Maximizing Medication Safety

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Adverse Drug Events (ADE's)

RISK FACTORS FOR Adverse Drug Events (ADEs)

- 6 or more concurrent chronic conditions
- 12 or more doses of drugs/day
- **9 or more medications**
- Prior adverse drug reaction
- Low body weight or low BMI
- Age 85 or older
- Estimated CrCl < 50 mL/min

Consult Pharm 1997;12:1103-11

Common Drug-Drug Interactions

Combination	Risk
ACE inhibitor + potassium	Hyperkalemia
ACE inhibitor + K sparing diuretic	Hyperkalemia, hypotension
Digoxin + antiarrhythmic	Bradycardia, arrhythmia
Digoxin + diuretic Antiarrhythmic + diuretic	Electrolyte imbalance; arrhythmia
Diuretic + diuretic e.g. lasix + HCTZ	Electrolyte imbalance; dehydration
Benzodiazepine + antidepressant Benzodiazepine + antipsychotic	Sedation; confusion; falls
CCB/nitrate/vasodilator/diuretic	Hypotension

Doucet J, Chassagne P, Trivalle C, et al. Drug-drug interactions related to hospital admissions in older adults: a prospective study of 1000 patients. J Am Geriatr Soc 1996;44(9):944-948.

Common ADEs

NSAIDs: GI Bleeds, kidney damage

Antihypertensives: hypotension

Diabetes medications: hypoglycemia, lactic acidosis

Opioids: confusion, constipation, urine retention

Warfarin: bleeding with supra-therapeutic INR

Polypharmacy

What is Polypharmacy?

The use of medications that are neither indicated nor necessary.

Patient A: 80 yo male on 10 appropriate medications vs.

Patient B: 80 yo male on 6 inappropriate medications

Why is Polypharmacy Bad?

- Drug Related Problems
- Drug-Drug Interactions
- Drug-Disease Interactions
- Adverse Drug Reactions

Risk increases proportionally with the number of medications

Why is Polypharmacy Bad?

- Elderly have higher susceptibility to side effects and develop toxicity to certain drugs more easily than young people

  - Pharmacodynamics(effect of drugs on the body)
  - Pharmacokinetics(absorption & distribution)

Why is Polypharmacy Bad?

- Adverse drug events or reactions (preventable & unavoidable drug-related events that lead to potentially negative outcomes)
  - 1-3 meds: 6% risk of adverse drug reactions
  - 7 meds: 52% risk of adverse drug reactions
  - 34% of the prescriptions are unnecessary
  - An estimated 106,000 fatal adverse drug reactions occur every year

Farrell VM et al. Am J Health Syst Pharm 2003; 60:1830, 1834-5 & Williams ME et al. JAGS 2004; 52: 93-8

Why is Polypharmacy Bad?

Potentially Inappropriate Medications (PIM)

- Higher number of medications associated with higher likelihood of having a potentially inappropriate medication
- PIM's have been associated with increased risk of hospitalization or death

Potentially Inappropriate Medications

Potentially Inappropriate Medications

- Updated Beers Criteria
- Screening Tool of Older Persons' potentially inappropriate Prescriptions (STOPP)
- Improving Prescribing in the Elderly Tool (IPET)
- Assessing Care of Vulnerable Elders-3 Quality Indicators (ACOVE 3)
- CMS

Table 2. 2015 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medication Use in Older Adults

Organ System, Therapeutic Category, Drugs	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
1 st generation antihistamines Brompheniramine Carbinoxamine Chlorpheniramine Clemastine Cyproheptadine Dexbrompheniramine Dimenhydrinate Diphenhydramine (oral)	Highly anticholinergic; clearance reduced with advanced age, and tolerance develops when used as hypnotic; risk of confusion, dry mouth, constipation, and other anticholinergic effects or toxicity Use of diphenhydramine in situations such as acute treatment of severe allergic reaction may be appropriate	Avoid	Moderate	Strong

Table 3. 2015 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medication Use in Older Adults Due to Drug–Disease or Drug–Syndrome Interactions That May Exacerbate the Disease or Syndrome

Disease or Syndrome	Drug(s)	Rationale	Recommendation	Quality of Evidence	Strength of Recommend-ation
Heart failure	NSAIDs and COX-2 inhibitors Nondihydropyridine CCBs (diltiazem, verapamil)—avoid only for heart failure with reduced ejection fraction	Potential to promote fluid retention and exacerbate heart failure	Avoid	NSAIDs: moderate CCBs: moderate	Strong

Table 4. 2015 American Geriatrics Society Beers Criteria for Potentially Inappropriate Medications to Be Used with Caution in Older Adults

Drugs(s)	Rationale	Recommnedation	Quality Of Evidence	Strength of Recommendation
Aspirin for primary prevention of cardiac events	Lack of evidence of benefit versus risk in adults aged ≥80	Use with caution in adults aged ≥80	Low	Strong
Dabigatran	Increased risk of gastrointestinal bleeding compared with warfarin and reported rates with other target-specific oral anticoagulants in adults aged ≥75; lack of evidence of efficacy and safety in individuals with CrCl <30 mL/min	Use with caution in in adults aged ≥75 and in patients with CrCl <30 mL/min	Moderate	Strong

Principle 1: "Less is More" (Keep the Medication List Short)

- Question the need for new medications
- Prioritize treatments
- Weigh potential risks and potential benefits
- But, avoid undertreating older patients
- Pain
- Anticoagulation for stroke prevention

Drugs Aging 2003; 20 (1): 23-57.
Lancet 2000; 355: 865–872.
Ann Intern Med 1999;131:492-501.
J Gen Intern Med 2005; 20:116–122.

Stopping Medications

- Consider interactions with other medications
- Is it helping? (Benefit)
- Is it harmful? (Risk)
- Why was it started?
- Consider underlying renal and hepatic insufficiency
  - E.g. neurontin and renal insufficiency

Don’t prescribe a new drug to treat an ADE

Establish the diagnosis

- E.g. Diphenhydramine and the decongestant precipitated urinary retention in a older male with prostatic enlargement

➢ *Urinary retention is an ADE*

✓ Stop (or reduce) the offending medications

✓ OTC cold medicine

✓ Need to ask about ALL medications

✓ Avoid prescribing new medications (terazosin)

Principle 2: Before making a new diagnosis: "Think Drugs"

- Consider ADE as etiology of new signs/symptoms
- Remember that OTC drugs, supplements, and herbals can cause ADEs
- Consider discontinuing or dose-reducing medications rather than jumping to start a new medication

Challenges & Educational Issues

The Challenge of Patient Education

Research shows that patients remember and understand less than half of what clinicians explain to them

Ley, Communicating with patients: improving communication satisfaction, and compliance 1988

Rost, Predictors of recall of medication regimens and recommendations for lifestyle change in elderly patients 1987.

Challenges of Prescribing for Older Adults

- Multiple chronic medical problems
- Multiple medications and multiple dosing
- Multiple prescribers/specialists
- More drugs are available each year
  - Prescription
  - Over the Counter
  - "Neutroceuticals"

More Challenges of Prescribing for Older Adults

FDA indications and off-label use are increasing

- Formularies change frequently
- Evidence of new drug-drug interactions and drug side effects are discovered
- Drugs change from prescription to OTC
- "Neutroceuticals" (herbal preparations, nutritional supplements) are booming

More Challenges of Prescribing for Older Adults

- Cost: are they on a fixed income?
- Sensory Impairments
  Vision, Hearing
- Physical Impairments
- Arthritis limits opening bottles
- Memory Impairments
  - Forget to take medications or take too much

References

…Updated Beers Criteria… JAGS 2015

Hanlon et al. Alternative Medications… JAGS 2015

Geriatric Review Syllabus

Department of Health/Human Services: Office of Inspector General

HEDIS

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