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Med rec double check: Inpatient psychiatry medication errors identified on admission using Medicaid Web portals and electronic pharmaceutical claims data

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Abstract

Introduction: The role of pharmacists during medication reconciliation (MR) is well established, with a number of reports describing this in the context of psychiatric hospitalizations. However, medication errors (MEs) are common during transitions of care, with no exception during psychiatric hospitalizations. Our institution uses pharmacy-performed MR processes using patient interviews and reviewing objective sources, such as electronic pharmaceutical claims data (EPCD), which includes Medicaid Web portals. The inpatient psychiatric pharmacist reviews EPCD sources against previously pharmacy-completed MRs for new admissions, where if discrepancies are found, the patient is reinterviewed to identify and correct MEs.

Methods: We performed a prospective quality improvement project during 28 days to evaluate the quantity and classification of MEs upon admission to a 22-bed inpatient psychiatry unit.

Results: Of 52 included patients, where a cumulative 426 medications were reviewed, a total of 29 MEs in 16 patients were identified. Eight patients had discrepancies on their home medication lists when compared to EPCD, where 7 of these had at least 1 ME due to inaccurate MR.

Discussion: Of all the MEs identified, the greatest quantity was found secondary to the EPCD "double-check" method. The most common MEs in all patients were the omission of home medications (34%), wrong frequency (28%), and ordering medication the patient is not taking (10%). All patients admitted on long-acting injection antipsychotics had errors in last dose received. No MEs resulted in patient harm, and they were identified and corrected by the psychiatric pharmacist 97% of the time.

Keywords: clinical pharmacy information systems, health information exchange, pharmacy technology, continuity of patient care, electronic health records, Medicaid, medication errors, medication reconciliation

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Introduction

The medication reconciliation (MR) process is critical for transitions of care to reduce medication errors (MEs).[1] Medication errors during transitions of care are common during inpatient psychiatry admissions, which can lead to patient harm.[2–12] This problem has led to the successful incorporation of psychiatric pharmacists in the emergency department to perform MR,[13,14] comprehensive medication reviews by pharmacists or technicians,[6,12,15] and use of integrated electronic medication management systems to identify medication

discrepancies during transitions of care.[9] Despite best efforts, MEs still occur following MR based on inaccurate subjective information obtained during patient interview, possibly due to mental decline, psychiatric instability, or increased quantity of medications taken.[5,8,13] During psychiatric hospitalization, longer gaps in time between admission and MR completion have resulted in lower MEs, likely due to improved psychiatric stability.[12] It stands to reason that additional safeguards for identifying MEs following an initial MR during psychiatric hospitalization should exist.

Electronic pharmaceutical claims data (EPCD) through health insurance exchange programs (HIEs) and Medicaid Web portals (MWPs) offer objective and accurate medication history.[16,17] EPCD provides medication names, formulation, quantity dispensed, days supplied, pharmacy dispensed from, and provider name.[16–18] The EPCD also provides this information for long-acting injection (LAI) medications if the claims are processed by a pharmacy. Although HIE EPCD is commercially available to health systems, MWP EPCD is a free resource and offered in at least 8 states.[17] The addition of using MWP EPCD, along with HIE EPCD and other MR processes, was able to identify at least 1 ME in every 4 patients admitted to a community hospital in Montana.[18] At our facility, it has been the longstanding practice of the psychiatric pharmacist to compare pharmacy-completed patient home medication lists against available EPCD sources to evaluate their accuracy a second time. This EPCD "double-check" not only can contribute to the identification of MEs at time of admission, but it can also provide awareness of a patient's past medication trials or medication adherence difficulties. We seek to evaluate how the MR "double-check" using EPCD contributes to identification of MEs on an inpatient psychiatric unit.

Methods

At our institution, the MR process is not completed until it has been documented as such by a pharmacist. Pharmacy-performed MRs are primarily performed in the emergency department and include patient or caregiver interview, electronic medical record review, EPCD review, and contacting outpatient pharmacies or clinics if necessary. When patients are transferred to the inpatient psychiatric unit, the patient's home medication list from the pharmacy-performed MR is compared for accuracy against available EPCD by the sole psychiatric pharmacist a second time (ie, "double-check"). This "double-check" is performed for all patients by the psychiatric pharmacist and either confirms the accuracy of previously performed MRs or identifies discrepancies. If discrepancies are found during the "double-check," potentially erroneous inpatient medication orders (eg, medications ordered from the home medication list that do not appear to be active based on EPCD) are discontinued by the psychiatric pharmacist using a collaborative practice agreement until their accuracy is verified with a reinterview of the patient. The

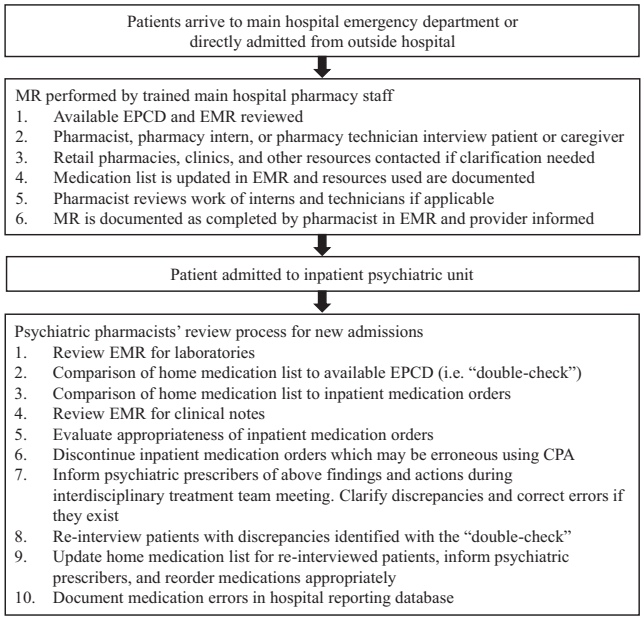

FIGURE: Pharmacy-performed medication reconciliation process and inpatient psychiatric pharmacist's process for review of new psychiatric admissions. CPA = collaborative practice agreement; EMR = electronic medical record; EPCD = electronic pharmaceutical claims data; MR = medication reconciliation

psychiatric pharmacist also identifies MEs that are not secondary to inaccurate MR (ie, MEs not identified with the "double-check"), which include providers omitting the reordering of home medications, duplicate indication medication orders, and discrepancies between medication orders and the provider's EMR documentation, among others. These discrepancies are discussed with providers to determine if the orders are intended or errors, and corrected if they are the latter (Figure).

We prospectively reviewed MEs identified for new admissions with completed MRs to our 22-bed inpatient psychiatric adult unit between July 7, 2023, to August 4, 2023. The MEs included in our analysis were identified during the sole psychiatric pharmacist's first review of each patient, which occurs on weekday mornings. Patients who did not have their pharmacy-performed MR completed on first psychiatric pharmacist review were not included in the analysis. The MEs were categorized as being identified secondary to the "double-check" using EPCD, or unrelated to that process. This quality improvement project was deemed to be Institutional Review Board exempt by our regional Human Research Protection Program.

Data collected included admission date; sex; age; reason for admission; presence of alcohol, methamphetamine, pharmaceutical overdose, or other intoxicating agent present before inpatient psychiatry transfer; primary psychiatric diagnosis; admission to the inpatient psychiatry intensive care unit (ICU) or open unit; transferring location prior to admission;

availability of EPCD; if EPCD was documented as "used" during the initial MR process; total number of medications on the patient's prior-to-admission medication list; if a second MR interview was performed by the psychiatric pharmacist because of discrepancies with EPCD; quantity and classification of MEs identified,[19] including if high alert medications[20] or if LAIs were involved; and the health care professional who identified and corrected the ME.

The primary objective was to determine the difference in quantity of MEs identified in patients who had a second MR interview performed because of discrepancies found with the EPCD "double-check" compared with patients without EPCD discrepancies. Secondary objectives were to identify: (1) differences in ME quantity between patients admitted to the psychiatric ICU or open unit; (2) differences in ME quantity based on the documented use of the MWP during the initial MR processes; (3) differences in ME quantity between patients transferred to inpatient psychiatry from our hospital compared with those from an outside facility; (4) difference in ME quantity between patients who had been intoxicated on any substance compared with those who were not; (5) quantification and classification of MEs; (6) quantification of which health care professional was responsible for resolution of MEs; (7) relationships between ME quantity per patient based on total prior to admission medications; and (8) relationships between ME quantity per patient and patient age. Classification of MEs was based on the National Coordinating Council for Medication Error Reporting and Prevention.[19] According to this classification, category A events are circumstances that have the capacity to cause errors, category B events are when an error occurred that did not reach the patient, and category C events are when an ME reached the patient but did not cause harm.[19] A Wilcoxon rank sum test was used for the primary objective, a 2-tailed *t* test was used for the first 4 secondary objectives, and regression analysis was used for the last 2 secondary objectives.

Results

A total of 60 patients were admitted to the psychiatry unit during the evaluation period, where 8 patients were excluded because their MRs were not completed prior to admission (Table). The 52 included patients had a cumulative 426 medications, where 2 patients were prescribed 1 LAI antipsychotic each. The EPCD via HIE was available in 85% of patients and used 100% of the time during the initial MR. The EPCD via MWP was available in 50% of patients and used 73% of the time during the initial MR.

A total of 29 MEs were identified in 16 patients. The EPCD "double-check" identified MR discrepancies in 8 patients who were reinterviewed by the psychiatric pharmacist. Seven of the reinterviewed patients had at least 1 ME, constituting a cumulative 16 MEs. One of the reinterviewed patients was not found to have an ME. The remaining 9 patients with MEs were not identified with the EPCD "double-check," meaning their initial MR was accurate, but errors occurred after this process. These 9 patients had MEs that were related to incorrect inpatient orders of home medications by prescribers, incorrect ordering of durations of therapy (eg, antibiotics), duplicate medications for the same indication (eg, lorazepam and phenobarbital orders for alcohol withdrawal protocols), and incorrect formulation orders.

The 29 MEs were due to omissions of prior to admission medications (34%), wrong frequency (28%), ordering medication the patient is not taking (10%), wrong formulation (10%), wrong last dose administered for LAI antipsychotics (7%), wrong dose (3%), wrong indication (3%), and wrong duration (3%). The MEs were caused by inaccurate MR (69%),

TABLE: Patient characteristics, transferring and admitting locations, and intoxication status prior to acute psychiatric admission

Characteristic	Value
Patients included, n	52
Female, n (%)	33 (63)
Age, mean (SD), y	39.2 (16.4)
Number of home medications, mean (SD)	8.19 (6.61)
Reason for admission, n (%)	
Suicidality	34 (65)
Mania	4 (8)
Psychosis	6 (12)
Anxiety	6 (12)
Severe refractory depression	2 (4)
Primary psychiatric diagnosis, n (%)	
Major depression	25 (48)
Bipolar disorder	14 (27)
Anxiety disorder/PTSD/OCD	4 (8)
Schizophrenia/SAFD	3 (6)
Substance use disorder	2 (4)
Personality disorder	1 (2)
Intermittent explosive disorder	1 (2)
Attention-deficit/hyperactivity disorder	1 (2)
Autism spectrum disorder	1 (2)
Initial admitting location, n (%)	
Psychiatric open unit	28 (54)
Psychiatric ICU	24 (46)
Transfer location prior to admission, n (%)	
Emergency department	46 (88)
Main hospital floor	2 (4)
Outside facility	4 (8)
Intoxicated status at transferring location, n (%)	
None	41 (79)
Alcohol	4 (8)
Methamphetamine	3 (6)
Pharmaceutical overdose	2 (4)
Cocaine	1 (2)
Fentanyl	1 (2)

ICU = intensive care unit; OCD = obsessive compulsive disorder; PTSD = posttraumatic stress disorder; SAFD = schizoaffective disorder.

incorrect order by provider (28%), and medications ordered before MR was completed (3%). Of these errors, 1 involved phenobarbital, a "high-alert" medication,[20] and 2 involved LAI antipsychotics. The ME severities were category A (7%), category B (66%), and category C (28%).[19] Errors were identified and corrected by the psychiatric pharmacist 97% of the time and by psychiatric providers for the remainder.

The quantity of MEs in patients who were reinterviewed (n = 8) compared with those not reinterviewed (n = 44) was 16 versus 13 ($P = .00078$), respectively. No differences in MEs were found between patients admitted to the psychiatric ICU compared with the open unit ($P = .328$); patients transferred from our hospital compared with those from an outside facility ($P = .303$); or patients who had been intoxicated on any substance prior to admission compared with those who were not ($P = .792$). In patients who had Medicaid insurance coverage, and therefore had available MWP EPCD, no differences in MEs were found between patients who had their MWP data evaluated during the initial MR compared with those who did not ($P = .908$). Using linear regression, no relationship was found between MEs and patient age or the total number of medications prior to admission in the 16 patients where MEs were detected.

Discussion

The role of pharmacists in the MR process is well established, and an accruing number of reports have described psychiatric pharmacists in this regard.[2,5,6,10,13–15] Lizer and Brackbill[15] found pharmacy-performed MR following a previous nursing-performed MR identified an average of 2.9 discrepancies per patient. Accomando and colleagues[14] identified 89% of behavioral health patients in the emergency department had a median of 4 medication discrepancies, where approximately 70% of all patients had a MR previously completed by a nonpharmacist health care professional. Pharmacy-performed MRs by Oliveira and colleagues[10] found that of 1147 reviewed medications, 359 had discrepancies, and 291 of these were not intentional after discussion with providers. To our knowledge, our "double-check" process using EPCD to evaluate the accuracy of pharmacy-performed MRs during acute psychiatric hospitalization is the first of its kind to be reported.

Although MEs occurred in reinterviewed patients identified with the EPCD "double-check," and those not reinterviewed, there was a statistically greater quantity of MEs in the former group. Therefore, the greatest number of MEs identified upon the psychiatric pharmacist's first review of a patient were found secondary to the EPCD "double-check." Errors of omission were the most common type we identified, which agrees with a previous MR study,[12] and a study showing discontinuation of nonpsychiatric medications upon psychiatric hospitalization may occur in 39% of patients.[4] Contrary to other studies, we found no relationship in the quantity of errors based on patient age or total medications prior to admission.[8,12] Our lack of relationship between quantification of MEs and admission location, use of MWP, origin of transfer, and intoxication status suggests errors may occur in all types of patients at our facility. We identified errors in last administered dose for both patients admitted on LAI antipsychotics, which highlights the importance of using objective information for these medications, such as contacting the patient's outside clinic.[5]

Our report has several limitations including (1) the short 28-day evaluation period, (2) a lack of randomization of the "double-check" process, (3) a lack of differentiation between prescription and over-the-counter medications during data collection, and (4) lack of external validity due to being performed at a single adult psychiatric unit. Future research on ME reduction is needed on a larger scale to evaluate our MR "double-check" process, particularly in states where MWPs are available.[17] In our experience, obtaining access to MWP EPCD can also be challenging and may vary based on state or institution.[17] We recommend contacting institutional MWP administrators as the first step to enroll in the use of this free technology.

Despite the initial MR process at our institution being performed by pharmacy staff, MEs due to inaccurate MRs accounted for the largest proportion of MEs on our unit. These MR-related MEs were initially discrepancies identified by the psychiatric pharmacist's EPCD "double-check" method. Through reinterview of patients with initial MR discrepancies, MEs were found and corrected. Although the EPCD "double-check" method is a process redundancy, in our experience it is not time intensive and can also supplement the pharmacist's knowledge related to a patient's past medication trials and medication adherence difficulties. Future research is needed to confirm our findings and provide external validity.

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