Deprescribing: An Antidote to Polypharmacy in Older Adults

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Objectives

- Following this presentation, participants will identify one alteration in pharmacodynamics and/or pharmacokinetics in older adults that contributes to adverse drug reactions.
- Participants will be able to define polypharmacy and list one way that it contributes to adverse drug reactions in older adults.
- Participants will be able to explain the basic concepts of safe deprescribing and apply these to examples supplied by the presenter.
Keys to Understanding Older Adults

- Heterogeneity—older adults are the most heterogeneous population group
- Know general principles of aging physiology versus pathophysiology
- Significance of lab values and changes with aging
- Need to individualize treatment
- For any new symptom, consider ADR (adverse drug reaction) in differential
Key Issues with Physiological Changes

- Interrelationship of all systems increases vulnerability to illness and to drug interactions.
- Reduced physiological reserve of most body systems, particularly cardiac, respiratory, and renal.
- Reduced homeostatic mechanisms → failure to adjust regulatory systems such as temperature control and fluid and electrolyte balance.
- Impaired immunological function → increased infection, increase in autoimmune diseases.
Drug Use in Older Adults

- Comprise 13% of the population in the U.S.
- Consume 34% of all Rx drugs
  - 91% regularly use at least one Rx med (F>M)
  - 29% regularly use 5 or more Rx meds
- Big consumers of OTC, dietary supplements, and Rx drugs (GNC loves older adults!!)
- Consume 40% of all OTC medications
  - 52 % currently use dietary supplements and Rx drugs (F>M)
  - 46% currently use OTC and Rx medications (M>F)
- Vulnerable to ADE (adverse drug events) and drug interactions
Most common health conditions and most commonly used prescription drugs

- 1. HCTZ
- 2. Atorvastatin
- 3. Levothyroxine
- 4. Lisinopril
- 5. Metoprolol
- 6. Simvastatin
- 7. Atenolol
- 8. Amlodipine
- 9. Metformin
- 10. Furosemide
- 11. Ezetimibe
- 12. Valsartan
- 13. Alendronate
- 14. Warfarin

- 1. Cardiovascular disease
- 2. Arthritis
- 3. Diabetes
- 4. Thyroid problems
- 5. Ulcers
- 6. COPD or emphysema
- 7. Asthma

Majority (70%) have 1-4 comorbidities

Source: Qato, JAMA 2008
What are Pharmacokinetics and Pharmacodynamics?

"Quick and Dirty"

- Pharmacokinetics—what the body does with the drug
  - Absorption
  - Distribution
  - Metabolism
  - Elimination

- Pharmacodynamics—what the drug does to the body
Altered Pharmacokinetics

Age-related changes in physiology and organ function result in altered pharmacokinetics: Absorption, Distribution, Metabolism (Biotransformation), Elimination

- **Absorption**: Primarily unchanged
- Little clinical significance for commonly used drugs
- Iron, calcium, zinc chelate with quinolones, levothyroxine and L-dopa, decreasing absorption

Gastric motility is decreased; gastric pH is increased BUT . . .

Add a PPI—what happens? Antisecretory drug -> reduced absorption ofazole antifungals, cephalosporin; increased absorption of digoxin and nifedipine, increased bioavailability of alendronate.
Altered Pharmacokinetics

- **Volume of Distribution (Vd):**
  - Decreased Vd (volume of distribution) for water soluble drugs, increased drug plasma concentration (e.g., digoxin)—decreased body water in older adults
  - Increased Vd for fat soluble drugs, increases half life (e.g., diazepam)
  - Decreased protein binding, increased bioavailability (e.g., warfarin, phenytoin, aspirin, digoxin)
  - Body fat increases, lean muscle mass and body water decrease (serum creatinine is unreliable)
Altered Pharmacokinetics

- **Metabolism (Biotransformation):**
- Metabolic clearance by the liver may be reduced (CYP-450 enzyme activity is unpredictable)
- Drugs with a high rate of extraction by the liver may have increased bioavailability (e.g., warfarin, tricyclic antidepressants, propranolol)

Liver shrinks in size, hepatic blood flow decreases by ~40%, decrease in Phase 1 CYP-450 action
Altered Pharmacokinetics

- **Elimination:**
  - Decreased renal function (40-50%) may lead to higher serum drug levels and longer drug half-life
  - Reduced renal clearance of active metabolites may enhance therapeutic effect or risk of toxicity (e.g., digoxin, lithium, aminoglycosides, vancomycin)

  Decrease in renal mass, formation of cysts, decreased blood flow, GFR and tubular function.

- Serum creatinine not a reliable predictor of renal function in older adults due to decreased muscle mass
Pharmacodynamic Alterations

- Age-related changes resulting in sensitivity to certain classes of drugs place the elderly at risk for adverse drug reactions
- **CNS depressants** (e.g., benzodiazepines) resulting in delirium, confusion, agitation and sedation
- **Anticoagulants** and hemorrhage (e.g., in combination with NSAIDs, salicylates)
- **Alpha-blockers and various antihypertensive medications** resulting in orthostatic hypotension
- **Anticholinergic medications** resulting in dry mouth, constipation, urinary retention, blurred vision, confusion
What is Polypharmacy?

- Poly=many; Pharmacy refers to drugs
- No real consensus definition? >5 drugs
- Can include potentially inappropriate medications (PIMS)
  - Underprescribing
  - Overprescribing
  - Misprescribing

- Strong association between polypharmacy and adverse drug reactions, increased morbidity and mortality in older adults
Is Polypharmacy Always A Problem?
What are some Factors Contributing to Polypharmacy in Older Adults?

- Multiple chronic health conditions
- Addition of an acute health problem on pre-existing chronic condition
- Confusion in following clinical guidelines
- Patient is seeing several specialty providers, lack of coordination of care
- Undisclosed use of OTC preparations, herbals, dietary supplements
What are some Factors Contributing to Polypharmacy in Older Adults?

- Patient does not understand what medications are for, may be taking them incorrectly
- Failure to reconcile medications after a hospitalization (sent home or back to nursing home without explicit instructions or “resume previous medication”)—handoffs/transition
- Patient is unable to afford medications, so does not fill prescriptions
- Sharing of medications—”this really helped me, why don’t you try it”
- Direct to consumer advertising (in countries where permitted)
Other Considerations Related to Polypharmacy

- Prescribing Cascade—ADR from one drug goes unrecognized and an additional drug is prescribed
- Drug-Drug interaction
- Dose related problem
- Renal dosing
- PIMS:
  - Anticholinergics
  - Atypical Antipsychotics
  - Benzodiazepines
  - Digoxin
  - Warfarin (not inappropriate but multiple drug-drug interactions)
Characteristics of the Optimal Medication Prescription

- Maximum Efficacy
- Safety
- Evidence-based
- Cost-effective
- Minimal side-effects
- Easy to self-administer
- Respects patient preferences
Resources for Evaluating Drug Regime

- BEERS list
- STOPP/START
- FORTA
- See Kauffman reference on systematic review of current tools to assess inappropriate prescribing
- Collaboration with clinical pharmacist
- Clinical Guidelines
- *American Geriatrics Society Guiding Principles for the Care of Older Adults with Multimorbidity*
Deprescribing—an Antidote to Polypharmacy

- Deprescribing—the systematic and deliberate discontinuation of drugs in conjunction with the patient/family and utilizing evidence-based resources.
- Originated in Europe, recent press in the US (JAMDA newsletter).
- Several small studies trialing different methods—single drug or multiple drugs
- Some using the Good Palliative-Geriatric Algorithm (Garfinkel, 2010).
- Pharmacist and physician community primarily involved; goal is to engage primary care providers to participate.
- Subscribes to need for continuous and ongoing re-evaluation of older adult, changes in condition and goals for care, risk-benefit of drug—e.g. high dose statin in 90 year old patient with advanced dementia, ongoing PPI
Deprescribing—an Antidote to Polypharmacy

- Safeguards include consent/buy in from patient/family; need to carefully focus on scientific basis, e.g. Less is More, new events masquerading as another illness but really an adverse drug reaction
- Families/patient may be resistant, feel that they are being abandoned
- Instructions in s/s of any adverse events due to discontinuation—e.g shortness of breath, chest pain
- Regular monitoring of patient during chronic management visits (3 months initially)
- Restart medication if adverse event detected
- In some cases, dose reduction rather than discontinuation is the goal
Cases from Practice
Advanced Practice Nursing Interventions to Decrease Polypharmacy

- Parsimonious prescribing—for every drug, consider the risks and benefits, necessity. Keep it simple; less is more.
- Consider the patient who will be taking the drug
- Look at the broader picture—what alternatives are available in lieu of pharmacotherapy
- *If you are not the prescriber, don’t hesitate to question or initiate a change (clinical inertia, tend to add on but not discontinue existing)*
- Communicate: patient/family, other providers
- Educate or delegate (home health nurse)
Advanced Practice Nursing Interventions to Decrease Polypharmacy

- Review meds at every visit; periodic “brown bag” session
- Discuss with patient/family: risk/benefit
- Age of patient/life expectancy/goals of treatment
- Alternatives to pharmaceuticals—lifestyle, holistic
- Discontinue unnecessary drugs
- Consider dose reduction


Selected References


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