Polypharmacy

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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 and/or > 5 PCP visits/year**
- **Any transitions of care (hospitalization, ED visit)**
- Health insurance coverage
- 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?

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
  - V_d changes - ↑ % body fat, ↓ lean body mass and ↓ total body water
  - Excretion- ↓ GFR, tubular secretion, and renal blood flow
  - Metabolism– ↓ hepatic blood flow and enzyme activity (CYP-450)
- **Reassess constantly** and stop medications whenever possible

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, ↑ QTc
	- SSRI/SNRI– SIADH, serotonin syndrome and withdrawal syndrome
- Pain	**- NSAIDs**– GI, HTN, CHF, and renal side effects
	- especially ketorolac and indomethacin
	- meperidine – toxic metabolite (seizures), anticholinergic, renal excretion
	- muscle relaxants–anticholinergic, falls
- GI/GU	**- H_2 Blockers** – CNS effects including delirium
	- oxybutynin – anticholinergic, sedation, weakness, falls
	- metoclopramide– extrapyramidal effects/TD, delirium
- CV	**- spironolactone–** contraindicated CrCl<30 ml/min, hyperkalemia
	- digoxin- (max 0.125 mg/day for CHF and caution with CKD) dig toxicity
- Misc	**- nitrofurantoin-** contraindicated with CrCl<30 ml/min
	- glyburide – long $T_{1/2}$, risk hypoglycemia (avoid CrCl <50 ml/min)
	- CaCB – constipation, urinary retention, LEE, relaxes LES
	- megestrol– increase thromboembolic events, w/ minimal effect on weight

References

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