

Medications Role in Assessing Fall Risk

Presented by
Pamela Wong PharmD., MPH
Director of Clinical Services
Justin Rash PharmD. CGP
VP of Clinical Services

Prepared by
Marshall Johnson
PharmD. Candidate 2017
The University of Iowa College of Pharmacy



Objectives

- To understand medications often implicated in increasing risk of falls and strategies to minimize risk associated with their use
- Understand chronic conditions that often require pharmaceutical management and how proper medication use can decrease risk of falls
- Discuss issues with medication usage; including poly-pharmacy and multiple prescribers that can lead to increase fall risk





Available at: <http://abcnews.go.com/GMA/DnCall/story?id=6173302&page=2>
Accessed June 1, 2015.



Why Elderly Are At Higher Risk

- More likely to suffer from multiple chronic conditions¹
 - Average older person takes 4.5 prescription drugs
 - As the number increases so do potential problems
- Increasing use of over the counter medications¹
 - Number of medications available increasing
 - No labeling information particular to seniors
- Inappropriate medication prescribing in the elderly²
 - 17.5% of Medicare recipients prescribed medications considered inappropriate
 - 4-15% of community dwelling elderly
 - 40% of elderly in nursing homes



Falls

- Falls are the leading cause of injury-related deaths and the most common cause of nonfatal injuries and hospital trauma admissions among older adults¹
- 33% of adults over age 65 report falling within the past year
- Most result in minor soft tissue injuries
- 10-15% result in fractures
- Cost is considerable – ED visits, admission surgery etc.



Contributing Factors

- *Medication effects*^{4,5,6}
- Age related changes
- Disease related effects
- Environmental



Contributing Factor: Medication

- Many offending agents
- Poly-Pharmacy
- Aging and effects on drug pharmacology
- Multiple disease states
- Increasing use of OTC medications



Offending Agents

Alprazolam (Xanax)	Fentanyl (Duragesic)	Paroxetine (Paxil)
Amitriptyline (Elavil)	Fluoxetine (Prozac)	Pentobarbital (Nembutal)
Amobarbital (Amytal)	Fluphenazine (Permol, Prolin)	Perphenazine (Frisolone)
Amoxapine (Asendis)	Flurazepam (Dalmane)	Phenethazine (Nardil)
Angiprazole (Ablity)	Fluvoxamine (Luvox)	Phenobarbital
Baclofen (Lioresal)	Gabapentin (Neurontin)	Phenytoin (Dilantin)
Bupropion (Wellbutrin, Wellbutrin SR)	Halazepam (Paxipam)	Pinsolide (Drap)
Bupropion (Buprop)	Haloperidol (Haldol)	Pregabalin (Lyrica)
Butabarbital	Hydrocodone (Vicodin)	Promethazine (Phenadoz)
Carbamazepine (Tegretol, Tegretol XR, Carbatrol)	Hydromorphone (Dilaudid)	Propoxyphene (Darvon, Darvocet)
Chloral hydrate	Imipramine (Tofranil)	Protriptyline (Vivactil)
Chlorazepate (Tranzene)	Isocarboxazid (Marplan)	Quazepam (Doral)
Chlordiazepoxide (Librium, Limbitrol, Librax)	Levetiracetam (Keppra)	Quetiapine (Seroquel)
Chlorpromazine (Thorazine)	Levorphanol (Levo-Dromoran)	Risperidone (Risperdal)
Citalopram (Celexa)	Lorazepam (Ativan)	Saccharin (Sweet'N Low)
Clidinium-Chlordiazepoxide (Librax)	Loxapine (Loxitan, Loxitane CI)	Setraline (Zoloft)
Clomipramine (Anafranil)	Maprotiline (Ludomil)	Temazepam (Restoril)
Clonazepam (Klonopin)	Mefloquine (Lariam)	Thioridazine (Mellaril)
Clozapine (Clozaril)	Meprobamate (Miltown, Equanil)	Thiothixene (Navane)
Codaine (Tylenol with Codeine)	Mesoridazine (Serenal)	Tiagabine (Gabatril)
Desipramine (Norpramin)	Methadone (Dolophene)	Tigamycin (Topamax)
Diazepam (Valium)	Methaqualone (Quaalude)	Tranylcypromine (Parnate)
Digoxin (Lanoxin)	Mirtazapine (Remeron)	Trazodone (Desyrel)
Diopramide (Nopron)	Molindone (Moban)	Triazolam (Halcion)
Divalproex sodium (Depakote, Depakote ER)	Morphine (MS Contin)	Trifluoperazine (Stelazine)
Doxepin (Sinequan, Zonitox, Prudoxin)	Nefazodone (Serzone)	Trisopramine (Surmontil)
Duloxetine (Cymbalta)	Olanzapine (Zyprexa, Zyprexa Zydis)	Venlafaxine (Effexor, Effexor XR)
Escitalopram (Lexapro)	Oxazepam (Serax)	Ziprasidone (Geodon)
Eszopiclone (Prosom)	Oxycodone (Percocet)	Zolpidem (Ambien)
Ethosuximide (Zarontin)	Oxycodone (Numorphan)	Zonisamide (Zonegran)
Felbamate (Felbatol)		

Listed as generic name (brand name)
 Reprinted University of North Carolina at Chapel Hill news release: http://news.unc.edu/pressroom/health_and_medicine/meds_that_increase_risk_of_falling_in_northcarolina.html

Most Common Medications Associated with falls in the Elderly

- Psychoactive Agents
 - Psychotropic, Opioid, Parkinson & Seizure agents, Muscle Relaxants, Antihistamines
- Psychotropic Agents
 - Anxiolytics (Benzodiazepines)
 - Hypnotics (Ambien)
 - Antipsychotics (Haloperidol)
 - Antidepressants (SSRIs)
- Cardiovascular Agents
 - Antihypertensive

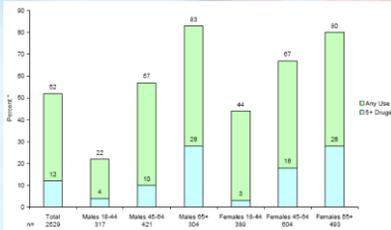


Poly-Pharmacy

- Drug Therapy in Elderly
 - Persons over the age of 65 consume^{1,7}
 - 30% of all prescription drugs
 - Average 4.5 prescriptions
 - Average nursing home resident takes 6.7 medications
 - 40% of over-the-counter drugs



Prescription Drug Use During the Preceding Week Among U.S. Adults, by Sex and Age



Available at: Boston University, Patterns of Medication Use in the United States: A report from the Stone Survey, 2006



Poly-Pharmacy

- **≥5 chronic medications^{8,9}**
- Use of >1 agent for a therapeutic endpoint
- Prescribing more medication than is clinically indicated (including dose too high)
- Medications that are incorrectly prescribed or filled
- Medications (including supplements) that interact with or duplicate the action of other medications



Poly-Pharmacy Causes

- Multiple medical conditions
- Multiple physicians
 - With no coordination of care
- Vague symptoms
- Patient factors
 - Self treatment with over-the-counter products
- Addition of medication to treat drug-related complaints



Poly-Pharmacy or Treatment?

- Diseases may require multidrug regimens
 - Examples:
 - Diabetes
 - ACE inhibitor/ARB, aspirin, statin, oral and injectable diabetes medications
 - Post-MI
 - Beta blocker, statin, aspirin, sublingual nitroglycerin, ACE inhibitor, warfarin, clopidogrel

Example credit goes to Dr Michael Ernst PharmD The University of Iowa College of Pharmacy, Geriatrics I PMID:24802001 Fall 2014



The Prescribing Cascade

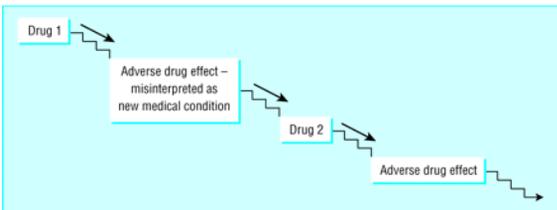


Image available: Rochon PA, Gurwitz JH. Optimising drug treatment for elderly people: the prescribing cascade. BMJ. 1997;315(7115):1096-9.



Prescribing Cascade

- Common cause of poly-pharmacy in elderly¹⁰
- Examples
 - NSAID → HTN → hydrochlorothiazide → gout → more NSAID → uncontrolled HTN → amlodipine → edema → furosemide
 - NSAID → GERD → cimetidine → delirium → haloperidol
- New symptoms or conditions should be considered an effect from a current medication first.



Medication Non-Adherence

- 21-55% of older patients are non-adherent with drug therapy¹¹
- Intentional vs. unintentional
- Risk factors
 - Complicated drug regimens
 - Number of pills/daily doses
 - 4+ meds or 12+ doses per day may decrease adherence by 50%
 - Side effects/sensitivity to drugs



Age effects on medication



Geriatric Medicine 101

- Start low and go slow
- Stop medications without known benefit
- Know your “Beers”; know when to START and when to STOPP
- Stop any drug without an indication
- Any new symptom should be considered drug-related until proven otherwise
- Avoid “a pill for every ill”



Appropriateness of Medication

- Consider
 - Life expectancy
 - Time until benefit
 - Goals of care
 - Treatment targets
 - Risks
 - Patient preferences
- Medications do have therapeutic endpoints



How Pharmacists Help Decrease Medication Related Fall Risk^{1,11}

- Strong patient-pharmacist relationships
 - Monitor how patients medications are working
 - Monitor for possible side effects
 - Teach patients about their medications
 - Address patients questions and concerns about medications
 - Avoid patients going to multiple pharmacies
- Pharmacist Services
 - CMR: a comprehensive evaluation of all medications both before and especially after each fall which allows for assessment and recommendation for changes in patients’ drug regimen
 - Transition of Care



Pamela Wong
 Director of Clinical Services
 (319)594-6082
 pwong@nucara.com

Justin Rash
 VP of Clinical Services
 515-986-3054
 jrash@martinhealthservices.com

Marshall Johnson
 Student Coordinator of Clinical Services
 marshall-johnson@uiowa.edu



References

1. Cooper JM, Burfield AH. Medication interventions for fall prevention in the older adult. *J Am Pharm Assoc* (2003). 2009;49(3):e70-82.
2. Available at: http://www.cms.gov/mmrr/Downloads/MMRR2012_002_02_A01. Accessed July 1, 2015.
3. Leipzig RM, Cumming RG, Tinetti ME. Drugs and falls in older people: a systematic review and meta-analysis: II. Cardiac and analgesic drugs. *J Am Geriatr Soc*. 1999;47(1):40-50.
4. Leipzig RM, Cumming RG, Tinetti ME. Drugs and falls in older people: a systematic review and meta-analysis: I. Psychotropic drugs. *J Am Geriatr Soc*. 1999;47(1):30-9.
5. Tinetti ME, Doucette J, Claus E, Marottoli R. Risk factors for serious injury during falls by older persons in the community. *J Am Geriatr Soc*. 1995;43(11):1214-21.
6. Woolcott JC, Richardson KJ, Wiens MO, et al. Meta-analysis of the impact of 9 medication classes on falls in elderly persons. *Arch Intern Med*. 2009;169(21):1952-60.
7. *Am Fam Physician*. 2002;66:1917-24.
8. *Am J Geriatr Pharmacother*. 2007; 5:345-51.
9. *Drugs Aging*. 2003; 20:817-32.
10. *Am Fam Physician* 2007; 75:231-40
11. http://www.pharmacy.umn.edu/innovations/prod/groups/cop/@pub/@cop/@innov/documents/article/cop_article_471797. Accessed June 6, 2015.