Medication Reconciliation in the Era of Telepharmacy: An Innovator’s Tale

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Medication Reconciliation/Telepharmacy

Practice Report

Providing nighttime pharmaceutical services through telepharmacy

CHRISTOPHER A. KEEYS, KENNETH DANDURAND, JUSTINE HARRIS, LOLA GBADAMOSI, JOAN VINCENT, BLAIR JACKSON-TYGER, AND JYMEANN KING

Am J Health-Syst Pharm. 2002; 59:716-21
Medication Reconciliation/Telepharmacy- After Hours Experience

- **Problem:** Over 50% of medication errors are due to prescribing errors
- **Solutions:**
  - Prospective review of orders by pharmacists
  - Preventing non-pharmacy personnel from accessing pharmacies after hours
- **Challenge:** More than 3000 hospitals nationwide in 1999, including acute care, rehabilitation, and psychiatric facilities, closed their pharmacy departments at night.
Medication Reconciliation/Telepharmacy- After Hours Experience

- Order Clarifications (Interventions) After Hours:
  - 226/1099 orders (21.7% of all orders reviewed) within an initial 3-month period
  - A total of 125/226 orders clarified were resolved directly with a physician or nurse during the night shift.
Medication Reconciliation/Telepharmacy - After Hours Experience

- Top Intervention Types Afterhours
  - lack of required information, e.g., allergy history, weight (n = 42)
  - restricted drugs, drugs protocol/guideline noncompliance (n = 41)
  - Cross-allergenicity (n=35)
Medication Reconciliation/Telepharmacy - After Hours Experience

• Top Intervention Types Afterhours
  ▪ pharmacokinetic dosing e.g., dosage adjustment for renal status/age (n = 25)
  ▪ therapeutic interchanges or formulary alternatives (n = 15)
  ▪ illegible handwriting or incomplete orders (n = 11)
Remote order entry: Innovative practice to reduce distractions and offer 24-hour pharmacy service

From the April 17, 2002 issue
Medication Reconciliation/ Telepharmacy- After Hours Experience

- After Hours Medication Order Review by Hospitals (N = 425)
  - 2005: 30.1%
  - 2014: 40.2%

- 24-hr Rx
  - 2005: 3.1%
  - 2014: 20.5%

- Telepharmacy Outsourced
  - 2005: 5.3%
  - 2014: 14.5%

- Telepharmacy- Affiliate
  - 2005: 1.9%
  - 2014: 3.4%

- On Call
  - 2005: 59.6%
  - 2014: 21.4%

- No Review
  - 2005: 59.6%
  - 2014: 21.4%

Medication Reconciliation/ Telepharmacy

Problem

• Based on the literature, past experience has shown that a lack of medication reconciliations accounts for 46% of all medication errors and approximately 20% of adverse drug events in the hospital setting.

Medication Reconciliation/Telepharmacy and Medication Use Process

Order/Prescribing

Preparation/Dispensing

Transcription/Administration

Monitoring/Patient Education
Medication Reconciliation Process – 5 Steps

1. Develop a list of current medications (and allergies)

2. Develop a list of medications to be prescribed

3. Compare the medications on the 2 lists

4. Make clinical decisions based on comparison

5. Communicate the list to the appropriate caregiver and patients
Medication Reconciliation/ Telepharmacy
Transitions of Care

- Patient
  - Between Providers
  - Levels of Care
  - Care Settings
Medication Reconciliation/Telepharmacy- Case Study

• The ED physician in a Massachusetts hospital prescribes Zyvox 600mg twice a day to an adult male for persistent cellulitis. The same retail pharmacy dispensed the Zyvox that dispensed his other prescriptions including Celexa 20mg daily and Ambien 10mg at bed time.
Medication Reconciliation/ Telepharmacy- Case Study

- Severe headache, tremors, neck stiffness, increased HR and BP brought him back to the ED within 24 hours with r/o meningitis.

- The initial workup was negative. After review by their clinical pharmacist via phone, the Zyvox was stopped and Bactrim was started for cellulitis.

- The event resolved without hospitalization. The suspected ADR - serotonin syndrome due to an unreconciled DDI (Zyvox and Celexa)
Medication Reconciliation/ Telepharmacy

“Pharmacies miss half of dangerous drug combinations” (Chicago Tribune, December 15, 2016)

- N = 255 Pharmacies - Chain and Independents in Chicago area
- 52% failed test of major drug-drug interactions
Medication Reconciliation/ Telepharmacy

Challenge
Performing medication reconciliations competently requires effective systems, time, and accuracy. Individuals performing medication reconciliation should have extensive medication knowledge and understanding of medication use across the continuum of healthcare.

<table>
<thead>
<tr>
<th>Prescribing</th>
<th>Preparation/Dispensing</th>
<th>Transcription/Administration</th>
<th>Monitoring/Patient Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician (MD)</td>
<td>Pharmacist (R.Ph)</td>
<td>Nurse (RN)</td>
<td>MD/ DPM /DDS</td>
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<tr>
<td>Podiatrist (DPM)</td>
<td>Pharmacy Technician</td>
<td>Licensed Practicing Nurse</td>
<td>Nurse (NP/CRNA/NM/RN/LPN)</td>
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<tr>
<td>Dentist (DDS)</td>
<td>Nurse Anesthetist (CRNA)</td>
<td>Anesthesia Tech Nurse</td>
<td>R.Ph and Pharm Tech</td>
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<td>Nurse Anesthetist (CRNA)</td>
<td>Anesthesia Tech Nurse</td>
<td>(RN)</td>
<td>PA</td>
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<tr>
<td>Nurse Practitioner (NP)</td>
<td>Pharmacy Technician</td>
<td>MD/DP/DDS</td>
<td>RT</td>
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<tr>
<td>Physician Assistant (PA)</td>
<td>Respiratory Therapist</td>
<td>NP</td>
<td>CRT</td>
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<td>Nurse Midwife (NM)</td>
<td>Other Technicians</td>
<td>NM</td>
<td>Pathologists</td>
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<tr>
<td>Clinical Pharmacist (R.Ph)</td>
<td>Respiratory Therapist</td>
<td>NP</td>
<td>Lab Specialists</td>
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<tr>
<td>Nurse Radiology</td>
<td>Other Technicians</td>
<td>PA</td>
<td>Case Coordinators</td>
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<td>Technologist (CRT)</td>
<td>Other Technicians</td>
<td>RT</td>
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<td>Respiratory Therapist (RT)</td>
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<td>Pharmacy Technicians</td>
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*5/20/2018*
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<tr>
<th>Medication Histories</th>
<th>Hospital/ Health System Staffing Models</th>
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</thead>
<tbody>
<tr>
<td>RN- MD Managed with/without RPh/PharmD or CPhT Onsite</td>
<td>RN- MD Managed with Consulting RPh/PharmD Onsite or Telepharmacy</td>
</tr>
</tbody>
</table>
Medication Reconciliation –
Established & Innovative Practices

- Medication Therapy Management (MTM) Service
- Telepharmacy +/- onsite support
- Patient Centered Care – pharmacists provided
- Nurse/discharge planner – coordinated MR
- Public Health Outreach Workers

- ED Pharmacy Practices
- Pharmacist-managed MR/Discharge planning services
- Nursing Home Consultant pharmacist
- Interdisciplinary teams – Medical homes
- Rounding
- Collaborative Practice Models
Medication Reconciliation/ Telepharmacy Innovation in Technologies

- Databases - Prescription, PDMP, Immunization
- Communications Technology - Email/ Text
- E-prescribing/EHR/ Health Information Exchanges (HEI)
- Videoconferencing/Webcam
- Automation - Medication Distribution Systems
- Clinical Decision - Support/ Computerization
- Telemedicine/ Telepharmacy
- Drug Information/ Patient focused Drug Information- Electronic/Mobile
- Web-Based Patient Medication Histories
Medication Reconciliation/Telepharmacy—Quality Improvement and Risk Management/ROI

- Medication Incident/Error Reporting
- Audits – Retrospective and Concurrent
- Failure Mode Effect Analysis (FMEA)
- Adverse Drug Event Reporting
- Pharmacists’ Intervention Reporting
- Root Cause Analysis
- Sentinel Event Reporting
- Tracers
- Computerized Alerts/Audits: e-prescribing/ EHR
- Meaningful use measures – CMS
- ICD-10CM - Coding Audits
Medication Reconciliation/ Telepharmacy

Case Study
Pharmacist-managed inpatient discharge medication reconciliation: A combined onsite and telepharmacy model

Christopher Keeys, Bamidele Kalejaiye, Michelle Skinner, Mandana Eimen, JoAnn Neufer, Gisele Sidbury, Norman Buster, and Joan Vincent

Am J Health-Syst Pharm. 2014; 71:2159-66
Medication Reconciliation/ Telepharmacy

Errors

- 634 errors out of 6402 medication lists resolved during completion of discharge medication list

Patient Care Services

- Skilled Nursing–Rehabilitation  N=193 (30%)
- Orthopedics Service  N=181 (29%)
- Medical–Surgical  N=167 (26%)
Medication Reconciliation/ Telepharmacy

Top 10 Error Types

- Allergy
- Automatic Substitution not Reversed
- Discontinued Medication
- Dosage Adjustment
- Drug Interaction
- Duplicate Therapy
- Incomplete Prescription
- Omission
- Order Clarification
- Unreconciled Medication

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Discharge Medication Reconciliation

Type of Intervention – 6 leading categories – ("N=65") of interventions

- Omission: 27.70%
- Therapeutic Duplication: 15.70%
- Incorrect Frequency: 10.80%
- Inappropriate Medication: 8.40%
- Dosing Adjustment: 7.20%
Medication Reconciliation at Discharge: Indications Completed (N=1140)
Medications to be Reconciled – Changing (USA)

- New FDA-approved Drugs and biologicals

- Revised Safety Labeling of new and older medications – drug interactions, precautions/contraindications

- New formulation of existing drugs – Extended Release, topicals, combination products

- Expanding list OTC and Nutraceuticals

- Use in special populations, e.g. children, persons living with HIV, and elderly
Medication Reconciliation -

ED to Hospitalization

(Telepharmacy)
Medication Reconciliation (ED-Admit) – 24/7

- **Rx/Admission Meds**
  - R.Ph monitors ED Admit via EHR
  - Patient Med List/RxDB resolves errors/update Med Rec in ED-EHR/ e-prescribing
  - In hospital, access med list for transfers and start of discharge Med list
  - Updated Med List and send to nursing unit on admission/EHR-Hospital

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Telepharmacy & Medication Reconciliation

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Board of Health Launches Mednovate Connect - “Telehealth” Initiative for County’s Senior Residents
Question and Answer Session