

# Medication Utilization

## Understanding Potential Medication Problems of the Elderly



**NICE**

National Initiative for the Care of the Elderly

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## WHAT ARE MEDICATION UTILIZATION PROBLEMS AMONG THE ELDERLY?

A useful model for understanding potential medication problems for elderly patients is reviewed in a series of guidelines contained in the Drug-related Problems Model.

Strand LM, Morley PC, Cipolle RJ. Drug-related problems: their structure and function. *Drug Intell Clin Pharm* 1990;24:1093-7.

- The patient has a medical condition for which a medication is indicated but the patient has not been prescribed a medication
- The wrong medication has been prescribed for a specific condition
- The dose of the drug is too low for a therapeutic effect
- The dose of the drug is too high causing possible toxicity or other adverse effects
- Patient becomes symptomatic because of a side effect or adverse reaction to a drug
- Food-drug, drug-drug, or disease- drug interactions are (is) present which in turn cause another medical problem

## DOSE RELATED COMPLICATIONS

Dose related problems could be specific for elderly patients. Pharmacokinetics is a specialized branch of pharmacy practice that tailors the dose of a medication to specific populations and physiological parameters unique to the individual.

The following is a list of considerations for the elderly that are important for dose adjustment and tailoring. This list is not comprehensive as clinical pharmacokinetics is a highly specialized area of pharmacy and beyond the scope of this tool. The take home messages are: for any individual elderly patient dosing is not always similar to a nonelderly individual; and dose related problems should be referred for pharmacokinetic consultation.

## **DOSE RELATED PROBLEMS AND THE ELDERLY**

Specific physiological changes in the elderly place older adults at increased risk for DRP's.

- The absorption, distribution, metabolism and elimination of drugs (ADME) in the body of elderly persons can be altered by specific physiological changes in aging.
- The ADME of any particular drug in the body is dependent upon the physiochemical properties of the drug; patient related variables such as individual body composition and weight; the presence of disease, altered physiological functioning, and the presence of other drugs in the body.
- All drugs have a “therapeutic window.” If you can think of the window as composed of the glass enclosed in a top sash and bottom sash, proper therapeutic concentration is within the window. Any concentration of a drug in the body over the top sash can be toxic or lead to other complications while concentrations under the bottom sash can be sub therapeutic.
- Drug concentration may either be increased (possible toxicity) or decreased (possible sub therapeutic response) as a result of physiological changes in the elderly.

## DRUG DISPOSITION IN THE ELDERLY

The most common changes that can affect ADME in the elderly are as follows:

Changes in lean to fat tissue

- Affects fat-soluble drugs

Changes in fluid and water retention

- Affects water soluble drugs

Changes in glomerular filtration rate

- Slows down rate at which drugs are eliminated by the kidney

Decrease in liver function often due to disease

- Affects clearance of hepatically metabolized drugs because of changes in the activity of drug metabolizing enzymes

Cerebral vascular and coronary artery disease

- Reduced blood flow to the brain and reduced cardiac output can modify the distribution of drugs to target tissues and organ systems

Changes in intestinal motility and function

- Affects drugs whose primary absorption site is in the intestine

Decline in plasma albumin

- Affects the concentration of protein binding drugs

Dose adjustments or medication changes may be needed to account for these factors in any individual patient

## **MEDICATION USE ASSESSMENT: UTILIZING THE MEDICATION APPROPRIATENESS INDEX**

Hanlon JT, Schmader KE, Samsa GP, Weinberger M, Uttech KM, Lewis IK, et al. A method for assessing drug therapy appropriateness. *J Clin Epidemiol* 1992;45:1045-51.

The questions contained within the Medication Appropriateness Index are a useful tool for assessing medication utilization problems. These questions can be explored with either the prescriber or a pharmacist dispensing the medication.

- Is there an indication for the drug?
- Is the medication effective for the condition?
- Is the dosage correct?
- Are the directions correct?
- Are the directions practical?
- Are there clinically significant drug-drug interactions?
- Are there clinically significant drug-disease interactions?
- Is there unnecessary duplication with other drugs?
- Is the duration of therapy acceptable?
- Is this drug the least expensive alternative compared to others of equal utility?

## **ADHERENCE**

McLaughlin et al. Drugs Aging 2005; 22 (3)

- Adherence can be defined as the extent to which medication administration coincides with medical advice and instructions
- 30 to 50 % of the ambulatory population does not adhere with their medication directives and non-adherence can be as high as 60% in the elderly
- Adherence varies with the disease state; number and type of medications taken; characteristics of the patient; the nature of communication between practitioner and patient; and economic factors
- Elderly patients not adhering with medications results in 10% of hospital admissions and 23% of nursing home admissions

## **NON-ADHERENCE BEHAVIORS IN THE ELDERLY**

- Not filling the prescription
- Not refilling the prescription
- Prematurely quitting the medication
- Taking more or less of the medication prescribed
- Not taking the medication according to the dosing schedule
- Not taking the medication according to special instructions such as taking on an empty or full stomach (can effect absorption or cause stomach problems)
- Taking medication not prescribed (sharing medication)

## **RISK FACTORS FOR NON-ADHERENCE**

### **Asymptomatic diseases**

- Hypertension, osteoporosis, hypercholesterolemia
- Diseases that do not have symptoms in the early stages of their natural history have high rates of non-adherence because patients assume if they do not have pain or other symptoms they must not be ill
- Patient education is critical, explaining in lay language the consequences if the disease is not treated in the early stages. Example: stroke and heart attack for uncontrolled hypertension
- Explaining the pathophysiological change in the body when medication is not taken helps the patient understand the role medication plays in prevention.

### **Multiple medications with complex dosing or administration schedules**

- The elderly may have memory problems, diminished eyesight, hearing, arthritic hands that make opening bottles or administering medications difficult
- Counsel family members or caregivers to monitor medication taking if possible
- Pill organizers that can be filled weekly
- Special bottle caps and large print
- Simplifying the regimen by eliminating duplication
- Prescribing extended release medications or medications in alternative formulations that require less frequent administration

## Side effects of medication

- Unanticipated side effects are more likely to cause premature discontinuance of medication
- When patients can anticipate side effects and have some means for managing the side effects, they are less likely to discontinue taking the medication (we all like to feel in control of our health)
- The most frequent side effects and side effects with lethal consequences should be discussed in patient counseling
- Ways of managing the side effects, when to quit taking the medication if serious side effects appear and which ones to report to the doctor should all be discussed.

## Social and economic barriers

- Transportation barriers
- Lack of convenient access to a pharmacy

## Health literacy

- Lack of educationally appropriate and culturally sensitive oral and written drug information material
- Language problems with recent immigrants
- Training for all health professionals in how to deliver culturally sensitive, and educationally appropriate oral and written medication information tailored specifically to the patient's needs is essential
- Assessment of the patient's economic and living situation and referral to appropriate agencies for assistance should be an integral part of care for the elderly



## QUESTIONS FOR A WELL-INFORMED ELDERLY CONSUMER OF MEDICATION

Elderly patients should be able to answer all of these questions for their medications.

Why is the medication prescribed?

How is the medication controlling my symptoms and preventing further disease?

How should I take this medication? How much? When? Special dosing considerations?

What side effects should I be aware of? How can I manage my side effects? What side effects should I report to my physician? Should I immediately stop taking a medication when I experience a side effect?

What other medications could this medication interact with and does the prescriber know my complete medical and medication history?

Are there any interactions with food or alcohol that I should be aware of?

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FACULTY OF SOCIAL WORK

National Initiative for the Care of the Elderly  
263 McCaul Street, Room 328, Toronto, Ontario M5T 1W7  
Tel: 416-978-0545 • Website: [www.nicenet.ca](http://www.nicenet.ca)