UPDATE: Empowering the Safe, Effective and Efficient (S-E-E) Use of Medication in Older Adults

**Investigators:**

<table>
<thead>
<tr>
<th>Stephen Kogut, PhD MBA RPh</th>
<th>Phillip Clark, ScD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program in Pharmacoepidemiology &amp; Pharmacoeconomics</td>
<td>Director of URI Gerontology Program</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>Director, Rhode Island Geriatric Education Program</td>
</tr>
<tr>
<td><a href="mailto:SKogut@URI.edu">SKogut@URI.edu</a>  401.874.5370</td>
<td><a href="mailto:aging@URI.edu">aging@URI.edu</a>  401.874.2689</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Norma Owens, Pharm.D., BCPS, FCCP</th>
<th>Ami Vyas, PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor, Department of Pharmacy Practice</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td><a href="mailto:NormaOwens@URI.edu">NormaOwens@URI.edu</a>  401.874.2964</td>
<td>Program in Pharmacoepidemiology and Pharmacoeconomics</td>
</tr>
<tr>
<td></td>
<td>College of Pharmacy</td>
</tr>
</tbody>
</table>

**Research Assistants:** Nick Belviso, PharmD, MBA  Emily Patry, MS
Empowering the Safe, Effective and Efficient (S-E-E) Use of Medication in Older Adults

• **Objective**
  – To define and apply a set of quality measures to evaluate medication use among older adults
    • Domains: Safety, Effectiveness and Efficiency
    • Using pharmacy data solely
  – Determine if measures vary according by demographics and practices
    • No prescriber-level analyses
Study Population

- RI pharmacy claims data 2018
  - Older adults (65+)
  - Predominantly community dwelling
  - Excluded patients with Rx suggestive of cancer
  - Continuous pharmacy use
    - Filled at least one prescription in the first and last quarter of 2018
Independent Variables

- Gender, Age Group
  - 65-70; 71-79; 80+
- Payment Type
- RI Region (county)
- Comorbidity (Rx proxys)
- Provider group
  - Linked prescriber to practice affiliation using NPI
Empowering the Safe, Effective and Efficient (S-E-E) Use of Medication in Older Adults

• Measures
  – Environmental scan yielded 47 candidate measures
  – Rated by experts for:
    • Clinical relevance to older adults
    • Evidence-based
    • Feasibility (using pharmacy data only)
  – Operationally define and apply
Safety

Avoid use of:

1. Benzodiazepines
2. CNS depressants
3. NSAIDS, if using anticoagulants
4. Anticholinergic drugs in dementia
5. Fluoroquinolones as initial therapy
6. Continuing opioid rxs after an initial opioid Rx
7. High(er) risk drugs
Effectiveness

Patient adherence
1. Anticoagulants
2. Diabetes medications
3. Depression medications
4. Cholesterol medications
5. Respiratory inhalers

Evidence-based therapies
6. Statin use in diabetes
7. ACEI/ARB use in diabetes
Efficiency

Health system:
1. Limit the number of prescribers
2. Avoid poly-pharmacy

Use of generics:
3. Overall
4. Diabetes medications
5. Mental health medications

Piloting: Low value drugs
Empowering the Safe, Effective and Efficient (S-E-E) Use of Medication in Older Adults

<table>
<thead>
<tr>
<th>Safe (S)</th>
<th>Effective (E)</th>
<th>Efficient (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avoiding use of:</strong></td>
<td><strong>Patient adherence to:</strong></td>
<td><strong>Health system use:</strong></td>
</tr>
<tr>
<td>1. Benzodiazepines</td>
<td>1. Anticoagulants</td>
<td>1. Limit number of prescribers</td>
</tr>
<tr>
<td>2. CNS depressants</td>
<td>2. Diabetes medications</td>
<td>2. Avoid polypharmacy</td>
</tr>
<tr>
<td>3. NSAIDS, if using anticoagulants</td>
<td>3. Depression medications</td>
<td><strong>Use of generics:</strong></td>
</tr>
<tr>
<td>5. Fluoroquinolones as initial therapy</td>
<td>5. Respiratory inhalers</td>
<td>4. Diabetes medications</td>
</tr>
<tr>
<td>6. Chronic opioids</td>
<td></td>
<td>5. Mental health medications</td>
</tr>
<tr>
<td>7. Higher-risk drugs (PIMs)</td>
<td><strong>Evidence-based therapies:</strong></td>
<td><strong>Other:</strong></td>
</tr>
<tr>
<td></td>
<td>7. ACE/ARB use in diabetes</td>
<td></td>
</tr>
</tbody>
</table>

100% is optimal for all measures

**2016**

- **Safety**: 85.7%
- **Effectiveness**: 76.1%
- **Efficiency**: 87.9%
## Study Population: Older Adults Filling Prescriptions in RI in 2018 (n = 108,050)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGE CATEGORY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-70</td>
<td>41,922</td>
<td>38.8</td>
</tr>
<tr>
<td>71-79</td>
<td>42,642</td>
<td>39.5</td>
</tr>
<tr>
<td>80+</td>
<td>23,441</td>
<td>21.7</td>
</tr>
<tr>
<td><strong>GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>61,044</td>
<td>56.5</td>
</tr>
<tr>
<td>Male</td>
<td>47,006</td>
<td>43.5</td>
</tr>
<tr>
<td><strong>REGION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bristol</td>
<td>6,753</td>
<td>6.3</td>
</tr>
<tr>
<td>Kent</td>
<td>19,558</td>
<td>18.1</td>
</tr>
<tr>
<td>Newport</td>
<td>10,123</td>
<td>9.4</td>
</tr>
<tr>
<td>Providence</td>
<td>53,885</td>
<td>49.9</td>
</tr>
<tr>
<td>Washington</td>
<td>17,686</td>
<td>16.4</td>
</tr>
<tr>
<td><strong>PAYMENT TYPE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>10,170</td>
<td>9.4</td>
</tr>
<tr>
<td>Medicaid</td>
<td>698</td>
<td>0.7</td>
</tr>
<tr>
<td>Medicare</td>
<td>76,566</td>
<td>70.9</td>
</tr>
<tr>
<td>PBM / Commercial</td>
<td>15,232</td>
<td>14.1</td>
</tr>
<tr>
<td>Other</td>
<td>5,384</td>
<td>4.9</td>
</tr>
</tbody>
</table>
S1. Avoiding Use of Benzodiazepines
Patients without 60+ days supply of benzodiazepine during 2018

N = 67,322
S1. Avoiding Use of Benzodiazepines

Subgroup Analysis: Age Group and Gender

### Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>N</th>
<th>Avoidance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-70</td>
<td>26,018</td>
<td>88%</td>
</tr>
<tr>
<td>71-80</td>
<td>26,711</td>
<td>89%</td>
</tr>
<tr>
<td>80+</td>
<td>14,575</td>
<td>90%</td>
</tr>
</tbody>
</table>

### Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Avoidance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>33,281</td>
<td>87%</td>
</tr>
<tr>
<td>M</td>
<td>26,489</td>
<td>92%</td>
</tr>
</tbody>
</table>
S2. Avoiding CNS Medications

Patients without 60+ days supply for any of the following drug classes during Q4 2018: opioid, benzodiazepine, skeletal muscle relaxant, sleep medication, or barbiturate

N = 67,034
S3. Avoid Chronic Use of NSAIDs with Warfarin/DOACs

Patients with 10+ months supply of warfarin and/or DOAC during 2018 and without 90 days or more supply of any NSAID

N = 2,741
S4. Avoid Concurrent Use of Anticholinergic and Dementia Medications

Patients with 10+ months supply of dementia medication during 2018 and without 90 days or more supply of anticholinergic drug
S5. Avoid Use of Fluoroquinolones as Initial Therapy

Patients with a new antibiotic rx after period of no antibiotic prescription in previous 120 days; antibiotic is not a fluoroquinolone

N = 33,193
S6. Avoiding Chronic Opioid Use

Among patients who received at least one prescription for an oral opioid medication during Sept.-Dec 2018, the proportion who received less than 200 total dosage units.

N = 8,671
S7. Avoid Use of High(er) Risk Drugs
Patients without any prescription for a medication considered high(er) risk drug

- First-generation antihistamines
- Antispasmodics
- Ticlopidine and dipyridamole
- Nifedipine, immediate release
- Tertiary tricyclic antidepressants
- Barbiturates
- Nonbenzodiazepine “Z” drugs
- Desiccated thyroid
- Sulfonylureas, long duration
- Metoclopramide
- Meperidine
- Indomethacin
- Skeletal muscle relaxants

N = 67,322
Highlights

• Benzodiazepine use is frequent among older adults
• Interacting drugs generally avoided in Afib and dementia
• Fluoroquinolone use first line in 14% of cases; variability among provider organizations
• Among patients prescribed opioids, approximately 1 in 5 received 200+ dosage units
• Approximately 1 in 4 patients received a potentially inappropriate rx
Next Steps

• Additional / revised measures
  – Refine NPI mappings

• Effectiveness and efficiency domains
  – Low value drugs

• Intervention
  – Clinical pharmacy
  – HIT

• Other data sources: APCD
Empowering the Safe, Effective and Efficient (S-E-E) Use of Medication in Older Adults

Investigators:

Stephen Kogut, PhD MBA RPh
Professor
Program in Pharmacoepidemiology & Pharmacoeconomics
College of Pharmacy
SKogut@URI.edu  401.874.5370

Phillip Clark, ScD
Professor
Director of URI Gerontology Program
Director, Rhode Island Geriatric Education Program
aging@URI.edu  401.874.2689

Norma Owens, Pharm.D., BCPS, FCCP
Professor, Department of Pharmacy Practice
NormaOwens@URI.edu  401.874.2964

Ami Vyas, PhD
Assistant Professor
Program in Pharmacoepidemiology and Pharmacoeconomics
College of Pharmacy

Research Assistants:  Nick Belviso, PharmD, MBA  Emily Patry, MS

Questions