2019 Peter P. Lamy Memorial Lecture:
Aging in Place: What Pharmacists can do to Reduce Community-Acquired Medication Harm in Older Adults

This session was partially supported by The Peter Lamy Center on Drug Therapy and Aging

2019 ASCP Annual Meeting & Exhibition
Aged to Perfection
November 7-10, 2019 | Grapevine, Texas
#ASCP50
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Moderated by: Dr. Nicole Brandt

- Dr. Brandt's Disclosures:

<table>
<thead>
<tr>
<th>Employer</th>
<th>University of Maryland School of Pharmacy MedStar Center for Successful Aging</th>
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<tr>
<td>Research Support:</td>
<td>HRSA GWEP, AMCP, IMPAQ, NIA, ASCP/Omnicell</td>
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<td>Consultant:</td>
<td>IHI, NCQA GMAP, Remedi SeniorCare</td>
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<td>Advisor/Panelist</td>
<td>AGS Beers Criteria Updates 2012, 2015, 2019 and Advisory Committee on Interdisciplinary, Community-Based Linkages (ACICBL) The Health Resources and Services Administration (HRSA)</td>
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Daniel K. Inouye College of Pharmacy
Founding Director, Center for Rural Health Science
University of Hawai`i at Hilo

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Meet The Speaker

Karen Pellegrin is Director of Continuing Education and Strategic Planning, Founding Director of the Center for Rural Health Science, and senior faculty at the Daniel K. Inouye College of Pharmacy at the University of Hawaii at Hilo. She has a PhD in clinical psychology, an MBA, and completed a postdoctoral fellowship in health psychology and quality management. She is the 2019 Healthcare Management Series Editor for SAGE Business Cases, a peer-reviewed library of applied learning resources for faculty teaching business courses and was PI and Project Director for the “Pharm2Pharm” program, funded by the CMS Innovation Center.
Disclosure

None
Learning Objectives

1. Define community-acquired medication harm
2. Identify medication process measures and quality improvement methods that drive patient outcomes
3. Describe how to use communication tools to increase adoption of recommendations
4. Describe a pharmacist-led model that reduced community-acquired medication harm
Age disparity measured by ICD code

% of hospitalizations that are "medication-related" per ICD code in Hawaii, 2010*

0.9% 3.4% 6.8%
0-17 18-64 65+


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The vision

• Leverage underutilized pharmacist expertise across the continuum of care to improve patient outcomes and reduce costs

• Pharm2Pharm model designed to achieve the vision
  • “Pharm2Pharm” = “Hospital Pharmacist to Community Pharmacist” care transition and coordination model focused on medications
  • A pharmacist-led service model
  • Funded by the CMS Innovation Center
**PHARMACIST ROLE:**
- Dispense medications
- Answer clinician questions
- Manage formulary

**ADDED PHARMACIST ROLE:**
- Identify patients at risk
- Medication management*
- Patient engagement
- Hand-off to community pharmacist
- Readmission reviews

**ADDED PHARMACIST ROLE:**
- Medication management*
  across prescribers and pharmacies for 1 year

**PHARMACIST ROLE:**
- Dispense medications
- Answer patient questions


**“Pharm2Pharm” MODEL for HIGH RISK PATIENTS**

Pharm2Pharm model implementation

• Launched sequentially in all 4 counties in Hawaii, starting with 3 rural counties
• > 2,500 high risk patients enrolled by Hospital Consulting Pharmacists and handed off to Community Consulting Pharmacists
• Implemented:
  • As an all-payer, population health intervention
  • Using a continuous quality improvement approach, including...
• Procedures
• Tools/templates
• Training*

*now available online (6-hour CPE):
http://pharmacy.uhh.hawaii.edu/academics/continuing-education/identifying-resolving-drug-therapy-problems
Health information technology

• Guiding principles*:
  • Implement the Pharm2Pharm model first, then the supporting health IT to ensure that:
    • the model itself could be replicated in any environment (with or without IT)
    • the IT is designed based on experience with the model.
  • Prioritize IT that will add value to the healthcare system beyond the Pharm2Pharm model.

*Pellegrin, Chan, Pagoria, Jolson-Oakes, Uyeno, Levin; A State-wide Medication Management System: Connecting Pharmacists Across the Continuum of Care, Applied Clinical Informatics; 2018, 9(1), 1-10
Health information technology priority needs identified by pharmacists, addressed by Hawaii Health Information Exchange (HHIE)*

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<td>More efficient and secure way to transmit care transition documents</td>
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<td>Reliable access to outpatient translators</td>
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<td>More efficient way to identify outpatient medications for medication reconciliation</td>
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<td>More efficient access to clinical information</td>
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<td>System to document and communicate reconciled medication list and drug therapy problems</td>
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<td>System to manage the population of patients enrolled</td>
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<td>Mobility</td>
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*Pellegrin, Chan, Pagoria, Jolson-Oakes, Uyeno, Levin; A State-wide Medication Management System: Connecting Pharmacists Across the Continuum of Care, Applied Clinical Informatics; 2018, 9(1), 1-10
Process measures hypothesized to drive key outcomes (examples)

- Med rec completed
- Drug therapy problems identified / resolved
- Patient education
- Days between discharge and first visit
- # visits per month
- Contacts with prescribers
- Satisfaction with Pharm2Pharm
  - Patient
  - Physician
  - Pharmacist
- Reason for readmission (key quality improvement approach)
Hospital pharmacist readmission reviews*

• Reviewed readmission of any previously enrolled Pharm2Pharm patient (at any time post-discharge, i.e., NOT limited to 30-day window)

• Categorized as “potentially preventable medication-related” admission if both were met:
  • “medication-related” = hospitalization was potentially due to any suboptimization in the medication regimen (prescriber or patient non-adherence)
  • “potentially preventable” = any evidence-based or best-practice action any member of the care team could have taken that would have prevented the suboptimized medication regimen

Hospital pharmacist readmission reviews*

Hospital pharmacist readmission reviews*

Hospital pharmacist readmission reviews*

Frequency of prescriber non-adherence sub-categories

- Indication: untreated condition - 14
- Safety: ADR due to dose too high - 11
- Effectiveness: Dose too low - 11
- Safety: ADR due to inadequate monitoring - 7
- Effectiveness: Ineffective drug - 6
- Indication: medication not indicated - 4
- Safety: ADR due to drug-drug interaction - 2
- Safety: ADR due to contraindication - 0

Hospital pharmacist readmission reviews*

Outcome evaluation design

• Interrupted time series design with:
  • quarterly outcome measure based on ICD codes: medication-related hospitalization rate among 65+
  • 3-year baseline period
  • different launch times across hospitals
  • all 11 non-federal, general, acute care hospitals with 50+ beds comparing:
    • 6 Pharm2Pharm hospitals
    • 5 hospitals without Pharm2Pharm

• Cited as a rigorous quasi-experimental design*
The Pharm2Pharm model results

Case mix–adjusted predicted medication-related hospitalization rates per 1,000 admissions of individuals aged 65 and older, baseline through post-implementation, intervention hospitals versus comparison hospitals.

\[ p = .01 \]

The Pharm2Pharm model results

- Case mix–adjusted predicted medication-related hospitalization rates per 1,000 admissions of individuals aged 65 and older, baseline through post-implementation, intervention hospitals versus comparison hospitals.

- Return on investment in pharmacists = 264%

- Annual Pharm2Pharm costs of...
  - Pharmacists = $1.8M
  - Avoided medication-related hospitalizations = $6.6M

- p = .01
Defining hospitalizations with “community-acquired medication harm”

• ICD-9 codes used by AHRQ* & CMS Innovation Center indicating “medication harm”:
  • 357.6 (neuropathy due to drugs)
  • 692.3 (contact dermatitis due to drugs and medicines in contact with skin)
  • 693.0 (dermatitis due to drugs or medicines taken internally)
  • 960.0-964.9, 965.02-969.5, 969.8-979.9 (poisoning by drugs, medicinal and biological substances, including overdose of these substances and wrong substances given or taken in error)
  • E850.1-E858.9 (accidental poisoning by drugs, medicinal substances, and biologicals, including accidental overdose, wrong dose given or taken in error, and drug taken inadvertently)
  • E930.0-E934.9, E935.1-E949.9 (drugs, medicinal substances, and biologicals causing adverse effects in therapeutic use, including correct drug properly administered in therapeutic or prophylactic dosage as the cause of any adverse reaction including Allergic or hypersensitivity reactions)

• “present on admission” code indicates “community-acquired”
  • Per AHRQ**, 75% of ICD-coded medication harm among inpatients in a 2011 sample were coded as present on admission (POA)


Pharm2Pharm results drilldown:
Which medication-related hospitalizations were avoided?


Aggregate medication-related hospitalizations

Community-acquired medication harm

Harm from medication in therapeutic use*

Hospital-acquired medication harm

Harm from medication error**

*Correct drug properly dosed and administered
**Wrong drug, wrong dose, given or taken in error
Acknowledgement of federal funding

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• Its contents are solely the responsibility of the authors and do not necessarily represent the official views of HHS or any of its agencies.
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