-Term Care Pharmacy Sample Interview Questions

	Skilled Nursing Facility	Long-Term Care Pharmacy
Sample Questions *	<ul style="list-style-type: none"> • Did you receive the discharge packet? Did you receive all of the prescriptions you needed? • <i>If patient was discharged on controlled medication:</i> Did you receive the copy of the controlled medication prescription? • <i>Applicable if patient was a previous resident before hospitalization:</i> Did you find any discrepancies between the medication list from our hospital and your medication list after completing medication reconciliation? What were the discrepancies? • Did the patient experience any delay in treatment upon admission? How? • What other comments or concerns do you have about the transition of care process? What happened during this process? 	<ul style="list-style-type: none"> • Did you receive all of the prescriptions you needed? What was missing? • <i>If patient was discharged on controlled medication:</i> Did you receive the hardcopy of the controlled medication prescription? • <i>Applicable if patient was not new to LTC pharmacy:</i> Did you find any discrepancies between the medication list from our hospital and your medication list after completing medication reconciliation? What were the discrepancies? • Were the new or changed prescription orders sent to the SNF from the pharmacy on the same day as discharge? • What other comments or concerns do you have about the transition of care process? What happened during this process?

LTC = long-term care; SNF = skilled nursing facility

* Questions evolved throughout the study period. When unanticipated content was discovered, it was elaborated upon during the interview process.

Table 2
Medication Classification of Total Discrepancies Categorized by Labeling and Dosing Schedule

Medication Classification	Labeling (n)		Dosing Schedule (n)		% of 191 discrepancies
	Prescription	Over-the-Counter	Routine	As Needed	
Gastrointestinal agents ^a	8	45	10	43	27.7
Topical agents ^b	8	20	8	20	14.7
Vitamins/supplements ^c	1	16	17	0	8.9
Non-opioid analgesics	1	15	1	15	8.4
Antimicrobials ^d	13	0	13	0	6.8
Anticoagulants ^e	6	7	13	0	6.8
Neuropsychiatric agents ^f	10	0	6	4	5.2
Cardiovascular agents ^g	10	0	10	0	5.2
Hypoglycemic agents ^h	8	2	6	4	5.2
Opioid analgesics	9	0	0	9	4.7
Asthma/allergy agents	3	3	4	2	3.1
Other ⁱ	6	0	6	0	3.1

^a : H2 blockers, proton pump inhibitors, antiemetics, stool softeners, stool bulking agents, laxatives, anti-diarrheals, probiotics

^b : Powders, patches, ophthalmic agents, otic agents

^c : Vitamins, nutritional supplements, melatonin

^d : Cephalosporins, fluoroquinolones, nitrofurantoin, vancomycin (oral), nystatin (oral)

^e : Aspirin, warfarin

^f : Antidepressants, antipsychotics, anti-anxiolytics

^g : Antihypertensive agents, antiarrhythmic agents, antihyperlipidemic agents

^h : Insulin, oral antihyperglycemic agents, glucose

ⁱ : Corticosteroids, osteoporosis agents, immunosuppressants