

# Nurse Practitioner—led Medication Reconciliation in Critical Access Hospitals

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## ABSTRACT

Medication discrepancies are common in cardiac patients discharged from hospital to home, leading to increased risk for adverse drug events and hospital readmissions. Medication reconciliation identifies discrepancies and reduces medication error—related adverse drug events. The objective of this study is to examine the effect of advanced practice nurse—managed medication reconciliation on the occurrence of medication discrepancies in elderly cardiac patients discharged from a rural hospital. The study findings showed that advanced practice nurse—managed medication reconciliation reduced the total unintentional medication discrepancies in elderly cardiac patients during the transition from the rural hospital to home.

**Keywords:** Cardiac, care transition, medication discrepancy, medication reconciliation, rural hospital

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Medication error—induced adverse events have a significant impact on hospital readmissions,<sup>1</sup> poor health outcomes, and decreased quality of life.<sup>2</sup> Elderly cardiac patients are at high risk of having medication error—induced adverse events because of their multiple chronic conditions (average 5 conditions per patient),<sup>3</sup> concurrent medication use (average 11.6 per patient), and multiple providers (average 3.6 per patient).<sup>2</sup> The annual costs associated with medication-related adverse events were \$177 billion in the elderly population with heart disease and other chronic conditions.<sup>2</sup>

Medication discrepancy refers to a difference between medication regimens derived from various sources (eg, medical records and patients' home medication lists).<sup>4</sup> More than 80% of patients discharged from hospital to home experienced a medication discrepancy (Figure 1).<sup>5</sup> The average number of medication discrepancies in elderly patients discharged from hospitals ranged from 3.3 to 4.2 per patient.<sup>4,6,7</sup> More than half of cardiac patients discharged from hospitals had medication discrepancies.<sup>8</sup> A study by Coleman et al<sup>9</sup> showed 14.3% of patients experiencing medication discrepancies were rehospitalized within 30 days of discharge compared with 6.1% of patients who did not have a discrepancy ( $P = .04$ ).

To reduce adverse events caused by medication discrepancies during care transitions,<sup>1,10</sup> the Joint Commission recommends the implementation of medication reconciliation in all health care settings.<sup>11</sup> The Joint Commission defines medication reconciliation as the process of comparing a patient's medication orders with all of the medications that the patient has been taking to identify medication discrepancies and prevent medication errors.<sup>12</sup> Despite its critical role, the implementation of meaningful medication reconciliation has proved to be difficult for all health care institutions.<sup>1</sup> In rural health care settings, additional challenges to implementing effective medication reconciliation processes include 1) time constraints, 2) limited resources, 3) lack of staff training and skills in collecting accurate and comprehensive medication history, 4) gaps in communication between health care providers across settings, 5) inaccurate and/or incomplete documentation, and 6) lack of compatible electronic health record systems and processes to transfer medication information between care settings.<sup>13</sup> Studies to identify effective medication reconciliation processes have been primarily conducted in urban hospitals.<sup>6,14–16</sup> Medication reconciliation programs in urban hospitals often involve interdisciplinary teams led by a 24-hour in-hospital pharmacist, which is usually not available in rural hospitals. Therefore, there is a lack of evidence

**Figure 1. Medication discrepancy.**

**Medication discrepancy:** A difference between medication regimens derived from various sources (e.g., medical records and patients' home medication lists).

- **Intentional discrepancy:** A medication prescribed differently from the patient's original medication order due to the patient's current health status (e.g., the reduced dosage of the antihypertensive agent due to patient's hypotensive state).
- **Unintentional discrepancy:** A medication prescribed differently from the original medication order without a documented reason.

regarding the effectiveness of medication reconciliation in rural hospitals.<sup>1</sup> The advanced practice nurse (APN) is the main workforce in rural health care settings,<sup>17</sup> yet little study has focused on the impact of APN-managed medication reconciliation programs on medication discrepancy and patient outcomes.

The purpose of this study is to examine the effectiveness of APN-managed medication reconciliation on transition-related medication discrepancies in cardiac patients discharged from a rural community hospital (ie, a critical access hospital). The long-term goal is to develop strategies to improve medication safety and quality of care during care transitions in rural communities. The aims of this study are 1) to discover if the pre- and postintervention groups have different occurrences in the total medication discrepancy between preadmission home medication and discharge medication lists (aim 1), 2) to discover if the pre- and postintervention groups have different occurrences in the unintentional medication discrepancy between preadmission home medication and discharge medication lists (aim 2), and 3) to discover if the pre- and postintervention groups have different occurrences in the intentional medication discrepancy between preadmission home medication and discharge medication lists (aim 3).

## METHODS

### Study Design

A prospective, pre-post study design was conducted in a rural critical access hospital. The study protocol

was approved by the university's institutional review board and the hospital medical ethics committee.

### Sample and Setting

The inclusion criteria were elderly cardiac patients (65 years of age or older) being admitted to the critical access hospital between February 2012 and May 2012 (preintervention group) or between August 2012 and November 2012 (postintervention group). The study excluded 1) patients who were not taking any prescribed medication at admission, 2) patients who were transferred to another hospital, and 3) patients who died during hospitalization.

### Procedures

The study was conducted in 2 phases: the pre-intervention and intervention phases (phase I and II), each of which lasted 12 weeks. In the preintervention phase (phase I), the medication reconciliation process followed the existing hospital protocol that required the nurse from the emergency department and/or inpatient department to conduct medication reconciliation without a standardized protocol or forms.

During the intervention phase (phase II), the APN-managed medication reconciliation protocol was implemented for 12 weeks. The APN was responsible for 1) reviewing and reconciling the admission medication list, 2) conducting the medication history interview to clarify the admission medication list and checking the medication containers brought from the patient's home, 3) contacting the patient's pharmacies and the providers' offices to clarify any inaccurate or incomplete medication information, 4) updating the admission medication list on electronic medical record (EMR) based on the collected information, and 5) presenting the final medication list to the hospital physicians and hospital pharmacist for potential inappropriate prescriptions. At discharge, the APN assisted in preparing the discharge medication list, educating the patient and their caregiver(s) of any medication changes, and sending the discharge medication summary to the patient's primary care provider and their community pharmacist.

### Data Collection

A total of 200 medical records were selected (100 records from each of the pre- and postintervention

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