

# The Impact of Medication Reconciliation

Jeffrey W. Gower  
Pharmacy Resident  
Saint Alphonsus Regional Medical Center

---

---

---

---

---

---

---

---

- ## Objectives
- Understand the definition and components of effective medication reconciliation
  - Recognize the prevalence of medication errors in health care
  - Identify when medication reconciliation should be performed
  - Review current literature and summarize the impact of medication reconciliation

---

---

---

---

---

---

---

---

## What is Medication Reconciliation?<sup>1</sup>

- **Shared Medication Reconciliation Definition**
  - Medication reconciliation is the comprehensive evaluation of a patient's medication regimen any time there is a change in therapy in an effort to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions, as well as to observe compliance and adherence patterns. This process should include a comparison of the existing and previous medication regimens and should occur at every transition of care in which new medications are ordered, existing orders are rewritten or adjusted, or if the patient has added non-prescription medications to their self-care

---

---

---

---

---

---

---

---

### Who Cares About Medication Reconciliation?

- American Pharmacists Association
- American Society of Health-system Pharmacists
- The Joint Commission
- Agency for Healthcare Research and Quality (AHRQ)
- and more!

---

---

---

---

---

---

---

---

### What is the Joint Commission?

- Formerly the Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
- Accreditation and certification recognized as symbol of quality reflecting organization's commitment to meeting set performance standards
  - **Mission:** Continuously improve health care for the public... by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value<sup>2</sup>

---

---

---

---

---

---

---

---

### What is AHRQ?

- Division of the US Department of Health and Human Services
- Invests budget in research, reports, and tools that make care safer and better for people in communities across the country
- **Mission:** to improve the quality, safety, efficiency, and effectiveness of health care for all Americans<sup>3</sup>

---

---

---

---

---

---

---

---

### Why Do They Care So Much?

- About half of hospital-related medication errors and 20% of adverse drug events (ADEs) are attributed to poor communication at transitions of care<sup>4</sup>
- At least half of patients have  $\geq 1$  medication discrepancy at hospital admission<sup>5</sup>
- The average hospitalized patient is subject to at least one medication error per day<sup>6</sup>

---

---

---

---

---

---

---

---

### Why Do They Care So Much?

- Joint Commission 2005 – Medication reconciliation as National Patient Safety Goal 8
  - 2011 revision included it within NPSG 3<sup>7</sup>

NPSG.03.06.01 Record and pass along correct information about a patient's medicines. Find out what medicines the patient is taking. Compare those medicines to new medicines given to the patient. Make sure the patient knows which medicines to take when they are at home. Tell the patient: it is important to bring their up-to-date list of medicines every time they visit a doctor.

---

---

---

---

---

---

---

---

### Why Should *You* Care So Much?

- Anywhere you work as a technician, you will deal with patients whose therapy has seen changes!
- Medication reconciliation is essential to the reduction of medication errors in prescribing, assurance of safe medication use by patients, and appropriate monitoring and adjustment of drug therapy.<sup>8</sup>

---

---

---

---

---

---

---

---

**What are the Components of a Medication Reconciliation?<sup>9</sup>**

- Purpose: “Record and pass along correct information about a patient’s medications”<sup>7</sup>
  - Create a complete & accurate list of patient’s pre-admission medications
  - Compare list against the physician’s orders
  - Alert physician to discrepancies and, if appropriate, changes are made to the orders

---

---

---

---

---

---

---

---

**What are the Components of a Medication Reconciliation?<sup>10</sup>**

- Include all:
  - Prescription medications
  - OTC drugs or herbal supplements
  - Nutritional supplements and vitamins
  - Vaccines
  - Parenteral nutrition or IV solutions
  - Radioactive medications
  - Blood derivatives
  - Diagnostic and contrast agents

---

---

---

---

---

---

---

---

**What are the Components of a Medication Reconciliation?<sup>10</sup>**

- Many clinicians may not think of OTC drugs and dietary supplements as medications
  - Many patients may not think of OTC drugs, etc as medications either!
  - Include any product that could interact with prescription medications

---

---

---

---

---

---

---

---

### What are the Components of a Medication Reconciliation?<sup>11</sup>

- Also include for each agent:
  - Dosage forms
  - Doses
  - Frequencies
  - Routes of administration
- Date and time last taken
- Allergies, intolerances, adverse effects
  - Be sure to get medication AND problem caused

---

---

---

---

---

---

---

---

### When to do Medication Reconciliation?<sup>9</sup>

- Inpatient Admission
- On admission to outpatient service where medication may be administered
- Intra-hospital transfer to different level of care
- At the time of discharge from the hospital
- Every physician office visit
- Every retail pharmacy visit

---

---

---

---

---

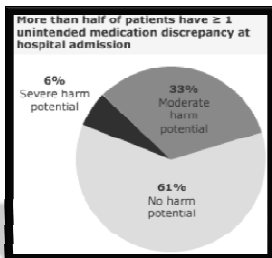
---

---

---

### Admission Medication Errors<sup>5</sup>

- Admission error data from one study
  - Most common? Omitting regularly used med (46.4%)



---

---

---

---

---

---

---

---

### Admission Medication Errors<sup>12</sup>

- Admission errors per another study
  - 42% had ≥1 pre-admit medication list error (PAML)
  - 18% had ≥1 clinically relevant error
    - Associated with older age and number of pre-admit meds
  - Fewer PAML errors when recent med list present in electronic medical record
  - Clinically relevant admission order errors also associated with older age, number of pre-admission meds

---

---

---

---

---

---

---

---

### How do we Make Errors on Admission?

- Don't take accurate record of home meds
- Transcription mistakes by record taker
- Reporting mistakes from patient/caregiver
- Lack of time to search for info!
  - Nurses have spent > 1 hour per patient for admission or transfer<sup>13</sup>
    - Includes asking patient, checking with patient pharmacy and primary care physician

---

---

---

---

---

---

---

---

### Admission Medication Reconciliation<sup>11</sup>

- Pre-admit medication not ordered? Not explicitly declared to be inappropriate?
  - Contact physician
  - Physician should order med or confirm that omission was deliberate
- Prescriber should routinely document reason for excluding any meds on admission
- Standardized forms and standard location are critical to success (EHR!)

---

---

---

---

---

---

---

---

### Intra-hospital Transitions<sup>11</sup>

- Transfer may = new medication orders
  - Before transfer, nurse or pharmacist should compare meds taken prior to admission and those ordered in the sending unit against meds in transfer orders
  - Any pre-transfer medication not ordered again or explicitly declared to be inappropriate?
    - Contact provider!
  - Physician should either order the medication or formally confirm that omission is deliberate

---

---

---

---

---

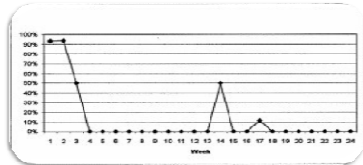
---

---

---

### Intra-hospital Transitions<sup>14</sup>

- One study's findings on incorporating med rec
  - Baseline medication order changes: 94%
    - Change in orders upon surgical ICU discharge
  - Following med rec initiative for 24 weeks:
    - Nearly eliminated discharge order errors




---

---

---

---

---

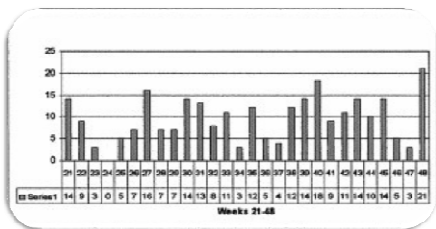
---

---

---

### Intra-hospital Transitions<sup>14</sup>

- Number of medication errors per week prevented through medication reconciliation?




---

---

---

---

---

---

---

---

### Discharge Medication Errors

- Results of studies
  - 42% of patients had  $\geq 1$  errors in discharge medication orders<sup>15</sup>
    - Most often involved not restarting home meds
  - 59% of discrepancies not corrected could have resulted in patient harm<sup>16</sup>

---

---

---

---

---

---

---

---

### Discharge Medication Errors

- Per another study<sup>12</sup>
  - Discharge medication errors more likely for every pre-admit medication list error and the number of meds changed prior to discharge
- Failure to note which hospital meds to keep versus home meds
  - “First understood discharge error” example
- Communication breakdown between providers

---

---

---

---

---

---

---

---

### Discharge Medication Error Improvement Efforts<sup>11</sup>

- Review home med list, inpatient medication list, compare to discharge orders
  - Any home or hospital meds not accounted for? Any explanation of why omitted? Contact provider!
- Integrate med list into discharge instructions for the patient and discharge summary for the primary provider
  - Make sure primary provider aware of hospital course and medications

---

---

---

---

---

---

---

---



### Discharge Medication Error Improvement Efforts<sup>17</sup>

- Give the patient responsibility
  - Written information on meds patient should be taking when discharged
  - Explain importance of self-managing med info
    - Give a list to primary care provider
    - Update the list when meds change
    - Carry medication information at all times in case of an emergency
  - Ideally, this process also takes place with each provider and pharmacy visit

---

---

---

---

---

---

---

---

### Studies of Impact of Medication Reconciliation<sup>18</sup>

- Med rec for discharge to skilled-nursing facility
  - Investigated 30-day readmit rate for cardiac and medical patients
  - Intervention group had readmission rate of 5.40%
  - Control group readmit rate of 9.49%
  - After extension of med rec program hospital wide, readmission rate leveled to 6.7%

---

---

---

---

---

---

---

---

### Studies of Impact of Medication Reconciliation<sup>19</sup>

- Pharmacist reconciliation of discrepancies on admission orders and medication histories
  - Pharmacist interview of direct-admit patient within 24-48 hours post-admit to medical/surgical floor
  - This followed review of med list on admit or admission orders (per nurse and physician)
  - Found > 50% had discrepancies and required clarification
    - In absence of pharmacist intervention, 22% could have done harm inpatient, 59% possibly beyond discharge

---

---

---

---

---

---

---

---

### Studies of Impact of Medication Reconciliation<sup>20</sup>

- Use of pharmacy technicians for med rec
  - Goal of 80% ↓ in potential adverse drug events in surgical patients over 4 months
    - Defects on admission med histories as marker
  - Called patients before surgical admission or saw face to face
    - Pharmacist reviewed tech's data to check for defects
    - Completed standardized med sheet given to surgeon
  - Positions created for technicians with special training

---

---

---

---

---

---

---

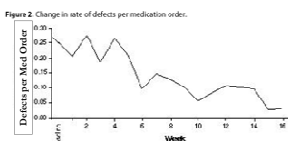
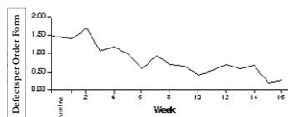
---

---

---

### Studies of Impact of Medication Reconciliation<sup>20</sup>

- Use of pharmacy technicians for med rec
  - Defects per form
    - Mean ↓ from 1.45 to 0.76
    - 0.26 in 16<sup>th</sup> week
  - Defects per order
    - Mean ↓ from 0.25 to 0.12
    - 0.035 in 16<sup>th</sup> week
  - Both = 82% ↓




---

---

---

---

---

---

---

---

---

---

### Studies of Impact of Medication Reconciliation<sup>21</sup>

- Pharmacy techs or pharmacists in taking history?

Table 2. Discrepancies for Prescription and Over-the-Counter Drugs

Product Type	No. of Patients with Discrepancies*	
	Pharmacist Performing Reconciliation	Technician Performing Reconciliation
<b>Prescription drugs</b>		
No discrepancies	47	50
At least 1 discrepancy	12	9
<b>Over-the-counter products</b>		
No discrepancies	52	53
At least 1 discrepancy	7	6
<b>Discrepancies per patient (mean ± SD)</b>		
Prescription drugs	0.25 ± 0.54	0.24 ± 0.68
Over-the-counter products	0.14 ± 0.39	0.15 ± 0.46

---

---

---

---

---

---

---

---

---

---

### Studies of Impact of Medication Reconciliation<sup>21</sup>

- Pharmacy techs or pharmacists in taking history?
  - No significant difference between two groups
    - In prescription or OTC discrepancy presence
    - In mean number of discrepancies for each med type
    - Severity of discrepancies not significantly different
  - Both groups superior to national average for unintended discrepancies

---

---

---

---

---

---

---

---

### Studies of Impact of Medication Reconciliation<sup>22</sup>

- Systematic review of med rec studies
  - 26 studies met inclusion criteria, 10 RCTs
  - Only 6 deemed good quality
  - Involved studies showed ↓ discrepancies
  - 5/6 good studies saw ↓ potential adverse drug events
  - 2 showed ↓ adverse drug events
  - 2/8 saw improved post-discharge healthcare use
- Pharmacy intervention, IT intervention, and focus on high-risk patients deemed most robust

---

---

---

---

---

---

---

---

### So is There an Impact?

- Reviewing the studies
  - Most studies not randomized, controlled trials
  - Many are small sample size, poor generalization
  - Many lack data for ↓ in adverse drug events or readmit
- Consider: What impact is intended?
  - Consider best practice and patient care
  - Value of markers and altering potential harm
  - Most better studies show positive improved patient healthcare!

---

---

---

---

---

---

---

---

**Questions?**

---

---

---

---

---

---

---

---

**References**

1. Chen D, Burns A. ASHP–APhA Medication Reconciliation Initiative Workgroup Meeting, February 12, 2007: Summary and Recommendations. [www.ashp.org/s\\_ashp/docs/files/MedRec\\_ASHP\\_APhA\\_Wkgrp\\_MtgSummary.pdf](http://www.ashp.org/s_ashp/docs/files/MedRec_ASHP_APhA_Wkgrp_MtgSummary.pdf)
2. The Joint Commission. Mission statement. Available at: [http://www.jointcommission.org/about\\_us/about\\_the\\_joint\\_commission\\_main.aspx](http://www.jointcommission.org/about_us/about_the_joint_commission_main.aspx)
3. Agency for Healthcare Research and Quality. Mission statement. Available at: <http://www.ahrq.gov/about/index.html>
4. Barnsteiner JH. Medication reconciliation: transfer of medication information across settings: keeping it free from error. *J Infus Nurs.* 2005;28 (2 suppl):31-6

---

---

---

---

---

---

---

---

**References**

5. Cornish PL, Knowles SR, Marchesano R, et al. Unintended medication discrepancies at the time of hospital admission. *Arch Intern Med.* 2005;165:424-429.
6. Institute of Medicine. Preventing Medication Errors. Washington, DC: The National Academies Press; 2007.
7. Joint Commission. Hospital national patient safety goals (2013). Available at: [http://www.jointcommission.org/assets/1/6/2013\\_HAP\\_NPSG\\_final\\_10-23.pdf](http://www.jointcommission.org/assets/1/6/2013_HAP_NPSG_final_10-23.pdf)
8. Steeb D, Webster L. Improving Care Transitions: Optimizing Medication Reconciliation (2012). Available at: <http://www.ashp.org/DocLibrary/Policy/PatientSafety/Optimizing-Med-Reconciliation.aspx>

---

---

---

---

---

---

---

---

### References

9. Nichol, Natasha. Medication Reconciliation: Everything you need to know in 2.5 hours (2007). American Society of Health-System Pharmacists Presentation.
10. Barnsteiner JH. Chapter 38: medication reconciliation. In: Patient Safety and Quality: An Evidence-Based Handbook for Nurses: Vol. 2; 459-72.
11. Institute for Healthcare Improvement (2011). Reconcile Medications at All Transition Points. Available at: <http://www.ihc.org/knowledge/Pages/Changes/ReconcileMedicationsatAllTransitionPoints.aspx>>
12. Salanitro AH, Osborn CY, Schnipper JL, et al. Effect of Patient- and Medication-Related Factors on Inpatient Medication Reconciliation Errors. *Journal of General Internal Medicine* 2012; 27(8):924-32.

---

---

---

---

---

---

---

---

### References

13. Rozich JD, Howard RJ, Justeson JM, et al. Patient safety standardization as a mechanism to improve safety in health care. *Jt Comm J Qual Saf* 2004; 30(1):5-14.
14. Pronovost P, Weast B, Schwarz M, et al. Medication reconciliation: A practical tool to reduce the risk of medication errors. *J Crit Care* 2003;18(4):201-5.
15. Moore C, Wisnivesky J, Williams S, et al. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. *J Gen Intern Med* 2003;18(8): 646-51.
16. Sullivan C, Gleason KM, Rooney D, et al. Medication reconciliation in the acute care setting: opportunity and challenge for nursing. *J Nurs Care Qual* 2005; 20(2):95-98.

---

---

---

---

---

---

---

---

### References

17. Agency for Healthcare Research and Quality. Chapter 3: Developing Change: Designing the Medication Reconciliation Process: Medications at Transitions and Clinical Handoffs (MATCH) Toolkit for Medication Reconciliation (Aug 2012). Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/match3.html>
18. Lu Y, Clifford P, Bjorneby A, et al. Quality improvement through implementation of discharge order reconciliation. *Am J Health-Syst Pharm* 2013 (70):815-820.
19. Gleason KM, Groszek JM, Sullivan C, et al. Reconciliation of discrepancies in medication histories and admission orders of newly hospitalized patients. *Am J Health-Syst Pharm* 2004; 61:1689-95.

---

---

---

---

---

---

---

---

## References

20. Michels RD, Meisel SB. Program using pharmacy technicians to obtain medication histories. *Am J Health Syst Pharm* 2003; 60(19): 1982-1986.
21. Johnston R, Saulnier L, Gould O. Best possible medication history in the emergency department: comparing pharmacy technicians and pharmacists. *Can J Hosp Pharm* 2010;63(5):359-365.
22. Mueller SK, Sponsler KC, et al. Hospital-Based Medication Reconciliation Practices: A Systematic Review. *Arch Intern Med* 2012; 172(14)

---

---

---

---

---

---

---

---