

Geriatrics, Palliative Care and Interprofessional Teamwork Curriculum

Module # 14 : Pharmacology

Editors

**Judith L. Howe, PhD
Barbara Morano, LCSW**

**James J. Peters VA Bronx-NY Harbor
Geriatric Research, Education & Clinical Center**

**Mount Sinai School of Medicine
Brookdale Department of Geriatrics and Adult Development**

This interdisciplinary curriculum is geared to allied health students, and may be reproduced and used with attribution.

**Geriatrics, Palliative Care and Interprofessional Teamwork
Curriculum**

Module #14: Pharmacological Issues in the Elderly

Table of Contents

	Page (s)
I. Overview	1
II. Learning Objectives	1
III. What is pharmacology?	2
IV. Demographics	2
V. Physiologic changes of aging effecting pharmacologic therapy	2
VI. Adverse reactions to medications	2
VII. Iatrogenic Problems	3
VIII. Compliance	3
IX. Guidelines for prescribing	4
X. References	5
XI. Learning Resources	5
XII. Tables	5

Geriatrics, Palliative Care & Interprofessional Teamwork Curriculum

Module #14: Pharmacological Issues in the Elderly

I. Overview: The proper use of medications represents one of the most crucial ways in which the practice of geriatric medicine differs from conventional medical care. Pharmacotherapy is probably the single most important medical intervention in the care of elderly patients, and its appropriate implementation requires a special understanding of the unique pharmacologic properties of drugs in this population, as well as a grasp of the clinical, epidemiologic, sociocultural, economic, and regulatory aspects of medication use in aging.

This section includes discussion of key clinical strategies for prescribing in older adults, including the following topics: taking an accurate and thorough medication history, minimizing overmedication, maximizing compliance, and prevention of potentially life-threatening adverse side effects

II. Learning Objectives

1. Define pharmacology
2. Identify some physiologic changes of aging that affect pharmacologic therapy
3. List some of the common adverse reactions to medications
4. Discuss causes for non-compliance
5. Identify strategies for enhancing compliance

III. What is pharmacology? “Pharmacology is a discipline concerned with the study of therapeutic medications, their effects on the body and, conversely, the effects of the body on the medication itself.”¹ (Ency. of Ger. vol 2, p. 295)

IV. Demographics

- Older adults are prescribed the greatest number of medications, use the greatest number of nonprescription medications, and are more likely to be administered several medications at once for longer periods of time. Although they only comprise 12% of the US population, they receive 32% of all prescription drugs dispensed.² (Nursing and Ger. Ency. v2, 296)
- Upwards of one half of older outpatients reportedly do not take their medications as prescribed, with underutilization being the predominant deviation.³ (Ency. of Ger. vol 2, p. 296)

V. Physiologic Changes of Aging that Affect Pharmacologic Therapy

- Delayed gastric emptying, decreased gastric acidity, and decreased splanchnic blood flow affect absorption.
- Absorption may be delayed, postponing onset of action and peak effect of medications.
- A higher percentage of fat compared to lean body mass, a decrease in total body water, and decreased plasma albumin concentration affect drug distribution.
- Changes in body composition with aging affect the serum concentrations of water soluble drugs, and changes in fat mass affect fat soluble medications.
- Altered liver metabolism of certain drugs and decreased renal excretion of drugs affect drug clearance.

VI. Common Adverse Reactions to Medications

- Potentially dangerous side effects in many medications
- Changes in pharmacokinetics may adversely affect cognitive status
- Accidents as a result of orthostatic hypotension
- Renal or hepatic toxicity from medication and/or drug-drug interactions

VII. Iatrogenic Problems with Multi-Geriatric Syndromes and their Medication Regimens ⁴ (Nursing and Ger. Ency. v2)

- Drugs with anticholinergic side effects can cause confusion, orthostatic hypotension, dry mouth, blurred vision, and urinary retention
- Tricyclics, which are sedating, may cause confusion and unstable gait. They are known to cause anticholinergic effects in older adults. Potential adverse side effects include hypotension tachycardia and arrhythmia.
- Antiemetics such as the phenothiazines may cause confusion, orthostatic hypotension, blurred vision, falls, dry mouth and urinary retention
- Digoxin can be a controversial medication with the elderly due to toxicity that may occur even with normal serum concentrations
- H2 blockers require dose reduction in older adults to prevent confusion
- Long acting benzodiazepines may have half-lives prolonged as much as four days and cause central nervous system toxicity
- Doses of narcotics need to be started low, with careful attention to preventing constipation

VIII. Compliance

A. Causes for Noncompliance ⁵ (Ency. of Ger. vol 2, p. 296)

- Forgetfulness
- Misunderstanding of verbal directions
- Inability to purchase the medication
- Trouble with side effects
- Difficulty in swallowing larger capsules and tablets
- For the frail and arthritic, inability to open some medication containers
- Strategies for Enhancing Compliance ⁶ (Nursing and Ger. Ency. v2)
 - Social or nursing support
 - Awareness of risk factors including changes in cognition, living alone without social supports, depression, and declining function
 - Careful attention to patient education including written instructions
 - Discouragement of pill sharing

- Medication event monitoring systems (MEMS), pill boxes, pre-poured medications, friendly calls, pill counts

IX. General Guidelines for Prescribing Appropriately and Avoiding Polypharmacy

- *Obtain a Complete Drug History:* Be sure to ask about previous treatments and responses as well as about other prescribers. Ask about allergies, OTC drugs, nutritional supplements, alternative medications, alcohol, tobacco, caffeine, and recreational drugs.
- *Avoid Prescribing Before a Diagnosis is Made:* Consider nondrug therapy. Eliminate drugs for which no diagnosis can be identified.
- *Review Medications Regularly and Before Prescribing a New Medication:* Discontinue medications that have not had the intended response or are no longer needed. Monitor the use of prn and OTC drugs.
- *Know the Actions, Adverse Effects and Toxicity Profiles of the New Medications Prescribed:* Consider how these might interact or complement existing drug therapy
- *Start Chronic Drug Therapy at a Low Dose and Titrate Dose on Basis of Tolerability and Response:* Use drug levels when available
- *Attempt to Maximize Dose Before Switching or Adding Another Drug:* Encourage compliance with therapy. Educate patient and/or caregiver about each medication, its regimen, the therapeutic goal, its cost and potential adverse effects or drug interactions. Provide written instructions.
- *Avoid Using One Drug to Treat the Side Effects of Another:* Attempt to use one drug to treat two or more conditions.
- *Avoid Combination Products*
- *Communicate with other prescribers:* Don't assume the patient will – they assume the prescriber does.
- *Avoid Using Drugs from the Same Class or with Similar Actions:* (eg, alprazolam and zolpidem)

X. References

- ¹ Ency. of Ger. vol 2, p. 295
- ² Nursing and Ger. Ency. v2, 296
- ³ Ency. of Ger. vol 2, 296
- ⁴ Nursing and Ger. Ency. v2
- ⁵ Ency. of Ger. vol 2, p 296
- ⁶ Nursing and Ger. Ency. v2

XI. Learning Resources

- “Drug Therapy and the Interdisciplinary Team: A Clinical Pharmacist’s Perspective” Siple J.
- “Age-Related Changes as a Risk Factor for Medication-Related Problems” Beers MH.
- “What the Literature Tells Us About: The Complexity of Medication Compliance in the Elderly” Fulmer T et al.
- “Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults”, Fick EM, Cooper JW, Wade WE, et al. Arch Intern Med 2003; 163: Dec 8/22.

XII. Tables: (From “*Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults*”, Fick EM, Cooper JW, Wade WE, et al. Arch Intern Med 2003; 163: Dec 8/22. See attached)

- Table 1 - 2002 Criteria for Potentially Inappropriate Medication Use in Older Adults: Independent of Diagnosis or Conditions
- Table 2 - 2002 Criteria for Potentially Inappropriate Medication Use in Older Adults: Considering Diagnoses or Conditions
- Table 3 – Summary of Changes from 1997 Beers Criteria to New 2002 Criteria