Polypharmacy in the Elderly

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Disclosure

- I have no relationship that could be perceived as placing me in a real or apparent conflict of interest in the context of this presentation.
Learning Objectives

• Participants will be able to:
  – Define polypharmacy and impact
  – Report link to adverse drug events and aware of costs, causes
  – Review physiology of aging
  – Apply prescribing/deprescribing criteria
  – Review a local study looking at prevalence of polypharmacy in a geriatric OPD
  – Consider Medication Reconciliation as a strategy for safer prescribing
  – Become familiar in how to perform a Structured Medication Review
Polypharmacy

Use of >5 medications
Use of inappropriate medications or
Inappropriate doses
Incidence

- Depending on the definition, the incidence varies from 5% to 78%\(^1\)
- 10% of elderly population in most developed countries spend 25-30% of total expenditures on drugs
- Study found the elderly use twice as many prescriptions as the young
  - Over 65 years 12.8 prescriptions/year
  - 35-54 years 6.7 prescriptions/year
Adverse Drug Events

- Inappropriate drug prescribing leads to avoidable adverse drug events (ADE)
- This should be considered as a cause for any new symptom in an older adult until proven otherwise
- 2-3 times as frequently in older persons
- <3 drugs: 1-2% risk of ADE
- >6 drugs: 13% risk of ADE
Prevalence and Impact of ADE

• 20% of admissions are due to ADE
• 35% of elderly in the community are affected by ADE
• 23% of discharged patients experience an adverse event (ADE 72%, therapeutic error 16%)
• In nursing homes $1.33 is spent on ADE for every $1 spent on medications
• 4-6th leading cause of death
• Annual cost of drug related morbidity and mortality 76.6 billion - 1995 (USA), 177 billion - 2000
Costs of ADE

• 30% of admissions to hospital are because ADE
• ADE’s increase:
  – hospital length of stay
  – increase costs
  – increase mortality
• Annual cost of drug-related morbidity in US: $177 billion in 2000
Case - History

- 94 y o lady living alone admitted to geriatrics with falls. She has not been taking her medications
- PMH: macular degeneration, RA, diabetes with nephropathy, Alzheimer's dementia
- Meds: recent course of prednisone, celecoxib (celebrex), glyburide, donepezil (aricept), enalapril
  - What examples of non-adherence may be happening here?
Causes of ADE in the Elderly

- Changes with ageing
- Comorbidity
- ADR
- Polypharmacy
- Non-adherence
Physiology of Aging

Pharmacokinetics (Drug handling)
1. Absorption
2. Distribution
3. Metabolism
4. Excretion

Pharmacodynamics (Effect of the Drug)
Summary of Age-related Changes

- ↓ or Slower absorption
- ↓ Slower metabolism
- ↓ Slower excretion
- ↑ Fat, ↓ water
- ↑ Sensitivity to sedatives & anticholinergics
- ↓ Sensitivity to catecholamines
Non Adherence

• Intentional - patient non-compliance depending on how fits with their beliefs (may be as high as 50%)

• Non-intentional
  – Communication factors – cognitive impairment, ineffective instructions/advice regarding the drug, complex regimens, language barrier
  – Patient factors – poor vision/hearing, limited dexterity and mobility, income
  – Packaging factors – labels, containers, generic labeling
  – Coordination factors – multiple providers, lack of social support
Non Adherence

• 32% of drugs ordered at discharge are not taken at all

<table>
<thead>
<tr>
<th>Dosing</th>
<th>Adherence %</th>
</tr>
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<tbody>
<tr>
<td>daily</td>
<td>74</td>
</tr>
<tr>
<td>bid</td>
<td>72</td>
</tr>
<tr>
<td>tid</td>
<td>52</td>
</tr>
<tr>
<td>qid</td>
<td>53</td>
</tr>
</tbody>
</table>
Case – Physical Exam and Ix

- Cachectic, VSS, disorientated
- Multiple bruises
- RA hands
- Pale
- Tender epigastrium

- Hb 94
- MCV 70
- Creatinine 154
- Glucose 3-15
Case – Further Information

• What adverse drug reactions do you think are happening and why?
• What other history do you want?
• Any further physical?
• Any further investigations?
Prescribing/Deprescribing

• Criteria are drug- or disease-oriented and have high reliability and reproducibility for prescribing/deprescribing
• The criteria can become outdated
• Consider as screening tools to identify and prioritize problem areas in drug prescribing for high-risk elderly
• One example: Updated 2015 Beers criteria
Beers Criteria

• Categorizes the medications/classes that should be avoided in those aged 65 years or more
• It was developed from an interdisciplinary panel of 13 experts who applied modified Delphi method to the systematic review and grading to reach consensus
• Medications or classes were identified and divided into three categories as per 2012
Beers Criteria

- Potentially inappropriate medications (PIM) or classes to avoid
- Medications to avoid with certain diseases/syndromes
- Medications to be used with caution in older adults
Beers Criteria

Additions of drugs to avoid in the 2015 criteria include

- Drugs for which dose adjustment is required based on kidney function e.g., apixaban, rivoroxaban
- Drug–drug interactions e.g., taking three or more CNS-active drugs concomitantly
- The table of medications with strong anticholinergic properties was updated
Beers Criteria

Additions of drugs to avoid in the 2015 criteria include

• nonbenzodiazepine, benzodiazepine receptor agonist hypnotics (eszopiclone, zaleplon, zolpidem)

• Proton pump inhibitors beyond 8 weeks as risk of Clostridium difficile infection, bone loss, and fractures

• Desmopressin as risk hyponatremia
Screening Tools for Inappropriate Medications

• Beers Criteria

• STOPP criteria

  Screening Tool of Older Persons’ potentially inappropriate Prescriptions

• START Criteria

  Screening Tool to Alert doctors to Right Treatment

• Medication Appropriateness Index
Screening Tools for Inappropriate Medications

• No convincing evidence that these tools reduce morbidity, mortality or cost

• Use these tools with clinical judgment
Drug categories to avoid in the elderly, regardless of the consensus criteria used

- Anticholinergics
- Sedatives/hypnotics
- Anti-inflammatories
- Cardiovascular (e.g., some antiarrythmics, cardiac glycosides)
- Opiate-related analgesics
- Anti-infective (e.g., long-term nitrofurantoin use - pulmonary toxicity)
- Endocrine (e.g., testosterone, growth hormone)
“High blood pressure, high cholesterol, high blood sugar, high anxiety... getting high is no fun at my age!”
Maintain an up-to-date drug list with indications for all drugs prescribed, over the counter and herbal supplements.

Know the actions, adverse effects, and toxicity profiles of medications prescribed; avoid and be vigilant of high-risk drugs as identified by Beers criteria.
Strategies for Appropriate Prescribing

• Prioritize medication prescribing – consider the patient's life expectancy/prognosis/quality of life; time to benefit

• Start new medications at a low dose and titrate up based on tolerability and response
Strategies for Appropriate Prescribing

- Avoid using one drug to treat the side effects of another (e.g., prescribing cascade)
- Attempt to use one drug to treat two or more conditions
- Avoid using drugs from the same class or with similar actions
- Educate the patient/caregiver about each medication
Strategies for Appropriate Prescribing

• Maintain the simplest medication regimen regarding number of medications, routes, frequency of administration

• Communicate with other prescribers

• Engage in use of systems that support optimal prescribing behavior:
  – drug utilization reviews
  – pharmacist-led interventions for medication review
  – technology and drug alert systems
Methods

• **Design**: Cross-sectional study

• **Sample**: 200 patients ≥ 65 years seen for comprehensive geriatric assessments at the Glenrose Rehabilitation Hospital in 2012-2013

• **Procedure**: Chart review on usage of PIMs as defined by the 2012 BEERS criteria
# Prevalence of PIMs Prescribed

This compares with 41% using data from the Medical Expenditure Panel Survey (MEPS) in 2009–10 according to the 2012 AGS Beers Criteria.

49.5% of patients were prescribed PIMs (98/200).

<table>
<thead>
<tr>
<th>Group 1: Medications to Avoid in Older Adults (regardless of diseases or conditions)</th>
<th>Group 2: Medications Considered Potentially Inappropriate when Used in Older Adults with Certain Diseases or Syndromes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>45.5% (91/200) were prescribed at least One Group-1 PIM.</strong></td>
<td><strong>31% (62/200) were prescribed at least one Group-2 PIM.</strong></td>
</tr>
<tr>
<td>16% (32): at least 2 PIMs</td>
<td>13.5% (27): at least 2 PIMs</td>
</tr>
<tr>
<td>2.5% (5): at least 3 PIMs</td>
<td>5% (10): at least 3 PIMs</td>
</tr>
<tr>
<td>1.5% (3): 4 PIMs</td>
<td>3% (6): 4 PIMs</td>
</tr>
</tbody>
</table>
## Most Common PIMs Prescribed

<table>
<thead>
<tr>
<th>Group-1 PIMs:</th>
<th>Group-2 PIMs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zopiclone (n=32)</td>
<td>Benzodiazepines (n=29)</td>
</tr>
<tr>
<td>Benzodiazepines (n=33)</td>
<td>Zopiclone (n=14)</td>
</tr>
<tr>
<td>Pain-Indomethacin/NSAID (n=16)</td>
<td>SSRI (n=12)</td>
</tr>
</tbody>
</table>

Group 1: Medications to Avoid in Older Adults (regardless of diseases or conditions)

Group 2: Medications Considered Potentially Inappropriate when Used in Older Adults with Certain Diseases or Syndromes
Medication Reconciliation

- This is a formal process designed to prevent medication errors by collection and communication of accurate patient medication history
- Decreases medication errors by 70%
- Decreases ADE by 15%
- Best Possible Medication History
- Canadian Study – n 60, community hospital
  - 60% one discrepancy
  - 18% clinically important discrepancy
  - 75% intercepted by medication reconciliation before patient harmed
Prescriber Guidelines
- The following Medications are currently being taken by the client.
- If any medications are to be discontinued or changed, notify the pharmacy by sending in a prescription.

### Allergies:

| Medications that client is currently taking: include insulin, over the counter (OTC), drops, patches, creams, injections, inhalers, sprays, vitamins and herbals | Dose/Route/Frequency | Prescriber | Pharmacy | Comparison |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

<table>
<thead>
<tr>
<th>Comments</th>
<th>Discrepancy Code</th>
<th>Discrepancy Info Source</th>
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<tbody>
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</tbody>
</table>
### Medication Record

**Prescriber:**
- a. ph# Information Source: Discrepancy Codes
- b. ph# □ A – Client 1. No discrepancy
- c. ph# □ B – Caregiver 2. Med not currently prescribed
- d. ph# □ C – Medication vials 3. Client not taking med
- e. ph# □ D – Client's own med list 4. Different frequency

**Pharmacy:**
- 1. ph# □ E – Bubblepack/Dosette 5. Different route
- 2. ph# □ F – NetCare PIN Profile 6. Different dose
- 3. ph# □ G – Discharge info from Facility 7. OTC not taken as directed
- 4. ph# □ H – Other ______ 8. Other ______

**Medication Record sent to Prescriber**
- □ Yes Prescriber: □ a. □ b. □ c.
- □ No □ Client managing medication □ Client refused
  □ Client following up with prescriber □ Other ______

**Assessor Information**

<table>
<thead>
<tr>
<th>Assessor Name</th>
<th>Assessor Signature</th>
<th>Date</th>
</tr>
</thead>
</table>
Medication Reconciliation

- Medication reconciliation is particularly important at transitions of care
- The health system currently has significant deficiencies in safety at discharge (Snow, 2009)
- Medication errors tend to occur in transitions of care (Desai, 2013)
**MedRec as a Strategy**

Definition: “Medication reconciliation is a formal process in which healthcare providers work together with patients, families and care providers to ensure accurate & comprehensive medication information is communicated consistently across transitions of care.”

(Institute of Safe Medication Practices in Canada: ISMP)
MedRec as a Strategy

• It has been identified by the W.H.O., as part of their High 5s project, highlighting the top 5 safety priorities internationally

• MedRec is an Accreditation Canada Required Organizational Practice (Accreditation Canada, 2012)

• It is a major safety initiative to improve communication about medications as patients’ transition through healthcare settings
MedRec as a Strategy

It requires:

a. Best Possible Medication History (BPMH):
   Generation of a complete and up to date medication list including drug name, dosage, route and frequency from 2 sources

b. Reconciliation of the medication list and identification of discrepancies

c. Documentation and communication
Institute of Safe Medication Practices in Canada

http://www.ismp-canada.org/medrec/

**Medication Reconciliation (MedRec)**

Medication reconciliation is a formal process in which healthcare providers work together with patients, families and care providers to ensure accurate and comprehensive medication information is communicated consistently across transitions of care. Medication reconciliation requires a systematic and comprehensive review of all the medications a patient is taking (known as a BPMH) to ensure that medications being added, changed or discontinued are carefully evaluated. It is a component of medication management and will inform and enable prescribers to make the most appropriate prescribing decisions for the patient.
MedRec Online Resources

Alberta Health Services – Medication List Campaign
http://www.albertahealthservices.ca/info/page12614.aspx
MedRec Online Resources

Alberta Health Services – Medication Reconciliation eLearning Module
http://www4.albertahealthservices.ca/elearning/wbt/MedRec/index.html
STUCTURED MEDICATION REVIEW

- Definition: regularly scheduled discussion between a patient and their doctor/pharmacist/nurse to review ALL medications and address
  - How each medication is working
  - How each medication is taken
  - Patient concerns
- Aim is to reduce polypharmacy, non adherence and ADR
Why to do a SMR

• Improves appropriate prescribing
• Identifies drug related problems – administration, side effects and interactions
• Decreases
  – Unscheduled visits
  – ED visits
  – Hospitalization
  ▪ No. of medications
  ▪ Cost
When to do a SMR

• 5 key reasons for HCP:
  Patients asks
  Take > 5 medications
  Have > 3 comorbidities
  Receive medications from > 1 MD
  Medication change in last 12 mo
How to do a SMR

- Patient brings all medications (Rx, OTC and herbals)
- Calculate Creatinine Clearance
- List all medications and indications
- Consider appropriate dose and frequency
- Identify any administration issues, side effects or drug interactions
Case

• 6 mo. ago 83 y o female on no meds developed L knee pain
  – pain & insomnia Rx T#3 & lorazepam
  – Constipation & low energy Rx senokot & paroxetine
  – Confusion & falls Rx donepezil

• Now, there is confusion, falls, and constipation and five new medications
• Calculate creatinine clearance
## Case - SMR

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<tbody>
<tr>
<td>Tylenol #3</td>
<td>QA with L knee pain</td>
<td>Not prn</td>
<td>Communication</td>
<td>Constipation, Falls, Delirium</td>
<td>DC T#3 Tylenol qid</td>
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<tr>
<td>2 tabs qid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paroxetine</td>
<td>“Depression”</td>
<td>High</td>
<td>Communication</td>
<td>Falls, Delirium</td>
<td>Taper off</td>
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<tr>
<td>20 mg qd</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Donepezil</td>
<td>“Dementia”</td>
<td>High</td>
<td>Communication</td>
<td>Delirium</td>
<td>Hold. Reassess</td>
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<td>10 mg qd</td>
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<tr>
<td>Lorazepam</td>
<td>Insomnia</td>
<td>High</td>
<td>Communication</td>
<td>Delirium</td>
<td>Taper off. Reassess</td>
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<tr>
<td>2 mg qhs</td>
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<td>Falls</td>
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<tr>
<td>Senekot</td>
<td>Constipation</td>
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<td>No</td>
<td>DC Senokot Prune Juice</td>
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<td>2 tabs qhs</td>
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Approaching a Physician/NP

• If you feel a medication is adversely effecting the patients therapy – record your observation and temporal relationship to medication

• In hospital – bring up at rapid rounds

• In community – you’d have to fax information to FP
Questions

• Contact information:

  • Lesley.Charles@albertahealthservices.ca