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INSTRUCTIONS

1. After carefully reading this lesson, study each question and select the one answer you believe to be correct. For immediate results answer online at www.CanadianHealthcareNetwork.ca.

2. To pass this lesson, a grade of at least 70% (10 out of 15) is required. If you pass, your CEU(s) will be recorded with the relevant provincial authority(ies). (Note: some provinces require individual technicians to notify them.)

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Caring for geriatric patients

by Lisa Sever, BSc PHM, ACPR, CGP, RPh

Learning objectives

Upon successful completion of this lesson, the pharmacy technician will be able to do the following:

1. Recognize factors and medications that put older adults at risk of adverse drug events
2. Identify strategies to reduce medication errors at transitions of care
3. Increase awareness of limitations in the geriatric population that affect medication management and strategies to help overcome them
4. Identify programs or strategies to improve medication safety and adherence in geriatric patients

Overview

The population across Canada is aging. By 2036, people 65 years of age or older are expected to make up 25% of the Canadian population. Notably, 75%–80% of these people will have one or more chronic conditions, leading to an increase in the number of medically complex older adults being cared for in the home environment.[1] These statistics mean that healthcare professionals will have

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greater exposure to the geriatric population in both hospital and community settings. Registered pharmacy technicians need to be aware of the medication management issues surrounding the geriatric population.

A report noted that approximately 50% of prescriptions are not taken properly by seniors, and it estimated that 20% of hospitalizations are because of medication-related problems.[2] Managing medications in a safe and effective way is an ongoing challenge for this population. Seniors are dealing with the dynamic physical and chemical changes of an aging body, and managing multiple chronic diseases requiring physician, hospital and ambulatory clinic visits. Some are adjusting to changes in their socioeconomic status, with the onset of retirement or perhaps the loss of a spouse. All of these potential factors can contribute to adverse drug events, medication errors with transitions in care and adherence challenges.

TABLE 1 - Examples of medications that require dosage adjustment in renal impairment[9]

Antihyperglycemic agents	Glyburide* Metformin Sitagliptin / Saxagliptin Exenatide / Liraglutide Canagliflozin / Dapagliflozin / Empagliflozin
Anticoagulants	Apixaban Dabigatran Rivaroxaban
Antineoplastics	Methotrexate Hydroxyurea
Pain medications	Nonsteroidal anti-inflammatory drugs* Morphine Codeine Gabapentin Pregabalin
Antibiotics / antivirals	Sulfamethoxazole-Trimethoprim Ciprofloxacin Famciclovir
Other	Digoxin* Atenolol (based on heart rate)

* Potentially inappropriate medications in the elderly (per Beers criteria, discussed below).
For more information on dosage adjustments in renal impairment refer to https://kdpnet.kdp.louisville.edu/drugbook/adult/

Adverse Drug Events

Older adults are at risk of adverse drug events for many reasons. Adverse drug events are defined as "an injury from a medicine or lack of an intended medicine. Includes adverse drug reactions and harm from medication incidents."[3] The use of multiple medications, commonly referred to as polypharmacy, predisposes older adults to additive side effects and drug interactions that can cause harm. The number of medications a patient takes can be influenced by the number of different prescribers, diseases and hospitalizations, as well as the "cascade effect" (treating a drug side effect with another drug). In addition, primary care providers may not have accurate medication lists when making prescribing decisions, medication lists may be incomplete or they may not reflect how patients are actually taking their medications in the home environment.[4]

As the number of medications increases, so does the risk of adverse drug events. A Canadian report found that older adults taking 15 or more medications were 6.4 times more likely to experience an adverse event than those taking five medications. Anticoagulant-related bleeding, neutropenia (low number of white blood cells that fight infection) due to antineoplastic agents and constipation secondary to opioids were the top three reasons for drug-related hospitalization, with many of these events considered preventable.[5] Another study illustrated that anticoagulants, antiplatelet agents, oral hypoglycemic agents and insulin accounted for 66% of drug-related emergency room visits.[6] As the majority of serious medication adverse events are related to high-alert medications (e.g., warfarin), prescribers, home-visiting health providers and pharmacy professionals must be knowledgeable about the risks and actively engage with patients to ensure outcomes and adverse effects are being evaluated regularly. Polypharmacy can also lead to an increase in drug interactions. ISMP Canada identified drug interactions that lead to harm / hospitalization in the geriatric population[7]. They identified drug—drug pairs that require action when antibiotics are added to an existing medication regimen such as Digoxin—Clarithromycin or warfarin—ciprofloxacin. This reinforces the importance of patients maintaining and sharing their current medication list to ensure a valid drug-drug interaction check is completed.

Adverse drug events can also stem from changes to an aging body. Prescriber collaboration with pharmacists can aid in choosing the right medication, dose, frequency and time frame to keep the patient safe from medication harm while optimizing the therapeutic benefits.

Body changes with aging[8]

The aging body absorbs, distributes, metabolizes and excretes medications differently.

Absorption of some medications may be affected because stomach acid production is reduced as people age. In patients with chronic constipation or diarrhea, an alteration in gastrointestinal transit time can also affect the absorption of some medications.

Metabolism of some medications by the cytochrome P450 liver enzymes as well as hepatic first-pass metabolism (e.g., conversion of enalapril to enalaprilat, the active metabolite) may be reduced as the body ages.

Distribution of drugs within the body can be altered as the aging body has increased fat and reduced total body water, which can affect drug onset of action or result in toxic medication levels. Low albumin levels in the blood may lead to toxic levels of certain medications that bind to this protein (e.g., phenytoin).

BOX 1 - Clinical Scenarios: Falls caused by medications

- Over-diuresis with furosemide leading to dehydration and low blood pressure.
- Using an oral sulfonylurea (e.g., gliclazide) in a patient with type 2 diabetes who does not eat regularly, leading to hypoglycemia.
- Rushing to the bathroom due to untreated urinary incontinence

TABLE 2 - Examples of medications with anticholinergic properties[11]

Urinary incontinence agents	Oxybutynin Tolterodine Darifenacin Solifenacin Fesoterodine
Psychotropics	Amitriptyline Paroxetine Quetiapine
Antihistamines	Diphenhydramine Dimenhydrinate Hydroxyzine Scopolamine

Excretion of most medications or metabolites is primarily achieved through the kidneys. As the body ages, the kidneys shrink in size, blood flow to the kidneys may be diminished and the filtering ability can become altered. Chronic diseases such as diabetes and hypertension contribute to reduced kidney function. Kidney (renal) function is estimated by measuring the serum creatinine (a blood test). It is important to know a patient's kidney function before prescribing and dispensing certain medications (Table 1), as these drugs may require an adjustment in dosage or frequency of administration. Otherwise, the reduced excretion of these agents in patients with renal impairment can lead to toxic levels and severe adverse drug events. For example, methotrexate when taken by a patient with renal impairment can cause severe myelosuppression (decreased ability of the bone marrow to produce blood cells) and death.

Given that the human body is continuously evolving, it is recommended that medication regimens are periodically reviewed with older adults and changes recommended, if needed, to keep them safe from medication harm. [10]

Choosing safe and appropriate medications for seniors

Prescribing potentially inappropriate medications may put older adults at risk of adverse drug events such as falls and cognitive decline, which are two big influences on whether older adults remain as active and contributory participants in our society.

Experts have analyzed and reviewed the harm of certain medications in the geriatric population. Various tools are available to guide prescribers on making safe choices. The American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults is a widely recognized resource (http://onlinelibrary.wiley.com/doi/10.1111/jgs.13702/abstract). Other tools include the STOPP/START criteria for potentially inappropriate prescribing in older people (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4339726/pdf/afu145.pdf). In addition, deprescribing initiatives (see www.deprescribing.org) are underway to reassess medications that may no longer be indicated. Evidence-based algorithms provide step-by-step procedures to deprescribe (i.e., stop or reduce the use of) proton pump inhibitors, antipsychotics, benzodiazepines and antihyperglycemics. These are good resources to have available in the pharmacy.

Falls and cognitive decline

Healthcare professionals need to be aware of the potential for medications that cause falls or affect cognition (memory). Medications may often be overlooked as contributing factors (see Box 1 examples). Medications known to increase the risk of falls typically include antipsychotics, antidepressants, anticonvulsants, benzodiazepines, opioids and those with anticholinergic properties (see Table 2). Assessment of medications must go above and beyond linking a fall with a single medication.

Additive side effects (e.g., dizziness) and drug interactions (e.g., causing irregular heartbeats) need to be considered, as do the clinical scenarios surrounding the fall.

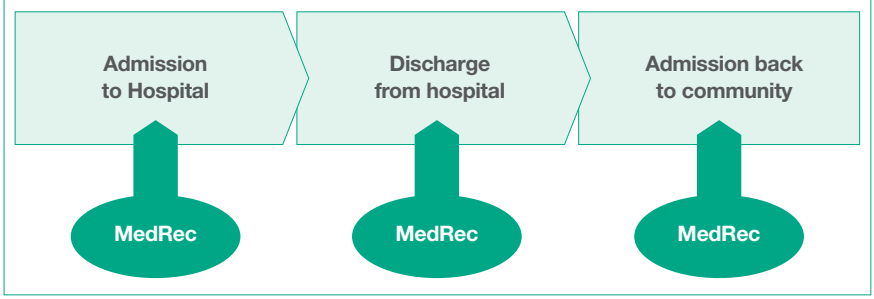
Cognitive decline, often mistakenly accepted as an outcome of aging, needs to be investigated by a primary care clinician or geriatrician to determine the root cause. [12] Untreated infection or nutritional deficiencies such as low vitamin B12, folate or thiamine levels may contribute to an older adult presenting with confusion. Medication classes such as opioids, benzodiazepines, cardiovascular agents and those with anticholinergic properties (see Table 2) can cause, mimic or worsen cognitive decline. Pharmacy technicians should watch for seniors purchasing common OTC products with anticholinergic properties, such as dimenhydrinate or diphenhydramine. These drugs can increase the risk of falls or cognitive decline and seniors / caregivers need to be informed of the risks.

Medication reconciliation at transitions in care

Transitioning between care environments puts patients, especially older adults, at risk of medication errors. Once patients return home from the hospital, up to 94% take medications differently than what the hospital discharge orders indicate.[13] A home care analysis also illustrated that 68% of reported medication incidents happen after discharge from hospital.[14] Medication reconciliation is an intervention that can help reduce errors due to communication gaps at transitions in care (see Figure 1).

Medication reconciliation (MedRec) is a formal process in which healthcare providers partner with patients and caregivers to ensure accurate and complete medication information is communicated consistently across transitions in care.[4] Heightened awareness of errors at transitions in care and hospital accreditation requirements

FIGURE 1 - The pharmacist's role in intervention



have led hospitals to implement MedRec at admission and discharge. A recent study demonstrated that pharmacy technicians in hospital complete more accurate admission medication histories than emergency room nurses.[15] The same opportunity exists for pharmacy technicians in the community setting when patients come home from the hospital; consider this an admission back into the community.[16] Despite best efforts, hospital discharge medication information may contain errors or omissions that need to be reconciled in a timely fashion. The community pharmacy team can take a leading role in this intervention.

Pharmacy technicians should be formally trained in the MedRec process.[16] Using a structured approach, the objective includes a dialogue with the patient and/or caregiver to get a picture of their ACTUAL medication usage patterns including all prescription and non-prescription drugs, vitamins and natural health products. Refer to the top 10 practical tips for obtaining a best possible medication history at https://www.ismp-canada.org/primarycaremedrecguide/2_interviewingPatients.htm and the resources in Box 2.

When interviewing older adults, use strategies that increase engagement (see Box 3 tips); use eye contact and show them the medication that you are discussing. After the initial interview, written records of medications (e.g., discharge medication prescription or pharmacy profile) are used to prompt conversations and compare medications to identify differences. For example, using an open-ended question, "From our pharmacy profile, I see that you used to take rosuvastatin, but it is not listed on your discharge prescription. What did the hospital say about this medication?" This interview and comparison, when completed by the registered pharmacy technician, identifies the differences (discrepancies) that can then be discussed with the pharmacist. Depending on the discrepancy, resolution can be achieved by the pharmacist, nurse or prescriber, based on their respective scope of practice.

BOX 2 - Training resources for Medication Reconciliation

- ISMP Workshop – BPMH training for Pharmacy Technicians offered quarterly (www.ismp-canada.org)
- RxBriefcase.com – Keeping patients safe with Medication Reconciliation: we all have a role to play (requires free account)
- Best Possible Medication History Guide (https://www.ismp-canada.org/download/MedRec/SHN_medcard_09_EN.pdf)

Adherence

Medication nonadherence accounts for an estimated 5.4% of hospitalizations.[17] While some nonadherence may be intentional, other confounding factors must be considered. A systematic review revealed nonadherence in the elderly was linked to patient-related factors including disease-related knowledge, health literacy and cognitive function, as well as drug-related factors such as polypharmacy, adverse effects and the ability to obtain medications. [18] In addition, mental health issues (e.g., depression) and social isolation may contribute to nonadherence. Physical limitations can also play a role. For instance, a patient who is unable to physically manipulate an inhaler, may become frustrated and stop using it. Or if a patient is dependent on others to get their prescriptions, they may go without for a while, especially if their caregiver is away or too busy to assist. Table 3 outlines patient limitations that might signal nonadherence and possible management strategies for each. It is vital to start a conversation with the patient or caregiver to determine the root cause of the patient's nonadherence. Identifying that a patient is late with a medication refill is an excellent time to ask non-threatening open ended question such as "I just wanted to review that our instructions are up to date. How are you taking this medication?" Medication nonadherence is complex and patients should not be judged at the outset.

Implications for Pharmacy Technicians

Pharmacy technicians as direct patient care providers can effectively engage older adults and caregivers in medication safety by being effective communicators. Always use compassion and patience when talking with older adults. Actively listen to their concerns. Have empathy by recognizing that

BOX 3 - Tips for Teaching and Dialoguing with Seniors

- Use a caring tone of voice and attitude
- Use open-ended questions
- Speak clearly, at an appropriate pace
- Use plain language

TABLE 3 - Patient limitations that might signal nonadherence

	Limitations that prevent optimal medication use	Strategies to consider
Physical	• Unable to open up and apply patches • Cannot depress the inhaler • Swallowing big pills is difficult • Can't see the instructions on the vial • Drops pills when getting out of compliance package and can't see them on floor • Is not answering questions properly when asked	• Change to an alternate formulation or enlist help from a caregiver • Change to a dry powder inhaler • Verify if pills can be cut or crushed (may need to change choice of med) • Increase font size on label, recommend magnifying glass • Use a bright-coloured bowl to empty compliance pack bubble into • Ask about hearing. The patient may have a good side (i.e., ear that hears) or they may have forgotten to put in their hearing aids
Cognitive	• Does not remember day or time • Taking pills when not supposed to be • Unable to remember multiple steps for using new inhaler	• Enlist the help of a caregiver • Put medications in a lock box, ensure old or discontinued medications are removed for disposal • Discuss alternative inhalers that have fewer steps with prescriber
Accessibility	• Not able to pick up from the pharmacy • Unable to afford the medication	• Deliver medications to patient • Discuss alternatives with the prescriber

some seniors have lost their sense of control, which may present as anger or hostility. Pharmacy technicians must also understand that caregivers can have high stress levels and may be overwhelmed, thereby negatively affecting their ability to manage medications safely. Find out what resources are available in your community for caregivers and share them when indicated.

Help establish programs that promote medication safety in the pharmacy. For example, knowing that renal function may decline in older adults, develop a service or process that enables the pharmacist to have access to a patient's most recent kidney function tests when evaluating the appropriateness of prescriptions. Another idea is to educate staff about the top drug-drug interactions chart (from ISMP Canada) and post it where it is easily accessible.

Watch for clues that a patient is struggling to manage their medications. During your encounter, ask if they are having any trouble with swallowing, using devices or remembering to take their medications. Polypharmacy and complex medication regimens make it easy for patients / caregivers to make mistakes. Refer patients to have a medication review with the pharmacist.

Be a leader in implementing medication reconciliation. Get yourself trained. Develop a form that allows you to document issues and discrepancies effectively. Engage the pharmacist to resolve discrepancies. Help your patients maintain an up-to-date list of medications and vaccinations.

Empower patients to ask questions about medications and link them with the pharmacist. Provide patients with a copy of the *5 Questions to ask about your medications* found on the ISMP Canada website. If they were just discharged from hospital, ask if they have a follow-up appointment booked with their doctor, as follow-up can reduce their chance of readmission. "Remember that the patient and their family are highly motivated to avoid problems, so if they are made aware that they have an important role to play in the process, they can contribute significantly to improving the safety of medication use."[19]

Counsel patients and caregivers about safely storing medication out of reach of children AND patients with cognitive challenges to prevent accidental administration. Always remind them to bring old, discontinued or expired medications back to the pharmacy for proper disposal.

Conclusion

Complex medication regimens and an aging population are challenging the healthcare system. Healthcare professionals need to be knowledgeable about medication misadventures in this population. Proactive strategies are necessary for older adults to attain the benefits of medications, while keeping them safe from medication harm.

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QUESTIONS

Please select the best answer for each question and answer online at www.CanadianHealthcareNetwork.ca for instant results.

1. By 2036, what percentage of people in Canada will be 65 years of age or older?
a) 35%
b) 25%
c) 15%
d) 20%

2. It is estimated that 50% of hospitalizations are due to medication-related problems.
a) True b) False

3. What factors put older adults at risk for adverse drug events?
a) Polypharmacy, drug interactions
b) Medication incidents, non-adherence, transitions of care
c) Additive side effects, reduced renal function
d) All of the above

4. Which of the following could be an example of an adverse drug event?
a) Upset stomach
b) Fall
c) Stroke from non-adherence to blood pressure medication
d) b and c

5. Warfarin is an example of a high-alert medication.
a) True
b) False

6. In an aging body:
a) Absorption of medications in unaffected
b) Metabolism through the liver increases
c) Kidney function may reduce excretion of medications
d) Distribution of medications is changed due to increased total body water

7. What medications need to be adjusted in a patient with kidney impairment:
a) Digoxin
b) Methotrexate
c) Gabapentin
d) All of the above

8. Deprescribing is an evidence-based way to reassess and abruptly stop medications that are no longer clinically indicated
a) True
b) False

9. How do medications contribute to falls?
a) Side effects
b) Drug interactions
c) Over- or undertreatment
d) All of the above

10. The only cause of cognitive decline is increasing age
a) True
b) False

11. Medications with anticholinergic properties can:
a) Contribute to falls
b) Increase confusion or affect memory
c) Always be used safely in older adults
d) Both a and b

12. After discharge from hospital, up to 94% of patients take medications differently than what the hospital discharge orders say
a) True
b) False

13. Medication reconciliation can be completed without talking to the patient or caregiver
a) True
b) False

14. Medication nonadherence in older adults can be caused by:
a) Caregiver stress
b) Physical limitations such as swallowing difficulties or inability to open and apply patches
c) Inability to afford a medication
d) All of the above

15. What strategies can pharmacy technicians use to improve communication with the elderly?
a) Talk loudly, as all elderly patients are hearing impaired
b) Speak clearly, use empathy and compassion when interacting
c.) Encourage them to talk faster because there are other customers waiting
d) All of the above

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Caring for Geriatric Patients

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***REFERENCE ONLY: PLEASE SUBMIT YOUR ANSWERS ONLINE**

1. a b c d	**4.** a b c d	**7.** a b c d	**10.** a b	**13.** a b
2. a b	**5.** a b	**8.** a b	**11.** a b c d	**14.** a b c d
3. a b c d	**6.** a b c d	**9.** a b c d	**12.** a b	**15.** a b c d

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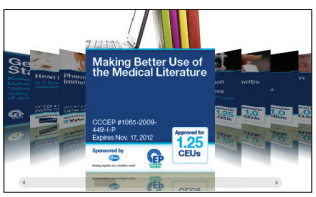

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