Clinical Pharmacology & Toxicology Pearl of the Week

~ Beers Criteria: Medication Use in Older Adults ~

- ✓ Because of physiological deterioration, increasing comorbidities, polypharmacy, and other age-related factors, adults generally become more susceptible to adverse drug events with advancing age.

- ✓ *The Beers Criteria for Potentially Inappropriate Medication Use in Older Adults* ("Beers List"), are guidelines from the American Geriatric Society for healthcare professionals to help improve the safety of prescribing medications for older adults.

- ✓ The criteria are intended for use in adults 65 years and older in all ambulatory, acute, and institutionalized settings of care, except for the hospice and palliative care settings.

- ✓ These criteria include lists of medications in which the potential risks may be greater than the potential benefits for people 65 and older.

- ✓ The intention of the Beers Criteria is to improve medication selection, educate clinicians and patients, reduce adverse drug events, and serve as a tool for evaluating quality of care, cost, and patterns of drug use of older adults.

- ✓ The criteria also include drug-drug interactions to avoid and dose recommendations in older adults with poor creatinine clearance.

- ✓ Some examples of drugs that the Beers criteria group recommends to avoid in older adults include:
  - anticholinergic agents (e.g. diphenhydramine, dimenhydrinate, scopolamine, benztropine, TCAs)
  - clonidine
  - some peripheral alpha 1 blockers (e.g. prazosin, terazosin)
  - digoxin as first line treatment for atrial fibrillation
  - barbiturates
  - benzodiazepines
  - the "Z drugs" (zolpidem, zopiclone)
  - rapid acting insulin sliding scales
  - metoclopramide
  - NSAIDS (chronic use)
  - skeletal muscle relaxants (e.g. cyclobenzaprine)
  - immediate release nifidepine
  - long-acting sulfonylureas
  - proton pump inhibitors for > 8 weeks
  - antipsychotics (unless using for psychiatric illnesses such as bipolar disorder or schizophrenia or for short term antiemetic therapy)

- ✓ Limitations of the criteria include:
  - evidence for the benefits and harms of medications in older adults is often limited, so decisions on the composition of the criteria were often made in context of best-available evidence
  - cannot account for the complexity of all individuals and patient subpopulations, and thus should not be taken as "the final word" as to whether a specific drug is appropriate or inappropriate for an individual patient
  - do not apply to patients at the end of life or receiving palliative care, when risk-benefit considerations of drug therapy can be different

Two examples of tables within the 2019 Beers Criteria update include:

Table 7. Drugs With Strong Anticholinergic Properties

Antiarrhythmic	Promethazine
Disopyramide	Pyrilamine
	Triprolidine
Antidepressants	
Amitriptyline	
Amoxapine	
Clomipramine	Antimuscarinics
Desipramine	(urinary incontinence)
Doxepin (>6 mg)	Darifenacin
Imipramine	Fesoterodine
Nortriptyline	Flavoxate
Paroxetine	Oxybutynin
Protriptyline	Solifenacin
Trimipramine	Tolterodine
	Trospium
Antiemetics	
Prochlorperazine	Antiparkinsonian agents
Promethazine	Benztropine
	Trihexyphenidyl
Antihistamines (first generation)	
Brompheniramine	Antipsychotics
Carbinoxamine	Chlorpromazine
Chlorpheniramine	Clozapine
Clemastine	Loxapine
Cyproheptadine	Olanzapine
Dexbrompheniramine	Perphenazine
Dexchlorpheniramine	Thioridazine
Dimenhydrinate	Trifluoperazine
Diphenhydramine (oral)	
Doxylamine	Antispasmodics
Hydroxyzine	Atropine (excludes ophthalmic)
Meclizine	Belladonna alkaloids
Clidinium-chlordiazepoxide	Scopolamine (excludes ophthalmic)
Dicyclomine	
Homatropine (excludes ophthalmic)	Skeletal muscle relaxants
Hyoscyamine	Cyclobenzaprine
Methscopolamine	Orphenadrine
Propantheline	

Table 9. Medications/Criteria Added Since 2015 American Geriatrics Society Beers Criteria®

Medication/Criterion	Reason for Addition
Independent of Diagnosis or Condition (Table 2)	
Glimepiride	Severe, prolonged hypoglycemia in older adults
Methscopolamine	Strong anticholinergic
Pyrilamine	
Considering Disease and Syndrome Interactions (Table 3)	
History of falls or fractures	Associated with increased risk
SNRI	in older adults
Parkinson disease	Unlike most other
Pimavanserin	antipsychotics, the revised criteria consider pimavanserin acceptable for treatment of psychosis in Parkinson disease
Use With Caution (Table 4)	
Rivaroxaban	Emerging evidence of increased risk of serious bleeding compared with other anticoagulant options
Tramadol	Risk of SIADH/hyponatremia
Dextromethorphan/quinidine	Limited efficacy in treating patients with dementia symptoms disorder in absence of pseudobulbar affect while potentially increasing risk of falls and drug-drug interactions
TMP-SMX	Increased risk of hyperkalemia in combination with ACEIs and ARBs in patients with reduced kidney function
Clinically Important Drug-Drug Interactions (Table 5)	
Opioids + benzodiazepines	Increased risk of overdose
Opioids + gabapentin/pregabalin	Increased risk of overdose
Phenytoin + TMP-SMX	Increased risk of phenytoin toxicity
Theophylline + ciprofloxacin	Increased risk of theophylline toxicity
Warfarin + ciprofloxacin	Increased risk of bleeding
Warfarin + macrolides (excluding azithromycin)	Increased risk of bleeding
Warfarin + TMP-SMX	Increased risk of bleeding
Medications That Should Be Avoided or Have Their Dosage Reduced With Decreased Kidney Function (Table 6)	
Ciprofloxacin	Increased risk of CNS effects
TMP-SMX	Increased risk of worsening of renal function and hyperkalemia

References:

American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatr Soc*:1–21, 2019.

The Calgary Clinical Pharmacology physician consultation service is available Mon-Fri, 9am-5pm. The on-call physician is listed in ROCA. Click HERE for clinical issues the CP service can assist with.

The Poison and Drug Information Service (PADIS) is available 24/7 for questions related to poisonings. Please call 1-800-332-1414, and select option 1.