

Principles of Therapeutics in the Elderly



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Individuals > 65-years-of-age consume approximately 40% of prescription drugs, despite the fact they represent only 13% of the total Canadian population. It is estimated that the prevalence of potentially inappropriate prescribing (PIP) in this age group ranges from 12% to 40%. With increased numbers of drugs consumed per day, the PIP risk rises; less than four drugs is associated with a 12% risk and more than five drugs increases the risk to 40%. Unfortunately, the trend of PIP has not declined over the years.



What is the definition of inappropriate prescribing?

Excessive and unnecessary use of drug therapy or the underprescribing of proven beneficial therapy¹ best describes this problem. Specifically it includes:

- Overuse where medications are not indicated or contraindicated (e.g., long-acting benzodiazepines)
- Underuse where medications are not prescribed for an accepted indication despite the fact evidence supports that treatment (e.g., anticoagulation for atrial fibrillation, treatment for depression, pain and osteoporosis)

Leona's case

Leona, 75, is seen for acute confusion and new onset of urinary incontinence. She has recently been discharged from hospital after a 3 week stay for pneumonia, delirium and an acute flare of gout. She has known hypertension, renal insufficiency, osteoporosis with compression fractures, mild cognitive impairment and venous insufficiency. She lives alone, uses 2 pharmacies and takes her medications out of pill bottles.

Her current medications include:

- Haloperidol 1 mg t.i.d.
- Propoxyphene 1 tablet q.i.d.
- Furosemide 40 mg q.d.
- Indomethacin 50 mg t.i.d.
- Enalapril 7.5 mg b.i.d.
- Oxybutynin 2.5 mg t.i.d.
- Calcium 500 mg t.i.d.
- Vitamin D 400 IU q.d.
- Sinemet 100/25 1 tablet b.i.d.

On examination, Leona's BP is 160/90 mmHg. She has no active synovitis. There is cogwheel rigidity at her wrists/elbows. She has pedal edema, but her chest is clear and there is no jugular venous distention. Her balance is poor and mobility is reduced. She is distractible and unable to focus on tasks. Her labs are:

- Sodium 130 mmol/L
- Potassium 5.0 mmol/L
- Creatinine 130 umol/L
- Creatinine clearance 32 ml/min
- Blood urea nitrogen 14 mmol/L

Turn to page 67 for more about Leona.

- Misuse where medications are prescribed with inappropriate dosages, for an inappropriate duration or in ways that introduce unnecessary risk (*e.g.*, dangerous combinations of drugs)

Q *What are the reasons why older persons are predisposed to PIP?*

Some reasons for this predisposition include:

- **Patient factors**
 - Increased comorbidities
 - Consumer expectations
 - Atypical disease presentation
 - Noncompliance
 - Health literacy
 - OTC drug usage
 - Physiologic changes affecting medication disposition
- **Physician factors**
 - Reluctance to stop drugs
 - Prescribing cascade to treat symptoms induced by current medications
 - Multiple prescribers/pharmacies
 - Reduced pharmacist interaction
 - Suboptimal communication, especially at transitions of care

Q *What are the sequelae of inappropriate prescribing?*

Adverse drug events occur two to three times more frequently in older persons due to:

- the increased drugs prescribed,
- multiple diseases present,
- changes with drug handling with aging and

- drug-drug and drug-disease interactions.

Drug-related morbidity annual costs are estimated to be approximately \$10.9 billion in Canada. Other sequelae include reduced quality of life, decreased function, hospitalization or death.

Q *How can we define inappropriate drugs?*

Defining inappropriate drugs can occur by two methods—arbitrary decision making or by consensus, as seen with the Beers and the McLeod criteria. At best, these criteria may be considered screening tools to identify and prioritize problem areas in drug prescribing for high-risk elderly patients. Recurring drug categories to be vigilant with the elderly include the following:

- Anticholinergics (*e.g.*, tertiary tricyclic antidepressants, GI anti-spasmodics, typical antipsychotics, first-generation antihistamines)
- Sedative/hypnotics
- Anti-inflammatories (*e.g.*, NSAIDs). These should ideally be used for short periods of time, in low doses when alternatives have failed
- Opiate-related analgesics (*e.g.*, pentazocine, propoxyphene, meperidine)
- Antiarrhythmics (*e.g.*, disopyramide)

The Medication Appropriateness Index lists 10 items that include:

- medication indication,
- effectiveness,
- dosage,

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More about Leona...

Questions

1. Does Leona qualify for a structured medication review? If so, how would you proceed?
2. What examples of medication-related problems exist?
3. What strategies can be implemented to reduce adverse drug events?

Answers

1. Yes, since she has had medicinal changes, has > 5 medications, > 3 comorbidities and new cognitive and functional changes. All the medications need to be listed and their indications evaluated. The doses of the various drugs and the frequency need to be critiqued carefully. Administration/compliance issues should be determined and side-effects or drug interactions considered
2. Medication-related problems include the following examples:
 - Overuse: haloperidol, prooxyphene
 - Underuse: bisphosphonate for osteoporosis
 - Misuse: haloperidol, propoxyphene, indomethacin, furosemide, oxybutynin and low dose of Vitamin D
 - Drug-drug interaction: indomethacin

- attenuates the effect of enalapril
 - Drug-disease interaction: indomethacin and renal insufficiency
 - Prescribing cascade: levodopa and carbidopa for haloperidol-induced extrapyramidal side-effects; oxybutynin for urge urinary incontinence secondary to furosemide
 - Delirium secondary to various drugs including prooxyphene, oxybutynin, sinemet and indomethacin
3. Strategies include:
 - Simplify the medication regimen by stopping indomethacin, haloperidol, oxybutynin, furosemide, propoxyphene, levodopa and carbidopa
 - Use compliance aid (e.g., blisterpack the medications)
 - Supervise medication usage—home care involvement
 - Recommend 1 pharmacy
 - Consider nonpharmacologic options (e.g., pressure gradient stockings for venous insufficiency/pedal edema)
 - Engage clinical pharmacist and regularly review compliance and medicine list
 - Monitor lab and BP with medication changes
 - Review cognitive and functional status

- directions,
- drug-drug interactions,
- drug-disease interactions,
- expense,
- duplication,
- practicality and
- duration.

It takes 10 minutes per drug to complete and this tool has been validated in various settings. A medicine with a higher score indicates the drug is less suitable to use for an elderly patient.

What are some strategies for appropriate prescribing?

There are many factors that contribute to a strategy for appropriate prescribing. Physicians should:


- Maintain an up-to-date drug list with explicit indications/objectives for all drugs prescribed and:
 - Consider nonpharmacologic options
 - Use drugs of proven efficacy

Take-home message

- Critically analyze drugs prescribed for seniors to ensure appropriateness
- Think of adverse drug events with new symptoms or functional decline
- Communicate effectively with patients and other care providers to increase adherence

- Regularly review need for the drug and stop the drug if possible
- Know the actions, adverse effects and toxicity profiles of medicines prescribed and consider adverse drug effect as a potential cause for any new symptom or functional decline
- Start new medications at a low dose and titrate up based on tolerability and response
- Avoid using one drug to treat the side-effects of another (*i.e.*, prescribing cascade)
- Attempt to use one drug to treat two of more conditions
- Avoid using drugs from the same class or with similar actions
- Educate patient and/or caregiver about each medication:
 - Know patient's cognitive/functional strengths and limitations and health literacy
 - Provide written information or visual aids
 - Use structured medication review process to optimize impact of medications and minimize the number of medication related problems and waste. This should be done when there are over five medications, over three co-morbidities, changes in medications, or more than one prescriber
- Maintain the simplest medication regimen regarding number of medicines, routes and

frequency of administration (once or twice daily dosing is preferable)

- Communicate with other prescribers (teamwork between doctors and pharmacists leads to best outcomes) and try to limit to one prescriber
- Engage in use of systems/technologies that support optimal prescribing behaviour (*e.g.*, drug utilization reviews, computerized physician order entry with decision support and palmtop reference guides)
- Reduce errors with the practice of medication reconciliation, which identifies and rectifies medication discrepancies at transitions of care 

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Resources

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