

High-Risk Medications in Older Adults

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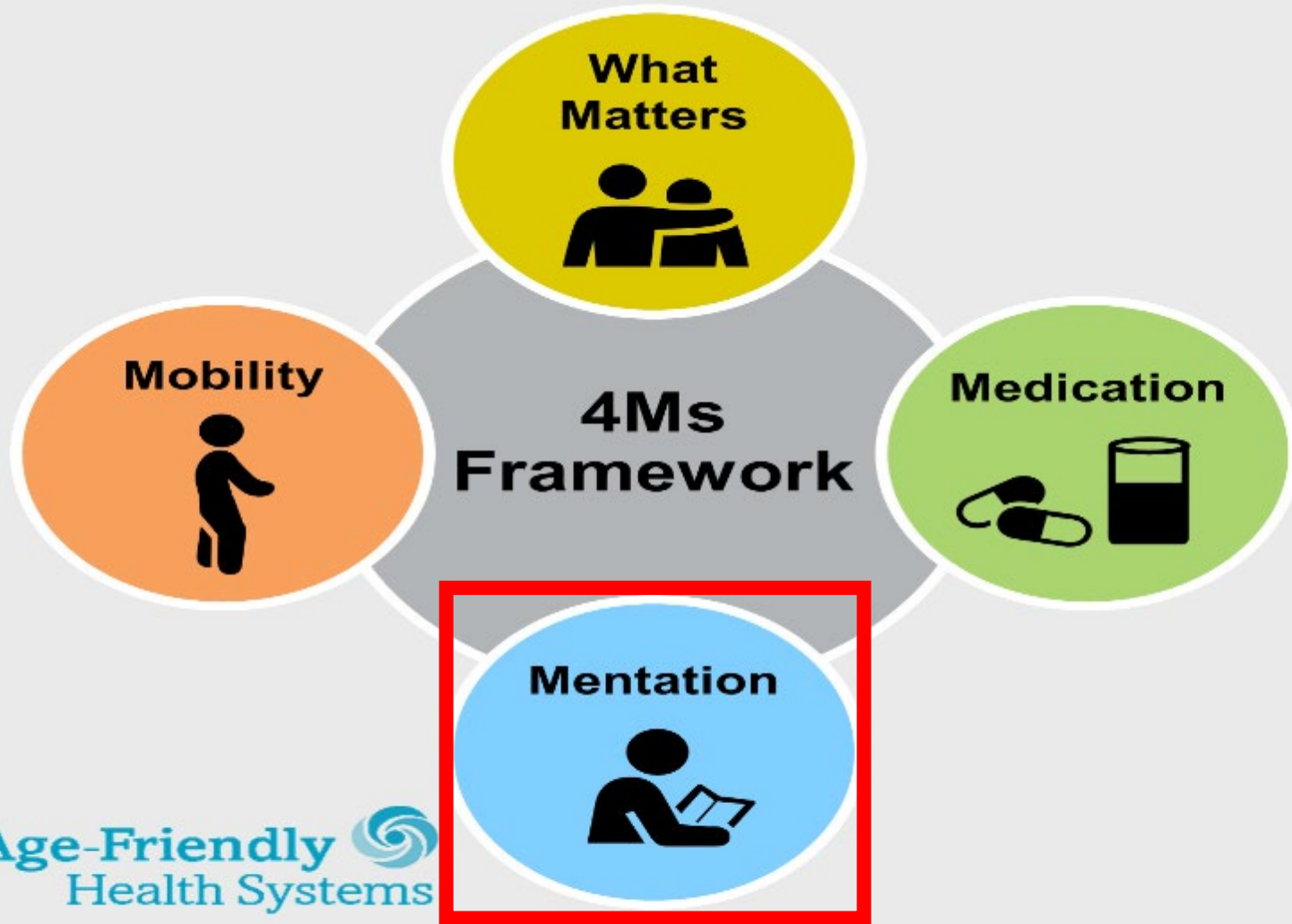
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Age-Friendly 
Health Systems

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AGS Beers Criteria for Potentially Inappropriate Meds

J Am Ger Soc 2019; 00:1-21

CLINICAL INVESTIGATION

American Geriatrics Society 2019 Updated AGS Beers Criteria[®] for Potentially Inappropriate Medication Use in Older Adults

By the 2019 American Geriatrics Society Beers Criteria[®] Update Expert Panel*

The American Geriatrics Society (AGS) Beers Criteria[®] (AGS Beers Criteria[®]) for Potentially Inappropriate Medication (PIM) Use in Older Adults are widely used by clinicians, educators, researchers, healthcare administrators, and regulators. Since 2011, the AGS has been the steward of the criteria and has produced updates on a 3-year cycle. The AGS Beers Criteria[®] is an explicit list of PIMs that are typically best avoided by older adults in most circumstances or under specific situations, such as in certain diseases or conditions. For the 2019 update, an interdisciplinary expert panel reviewed the evidence published since the last update (2015) to determine if new criteria should be added or if existing criteria should be removed or undergo changes to their recommendation, rationale, level of evidence, or strength of recommendation. *J Am Geriatr Soc* 00:1-21, 2019.

Key words: medications; drugs; older adults; Beers list; Beers Criteria

The American Geriatrics Society (AGS) Beers Criteria[®] (AGS Beers Criteria[®]) for Potentially Inappropriate Medication (PIM) Use in Older Adults are widely used by clinicians, educators, researchers, healthcare administrators, and regulators. Since 2011, the AGS has been the steward of the criteria and has produced updates on a 3-year cycle that began in 2012.¹⁻³ The AGS Beers Criteria[®] are an explicit list of PIMs that are typically best avoided by older adults in most circumstances or under specific situations, such as in certain diseases or conditions.

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See related editorial by Michael Steinman et al.
DOI: 10.1111/jgs.15767

For the 2019 update, an interdisciplinary expert panel reviewed the evidence published since the last update (2015) to determine if new criteria should be added or if existing criteria should be removed or undergo changes to their recommendation, rationale, level of evidence, or strength of recommendation. Each of the five types of criteria in the 2015 update were retained in this 2019 update: medications that are potentially inappropriate in most older adults, those that should typically be avoided in older adults with certain conditions, drugs to use with caution, drug-drug interactions, and drug dose adjustment based on kidney function.

OBJECTIVES

The specific aim was to update the 2015 AGS Beers Criteria[®] using a comprehensive, systematic review and grading of the evidence on drug-related problems and adverse events in older adults. The strategies to achieve this aim were to:

- Incorporate new evidence on PIMs included in the 2015 AGS Beers Criteria[®] and evidence regarding new criteria or modifications of existing criteria being considered for the 2019 update.
- Grade the strength and quality of each PIM statement based on the level of evidence and strength of recommendation.
- Convene an interdisciplinary panel of 13 experts in geriatric care and pharmacotherapy who would apply a modified Delphi method, informed by the systematic review and grading, to reach consensus on the 2019 update.
- Incorporate exceptions in the AGS Beers Criteria[®] that the panel deemed clinically appropriate. These exceptions would be designed to make the criteria more individualized to clinical practice and be more relevant across settings of care.

INTENT OF CRITERIA

The primary target audience for the AGS Beers Criteria[®] is practicing clinicians. 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. Consumers, researchers, pharmacy benefits managers, regulators, and policymakers also widely use the AGS Beers Criteria[®]. The intention of the AGS Beers Criteria[®] is to improve medication selection;

Mechanisms Affecting Risk of ADRs

- **Pharmacokinetic:** drugs for which distribution or elimination are slowed (e.g. drugs that are renally cleared)
- **Pharmacodynamic:** drugs that have exaggerated side effects in older adults (e.g. drugs that lower blood pressure)
- **Drug-drug interactions:** drug interactions thorough pharmacokinetic and pharmacodynamic effects (e.g. NSAIDs and gabapentin)
- **Drug-disease interactions:** drug side effects exacerbate disease symptoms (e.g. anticholinergic meds with Alzheimer's disease)
- **Risk of tolerance, dependency or abuse:** e.g. benzodiazepines, sleep medications, opioid analgesics

ED Visits for Adverse Drug Reactions 2013-2014

Shehab N et al. JAMA 2016; 316:20:2115-2125

- Rate of 4 visits/1000 persons/year
- Older adults accounted for 34.5% of ADR ED visits
- Older adults had the highest hospitalization rate (43.6%)
- Anticoagulants, diabetes meds and opioid analgesics were the most common meds implicated (59.9%)
- Beers criteria meds accounted for only 3.4% of visits

High Risk Medications in Older Adults

- Opioid analgesics
- Benzodiazepines
- Insulin
- Anticoagulants
- NSAID analgesics
- Antipsychotic mood stabilizers
- Muscle relaxers
- Anticholinergics
- PPI >8 weeks

OPIOID ANALGESICS

Definitions

- **Misuse:** taken in ways other than how prescribed, intentional or not
- **Dependency:** physiologic or psychologic withdrawal with discontinuation
- **Tolerance:** needing increased amounts to get same effect
- **Abuse:** on-going use for secondary purposes other than for which drug is intended despite negative consequences
- **Addiction:** difficulty stopping compulsive behavior despite negative consequences and preoccupation with obtaining drug
- **Opioid use disorder:** addiction, dependency and tolerance to opioids

A National Opioid Crisis Among Older Adults?

AHRQ Technical Brief from the Evidence-based Practice Center 2015

Research and media focused on younger adult crisis

In US in 2017, there were 58 prescriptions per 100 people

In adults >65, between 2010 and 2015:

opioid-related hospitalizations increased by 34%

ED visits increased by 74%

Driven by opioid misuse and high prevalence of chronic pain

Misuse: taken in ways other than how prescribed, intentional or not

Adverse effects also common at prescribed doses

Slight reduction in acute pain sensitivity but increased chronic hyperalgesia

Lower tolerance of NSAIDs (opioid alternatives)

Prescription Opioid Use in US Adults

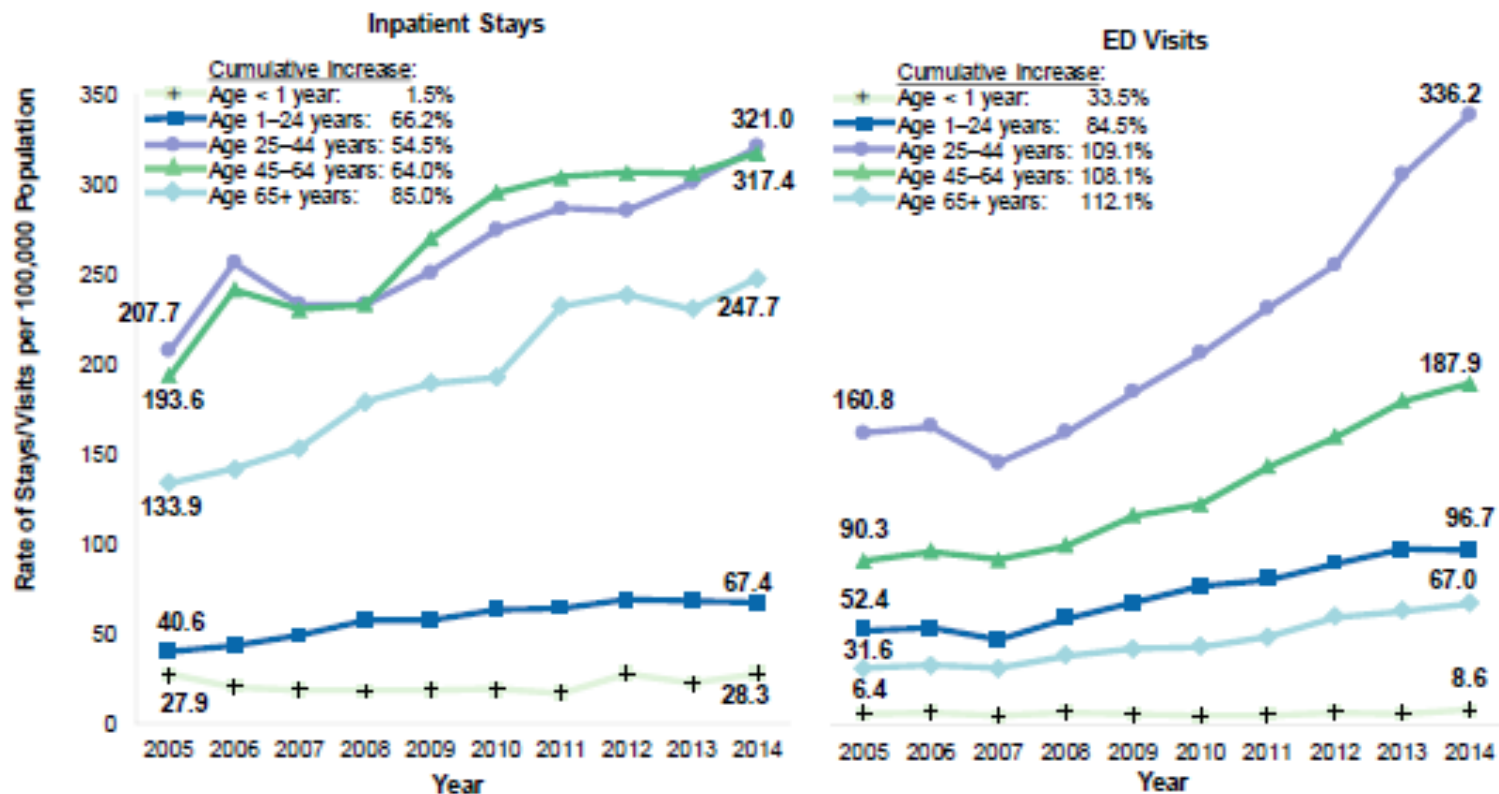
Han B et al. Ann Int Med 2017 167:5:293-301

- In 2015, 91.8 million (38%) of US civilians, noninstitutionalized, used prescription opioids
- 11.5 million (5%) misused them and 2% had OUD
 - 60% misused others' prescriptions
 - Only 1-3% of older adults misuse their prescribed opioids
 - Papaleontiou M et al. J Am Ger Soc 2010
- 63% of those reporting OUD attributed this to self-treatment of pain
- 6-9% of older adults use opioids for chronic pain
 - Greene Naples J et al. Clin Ger Med 2016; 32:4:725-735

National rate of opioid-related inpatient stays and ED visits by patient age, 2005–2014

Figure 4 presents the 10-year trends in the national rate of opioid-related inpatient stays and ED visits by patient age group, from 2005–2014.

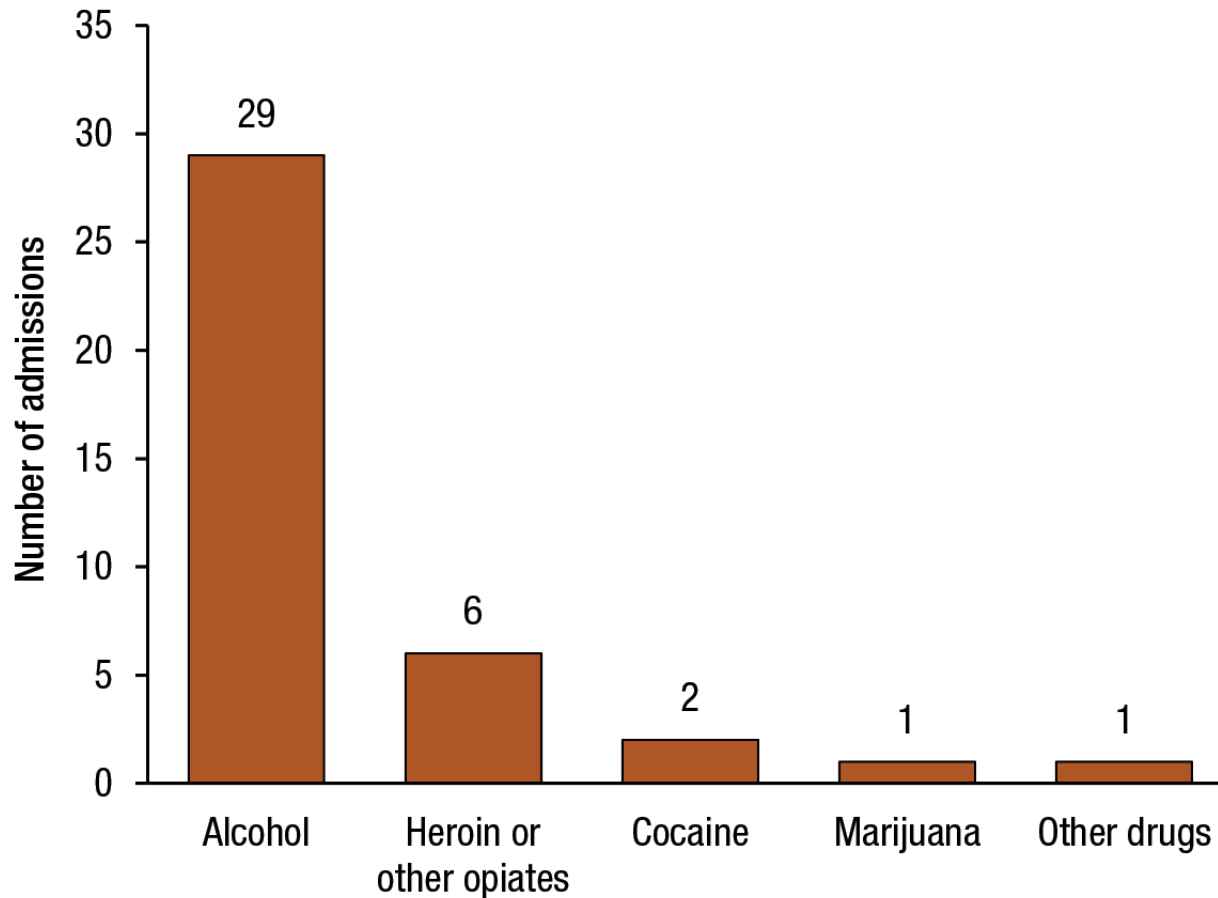
Figure 4. National rate of opioid-related inpatient stays and ED visits by patient age, 2005–2014



Abbreviation: ED, emergency department

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP National (Nationwide) Inpatient Sample (NIS) and the Nationwide Emergency Department Sample (NEDS)

Alcohol Still Accounts for More SUD Treatment



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, Treatment Episode Data Set (TEDS), 2012.

Opioid Pharmacology in Older Adults

Reviewed in Greene Naples J et al. Clin Ger Med 2016; 32:4:725-735

- **Pharmacokinetics:**

- Absorption similar (including transdermal)
- Morphine less “first pass” metabolism
- Longer T1/2 in oxycodone, buprenorphine
- Reduced efficacy of codeine, hydrocodone, tramadol (precursor drugs)
- Renal clearance for all opioid metabolites and that prolongs elimination time

- **Pharmacodynamics:**

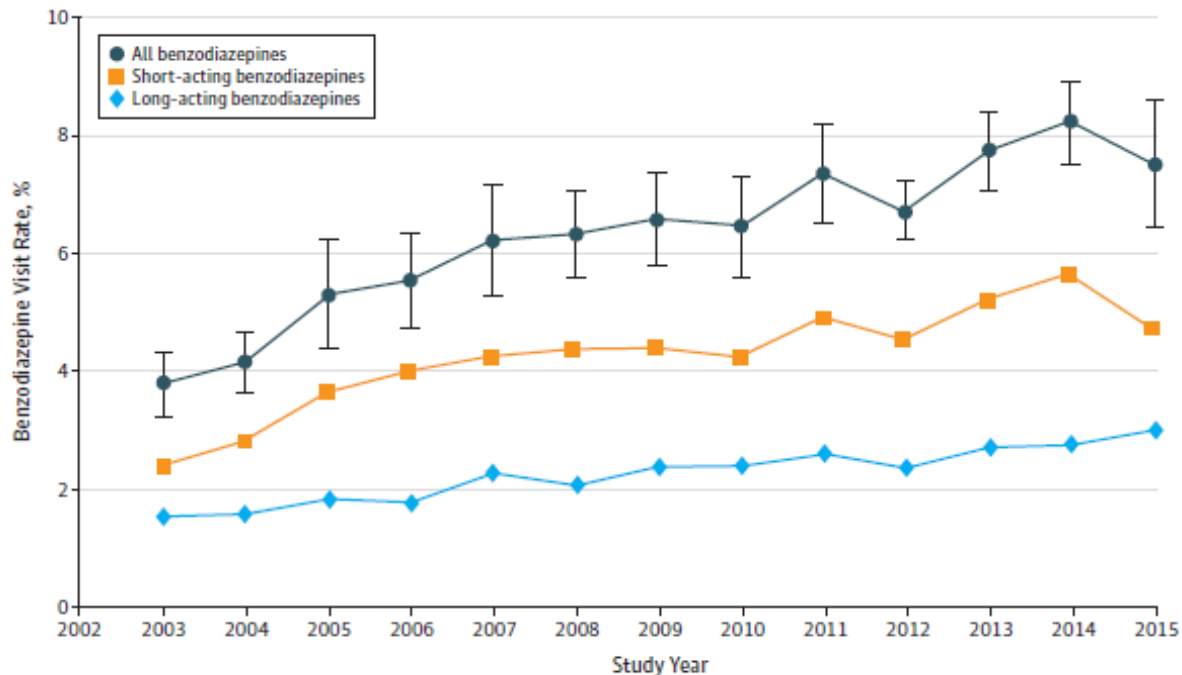
- Enhanced sensitivity (more pronounced effects, good and bad)
 - 4-5X’s higher fracture risk than older adults with NSAID use
 - Higher doses and co-administration with psychotropics associated with higher fracture risk
 - Risk of delirium with meperidine
 - Constipation most common problem

Benzodiazepines

Patterns of Outpatient Benzodiazepine Prescribing in US

Agarwal SD et al. JAMA Open 2019; 2:1:e187399

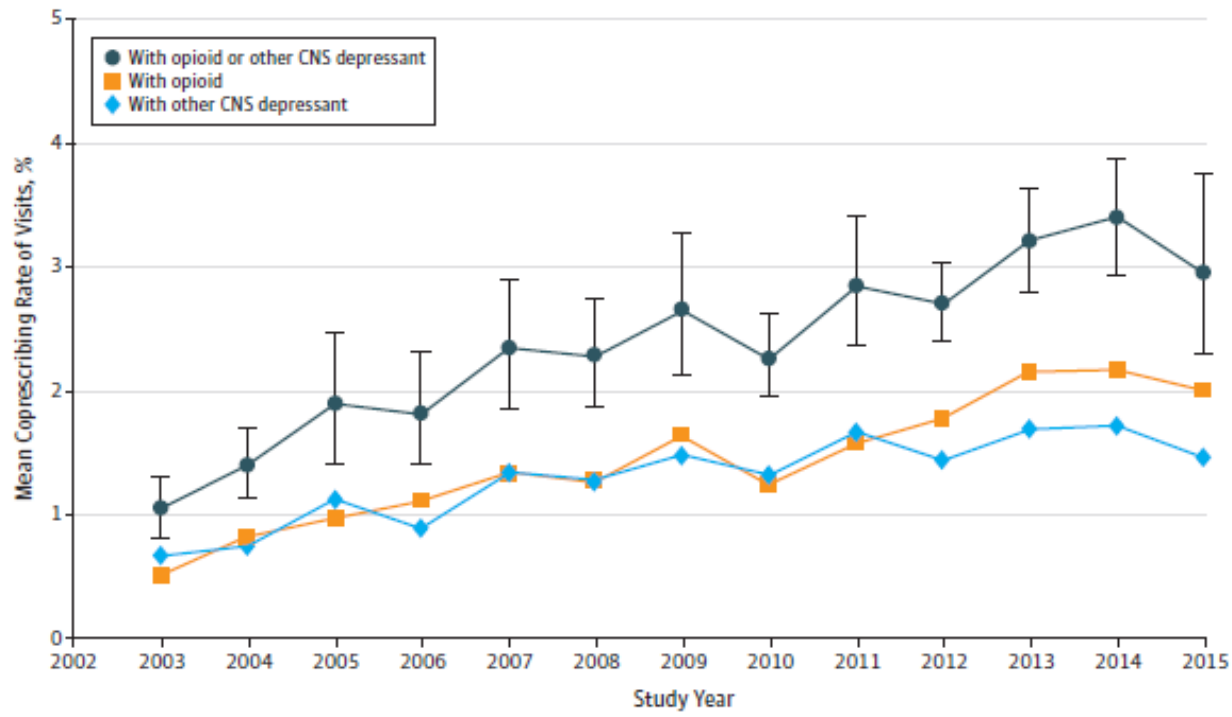
Figure 1. Benzodiazepine Visit Rate in the United States



Patterns of Outpatient Benzodiazepine Prescribing in US

Agarwal SD et al. JAMA Open 2019; 2:1:e187399

Figure 3. Coprescribing Rate for Benzodiazepines With Opioids and Other Central Nervous System (CNS) Depressants



Patterns of Outpatient Benzodiazepine Prescribing in US

Agarwal SD et al. JAMA Open 2019; 2:1:e187399

Figure 2. Benzodiazepine Visits by Specialty

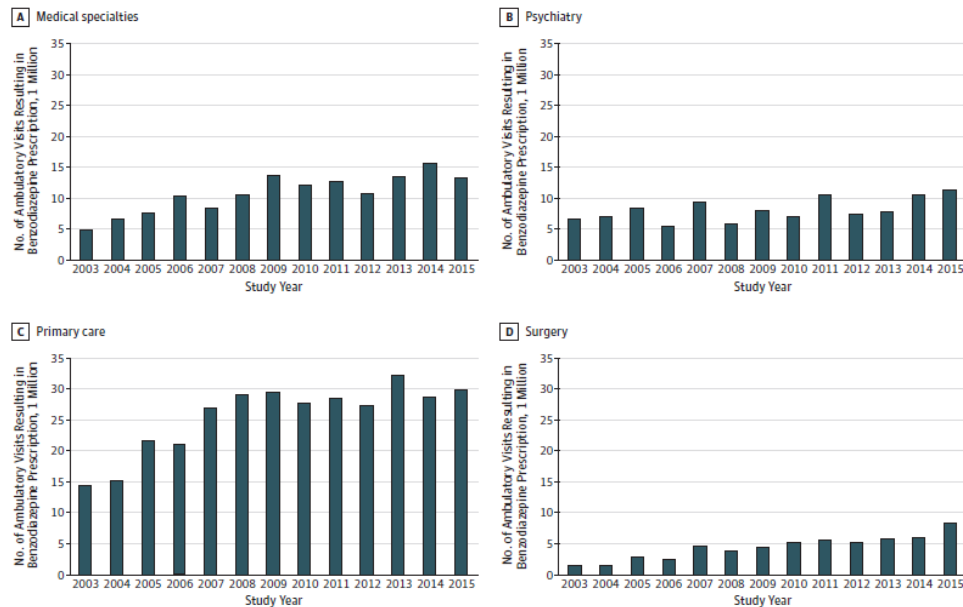


Table 2. Benzodiazepine Visit Rate by Indication

Indication ^a	Unweighted No. of Benzodiazepine Visits, 1 Million		Unadjusted Estimated Benzodiazepine Visit Rate, % (95% CI)			
	2003 (n = 919)	2015 (n = 1672)	2003	2015	P Value ^b	Adjusted OR (95% CI) ^c
Anxiety and depression	12.8	23.7	26.6 (22.6-31.0)	33.5 (28.8-38.6)	.003	1.43 (1.05-1.95)
Back and chronic pain	4.9	15.1	3.6 (2.6-4.9)	8.5 (6.0-11.9)	<.001	2.65 (1.65-4.26)
Insomnia	2.1	3.4	26.9 (19.3-36.0)	25.6 (15.3-39.6)	.72	0.94 (0.46-1.92)
Neurologic ^d	3.3	5.0	6.8 (4.8-9.5)	8.7 (6.2-12.1)	<.001	1.37 (0.85-2.22)
Other	9.1	24.5	1.8 (1.4-2.2)	4.4 (3.7-5.2)	<.001	2.50 (1.90-3.29)

Abbreviation: OR, odds ratio.

^a A visit can be ascribed to multiple diagnoses.

^b Calculated using χ^2 trend test.

^c Adjusted for age, sex, race, insurance, region, and location.

^d Includes headache, seizures, vertigo, and movement disorders.

Benzodiazepines are high risk

Sithampanathan K et al. Asian J Geron. Ger. 2012; 7:107-11

- Commonly used for anxiety and sleep (7-43%)
- Older adults have increased sensitivity and slower elimination (esp. long acting ones)
- Short and intermediate acting:
 - Alprazolam, estazolam, lorazepam, oxazepam, temazepam, triazolam
- Long acting:
 - Chlordiazepoxide, clonazepam, clorazepate, diazepam, flurazepam, quazepam
- Risks:
 - Falls, fractures, confusion, memory lapses, worsened sleep apnea, driving impairment, dependency, dementia??
 - One adverse event for every 7 older adults prescribed a BZ

BZ Use and Incident Dementia or AD

Gray SL et al. BMJ 2016; 352:i190

Table 5 | Association between incident dementia and Alzheimer's disease and six year cumulative benzodiazepine use with five year lag time.*† Figures are hazard ratios (95% CI)

TSDD‡	Adjusted model§
Dementia	
0	1.00 (Reference)
1-30	1.21 (0.98 to 1.50)
31-120	1.20 (0.88 to 1.64)
≥121	1.13 (0.85 to 1.52)
Alzheimer's disease	
0	1.00 (Reference)
1-30	1.24 (0.98 to 1.57)
31-120	1.04 (0.72 to 1.51)
≥121	1.05 (0.75 to 1.46)

TSDD=total standardized daily dose; ACT=Adult Changes in Thought.

*Observations with missing adjustment variables excluded from model (n=130; 3.8%).

†Prescriptions in five years before dementia onset excluded from calculation of exposure.

‡TSDD example=minimum effective daily dose for temazepam is 15 mg daily (=1 TSDD); person would fall into following TSDD category if they were using 15 mg daily for 15 days (TSDD 1-30); 15 mg daily for 90 days (TSDD 31-120); 15 mg daily for 6 months (TSDD ≥121)

§Adjusted for ACT cohort, age (via the time-axis), age at ACT study entry, sex, educational level, BMI, current smoking, regular exercise, self-rated health, hypertension, diabetes mellitus, stroke, coronary heart disease, history of high depressive symptoms.

Taper and Discontinuation of Benzodiazepines

Reviewed in Williams S et al. *Annals of Clin Psychiatry* 2019; 31:2:144-152

- Short term risk of confusion, memory impairment, alertness
- Long terms risks less clear, although some studies show risk of dementia with OR of 1.33-1.84
- Challenging to reduce due to dependency and rebound
- Many can tolerate a 4-week taper, but a slower taper is needed for many
- Reduced doses or discontinuation can improve daytime function
- Alternatives: antidepressants, buspirone, CBT

Antipsychotics

Antipsychotics

Reviewed in Williams S et al. *Annals of Clin Psychiatry* 2019; 31:2:144-152

- Commonly prescribed for psychotic disorders, mood disorders and behavioral dysregulation
- High risk for falls, sedation, acute and chronic neurologic problems, hypotension and increased mortality
- Often necessary for maintaining remission of psychotic symptoms and severe mood disturbance but attempts to reduce dose and discontinue is good practice
- Metabolic, cardiac and neurologic side effects need close monitoring
 - For dementia-related mood symptoms, dose reduction should be attempted after 12 weeks

Deprescribing

STOPP

Gallaher P et al. Int J Clin. Pharm and Therap 2008; 46:2:72-83

- Screening Tool of Older Person's Prescriptions
- Consensus panel determinations of high-risk or low benefit situations:
 - Cardiovascular drugs #17 drugs/conditions
 - Central nervous system: #13
 - Gastrointestinal: #5
 - Musculoskeletal: #8
 - Respiratory: #3
 - Urogenital: #6
 - Endocrine: #4
 - Analgesics: #3

Deprescribing Algorithm

Frank C and Weir E. CMAJ 2014; DOI:10.1503

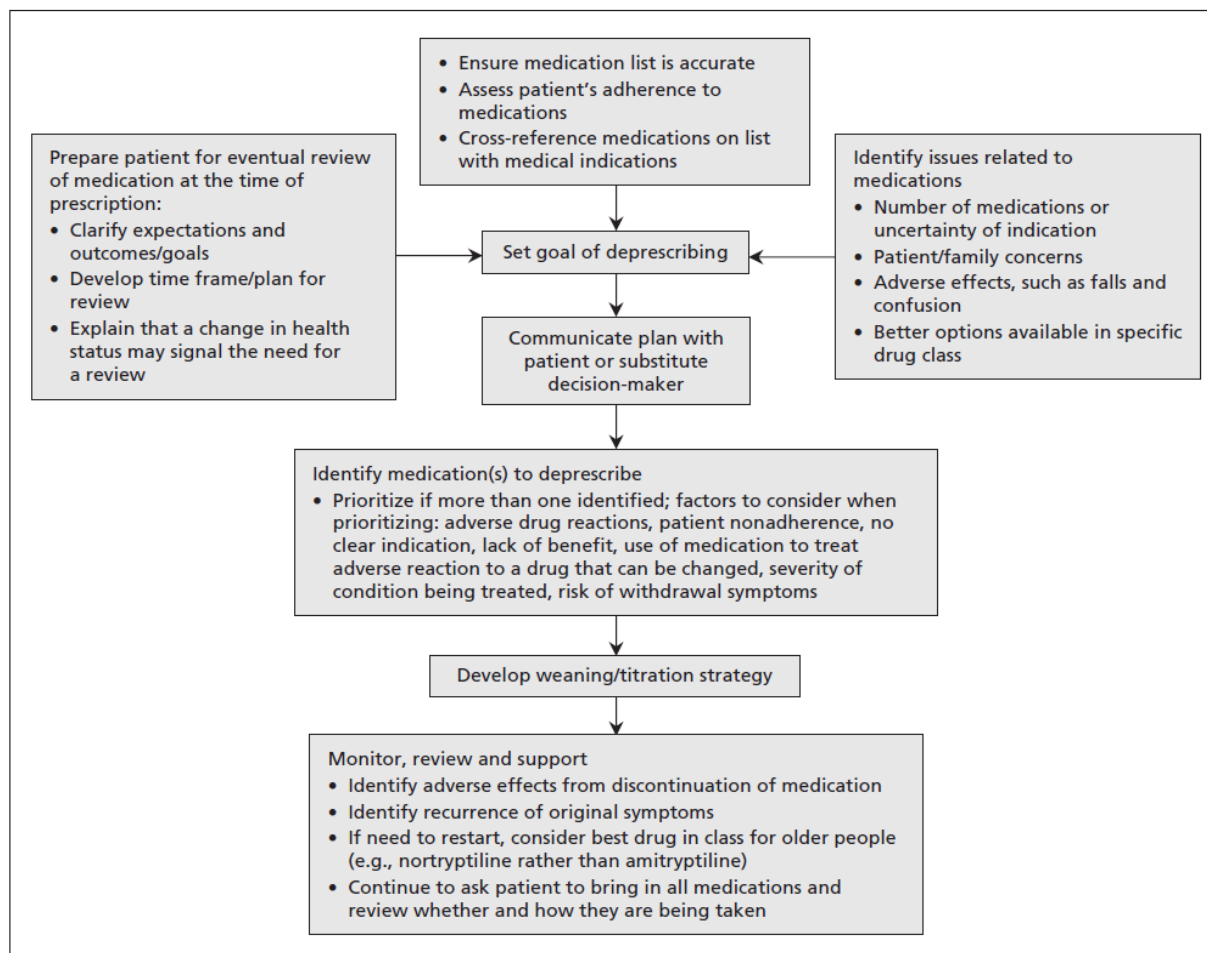


Figure 1: Practical approach to deprescribing.

Deprescribing

- Takes time
 - Identify drugs that may no longer be necessary, may be ineffective, may have dose lowered, may be interacting with other drugs or health status
 - Explain goals of dose reduction and discontinuation
- Creates anxiety
- Sometimes “backfires” but still yields information
 - Develop a plan and timetable and monitor for adverse consequences
 - Can result in relapse of condition, drug withdrawal and anxiety-related symptoms (especially benzodiazepines)
- Reduces costs and can improve health and function

Thank you! Now, let's discuss.

