Reducing Medication Related Adverse Events in Rural Communities

Amy Yanicak, PharmD, MPH
Amy.Yanicak@acphs.edu
Assistant Professor at Albany College of Pharmacy and Health Sciences (Colchester, VT)
Clinical Ambulatory Care Pharmacist at Richmond Family Medicine (Richmond, VT)
Disclosures

- I have no relevant financial or nonfinancial relationships to disclose.
Objectives

- Delineate common prescription medication-related access, adherence, understanding and use issues in a rural setting.
- Understand the impact of regional and national measures to improve access to medication resources.
- Apply current approaches for improved medication use to care plans for patients in rural areas.
Medication Adverse Events

- Adverse Drug Event (ADE): harm experienced by a patient as a result of exposure to a medication
  - Not necessarily from an error or poor quality care

- Prevention at the points of: Prescribing, Transcribing, Dispensing, and Administration
ADEs in ACGME Standards

- Create a Culture of Safety
- Educate on Patient Safety
- Report events
- Complete root cause analyses
- Implement actions for improvement
ADEs in Rural Hospitals

Rates of common adverse drug events originating during the hospital stay by hospital teaching status, 2011

- Top 4 ADEs show no difference between hospital settings
Preventing ADEs in Rural Hospitals

- Training of hospital staff is imperative
- Internal Assessment
  - Example: IHI Trigger Tool for Measuring Adverse Drug Events
- Creation of committees for medication safety
- Medication reconciliations at all transitions of care
- Developing protocols and processes
  - Example: TALL-man lettering, monitoring parameters for medications, pharmacist review
What ADEs will be encountered in rural practices outside of the acute care setting?
What ADEs will be encountered in rural practices outside of the acute care setting?

What if we change the definition of ADEs?
Expanding Medication Adverse Events

- *Medication-Related Adverse Events*: Patient harm as a result of exposure OR in exposure to a medication, including barriers/delays to obtaining medication, unintended side effects, improper disposal, incorrect administration, and lack of adequate health literacy.

- Examples:
  - Absence of nearby pharmacies
  - Medication counseling without a method for measuring patient understanding
  - Hoarding of medicines

- Prevention from a Public Health Perspective
  - Drug Take Back Days
  - Medication reconciliation
  - Telehealth medication counseling
Are there medication problems of concern for rural patients (using expanded definition)?
Medications issues in rural areas

- More medications than urban patients (5.5 vs 3.7 meds per month in elderly patients)
- Hoarding unused medications
- Pharmacies closing (Travel avg. 20 miles)
- High medication costs
  - $495 per month
  - No significant difference from metro areas
- Low adherence
  - 50% have low adherence to medications
  - Equal to urban areas

Addressing the issues

- More Medications
- Hoarding
- Closing of Pharmacies
- Costs
- Adherence
MORE MEDICATIONS

- Polypharmacy = greater risk for ADEs
  - Example: Fall risk in elderly

- How to mitigate risks
  - Routine monitoring
  - Deprescribing
  - Medication reviews
  - Patient education

(https://medshadow.org/medication-falls/)
Medication Monitoring

- Monitoring errors make up a **major** portion of medical errors
  - Dynamic patients, medication interactions, long term effects
- Why we don’t routinely monitor
  - No perceived urgency
  - Usually fine
  - Bias of practice experience
  - Delegation
- Common classes of medications where monitoring is missed
  - Antidiabetics
  - Antihypertensives
  - Lipid lowering/cholesterol
  - Antipsychotics
  - Antiarrhythmics
  - Many more……

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Laboratory Monitoring Interval (in Months) Recommended for Chronic Medications, Table 2: Consult Pharm. 2008 May; 23(5): 387–395.
<table>
<thead>
<tr>
<th>Medication/class</th>
<th>Monitoring Test</th>
<th>Frequency</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aldosterone Antagonists</strong> (ex. Spironolactone)</td>
<td>Potassium Renal function</td>
<td>3 and 7 days after initiation, then quarterly</td>
<td>Hyperkalemia and worsening renal function risk</td>
</tr>
<tr>
<td><strong>ACEi or ARB (ex. Lisinopril, Losartan)</strong></td>
<td>Potassium Renal function</td>
<td>1-2 weeks after initiation, then 1-2 times yearly</td>
<td>Kidney perfusion highly dependent on angiotensin for some patients</td>
</tr>
<tr>
<td><strong>Statins (ex. Simvastatin)</strong></td>
<td>Lipids</td>
<td>6-8 weeks after initiation or dose change</td>
<td>Assessing efficacy and dose adjustment</td>
</tr>
<tr>
<td><strong>Amiodarone</strong></td>
<td>TSH LFTs</td>
<td>Every 6 months</td>
<td>Thyroid dysfunction common, hepatotoxicity</td>
</tr>
<tr>
<td><strong>Direct Oral Anticoagulants</strong> (ex. Rivaroxaban)</td>
<td>CBC, LFTs Renal function</td>
<td>Yearly Every 6 months</td>
<td>Bleeding risks, metabolized by liver, renal dose adjustments</td>
</tr>
</tbody>
</table>
How to effectively monitor meds

✧ Panel management
  ❧ Assigned staff to review medications and set up monitoring appointment or lab draw

✧ Alerts
  ❧ Reminders to prescribers about monitoring

✧ Patient visit checklist
  ❧ Comprehensive monitoring at convenient times for patient
Deprescribing

◊ Why it’s important
  ◊ Eliminates mediations that may be ineffective or cause harm currently or in the future
  ◊ Combats clinical inertia
    ◊ Ex: Deprescribing aspirin

◊ **D-PRESCRIBE: A Trial to De-prescribe Inappropriate Medications in the Community Dwelling Elderly**
  ◊ Design: Cluster-randomized trial at community pharmacies in Quebec
    ◊ 489 patients at 69 pharmacies for 6 months
    ◊ Pharmacist led intervention to deprescribe potentially inappropriate meds (PIMs) in the elderly
    ◊ Included patient and prescriber involvement
  ◊ Results: Significant difference in patients stopping PIMs in intervention group (43%) compared with the control group (12%)
  ◊ Conclusion: Health care teams can work together to reduce use of potentially harmful medications

Medication Reconciliation

◊ According to the Joint Commission:
  ◊ Medication reconciliation is the process of comparing a patient's medication orders to all of the medications that the patient has been taking
  ◊ Looks for omissions, duplications, dosing errors, or drug interactions
  ◊ **Recommended to be done at EVERY transition of care when new meds are ordered or changed**

◊ Why does it matter?
  ◊ More than 40% of medication errors are believed to result from inadequate reconciliation in handoffs

◊ Improving the med rec process
  ◊ Develop a workflow process, ex: nurse call or part of office visit intake forms
  ◊ MedManage: a tool for primary care rural clinics
    ◊ Increased reporting of over the counter products
MED MANAGE

Please list any medicine you have taken in the last two (2) weeks for these conditions.

- Headache?
- Eyedrops/Eardrops
- Allergy/Congestion?
- Sore throat/Gum or tooth pain?
- Chest pain?
- Heartburn/Indigestion/Nausea?
- Diarrhea/Constipation?
- Back Pain?
- Difficulty urinating/Erectile dysfunction?
- Cramps/Menopausal/Birth Control?
- Muscle or Joint pain/Arthritis/Gout?
- Depression/Anxiety/Sleep
- Foot pain?
- Acne/Dandruff/Skin conditions/Patches
- Herbals/Vitamins
- Naturopathic Remedies/Weight Loss Meds
- Shakes/Pills/Supplements/Energy drinks
- Lotions/Creams/Ointments

Figure 2. MedManage patient worksheet.
Medication reconciliation for learners

- Teaching medical residents and students to do medication reconciliation (med rec) may reduce ADEs
  - In a systematic review, curriculum integration and interactive sessions **resulted more often** in increased confidence and knowledge for med recs

*Proposed medication reconciliation teaching:*
- Incorporation in lectures for 2\textsuperscript{nd} year medical students
- During a rotation or clinical time (shadowing)
- Include a pharmacist
- Evaluate competency and confidence
Medication Education

- Medication Education for Patients =
  - How to take a medication
  - What it is for
  - What to expect

- Why is it important?
  - Closed loop communication
  - Patient engagement
  - Opportunity for questions
  - Educating patients on meds reduces errors!

http://lippincottsolutions.lww.com
HOARDING
A “Home Pharmacy”

- Many patients keep extra medications at home
  - Increased with distance from medical facilities?

- Risks
  - Use of expired medications
  - Use for wrong indication
  - Medication sharing
  - Overdose

- Strategies to reduce medication hoarding
  - Home visits
  - Drug take back efforts
    - Envelopes for patients to mail back medications
    - Handouts for drug take back locations
Taking back medications

- Mail in services may be most feasible in rural areas
  - Available at public facilities: pharmacies, hospitals, libraries
  - Free mail in service
  - Safe disposal from Stericycle, Inc
CLOSING OF PHARMACIES

April 8, 2019
Pharmacies closing

◊ Since 2003, 16% of independent rural pharmacies – or roughly 1,230 stores – have closed
  ◊ 630 rural communities lost their only pharmacy

◊ Impact = Longer travel time - 20 miles (or ~ 27 minutes) for patients in areas where a pharmacy closed

◊ Solution Strategies
  ◊ Mail order
  ◊ Medications for acute illnesses in primary care
  ◊ Telepharmacy
Telepharmacy

- North Dakota was the first state to pass rules allowing retail pharmacies to operate in certain remote areas without requiring a pharmacist to be present
  - Authorized in 23 states as of 2016

- North Dakota Telepharmacy Project
  - A licensed pharmacist at a central pharmacy site supervises a pharmacy technician at a remote telepharmacy site using video conferencing technology
  - Restored pharmacy services to 80,000 rural citizens
COSTS

PERSONAL HEALTH

The Cost of Not Taking Your Medicine

Paul Rogers
The list price of Humalog insulin keeps going up

Since 1996, there have been more than two dozen price increases on a vial of Humalog insulin. Adjusted for inflation, the current price is 700% higher than it was 20 years ago.

Note: List price is in unadjusted dollars and does not reflect rebates or discounts.

Source: Truven Health Analytics
Costs

- Less adherence when costs are > $50 for a medication/month
- Free medications can increase adherence and reduce ADEs

What can be done?
- Discussing costs as a barrier to care
  - “Will you take this if it costs this much?”
- Assistance programs and coupons
  - Care managers to assist with paperwork
- Activism

The most expensive medication is the one the patient doesn’t take.
Nonadherence can lead to ADEs, and ADEs can lead to nonadherence.
Adherence Stats

✧ A LOT OF PEOPLE DON’T TAKE MEDS AS PRESCRIBED
  ✧ 20 - 30% of medication prescriptions are never filled
  ✧ 50% of medications for chronic disease are not taken as prescribed

✧ Costs
  ✧ Hospitalizations from side effects of improper use
  ✧ $100 billion to $289 billion a year in costs to American healthcare system
Adherence and Medication Access in VT

- Adherence is tied to Access (to PCP and Pharmacist)
  - Data from GIS mapping on blood pressure medication adherence and pharmacy access in Vermont indicate that access and adherence are related.
  - Report conclusions: “Many Vermont towns with limited access to community pharmacies also have lower rates of blood pressure medication adherence.”
Map 1: Drive Times to Community Pharmacies and Blood Pressure Medication Adherence* among Adults Aged 18 and Older, by Vermont Town, 2014-2016

Blood Pressure Medication Adherence*, by Town

Drive Time to Pharmacies In/Near Vermont

Towns With Low Adherence and Limited Pharmacy Access^

* A person was considered adherent to their blood pressure medication if they had a "proportion of days covered" (PDC) value of 80% or higher (i.e., medication available for 80% of days or more from the time of the first medication fill through the end of the calendar year).

^ Low adherence are towns with less 75.5% of persons at least 80% adherent*. Limited pharmacy access are towns whose town center is greater than a 15-minute drive to a community pharmacy.

Data Sources: Green Mountain Care Board (GMCB) Vermont Health Care Uniform Reporting and Evaluation System, 2014-2016.

All analyses, conclusions, and recommendations provided here are solely those of the Vermont Department of Health and not necessarily those of the GMCB.

DEPARTMENT OF HEALTH
AHS.VDHGIS@Vermont.gov
November 2018
Determining Non Adherence

- **Direct Measures**
  - Medication Possession Ratio
  - Pill Counts

- **Indirect Measures – Screening tools**
  - Morisky Medication Adherence Scale (MMAS 4 and MMAS 8)

![Morisky's instrument (MMAS-4) Questionnaires](image)
Combating Non Adherence

- Simplifying drug regimens
- Pre-packaged meds
- 90-day supplies
- Lower costs
- Education on the medication and how to take it
- Adherence tools: boxes, apps
- Following up with patients on whether they are using their drugs and whether they are experiencing any problems

Have you talked to your patient about adherence today?
Educator Tools

AACP-NCPA Medication Adherence Educators Toolkit

https://www.aacp.org/sites/default/files/aacp_ncpa_medication_adherence_educators_toolkit_0.pdf
Addressing the issues

- MORE MEDICATIONS
- HOARDING
- CLOSING OF PHARMACIES
- COSTS
- ADHERENCE
In what ways can medical students and residents help reduce ADEs for patients in rural areas?
In what ways can medical students and residents help reduce ADEs for patients in rural areas?

- Recognize differences in medication related needs
- Medication reconciliation during a home visit
- Teach back method with a patient
- Telepharmacy, mail order medication options or pharmacy connection
- Choosing lower cost medications
Teaching medical students and residents about “med rec”

- Medication reconciliation (med rec) is an important step in identifying potential adverse drug events
- Formal education on med rec can vary by institution and preceptor
- A pharmacist is situated to provide a comprehensive review of the med rec process to identify:
  - Errors
  - Therapeutic alternatives
  - Patient knowledge gaps
  - Lab values needed
  - Lower drug costs
Project: Medical student and resident perceptions of ambulatory pharmacy in an adult medicine evening clinic

◇ **Objectives:**
   - Determine changes in medical students’ and residents’ perceptions of pharmacists after year-long interactions in an adult medicine clinic at University of Washington
   - Identify areas of opportunity to educate medical students and residents about pharmacy topics and pharmacists’ responsibilities

◇ **Intervention:** Teaching (called clinical conference) performed monthly at a resident and student led clinic from 2017-2018
   - 30 minutes sessions on med rec and other medication topic by a pharmacist
   - Pharmacist available at clinic weekly to review med student medication orders and treatment plans

◇ **Outcomes:** Residents and students found med rec an important topic and improved their knowledge about the pharmacist’s role
   - More shared responsibility between pharmacists and student provider for med rec
   - Incorporated change - pharmacist and student co-visits to observe and teach med rec process
Medication adverse events are different for rural communities, especially in an outpatient setting.

Key issues that need to be addressed by learners and site providers are:
- More medications
- Hoarding
- Closing of Pharmacies
- Cost
- Adherence

Steps can be taken to:
- Redefine ADEs for rural patients
- Identify ADEs
- Incorporate ADE management techniques into medical school and residency curriculums
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