Medication Reconciliation as a Patient Safety Practice During Transitions of Care

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Recorded Version

Agency for Healthcare Research and Quality

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Making Health Care Safer II: An Updated Critical Analysis of the Evidence for Patient Safety Practices

AHRQ’S MISSION

To produce evidence to make health care safer, higher quality, more accessible, equitable, and affordable, and to work with the U.S. Department of Health and Human Services and other partners to make sure that the evidence is understood and used.

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Learning Objectives

1. Define medication reconciliation as a formal patient safety practice.

2. Identify four sources of medication information.

3. Describe what is known about potential harms associated with unintended medication changes at care transitions.

4. Describe the steps outlined in the MATCH toolkit for evaluating, designing, and implementing medication reconciliation processes.
Janice L. Kwan, MD, MPH, FRCPC
Introduction to Patient Safety

- Preoperative and Anesthesia Checklists
- Preventing Pressure Ulcers
- Preventing Health Care–Associated Infections
What Will We Cover?

• Unintended medication discrepancies
• Medication reconciliation interventions
• Beneficial effects of medication reconciliation
• Harms associated with medication reconciliation
• Implementation and in what context
• Effect of context on effectiveness
• Cost
• MATCH toolkit to implement in your practice
Case Study: Medication Reconciliation

Evaluation
Case Study: Medication Reconciliation

Discrepancy
Case Study: Medication Reconciliation

Resolution
A Note about Clinical Pharmacists

- Most of the evidence includes the use of clinical pharmacists
- Accreditation standards do NOT require use of pharmacists
- Medication reconciliation in practice may not achieve the same effects
What is the Patient Safety Issue?

- Transitions in care
  - Admission and discharge from acute care hospital
  - Changes in setting within a hospital
- Errors in medications result from
  - Poor communication
  - Inadvertent information loss
Unintentional Medication Discrepancies

- Unintentional Medication Discrepancy
  - Example: Physician unaware of the full list of preadmission medications.
  - Example: Physician does not have accurate information on the most recent dose.
Incidence of Medication Discrepancies

• Up to 67% of patients upon admission to hospitals*
• Internal hospital transfers may result in slightly higher rates
  ▶ Example: Transfer from intensive care unit to ward
• ≥40% of patients at hospital discharge

Risk for Unintentional Discontinuation

Population

Ontario, Canada

Admitted

Risk of Unintentional Discontinuation

Not Admitted

Control

Patients

Intensive Care Unit

Other Unit

>
Clinical Risk

- Estimated proportion of all discrepancies likely to cause clinical problems:
  - Wide range: 11%-59%
- Omissions
  - Key medications inappropriately not started or continued
  - 46%-56% of all discrepancies
- Commissions
  - Discontinued medications inadvertently re-started
What is Medication Reconciliation?

- Formal, systematic strategy to overcome medication information communication challenges.
- Aims to reduce unintended medication discrepancies that occur at transitions in care.
- Health care providers work with patients and families to ensure accurate information.

Sources of Medication Information:
- Patient/Family interview
- Medication vials/list
- Government medication database
- Previous patient health records

Best Possible Medication History (BPMH):
Medications ordered during admission and internal transfer

Decision to discharge

Best Possible Medication Discharge Plan (BPMDP):
- Reconciled discharge prescriptions
- Physician discharge summary
- Patient medication schedule

BPMDP communicated to patient and next provider
Best Possible Medication History

- More comprehensive than routine medication history
- Systematic process for interviewing patient and family
- Review of at least one reliable source of information
  - Central medication database
  - Medication vials
  - Contact with community pharmacy
What are the Effects of Medication Reconciliation?

Outcomes
- Clinically significant discrepancies
- Emergency department visits
- Hospital readmission

Patients undergoing transitions of care

Medication reconciliation interventions

Harms of medication reconciliation interventions
Systematic Review Methods

- Literature Search
  - MEDLINE
  - Embase
  - Cochrane
  - Reference lists

- Assessed for Eligibility
  - Clinically significant discrepancies
  - Hospital utilization

- Evidence Synthesis
  - Meta-analysis
  - Qualitative synthesis
## Included Studies

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The Intervention Components

- BPMH w/ admission reconciliation
- Discharge reconciliation w/ prescribing physician
- Discharge reconciliation is interprofessional
- Electronically generated discharge prescription
- Attention to broader medication issues
- Pharmacist-led medication counseling prior to discharge
- Communicating medication changes to community pharmacy
- Post-discharge follow-up phone call
Clinically significant discrepancies

- All unintentional discrepancies that were not considered “trivial,” “minor,” or “unlikely to cause harm”
- Corresponds to potential adverse drug events
Clinically Significant Unintended Medication Discrepancies

Median and Interquartile Range for the Number of Clinically Significant Unintended Medication Discrepancies per Patient

Schnipper, 2009
Pippins, 2008
Wong, 2008
Vira, 2006
Cornish, 2005
Gleason, 2004
Lee, 2010
Gleason, 2010
Stone, 2010
Coffey, 2009
Kripalani, 2012
Kripalani, 2012
Median, IQR
Clinically Significant Unintended Discrepancies

Proportion of clinically significant unintended discrepancies

- Mean = 35.1%
- Heterogeneous ($I^2=92\%$)
- Range = 15\%-54\%
- Median = 34\%
- IQR = 28\%-49\%
Patients with Clinically Significant Unintended Discrepancies

Proportion of patients with clinically significant unintended discrepancies

- Mean = 39.3%
- Heterogeneous ($I^2=95\%$)
- Range = 15\%-60\%
- Median = 45\%
- IQR = 31\%-56\%
Preventable Adverse Drug Events

178 pts
Discharged

Intervention

- Medication reconciliation
- Counseling by pharmacist
- Follow-up phone call w/in 5 days

1%
Preventable adverse drug events

Control

- Counseling by nurse
- Pharmacists reviewed medication orders

11%
Preventable adverse drug events
Preventable Adverse Drug Events

• Cluster randomized controlled trial
  ► 14 medical teams
  ► 2 hospitals

• Intervention
  ► Web-based app using electronic medical record (EMR)
    □ EMR included ambulatory visits
  ► Created preadmission medication list

• Results
  ► Hospital A: adjusted relative risk for potential adverse drug events = 0.72 (95% CI, 0.52-0.99) – Statistically significant
  ► Hospital B: adjusted relative risk for potential adverse drug events = 0.87 (95% CI, 0.57-1.32) – Not statistically significant

• Discussion
  ► Authors attribute difference between 2 hospitals to variation in the degree to which they integrated the intervention
• Emergency department visits or readmission within 30 days:
  ▶ Proportion of patients (9 studies)
    o Median 28% (IQR, 20%-32%)
  ▶ Rate of utilization (7 studies)
    o Median 30% (IQR, 22%-31%)
    o No statistically significant difference between intervention and control groups
Emergency department visits or readmission within 30 days:

- Reduced by 23% compared with controls
  - 95% CI, 5%-37%; I²=24%
  - Statistically significant

**NOTE:** Pooled result of 3 studies driven by one intensive intervention comprised several efforts aimed at reducing readmissions.
Hospital Utilization at 12 Months

- Readmission rates at 12 months:
  - Study not included in meta-analysis
  - 16% reduction in all hospital visits in intervention group – Statistically significant
  - Intervention included:
    - Pharmacists identifying drug-related problems beyond unintended discrepancies
    - Pharmacists delivering counseling to patients at admission and discharge
    - Pharmacists telephoning patients 2 months after discharge
A Comment on Measuring Hospital Utilization

- Is 30 days after discharge long enough?
- Inadvertent discontinuation of certain medications may result in adverse effects requiring hospital utilization in the long term, but not necessarily within 30 days.
What are the Harms of Medication Reconciliation?

- Transition in care
- Mistake in medication reconciliation
- Mistake in patient record
- Potential clinical effect
What are the Harms of Medication Reconciliation?

- Reliance on pharmacists
- Clinical pharmacists in short supply
- Risk of taking pharmacist away from other important patient safety practices
How has the patient safety practice been implemented?

...and in what context?
Bronze

Best Possible Medication History (BPMH) with admission reconciliation
Silver Level

Bronze level +
Discharge reconciliation by prescribing physician
Discharge reconciliation is interprofessional
Electronically generated discharge summary and prescriptions
Platinum Level

Bronze

Silver

Gold

Platinum

Gold level +
Attention to broader medication issues
Appropriateness of medication choices
Diamond Level

- **Platinum + Pharmacist counseling**
- **Communicating directly with patient’s pharmacy**
- **Follow-up phone call to patient**

Bronze
Silver
Gold
Platinum
Diamond
• No studies assessed effect of context on effectiveness
• Review limited to:
  ► Hospital setting
  ► Interventions including a clinical pharmacist
• Medication reconciliation interventions have only been assessed in academically affiliated hospitals using clinical pharmacists
Are There Any Data About Costs?

• Cost-effectiveness of 5 pharmacist-led strategies
  ► £10,000 = $16,272 per quality-adjusted life-year (2009 exchange rate)
  ► Limit: Assumptions about reduction in actual vs potential adverse drug events
Applicability
Limitations of the Evidence

- Discrepancy in findings from 2 RCTs
  - 1 reported reduction in preventable adverse drug events
  - 1 reported mixed results
    - Statistically significant reduction at one site but not the other
Limitations of the Evidence

• Judgment about potential clinical importance of medication discrepancy
  ► Inter-rater reliability
  ► Speculation about:
    o Potential risk
    o Likelihood that the discrepancy will persist
    o How long the discrepancy will persist before being detected
What Did We Learn From This Review?
Serious Adverse Drug Events

- Variation in frequency of non-trivial discrepancies
- Extremely severe discrepancies rarely reported
- Post-discharge adverse drug events could be related to drug monitoring, NOT medication reconciliation
• Potential adverse drug events
  ▶ Significant reduction at 1 of 2 study hospitals
• 30 days after discharge
  ▶ Reduction in preventable adverse drug events
  ▶ No difference in total adverse drug events
Hospital Utilization

- No reduction in hospital utilization within 30 days
- May result in reduction when bundled with other interventions aimed at improving transitions in care
- May reduce utilization in long term
How Can I Implement Medication Reconciliation in My Practice?

Available at: http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/
How to Use This Toolkit

1. Building the Project Foundation: Gaining Leadership Support Within the Organization
2. Building the Project Foundation: Project Teams and Scope
3. Developing Change: Designing the Medication Reconciliation Process
4. Developing and Pilot Testing Change: Implementing the Medication Reconciliation Process
5. Education and Training
6. Assessment and Process Evaluation
7. High-Risk Situations for Medication Reconciliation
MATCH Work Plan

Work Plan available at:
Chapter 1: Building the Project
Foundation: Gaining Leadership Support

**Talking Points**

- Medication reconciliation is a patient safety issue
- Resource justification to produce a successful project
- Linking medication reconciliation with other initiatives
Chapter 2: Building the Project Foundation: Project Teams and Scope

- Identify and assemble interdisciplinary team
- Create a flowchart of the current medication reconciliation process
- Develop a project charter or work plan for improvements
- Establish a measurement strategy
Chapter 3: Developing Change: Designing the Process

Tools for Designing a Medication Reconciliation Process

- Guiding principles
- “One Source of Truth”
- Defining roles and responsibilities
- Integrating medication reconciliation into the existing workflow
- Flowcharting the design
- Designing the process
- Examples of electronic, paper-based, or hybrid systems
Chapter 4: Developing and Pilot Testing Change: Implement the Process

- Pilot test the solution:
  - Implement on a small scale
  - Receive input
  - Identify major gaps within the process
  - Confirm utility within current workflow
  - Weaknesses can be addressed before facility-wide implementation
Chapter 5: Education and Training

- **Multidisciplinary training supported by key leaders:**
  - Promotes team approach
  - Creates appreciation of interdependency of each discipline
  - Defines roles and responsibilities
  - Ensures consistent training for all disciplines
Chapter 5: Education and Training – Overarching Message

1. Obtain, document, and verify current medication list
2. Compare this list with medication ordered
3. Ensure that any discrepancies are appropriate and intentional
4. Resolve unintended discrepancies with supporting documentation
5. Communicate medication information during transitions in care
Chapter 6: Assessment and Process Evaluation

- Audit critical to assess adoption
- Perform at all transitions of care
- Involve each discipline
- Audit can be:
  - Electronic or manual
  - Prospective or retrospective
- Quantity audit assesses:
  - Adoption
  - Adherence
- Quality audit assesses:
  - Impact on patient safety
• Patients at increased risk for medication reconciliation errors:
  ► Limited health literacy
  ► Cognitive impairment
High-Risk Situations: Health Literacy

- Patients with limited health literacy:
  - Difficulty processing information about health and health care encounters
  - Difficulty adhering to a medication regimen
  - Difficulty providing an accurate medication history
  - Difficulty understanding prescription instructions and warning labels
  - At discharge, changes to prior medications or new medications may require more targeted efforts from clinicians
High-Risk Situations: Cognitive Impairment

• Cognitive impairment may pose challenges:
  ► When obtaining medication history from patient upon admission
  ► When providing medication education and counseling to patient at discharge

• Screening for cognitive impairment:
  ► Mini-Mental State Examination (MMSE)
    o Takes ~ 10 minutes to administer
    o [http://www.minimental.com](http://www.minimental.com)
  ► Mini-Cog
    o Takes less than 5 minutes to administer
    o 3-item recall test for memory and simply scored clock-drawing test
    o [www.alz.org/documents_custom/minicog.pdf](http://www.alz.org/documents_custom/minicog.pdf)
CONCLUSIONS
Conclusions of the Systematic Review

• Where to direct resources?
• Almost all evaluated interventions involved the use of clinical pharmacists
• Studies with high-risk patients
  ▶ Did not report higher rates of clinically significant unintentional discrepancies
  ▶ Did not show larger effects on readmissions
Conclusions of the Systematic Review

• Results could reflect
  ► Limited number of studies
  ► Limitations of the high-risk criteria used

• High-risk patients may take large numbers of medications
  ► Regimens may remain stable
  ► Regimens may be well-known
  ► Direct risk factor may be frequent or recent changes
    ○ This would be ascertained through a thorough medication history, like BPMH
Implementing Change in Your Practice

• Medication reconciliation process should:
  ► Encompass all areas where patient transitions occur
    o Admission, transfer, and discharge
  ► Follow your patients in the post-acute setting or at home
  ► Involve all caregiver disciplines
  ► Be integrated into caregiver daily workflow
  ► Have the support of facility leadership

• Interventions and improvements must be appropriately implemented as process gaps are identified, and these corrections should be measured for the effectiveness of your patient safety improvement efforts.
Using the MATCH Toolkit

Available at:
Wrap-up

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Next Live Webinar: June 24, 2015; 1:00 PM – 2:00 PM EDT

Topic: Obtaining Informed Consent from Patients and Ensuring Documentation of Patients’ Preferences for Life-Sustaining Treatment

Presenters: Kristina Cordasco, MD, MPH, MSHS, and Sydney Dy, MD