

Original Research

Pharmacy-Led Medication Reconciliation Program Reduces Adverse Drug Events and Improves Satisfaction in a Community Hospital

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Abstract

Background

Pharmacy-led medication reconciliation identifies and corrects medication errors that can potentially cause moderate to severe harm. This research sought to identify the impact of pharmacy-led medication reconciliation on patient outcomes and describe the changes in healthcare workers' perceptions of the program.

Methods

A pharmacy-led admission medication reconciliation program pilot started in July 2019, and a discharge medication reconciliation proof of concept was tested in September 2020 at a 432-bed hospital. The following periods were compared: August 2018 to February 2019 (pre-program implementation) and August 2019 to February 2020 (post-program implementation). Endpoints included patient outcomes, workforce productivity and interdisciplinary healthcare team satisfaction through program surveys. Patient outcomes were assessed with chi-squared tests. Survey responses were assessed using the Likert scale. Descriptive statistics were used for productivity outcomes and the number of discharge medication reconciliations completed.

Results

Approximately 18,000 admissions were recorded for each period. The adverse drug event (ADE) rate decreased 49% ($p < 0.001$), and the complication rate decreased 29.7% ($p = 0.001$). During post-pilot implementation, 6,530 medication histories were completed, and 70,050 medications were reviewed. Of medication histories completed, 22.6% of patient allergies/adverse drug reactions were updated, 52.3% of medications were clarified, and 54.7% of preferred outpatient pharmacies were updated. Pharmacy services completed medication histories in 38.8% of inpatients. In the proof of concept, 168 discharge medication lists were drafted. Survey results showed statistically significant improvement in healthcare team satisfaction.

Conclusion

A pharmacy-led medication reconciliation program involving designated pharmacists and pharmacy technicians has shown to decrease ADEs and complications while improving interdisciplinary healthcare team satisfaction.

Keywords

medication reconciliation; pharmacy-led medication reconciliation; medication errors; pharmacy technicians; patient safety; patient care management; satisfaction; interdisciplinary healthcare team; adverse drug events

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Background

Medication reconciliation serves as a crucial component of delivering high-quality patient care. The Institute for Healthcare Improvement defines it as “the process of creating the most accurate list possible of all medications a patient is taking—including drug name, dosage, frequency, and route—and comparing that list against the physician’s admission, transfer, and/or discharge orders, with the goal of providing correct medications to the patient at all transition points within the hospital”.¹ Upon admission, medication reconciliation involves verifying a patient’s outpatient medication information and ensuring that appropriate medications are continued during hospitalization. At the time of discharge, inpatient and home medication lists are reviewed, and actions are taken to ensure that appropriate medications are continued, resumed or discontinued upon transition to the home or outpatient care setting.

In a traditional medication reconciliation workflow, direct-care nurses and physicians are responsible for ensuring drug regimen accuracy with minimal pharmacist input. It has been estimated that 87% of emergency department medication lists have at least one error when medication histories are completed by emergency department staff.² Medication histories are often incomplete as a possible result of patients lacking an accurate picture of their medication regimen, healthcare providers working to triage more immediate patient needs, clinical settings having frequent distractions, or “illegible medication lists accompanying the patient”.² In a statement from the Emergency Nurses Association, the committee identified that “the use of pharmacy staff to complete the Best Possible Medication History (BPMH) and conduct the reconciliation evaluation saves time and reduces medication discrepancies”.³ Since medication reconciliation and the early identification of drug therapy problems play an integral role in establishing a continuum of care and safe medication use, their absence or incompleteness can lead to worse than expected patient outcomes, such as increased inpatient readmissions, adverse drug events (ADEs), complications and increased utilization of the emergency department.⁴

Pharmacy-led medication reconciliation alleviates some burden from the emergency department staff while providing a more robust and comprehensive medication list.³ A study comparing the medication lists gathered by emergency department clinical pharmacists versus their physician counterparts found that pharmacists completed the medication reconciliation with 100% accuracy, while the physician group reported an accurate medication history 22% of the time.⁵ Mekonnen and colleagues reported a 66% reduction in medication discrepancy errors at both hospital admission and discharge through pharmacy-led medication reconciliation.⁶

Pharmacy-led medication reconciliation helps identify and correct medication errors that often carry the potential to cause moderate to severe patient harm, such as ordering an antihypertensive medication for a hypotensive patient or omitting allopurinol on the medication list for a patient with hyperuricemia.⁷ The impact of pharmacy-led medication reconciliation is especially valuable for a hospital given the incentives from various organizations. The Joint Commission has incorporated medication reconciliation as a national patient safety goal since 2005.⁸ In 2012, the Centers for Medicare and Medicaid Services (CMS) established the Hospital Readmission Reduction Program (HRRP) to reduce financial burden in light of a study estimating that 30-day readmission rates for Medicare patients cost the United States healthcare system an estimated \$17 billion in 2004.⁹

Despite evidence to support pharmacy-led admission medication reconciliation, less is known about the long-term impact of an operationalized program in providing safe and effective care, decreasing readmissions and assessing interdisciplinary healthcare team satisfaction. The model created in this study seeks to expand pharmacy-led medication reconciliation to identify drug therapy problems upon admission and address any lingering medication discrepancies or issues prior to discharge. The purpose of this research was to identify the impact of pharmacy-led medication reconciliation on patient outcomes and describe the change in perceptions of healthcare workers with pharmacy-led medication reconciliation.

Methods

A pilot program implementing pharmacy-led admission medication reconciliation was initiated in July 2019, and a 10 hour per day discharge medication reconciliation proof of concept was tested in September 2020 at a 432-bed hospital offering full-service medical and surgical acute care.

Description of Pharmacy-Led Admission Medication Reconciliation

In the admission medication history workflow, (Figure 1) four certified pharmacy technicians were hired to serve in a medication history technician role, which included gathering patient information at the bedside and documenting information in the patient medication history profile. The profile was also updated to contain supplementary information, including medication adherence issues, confirmation of a primary care physician (PCP), the patient's preferred community pharmacy, financial concerns for drug therapy, and any reported adverse effects or allergies. Medication history technicians began with an attempt to interview the patient. If the patient was unable to complete the interview or did not have a complete understanding of the medication list, the technicians were trained to then contact entities outside of the hospital and use multiple sources to verify medication histories. Typically, this process would include clarifying medications and doses with caregivers, community pharmacies, long-term care facilities, primary care providers, and specialists.

A medication reconciliation pharmacist was hired to manage the medication history technicians and to collaborate with providers to reconcile each home medication list. The pharmacist evaluated the list presented by the medication history technician, rectified drug therapy issues (e.g., duplication, omissions), proposed guideline-driven therapies and solved medication adherence barriers. Any admission drug therapy issues identified by the pharmacy team were brought in real-time to the emergency department or the admitting physician to provide robust care for patients. If a medication-related issue required inpatient follow-up, then this information was documented and communicated to the inpatient pharmacists giving care to the patient. If inpatient medication orders were already entered based on an outdated medication list, the medication reconciliation pharmacist notified the physician of any needed changes immediately following the completion of medication reconciliation activities. This pharmacist workflow process was first targeted with patients admitted through the emergency department and then to patients greater than 65 years of age having medical conditions with a high risk of readmission (conditions highlighted in this study included acute myocardial infarction (AMI), coronary artery bypass graft (CABG), chronic obstructive pulmonary disease (COPD), heart failure (HF), pneumonia, stroke and total hip or knee arthroplasty (THA/TKA)) to test high-impact interventions. For scheduled cardiovascular surgeries, patients were contacted prior to surgery for a home medication list and identifica-

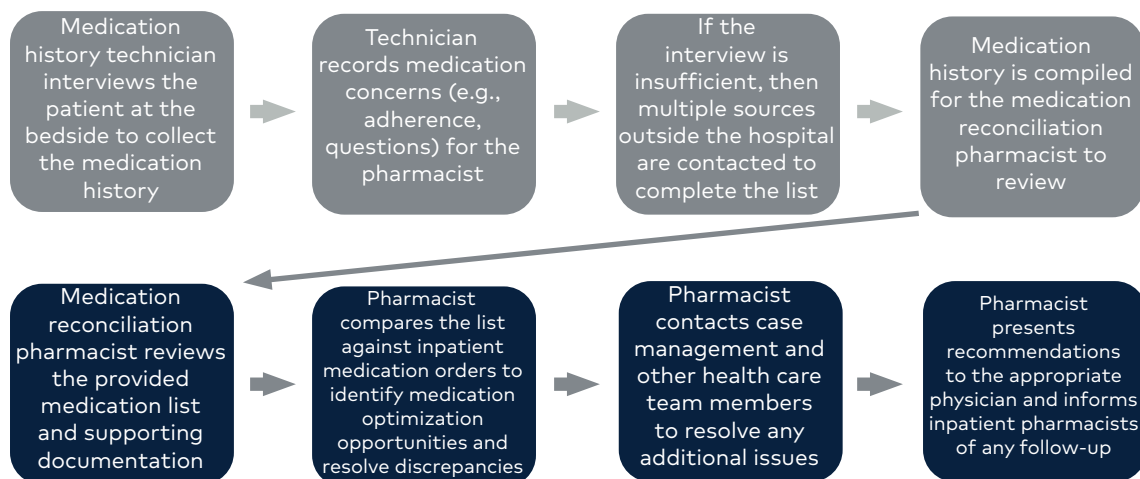


Figure 1. Pharmacy-led admission medication reconciliation workflow.

tion of medication-related issues. Additionally, a real-time clinical pharmacist transition of care worklist was developed to ensure continuity with drug therapy issues that could be resolved before discharge.

To champion the medication reconciliation program, an interdisciplinary hospital governance committee was established with responsibilities such as distribution of healthcare team satisfaction surveys, dissemination of hospital-wide communication on the new service and identification of gaps and barriers with current workflows.

Pharmacy-Led Admission Medication Reconciliation Outcomes

Measures for the admission medication reconciliation program included patient outcomes, the productivity of the workforce and the satisfaction of the interdisciplinary healthcare team. (Table 1) The following periods of data were compared: August 2018 to February 2019 (pre-program implementation) and August 2019 to February 2020 (post-program implementation). De-identified patient outcome measures were assessed pre- and post-program using an internal data dashboard tool. Interdisciplinary healthcare team surveys were conducted pre- and post-program implementation. The survey was designed to gauge confidence in medication history and reconciliation practices before and after implementation of the pharmacy-led admission medication reconciliation program. Survey respondents were instructed to assess their level of agreement using a Likert scale (strongly disagree, disagree,

undecided, agree, and strongly agree) and were offered the opportunity to provide free text for any comments. Survey questions are detailed in Table 1.

Description of Discharge Medication Reconciliation Proof of Concept

In September 2020, a 12-day discharge medication reconciliation proof of concept tested the addition of remote pharmacists to draft the discharge medication list for provider approval. (Figure 2) To prepare the draft discharge medication list, pharmacists held or continued home medications and continued inpatient medications as new pending prescriptions, if appropriate. Using electronic medical record (EMR) technology, pharmacists also had the ability to view which medications would be covered by the patient’s health insurance. This resource helped ensure accessibility upon discharge. Providers were contacted for clarifications and changes to the medication regimen as necessary. The drafted discharge medication reconciliation was then available for provider review and approval. Once approved, nurses completed the discharge process as normal.

Discharge Medication Reconciliation Proof of Concept Outcomes

In the discharge medication reconciliation proof of concept, the number of medication histories completed and estimated pharmacist time to draft the discharge medication reconciliation during the 12-day period were collected to estimate the impact of the program.

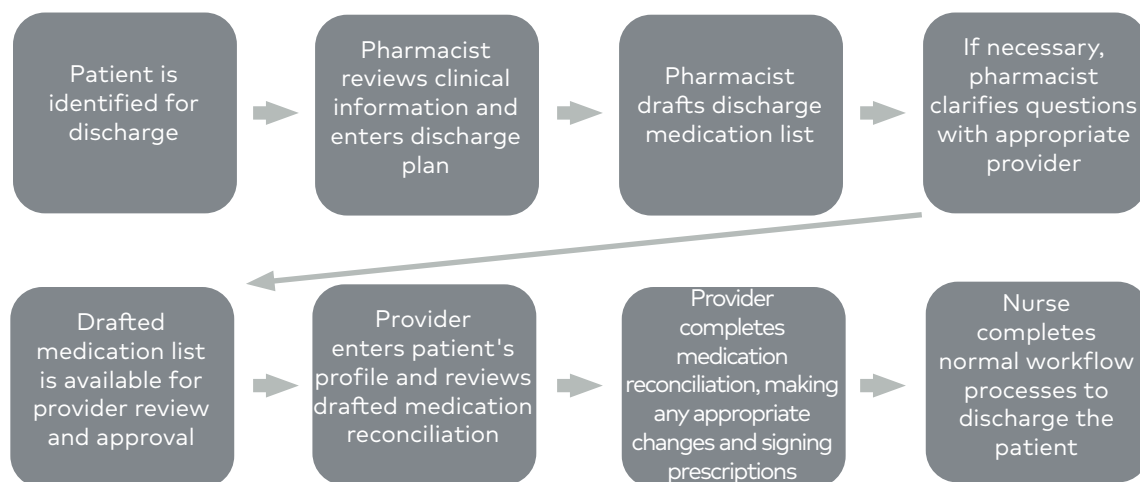


Figure 2. Remote pharmacist involvement in discharge medication reconciliation workflow.

Table 1. Outcome Measures of Pharmacy-Led Admission Medication Reconciliation

Measure	Definition
Patient Outcome Measures	
All-Cause 30-Day Readmissions	All-cause 30-day inpatient readmissions to the hospital, patients with an in-hospital mortality on their index stay and patients without an enterprise master patient index (EMPI) number were excluded.
ADE Rate	Hospital-acquired ADEs (ICD-10 diagnosis) per 1,000 inpatients.
Complication Rate	Total number of complications divided by the total number of eligible cases.
Average Length of Stay (days)	Total number of inpatient days divided by the total number of inpatients.
Mortality Rate	Total number of mortalities divided by the total number of eligible cases.
Total Spend per APD	Total spend divided by adjusted patient days.
CMS Readmissions	Readmissions related to CMS patients, patients with an in-hospital mortality on their index stay and patients without an EMPI number used to track readmission were excluded. The following conditions were individually assessed: AMI, CABG, COPD, HF, pneumonia, stroke and THA/TKA.
Productivity of Workforce	
Medication Histories Completed	Number of medication histories completed by pharmacy services.
Percent of Histories with Allergies and ADRs Updated	Patients with allergies and ADRs updated divided by the number of medication histories completed.
Percent of Histories with Medications Clarified	Patients with medications clarified divided by the number of medication histories completed.
Percent of Histories with Preferred Pharmacy Updated	Patients with preferred pharmacy updated divided by the number of medication histories completed.
Total Medications Reviewed	Number of medications documented by pharmacy services.
Average Medications Reviewed per History Completed	Number of medications reviewed divided by the number of medication histories completed.
Percent of Medications Clarified	Medications clarified divided by the number of medications reviewed. Clarifying medications include utilizing outpatient hospitals, pharmacies, primary care providers, and the prescription drug monitoring program (PDMP) to obtain complete medication lists.
Percent of Medication Histories Completed	Number of patients with at least one medication history completed divided by the number of inpatients excluding deliveries, neonatal intensive care unit (NICU) patients, and newborns.
Satisfaction of Interdisciplinary Health Care Team	
Healthcare Team Satisfaction Survey	Question 1: "I feel the staff member performing the admission medication history is knowledgeable about the medication my patients take at home."
	Question 2: "I feel the staff member performing the admission medication history is accessible if I have a question or concern about the medication history and reconciliation for my patients."
	Question 3: "I feel the admission medication history and reconciliation process provides reliable information."
	Question 4: "I feel the admission medication history and reconciliation process leads to better medication orders being written."

Statistical Analysis

Almost all patient outcomes were assessed with Pearson’s chi-squared tests. Fisher’s exact tests were used in the readmission data for CABG and THA/TKA groups. Data were analyzed using the statistical software R.¹⁰ Ratios were then used for the readmissions groups by taking the percent of readmissions in the post-program group and dividing it by the per-

cent of readmissions in the pre-program group.

All survey responses were given a number from 1 to 5 based on the previously mentioned Likert scale (strongly disagree being assigned with 1, disagree with 2, undecided with 3, agree with 4, and strongly agree with 5). From there, a mean score and standard deviation were calculated for the survey group overall and then for nurs-

Table 2. Pharmacy-Led Admission Medication Reconciliation Outcome Measure Results

Measure	Percent Change (%)	p-value
ADE Rate	-49.0	<0.001
Complication Rate	-29.3	0.001
Total Spend per APD	-1.2	Not applicable
Average Length of Stay (days)	-1.0	Not applicable
Mortality Rate	-1.0	Not applicable
All-Cause 30-Day Readmissions	1.01	0.618
CMS Readmissions	1.02	0.831
CMS AMI Readmissions	0.69	0.209
CMS Stroke Readmissions	0.83	0.574
CMS HF Readmissions	1.00	0.982
CMS Pneumonia Readmissions	1.01	0.961
CMS CABG Readmissions	1.31	1.000
CMS COPD Readmissions	1.34	0.295
CMS THA/TKA Readmissions	1.38	0.753

ing, pharmacy and physician subgroups. Responses from the aggregate survey group and each healthcare discipline group were assessed with two-sample t-tests.

Descriptive statistics were used to report the productivity outcomes and the number of discharge medication reconciliations completed during the 12 day proof of concept.

Results

Pharmacy-Led Admission Medication Reconciliation Patient Outcome Measure Results

From August 2018 to February 2019 compared to August 2019 to February 2020, inpatient admissions increased 2.6%, with approximately 18,000 admissions in each period. Between the two study periods, (Table 2) the ADE rate

decreased 49.0% ($p < 0.001$) and the complication rate decreased by 29.3% ($p = 0.001$). Little difference was observed in the average length of stay, mortality rate, and the total spend per adjusted patient day (APD). In the CMS readmission data, AMI and stroke readmissions had the greatest decreases, with ratios of 0.69 ($p = 0.209$) and 0.83 ($p = 0.574$), respectively.

Workforce Productivity Assessment for the Pharmacy-Led Medication Reconciliation Program

During post-pilot implementation, 6,530 admission medication histories were completed and 70,050 unique medications were reviewed by the medication reconciliation team with coverage between 0700 and 1700. (Table 3) Of medication histories completed, 22.6% of patient allergies/adverse drug reactions (ADRs) were updated, 52.3% of medications were

Table 3. Workforce Productivity Results (August 2019 to February 2020)

Measure	Result
Medication Histories Completed, n	6,530
Histories with Allergies and ADR Updated, %	22.6%
Histories with Medications Clarified, %	52.3%
Histories with Preferred Outpatient Pharmacy Updated, %	54.7%
Total Medications Reviewed, n	70,050
Average Medications Reviewed per Medication History Completed, n	10.7
Medications Clarified, %	45.1%
Medication Histories Completed, %	38.8%

clarified with all available sources (e.g., community pharmacies, long-term care facilities) and 54.7% of preferred outpatient pharmacies were updated. Medication histories were completed by pharmacy services in 38.8% of hospital inpatients.

Healthcare Professional Satisfaction Survey of Pharmacy-Led Admission Medication History and Reconciliation

A total of 94 interdisciplinary healthcare team

surveys were completed before the admission medication reconciliation pilot began, and 110 were completed after pilot implementation. (Table 4) A small percentage of questions in each survey group were left blank. The corresponding calculated percentages account for this change in the denominator.

In the pre-pilot survey, nurse respondents were undecided about the knowledge and accessibility of the individual collecting the medication history (mean scores 3.15 and 2.86, respective-

Table 4. Healthcare Professional Satisfaction Survey of Pharmacy-Led Admission Medication History and Reconciliation

Survey Question	Pre-Pilot Survey		Post-Pilot Survey		p-value
	Mean + Standard Deviation	Number of Responses	Mean + Standard Deviation	Number of Responses	
"I feel the staff member performing the admission medication history is knowledgeable about the medication my patients take at home."					
Total	2.89 + 1.16	93	4.34 + 0.87	110	<0.001
Nurses	3.15 + 1.04	41	4.35 + 0.88	82	<0.001
Pharmacists	1.93 + 0.59	15	4.60 + 0.63	15	<0.001
Physicians	2.76 + 1.15	29	3.91 + 1.04	11	0.006
"I feel the staff member performing the admission medication history is accessible if I have a question or concern about the medication history and reconciliation for my patients."					
Total	2.71 + 1.17	94	4.16 + 1.02	110	<0.001
Nurses	2.86 + 1.07	42	4.06 + 1.06	82	<0.001
Pharmacists	2.20 + 0.86	15	4.93 + 0.26	15	<0.001
Physicians	2.48 + 1.15	29	3.91 + 1.04	11	0.001
"I feel the admission medication history and reconciliation process provides reliable information."					
Total	2.72 + 1.26	93	4.48 + 0.77	110	<0.001
Nurses	3.12 + 1.19	41	4.51 + 0.77	82	<0.001
Pharmacists	1.60 + 0.63	15	4.67 + 0.49	15	<0.001
Physicians	2.31 + 1.04	29	4.09 + 1.04	11	<0.001
"I feel the admission medication history and reconciliation process leads to better medication orders being written."					
Total	3.23 + 1.36	94	4.53 + 0.77	108	<0.001
Nurses	3.64 + 1.16	42	4.51 + 0.81	81	<0.001
Pharmacists	1.87 + 0.99	15	4.86 + 0.36	14	<0.001
Physicians	3.00 + 1.34	29	4.36 + 0.81	11	0.003

ly), and they were also undecided regarding the quality of medication reconciliation. The highest mean score (3.64) was attributed to the quality of the orders being written through the medication reconciliation process. However, in the post-pilot survey, nurses reported mostly strong agreement across all categories. Mean scores ranged between 4.06 and 4.51. The number of nurse respondents doubled in the post-pilot survey versus the pre-pilot survey.

Pharmacist respondents in the pre-pilot survey indicated predominantly uniform disagreement in all categories, as evidenced by mean scores below the midpoint of the Likert scale. The lowest mean score (1.60) was given to the reliability of the information that the medication history provides while the highest mean score (2.20) was given to the accessibility of the individual performing the medication history. A significant change occurred in the pharmacist responses toward the medication history and reconciliation process in the post-pilot survey with strong agreement reported in all surveyed categories. Mean scores between 4.60 and 4.93 were observed with the highest score given to the accessibility of the person collecting the medication history.

In the pre-pilot survey, physicians largely disagreed or were undecided regarding the quality of medication history and reconciliation in the hospital (mean scores between 2.31 and 3.00). In the post-pilot survey, physician respondents indicated moderate agreement in the surveyed categories. Mean scores ranged between 3.91 and 4.36. The highest mean score (4.36) represented confidence in better medication orders being written as a result of the quality of the admission medication history and reconciliation process.

Overall, statistically significant improvements in the satisfaction of nursing, pharmacy, physicians and the healthcare team as a whole were observed in the post-pharmacy-led medication reconciliation pilot survey. The aggregate survey group scored above the 4 point threshold on the Likert scale for all surveyed questions. Respondents agreed or strongly agreed with the quality of care provided because of implementation of the pharmacy-led medication reconciliation program.

Discharge Medication Reconciliation Proof of Concept Results

During the 12-day discharge medication reconciliation proof of concept, 168 draft discharge medication reconciliations were completed with remote pharmacist coverage. The average remote pharmacist time to draft the discharge medication reconciliation was 20 minutes per patient.

Discussion

Comparing the study periods of August 2018 to February 2019 and August 2019 to February 2020, the ADE rate and complication rate decreased significantly after implementation of the pharmacy-led medication reconciliation pilot. These findings align with current literature reports of increased accuracy of medication lists with pharmacy-led medication reconciliation, which reduces ADEs leading to diminished opportunities for patient harm.^{4,7} Trends between CMS readmission groups were an interesting finding, as only AMI and stroke groups experienced a decrease in readmissions. The lack of uniform decrease in readmission among all groups could be attributed to more interventions made with anticoagulant medications and easier identification of errors in post-stroke medication lists upon discharge. Cardiovascular surgery patients became initial targets for pharmacotherapy interventions early in the pilot program's course, so this group experienced a broader scope of time for an impact to be made. The interdisciplinary survey provided insight into the satisfaction of the interdisciplinary healthcare team with the pharmacy-led medication reconciliation pilot program. Nurse, pharmacist and physician groups all saw a significant increase in mean survey scores with most of those respondents agreeing or strongly agreeing with the positive impact of the program on medication orders and patient care.

The medication reconciliation team was able to complete medication histories for 38.8% of inpatients with one medication reconciliation pharmacist and 4 medication history technicians. At the start of the program, the team staffed the highest volume days of the week for hospital patient admissions Monday through Friday from 0700 to 2330. Working hours were subsequently adjusted to 0700 to

2000 for easier access to community pharmacies for patient medication information. Hours were also expanded to provide weekend coverage as the team grew over time. Unit-based pharmacists and an emergency department pharmacist provided assistance in medication reconciliation pharmacist duties when the medication reconciliation pharmacist was not available. Based on lessons learned from the pilot, one additional medication reconciliation pharmacist and three medication history technicians were hired to expand the program's reach to a greater percentage of inpatients.

Common themes emerged in the types of interventions performed through the medication reconciliation program. The pharmacy team encountered several instances of medications that did not have a specific hospital formulary substitution, so they were omitted by the admitting physician while completing admission medication reconciliation. Prior to program implementation, these omissions caused critical gaps in patient therapy (especially for oral chemotherapy agents or human immunodeficiency virus (HIV) medications). During admission medication reconciliation with a pharmacist, issues with non-formulary medications were solved at the time of admission. If there was an appropriate substitute, the pharmacist would communicate with the provider and initiate a substitution. During inpatient care, if a substitution was not available, the medication reconciliation pharmacist would ensure the patient's own medication hospital policy and process was initiated. Medication reconciliation pharmacists communicated the omitted medication with the provider, ensured that a family member could provide the medication, loaded the medication into the automated dispensing cabinet and added the medication to the electronic medication administration record (eMAR) to bring awareness to the healthcare team.

During admission medication history compilation, medication history technicians were trained to ask patients about non-oral medication formulations. The team found that medication patches and pumps often were omitted from the admission home medication list prior to pharmacy involvement. The medication reconciliation team often intervened with inpatient pain management and diabetes

management upon learning of these medications at the time of the admission medication history. The medication reconciliation pharmacist would immediately contact the inpatient physician team to make them aware of non-oral drug therapy and thus prevent opportunities for duplication of medication therapy that could lead to medication overdoses. Additional intervention opportunities involved discovery of non-adherence due to patient financial issues. For example, a provider increased the dose of anti-hypertensive medications based on doses listed from a previous visit for a patient with hypertensive urgency. During medication history and reconciliation, it was identified that the patient had not taken any medications for hypertension in several weeks due to cost issues, which led to their current admission. Upon learning of patient financial constraints, the medication reconciliation pharmacist informed the attending physician of alternative medication options to improve outpatient medication adherence. This scenario has been observed with medications for diabetes, COPD, seizures and diuresis as well.

Commentary on the program from survey respondents frequently included the time and effort saved that was re-directed to address immediate patient care needs in keeping with similar findings in the literature.^{2,3} One respondent mentioned that the program "helps cut time off admissions" and that medication histories performed by pharmacy staff "are more accurate than what I can get from the patients". Another healthcare team member mentioned that "this process should be integral to [the] care of all patients. [Its] value is limitless when it comes to safer patient care". A nurse in the emergency department spoke to the value of the medication history technician as "one of the biggest safety wins for our hospital! They provide invaluable knowledge and have caught numerous [errors] that may have gone undetected or even caused harm". Finally, the hospital emergency department medical director and physician champion for the medication reconciliation program mentioned that it "has quickly become an invaluable resource to our emergency department". He also highlighted that the efficient time frame in which medications are updated by the program has resulted in "decreased drug interactions, accurate dosing of medications and [the] avoidance

of giving medications that patients are no longer taking.”

A strength of this study was in the survey design. Providing a brief questionnaire allowed for wider participation among hospital staff and enabled the authors to gauge interdisciplinary agreement with medication history and reconciliation pre- and post-pilot. Results captured the improvement in interdisciplinary satisfaction after pharmacy services involvement, indicating the greatest opportunities for future program impact.

The shortened time periods of the study presented a limitation. The decision to incorporate post-pilot data through February 2020 was made to isolate the impact of medication reconciliation during normal hospital processes before the COVID-19 pandemic. However, during the COVID-19 pandemic, we have observed positive effects of the program to decrease ADEs, complications and 30-day readmissions while noting concurrent hospital initiatives may limit the ability to attribute study findings solely to the medication reconciliation program.

As pharmacy involvement in medication history and reconciliation continues to expand, further research will be needed to replicate these results using similar medication reconciliation models in hospitals of varying size. Additionally, comparisons of data over longer periods of time may be considered to advance research in this area. Moving forward, the hospital has increased its staffing of medication history technicians and added a second medication reconciliation pharmacist to achieve a higher percentage of patient admission medication histories, and the discharge medication reconciliation workflow has been piloted by two other hospitals in the health system for further refinement.

The impact of the medication reconciliation pilot program cannot be understated, as these results were used to create a comprehensive, pharmacy-led medication reconciliation program for other hospitals in the health system. Emergency department staff continue to rely on the program to establish a foundation necessary for high-quality patient care. Pharmacists have shifted their focus to the patient

bedside, enhancing the level of medication management they provide to patients. The pharmacy team continues to identify innovative ways to assist patients with their medication regimens. The program has expanded its role in the hospital's elective surgery department by calling patients prior to scheduled surgeries. The medication reconciliation program credits The Joint Commission's National Patient Safety Goal in medication safety as a foundational resource to guide its establishment, growth and success.

The medication reconciliation pharmacists have enhanced their ability to address medication adherence concerns through student pharmacists and pharmacy residents. The medication reconciliation pharmacist supervisor has spoken to the value of the program, saying “Being a medication reconciliation pharmacist allows me the opportunity to optimize and individualize medication therapy regimens for each and every patient that comes into our hospital. No two patients are the same, and it is imperative we create a medication regimen from admission that is the most likely to lead to successful transitions of care on discharge.” Overall, the program has ingrained medication reconciliation into the culture of the pharmacy department's operations, and it has continued to empower pharmacy staff to highlight the value of their work to the interdisciplinary healthcare team. As the hospital director of pharmacy has stated of the program, “We are changing the paradigm of inpatient care”.

Conclusion

Implementation of a pharmacy-led medication reconciliation program involving designated pharmacist and medication history technician roles decreased adverse drug events and complications significantly. Significant positive change was observed in interdisciplinary healthcare team satisfaction after the admission pharmacy-led medication reconciliation pilot implementation. The interdisciplinary healthcare team has credited the program with reducing medication errors, creating a comprehensive and accurate medication list and conserving provider and nursing time.

Acknowledgments

The authors wish to thank Kimberly Korwek, PhD, for assistance with manuscript editing

and Marie Kilgore, PharmD, for assistance with the pharmacy-led medication reconciliation program.

Conflicts of Interest

The authors declare they have no conflicts of interest.

Drs. Burgess, Castelein, Fraker, Kramer, Skinner are employees of HCA Healthcare Clinical Operations Group, an organization affiliated with the journal's publisher.

Dr. Parra is an employee of HCA Healthcare, North Texas Division, an organization affiliated with the journal's publisher.

Dr. Pickens is an employee of Oviedo Medical Center, a hospital affiliated with the journal's publisher.

Dr. Timmons is an employee of North Florida Regional Medical Center, a hospital affiliated with the journal's publisher.

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

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