

## **The Pharmacodynamics of Aging**

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### **Resources for Further Reading**

Baltimore Longitudinal Study on Aging: <https://www.blsa.nih.gov/>

American Geriatrics Society Updated Beers Criteria identifying medications that older adults should avoid or use with caution:

<https://geriatricscareonline.org/ProductAbstract/american-geriatrics-society-updated-beers-criteria-for-potentially-inappropriate-medication-use-in-older-adults/CL001>

Increase in elderly population

<https://www.census.gov/prod/2014pubs/p25-1140.pdf>

U.S. Department of Health and Human Services. HHS Initiative on Multiple Chronic Conditions. 2014. Available at: <http://www.hhs.gov/ash/initiatives/mcc/>

U.S. Department of Health and Human Services. Multiple Chronic Conditions – A Strategic Framework: Optimum Health and Quality of Life for Individuals with Multiple Chronic Conditions. Available at:

[http://www.hhs.gov/sites/default/files/ash/initiatives/mcc/mcc\\_framework.pdf](http://www.hhs.gov/sites/default/files/ash/initiatives/mcc/mcc_framework.pdf)

### **References (in the order cited)**

Table 1 from Zisook S, Downs NS. *J Clin Psych* 1998, 59 (suppl 4):80-91, data from Dorgan CA, editor. *Statistical record of health and medicine*. New York: International Thompson Publishing Co. 1995. (Slide 6)

Figure 1 from *Annals of Internal Medicine*, Vol 117, No 8, 685, 15 Oct 1992 (Slide 7)

Adapted from Cluff LE et al. *JAMA* 1964;188:976 (Slide 8)

Baltimore Longitudinal Study on Aging, <https://www.blsa.nih.gov/> (Slide 10)

Vestal et al. *Clin Pharmacol Ther* 1979;26:181-186 (Slide 11)

Abernethy et al. *Am J Cardiol* 1987;60:697-702 (Slides 12 and 13)

R. Clinton Webb. *Advan in Physiol Edu* 2003;27:201-206 (Slide 14)

O'Rourke, MF. *Arterial Function in Health and Disease*, 1982 (Slide 16)

Abernethy et al. *Ann Int Med*, 1986;105:329-336 (Slides 17-19)

JV Mombouli and PM Vanhoutte. *J Mol Cell Cardiol* 1999; 31:61-74 (Slide 21)

Andrawis et al. *J Am Geriatr Soc* 2000;48:193-198 (Slide 22)

Chauhan et al. *JACC* 1996; 28:1796-1804 (Slide 23)

Drug Interaction Table, Indiana University, Clinical Pharmacology Research Institute (Slide 27) (<http://medicine.iupui.edu/CLINPHARM/ddis/main-table>)

Greenblatt et al. *Br J Clin Pharmacol* 1983;15:303-309 (Slide 28)

Greenblatt et al. *Anesthesiology* 1984;61:27-35 (Slide 29)

Steinman et al. *J Am Geriatr Soc* 2012;60:1872-1880 (Slide 35)

Hilmer et al. *Arch Int Med* 2007;167:781-787 (Slide 38)

### **Additional References, Including Those from the Case Studies and Self-Assessment:**

#### Polypharmacy

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Gnjidic D, Hilmer SN, Blyth FM, et al. Polypharmacy cutoff and outcomes: five or more medicines were used to identify community-dwelling older men at risk of different adverse outcomes. *J Clin Epidemiol* 2012;65:989-995.

Melzer D, Tavakoly B, Winder RE, et al. Much more medicine for the oldest old: trends in UK electronic clinical records. *Age Ageing* 2015;44(1):46-53.

National Action Plan for Adverse Drug Event Prevention. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2014). Washington, DC: <https://health.gov/hcq/pdfs/ade-action-plan-508c.pdf>

Quato DM, Wilder J, Schumm LP, et al. Changes in the prescription and over-the-counter medication and dietary supplement use among older adults in the United States, 2005 vs 2011. *JAMA Intern Med* 2016;176:473-482.

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Scott IA, Hilmer SN, Reeve E, et al. Reducing inappropriate polypharmacy: the process of deprescribing. *JAMA Intern Med* 2015;175(5):827-834.

#### Cardiovascular aging

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### Impaired drug responses

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### Changes in renal drug clearance (including calculation of glomerular filtration rate)

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### Changes in drug metabolism

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### Drug burden index and impaired functional status

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Note that all websites were accessed on 08-Jan-2018