Polypharmacy in the Geriatric Client
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Objectives
› Review changes in the geriatric population affecting future nurse practitioner practice
› Discuss pharmacokinetic/pharmacodynamic considerations in the geriatric client.
› Explain treatment modifications that need to be implemented for chronic conditions and pharmacology management with the geriatric client.

Disclosures
› There is no commercial support associated with this educational activity.
› The speaker has participated in the past on advisory boards and Speaker’s Bureaus for AbbVie, Bristol-Myers-Squibb, and Pfizer, but currently has no financial relationships with these agencies.
› The use of any trade names is solely for familiarity of the audience.

What is Polypharmacy?
› Numerical
› Descriptive
› Time span
› Healthcare setting

Associated Terms
› ADE – Adverse drug event
› ADR – Adverse drug reaction
› MRH – Medication-related harm
› MRM – Medication risk mitigation
› PIM – Potentially inappropriate medication

Significance of Polypharmacy

[Ref: Masnoon, Shakib, Kalisch-Ellett, & Caughey, 2017]
**Prescription drug use**

| Age Group | Use of Prescription Drugs in Past 30 Days (%)
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>61-64</td>
</tr>
<tr>
<td>30-44</td>
<td>65-69</td>
</tr>
<tr>
<td>50-64</td>
<td>70+</td>
</tr>
</tbody>
</table>

**National Social Life, Health, and Aging Project**

*Qato, Wille, Schumm, Gillet, & Alexander, 2016*

<table>
<thead>
<tr>
<th>NSHAP Findings</th>
<th>Wave 1 (n=2351) 2005-2006</th>
<th>Wave 2 (n=2206) 2010-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription medication use ages 62-85 years</td>
<td>84.1%</td>
<td>87.7%</td>
</tr>
<tr>
<td>≥ 5 prescription medications</td>
<td>30.6%</td>
<td>35.0%</td>
</tr>
<tr>
<td>5 or more medications or supplements</td>
<td>57.4%</td>
<td>67.1%</td>
</tr>
<tr>
<td>Over-the-counter medication use</td>
<td>44.4%</td>
<td>37.9%</td>
</tr>
<tr>
<td>Dietary supplements</td>
<td>51.8%</td>
<td>63.7%</td>
</tr>
<tr>
<td>2 or more dietary supplements</td>
<td>31.8%</td>
<td>47.0%</td>
</tr>
<tr>
<td>Drug use with potential major drug-drug interactions (ages 62-85)</td>
<td>8.4%</td>
<td>15.1%</td>
</tr>
<tr>
<td>≥ 2 potentially interacting drugs</td>
<td>1.6%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

**Drug Effects on Geriatric Clients**

*Fletcher, 2014*

**Pharmacokinetics**

- Impaired renal function
- Increased cognitive effects
- Reduced hepatic blood flow
- Increased body fat

**Geriatric Considerations**

- Reduced gastric acidity
- Reduced intestinal blood flow
- Absorption
  - Fewer absorbing cells
  - Increased contact time in transit

**Medication Trends 2005-2011**

- More than 1 in 3 adults use 5 or more concurrent prescription medications
- 2/3 of older adults use concurrent prescription, over-the-counter medications, and dietary supplements
- 1 in 6 older adults at risk for potentially major drug-drug interactions
- Almost 50% increase in use of multiple supplements

**Prescription medication use in the past 30 days by age and number of drugs taken**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>1 drug</th>
<th>2 drugs</th>
<th>3 or more</th>
</tr>
</thead>
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<tr>
<td>18-29</td>
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</table>
Geriatric Considerations

Decreased body water  
Increased body fat  
**Distribution**

 Decreased lean body mass  
Increased plasma concentration

(Katzung, 2018; Rochon, Gill, & Gurwitz, 2017; Steinman & Holmes, 2014)

Geriatric Considerations

Decreased liver size  
Decreased hepatic blood flow  
**Metabolism**

Decline in CP450 enzyme system  
Affected by multiple drugs

(Katzung, 2018; Rochon, Gill, & Gurwitz, 2017)

Geriatric Considerations

Decreased renal blood flow  
Reduced pulmonary capacity  
**Elimination**

Reduced creatinine clearance ($\text{Cl}_\text{cr}$)  
Slowed bowel transit

(Katzung, 2018; Fletcher, 2014)

Pharmacodynamics

Effects of drug on the body

› Biochemical and physiological processes  
› Control of body functions  
› Adverse reactions  
› Drug interactions

Adverse Drug Events (ADEs)

› 450,000 emergency room visits each year  
› Older adults are 7 times more likely to be hospitalized  
› Leading cause of nonsurgical adverse event in hospitals
  - Increased length of stay  
  - Higher costs  
  - Increased risk of in-hospital death  
› Up to 140,000 deaths annually in U.S.

(Agency for Healthcare Research and Quality [AHRQ], 2018; Centers for Disease Control and Prevention [CDC], 2018; Zhou & Rupa, 2018)

Patient Example

27 Potential Drug Interactions!
ADEs Reported to FDA

Main Drugs Associated with Adverse Drug Events

- Antibiotics and anti-infectives
- Antineoplastic drugs, antiallergy and antiemetic drugs
- Steroids, insulin and hypoglycemic agents
- Anticoagulants
- Antidepressants, antipsychotics, benzodiazepines
- Cardiovascular drugs – Digoxin, anti-adrenergics
- Water, mineral, and uric acid metabolism drugs
- Anticonvulsants and anti-Parkinson drugs

Factors Contributing to Polypharmacy

Increasing Life Expectancy

Multimorbidity

- 68% have 2 or more chronic conditions
- Non-chronic conditions
  - Cancer
  - Injuries
  - Surgery
  - Pneumonia

Source: Chronic Disease Management, Essentials of Clinical Geriatrics, 8e
Citation: Kane RL, Ouslander JG, Resnick B, Malone ML. Essentials of Clinical Geriatrics, 8e; 2017 Available at: http://accessmedicine.mhmedical.com/content.aspx?bookid=2300&sectionid=178119282 Accessed: March 24, 2018
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Clinical Practice Guidelines

Hypertension:
- “Many patients can be started on a single agent, but consideration should be given to starting with 2 drugs of different classes for those with stage 2 hypertension.
- Many patients started on a single agent will subsequently require ≥2 drugs from different pharmacological classes to reach their BP goals.”

(Whelton et al, 2018)

Clinical Practice Guidelines

Diabetes:
- American College of Physicians recommends that clinicians consider adding either a sulfonylurea, a thiazolidinedione, an SGLT-2 inhibitor, or a DPP-4 inhibitor to metformin to improve glycemic control when a second oral therapy is considered.

(Qaseem, Barry, Humphrey & Forciea, 2017)

Clinical Practice Guidelines

High Cholesterol:
- Adults 40-75 years of age with an LDL-C 70-189 mg/dL without clinical ASCVD or diabetes and an estimated ten-year ASCVD risk ≥ 7.5% should be treated with moderate- to high-intensity statin therapy.
- Adults 40-75 years of age with diabetes mellitus and an LDL-C 70-189 mg/dL should be treated with moderate-intensity statin therapy.
- Individuals ≤ 75 years of age who have clinical ASCVD should be treated with high-intensity statin therapy unless contraindicated.

(Stone et al, 2014)

Case Study

An 88-year-old female presents to your clinic with her daughter to discuss the arthritis pain in her hip. The patient has dementia which has been progressive. In reviewing her medications, what changes would you consider?
Medication List
› Lisinopril 5mg once a day
› Omega-3 fish oil 3 times a day
› Vitamin D 4,000 IU once a day
› Calcium 1500mg daily
› Aspirin 81mg every other day
› Synthroid 137 mcg daily
› Aricept 10mg at bedtime
› Probiotic Formula 1 tab daily
› Alfalfa tabs 500mg 2 tabs three times a day
› Multivitamin 1 tablet daily
› Oxybutynin 5mg 1 tab twice a day
› Omeprazole 20mg daily

Prescribing Cascades
› Adverse drug reaction is thought to be a new problem
› New drug is prescribed for “new problem”
  – Example:
    › Patient started on NSAID for arthritis develops hypertension
    › Patient taking anti-diabetic medication has dyspepsia
    › Patient taking pain medication has constipation
    [Barclay, Frassetto, Robb, & Mandel, 2018]

Other Contributors
› Cultural expectation that every patient-provider interaction needs to end in a prescription
› Doctor shopping (often for the same problem)
› Patient not knowing what medications they are on
› Incomplete medication list (especially with supplements)
› “Save” or borrow medications
› Self-medicating
[Divine, n.d.; Holmes & Todd, 2017]

Deprescribing Strategies

Deprescribing
The planned and supervised process of dose reduction or stopping of medication that may be causing harm or no longer providing benefit.
[Deprescribing.org, 2018]

Beers Criteria
› List of potentially inappropriate medication use in older adults
› Updated in 2015 (and 2018)
  – Drugs for which dose adjustment is required based on kidney function
  – Drug-drug interactions
  – Drug-disease interactions
› List of alternative pharmaceutical and non-pharmaceutical options
[Fick et al., 2015; Maroteaux et al., 2016]
Pocket card reference available from American Geriatrics Society at: https://geriatricscareonline.org/ProductAbstract/beers-criteria-pocketcards/PC001

Deprescribing.org

› Website with tools to help with deprescribing
› Information on research initiatives
› Deprescribing Guidelines and Algorithms
› Patient decision aids
› Webinars
› Information pamphlets

STOPP/START Criteria

› More widely used in Europe
› STOPP = Screening Tool of Older People’s potentially inappropriate Prescriptions
› START = Screening Tool to Alert providers to the Right Treatment
› Significantly associated with ADEs

(Ö Mahoney, O’Sullivan, Byrne, O’Connor, Ryan, & Gallagher, 2015)

STRIP Tool

› Drug History
› Analysis of Drugs
› Treatment Plan
› Patient Preferences
› Follow-up/Monitoring
› Yearly review

(Deeth van Maanen, 2017; Meulendijk, 2015)

“Brown Bag” Review

› Have patient bring ALL medications to appointments
› Include OTC products
› Reconcile with documented medication list
› Query patient on what each medication is for and how it is taken

Stepwise Approach to Deprescribing

› Determine all current medications
› Consider overall risk of potential harm
› Evaluate risk versus benefit
› Prioritize drugs for discontinuation
› Implement the deprescribing plan and monitor closely

(Baanwinder & O’neil, 2015; Scott et al., 2015)
Barriers to Deprescribing

Provider Barriers
- Guideline-recommended therapies
- Concern about withdrawal side effects
- Prescriptions initiated by another provider
- Patient resistance
- Lack of time

Patient Barriers
- Resistance to non-pharmaceutical interventions
- Uninformed/unaware of medication risks
- Medication perceived as necessary
- Not knowing how to cease medication
- Previous bad experience with medication cessation
- Fear of withdrawal

System Barriers
- Fragmented care continuum
- Non-interoperative electronic health records
- Inconsistent primary medication management
- Single-disease clinical practice guidelines

Summary
- Polypharmacy in combination with multimorbidity has become more prevalent as the population ages
- Clinical practice guidelines need to address multiple chronic disease management
- Tools are available to help clinicians address polypharmacy and deprescribing
- Comprehensive medication reviews and strategies for deprescribing need to be implemented in standard practice

Resources

References
- Djatche, Lee, Singer, Hegarty, Lombardi, & Maio, 2017
- Reeve, Hendrix, Shakib, Roberts, Wiese, 2013
- Guharoy, 2017
References

- References

Choosing Wisely Campaign

- American Geriatrics Society
- List of potentially inappropriate medication in elderly
- Pocket card reference: https://geriatricscareonline.org/ProductTypeStore/toolkits/20/

Multimorbidity Toolkit

- Free resource for clinicians
- https://geriatricscareonline.org/ProductTypeStore/toolkits/20/

References

- Beers Criteria. (2017). Patient resources
- Reference

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- Reference
References


