Optimizing Pharmacotherapy in Older Adults: The Case of Mrs. I. M. Olde

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PROLOGUE

This two-hour lecture, presented to first-year doctor of pharmacy candidates, is intended to assist students in becoming more aware of the many interrelated issues surrounding geriatric pharmacotherapy. Because of the limited time allotted for this topic, I have developed a continuous case study (found throughout this article as italicized text) which unfolds as we go through the lecture/discussion. The goal of this case is to empower students to think “on their feet” by presenting them with a series of potential and real pharmacotherapeutic dilemmas. After each vignette, students are asked to review the situation, to list real or potential drug therapy problems, to outline potential pharmaceutical care interventions, and to suggest a plan for patient monitoring. In their review of these situations, students are exposed to the negative outcomes that can ensue from the lack of provision of pharmaceutical care and the positive outcomes that result by taking an active, responsible role in the health care of patients who are 65 years of age or older. Clues to assist students in solving the problems are often provided in the discussion following the case break.

Students are not expected to leave this lecture as experts in geriatric drug therapy. However, they are expected to leave with a better understanding of the health care needs of this population and with a greater sensitivity to the need for their expertise in all health care settings. I also hope they obtain the information necessary to provide comprehensive and continuous pharmaceutical care as members of multidisciplinary care teams to all patients they serve.

INTRODUCTION

Currently, adults 65 years of age and older account for 12 percent of the nation’s population, but consume 30 percent of all prescription medications. Of all health care expenditures, 36 percent are incurred by older Americans(1). This population has a hospitalization rate that exceeds that of the general population by 50 percent. Their utilization of physician services is 30 percent greater, and their proportion of hospital days is expected to increase from 42 percent to 58 percent by the year 2000(2-4).

As the number of older adults increases, the proportion of medications consumed by these individuals will also increase(5). In addition, there will likely be an escalation of polypharmacy and adverse drug reactions. Concerns about medication misuse are especially critical among this population. Often, older adults have more chronic health conditions than younger age groups, are seen by more than one health care provider, consume more prescription and non-prescription drugs, and have more complex medication regimens(2,5,6). This disproportionately high use of medications can result in noncompliance, medication errors, therapeutic failure, and medication misuse, all of which have been identified as reasons for drug misadventures.

Drugs are prescribed for older adults with little consideration of their unique characteristics and their ability to take the medications properly. Several issues should be considered by prescribers including the patient’s functional ability to take medications properly (read the label, open the bottle), the cost of the medication, and the characteristics of the individual (physical and mental health). Evidence from past studies indicate that pharmacists, as members of multidisciplinary care teams, play a role in obtaining this information from patients. They can contribute to the appropriate use of pharmaceuticals in a way that enhances their efficacy and improves the efficiency and economy of health care(7-12).

PHARMACEUTICAL CARE

As pharmacists, it is our responsibility to investigate, resolve and ultimately prevent drug-related problems (DRP) for the purpose of achieving definitive outcomes that improve patients’ quality of life(13). This can be accomplished by developing relationships with our patients and other health care providers. These must be based on cooperation, trust, and obtaining desired therapeutic outcomes that meet the health care needs and wishes of patients. Table I outlines the steps necessary for pharmacists to familiarize themselves with their patients. This process involves collecting and analyzing patient information for the purpose of developing pharmaceutical care plans that consist of therapeutic alternatives and monitoring strategies. By not following these steps for all patients, pharmacists risk missing potential or real DRPs which prevents them from being proactive in their patient-care activities. Drug-related problems can be described as events or circumstances involving drug therapy that actually or potentially interfere with patients experiencing optimal outcomes from medical care(13). The eight categories of DRPs are listed in Table II. This list, in conjunction with the Hepler and Strand’s drug related problem approach to patient care, can be used by pharmacists to examine the appropriateness of patients’ drug regimens as well as determining patients’ risks for developing problems associated with their medications(13).

Pharmacists, at all times, must be patient advocates. This entails determining patients’ expectations from their drug therapy, coordinating care if multiple prescribers are
involved, evaluating drug versus non-drug therapeutic modalities, and most importantly, educating patients about their therapeutic regimens.

**Introduction.** Mrs. I.M. Olde is a 70-year-old widow of five years. She lives independently in her home that was shared by her and her husband for 30 years. Her daughter lives in town and visits her mother frequently. Mrs. Olde was a grade school teacher and now has a reasonable pension in addition to her Social Security and health insurance. However, she is responsible for paying for her medications. Mrs. Olde has many friends, enjoys walking and swimming and is able to carry out her own activities of daily living (ADLs). She presently has no trouble eating or sleeping.

**THE PHYSIOLOGY OF AGING**

There are many physiologic changes associated with aging that can, lead to the development of chronic conditions and the need for medications to maintain functioning. Similarly, these pharmacokinetic and pharmacodynamic changes can adversely affect the way the body responds to medications. Understanding these changes is critical to ensuring older patients’ safe and effective therapeutic responses to their medications. With an understanding of the following information, pharmacists should be prepared to evaluate critically these responses and to suggest methods to physicians and patients to improve the safety and efficacy of therapeutic regimens.

Mrs. I.M. Olde is 5'4" and weighs 50 kg. Her past medical history is significant for hypothyroidism, arthritis, an appendectomy (40 years ago) and a hospitalization for a major depressive episode 20 years ago. She says that she generally feels good about her health, but states “I am old! I don’t expect to feel good all of the time. Sometimes my knees hurt and I feel like my heart beats too fast. However, I can’t complain, I’ve had a good life.” After a complete work-up, the physician diagnoses Mrs. Olde with atrial fibrillation and decides to start her on warfarin. Mrs. Olde does not use alcohol or tobacco products and drinks two cups of coffee daily. Her current medication regimen is as follows:

- Levothyroxine 1mg po qd
- Enteric coated aspirin (ECASA) 325-650mg po 3-4 times daily
- Multivitamin with minerals (MVM) po qd
- Warfarin 2.5mg po qd (INR after 7 days of therapy is 2.1)

**Table I. The pharmaceutical care process**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.</td>
<td>Establish relationships with patients and health care practitioners</td>
</tr>
<tr>
<td>2.</td>
<td>Collect, synthesize, and interpret patient information</td>
</tr>
<tr>
<td>3.</td>
<td>List and rank drug-related problems</td>
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<td>4.</td>
<td>Establish desired therapeutic outcomes</td>
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<tr>
<td>5.</td>
<td>Determine useful alternatives</td>
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<td>6.</td>
<td>Choose best solution(s) to drug-related problem(s)</td>
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<td>7.</td>
<td>Design a monitoring plan</td>
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<tr>
<td>8.</td>
<td>Implement therapeutic regimen</td>
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<td>9.</td>
<td>Document plan and follow-up to measure success</td>
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</table>

**Table II. The drug-related problem list**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.</td>
<td>Indication without drug treatment (untreated indication)</td>
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<tr>
<td>2.</td>
<td>Indication with incorrect drug treatment (improper drug selection)</td>
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<tr>
<td>3.</td>
<td>Underdose (subtherapeutic dosage)</td>
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<tr>
<td>4.</td>
<td>Overdose (drug toxicity)</td>
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<tr>
<td>5.</td>
<td>Patient not receiving drug</td>
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<tr>
<td>6.</td>
<td>Adverse drug reaction</td>
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<tr>
<td>7.</td>
<td>Drug interaction</td>
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<tr>
<td>8.</td>
<td>Drug use without an indication</td>
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**Pharmacokinetic Changes**

Pharmacokinetics refer to the process by which the body acts on drugs to produce effects. This process involves the absorption, distribution, metabolism, and excretion of drugs. Each of these steps can be altered in older persons and ultimately affect the outcomes of medication use.

Absorption of medications in the elderly is not significantly altered despite several age-associated changes in gastrointestinal (GI) physiology and function. Increased gastric pH, decreased gastric motility, diminished splanchnic blood flow, and decreased intestinal absorptive surface may exist, but rarely delay the rate or extent of orally consumed drugs(14). However, other situations affecting GI functioning such as surgery, obstruction, and drugs including laxatives, antacids, and anticholinergic agents may clinically alter absorption. Other routes of absorption including the transdermal application of medications may be altered in persons with decreased peripheral blood flow, but the effect of this change has not been clearly defined(15).

The distribution of a drug in the body is dependent on several factors including body composition, plasma protein binding, and blood flow to the organs(16). Composition of the aging body changes significantly, resulting in a 10-20 percent decrease in total body water and lean body mass with a proportionate increase in total body fat(17). The volume of distribution of water soluble drugs such as cimetidine, digoxin, aminoglycosides and ethanol is smaller in older adults, which results in increased plasma concentrations and increased risk of toxicity if inappropriate doses are used. Diazepam and chlordiazepoxide are lipid-soluble drugs that experience volumes of distribution. This may result in prolonged duration of action due to the longer elimination half-lives of these drugs.

Older adults also tend to have reduced plasma protein binding which is related to a lower serum albumin concentration(18). This decrease may not be clinically significant except in the case of chronic conditions associated with substantial reductions in serum albumin concentrations. Similarly, multidrug regimens that include highly protein-bound drugs, e.g., anticoagulants, oral hypoglycemic agents, and salicylates, may expose the older person to the effects of increased serum concentrations of these agents as a result of competition for protein binding sites(17,18).

**Mrs. Olde Has an Upset Stomach.** One day, while visiting with her daughter, Mrs. Olde mentions that her stomach has been bothering her. Her daughter says that there is now a product available without a prescription that she used to take for her stomach called Tagamet HB. She remembers using 800mg at bedtime. However, Mrs. Olde doesn’t want to take eight tablets at once, so she takes two tablets four
Metabolism by the liver is dependent on hepatic blood flow and hepatic enzyme activity. Hepatic mass and blood flow begin to decrease around age 25 and continue until approximately age 65. It is possible to have a normal decrease of up to 45 percent over this period of time. Drugs with slow liver metabolism or low intrinsic clearance rely on the rate of metabolism for clearance. Conversely, drugs with rapid metabolism or high intrinsic clearance have hepatic blood flow as the rate-limiting step(17).

Phase I hepatic metabolism (reduction/oxidation/hydrolysis reactions) can be reduced in elders, whereas Phase II (conjugation reactions) remains unchanged. Drugs that primarily undergo Phase I metabolism such as diazepam and chlordiazepoxide should be avoided in this population and replaced with agents that primarily undergo Phase II metabolism such as temazepam or lorazepam.

Mrs. Olde Has Her Annual Physical Exam. You have just started your position as the patient care pharmacist at Mrs. Olde’s physician’s office. You notice as you review her labs that her serum creatinine has been steadily rising. It is now 1.5 mg/dL. She has been checked for secondary causes of renal dysfunction and all tests have come back negative. Her current creatinine clearance is 32mL/min. Her current drug regimen is as follows:

- levothyroxine .1mg po qd
- warfarin 2.5mg po qd (INR = 2.2)
- ECASA 325-650mg po 3-4 times daily
- ranitidine 150mg po bid
- MVM po qd

Age associated reduction in renal function is the most documented, predictable, and easily monitored physiologic change affecting the body’s action on drugs. It is also the age-related physiologic change most often responsible for adverse drug actions and drug toxicity. After age 40, glomerular filtration and tubular secretion begin to decrease, resulting in a decline in creatinine clearance of 10mL/min per decade of life(19). Also, there is a decrease in functioning nephrons and in renal perfusion secondary to decreased cardiac output and atherosclerotic changes. Drugs that are primarily cleared by the kidneys should be adjusted for the creatinine clearance of each patient. Drugs with potential for serious toxicity in older adults include the aminoglycosides, amantidine, digoxin, lithium, procanamide, chlorpropamide, and cimetidine.

Pharmacodynamic Changes

Pharmacodynamic principles, or the effects of drugs on target sites, can also be altered. However, these principles have been studied less extensively in elders than have pharmacokinetic changes. The major pharmacodynamic associated problems in the aging population result from altered sensitivity to drugs at normal doses. Several examples of increased sensitivity include urinary retention secondary to anticholinergic agents, an exaggerated response by the brain to narcotic analgesics leading to respiratory depression and confusion, and an increased response to oral anticoagulants(20).

Other age-associated physiologic alterations also have the potential to impact the health of older patients. These include altered sleep patterns (less time in REM sleep), decrease in taste and smell, decreased bladder capacity, decreased lung compliance/elasticity, decreased response to endogenous hormones, delayed short-term memory retrieval, and insufficient homeostatic adjustment. Several of these changes may cause functional limitations that could potentially hinder patients’ abilities to take their medications correctly. A decrease in visual acuity may make it difficult for older adults to read a prescription label or doctor’s instructions. Decreased hearing may make it very difficult for them to hear pharmacists’ counseling. Decreased blood flow to the brain may lead to cognitive changes causing patients to be forgetful, confused, or unsteady on their feet. Pharmacists must make a point to notice these changes in their patients and take appropriate actions. These may include using larger print on non-glossy labels, talking to patients in quiet counseling areas, or writing out physician instructions in large print. In the situation of noticeable mental or functional status changes, pharmacists should notify patients’ family members, caregivers or physicians and express their concerns. Regardless of the intervention, it is our responsibility as health care professionals committed to optimal patient outcomes, to see that our patients are prepared to use their medications safely and effectively when they leave the pharmacy.

Avoiding Specific Drug Therapy Problems

The high utilization of medications by older adults contributes significantly to the development of adverse drug reactions (ADRs) and side effects(21-23). The most common medications prescribed for older adults include cardiovascular agents, psychotropics and nonsteroidal anti-inflammatory agents(24). The use of specific drugs and drug classes, many of which are among those most commonly prescribed, has been identified as a risk factor for ADRs. Beers et al. have even published a list of medications that should be avoided in nursing home patients(25). During this lecture, we discuss many of these medications that should be avoided, if possible, or when used, closely monitored. ADRs that cause particular problems in elders include those that may lead to loss of function secondary to movement disorders, falls, fractures, confusion, and delirium.

Mrs. Olde visits with a Friend. Mrs. Olde is playing bridge with her friend Madge. She tells Madge that she has been thinking frequently about her late husband, Harry. She also has been very anxious and all she wants to do is sleep. Madge tells Isabell that she has been through the same situation and has just the thing for her; giving Isabell #10 diazepam 5mg. Madge says to use one tablet three to four times daily. These really help Isabell so she tells her doctor that she has used this medication in the past with success. He writes her a prescription for 990 diazepam 5mg po three times daily with three refills. He also notices that she is very tachycardic and decides to add propranolol 40mg po three times daily for rate control. Her thyroid function tests are normal.

Cardiovascular Agents

Certain cardiovascular agents require additional attention when monitored by pharmacists for efficacy and toxicity. Digoxin, because it is concentrated in body water and cleared through the kidneys, requires reduced dosages. Similarly, the signs and symptoms of digoxin toxicity may be diminished in older adults and may appear only as anorexia(26).
Class I and III antiarrhythmics have altered clearance and increased elimination half-lives. These agents potentially require reduced doses and close monitoring when used in this population. The beta-blockers can cause troublesome side effects in older adults. Depression, fatigue, reduced peripheral perfusion and exacerbation of chronic conditions may limit the use of these agents. Patients should be closely watched for the development of these adverse effects to therapy.

In addition to beta-blockers, reserpine and methyldopa have a high incidence of central nervous system adverse effects. If patients are achieving therapeutic goals on a current regimen containing these agents, they may be continued if closely monitored(27). However, if patients are experiencing clinically significant side effects, a change to a therapeutically equivalent regimen should occur. Finally, dipyridamole often leads to orthostasis in the elderly and offers little advantage over aspirin for the prevention of platelet aggregation. Its use should be avoided in this population.

One Month Later. Mrs. Olde is increasingly anxious, feels very “blue”, and doesn’t have any energy. She also is becoming very forgetful. The doctor feels Isabelle is depressed and increases her diazepam to four times daily and adds amitriptyline 50mg po at bedtime. Mrs. Olde’s medication regimen now includes the following:

- levothyroxine .1mg po qd
- warfarin 2.5mg po qd (INR = 2.2)
- ECASA 325-650mg po three to four times daily
- ranitidine 150mg po bid
- MVM po qd
- propranolol 40mg po tid
- diazepam 5mg po qid
- amitriptyline 50mg po hs

(At this point, students are asked to evaluate the above drug regimen for actual or potential problems. The goal is that they will identify indications with the wrong drugs [amitriptyline, diazepam]; drug interactions [warfarin and aspirin; propranolol, diazepam and amitriptyline (excess sedation)]; adverse drug reaction [propranolol, diazepam]; and drug use without an indication [ranitidine]. I also expect them to evaluate the need for an antidepressant since this depressive episode may be drug-induced by the propranolol and excessive dose of diazepam.)

Psychoactive Agents

For the purpose of this paper, the heading “psychotropic agents” is used to describe the neuroleptics, antidepressants, and sedative-hypnotic agents. Neuroleptic agents have established effectiveness for psychiatric disorders. However, their safety and efficacy in treating non-psychiatric behavior disorders in the elderly remain controversial. In fact, the use of neuroleptics for this purpose is restricted in nursing home patients by federal regulations. When neuroleptics are used for treating agitation and anxiety related to dementia, small doses should be used, patients should be closely monitored for efficacy and toxicity, and the need for such agents reevaluated frequently.

Amitriptyline is a highly anticholinergic drug and older adults are particularly sensitive to its side effects. Orthostatic hypotension, urinary retention leading to overflow incontinence, and confusion can lead to serious secondary problems including falls, urinary tract infections, and loss of independence. Since alternative agents with fewer adverse effects are available to treat depression, amitriptyline should be avoided.

Among the sedative-hypnotic agents, long-acting benzodiazepines (chloridiazepoxide, diazepam, flurazepam), meprobamate, and the barbiturates should be avoided, if possible. These drugs are associated with an increase in daytime sedation, confusion, and drug interactions. Short-acting benzodiazepines (lorazepam, temazepam) are preferred for patients needing an anxiolytic or sleep-inducing agent.

While You Were Sleeping. Mrs. Olde wasn’t. One week after her last visit, you evaluate Mrs. Olde’s medication regimen and make suggestions to her physician. Unfortunately, this is too late. The evening before last, Isabelle became very light-headed and dizzy when she got up to use the bathroom. She fell and broke her hip and was found the next morning by her daughter who called 911. In the hospital, Isabelle underwent hip replacement surgery. You were able to visit her, review her medications, complete medication education, and make further therapeutic recommendations. Despite your suggestion, the orthopedic physician that operated on Mrs. Olde, continued the proproxyphene napsylate and acetaminophen combination-two tablets every four to six hours for pain control. Mrs. Olde remains very fearful and anxious, and is very upset that this mishap occurred. She is fearful of falling again when she returns home.

(Students are asked at this time to formulate a plan for Mrs. Olde’s discharge. The expectation is that they will seek discontinuation of amitriptyline, diazepam, ECASA, ranitidine, proproxyphene, and propranolol and replacement with more appropriate alternatives if necessary i.e., sertraline in place of amitriptyline, lorazepam in place of diazepam, acetaminophen instead of ECASA, tramadol for short-term pain relief in place of proproxyphene. As well, they are expected to formulate a monitoring plan that will follow the efficacy and toxicity of each drug prescribed for Mrs. Olde once she is discharged.)

Analgesics

Many analgesic agents are available without a physician’s prescription including acetaminophen, aspirin, and several nonsteroidal anti-inflammatory agents. Although these agents are readily available for purchase, they may lead to significant problems in the elderly because they are often omitted from patients’ medications profiles and therefore, fall short of monitoring programs. Acetaminophen is viewed as a very safe and effective analgesic. However, in patients using chronically high doses (greater than four grams per day), in patients using concomitant drugs containing acetaminophen, and in patients with underlying hepatic or renal dysfunction, toxicity can ensue. Similarly, over the counter (OTC) and prescribed anti-inflammatory agents (aspirin and nonsteroidal agents) can interact with many medications leading to renal toxicity and gastrointestinal bleeding. Specifically, indomethacin and phenylbutazone should be saved as last resort medications for pain relief or
inflammation reduction. Indomethacin has a high incidence of central nervous system (CNS) and gastrointestinal (GI) toxicities while phenylbutazone is associated with blood dyscrasias. As well, ketorolac is associated with GI and renal toxicity, requires reduced dosages in the elderly, and should be limited to five days of use. The best way to prevent these potential toxicities, especially those related to OTC medications, is to follow the pharmaceutical care process listed in Table I. This allows pharmacists to collect complete patient databases that include prescribed and non-prescribed medications. This process will also help to build the pharmacist-patient trust so patients will be more likely to ask pharmacists’ advice before using non-prescribed medications.

Opioid analgesics are commonly used in hospitalized and community-dwelling patients with chronic pain syndromes. However, the elderly are particularly sensitive to the CNS side effects (respiratory depression, confusion and sedation) of these agents. The opioid analgesics can be safely and effectively used by older adults if closely monitored. However, mixed agonist/antagonist agents such as pentazocine have been associated with many adverse effects. They include seizures and delirium as well as providing inadequate pain control; they should therefore, be avoided.

Similarly, there exists some controversy about the toxicity to efficacy ratio of propoxyphene with or without the addition of acetaminophen. The pain relief qualities of this medication have been compared to that of OTC analgesics while the side effect profile can be significant for CNS and cardiac alterations secondary to accumulation of a toxic metabolite(27). However, this agent is still quite frequently used in the hospital and ambulatory settings. If possible, this agent should be replaced with a more appropriate pain-relieving drug.

The Saga Continues. Mrs. Olde has been home for two months since her surgery. Her affect has improved and she is using less lorazepam. As well, her pain is controlled on three to four tramadol tablets per day. However, her daughter brings Isabella to the doctor’s office because she has noticed several episodes of left sided facial droop and slurred speech which subside within 15 minutes. She is concerned that her mother may be having “mini-strokes.” The doctor agrees and begins Isabella on digoxin .25mg po qd and increases her warfarin to 5mg po qd. Therefore, her current regimen is as follows:

digoxin .25mg po qd
sertraline 50mg po qam
lorazepam .25-.5mg po tid prn
warfarin 5mg po qd
tramadol 50mg one tablet po qid
acetaminophen 500-1000mg po q4-6hrs prn
(maximum six tablets/day)
levothyr oxine .1mg po qd (thyroid function tests normal)
MVM po qd

D*E*L*I*R*I*U*M
The signs and symptoms of delirium can ensue from many different causes. It is important for pharmacists, as members of the health care team, to be able to differentiate between dementia, delirium and other causes of cognitive and behavioral changes in the elderly. The acronym “DELIRIUM” (Table III) can be used as a memory device for the most common causes of this disorder. Delirium can be distinguished from dementia in that it most often has a quick onset, is secondary to a reversible or explainable cause, and lasts for a short period of time. Patients are rarely aware of their deficits and little distress results despite global impairment in short-term memory(28). Dementia has an insidious onset and can take many years to develop. Patients and caregivers are aware of cognitive deficits early on in the disease as long-term memory is impaired. As the disease steadily progresses, short-term memory may also be impaired(28). The list of medications reported to have caused delirium are numerous and include prescription and non-prescription drugs. However, those most commonly implicated include agents with anticholinergic properties and those that affect the CNS(29).

Did You Hear That? Mrs. Olde has unfortunately continued to deteriorate. She now hears and sees people in her bedroom at night. She is becoming increasingly agitated with her daughter with whom she now lives. The doctor diagnoses Isabella with multi-infarct dementia and places her on haloperidol 5mg po bid and suggests that Mrs. Olde’s daughter consider nursing home placement. Upon admission to the nursing home, the nurse at Mrs. Olde’s physician’s office dictates the following medication list to the medication nurse:
digoxin .25mg po qd
sertraline 50mg po qam
lorazepam 2.5-5mg po tid prn
haloperidol 5mg po bid
warfarin 2.5mg po qd
tramadol 50mg one to two tablets q4-6hrs prn
pain
levothyroxine .1mg po qd

(Students are expected at this time to realize that errors have occurred in the transcription of orders from the physician’s office to the nursing home. The dictated medications were taken from an old list and the lorazepam was incorrectly ordered with a misplaced decimal point (2.5-5mg instead of .25-.5mg.).

Miscellaneous Agents
Laxative use in the elderly population is common(30). Poor diet, minimal exercise, low fluid intake, anticholinergic agents, and physiologic alterations in the gastrointestinal tract may lead to constipation and the need for these agents. When these agents are used, stimulant laxatives including bisacodyl and senna should be avoided while bulk laxatives or lactulose are recommended(31).

Muscle relaxants and antispasmodics are highly anticholinergic and often poorly tolerated by elderly patients. If possible, their use should be avoided or length of therapy limited. Other agents with similar adverse effects are the
antihistamines. Patients should be counseled about these effects and potential drug interactions at time of purchase.

Finally, older persons should be cautioned about the overuse of vitamins, herbal products, miscellaneous dietary supplements and foreign drugs. Vitamins are often viewed as safe agents with few adverse effects. However, the overuse of these agents, especially the fat soluble vitamins, can lead to many health problems. Similarly, since herbal products and many dietary supplements are not governed by the Federal Drug Administration, their safety cannot be guaranteed, e.g., Melatonin(32). The use of foreign drugs can complicate patients’ prescribed therapeutic regimens leading to drug interactions, and adverse outcomes which may be difficult to identify and treat. The trusting relationships developed between pharmacists and patients may help to prevent some of these potentially dangerous situations. Through these bonds, pharmacists can encourage patients to consult their health care providers before using any medication, prescribed or OTC.

And Where Were You? You plan to review Mrs. Olde’s medications at the end of the month. Unfortunately, you hear from her physician that one week after her admission to the nursing home, Mrs. Olde became confused, tried to get out of bed one morning and fell and broke her femur requiring surgery. While she was on the operating table, she developed a pulmonary embolus and died. You stop and wonder how could this have happened?

(The students are asked to respond to this question. They are expected to identify the following real or potential DRPs: Indication with the wrong drug [haloperidol], overdosages [haloperidol, lorazepam, digoxin], and adverse drug reactions [haloperidol and lorazepam]. They are also asked to discuss how this situation could have been prevented).

CONCLUSION

It is evident, because of their many risks for DRPs, that older patients require the assistance of the skills and expertise which pharmacists provide through their practice of pharmaceutical care. Pharmacists can play an important role in the positive outcomes of these patients by becoming their advocates and by familiarizing themselves with patients’ wishes. Pharmacists who are truly dedicated to practicing pharmaceutical care and to assisting their patients in achieving optimal therapeutic outcomes will consistently ask the following questions: (i) are drugs necessary; (ii) can non-drug modalities be employed; (iii) what interventions can I implement to improve patients’ outcomes; and (iv) how does the patient feel about this.

The Moral of the Story: Be proactive, identify and prevent DRPs, instead of having to resolve them. Stay abreast of patients’ needs by providing continuous pharmaceutical care. The best time to complete therapeutic reviews is now, not two weeks from now. Know when you expect to see your patients next, follow-up if they do not come in for refills or appointments. Check the pharmaceutical care plan frequently to determine if therapeutic goals are being met and therapies are being monitored for efficacy and toxicity. Most importantly, take responsibility for your patients’ outcomes.

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