Beers Criteria

Introduction

As people get older, physiological changes lead to decreased absorption, distribution, metabolism and excretion of medications. These changes raise the risk and severity of adverse drug reactions. Older people are, therefore, at greater danger of these complications.

For more than two decades, the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults[1] have been a leading source of information regarding the safety of prescribed medications in older adults. The American Geriatric Society Beers Criteria identify medications associated with risks that may be greater than their benefits for people aged 65 and older.

We at the Kuwait Clinical Pharmacy Network have a duty to ensure the safety of all medications the patient is taking especially the elderly population. We developed a local version of the Beers Criteria focusing on medications locally prescribed.

Aim of criteria

- To improve safety and efficacy of prescribing practices
- To educate clinicians and patients on proper drug usage
- To improve selection of prescription drugs by clinicians and patients

Note: Criteria should ***not*** supersede clinical judgment or individualized patient care and it should only be used as a guide in patient care.

Medication	Recommendation	Rationale ***Quality of evidence*** Strength of recommendation
Antimicrobials		
Nitrofurantoin	Avoid if CrCl < 60ml/min Avoid for long-term suppression (eGFR < 45[2])	Potential for pulmonary toxicity[3], hepatotoxicity & peripheral neuropathy esp. with long-term use ***Low***[4] Strong
Cardiovascular medications		
Peripheral alpha1 blockers Prazosin	Avoid use as antihypertensive	Risk of orthostatic hypertension[5]; not recommended as routine HTN treatment ***Moderate***[6] Strong
Central alpha agonists Clonidine Methyldopa	Avoid as first line antihypertensive	High risk of CNS effects[7,8]; may cause bradycardia and orthostatic hypertension; not recommended as routine HTN treatment ***Low*** Strong
Amiodarone	Avoid as first line for AF unless patient has HF or substantial left ventricular hypertrophy	Associated with greater toxicities including thyroid disease[9], pulmonary disorders[10], QT interval prolongation than other anti-arrhythmic medications ***High*** Strong
Digoxin	Avoid as first line for AF Avoid as first line for HF	More effective alternatives exist and is associated with increased mortality[11] ***Moderate*** Strong Questionable effects on risk of hospitalization and may be associated with increased mortality in older patients with HF[12] ***Low*** Strong
Central nervous system agents		
Antidepressants Amitriptyline Paroxetine	Avoid	Highly antimuscarinics[13], sedating, and cause orthostatic hypertension[14] ***High*** strong
Anti-psychotics Quetiapine Risperidone	Avoid; except for schizophrenia, bipolar disorder, or short term use as antiemetic during chemotherapy	Increased risk of stroke[15] and greater rate of cognitive decline and mortality in people with dementia Avoid for behavioral problems of dementia/delirium unless other options failed or not possible ***and*** patient is threat to self/others ***Moderate*** strong

Barbiturates Phenobarbital	Avoid	High rates of physical dependence, tolerance to sleep benefits and overdose risk at low doses ***High*** Strong
Benzodiazepines Lorazepam Temazepam Clonazepam Diazepam	Avoid for treatment of insomnia, delirium or agitation	Older adults have increased sensitivity to benzodiazepines and slower metabolism of long-acting agents. In general all BNZ increase risk of falls, fractures, cognitive impairment and delirium[16,17,18] ***Moderate*** Strong
Antiparkinsonian agents Trihexyphenidyl (artane®)	Avoid	Not recommended for prevention of EPS with antipsychotics[19]; other agents available for PD ***Moderate*** Strong
First-generation antihistamines Diphenhydramine Chlorpheniramine	Avoid	Highly antimuscarinics[20,21], clearance reduced with advanced age, tolerance develops when used as hypnotic[22,23] ***Moderate*** Strong
Gastrointestinal agents		
Metoclopramide	Avoid	Can cause extrapyramidal side effects; risk greater in frail older adults[24] ***Moderate*** Strong
Proton pump inhibitors Omeprazole Pantoprazole Esomeprazole	Avoid scheduled use for > 8 wks. unless for high-risk patients (e.g. on steroids, chronic NSAIDs), esophagitis or need for maintenance therapy	Risk of C. Difficile infection[25] and bone loss[26] and fractures[27] ***High*** strong
Pain medications		
NSAIDs, oral, non-COX agents Ibuprofen Diclofenac Aspirin 325 mg Naproxen etc.	Avoid chronic use unless other alternatives not effective and patient on gastro protective agents (e.g. PPIs)	Risk of GI bleed and peptic ulcer increased in high-risk patients including > 75, taking steroids[28], anticoagulant or antiplatelet agents. Use of PPIs reduce but not eliminate risk ***Moderate*** Strong
Indomethacin	Avoid	Of all NSAIDs, indomethacin has most adverse effects (!)[29] ***Moderate*** Strong
Ketorolac	Avoid	GI bleeding and peptic ulcer in high risk patients ?? ??

Skeletal muscle relaxants Orphenadrine	Avoid	Most muscle relaxants poorly tolerated by older adults because some have antimuscarinic adverse effects, sedation, increased fracture risk, effectiveness of doses tolerated by elderly questionable ***Moderate*** Strong

Table (2) – drug disease or drug syndrome interactions that may exacerbate disease/syndrome

Condition/syndrome	Medications	Recommendation Rationale ***Quality of evidence*** Strength of recommendation
Cardiovascular		
HF	NSAIDs & COX-2 inhibitors Non-DHP CCBs – avoid only for HF with reduced EF TZDs	Avoid Potential to promote fluid retention and exacerbate HF For NSAIDs: ***moderate*** For CCBs: ***moderate*** For TZDs: ***high*** Strong
Syncope	Peripheral alpha-blockers Tertiary TCAs Olanzapine	Avoid Increases risk of orthostatic hypotension/bradycardia For peripheral alpha-blockers: ***high*** For TCAs: ***moderate*** For antipsychotics: ***moderate*** For TCAs: strong For peripheral alpha-blockers: weak For antipsychotics: weak
CNS		
Seizures/epilepsy	Clozapine Olanzapine Tramadol Chlorpromazine	Avoid Lower seizure threshold; may be acceptable in people with well-controlled seizures in whom alternatives are not effective ***Low*** Strong
Delirium	Antimuscarinics Antipsychotics BNZs Corticosteroids H_2 antagonists Sedative hypnotics	Avoid Potential for worsening delirium; avoid antipsychotics for behavioral problems of dementia/delirium unless non-pharmacological options have failed and patient is threating to harm self/others Antipsychotics are associated with stroke and mortality in people with dementia ***Moderate*** Strong
Dementia/cognitive impairment	Antimuscarinics BNZs H_2 antagonists Antipsychotics	Avoid Avoid because of adverse CNS effects Avoid antipsychotics for behavioral problems of dementia/delirium unless non-pharmacological options have

		failed and patient is threating to harm self/others Antipsychotics are associated with stroke and mortality in people with dementia ***Moderate*** Strong
History of falls/fractures	Anticonvulsants Antipsychotics BNZs TCAs SSRIs Opioids	Avoid unless safer alternatives are not available; avoid anticonvulsants unless for seizures and mood disorders Risk of ataxia, impaired psychomotor function, syncope, additional falls Opioids: avoid unless for pain management due to recent falls or joint replacement ***High*** For opioids: ***moderate*** Strong
Insomnia	Oral decongestants Theophylline Caffeine	Avoid CNS stimulant effects ***Moderate*** Strong
Parkinson's disease	All antipsychotics (except aripiprazole, quetiapine and clozapine) Antiemetics Metoclopramide	Avoid Dopamine antagonists potentially worsen PD symptoms ***Moderate*** Strong
Gastrointestinal		
History of gastric/duodenal ulcers	Aspirin (>325mg/day) Non-COX_2 selective NSAIDs	Avoid unless other alternatives are not effective and patient can take gastro-protective agents May exacerbate existing ulcers or cause new ones ***Moderate*** Strong
Kidney/urinary tract		
CKD stage 4 or less	NSAIDs	Avoid May increase risk of AKI and further decline in renal function ***Moderate*** Strong
Urinary incontinence in women	Estrogen oral/transdermal Peripheral alpha blockers	Avoid in women Aggravation of incontinence For estrogen: ***high*** For peripheral alpha blockers: ***moderate*** Strong
Lower urinary tract symptoms, BPH	Strong antimuscarinic	Avoid in men

	agents (except antimuscarinics for urinary incontinence)	May decrease urinary flow and cause retention ***Moderate*** Strong

Table (3) – drug-drug interactions

Drug	Interacting drug/class	Risk rationale	Recommendation ***Quality of evidence*** Strength of recommendation
ACEIs	Amiloride	Increased risk of hyperkalemia	Avoid routine use; reserve for patient with demonstrated hypokalemia while on ACEIs ***Moderate*** Strong
antimuscarinics	Antimuscarinics	Increased risk of cognitive decline	Avoid; minimize number of antimuscarinic agents ***Moderate*** Strong
Antidepressants	>2 other CNS agents	Increased risk of falls	Avoid total of >3 CNS active agents ***Moderate*** Strong
Antipsychotics	>2 other CNS agents	Increased risk of falls	Avoid total of >3 CNS active agents ***Moderate*** Strong
BNZs	>2 other CNS agents	Increased risk of falls and fractures	Avoid total of >3 CNS active agents ***High*** Strong
Corticosteroids	NSAIDs	Increased risk of peptic ulcer disease and GI bleeding	Avoid; if not possible, provide gastro protection ***Moderate*** Strong
Lithium	ACEIs	Increased risk of lithium toxicity	Avoid, monitor Li concentrations ***Moderate*** Strong
Lithium	Loop diuretics	Increased risk of lithium toxicity	Avoid, monitor Li concentrations ***Moderate*** Strong
Opioids	>2 other CNS agents	Increased risk of falls	Avoid total of >3 CNS active agents ***High*** Strong
Peripheral alpha blockers	Loop diuretics	Increased risk of urinary incontinence	Avoid in older women, unless conditions warrant both drugs ***Moderate*** Strong

Warfarin	Amiodarone	Risk of bleeding increased	Avoid when possible; monitor INR ***Moderate*** Strong
Warfarin	NSAIDs	Risk of bleeding increased	Avoid if possible; if used concomitantly, monitor for bleeding ***High*** Strong

Adopted from American Geriatric Society Beers Criteria 2015. Available at the following link:

http://onlinelibrary.wiley.com/doi/10.1111/jgs.13702/full

References

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[3] http://www.ncbi.nlm.nih.gov/pubmed/23660771

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[5] http://www.ncbi.nlm.nih.gov/pubmed/11574742

[6] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3769171/#R24

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[11] http://www.ncbi.nlm.nih.gov/pubmed/25125296

[12] http://www.ncbi.nlm.nih.gov/pubmed/25939649

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[21] http://www.ncbi.nlm.nih.gov/pubmed/21707557

[22] http://www.ncbi.nlm.nih.gov/pubmed/12352276

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[24] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3325428/

[25] http://www.ncbi.nlm.nih.gov/pubmed/16907893

[26] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2974811/

[27] http://www.ncbi.nlm.nih.gov/pubmed/24825180

[28] http://www.ncbi.nlm.nih.gov/pubmed/2012355

[29] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1855338/