

Introduction to Geriatric Pharmacotherapy Resource List

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Prepared by: Thomas R. Clark, RPh, MHS, CGP
Executive Director
Commission for Certification in Geriatric Pharmacy

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NOTE: This list of resources and links is provided for information purposes only. This list is not intended to specifically prepare pharmacists to take the Certified Geriatric Pharmacist examination. The content of the examination is developed by an independent committee of experts, and the resources listed here may or may not be applicable to the examination.

1. Introduction

With the aging of the United States population, it is increasingly important for pharmacists to understand how drug therapy principles for older adults may be different from those applied in younger adults. Just as medications can be metabolized and behave differently in children than in adults, so can medications act differently in older adults. This is especially the case in the frail elderly, those adults above the age of 85.

Despite the importance of geriatrics, most health professional training programs, including those in pharmacy, lack adequate emphasis on geriatrics and the use of medications in older adults. The purpose of this Web page is to provide links to resources that may be helpful to pharmacists in learning basic information about geriatric pharmacotherapy.

Here is a link to an introductory article that describes some of the issues related to medication use in older adults:

<http://www.agingwellmag.com/archive/020110p8.shtml>

Citation: Clark, TR. Tough decisions about medications. Aging Well magazine, Winter 2010.

2. Getting Started

Two resources are especially useful to help provide a content outline of what geriatric pharmacotherapy is all about. These resources are:

Geriatric Pharmacy Curriculum Guide, published by the American Society of Consultant Pharmacists. This guide is available free and can be downloaded as a PDF file at:

<http://www.ascp.com/education/curriculumguide/index.cfm>

The candidate handbook for the Certified Geriatric Pharmacist examination also contains a content outline used for developing questions for the examination.

The CGP candidate handbook can be downloaded at this link:

<http://www.ccgp.org/pharmacist/certification/request.htm>

A brief, 10-question quiz on geriatric pharmacotherapy can also be taken free at the Web site of the Commission for Certification in Geriatric Pharmacy (CCGP).

The quiz is available here:

<http://www.ccgp.org/pharmacist/test.htm>

ASCP also has a sample 10-question quiz on geriatric pharmacotherapy. It is located here:

<http://www.ascp.com/resources/clinical/upload/TestYourGeriatricsIQ.pdf>

Pharmacists who desire to undertake a more comprehensive self-assessment of knowledge of geriatric drug therapy can purchase a self-assessment examination from CCGP. This examination can be taken online and scoring is provided as part of the process. More information is available at this link:

<http://www.ccgp.org/pharmacist/self.htm>

3. General Geriatric Resources

Merck Manual of Geriatrics Online

Although no longer available in printed form, this resource continues to be available and periodically updated online. Access is free. The link is:

<http://www.merck.com/mkgr/mmg/home.jsp>

ASCP Foundation Geriatric Clinical Newsletter

The American Society of Consultant Pharmacists Foundation launched *Geriatric Clinical News*, a bi-monthly electronic newsletter in February 2008. Since that time, topics covered in the newsletter include:

- Evidence-based medicine and older adults
- Patient preferences and clinical practice guidelines
- Update on the prescribing cascade

All past issues of the newsletter are archived and available in full text at this URL:
http://www.ascpfoundation.org/newspress/geriatric_clinical_news.cfm

ASCP List of Online Study Activities

The American Society of Consultant Pharmacists has a list of online continuing education programs, organized by topic. This list, with links to the programs, is available at:

<http://www.ascp.com/education/selfstudy/>

Geriatric Pharmacy Review

The web site at www.GeriatricPharmacyReview.com has 50 hours of continuing education in 20 modules. A fee is required to access the modules, and a discount is available for ASCP members. This resource is provided by the American Society of Consultant Pharmacists.

SCOUP.net

The Senior Care Online University for Professionals (SCOUP) provides online symposia on a variety of topics. Some are free and some charge a small fee for processing the continuing education credit. This Web site is provided by ASCP, and is available at:

<http://www.scoup.net>

Geriatrics At Your Fingertips

This handy resource is available as a pocket size print edition, or as an electronic edition for the PDA. It is produced by the American Geriatrics Society.

Information is available at this link:

<http://www.americangeriatrics.org/products/>

Geriatric Pharmacotherapy Listserver

ASCP maintains a listserver for discussion of issues related to geriatric drug therapy. Access to the listserver is free. Subscribe to the listserver at:

<http://www.ascp.com/consultnet/listservers.cfm>

The Silver Book

A service of the Alliance for Aging Research, **The Silver Book®** is an almanac of more than 1,000 facts, statistics, graphs, and data from more than 200 agencies, organizations, and experts. It is an online searchable database that is constantly updated and expanded in order to highlight the latest research and data on the burden of chronic disease and the value of investing in medical research.

This resource can be found at:

<http://www.silverbook.org>

4. Geriatric Journal List

Age & Ageing (British Geriatrics Society)

<http://ageing.oxfordjournals.org/>

American Journal of Geriatric Pharmacotherapy

<http://ajgeriparmacother.com/current.html>

Annals of Long-Term Care

<http://www.annalsoflongtermcare.com/>

BMC Geriatrics (open access journal)

<http://www.biomedcentral.com/bmcgeriatr/>

Clinical Geriatrics

<http://www.clinicalgeriatrics.com/>

Clinics in Geriatric Medicine

<http://geriatric.theclinics.com/>

The Consultant Pharmacist

<http://www.ascp.com/publications/tcp/>

Drugs & Aging

<http://adisonline.com/aging/Pages/default.aspx>

Geriatrics

<http://www.modernmedicine.com/modernmedicine/Geriatrics/home/40131>

Geriatrics & Aging (Canada)

<http://www.geriatricsandaging.ca/>

The Gerontologist

<http://gerontologist.oxfordjournals.org/>

Journal of the American Geriatrics Society
<http://www3.interscience.wiley.com/journal/117995531/toc?journal=jgs>

Journal of the American Medical Directors Association
<http://www.jamda.com/>

Journals of Gerontology: Medical Sciences
<http://biomedgerontology.oxfordjournals.org/>

5. Geriatric Primer Articles in *The Consultant Pharmacist*

The *Consultant Pharmacist*, ASCP's monthly journal, has published a series of articles in their "geriatric primer" series. These journals are available online and are free for ASCP members. The link to *The Consultant Pharmacist* Web page is:

<http://www.ascp.com/publications/tcp/>

- Pharmacokinetic and Pharmacodynamic Alterations in the Geriatric Patient (April 2008)
- Evaluating Medication Regimens in the Elderly (July 2008)
- Communicating with Seniors and their Caregivers (Sept. 2008)
- The Senior Friendly Pharmacy (Dec. 2008) - <http://tinyurl.com/y8nz9bf>
- Home is Where the Heart Is: Living Arrangements for Older Adults (Feb. 2009) - <http://tinyurl.com/yeposcd>
- Identifying, Preventing, and Reporting Elder Abuse (April 2009) - <http://tinyurl.com/yjg6olu>
- Common Geriatric Syndromes and Special Problems (June 2009) - <http://tinyurl.com/y8zpwr6>
- Implications and Management of Decline for the Geriatric Patient (Aug. 2009) - <http://tinyurl.com/yfmosj8>

6. General Journal Articles

Pharmaco-epistemology for the Prescribing Geriatrician

With the emphasis today on evidence-based prescribing, this excellent article helps the clinician caring for older adults to understand common mistakes that are made with interpretation and application of clinical trial evidence. Full text of this article is available free.

D. Le Couteur and H. Kendig. Australasian Journal on Ageing 2008; 27(1):3-7.
<http://www3.interscience.wiley.com/journal/119419086/abstract>

Clinical pharmacology in the geriatric patient

This article by Sarah Hilmer and colleagues is a good overview of medication use in older adults, and the full text is available online for free. The quality and accessibility of this article make it a good starting point for students or practitioners who need a good overview of the topic.

Link to abstract (full text can be downloaded free in PDF or HTML):

<http://www3.interscience.wiley.com/journal/117978191/abstract>

Pharmaceutical care

Although not specific to geriatrics, this classic article by Hepler and Strand introduced and defined “pharmaceutical care” and described the eight types of medication-related problems.

Full text of the article is available at:

http://www.pharmacy.umn.edu/img/assets/10745/opps_and_responsibilities.pdf

7. *Live Meetings and Workshops*

ASCP Annual Meeting – The ASCP Annual Meeting is in the Fall of each year. The 2010 Annual Meeting is in Orlando, FL on November 10-13. Link for meeting information:

<http://www.ascpannual.com/>

Clinical Update for the Geriatric Pharmacist Workshop – This workshop is held in conjunction with ASCP Annual and Midyear meetings, and also at some regional meetings. The 2010 presentations of this workshop are scheduled for:

- July 23 at the Midwest Conference in Oak Brook, IL
- November 9 at the ASCP Annual Meeting

More details on these workshops are at:

<http://www.ascp.com/education/meetings/clinicalupdateworkshop.cfm>

Geriatric Assessment for the Senior Care Pharmacist Workshop – This workshop is held in conjunction with ASCP Annual and Midyear meetings. The next presentation of this workshop is scheduled for:

- November 12 and 13 at the ASCP Annual Meeting

More details about this workshop are at:

<http://www.ascp.com/education/meetings/geriatricassessment.cfm>

8. *Adverse Drug Events in Older Adults*

A drug burden index to define the functional burden of medications in older people

Hilmer and colleagues developed a tool (drug burden index) to correlate medication use with decline in physical and cognitive performance. Medications with anticholinergic and sedative properties are associated with poorer function in community-dwelling older people.

Full text is available free at:

<http://archinte.ama-assn.org/cgi/content/abstract/167/8/781>

Hilmer SN, et al. *Arch Intern Med* 2007;167:781-787.

Medication use leading to emergency department visits for adverse drug events in older adults

A nationally representative public health surveillance system tracked emergency department visits, and visits related to adverse drug events in older adults were analyzed. Three medications accounted for one-third of all emergency department visits for adverse drug events in older adults. Full text of the article is available free. Link:

<http://www.annals.org/cgi/content/abstract/147/11/755>

Budnitz DS, Shehab N, Kegler SR, Richards CL. *Ann Intern Med* 2007;147:755-765.

Adverse drug events among older persons in the ambulatory setting

Multiple methods were used to detect possible drug-related events in this cohort study of an ambulatory Medicare population, with over 30,000 person-years of observation. The overall rate of adverse drug events was 50.1 per 1000 person-years, with 38% categorized as serious, life-threatening, or fatal. Cardiovascular medications, diuretics, and nonopioid analgesics were the most common medication categories associated with preventable adverse drug events. The article provides more extensive information about other types of adverse drug events and strategies for prevention.

The full text of the article is available at:

<http://jama.ama-assn.org/cgi/content/abstract/289/9/1107>

Gurwitz JH, et al. *JAMA*. 2003;289:1107-1116.

9. Clinical Practice Guidelines

Clinical practice guidelines and older adults

Boyd and colleagues reviewed clinical practice guidelines (CPGs) for diseases common in older adults, and evaluated implications of applying recommendations from these CPGs to older adults with multiple morbidities.

Their review suggests that adhering to current CPGs in caring for an older person with several co-morbidities may have undesirable effects. Basing standards for quality of care and pay for performance on existing CPGs could lead to inappropriate judgment of the care provided to older individuals with complex co-morbidities and could create perverse incentives that emphasize the wrong aspects of care for this population and diminish the quality of their care.

Link to abstract:

<http://jama.ama-assn.org/cgi/content/abstract/294/6/716>

Boyd CM, Darer J, Boulton C, Fried LP, Boulton L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. *JAMA*. 2005;294(6):716-724.

Patient Preferences and Clinical Practice Guidelines

This article is from the August 2008 issue of Geriatric Clinical News. The link is:

<http://content.eneuroletteronline.com/12293/17378.html>

National Guideline Clearinghouse

This compilation of clinical practice guidelines is made available by the Agency for Healthcare Research and Quality. The link is:

<http://www.guideline.gov/>

Pharmacological Management of Persistent Pain in Older Persons

This 2009 guideline is available free from the American Geriatrics Society:

http://www.americangeriatrics.org/education/pharm_management.shtml

Practice guideline for the treatment of patients with Alzheimer's disease and other dementias

This guideline from the American Psychiatric Association was updated in 2007:

http://www.guideline.gov/summary/summary.aspx?doc_id=11533&nbr=005974

COPD Guidelines—GOLD

<http://www.goldcopd.org/Guidelineitem.asp?l1=2&l2=1&intId=2180>

Osteoporosis—Management of osteoporosis in postmenopausal women: 2010 position statement of the North American Menopause Society. Download at:

<http://www.menopause.org/aboutmeno/consensus.aspx>

Adult Immunization Schedule for 2010

The link to the schedule on the CDC Web site is:

<http://www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm>

Catheter-associated Urinary Tract Infection

The Infectious Diseases Society of America has released 2010 guidelines on diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults, including those who are institutionalized. The full text of these guidelines is available free at:

<http://www.journals.uchicago.edu/doi/abs/10.1086/650482>

Diabetes—Standards of medical care in diabetes-January 2010, American Diabetes Association. Link to full text guidelines:

http://care.diabetesjournals.org/content/33/Supplement_1/S11.full.pdf+html

10. Geriatric Syndromes

Geriatric Conditions and Disability: The Health and Retirement Study

Of adults age 65 years or older, 50% have one or more geriatric conditions (or geriatric syndromes). These include cognitive impairment, falls, low body mass index, incontinence, dizziness, vision impairment, and hearing impairment. These conditions may be as strongly associated with disability as chronic diseases, and should be addressed in the care of older adults.

Full text of this article is available at:

<http://www.annals.org/cgi/content/abstract/147/3/156>

Cigolle CT, et al. *Annals of Internal Medicine* 2007;147(3):156-164.

Common Geriatric Syndromes and Special Problems

Link to abstract (full text free to subscribers and ASCP members):

<http://tinyurl.com/y8zpw6>

Sleeper RB. *Consult Pharm* 2009;24(6):447-462.

11. Potentially Inappropriate Medications in the Elderly

Updating the Beers criteria for potentially inappropriate medication use in older adults

The Beers criteria are well known as a list of medications that are considered to be potentially inappropriate in the elderly. The original list of Beers criteria medications was published in 1991 and the most recent version is from 2003.

The full text of the 2003 update is available from this link:

<http://archinte.ama-assn.org/cgi/content/abstract/163/22/2716>

Fick DM, et al. Arch Intern Med 2003;163:2716-2724.

Zhan criteria for potentially inappropriate medication use in the elderly

The best known criteria for potentially inappropriate medication use in the elderly are the Beers criteria. Zhan modified the Beers criteria for a study of potentially inappropriate medication use in community-dwelling elderly and reported the results.

The full text of the article is available free online. Here is a link to the abstract, which also includes a long list of articles that have referenced this study:

<http://jama.ama-assn.org/cgi/content/abstract/286/22/2823>

Zhan C, Sangl J, Bierman AS; et al. Potentially inappropriate medication use in the community-dwelling elderly: findings from the 1996 Medical Expenditure Panel Survey. JAMA.2001;286(22):2823-2829.

Developing Explicit Positive Beers Criteria for Preferred Central Nervous System Medications in Older Adults

This study identified 13 preferred medications for use in older adults with four central nervous system conditions: dementia, depression, Parkinson's disease, and psychosis.

Link to article:

<http://www.ascp.com/resources/clinical/BeersCriteriaArticle.cfm>

Stefanacci RG, Cavallero E, Beers MH, et al. Consult Pharm 2009;24:601-10.

ASCP-AMDA Joint Position Statement on Beers criteria

ASCP and the American Medical Directors Association developed a Joint Position Statement on the Beers List of Potentially Inappropriate Medications in Older Adults. The link to the policy statement is:

<http://www.ascp.com/resources/policy/upload/Sta04-ASCP-AMDA-Beers.pdf>

12. Prescribing Cascade

Increased incidence of levodopa therapy following metoclopramide use

In one of the early articles about the prescribing cascade, Avorn and colleagues used the New Jersey Medicaid database to determine whether there was an increase in use of anti-parkinsonian therapy in older persons (65 years and over) taking metoclopramide hydrochloride. They found that metoclopramide users

were three times more likely to begin use of a levodopa-containing medication compared with nonusers.

Link to abstract:

<http://jama.ama-assn.org/cgi/content/abstract/274/22/1780>

Avorn A, Gurwitz JH, Bohn RL, et al. *JAMA*. 1995;274(22):1780-1782.

Update on the prescribing cascade

Clark, TR. *Geriatric Clinical News*, October 2008.

<http://content.eneurosonline.com/12293/18770.html>

13. Population-Specific Activities

Shown below is a list of resources that have been recommended by Certified Geriatric Pharmacists. These resources may have applicability to Domain #3 of the content outline for the Certified Geriatric Pharmacist examination, "Population Specific Activities."

Full text journal articles

Below is a series of six articles from the *Canadian Medical Association Journal* that provide an overview of statistics and literature evaluation. The full text of the articles is available free online.

Wyer PC, et al. Tips for learning and teaching evidence-based medicine: introduction to the series. *CMAJ*. Aug. 17, 2004. 171(4):347-348.

<http://www.cmaj.ca/cgi/reprint/171/4/347>

Barratt A, Wyer PC, Hatala R, et al. Tips for learners of evidence-based medicine, Part 1: relative risk reduction, absolute risk reduction, and number needed to treat. *CMAJ*. Aug. 17, 2004. 171(4):353-358.

<http://www.cmaj.ca/cgi/reprint/171/4/353>

Montori VM, Kleinbart J, Newman TB, et al. Tips for learners of evidence-based medicine, Part 2: measures of precision (confidence intervals). *CMAJ*. Sept. 14, 2004. 171(6):611-615.

<http://www.cmaj.ca/cgi/reprint/171/6/611>

McGinn T, Wyer PC, Newman TB, et al. Tips for learners of evidence-based medicine, Part 3: measures of observer variability (kappa statistic). *CMAJ*. Nov. 23, 2004. 171(11):1369-1373.

<http://www.cmaj.ca/cgi/reprint/171/11/1369>

Hatala R, Keitz S, Wyer P, et al. Tips for learners of evidence-based medicine, Part 4: assessing heterogeneity of primary studies in systematic reviews and whether to combine their results. CMAJ. March 1, 2005. 172(5):661-665.
<http://www.cmaj.ca/cgi/reprint/172/5/661>

Montori VM, Wyer P, Newman TB, et al. Tips for learners of evidence-based medicine, Part 5: the effect of spectrum of disease on the performance of diagnostic tests. CMAJ. Aug. 16, 2005. 173(4):385-390.
<http://www.cmaj.ca/cgi/reprint/173/4/385>

Books

Woloshin S, Schwartz LM, Welch HG. Know Your Chances: Understanding Health Statistics. 2008. This inexpensive paperback book was written for lay audiences and is very readable.

Link to Amazon.com: <http://tinyurl.com/29s42d2>

Malone P, Kier K, Stanovich J. Drug Information: A Guide for Pharmacists. 2006. Has a chapter on “clinical application of statistical analysis,” which is reportedly very good. The book costs over \$50 though.

Link to Amazon.com: <http://tinyurl.com/2g8app6>

Online Continuing Education

A Primer on Interpreting Published Studies, 1 hour continuing education. Cost = \$10. Available at: <http://www.theceinstitute.org/>

Module #19 at www.GeriatricPharmacyReview.com is 1 hour of continuing education on “Evaluation and Use of Clinical Information to Improve Patient Care.” Access to this module can be purchased for \$14 for ASCP members and \$35 for non-members.