

Medically Complex Older Adults: The Pharmacotherapeutic Challenge

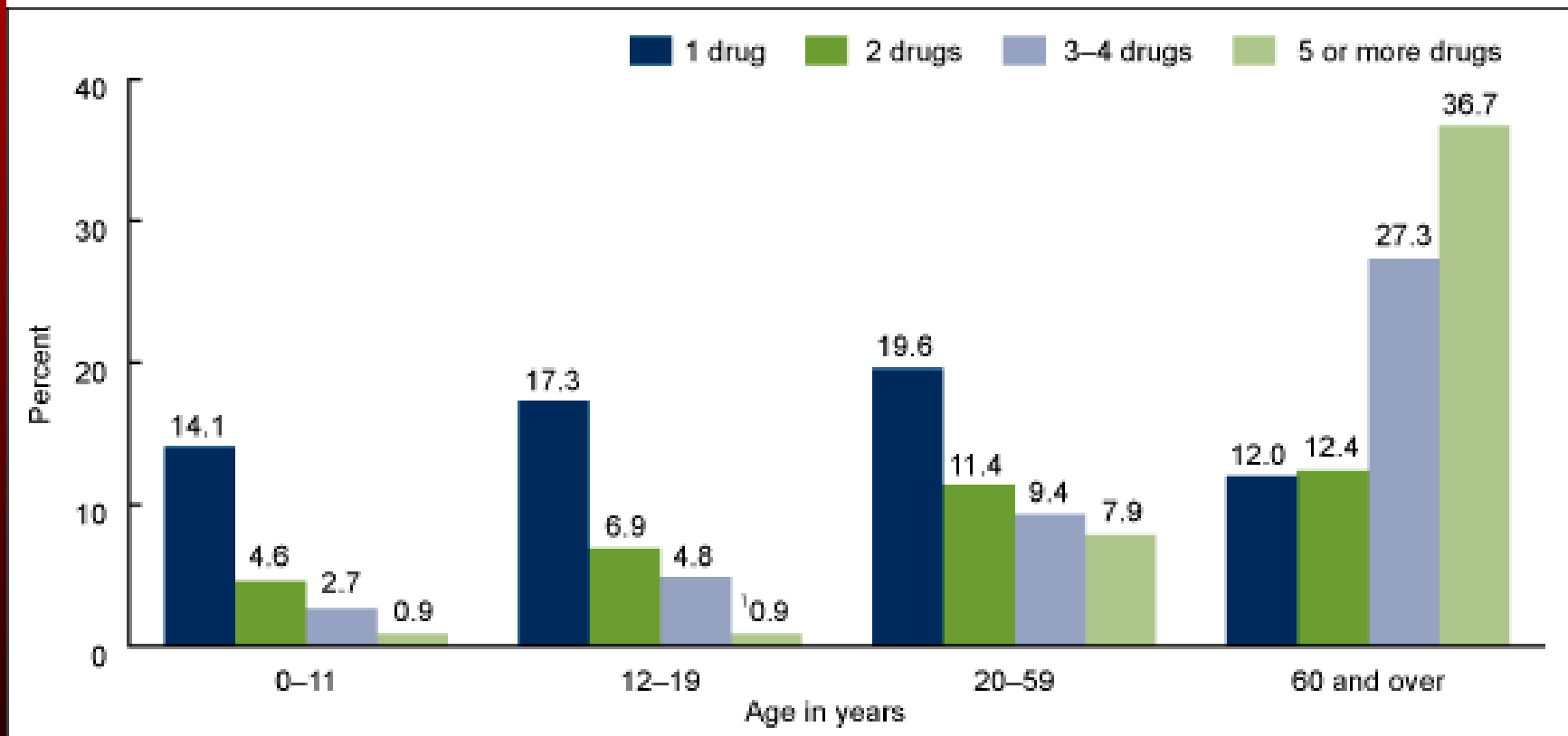
Bradley R. Williams, PharmD, CGP
Professor, Clinical Pharmacy & Clinical Gerontology
University of Southern California

Presentation Objectives

1. Identify the most common chronic disorders in older adults that are managed by drug therapy.
2. Describe how pharmacotherapy for one disorder may complicate the management of another disease.
3. Develop a pharmacotherapeutic plan for treating co-morbid conditions that minimize risk and optimize outcomes.

Prescription Medication Use

Figure 2. Percentage of prescription drugs used in the past month, by age: United States, 2007–2008



¹Estimate is unstable; the relative standard error is greater than 30%.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.

Medication-related Problems

- Dose too high
- Dose too low
- Improper medication
 - Contraindication
 - Allergy
 - Inappropriate for patient's age or function
- Drug interaction
- Adverse drug reaction
- Unnecessary medication
 - Duplicate
 - No indication
 - Problem resolved
- Untreated indication
- Patient not receiving medication

Medication Risk Assessment

- ≥ 5 medications
- ≥ 12 daily doses
- Narrow therapeutic index drugs
- Multiple prescribers
- Taking medicines for at least 3 problems
- Uses multiple pharmacies
- Someone brings medicines to the home
- Complex regimen
- At least 4 direction changes in 1 year
- Any medicine taken for an unknown reason

-Levy HB, Ann Pharmacother, 2003

Evidence-based Guidelines

- Geriatrics-focused
 - Alzheimer's disease
 - Depression
 - Persistent pain
 - Diabetes (AGS)
- Geriatrics addressed
 - Hypertension
 - Heart failure
 - Diabetes (ADA)
 - Osteoarthritis
- No Geriatrics
 - GERD
 - COPD

Why Are We Concerned?

- Older adults account for 49.8% of hospital admissions due to adverse drug events¹
 - Rate is greatest for age 85+ years
 - 87% due to hypoglycemics, anticonvulsants, warfarin, digoxin, theophylline, lithium
- Adults age 50+ account for 51.1% of ED admissions for adverse drug events²
 - CNS drugs (2.8%), blood modifiers (22.6%), cardiovascular meds (18.1%) are most common

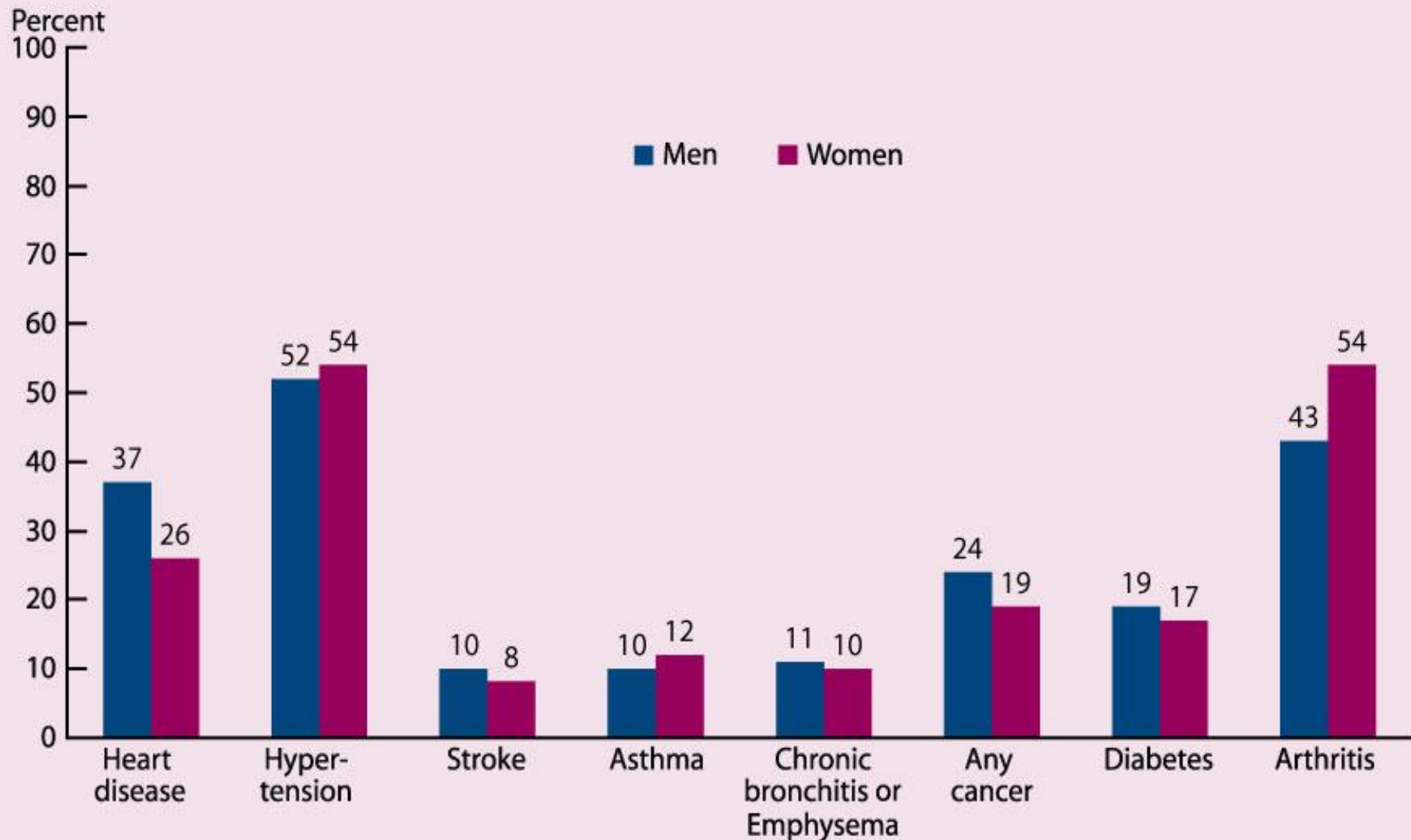
¹Budnitz, et al, JAMA, 2006; ²The DAWN Report, 2011

Why Are We Concerned?

- Medicare hospital readmissions¹
 - 30 days (19.6%); 60 days (28.2%)
 - Heart failure, pneumonia, COPD, psychosis are most common discharge diagnoses
- Preventable medication errors²
 - Renal and hepatic function
 - Drug interactions
 - Lack of individualized therapy

¹ Jencks, et al., *NEJM*, 2009; ² Kohn, et al. *Institute of Medicine*, 2000

Percentage of people age 65 and over who reported having selected chronic conditions, by sex, 2005–2006



Note: Data are based on a 2-year average from 2005–2006.

Reference population: These data refer to the civilian noninstitutionalized population.

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey.

A Medically Complex Patient...

- 88 year-old woman who lives alone
- Legally blind due to macular degeneration
- Hearing-impaired (R acoustic neuroma)
- Fractured pelvis at age 83, with accompanying L rotator cuff tear
- Fall at age 88 with R rotator cuff tear
- Uses cane or walker for ambulation

Medical Problems

- Hypertension
- Diabetes Type 2
 - Pancreatitis history
- History of heart failure
- Hyperlipidemia
- Osteoarthritis
- Osteoporosis
- Spinal stenosis
- GERD
- Mild cirrhosis
- S/P hyperparathyroidism
- Intermittent asthma symptoms

Medications

- Furosemide 20 mg 2 tabs daily
- Benazepril 20 mg/Amlodipine 10 mg daily
- Metoprolol 12.5 mg BID
- Nateglinide 120 mg with meals
- Insulin detemir (Levemir) 18 units at bedtime
- Rosuvastatin (Crestor) 5 mg daily
- Fenofibrate 145 mg daily
- Omega-3 (Lovaza) 1 gm 2 capsules BID

Medications

- Esomeprazole (Nexium) 20 mg daily
- Vitamin D3 4,000 units daily
- Conjugated estrogens (Premarin) 0.3 mg three times weekly
- Fluticasone (Flonase) 2 puffs daily
- Albuterol (ProAir HFA) BID PRN wheezing

Fasting Lab Results

LAB	RESULT	LAB	RESULT	LAB	RESULT
Na	142	Ca	10.0	TC	197
K	5.1	Phos	3.8	TG	178
Cl	106	Alb	4.8	LDL	118
HCO3	23	Protein (T)	7.3	HDL	35
FPG	202	T. Bili	0.3	RBC	3.91
HgbA1c	7.0%	AlkPhos	65	Hct	37.9
SCr	1.6	AST	27	Hgb	12.4
BUN	47	ALT	22	Plt	360K
BUN/SCr	29.4	Amylase	122	PTH	49.4
GFR	32	Lipase	82	Vit D	35.3

HYPERTENSION

BP Classification: JNC-7

Class	SBP (mm Hg)	DBP (mm Hg)
Normal	<120	and <80
Prehypertension	120-139	or 80-89
Stage 1 HTN	140-159	or 90-99
Stage 2 HTN	≥ 160	≥ 100

JNC-7 and Older Adults

- No changes based on age
 - $<140/90$ for most patients
 - $<130/80$ for diabetes or chronic renal disease
- Reference to declining renal function
- Many fall under “Compelling Indications”

Compelling Indications

Medscape®

www.medscape.com

COMPELLING INDICATION*	RECOMMENDED DRUGS						CLINICAL TRIAL BASIS†
	DIURETIC	BB	ACEI	ARB	CCB	ALDO ANT	
Heart failure	●	●	●	●		●	ACC/AHA Heart Failure Guideline, ¹³² MERIT-HF, ¹³³ COPERNICUS, ¹³⁴ CIBIS, ¹³⁵ SOLVD, ¹³⁶ AIRE, ¹³⁷ TRACE, ¹³⁸ ValHEFT, ¹³⁹ RALES, ¹⁴⁰ CHARM ¹⁴¹
Postmyocardial infarction		●	●			●	ACC/AHA Post-MI Guideline, ¹⁴² BHAT, ¹⁴³ SAVE, ¹⁴⁴ Capricorn, ¹⁴⁵ EPHEBUS ¹⁴⁶
High coronary disease risk	●	●	●		●		ALLHAT, ¹⁰⁹ HOPE, ¹¹⁰ ANBP2, ¹¹² LIFE, ¹⁰² CONVINCe, ¹⁰¹ EUROPA, ¹¹⁴ INVEST ¹⁴⁷
Diabetes	●	●	●	●	●		NKF-ADA Guideline, ^{88,89} UKPDS, ¹⁴⁸ ALLHAT ¹⁰⁹
Chronic kidney disease			●	●			NKF Guideline, ⁸⁹ Captopril Trial, ¹⁴⁹ RENAAL, ¹⁵⁰ IDNT, ¹⁵¹ REIN, ¹⁵² AASK ¹⁵³
Recurrent stroke prevention	●		●				PROGRESS ¹¹¹

Complicating Factors

- Guidelines do not address fall risk in older adults
- Thiazides less effective with renal impairment, but loop diuretics carry risks
- Beta-blockers may reduce exercise tolerance
- Multiple medications

HYPERLIPIDEMIA

Lipids and Aging

- Total Cholesterol and LDL
 - increase CHD risk, especially for males
- LDL B pattern genotype
 - inherited
 - multiple contributory risk factors
 - visceral obesity
 - high-fat diet
 - sedentary lifestyle
 - DMT2
- NCEP-ATP III not revised since 2004

Pharmacologic Inventions

Drug	TChol	LDL-C	HDL-C	TG
Fibrates	Dec	-10	+10	-35
Statins	-20-30	-20-30	+5-10	-15
Resins	-15	-15	\pm	\pm
Niacin	-20	-20	+10-20	-30

Lipid-Lowering Agents

Condition	Drug	Dose
Elevated TG	Gemfibrozil (Lopid)	600 mg BID
	Fenofibrate (TriCor)	48-145 mg qday
Low HDL, High LDL & TG	Above + statin	As above
	Niacin SR	150-2000 mg HS
Elevated LDL or nonresponse	Ezetimibe (Zetia)	10 mg qday
	Ezetimibe + Simvastatin (Vytorin)	10/20 to 10/40 qday

Complicating Factors

- Potential statin interactions
- Niacin intolerance
- Restrictive diet in the presence of:
 - Age-associated taste alterations
 - Ability to prepare meals
- Multiple medications

DIABETES

Factors To Consider: AGS Guidelines

- Older patients with DM are at greater risk for common geriatric syndromes:
 - Polymedicine
 - Depression
 - Cognitive impairment
 - Urinary Incontinence
 - Injurious Falls
 - Persistent Pain

ADA/AGS Recommendations

- “Patients who can be expected to live long enough to reap the benefits of long-term intensive diabetes management and who are active, have good cognitive function, and are willing to undertake the responsibility of self-management should be encouraged to do so and be treated using the goals for younger adults with diabetes.”

ADA/AGS Recommendations

- “For patients with advanced diabetes complications, life-limiting comorbid illness, or substantial cognitive or functional impairment, it is reasonable to set less intensive glycemic target goals. These patients are less likely to benefit from reducing the risk of microvascular complications and more likely to suffer serious adverse effects from hypoglycemia.”

Goals for Diabetes Care

- Glycemic control
- Reduce cardiovascular risk:
 - Hypertension management
 - Lipid management
 - Smoking cessation
 - Aspirin use
- Eye care
- Foot care
- Diabetes education

Recommendations for Glycemic Control

- Target A1C should be individualized:
 - In healthy individuals with good functional status $\leq 7\%$.
 - For frail older adults and persons with life expectancy <5 years less stringent target is appropriate, $\leq 8\%$.

2012 AGS/ADA Update

- Encourage physical activity
- Pharmacotherapy considerations
 - Avoid glyburide
 - Metformin, up to Stage IV CKD
 - eGFR for renal function evaluation
 - Hypoglycemia risk is more critical than A1c
 - Consider treatment burden and adherence
- Periodic screen for functional capacity

ADDITIONAL CONSIDERATIONS

Treatment Choices

- Aspirin for primary prevention
 - Risk for worsening renal impairment
 - GI-related risks
- Osteoporosis
 - Renal and GI considerations with bisphosphonates
 - Patient preferences for other treatments

Treatment Choices

- Pain management
 - NSAID risk
 - Acetaminophen risk with cirrhosis
 - Fall and cognition risk with opiates
- General considerations
 - Medication burden
 - Interaction and adverse reaction risk

Optimizing Outcomes

- Take a risk management approach to pharmacotherapy
 - What is the evidence for efficacy?
 - Is the evidence inclusive of older adults?
 - What adverse effects pose the lowest risk for an individual patient?
 - Can (or will) the patient adhere to the regimen?
- Recognize and respect patient goals

Summary

- Use of clinical guidelines can be very helpful in guiding treatment for older adults
- In the absence of specific guidelines, it is important to look for discussion of special populations, such as geriatrics
- Guidelines that do not address older adults at all may lead to false or misleading assumptions, and result in negative outcomes, or at least less-than-optimum treatment