Adverse Drug Events and Readmissions: The Global Picture

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Learning Objectives

- Discuss why readmissions associated with adverse drug events are a current national focus
- Identify the high-risk medication classes that cause ADEs
- Connect ADEs directly to readmissions as a frequent root cause
Welcome and Overview

- Welcome!

  Define terms: readmissions and ADEs
  Identify high-risk medications
  Where meds and readmissions meet

- Self-assessment tool
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- Discovery of safe medication use practices
- Delivering knowledge to all who may benefit
- Innovation and collaboration between health care practitioners, faculty, staff and students
- Provide education, research and outreach
- GOAL: reduce medication errors
Deliverables and Expectations

- Highlight top 6 high-risk medication classes
- Think about what medications cause the most harm at your institution
- Self-assessment completion is encouraged
Step 1: Define the Terms

Define terms: readmissions and ADEs

Identify high-risk medications

Where meds and readmissions meet
Readmissions

- One in five Medicare patients readmitted within 30 days
- 35% within 90 days
- 17 billion dollars annually
- ADEs implicated in ~7000 deaths
- Compared to inpatients, little data is available on ADEs for patients post discharge relating to medications.


Readmissions

- Why focus on readmissions?
  - Measureable
  - Good marker of care across continuum (from hospital to long term care to home etc.)
  - Improvement in this area targets:
    - Patient self-care and in-home care
    - Communication between patients and providers

Readmissions

- Penalties for readmissions
  - Section 3025 of Affordable Care Act
  - Hospitals with higher than expected readmission rates for HF, AMI, and Pneumonia targeted
  - In FY13, penalized up to 1% of total Medicare revenues
  - Up to 2% and 3% in FY14 and FY15
  - Conditions will be added – not done here
Readmissions

- Family caregivers at home performing nursing functions
  - 42 million family caregivers
  - Nearly half perform nursing functions
  - 75% perform medication management

Readmissions

- Partnership for Patients (PfP)
  - Reduce preventable hospital-acquired conditions by 40% by December 31, 2013
  - Reduce all hospital readmissions by 20% by December 31, 2013

- PfP focus is on anticoagulants, narcotics, sedatives, and insulin

Medication Errors

• 1999 Institute of Medicine (IOM) report
• 44,000 – 98,000 people per year die as a direct result of medical errors
Medication Errors

• 2006 IOM report
• 1.5 million *preventable* adverse drug events (ADE) annually in the United States
• Each costs ~$8,750

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But that was 12 years ago...

- 2010 Landrigan et al study in NEJM
  - Randomized sample of 10 NC hospitals
  - 100 admissions per quarter reviewed for medical errors from Jan 2002 through Dec 2007
  - Results
    - 25.1 harms per 100 admissions
    - No statistical significant drop in rate of harms over 6 years

Medication Errors

"A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use."

- National Coordinating Council on Medication Error Reporting and Prevention (NCC MERP)
Adverse Drug Events

“Injury resulting from medical intervention related to a drug.”

Adverse Drug Reactions

“An effect that is noxious and unintended, and which occurs at doses used in man for prophylaxis, diagnosis, or therapy.”

- World Health Organization

IMPORTANT: Includes only appropriate use of drugs.
Medication Errors

Preventable Adverse Drug Events

Adverse Drug Events

ADR
Bad practitioner or bad system?
Step 2: Identify the Meds

Define terms: readmissions and ADEs

Identify high-risk medications

Where meds and readmissions meet
High Risk Medications

http://polypharmacyinitiative.com/drugalert.html
Data Collection

- Formulate research question:
  - Readmissions
  - ADEs
  - High-risk Medications

- Search strategy:
  - PubMed & MEDLINE
  - MeSH terms
    - “readmissions”
    - “rehospitalizations”
    - “ADEs”
    - “high-risk meds”
    - “high-alert meds”
    - “transitions”
    - “post-discharge”
  - Cross-reference
Data Abstraction

- 300+ abstracts
- Inclusion criteria
  - Readmitted
  - ADE
  - High-risk meds
- Exclusion criteria
  - Drug/alcohol abuse
- Article selection
- Limited results
- Analyzed occurrence of most common offending classes
## Data Discovery and Delivery

<table>
<thead>
<tr>
<th>Medications</th>
<th>Studies</th>
<th>Why implicated</th>
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</thead>
</table>
| Hematologic            | Forster, Budnitz, McDonnel, Beckett, Classen, Ruiz, Roughead, Evans | ▪ Complexity of dosing and monitoring  
▪ Patient adherence  
▪ Drug interactions  
▪ Dietary interactions |
| Anti-diabetic          | Budnitz, McDonnel, Beckett, Classen | ▪ Pharmacology of drugs  
▪ Complexity of dosing  
▪ Medication adjustments  
▪ Narrow therapeutic range |
| Anti-neoplastic        | Budnitz, McDonnel, Ruiz, Roughead,   | ▪ Pharmacology of drugs  
▪ Adverse effects  
▪ Dose scheduling  
▪ Drug interactions  
▪ Depressed immune system |
| Analgesics (including narcotics) | Forster, Boockvar, Budnitz, Beckett, Evans | ▪ Dose mix ups  
▪ Allergic reactions  
▪ Enhanced CNS effects  
▪ Ambiguous directions |
| Cardiovascular         | Forster, Boockvar, Budnitz, McDonnel, Beckett, Classen, Roughead, Evans | ▪ Patient adherence  
▪ Polypharmacy  
▪ Adverse effects |
| Anti-infectives        | Forster, Budnitz, Beckett, Classen, Evans | ▪ Patient adherence  
▪ Overuse/misuse  
▪ Kill normal flora  
▪ Adverse effects/allergies  
▪ Drug interactions |

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High-Risk Medications

Hematologic

- Complexity of dosing and monitoring
- Patient adherence
- Drug interactions
- Dietary interactions
High-risk Medications

**Anti-diabetic**
- Pharmacology of drugs
- Complexity of dosing
- Medication adjustments
- Narrow therapeutic range
High-Risk Medications

**Antineoplastics**
- Pharmacology of drugs
- Adverse effects
- Dose scheduling
- Drug interactions
- Depressed immune system
High-risk Medications

Analgesics (narcotics too)
- Dose mix ups
- Allergic reactions
- Enhanced CNS effects
- Ambiguous directions
High-risk Medications

Cardiovascular
- Patient adherence
- Polypharmacy
- Adverse effects
High-Risk Medications

Anti-infectives
- Patient adherence
- Overuse
- Misuse
- Kill normal flora
- Adverse effects
- Allergies
- Drug interactions
Step 3: Putting it Together

Define terms: readmissions and ADEs

Identify high-risk medications

Where meds and readmissions meet
Errors in Transition

• Greater than 50% of medication histories taken upon admission have some form of discrepancy requiring resolution

• Greater than 50% of documented medication errors occur at three times:
  – Admission
  – Transfer
  – Discharge

Errors in Transition

• High risk meds leading to harm
• Narrow therapeutic window agents
• Family caregiving
• Medication histories
• Information systems
• Poor communication
UCSF Medical Center, CA

- 30-day readmissions → 22% to 16%
- Virtual team through email communication
- Bedside counseling totaling 90 minutes from admission to discharge
- Binder for heart failure and how to manage
- Teach-back method*
- Follow-up phone calls*

Piedmont Hospital, GA

- <70yo $\rightarrow$ 13.05% to 3.97%
- >70yo $\rightarrow$ 15.9% to 11.2%
- Medication reconciliation done by pharmacists
- Identify patients at high risk
- Schedule follow-up care
- Follow-up phone call within 72 hours
- Discharge document (BOOST)

Evergreen Hospital Medical Center, WA

- National heart failure rate: 24.7%
- 30-day hospital readmission rate: 14% and 6% for patients referred
- Identify high-risk patients
- Refer to Evergreen Cardiac Enhancement Center within 3 days
- 90 minute long initial session
- Follow-up visits Q2weeks until stable

Conclusion

- ADEs and high-risk meds directly linked to readmissions
- Identify ADE associated readmissions
- Understand the relationship
- Communicate clearly
Next Steps...

- Mitigation strategies
- Measurement methods and techniques
- Sharing your stories!
Resources

- Hospital Engagement Network (PfP)
  - http://www.hret-hen.org/adverse-drugs-events

- IHI STAAR Initiative
  - http://www.ihi.org/offerings/Initiatives/STAAR/Pages/default.aspx

- Project RED
  - https://www.bu.edu/fammed/projectred/index.html

- BOOST
Studies


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Questions?