Improving appropriate prescribing in older patients

Geriatric Refresher Day
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RGP REGIONAL GERIATRIC PROGRAM OF TORONTO

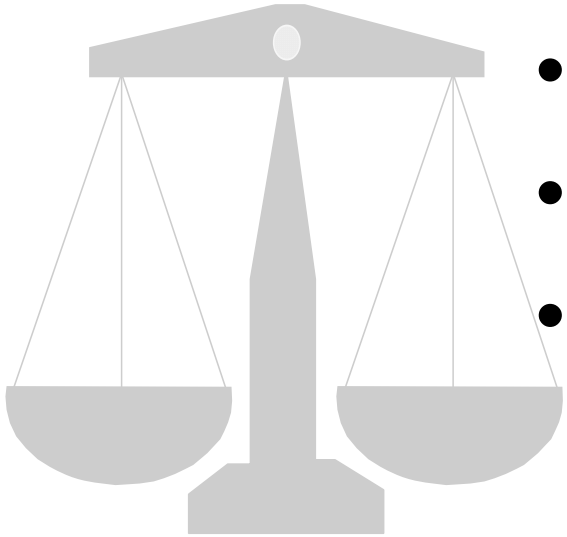
Objectives

- Identify methods to evaluate appropriateness of prescribing
- Identify strategies to address medication-related problems
- Identify opportunities for interprofessional practice to support appropriate medication use

Prescribing Balance

Risks

- adverse effects
- non adherence
- drug interactions
- Costs



Benefits

- Mortality
- Morbidity
- Functional performance
- Quality of life
- Symptom control
- Health service utilization

Prevalence (%) of potentially inappropriate medication use

	Beers	STOPP
Primary care	13-18	21
Acute	25-32	34-50
Nursing home	37	60

- Beers criteria Fick DM. Arch Intern Med. 2003; 163: 2716-2724
- Screening tool of older people's potentially inappropriate prescriptions. Gallagher PF. Clin Pharmacol Therapeutics 2011;89:845-854

Beers criteria – Inappropriateness

Fick DM. Arch Intern Med. 2003; 163: 2716-2724

- Amitriptyline (Elavil), doxepine (Sinequan)
- Long acting benzodiazepines: diazepam, flurazepam (Dalmane), chlordiazepoxide
- Short acting BZD at high doses
- Barbiturates
- Indomethacin, other NSAIDS long term, full dose
- Meperidine (Demerol), pentazocine (Talwin)
- Muscle relaxants and antispasmodics
- Anticholinergics

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STOPP Criteria RCT

(Gallagher Int J Clin Pharmacol Ther 2008)

- Screening with STOPP criteria versus usual care
- N=400 older patients acute hospital
- 71% of intervention group vs 35% had improved appropriateness of prescribing
- Number needed to screen = 2.8
- Significant difference sustained for 6 months

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Table 2 Frequency of potentially inappropriate prescriptions in the intervention group as determined by STOPP/START

STOPP criteria	*n*
Cardiovascular system	
Digoxin at a long-term dose >125µg per day with impaired renal function	3
Loop diuretic for dependent ankle edema only, i.e., no clinical signs of heart failure	8
Thiazide diuretic with a history of gout	3
Central nervous system	
Tricyclic antidepressant with an opiate or calcium channel blocker	1
Long-term, long-acting benzodiazepines	9

Gallagher PF et al. Clin Pharmacol Therapeutics 2011;89:845

Gastrointestinal system	
Prochlorperazine or metoclopramide with Parkinsonism	1
PPI for peptic ulcer disease at full therapeutic dosage for >8 weeks	34
Drugs that adversely affect those prone to falls	
Benzodiazepines	9
Neuroleptic drugs	3
Vasodilator drugs known to cause hypotension in those with persistent postural hypotension	6
Analgesic drugs	
Regular opiates for >2 weeks in those with chronic constipation without concurrent use of laxatives	4
Duplicate drug-class prescriptions	11

Gallagher PF et al. Clin Pharmacol Therapeutics 2011;89:845

STOPP criteria associated with avoidable ADE (Hamilton J et al. Arch Intern Med 2011;171:1013)

- N=600 admitted to hospital
- 610 inapprop prescriptions in 600 patients
- 329 ADE in 158 older patients
- 69% of ADE were avoidable
- Odds ratio = 1.85 (1.5 to 2.3) ADE with use of STOPP drug

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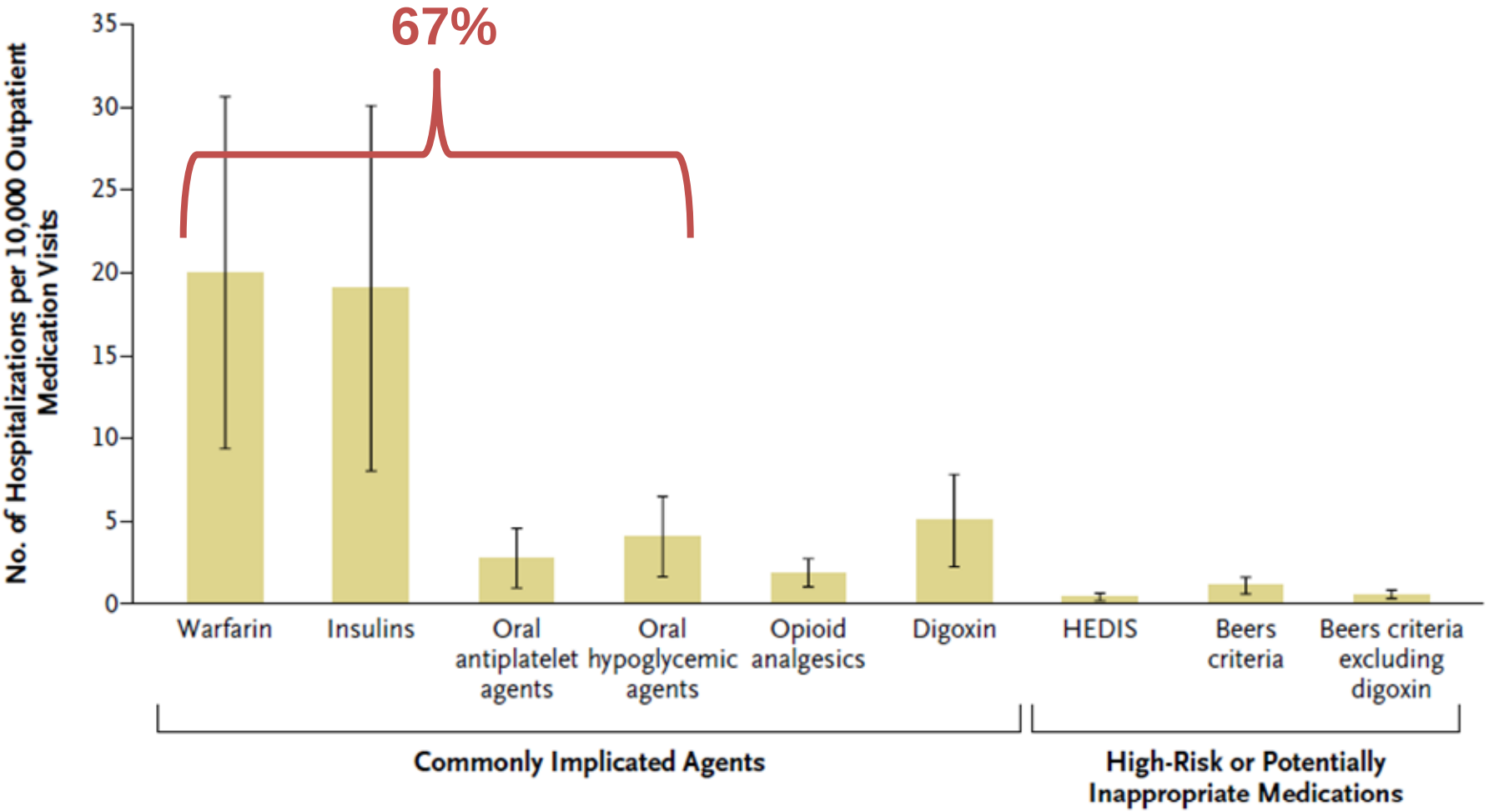
The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Emergency Hospitalizations for Adverse Drug Events in Older Americans

Daniel S. Budnitz, M.D., M.P.H., Maribeth C. Lovegrove, M.P.H.,
Nadine Shehab, Pharm.D., M.P.H., and Chesley L. Richards, M.D., M.P.H.

Emergency Hospitalizations for Adverse Drug Events in Older Americans



Budnitz DS et al. N Engl J Med 2011;365:2002-12

Medication Appropriateness Index

Hanlon et al. J Clin Epidemiol 1992;45:1045-51

- Indication?
- Is drug effective?
- Is dose correct?
- Are directions correct?
- Are directions practical?
- Drug-drug interactions?
- Drug-disease interactions?
- Is there duplication with other drugs?
- Is duration of therapy acceptable?
- Economics

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No TEARS Tool (BMJ 2004;329:434)

- **N**eed and indication
- **O**pen questions
- **T**ests and monitoring
- **E**vidence and guidelines
- **A**dverse events
- **R**isk reduction or prevention
- **S**implification and switches

Patient-related risk factors for medication-related problems

- Taking four or more medications
- Use of specific high-risk medications such as
- Recent discharge from hospital
- Poor vision, hearing, and dexterity
- Impaired cognition
- Low level of social support
- Poor health status
- Alcohol abuse

Adverse Drug Reaction - Definition

- any noxious or unintended response to a drug that occurs at doses used for prophylaxis, therapy or diagnosis
- type A - augmented but qualitatively normal response to drug
- type B - bizarre, unexpected, not related to known pharmacology of drug

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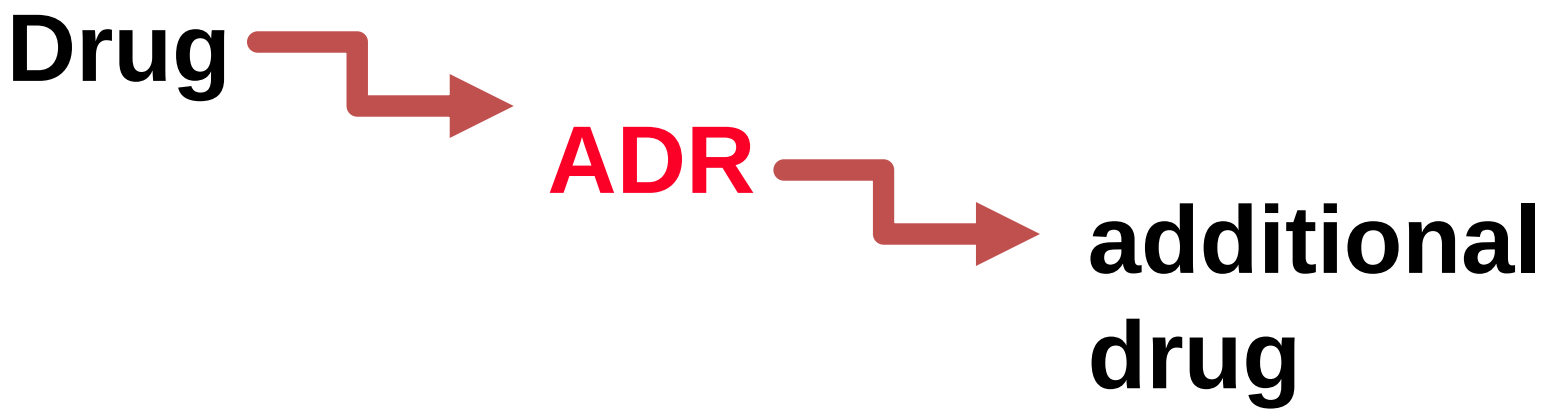
Any new symptom or exacerbation may be an adverse drug effect

- Change in mental status/confusion
- Falls
- Change in bladder function - incontinence or retention
- Change in bowel function - constipation or diarrhea
- Electrolyte abnormalities - hyponatremia, hyper- or hypokalemia

Have a high index of suspicion and ask direct questions

Drug Domino or Cascade



ADE in older persons Gurwitz JAMA 2003

- Rate of ADE was 50 per 1000 person-years
- 28% of identified ADEs were considered preventable
- Preventable ADE
  - 58% at prescribing stage
  - 61% or monitoring stage
  - 21% at patient adherence stage
- 38% of ADE were serious or life-threatening

Selected ACOVE Quality Indicators Drug Monitoring (JAGS Oct 2007)

- warfarin → check INR within 4 days of initiation and at least q 6 weeks
- diuretic → check electrolytes within 2 weeks of initiation and at least annually
- ACE inhibitor → check K and creatinine within 2 weeks of initiation
- Assess antipsychotic response within 1 month

- do not use chlorpropamide
- avoid drugs with anticholinergic potential, barbiturates, meperidine, ketoralac, ticlopidine
- Low dose iron

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Assessing for non-adherence

- Using a non-judgmental approach,
  - "I know it must be difficult to take all your medications regularly. How often do you miss taking them?"
- Medication routine
- Method of administration
- Frequency of prescription refills
- Pill counts

Barriers to adherence	Potential solutions
Forgetting to take; limited organizational skills	
Patient beliefs	
Difficulty with administration	
Cost	

Steinman MA. JAMA 2010;304:1592-1601

Barriers to adherence	Potential solutions
	Simplify regimen, reduce pill burden
Forgetting to take; limited organizational skills	Pill organizers, calendars, blister packaging, electronic dispensing devices; family, caregiver involvement
Patient beliefs	Collaborative partnership – identify goals of care Education – interprofessional practice Reassess indication and effectiveness
Difficulty with administration	Change formulation, pill cutter, packaging
Cost	

↑11 %

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Steinman MA. JAMA 2010;304:1592-1601

Screen older patients for additional risk factors for non adherence such as:

- cognitive impairment
- decreased visual acuity
- impaired manual dexterity
- psychosocial risk factors such as depression, decreased expectations of health status

Top 10 dangerous drug interactions in LTC

- Warfarin +
  - NSAIDS, sulfonamides, macrolide antibiotics, quinolone antibiotics, phenytoin
- ACE inhibitor +
  - potassium supplements, spironolactone
- Digoxin +
  - amiodarone, verapamil
- Theophylline +
  - quinolone antibiotics

- American Society of Consultant Pharmacists. http://www.scoup.net/M3Project/topten/

Other drug interactions

- Atorvastatin and macrolides
- Levothyroxine and divalent cations
- Quinolones and divalent cations
- PPI and calcium, B12, iron absorption
- Codeine and CYP2D6 inhibitors

Perform medication review at least annually

- Explain the purpose of the medication review to the patient.
- Ask the patient to bring in all medications including prescription, over-the-counter drugs, and dietary supplements.
- Apply medication appropriateness criteria
  - Explicit - e.g. STOPP
  - Implicit - assess the appropriateness of each medication given the patient context
  - Cross match: conditions - medications - potential problems

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Provide patient / caregiver with education

- purpose of drug
- how to take it
- expected side effects
- important adverse reactions
- up to date medication list

Under prescribing in older patients

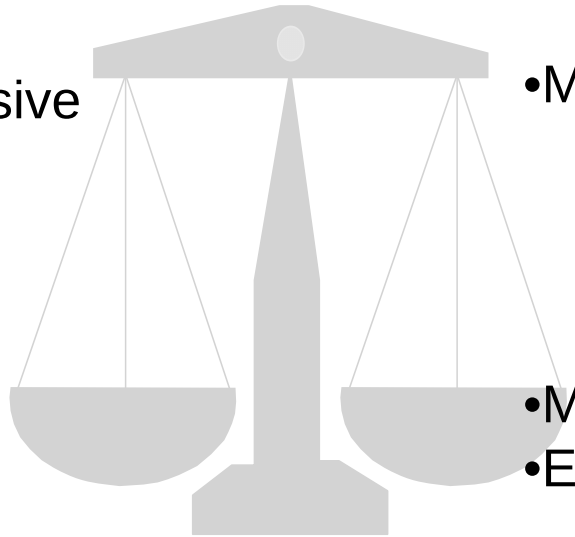
START criteria	*n*
Cardiovascular system	
Warfarin with chronic atrial fibrillation	11
Statin therapy with history of coronary, cerebral, or peripheral vascular disease without contraindication	19
ACE inhibitor with chronic heart failure	6
ACE inhibitor following acute myocardial infarction	2
β-Blocker with chronic stable angina	2
Respiratory system	
Regular inhaled β-2 agonist or anticholinergic agent for mild to moderate asthma or COPD	5
Musculoskeletal system	
Bisphosphonates in patients taking maintenance oral corticosteroid therapy	2
Calcium and vitamin D supplement in patients with known osteoporosis	10
Endocrine system	
Statin therapy in patients with diabetes mellitus and one or more major cardiovascular risk factors	8

Gallagher PF et al. Clin Pharmacol Therapeutics 2011;89:845

Spectrum of Drug Prescribing

Under-treatment ⟵ **Optimal Therapeutics** ⟶ **Polypharmacy**

- Comprehensive assessment
- Accurate Dx
- EBM



- Medication review
  - EBM
  - Adverse drug effects
  - Adherence
  - Interactions
- Monitoring
- Education

Individualized Risk vs. Benefit
Role of the interprofessional team

Resources

- www.rxfiles.ca
- Medical Letter
- Therapeutics Initiative, evidence based drug therapy, www.ti.ubc.ca
- www.drug-interactions.com
- http://medicine.iupui.edu/flockhart/ Drug interactions with searchable P450 interaction table
- http://www.arizonacert.org/medical-pros/drug-lists/drug-lists.htm List of drugs which prolong QT

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