



Beer's criteria:
Polypharmacy and
inappropriate drug use
in elderly

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Content

- Polypharmacy
- Inappropriate drug use
- Beer's Criteria
- Preventing polypharmacy



Polypharmacy

- The DEFINITION of Polypharmacy
 - Concomittant use of multiple drugs, done by simply drug counting
 - Administration of more medications than is clinically-indicated
- The SCALE of Polypharmacy
 - 34% of all drugs prescribed in the United States are considered unnecessary

References:

- Stewarb RB. Polypharmacy in elderly: a fair accompli? DICP 1990; 24; 321-323.
- Montamat SC, Cusack B. Overcome the problems with polypharmacy and drug misuse. Clin Geriatr Med 1992; 8: 143-158.
- LeSage J. Polypharmacy in the geriatric patient. Nurs Clin North Am 1991; 26: 273-287.



Polypharmacy

- The ADVERSE IMPACTS of Polypharmacy
 - ↑ adverse drug reactions
 - ↑ drug-drug interactions
 - ↑ medication errors made up of non-compliance
 - Link to 5% of hospital admission
 - Prybys et al. reported an annual cost of \$76.6 billion resulting from polypharmacy

References:

- AACN Clinical Issues. Volume 8, number 4, pp. 627-634.
- J Chronic Disease 1975; 28(1): 7-21.
- Br J Clin Pharmacol 1998; 45:301-8.
- Emergency Medicine Reports, 23(11), 145-153.



Polypharmacy

- ELDERLY is vulnerable to Polypharmacy
 - US: ~40% of pt > 65 yr
 - UK: >10% of community-dwelling people aged 65 years
- ELDERLY has poor outcome associated with polypharmacy
 - Age-related changes in PK/PE
 - Presence of comorbidities requiring pharmacologic management
 - ↑ unintentional noncompliance

References:

- Q J Med 2006; 99:797–800
- JAMA 2002; 287:337–44.
- Royal College of Physicians of London. London, Royal College of Physicians, 1997.
- AACN Clinical Issues. Volume 8, number 4, pp. 627-634.



Polypharmacy

Some Local Studies

<p>Polypharmacy, Drug Education Bulletin. Issue 11 Drug Utilization Review Committee, Hospital Authority Hong Kong 1997 Jun</p>	<ul style="list-style-type: none">• Prevalence of polypharmacy (>5 drug item) is 2.9%-28%• Most common in Medical specialty (Average 26%)
<p>Auyeung TW et al. Is polypharmacy common or avoidable in the elderly? The Hong Kong Practitioner 17(8):348-353 1995 Aug</p>	<ul style="list-style-type: none">• Showed 60% of patient is on unnecessary drugs



Inappropriate drug use

Drugs accounting most ADEs in elderly

- Analgesics
 - Opioid
 - NSAIDS
- Anticoagulants
- Antihistamines
- Anticonvulsants
- Antipsychotics
- Cardiovascular medications
- Diabetic medications
 - Insulins
 - Oral agents

JAMA 2006; 296:1858-1866

JAGS 2004;52:1349-1354

NEJM 2003;348:1556-64



Inappropriate Drug Use

- Outcomes of prescribing inappropriate medications
 - Increase hospitalisation
 - Increase healthcare expenditure
 - Increase in ADRs

References:

- Medical Care. 45(5):472-6, 2007 May
- Drugs & Aging. 22(1):69-82, 2005.
- Pharmacotherapy. 2005;25(6):831-838.



Inappropriate Drug Use

- Prevalence of prescribing inappropriate drugs in elderly:
 - 17.5%-23.5% in out-patient settings (USA)
 - Local survey in 1996 showed 7.7%

References:

- JAMA 2001; 286 (22): 2823–9.
- Washington, DC: US General Accounting Office 1995.
- Arch Intern Med 2004;164 (15): 1621–5.
- Journal of the Hong Kong Geriatric Society 7(1):28-21, 1996 Dec.



The Beers Criteria

- Consensus-based list of *potentially* inappropriate medications for older adults
- Published 1991, revised 1997, 2003
- Started as a study of medication use in nursing homes
- Widely used over past 10 years in studying:
 1. Health outcomes and cost
 2. Studying prescribing patterns
 3. Education clinicians
- Adopted originally for nursing-home regulation



Criteria for Potentially Inappropriate Medication Use in Older Adults: (2002 Beers Criteria)

- Table 1: Independent of disease or condition
 - Describes concern for prescribing certain drugs or classes of drugs for older adults
 - Gives severity rating (low or high)
- Table 2: Considering diagnosis or condition
 - Describes drugs or classes of drugs that can cause or worsen a particular disease or condition
 - Gives severity rating (high or low)



The Beers Criteria

Beer's criteria 2002 update:

48 medications or drug class to be avoided in all situations

Table 1. 2002 Criteria for Potentially Inappropriate Medication Use in Older Adults: Independent of Diagnoses or Conditions

Drug	Concern	Severity Rating (High or Low)
Propoxyphene (Darvon) and combination products (Darvon with ASA, Darvon-N, and Darvocet-N)	Offers few analgesic advantages over acetaminophen, yet has the adverse effects of other narcotic drugs.	Low
Indomethacin (Indocin and Indocin SR)	Of all available nonsteroidal anti-inflammatory drugs, this drug produces the most CNS adverse effects.	High
Pentazocine (Talwin)	Narcotic analgesic that causes more CNS adverse effects, including confusion and hallucinations, more commonly than other narcotic drugs. Additionally, it is a mixed agonist and antagonist.	High

20 medication or drug class to be avoided in specific disease

Table 2. 2002 Criteria for Potentially Inappropriate Medication Use in Older Adults: Considering Diagnoses or Conditions

Disease or Condition	Drug	Concern	Severity Rating (High or Low)
Heart failure	Diuretic (furosemide, torsemide, and high sodium content drugs (sodium and sodium salts [alginate bicarbonate, biphosphate, citrate, phosphate, salicylate, and sulfate])	Negative inotropic effect. Potential to promote fluid retention and exacerbation of heart failure.	High
Hypertension	Phenylephrine hydrochloride (removed from the market in 2001), pseudoephedrine, diet pills, and amphetamines	May produce elevation of blood pressure secondary to sympathomimetic activity.	High
Gastric or duodenal ulcers	NSAIDs and aspirin (>325 mg) (coxibs excluded)	May exacerbate existing ulcers or produce new/additional ulcers.	High



The Beers Criteria

- **Anticholinergic Medications**
 - Drug classes
 - Tricyclic antidepressants
 - Antihistamines
 - Antispasmodics and muscle relaxants
 - Adverse Effects
 - Urinary retention
 - Constipation
 - Confusion, delirium, behavior changes
 - Exacerbation of dementia



Antihypertensives

Principles:

- Select agents which act peripherally and are not highly lipophilic

Preferred:

- - ACE inhibitors, ARBs, CC blockers, atenolol

Avoid:

- Agents which act centrally or are highly lipophilic
 - Methyldopa, clonidine, propranolol
 - Short-acting nifedepine



Antianxiety/ Sedative Agents

Principles:

- Select short-acting agents, without active metabolites
- Lowest possible dose
- Shortest possible time
- Evaluate need for therapy frequently
- Preferred:
 - Lorazepam, Triazolam, Zolpidem, Zopiclone
- Avoid:
 - Diazepam, Chlordiazepoxide



Antipsychotics

Principles:

Use least sedating agents

Minimal anticholinergic effects

Preferred:

- Atypical antipsychotics
 - Risperidone, Olanzapine, Ziprasidone, Quetiapine, Aripiprazole

Avoid:

- - Chlorpromazine, perphenazine



Antidepressants

Principles:

- Use least sedating agents
- Minimal cardiotoxicity
- Minimal anticholinergic S/E

Preferred:

- SSRIs (Except Fluoxetine)
- SNRI, NRTIs or adrenergic blockers
 - Venlafaxine, Duloxetine or mirtazapine
- - Secondary amines TCAs: nortriptyline

Avoid:

- Tertiary amine TCAs: Amitriptyline, imipramine



The Beers Criteria

Most common local examples:

- Dologesics
- Antihistamines
- Methyldopa
- TCA
- Dipyridamole
- Cimetidine
- Nitrofurantoin



The Beers Criteria

- Limitations of the Beer's List
 1. Miss other drug related problems
 2. Study involved are mainly retrospective
 3. Not shown to be associated with mortality
 4. No meta-analysis demonstrating its usefulness
 5. Not intended to supersede clinical judgment and assessment



Preventing polypharmacy

Step 1- Step 5: Gathering information

- Determine all medications being used.
- Identify medications by generic name and drug class.
- Identify the clinical indication of each medication.
- Know the side effect profile of each medication.
- Identify risk factors for an adverse drug reaction.



Preventing polypharmacy

Step 6 – Step 10 (Eliminate, substitute and simplify)

- Eliminate medication with no therapeutic benefit.
- Eliminate medication with no clinical indication.
- Substitute a safer medication.
- Avoid treating an adverse drug reaction with a drug.
- Use a single drug with an infrequent dosing schedule



Preventing polypharmacy

- Pharmaceutical Care services examples:
 - Polypharmacy Clinic
 - In USA, A VA institution set up a polypharmacy clinic

- Impact of the clinic after 1 year:

- Reducing the percentage on >15 drugs from 4.4 % to 3.2%
- Decrease inappropriate drug use



Preventing polypharmacy

- Local experience
 - PWH, telephone based counselling service
 - Target Patients on >5 drugs

Impact of the service

- Reduction in all cause mortality by 41% after 2 years



Preventing polypharmacy

- Pharmacist contributions
 1. Preventing Polypharmacy through medication review
 2. Prescriber education
 3. Patient counselling



Thank You