

Introduction to Geriatric Pharmacotherapy Resource List

Date: March 2011

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

1. Introduction
2. Getting Started
3. General Geriatric Resources
4. Geriatric Books and Textbooks
5. Geriatric Journal List
6. Geriatric Primer Article Series in *The Consultant Pharmacist*
7. General Journal Articles
8. Live Meetings and Workshops
9. Adverse Drug Events in Older Adults
10. Clinical Practice Guidelines
11. Geriatric Syndromes
12. Potentially Inappropriate Medications in Older Adults
13. Prescribing Cascade
14. Drug Interactions
15. Adherence or Compliance with Drug Therapy
16. Population-Specific Activities

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.

CCGP
Geriatric Pharmacotherapy Resource List

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 (ASCP). This guide is available free and can be downloaded as a PDF file at:

<http://www.ascp.com/sites/default/files/2ndEd-ASCP-CurriculumGuide.pdf>

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://tinyurl.com/yawgcg4>

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/articles/professional-development/online-self-study-activities>

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

CCGP
Geriatric Pharmacotherapy Resource List

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/publications/shop_publications/

Geriatric Pharmacotherapy Listserver

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

<http://www.ascp.com/articles/list-server-lists>

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 Books and Textbooks

Brocklehurst's Textbook of Geriatric Medicine and Gerontology

Authors: Fillit HM, Rockwood K, Woodhouse K.

Hardcover: 1152 pages

Publisher: Saunders; 7th edition (March 29, 2010)

Link: <http://tinyurl.com/277hxur>

Essentials of Clinical Geriatrics: Sixth Edition

Authors: Kane R, Ouslander J, Abrass I, Resnick B.

Paperback: 598 pages

Publisher: McGraw-Hill Professional; 6th edition (November 13, 2008)

Link: <http://tinyurl.com/29frbvr>

Fundamentals of Geriatric Medicine: A Case-Based Approach

Authors: Fernandez H, Cassel CK, Leipzig R, Soriano RP

Paperback: 624 pages

Publisher: Springer; 1st edition (June 2, 2010)

Link: <http://tinyurl.com/27drcgd>

Fundamentals of Geriatric Pharmacotherapy: An Evidence-Based Approach

Authors: Hutchison LC, Sleeper RB

Paperback: 450 pages

Publisher: American Society of Health-Systems Pharmacists; 1st edition (January 1, 2010)

Link: <http://tinyurl.com/28olh7b>

Geriatric Pharmacotherapy: A Guide for the Helping Professional

Authors: Olson CG, Tindall WN, Clasen ME.

Hardcover: 300 pages

Publisher: APhA Publications; 1st edition (January 15, 2007)

Link: <http://tinyurl.com/2faoepx>

Hazzard's Geriatric Medicine & Gerontology, Sixth Edition

Authors: Halter J, Ouslander J, Tinetti M, et al.

Hardcover: 1760 pages

CCGP
Geriatric Pharmacotherapy Resource List

Publisher: McGraw-Hill Professional; 6th edition (March 9, 2009)

Link: <http://tinyurl.com/27agvny>

5. Geriatric Journal List

Age & Ageing (British Geriatrics Society)
<http://ageing.oxfordjournals.org/>

American Journal of Geriatric Pharmacotherapy
<http://ajgeripharmacother.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
<https://www.ascp.com/articles/consultant-pharmacist>

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

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

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

Journal of the American Geriatrics Society
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1532-5415/issues](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1532-5415/issues)

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

Journals of Gerontology: Medical Sciences

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

6. *Articles from The Consultant Pharmacist*

Geriatric Primer Series

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

<https://www.ascp.com/articles/consultant-pharmacist>

- Pharmacokinetic and Pharmacodynamic Alterations in the Geriatric Patient (April 2008) - <http://tinyurl.com/23n5o7z>
- Evaluating Medication Regimens in the Elderly (July 2008) - <http://tinyurl.com/2bs8ule>
- Communicating with Seniors and their Caregivers (Sept. 2008) - <http://tinyurl.com/292n5ds>
- 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/y8zpw6>
- Implications and Management of Decline for the Geriatric Patient (Aug. 2009) - <http://tinyurl.com/yfmosj8>

Medication Regimen Review Series

In 2010-2011, The Consultant Pharmacist published a 3-part series of articles on Introduction to the Medication Regimen Review. Here are links to the individual articles:

- Introduction to the Medication Regimen Review—Part 1 (November 2010) - <http://tinyurl.com/4634dcm>
- Introduction to the Medication Regimen Review—Part 2 (December 2010) - <http://tinyurl.com/4cg4yz9>
- Introduction to the Medication Regimen Review—Part 3 (January 2011) - <http://tinyurl.com/4e67y7p>

7. *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.

D. Le Couteur and H. Kendig. *Australasian Journal on Ageing* 2008; 27(1):3-7.

Link to abstract:

<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.

Hilmer SN, McLachlan AJ, Le Couteur DG. *Fundamental & Clinical Pharmacology* 2007;21(3):217-230.

Link to abstract:

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

Appropriate prescribing in elderly people

Spinewine A, Schmader KE, Barber N, Hughes C, Lapane K, Swine C, Hanlon JT. Appropriate prescribing in elderly people: How can it be measured and optimized? *Lancet* 2007;370:173-184.

Link to abstract:

[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(07\)61091-5/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(07)61091-5/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.

Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm* 1990;47:533-543.

Full text of the article is available at:

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

End of life care

Holmes, HM, Hayley, DC, Alexander, GC & Sachs, GA. Reconsidering medication appropriateness for patients late in life. *Arch Intern Med* 2006;166:605-609.

Link to abstract:

<http://archinte.ama-assn.org/cgi/content/extract/166/6/605>

Quality indicators for medication use in vulnerable elders

This article is one of a series from the Assessing Care of Vulnerable Elders (ACOVE) project. The entire collection of articles was published as a supplement to the Journal of the American Geriatrics Society.

Shrank WH, Polinski JM, Avorn J. Quality indicators for medication use in vulnerable elders. *J Am Geriatr Soc.* 2007;55 Suppl 2:S373-382.

Link to abstract:

<http://www3.interscience.wiley.com/journal/117996005/abstract>

8. Live Meetings and Workshops

ASCP Midyear Meeting – The ASCP Midyear Meeting is in the Spring of each year. The 2011 Midyear Meeting is in Las Vegas, NV on May 17-20.

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 next presentation of this workshop is scheduled for:

- May 17 at the ASCP Midyear Meeting

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:

- May 19 and 20 at the ASCP Midyear Meeting

9. 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.

The abstract is available 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 at this 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.

Adverse drug events in nursing homes

Handler, SM, Wright RM, Ruby CM, Hanlon JT. The epidemiology of medication-related adverse events in nursing homes. *Am J Geriatr Pharmacother* 2006;4:264-272.

Link to abstract:

<http://tinyurl.com/2d52atd>

Handler SM, Hanlon JT. Detecting Adverse Drug Events Using a Nursing Home Specific Trigger Tool. *Ann Long-Term Care* 2010;18(5):17-22.

Full text can be obtained from this link:

<http://www.annalsoflongtermcare.com/issue/765>

10. 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

CCGP
Geriatric Pharmacotherapy Resource List

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 the ASCP Foundation Geriatric Clinical News. The link is:

<http://content.newsletteronline.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/>

AHRQ Effective Health Care Program

The Agency for Healthcare Research and Quality maintains a Web site with a variety of useful resources, including guidelines, literature reviews and comparative effectiveness reviews.

Link to Web site:

<http://effectivehealthcare.ahrq.gov/>

Adult Immunization Schedule for 2011

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

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6004a10.htm>

Alzheimer's disease—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

Antithrombotic and thrombolytic therapy-CHEST Guidelines, 2008

http://chestjournal.chestpubs.org/content/133/6_suppl

Atrial fibrillation—Management of patients with atrial fibrillation, 2011 update from the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Link to full text guidelines:

<http://circ.ahajournals.org/cgi/reprint/CIR.0b013e3181fa3cf4v1>

Atrial fibrillation—2011 ACCF/AHA/HRS Focused Update on the Management of Patients with Atrial Fibrillation (Update on Dabigatran). Full text is available at:

<http://circ.ahajournals.org/cgi/reprint/CIR.0b013e31820f14c0v1>

Benign prostatic hypertrophy (BPH)—Guidelines from the American Urological Association, 2010. Full text is available at:

<http://www.auanet.org/content/guidelines-and-quality-care/clinical-guidelines.cfm?sub=bph>

Cardiovascular disease prevention in women—Guidelines from the American Heart Association, 2011. Full text is available at:

<http://circ.ahajournals.org/cgi/reprint/CIR.0b013e31820faaf8v1>

Cardiovascular risk assessment in asymptomatic adults—Guidelines from the American Heart Association and the American College of Cardiology Foundation, 2011. Full text is available at:

<http://content.onlinejacc.org/cgi/content/full/56/25/e50>

Clinical Practice Guidelines for *Clostridium difficile* Infection in Adults: 2010 Update by the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA). Link to full text:

<http://www.journals.uchicago.edu/doi/full/10.1086/651706>

COPD Guidelines—GOLD

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

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

Falls—American Geriatrics Society clinical practice guidelines on prevention of falls in older persons, 2010. Link to full text guidelines:

http://www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2010/

Framingham Risk Calculator—to estimate a person's risk for cardiovascular events. Note that this Web site uses the actual equation for risk calculation. Framingham risk estimators based on a point system are less accurate. The Web site is:

<http://hp2010.nhlbihin.net/atp/iii/calculator.asp?usertype=prof>

Heart Failure—Guidelines for the Diagnosis and Management of Heart Failure in Adults: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines-2009. Link to full text guidelines:

<http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.109.192065>

HIV/AIDS—Use of antiretrovirals in adults with HIV infection, from the International AIDS Society-USA; full text of guidelines are available free on the JAMA Web site at:

<http://jama.ama-assn.org/cgi/content/full/304/3/321>

Hyperlipidemia—National Cholesterol Education Program Adult Treatment Panel III recommendations on detection, evaluation, and treatment of high cholesterol. Full text guidelines available at:

<http://www.nhlbi.nih.gov/guidelines/cholesterol/index.htm>

Hypertension—NOTE: JNC 7 (Joint National Committee hypertension guidelines, 7th revision) were released in 2003 and are now obsolete. The JNC 8 Guidelines are expected to be released in Spring 2011. Check this Web site for updates:

<http://www.nhlbi.nih.gov/guidelines/hypertension/jnc8/index.htm>

Hypertension—2010 Annual Canadian Hypertension Education Program Recommendations. This Web site has full text of guidelines, along with summary and other resources and tools:

<http://hypertension.ca/chep/recommendations-2010/>

Methicillin-resistant *Staphylococcus aureus*—Clinical practice guidelines for the treatment of MRSA infections in children and adults, from the Infectious Diseases Society of America, January 2011. Link to full text guidelines:

<http://cid.oxfordjournals.org/content/early/2011/01/04/cid.ciq146.full.pdf+html>

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>

Osteoporosis—Clinical practice guidelines for diagnosis and treatment of postmenopausal osteoporosis, from American Association of Clinical Endocrinologists, 2010. Full text at:

<http://www.aace.com/pub/pdf/guidelines/OsteoGuidelines2010.pdf>

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 Guidelines for Chronic Pain Management—An Updated Report by the American Society of Anesthesiologists Task Force on Chronic Pain Management and the American Society of Regional Anesthesia and Pain Medicine. April 2010. Download at:
<http://tinyurl.com/23p3gvx>

Renal Dosing—Consensus Guidelines for Oral Dosing of Primarily Renally Cleared Medications in Older Adults, 2009. National Institutes of Health, public access:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2640432/pdf/nihms74350.pdf>

Stroke Prevention— Guidelines for Prevention of Stroke in Patients with Stroke or Transient Ischemic Attack, 2011. American Heart Association and American Stroke Association. Full text available free at:
<http://stroke.ahajournals.org/cgi/content/full/42/1/227>

Guidelines for the Primary Prevention of Stroke, 2010. American Heart Association and American Stroke Association. Full text available free at:
<http://stroke.ahajournals.org/cgi/reprint/STR.0b013e3181fcb238v1>

Urinary Tract Infection, Catheter-associated

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>

11. 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. *Ann Intern Med.* 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.

Delirium: Diagnosis, Prevention, and Management.

From the National Institute for Health and Clinical Excellence (NICE) in the UK. A quick reference guide is also available. July 2010. Full text online:
<http://www.nice.org.uk/CG103>

Falls and medication use

Woolcott JC, et al. Meta-analysis of the impact of 9 medication classes on falls in elderly persons. *Arch Intern Med.* 2009;169(21):1952-1960.

Link to abstract:

<http://archinte.ama-assn.org/cgi/content/abstract/169/21/1952>

Falls—American Geriatrics Society clinical practice guidelines on prevention of falls in older persons, 2010. Link to full text guidelines:
http://www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2010/

12. 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.

STOPP and START Criteria

The STOPP and START criteria have been attracting interest among geriatric clinicians because they are more recent than the Beers criteria and they address undertreatment among older adults along with use of medications that are potentially inappropriate. This article by the ASCP Foundation provides an overview and references:

<http://content.eneuroletteronline.com/12293/20682.html>

Barry PJ et al. START (Screening Tool to Alert doctors to the Right Treatment)—an evidence-based screening tool to detect prescribing omissions in elderly patients. *Age Ageing*. 2007;36:632-638. Full text at:

<http://ageing.oxfordjournals.org/cgi/reprint/36/6/632>

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://tinyurl.com/4l5wwjn>

Stefanacci RG, Cavallero E, Beers MH, et al. *Consult Pharm* 2009;24(8):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:

[Temporarily unavailable due to ASCP Web site revamping]

13. 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.enelectrononline.com/12293/18770.html>

14. Drug Interactions

Juurlink DN, et al. Drug-drug interactions among elderly patients hospitalized for drug toxicity. *JAMA* 2003;289:1652-1658. Link to abstract:

<http://jama.ama-assn.org/content/289/13/1652.abstract>

Flockhart DA. Drug Interactions: Cytochrome P450 Drug Interaction Table. Indiana University School of Medicine (2007). Updated January 12, 2009. Link to Web site:

<http://medicine.iupui.edu/clinpharm/DDIs/>

Medscape Drug Interaction Checker

<http://www.medscape.com/druginfo/druginterchecker>

15. Adherence or Compliance with Drug Therapy

Medication Use Safety Training (MUST for Seniors)

This Web site is sponsored by the National Council on Patient Information and Education (NCPPIE), and is available at:

<http://www.mustforseniors.org>

Adult Medication

Sponsored by the American Society of Consultant Pharmacists Foundation, the focus of this Web site is on improving medication adherence in older adults. The link is:

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

Center for Connected Health

The Center for Connected Health has resources on medication adherence at:
<http://www.connected-health.org/programs/medication-adherence.aspx>

16. 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>

CCGP
Geriatric Pharmacotherapy Resource List

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>

Ioannidis JPA. Why most published research findings are false. *PLoS Medicine* 2005;2(8):0696-0701.
<http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.0020124>

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.

Note: All links verified February 3, 2011.

Suggestions for additions, updates, or other comments should be sent to: info@ccgp.org

Commission for Certification in Geriatric Pharmacy
1321 Duke Street
Alexandria, VA 22314
Phone: 703-535-3036
E-mail: info@ccgp.org
Web: www.ccgp.org