

Clinical Considerations

- Consider new symptom may be a side effect rather than a new diagnosis/disease
- Get an accurate list of meds—include over-the-counter drugs and nutraceuticals
- **Does benefit clearly outweigh the risk of an additional med?**
- Use non-pharmacologic means whenever possible
- **Start low go slow...** but get there
- Dose for aging physiology
 - Renal - ↓ GFR, tubular secretion, and blood flow
 - V_d changes - ↑ % body fat, ↓ lean body mass and ↓ total body water
- **Reassess constantly** and stop medications whenever possible (Set a precise target of treatment - stop/change medications if not achieved)

Consider appropriateness/interaction of the medication with:

- **Competing Risks** – life expectancy, comorbidities, prognosis
- **Occult physiologic changes** – occult disease, CRF, ↓ cognition, ↓ reserves
- **Functional Status** – ADL/IADL loss, sensory loss, disability
- **Support Systems** – living situation, caregiver burden, access to care/transportation
- **Patient-Centered Care** – preferences/expectations, treatment burden
- **Geriatric Syndromes** – falls, frailty, delirium, dizziness, incontinence

Beers Criteria (selected medicines/classes) - meds to avoid in elderly

- Psych
 - **benzodiazepines** – confusion, falls, ↑ risk of hip fracture by at least 50%
 - **amitriptyline** (TCAs) – anticholinergic, active metabolites
 - **SSRI/SNRI- SIADH**
- Pain
 - **NSAIDs** (long term) – GI, HTN, CHF, and renal side effects
 - **especially ketorolac and indomethacin**
 - **meperidine** – toxic metabolite (seizures), renal elimination
 - **muscle relaxants**—anticholinergic, falls
- GI/GU
 - **H₂ Blockers** – CNS effects including delirium
 - **oxybutynin** – anticholinergic, sedation, weakness, falls
 - **metoclopramide**— extrapyramidal effects/TD, delirium
- CV
 - **spironolactone**- (CHF or CrCl<30 ml/min max 25 mg/day) hyperkalemia
 - **digoxin**- (max 0.125 mg/day for CHF and caution with CKD) dig toxicity
- Misc
 - **nitrofurantoin**- contraindicated with CrCl<60 ml/min
 - **glyburide** – long T_{1/2}, risk hypoglycemia (avoid CrCl <50 ml/min)
 - **CaCB** – constipation, urinary retention, lower extremity edema
 - **megestrol**— increase thromboembolic events, w/ minimal effect on weight

References

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3. Updating the Beers Criteria. J Am Geriatr Soc 2012
4. A method for assessing drug therapy appropriateness (MAI). J Clin Epidemiol 1992;45:1045-1051.



Polypharmacy

UT Southwestern Medical Center

• Kathryn Eubank, MD
• Shelley Bingham PharmD
• Anita Rahman, Pharm D, BCPS

Definition

- More than 5 medications
- More medications than clinically indicated
- Inappropriate prescribing
 - **Medication Appropriateness Index (MAI)**
 - **Beers Criteria Medication List**

Important Risk Factors

- Age
- **Multiple Providers**
- **Hospitalization**
- Increase in medications moving from prescription to over-the-counter
- Increase in herbals and alternative therapies

Consequences of Polypharmacy

1. **Non-adherence** – increases directly with # of meds
2. **Adverse drug events (ADE) – # of medications/polypharmacy is the strongest and most consistent predictor of an ADE**
3. **Drug-drug interactions** –if you take 6 drugs, you have an 80% chance of AT LEAST one drug interaction
4. **Increases health care utilization and cost** – one of every 5 admissions for patients 65 and older is linked to an ADE
5. **Geriatric Syndromes** – contributes to cognitive impairment, falls, hip fractures, urinary incontinence, disability, and delirium
6. **Inappropriate prescribing** begets more inappropriate prescribing
7. **Mortality** - HR of 1.27-2.23 independent of age, comorbidities, functional status, etc.

Medication Appropriateness Index (MAI)

1. Is there an indication for the drug?
2. Is the medication effective for the condition?
3. Is the dosage correct?
4. Are the directions correct?
5. Are there clinically significant drug-drug interactions?
6. Are there clinically significant drug-disease interactions?
7. Are the directions practical?
8. Is the drug the least expensive alternative?
9. Is there unnecessary duplication with other drugs?
10. Is the duration of therapy acceptable?