



A review of medication reconciliation in Utah

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About this report

This report was produced in response to interest from the Utah Patient Safety Workgroup which sought to learn more about the topic of medication reconciliation (MR) in the form of a literature review. The workgroup is convened bi-monthly by staff of the Utah Department of Health (UDOH) Office of Health Care Statistics (OHCS) Patient Safety Surveillance & Improvement Program (PSSIP). This report provides an overview of medication reconciliation, and discusses national and local best practices and solutions to ensure the safety of patients with regard to medication administration in healthcare facilities.

Patient Safety Surveillance and Improvement Program

The PSSIP works to ensure patient safety events (injuries, death, or other adverse events) associated with healthcare delivery and administration of anesthesia are reported to the UDOH. The program also fosters conversations among healthcare providers on how to minimize adverse patient safety events in Utah.

About the Office of Health Care Statistics

The OHCS implements the goals and directions of the Health Data Committee. The office collects, analyzes, and disseminates health care data. These data help people understand cost, quality, access, and value in our healthcare system and allow users to identify opportunities for improvement.

The data sets under the purview of the office include:

- **Consumer Assessment of Healthcare Providers and Systems (CAHPS)**—Annual customer satisfaction surveys relating to health plan performance.
- **Healthcare Effectiveness Data and Information Set (HEDIS)**—Annual quality measures relating to health plan performance.
- **Healthcare Facility Data (HFD)**—A collection of information about all inpatient, emergency room, and outpatient surgery/diagnostic procedures performed in the state.
- **All Payer Claims Data (APCD)**—A collection of data about health care paid for by third parties, including insurers, plan administrators, and dental and pharmacy benefits plans.
- **Patient Safety Surveillance and Improvement Program (PSSIP)**—A reporting mechanism which captures patient safety events (injuries, deaths, or other adverse events) associated with healthcare delivery and administration of anesthesia, which fosters conversations on how to minimize adverse patient safety events in Utah

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Introduction

The *Institute for Healthcare Improvement* identifies medication reconciliation (MR) as a process that identifies the patient's most up-to-date medication list and uses this medication history to provide correct medication for each phase of care within the health care facility (Institute for Healthcare Improvement, 2022). MR compares a patient's prior and current medication records at the time of admission with any prescribed medications that result from the visit (Barnsteiner, 2008). It is a complex process that involves effective communication between hospital staff to ensure proper documentation and procedures are used to avoid medication errors.

There is an estimated median error rate of 8%–25% during medication administration in hospitals and long-term care facilities across the United States (Keers, et al., 2013). MR studies show that 1-2% of MR errors are potentially life-threatening with more than 90% of MR errors resulting in harm that prolonged the patient's hospitalization (Harper et al., 2021). MR has proven to contribute to patient safety. In the year 2005, *The Joint Commission*, an organization that aims to improve overall health care and accredits hospitals and healthcare organizations both globally and nationally, recognized the importance of medication reconciliation and listed it as a National Patient Safety Goal (NPSG) (The Joint Commission, 2021). The NPSGs are established by *The Joint Commission* as a formula to ensure patient safety across all healthcare settings. As the third NPSG, the primary focus is to improve the safety of medication use to help health care facilities decrease the amount of harm to the patients that occur due to medication errors (The Joint Commission, 2021). In order to provide patients with a higher level of safety, it is essential to be aware of the implications when MR practices are not established, as well as best practices

that should be implemented immediately among all health care facilities (da Silva & Krishnamurthy, 2016).

Implications

Electronic health records (EHR) have helped hospitals record the patient's medication regime. However, in a recent study, researchers found EHRs still fail to detect 33% of medication errors and drug interactions that put the patient's life at risk (Classen et al., 2020). Across the United States alone, an estimated 8,000 people die each year due to medication error (Tariq et al., 2021). This number does not reflect the countless patients who experience unreported medication error adverse events (Tariq et al., 2021). By comparison, statistics in England show MR errors contribute to around 1,700 deaths annually (Elliot et al., 2021).

MR errors may include, but are not limited to: wrong dose, dose omission, wrong medication, duplicate therapy, contraindication, and wrong formulation (Harper et al., 2021). These errors occur due to physical, psychological, and environmental factors such as small clerical errors due to misreading or mistyping, fatigue, and cognitive lapse from hospital staff, or even simply giving the wrong medication to the wrong patient or incorrect dosage preparation (Team Singlecare, 2022). These errors occur throughout the medication reconciliation process. Research shows more than 40% of medication errors occur in handoffs during admission, transfer, and patient discharge (Barnsteiner, 2008). Medication errors can occur during an electronic order, the transcription of information, or even unclear instructions to the patient (Harper et al., 2021). Studies showed in 2004 that 20% of MR errors resulted in harm to the patient (Barnsteiner, 2008). Additionally, MR errors are very costly. In 2007, it was estimated that costs related to MR errors added up to \$3.5 billion annually across the United States (World Health Organization, 2014). Costs of MR errors have since risen to more than \$40 billion in

2021, directly or indirectly affecting more than 7 million patients annually (Tariq et al., 2021). In the United States, at least one death each day is caused by MR errors and 1.3 million patients are injured each year (WHO, 2017). Globally, the total cost of medication errors is about 1% of the total global health expenditure (WHO, 2017). The good news is that many of these errors can be avoided if best practices are established and an efficient MR process is put in place.

Best Practices and Recommendations

To reduce the risk of MR errors, it's important to analyze where and how problems occur within each health care facility and establish several best practices. The focus should be on MR error prevention through both low-tech and high-tech solutions (Patient Safety Network, 2021). Low-tech solutions include standardized communication for medications, patient education and involvement, standardized processes to optimize nursing workflow, and frequent double checks for medication errors.

Research shows this type of standardized protocol to double check medication history and processes prior to administration, detects 93% of errors and inaccuracies (Patient Safety Network, 2021). High-tech solutions include barcode medication administration and smart infusion pumps (Patient Safety Network, 2021). Some studies found MR errors were reduced by 41% when the barcode system technology was used. (Patient Safety Network, 2021). These solutions must involve a collective and multidisciplinary approach from all parties involved in order to be successful.

Low-tech solutions

- Ensure the labels on medications are clear and standardized (Patient Safety Network, 2021).

- Color code the medications to help low-vision patients differentiate medications (Patient Safety Network, 2021).
- Simplify instructions for all high-risk medications by using models, pictures, or videos (Patient Safety Network, 2019). Written material should be simple enough that low-reading level patients can understand (Patient Safety Network, 2021).
- Standardized protocol for prescribing medication and dual verification before administration of medications (Patient Safety Network, 2021).
- Confirm patient comprehension of intended medication outcomes and signs and symptoms leading to adverse events by using a “teach back” or “show me” method (Patient Safety Network, 2021).
- Educate patients on the importance of double checking and re-reading labels upon picking up prescription refills (Patient Safety Network, 2021).
- Standardize processes to obtain, share, and utilize a comprehensive list of medication records (Barnsteiner, 2008) and medication history by all disciplines involved in a patient’s care (Lippincott Williams & Wilkins, 2012).
- Clearly define roles and responsibilities for all hospital staff across the different disciplines. (Barnsteiner, 2008).
- Create distraction-free, non-interruption zones to allow for safe medication administration preparation (Patient Safety Network, 2021).
- Dedicate a pharmacy role to specifically assist with the independent double checks and reconciliation of medication discrepancies (Harper et al.,2021).

High-tech solutions

- Incorporate bar coded medication administration (BCMA) technology to electronically link the right medication and appropriate dose for the designated patient (Patient Safety Network, 2021).
- Utilize dose error reduction software through smart infusion pumps for intravenous medication administration (Patient Safety Network, 2021).

Challenges of implementing best MR practices and recommendations

Historically in the United States, there have been many challenges associated with implementation of an effective MR program. One of these challenges is there is no standardized process for medication history collection, accessing and sharing medication history, or discharge medication instructions (Barnsteiner, 2008). Furthermore, many health care facilities struggle to determine whose responsibility it is to complete the task of medication reconciliation. In some studies “physicians suggested either pharmacists or nurses be responsible because it was viewed as a simple clerical task, whereas pharmacists and nurses often identified physicians as most appropriate because they ultimately decide the course of care” (Vogelsmeier et al., 2013). Clear and efficient communication among the healthcare team as well as a standardized delegation of responsibilities must be prioritized and addressed in order to reduce MR errors.

Utah-based MR practices

Many steps are underway to reduce medication errors in Utah. In 2019, Intermountain Healthcare prohibited pharmaceutical representatives and medication samples from entering any hospital throughout the state (Hammond, 2019). Through this groundbreaking policy, prescription patterns and patient safety have improved, and medicine costs, MR errors and adverse side effects have decreased (Hammond, 2019).

Molina Healthcare of Utah offers a health maintenance organization (HMO) insurance plan that allows patients to receive medication history services for a monthly fee. The insurance plan services include a thorough review of medication history before new prescriptions are administered and an ongoing review of prescription information and dosage checks. These services ensure medication guidelines are followed and support the MR process outside of the hospital setting (Molina Healthcare, 2018).

The Jordan Valley Medical Center in Utah is a local leader in using BMCA technology and an electronic medication administration recording (MAR) system. All patient health records and physician instructions are updated and shared electronically on one single health record. This improves information sharing and access to patient information and reduces the possibility of medication errors (Jordan Valley Medical Center, 2022).

A study led by Primary Children's Medical Center in Salt Lake City, Utah noted MR errors among children. This was largely due to the lack of parent availability at the time of admission. Parents are a reliable source for accurate medication history and if they aren't available at the time of admission, it contributes significantly to medication omissions (Stone et al., 2009). Due to medication omissions, almost "one in five admission medication orders were in error, affecting more than half of the children with medically complex conditions" (Stone et al., 2009). It is important for health care facilities to determine where and how MR errors occur in order to come up with appropriate solutions.

In order to decrease medication errors in Utah, it is suggested:

- Begin with a collection of the most attainable sources from each patient including a comprehensive medication list as well as hospital discharge history. Double check for medication inaccuracies and discrepancies (Comagine Health, 2020).
- Use open-ended questions to allow each patient to express their medication understanding in their own words (Comagine Health, 2020).
- Verify the patient's medication report with a family member or caregiver when possible (Comagine Health, 2020).
- Create structured prompts to identify the patient's current medication regimen as well as adherence to regimen (Comagine Health, 2020).
- Ask follow-up questions to gain more of an understanding for medications being taken (Comagine Health, 2020).
- Create a culture of staff empowerment, where everyone on the hospital staff is encouraged to voice their opinions without repercussions (Hansen, 2020).
- Attend semi-annual team simulations to educate and improve the hospital staff communication and culture (Hansen, 2020).
- Create a management system within the health care facility to ensure the completion of the semi-annual team simulations (Hansen, 2020).

Conclusion

Implementation of MR is essential to provide optimum care for patients and must be a priority in healthcare facilities. There is evidence that proper MR in the healthcare settings will not only decrease the amount of medication errors but further help establish practices that contribute to patient safety. These practices should include standardized processes that involve

comprehensive documentation that is communicated among all physicians, nurses, pharmacists, and all the hospital staff to eliminate discrepancies. There should be defined roles through every phase of care of the patient. Health care facilities that have implemented these best practices have noticed significant results. In fact, in one particular study, “medication error rates decreased from 7.2% to 3.4%” (Stone et al., 2009) which showcases the significance of establishment of proper MR processes. These crucial steps will reduce costs resulting from MR errors, reduce adverse effects among patients, and ultimately save lives.

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