Deprescribing Resource Guide: Introduction

The purpose of this document is to consolidate information for Alberta Health Services (AHS) clinicians on the importance of deprescribing medications which no longer serve their purpose, or where benefits no longer outweigh the risks of treatment. Information is current as of the time of publication.

Deprescribing is explored here as a proposed means to tailor patient care and to improve patient outcomes and the healthcare system by addressing medication safety and effectiveness, and minimizing medication burden. Though difficult to quantify, benefits also include reduced medication preparation and administration time, and emergency room visits.

This document is not intended to be all-inclusive. It is meant to highlight classes of medications that are prime targets for deprescribing, primarily in older adults, and to provide clinicians with evidence, references and tools to support clinical decisions to deprescribe.

If you have questions or would like more information, please contact:

AHS Pharmacy Drug Stewardship Team: AHS.PharmacyDrugStewardship@ahs.ca

This guide was initially developed by Anthony Sudano, PharmD (as a PharmD student supervised by Rhonda Shkrobot, BScPharm, ACPR).

Updated by: Rhonda Shkrobot, BScPharm, ACPR, with assistance from, and gratitude to, Brian Chow, PharmD student

Reviewed by: Cheryl Sadowski, PharmD; Frances Carr, MD; James Silvius, MD

November 2021

Table of Contents

Why We are Interested in Deprescribing

Polypharmacy has become a ubiquitous concern for health care systems globally. It is generally defined as the use of five (5) or more medications by one individual patient.[1] As the number of medications a patient is taking increases, the risk of adverse drug reaction (ADR) related hospitalizations increases exponentially. In 2016, 0.7% of seniors in Canada were hospitalized for an ADR.[2] Those on 10 to 14 different medication classes were five times more likely to be hospitalized than those taking only one to four medication classes, even after controlling for other factors.[2]

Even in cases of chronic medical conditions, some medications no longer retain their therapeutic effects after prolonged use, after progression of the disease state, if other patient characteristics have changed, or if a palliative approach to care has been chosen by the patient, patient's family and caregivers. The risks and benefits of all medications, including over-the-counter and natural health products, should be reviewed at each patient encounter. When initiating new therapies for older adults, time-to-benefit for effectiveness of medications should be considered.[5]

Deprescribing medications when benefits no longer outweigh the risks has the potential to create several positive outcomes and benefits for our patients, such as:

- Decreased pill burden
- Facilitating medication adherence
- Eliminating medication cascades (using a medication to treat the side effects of another)
- Stopping ineffective treatments
- Decreasing harm
- Decreasing the risk of interactions (drug-drug, drug-food, drug-disease and drug-herbal)
- Increasing safety by reducing use of medications that have potential for misuse or dependency such as sleep aids, benzodiazepines, and opioids
- Decreased financial cost of medications for patients

According to the 2018 Canadian Institute for Health Information (CIHI) report on Drug Use Among Seniors in Canada[2]:

- ➔ Roughly two-thirds (65.7%) of older adults are prescribed 5 or more medications.
- ➔ More than one-quarter (26.5%) of older adults are prescribed 10 or more medications.
- ➔ Almost one-tenth (8.4%) of older adults are prescribed 15 or more medications.

The Institute for Safe Medication Practices Canada (ISMP) refers to deprescribing as one approach to address polypharmacy[1]. Furthermore, the World Health Organization (WHO) 2017 Global Patient Safety Challenge is centered on the theme of medication safety. 'Medication Without Harm' is a challenge to healthcare systems globally, with a unified goal to minimize the potential harms caused by medications.[3] This Resource Guide provides information to assist clinicians to decrease the prevalence and risk of polypharmacy.

Of note, in 2020, the AHS Seniors Health Strategic Clinical Network™ (now part of AHS Provincial Seniors Health and Continuing Care) launched the *Appropriate Prescribing & Medication Use Strategy for Older Albertans (APMUSOA)*, with a strategy document created as a guide to achieve a systems approach in implementation of appropriate prescribing initiatives across diverse healthcare settings. There is also an excellent list of supporting resources.

Barriers to Deprescribing

The Canadian Deprescribing Network (CaDeN) recently published a brief video about the top 5 common myths about deprescribing.[4]

- **Myth 1: The current prescriptions are fine – "If it ain't broke, don't fix it".**
  - It is always easier to prevent adverse drug reactions, than to treat the potential complications caused by them.
- **Myth 2: If I deprescribe, my patient's symptoms will return.**
  - This only applies if the medication in question is actually providing a benefit. Furthermore, the returning symptoms may even be less harmful than the potential side effects of the treatment. Substituting to safer, evidence-based medications, or other non-drug alternatives are always options available to prescribers.
- **Myth 3: There is no evidence for safe deprescribing.**
  - There is evidence from many randomized controlled trials (RCTs) for deprescribing. Medication-specific guidelines and algorithms are available at: https://deprescribing.org/resources/deprescribing-guidelines-algorithms/.
- **Myth 4: My patients are reluctant to stop their medications.**
  - Up to 70% of older adult patients are willing to stop their medications if their doctor would ask them to do so.
- **Myth 5: I don't have time for deprescribing.**
  - Deprescribing can be quick and simple. A single visit providing an individualized tapering protocol is equally as effective as longer, more time intensive interventions.

Three Pillars of AHS Drug Stewardship

The AHS Drug Stewardship Program supports three pillars of medication use: Effectiveness, Safety, and Sustainability. Each of these pillars can be expanded upon with the focus of deprescribing in older adults, as follows:

- **Effectiveness:** Many medications have a prolonged 'time-to-benefit (TTB)' period; examples of medications in this class would be statins[5] (approximate TTB two to five years for primary prevention) or bisphosphonates[6] (TTB ranges from 8 to 19 months). Some medications prove to be effective upon therapy initiation, but are later no longer effective, usually because the condition for which it was prescribed has since resolved (anemia, acid reflux).
- **Safety:** Physiologic changes occur with age, which alter both the pharmacokinetics and the pharmacodynamics of medications. The following changes are of particular note[7]:
  - Decreased muscle mass and total body water, and increased total body fat ratio. This changes the volume of distribution of medications. Water soluble medications (e.g. digoxin, ethanol) have higher concentrations, and lipid soluble medications (e.g. benzodiazepines) remain in the body longer.
  - Decreased blood flow to the nervous system, altered central nervous system (CNS) permeability.
  - Liver size decreases, as does first pass hepatic metabolism and phase 1 metabolism (oxidation/reduction), leading to potential accumulation and increased toxicity for hepatically metabolized drugs.
  - Steady decrease in kidney function (i.e., glomerular filtration rate or GFR) from age 40 as part of normal aging, which leads to potential drug accumulation and toxicities for renally eliminated drugs and metabolites.

- Cardiac output decreases, systolic blood pressure increases, homeostatic mechanisms become less responsive.
- Intestinal absorption of several vitamins/nutrients is decreased, such as vitamin B12, calcium and iron.

Medications that were previously considered benign may eventually pose a significant threat in terms of adverse events and toxicities. Reducing exposure to what are known as 'Potentially Inappropriate Medications (PIMs)' is a proven method to improve the safety of an older adults' medication therapies.

It is worth noting that removing even a single medication from a polypharmacy regimen can lead to a decreased potential for drug interactions, decreased cost and pill burden to the patient, and decreased adverse drug events.[8]

➔ **Sustainability:** Almost 1% (over 20,000) of Canadian seniors are hospitalized every year due to adverse drug events.[2] Deprescribing minimizes the opportunity for such events to occur, which has positive outcomes for both patients, and the healthcare system as a whole. Decreasing medications has the potential for less medication administration by nurses, less burden and adverse drug events for patients, and improved drug stewardship for the health care system. Finally, adverse drug events in older adults cost Canadians an estimated $35.7 million dollars annually.[9]

Section References:

1. ISMP – Deprescribing: Managing medications to Reduce Polypharmacy – March 28, 2018. ISMPCSB2018-03-Deprescribing.pdf (ismp-canada.org)
2. Canadian Institute for Health Information. Drug Use Among Seniors in Canada, 2018. Ottawa, ON: CIHI; 2018. Drug use among seniors in Canada | CIHI
3. Medication Without Harm - Global Patient Safety Challenge on Medication Safety. Geneva: World Health Organization, 2017. License: CC BY-NC-SA 3.0 IGO. Medication Without Harm (who.int)
4. Canadian Deprescribing Network. Overcoming barriers to deprescribing. Video. Vidéo: overcoming barriers to deprescribing — Do I still need this medication? Is deprescribing for you? (deprescribingnetwork.ca)
5. Holmes, Holly M et al. Rationalizing prescribing for older patients with multimorbidity: considering time to benefit. *Drugs & aging* vol. 30,9 (2013): 655-66. doi:10.1007/s40266-013-0095-7
6. van de Glind, Esther M M et al. "Estimating the Time to Benefit for Preventive Drugs with the Statistical Process Control Method: An Example with Alendronate." *Drugs & aging* vol. 33,5 (2016): 347-53. doi:10.1007/s40266-016-0344-7
7. Carr, Frances. Seniors Guidance Document. Alberta Health Services 2018.
8. Iyer, S., Naganathan, V., McLachlan, A.J. et al. Medication Withdrawal Trials in People Aged 65 Years and Older. Drugs Aging 25, 1021–1031 (2008). https://doi.org/10.2165/0002512-200825120-00004
9. Wu, Chen et al. "Incidence and economic burden of adverse drug reactions among elderly patients in Ontario emergency departments: a retrospective study." *Drug safety* vol. 35,9 (2012): 769-81. doi:10.1007/bf03261973

Deprescribing – Evidence-Based Resources

Select General Deprescribing Resources:

Canadian Resources	
College of Physicians & Surgeons of Alberta (CPSA) Prescribing Tools & Resources	Compilation of supportive tools and guidelines for appropriate prescribing of medications
Optimized Prescribing with Seniors	A joint communication of the Alberta Medical Association and the College of Physicians & Surgeons of Alberta, these articles are written by physicians for physicians prescribing in the care of older patients
AHS Drug Stewardship	General drug stewardship information, including deprescribing Drugs & Therapeutics Backgrounders
Deprescribing.org	Information for clinicians, patients, and researchers as well as examples of evidence-based deprescribing algorithms and recorded webinars
GeriRxFiles 3rd Edition (may require subscription)	Canadian drug information resource that helps clinicians answer medication therapy questions by offering objective, evidence-based comparisons, as well as tools that can be used to dosage adjust, taper, or deprescribe
Choosingwiselycanada.org/geriatrics	Canadian resource of evidence-based statements that guide proper drug stewardship in the older adult population
Bruyere.org/en/polypharmacy-deprescribing	Canadian educational module that promotes deprescribing and teaches clinicians how to apply a practical approach to deprescribing by guiding them through a fictional patient case
Medstopper.com	Deprescribing resource for clinicians that helps scan through patient medications lists to highlight those which may be suitable targets for deprescribing
Tapermd.com/deprescribing-resources/	Canadian information bank for potentially inappropriate medications, and strategies for reducing medication burden for older adults
International Resources	
Deprescribingresearch.org	American research network that develops and disseminates evidence about deprescribing for older adults
Primary Health Tasmania Deprescribing Resources	Australian collection of evidence-based guidelines for deprescribing a multitude of medication classes
New South Wales Therapeutic Advisory Group Inc.	Deprescribing guides, consumer information leaflets and other useful resources
American Geriatrics Society BEERS Criteria®	American tool for identifying potentially inappropriate medications and their reason(s) for concern(s) in older adults
STOPP/START criteria for potentially inappropriate prescribing in older people	European tool for identifying potentially inappropriate medications and reason(s) for concern(s) in older adults
NO TEARS tool for medication review	Offers clinicians a practical approach/strategy to initiating deprescribing conversations with older adults during a medication review
Deprescribing preventative medication in older patients	Publication describing the risk to benefit ratio of medications used for preventative purposes in older adults
WHO: Medication Safety in Polypharmacy	Report describing the importance of preventing harms associated with adverse drug events, and the importance of deprescribing as a means to address this concern
Polypharmacy: a global risk factor for elderly people	Publication describing the importance of comprehensive medication reviews and the harm of polypharmacy in older adults
Scotland: Managing Multiple Medicines	Provides information and tools to support healthcare professionals, patients and carers in making decisions about taking multiple medicines

Select Deprescribing Resources for Patients, Families and Caregivers

- Deprescribing Information Pamphlets - Deprescribing.org
- Patient Handouts on Medications – Canadian Deprescribing Network
- For Patients – US Deprescribing Research Network
- Rethinking your medications: For Better Health Outcomes – Primary Health Tasmania
- Scotland Managing Multiple Medicines: For Patients and Carers
- PPI Co-Decision Making Tool for Patients and healthcare providers - AHS Digestive Health Strategic Clinical Network™
- MyHealth Alberta

Specific Medication Class Deprescribing Resources

Anticholinergics

Classic anticholinergic side effects include: confusion, constipation, urinary retention, blurred vision, sedation, and hypotension. These side effects in older adults can lead to impaction, urinary incontinence, and falls. A common anticholinergic medication, diphenhydramine, an antihistamine, can be found in over-the-counter sleep aid products. Other examples of medications with anticholinergic side effects include the antinauseant dimenhydrinate, antimuscarinic medications for urinary incontinence, some anti-Parkinson medications, and tricyclic antidepressants. Antihistamines worsen preexisting conditions and potentiate the sedative effects of other central nervous system depressants. It is important to ensure over-the-counter medications are included in medication histories and reviews, and to engage in education and shared decision making to address overuse of these products.

Resources pertaining to deprescribing anticholinergic medications:

1. GeriRxFiles 3rd edition – Tapering Medications in Older Adults (subscription required)
   Main Website: https://www.rxfiles.ca/rxfiles/
2. New South Wales (NSW) Therapeutic Advisory Group Inc. Deprescribing Tools.
3. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
4. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.
5. Ailabouni, N., Mangin, D. & Nishtala, P.S. Int J Clin Pharm (2019) 41: 167.
6. Kouladjian O'Donnell L, Gnjidic D, Nahas R, et al. Anticholinergic burden: considerations for older adults. J Pharm Pract Res. 2017; 47(1): 67-77.
7. Farrell, Barbara et al. "What are priorities for deprescribing for elderly patients? Capturing the voice of practitioners: a modified delphi process." *PloS one* vol. 10,4 e0122246. 7 Apr. 2015, doi:10.1371/journal.pone.0122246.
8. Fulone, Izabela, and Luciane Cruz Lopes. Potentially inappropriate prescriptions for elderly people taking antidepressant: comparative tools. *BMC geriatrics* vol. 17,1 278. 2 Dec. 2017, doi:10.1186/s12877-017-0674-2.
9. Bonnie Wiese, MD, MA, FRCPC. Geriatric depression: The use of antidepressants in the elderly. BCMJ, Vol. 53, No. 47, September, 2011, Page(s) 341-347 - Clinical Articles.
10. Mark D. Coggins, PharmD, CGP, FASCP. Medication Monitor: Deprescribing Improves Quality of Life. Today's Geriatric Medicine, Vol. 10 No. 4 P. 8.
11. Scotland Managing Multiple Medicines
12. Medstopper.com

Anti-hyperglycemic Medications

Geriatric guidelines allow for less strict hemoglobin A1c (HbA1c) and other glucose targets, as it has been acknowledged that preventing hypoglycemia is of the utmost importance in older adults and there are limited benefits in adhering to strict glycemic targets. Decreasing the risk of falls and fractures, as well as improving functionality are benefits of avoiding hypoglycemia. HbA1c less than 6.5% increases morbidity and mortality in older adults.[4] Special consideration should be taken when using insulin or long-acting sulfonylureas (e.g. glyburide, gliclazide, glimepiride), as these pose the highest risks of hypoglycemia.

Resources pertaining to deprescribing anti-hyperglycemic medications:

1. Deprescribing.org/resources/deprescribing-guidelines-algorithms/
2. GeriRxFiles 3rd edition – Tapering Medications in Older Adults (subscription required) Main Website: https://www.rxfiles.ca/rxfiles/
3. Primary Health Tasmania. A guide to deprescribing Antihyperglycaemic agents. Accessed Jan 24 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
4. American Geriatrics Society 2019 Updated AGS BEERS Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
5. Farrell, Barbara et al. Deprescribing antihyperglycemic agents in older persons. Canadian Family Physician Nov 2017, 63 (11) 832-843.
6. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes. 2018;42(Suppl 1):S1-S325.
7. McGovern A (2017) Glycaemic control in the elderly: What should we be aiming for? Journal of Diabetes Nursing 21: 133–7.
8. Longo, M et al. Diabetes and Aging: From Treatment Goals to Pharmacologic Therapy. Frontiers in endocrinology. 18 February 2019.
9. Wei-Che, Chen. Blood Glucose Management of Type 2 Diabetes in the Older People. International Journal of Gerontology, Volume 12, Issue 3, September 2018, Pages 170-174.
10. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes in Older People. 2018 Clinical Practice Guidelines.
11. American Geriatrics Society Expert Panel on the Care of Older Adults with Diabetes Mellitus. Guidelines Abstracted from the American Geriatrics Society Guidelines for Improving the Care of Older Adults with Diabetes Mellitus: 2013 Update. J Am Geriatr Soc. 2013;61(11):2020-2026.
12. Scotland Managing Multiple Medicines
13. Medstopper.com

Anti-hypertensive Medications

Consider less aggressive blood pressure targets in older adults to minimize potentially harmful side effects and fall risks from postural hypotension, dizziness, and hypoperfusion. It is important in older adults to measure orthostatic blood pressure, from supine to standing. Older adults may experience orthostasis exacerbated by anti-hypertensive medication.

Resources pertaining to deprescribing anti-hypertensive medications in older adults:

1. Primary Health Tasmania. A guide to deprescribing antihypertensive agents. Accessed Jan 31 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
2. Parekh, Nikesh et al. A practical approach to the pharmacological management of hypertension in older people. *Therapeutic advances in drug safety* vol. 8,4 (2017): 117-132. doi:10.1177/2042098616682721

3. Gulla, Christine et al. Deprescribing antihypertensive treatment in nursing home patients and the effect on blood pressure. *Journal of geriatric cardiology: JGC* vol. 15,4 (2018): 275-283. doi:10.11909/j.issn.1671-5411.2018.04.011
4. van Middelaar T, Ivens SD, van Peet PG*, et al* Prescribing and deprescribing antihypertensive medication in older people by Dutch general practitioners: a qualitative study *BMJ Open* 2018; 8**:**e020871. doi: 10.1136/bmjopen-2017-020871
5. Benetos A. et al. Hypertension Management in Older and Frail Older Patients. Circulation Research. 2019;124:1045-1060.
6. Tessa van Middelaar, Eric P Moll van Charante. Deprescribing preventative medication in older patients. British Journal of General Practice 2018; 68 (675): 456-457. DOI: 10.3399/bjgp18X698933.
7. Shiva Satish et al The Relationship Between Blood Pressure and Mortality in the Oldest Old. J Am Geraitr Soc 2001 49: 367-74.
8. Ogihara T. et al. Practitioner's Trial on the Efficacy of Antihypertensive Treatment in Elderly Patients with Hypertension II in Japan. Geriatric Gerontology Int. 2011 Oct; 11(4):414-21.
9. Butt DA, Mamdani M, Austin PC, Tu K, Gomes T, Glazier RH. The risk of hip fracture after initiating antihypertensive drugs in the elderly. Arch Intern Med. 2012;172(22):1739.
10. Scotland Managing Multiple Medicines
11. Medstopper.com

Antimicrobials

Appropriate use of antimicrobials are generally covered under antimicrobial stewardship efforts. The theme of appropriate prescribing relates to deprescribing. It is well established that inappropriate urine testing and treatment of asymptomatic bacteriuria in older adults leads to poor outcomes such as antibiotic resistance, *Clostridioides difficile* infections, allergic and adverse reactions. There are several harmful side effects of commonly used antibiotics, such as nitrofurantoin (lung and liver toxicity, peripheral neuropathy) and fluoroquinolones (seizures, depression, anxiety, confusion, tendon rupture, peripheral neuropathy, QTc prolongation).

Resources pertaining to the use of antimicrobial medications:

1. Appropriateness of Care: Antimicrobial Stewardship and Asymptomatic Bacteriuria. Alberta Health Services. Online resources.
2. BugsandDrugs.org
3. College of Physicians and Surgeons of Alberta (CPSA) Prescribing Tools & Resources: https://cpsa.ca/physicians/competence/prescribing-practices/prescribing-tools-resources/
4. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
5. U.S. Food and Drug Administration. Drug Safety Communication. FDA reinforces safety information about serious low blood sugar levels and mental health side effects with fluoroquinolone antibiotics; requires label changes. Announcement date 07-10-2018.
6. Stahlmann R, Lode H. Safety Considerations of Fluoroquinolones in the Elderly: an update. Drugs Aging. 2010 Mar 1;27(3):193-209.
7. Carmen M. Faulkner, Heather L. Cox, John C. Williamson, Unique Aspects of Antimicrobial Use in Older Adults, Clinical Infectious Diseases, Volume 40, Issue 7, 1 April 2005, Pages 997–1004.
8. UptoDate – Asymptomatic bacteriuria in adults.
9. Givler DN, Givler A. Asymptomatic Bacteriuria. [Updated 2019 Aug 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan.
10. Asymptomatic Bacteriuria in Adults. Am Fam Physician 2006;74:985-90. © 2006 American Academy of Family Physicians
11. Scotland Managing Multiple Medicines

Antipsychotics

Significant side effects of antipsychotic medications increase the risk for stroke, worsen symptoms of cognitive decline in patients with dementia, increase overall mortality, cause potentially permanent movement disorders, increase falls and injuries, lead to metabolic syndrome, and are sedating.[6] Antipsychotic use in older adults is commonly used to suppress symptoms of dementia, like aggression and agitation. Such an indication is appropriate when the patient presents a serious harm to themselves or others, and only in the short term to allow other interventions to be instituted. Use of antipsychotics in older adults for approved indications such as schizophrenia may be appropriate, however clinicians should monitor these patients closely for side effects, and should adjust doses and encourage non-pharmacological measures when appropriate to offset these effects.

Resources pertaining to deprescribing antipsychotic medications:

1. Appropriate Use of Antispychotics (AUA) Toolkit. Alberta Health Services. Seniors Health SCN. Accessed Jan 26th, 2020
   SCN Website: https://www.albertahealthservices.ca/scns/Page7702.aspx
2. Deprescribing algorithm for Antipsychotics
   Main Website: Deprescribing.org/resources/deprescribing-guidelines-algorithms/
3. GeriRxFiles 3rd edition – Tapering Medications in Older Adults
   Main Website: https://www.rxfiles.ca/rxfiles/ (subscription required
4. Primary Health Tasmania. A guide to deprescribing Antipsychotics. Accessed January 22, 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
5. New South Wales (NSW) Therapeutic Advisory Group Inc. Deprescribing Tools.
6. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
7. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.
8. Bjerre, Lisa et al. Deprescribing Antipsychotics for behavioural and psychological symptoms of dementia and insomnia. Canadian Family Physician, Vol 64: January 2018
9. Scotland Managing Multiple Medicines
10. Medstopper.com

ASA (primary prevention of a cardiovascular event)

The use of ASA for primary prevention of a cardiovascular event involves weighing the risk of cardiovascular events, versus the risk of gastrointestinal bleeds. The number needed to treat (NNT) for primary prevention in patients with one to two risk factors for cardiovascular disease (e.g., hypertension, dyslipidemia) is 250-500 for one person over one year (0.2-0.4%); whereas in otherwise healthy patients the NNT approaches 2,000.[1] Gastrointestinal bleed risk is up to 7% (number needed to harm, NNH, as low as 15) in one year in adults aged 85 and over.[1] Therefore, patients taking daily ASA for primary prevention of a cardiovascular event are at a higher risk of serious side effects than benefit from primary prevention.

Resources pertaining to deprescribing ASA:

1. Primary Health Tasmania. A guide to deprescribing aspirin. Accessed Jan 22 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
2. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
3. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.

4. McNeil, John J et al. Effect of Aspirin on Disability-free Survival in the Healthy Elderly. *The New England journal of medicine* vol. 379,16 (2018): 1499-1508. doi:10.1056/NEJMoa1800722
5. Arnett DK, Blumenthal RS, Albert MA, Buroker AB, Goldberger ZD, Hahn EJ, Himmelfarb CD, Khera A, Lloyd-Jones D, McEvoy JW, Michos ED, Miedema MD, Muñoz D, Smith SC Jr, Virani SS, Williams KA Sr, Yeboah J, Ziaeian B. 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2019;140:e596–e646. DOI: 10.1161/ CIR.0000000000000678
6. McNeil, JJ et al. Effect of Aspirin on Cardiovascular events and bleeding in the Healthy Elderly. *The New England Journal of Medicine 2018;* 379:1509-18. DOI:10.1056/NEJMoa1805819.
7. McNeil, JJ et al. Effect of Aspirin on All-Cause Mortality in the Healhy Elderly (ASPREE trial). *The New England Journal of Medicine vol 379: 1519-1528.* DOI: 10.1056/NEJMoa1803955. 2018.
8. Fritsch, Paul et al. Does an ASA a day really keep the doctor away? Alberta College of Family Physicians Tools for Practice. March 18, 2019.
9. Antithrombotic Trialists' (ATT) Collaboration. Aspirin in the primary and secondary prevention of vascular disease: collaborative meta-analysis of individual participant data from randomized trials. Lancet. 2009;373:1849-1860.
10. Scotland Managing Multiple Medicines
11. Medstopper.com

Benzodiazepines and Sedative-Hypnotics

Benzodiazepines and other sedative-hypnotics (e.g., zopiclone) significantly increase the risk of motor vehicle accidents, falls and hip fractures, and daytime fatigue in older adults.[8] Other side effects include physical dependence, mild cognitive impairment and worsening of symptoms of dementia, sedation, and delirium.[8,9] They also compound the effects of opioids, and can cause significant central nervous system (CNS) depression when co-administered. These medications are a high priority for deprescribing initiatives, and should be reassessed thoroughly at each patient encounter.

Resources pertaining to deprescribing benzodiazepines and sedative-hypnotic medications:

1. Deprescribing Algorithm for Benzodiazepines Main Website: Deprescribing.org/resources/deprescribing-guidelines-algorithms/
2. College of Physicians and Surgeons of Alberta (CPSA) Prescribing Tools & Resources: https://cpsa.ca/physicians/competence/prescribing-practices/prescribing-tools-resources/
3. GeriRxFiles 3rd edition – Tapering Medications in Older Adults. (subscription required)
4. Pottie, Kevin et al. Deprescribing benzodiazepine receptor agonists. Canadian Family Physician May 2018, 64 (5) 339-351.
5. Canadian Institute for Health Information. *Unnecessary Care in Canada*. Ottawa, ON: CIHI; 2017.
6. Primary Health Tasmania. A guide to deprescribing Benzodiazepines. Accessed January 19th, 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
7. New South Wales (NSW) Therapeutic Advisory Group Inc. Deprescribing Tools.
8. Carr F, Tian P, Chow J, et al. Deprescribing benzodiazepines among hospitalised older adults: quality improvement initiative. BMJ Open Quality 2019; 8:e000539. doi:10.1136/ bmjoq-2018-000539
9. Steven G et al. Frequency and cost of potentially inappropriate prescribing for older adults: a cross-sectional study. CMAJ Open 2016. DOI:10.9778/cmajo.20150131
10. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
11. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.

12. Tannenbaum C et al. Reduction of inappropriate benzodiazepine prescriptions among older adults through direct patient education: the EMPOWER cluster randomized trial. JAMA Intern Med 2014 Jun; 174(6):890-9.
Sequel: Martin P, Tamblyn R, Benedetti A, Ahmed S, Tannenbaum C. Effect of a Pharmacist-Led Educational Intervention on Inappropriate Medication Prescriptions in Older Adults: The D-PRESCRIBE Randomized Clinical Trial. JAMA. 2018;320(18):1889–1898. doi:10.1001/jama.2018.16131
13. Scotland Managing Multiple Medicines
14. Medstopper.com

Bisphosphonates

Bisphosphonates have relatively low effectiveness when continued in the subsequent five years after the initial five year treatment period, specifically if the patient's T score is above -2.5.[1,3] Serious side effects can occur from bisphosphonate therapy such as: esophageal ulceration (improper administration), atypical fractures (i.e., femoral spiral fractures), and osteonecrosis of the jaw.[1]

Resources pertaining to deprescribing bisphosphonate medications in older adults:

1. Primary Health Tasmania. A guide to deprescribing bisphosphonates. Accessed Jan 30 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
2. Kolber et al. Bisphosphonates: forever or 5 years and stop? Canadian Family Physician May 2015, 61 (5) 443.
3. Black DM, Schwartz AV, Ensrud KE, et al. Effects of Continuing or Stopping Alendronate After 5 Years of Treatment: The Fracture Intervention Trial Long-term Extension (FLEX): A Randomized Trial. JAMA. 2006;296(24):2927–2938. doi:10.1001/jama.296.24.2927.
4. The Royal Australian College of General Practitioners and Osteoporosis Australia. Osteoporosis prevention, diagnosis and management in postmenopausal women and men over 50 years of age. 2nd edn. East Melbourne, Vic: RACGP, 2017.
5. Etxeberria A et al. Deprescribing long-term treatments with bisphosphonates for osteoporosis in primary care in the Basque Country (Spain). Gac Sanit. 2017 Jan – Feb;31(1):35-39. Doi: 10.1016/j.gaceta.2016.07.003.
6. Ann V Schwartz et al Efficacy of Continued Alendronate for Fractures in Women With and Without Prevalent Vertebral Fracture: The FLEX Trial. Journal of Bone and Mineral Research, Vol. 25, No. 5, May 2010, pp 976–982
7. Black DM, Reid IR, Boonen S, Bucci-Rechtweg C, Cauley JA, Cosman F, et al. The effect of 3 versus 6 years of zoledronic acid treatment of osteoporosis: a randomized extension to the HORIZON-Pivotal Fracture Trial (PFT). J Bone Miner Res 2012;27(2):243-54. Erratum in: J Bone Miner Res2012;27(12):2612.
8. Watts NB, Chines A, Olszynski WP, McKeever CD, McClung MR, Zhou X, et al. Fracture risk remains reduced one year after discontinuation of risedronate. Osteoporos Int 2008;19(3):365-72. Epub 2007 Oct 16.
9. Watts NB, Diab DL. Long-term use of bisphosphonates in osteoporosis. J Clin Endocrinol Metab 2010;95(4):1555-65. Epub 2010 Feb 19.
10. Scotland Managing Multiple Medicines
11. Medstopper.com

Cholinesterase Inhibitors

These medications are commonly used in older adults with a diagnosis of dementia, and may be targets for deprescribing as benefits tend to wane in many patients after the first 12 months of use. These medications have side effects that are hazardous in the older population, such as: dizziness, confusion, insomnia, agitation, weight loss and falls.[4] Consider reassessing these medications, including input from the caregivers and families of patients, to determine if they are still benefiting from treatment.

Resources pertaining to deprescribing Cholinesterase Inhibitor medications:

1. Deprescribing Cholinesterase Inhibitors
   Main Website: Deprescribing.org/resources/deprescribing-guidelines-algorithms/
2. Primary Health Tasmania. A guide to deprescribing Cholinesterase Inhibitors. Accessed January 25th, 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
3. GeriRxFiles 3rd edition – Tapering Medications in Older Adults (subscription required)
   Main Website: https://www.rxfiles.ca/rxfiles/
4. Reeve E, Farrell B, Thompson W, Herrmann N, Sketris I, Magin P, Chenoweth L, Gorman M, Quirke L, Bethune G, Forbes F, Hilmer S. Evidence-based Clinical Practice Guideline for Deprescribing Cholinesterase Inhibitors and Memantine. Sydney: The University of Sydney; 2018.
   Main Website: https://cdpc.sydney.edu.au/research/medication-management/deprescribing-guidelines/
5. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
6. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.
7. Scotland Managing Multiple Medicines
8. Medstopper.com

Metoclopramide

Metoclopramide causes tardive dyskinesia at a rate that is similar to or greater than that of first-generation antipsychotics. Its use should be avoided whenever possible; when metoclopramide must be used, it should be for a period less than 12 weeks.[1]

Resources pertaining to the inappropriateness of metoclopramide in older adults:

1. Health Canada Recalls and Safety Alerts. Metoclopramide: Stronger warnings on risk of abnormal muscle movements. July 20, 2011.
2. MedStopper
3. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
4. UptoDate – Tardive Dyskinesia
5. Stewart, R. B., Cerda, J. J., Moore, M. T., & Hale, W. E. (1992). Metoclopramide: An Analysis of Inappropriate Long-Term Use in the Elderly. Annals of Pharmacotherapy, 26(7–8), 977–979.
6. Orme ML, Tallis RC. Metoclopramide and tardive dyskinesia in the elderly. Br Med J (Clin Res Ed). 1984;289(6442):397–398. doi:10.1136/bmj.289.6442.397.
7. Scotland Managing Multiple Medicines
8. Medstopper.com

Non-Steroidal Anti-inflammatory Drugs (NSAIDs)

NSAIDs interact with many other medications prescribed in older adults, which may result in increasing the risk of gastrointestinal bleeds, increasing the risk of cardiovascular events, and increasing renal toxicity. Short-term use may be acceptable; however, chronic use of NSAIDs poses a significant risk for adverse drug events, especially in patients at risk of dehydration. The risk of gastrointestinal ulceration with chronic NSAID use generally leads to the initiation of PPI therapy, which is another potentially inappropriate medication in older adults; therefore, selecting alternatives that do not increase the chances of a prescribing cascade is strongly recommended.

Another commonly overlooked yet significant drug interaction is one between NSAIDs and antidepressants, which results in an increased bleed risk.

Resources pertaining to deprescribing NSAID medications:

1. Primary Health Tasmania. A guide to deprescribing Non Steroidal Anti-Inflammatory Drugs (NSAIDs). Accessed February 1st, 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
2. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
3. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.
4. NICE Key therapeutic topic Non-steroidal anti-inflammatory drugs Published: 15 January 2015.
5. Aguiar JP et al. Potentially inappropriate medications with risk of cardiovascular adverse events in the elderly: A systematic review of tools addressing inappropriate prescribing. J Clin Pharm Ther. 2019 Jun; 44(3):349-360. Doi: 10.1111/jcpt. 12811.
6. Wongrakpanich, Supakanya et al. A comprehensive review of Non-Steroidal Anti-inflammatory Drug Use in The Elderly. Aging and Disease, vol 9, number 1; 143-150, February 2018.
7. Martin P, Tamblyn R, Benedetti A, Ahmed S, Tannenbaum C. Effect of a Pharmacist-Led Educational Intervention on Inappropriate Medication Prescriptions in Older Adults: The D-PRESCRIBE Randomized Clinical Trial. JAMA. 2018;320(18):1889–1898. doi:10.1001/jama.2018.16131
8. Scotland Managing Multiple Medicines
9. Medstopper.com

Opioids

With the exception of palliative care and chronic cancer pain, opioids should not be used long-term for older adults. Opioids increase the risk of falls, cause sedation, constipation, respiratory depression, and interact with other CNS depressants such as alcohol and benzodiazepines.[1,7,8] Long-term opioid use has only been associated with a 0.69 point reduction on a 10 point visual analog scale for pain assessment.[9] Anticipated benefits must be weighed against the harmful side effects of use of opioids for acute, short-term pain.

Codeine and tramadol specifically pose significantly higher safety risks in older adults, due to the considerable pharmacokinetic variability and increased risk of drug interactions via CYP2D6 metabolism.[9]

Resources pertaining to the inappropriateness of opioid medications in chronic non-cancerous pain:

1. College of Physicians and Surgeons of Alberta (CPSA) Prescribing Tools & Resources: https://cpsa.ca/physicians/competence/prescribing-practices/prescribing-tools-resources/
2. GeriRxFiles 3rd edition – Tapering Medications in Older Adults (subscription required) Main Website: https://www.rxfiles.ca/rxfiles/

3. Primary Health Tasmania. A guide to deprescribing Opioids. Accessed Feb 1st, 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
4. NSW Health Translational – Deprescribing Guide for Regular Long Term Opioid Analgesic Use (>3 months) in Older Adults. Version 1, October 2018. Accessed Jan 28, 2020.
5. Canadian Coalition for Seniors' Mental Health. Canadian Guidelines on Opioid Use Disorder Among Older Adults 2019. Accessed Jan 28 2020.
6. Opioid Wisely - Choosing Wisely Canada
7. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
8. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.
9. Busse JW, Wang L, Kamaleldin M, et al. Opioids for Chronic Noncancer Pain: A Systematic Review and Meta-analysis. JAMA. 2018;320(23):2448–2460. doi:10.1001/jama.2018.18472
10. McLachlan, Andrew J et al. Clinical pharmacology of analgesic medicines in older people: impact of frailty and cognitive impairment. BJCP 2011.
11. Michael David Cory O'Brien, Anne Pamela Frances Wand, A systematic review of the evidence for the efficacy of opioids for chronic non-cancer pain in community-dwelling older adults, Age and Ageing, afz175
12. Busse, Jason. The 2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain. National Pain Center. Accessed Jan 28, 2020.
13. Guerriero, Fabio. "Guidance on opioids prescribing for the management of persistent non-cancer pain in older adults." *World journal of clinical cases* vol. 5,3 (2017): 73-81. doi:10.12998/wjcc.v5.i3.73
14. Huang, Allen & Mallet, Louise & Rochefort, Christian & Eguale, Tewodros & Buckeridge, David & Tamblyn, Robyn. (2012). Medication-Related Falls in the Elderly Causative Factors and Preventive Strategies. Drugs & aging. 29. 359-76.
15. Scotland Managing Multiple Medicines
16. Medstopper.com

Proton Pump Inhibitors

Proton pump inhibitors (PPIs) are another well studied class of medications for deprescribing initiatives in older adults. These medications often become 'legacy prescriptions', in the sense that they are initiated to treat an acute condition, and then are continuously renewed and refilled without being fully reassessed. PPIs increase the risk for *Clostridioides difficile* infection, as well as increase bone loss and fracture risk.[6] The constant suppression of gastric pH may decrease medication, vitamin and mineral absorption, which could lead to further complications in older adults, who already have compromised absorption due to the natural physiological changes caused by the aging process, as previously discussed in the safety section of this document.[4]

The AHS Digestive Health Strategic Clinical Network™ (DH SCN) has developed resources for Primary Care. Resources are available on the DH SCN website under the Projects, Priorities tab:

- PPI Co-Decision Making Tool for Patients and healthcare providers
- PPI Guideline
- PPI Patient Poster

Materials for the deprescribing of PPIs in acute care are available on the AHS Pharmacy Services Drugs & Therapeutics Backgrounder Insite page:

- Issue 33, January 2021 – Proton Pump Inhibitor (PPI) Deprescribing
  - PPI Deprescribing in Acute Care Algorithm
  - Bye Bye PPI – Proton Pump Inhibitor Deprescribing Presentation

Additional resources pertaining to deprescribing PPI medications:

1. Deprescribing algorithm for PPIs
   Main Website: Deprescribing.org/resources/deprescribing-guidelines-algorithms/
2. GeriRxFiles 3rd edition – Tapering Medications in Older Adults (subscription required)
   Main Website: https://www.rxfiles.ca/rxfiles/
3. Choosing Wisely Canada PPI toolkit
   Main Website: Choosingwiselycanada.org/perspective/ppi-toolkit/
4. Primary Health Tasmania. A guide to deprescribing Proton Pump Inhibitors. Accessed January 22, 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
5. New South Wales (NSW) Therapeutic Advisory Group Inc. Deprescribing Tools.
6. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019.
7. Denis O'Mahony et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age and Ageing 2015; 44: 213-218.
8. Farrell B, et al. Evidence-based clinical practice guideline for deprescribing proton pump inhibitors. Canadian Family Physician. 2017 May; 63(5):354- 364.
9. Benmassaoud A, McDonald EG, Lee TC. Potential harms of proton pump inhibitor therapy: rare adverse effects of commonly used drugs. CMAJ. 2016;188(9):657–662. doi:10.1503/cmaj.150570
10. Scotland Managing Multiple Medicines
11. Medstopper.com

Statins (HMG-CoA Reductase Inhibitors)

Older adults experience statin related myalgias at higher rates than younger patients, which may further affect mobility. Statins have a time-to-benefit effect which becomes limited after 75 years of age.[1-3] Use of statins for primary prevention has an NNT of 150-300 over a one year period, and the mortality benefit of statins is significantly diminished in the presence of other non-cardiovascular mortality factors.[2]

Resources pertaining to the deprescribing of statin medications in older adults:

1. Choosing wisely. Cholesterol drugs for people 75 and older – when you need them- and when you don't. Accessed Jan 28 2020.
2. Primary Health Tasmania. A guide to deprescribing statins. Accessed Jan 28 2020. Main Website: https://www.primaryhealthtas.com.au/resources/deprescribing-resources/
3. Martin Bødtker Mortensen and Erling Falk. Primary Prevention with Statins in the Elderly. Journal of the American College of Cardiology Volume 71, Issue 1, January 2018 DOI: 10.1016/j.jacc.2017.10.080
4. Holmes HM, Todd A. Evidence-based deprescribing of statins in patients with advanced illness. *JAMA Intern Med*. 2015;175(5):701–702. doi:10.1001/jamainternmed.2015.0328
5. Martin Gulliford, Rathi Ravindrarajah, Shota Hamada, Stephen Jackson, Judith Charlton, Inception and deprescribing of statins in people aged over 80 years: cohort study, Age and Ageing, Volume 46, Issue 6, November 2017, Pages 1001–1005
6. Hilmer, Sarah. Statins in older adults. Australian Prescriber. Volume 36: Number 3: June 2013.
7. van der, Ploeg, M.A., Floriani, C., Achterberg, W.P., Bogaerts, J.M., Gussekloo, J., Mooijaart, S.P., Streit, S., Poortvliet, R.K. and Drewes, Y.M. (2020), Recommendations for (Discontinuation of) Statin Treatment in Older Adults: Review of Guidelines. J Am Geriatr Soc.
8. Scotland Managing Multiple Medicines
9. Medstopper.com

Natural Health Products

Many older adults take natural health products (NHPs). Most of these products do not have evidence to warrant continued use. Many NHPs can interact with common medications, such as anticoagulants, NSAIDs, antidepressants and antimicrobials. This is a good reminder to inquire about NHP use at every patient encounter.

Resources pertaining to natural health product use in older adults:

1. Williams, Cynthia M. Using Medications Appropriately in Older Adults. *Am Fam Physician*. 2002 Nove 15;66(10): 1917-1925.
2. Eman, Alissa M. Medicinal Herbs and Therapeutic Drugs Interactions. *Therapeutic Drug Monitoring:* August 2014 – Volume 36 – Issue 4 – p413-422.
3. Agbabiaka, Taofikat B. et al. Prevalence of drug-herb and drug-supplement interactions in older adults. British Journal of General Practice, October 2018.
4. Nisly, Nicole L et al. Dietary supplement polypharmacy: an unrecognized public health problem?. Evidence-based complementary and alternative medicine : eCAM vol. 7,1 (2010): 107-13. doi:10.1093/ecam/nem150
5. Agbabiaka, Taofikat B et al. Concurrent Use of Prescription Drugs and Herbal Medicinal Products in Older Adults: A Systematic Review. Drugs & aging vol. 34,12 (2017): 891-905. doi:10.1007/s40266-017-0501-7
6. Medication Safety in Polypharmacy. Geneva: World Health Organization; 2019 (WHO/UHC/SDS/2019.11). License: CC BY-NC-SA 3.0 IGO.
7. Silva, José Edsonde Souza et al. Use of herbal medicines by elderly patients: a systematic review. Archives of Gerontology and Geriatrics. Volume 59, Issue 2, Sept-Oct 2014, pages 227-233.
8. González-Stuart, Armando. Herbal product use by older adults. Maturitas, 68 (2011) 52-55.
9. Scotland Managing Multiple Medicines

Appendix I: Select Medication Classes Commonly Inappropriately Prescribed in Older Adults

Medication / Class	Reason(s) for Concern in Older Adults	Select Deprescribing Tools & Algorithms:
Anticholinergics and medications with anticholinergic side effects	Confusion, dry mouth, constipation, urinary retention, sedation, blurred vision, hypotension[1]	GeriRxFiles Tapering Medications in Older Adults* NSW Therapeutic Advisory Group - Deprescribing tools
Anti-hyperglycemic medications (especially long-acting sulfonylureas)	Hypoglycemic events impose high fall/fracture risks, consider a more relaxed glucose target[1,2,3]	Deprescribing.org Guidelines and Algorithms GeriRxFiles Tapering Medications in Older Adults * PHN Tasmania Deprescribing Resources
Antihypertensive medications (especially short acting agents)	Postural hypotension, dizziness, fall risks.[1]	PHN Tasmania Deprescribing Resources
Select Antimicrobials (specifically Nitrofurantoin and Quinolones)	Nitrofurantoin: pulmonary toxicity, hepatotoxicity, peripheral neuropathy[1] Quinolones: CNS effects (seizures, confusion) and tendon rupture[1]	See Deprescribing Resources Guide for resources on select antibiotics and antimicrobial stewardship
Antipsychotics	Increased stroke risk, cognitive impairment, increased mortality, movement disorders, metabolic side effects, sedation[1,4]	AHS Antipsychotic Use Toolkit Deprescribing.org Guidelines and Algorithms GeriRxFiles Tapering Medications in Older Adults* NSW Therapeutic Advisory Group - Deprescribing tools PHN Tasmania Deprescribing Resources
ASA (when used for primary prevention)	Gastrointestinal bleeds, questionable evidence for primary prevention in older adults[1,5]	PHN Tasmania Deprescribing Resources
Benzodiazepines & Sedative Hypnotics	Cognitive impairment, physical dependence, dementia, sedation, delirium, falls, fractures[1,3]	CPSA Prescribing Resources and Tools Deprescribing.org Guidelines and Algorithms Drowsy Without Feeling Lousy Toolkit (Choosing Wisely Canada) Less Sedatives for Your Older Relatives Toolkit (Choosing Wisely Canada) NSW Therapeutic Advisory Group - Deprescribing tools PHN Tasmania Deprescribing Resources
Bisphosphonates	Little benefit beyond 5 years, especially if T score is above -2.5[6,7]	PHN Tasmania Deprescribing Resources
Cholinesterase Inhibitors	Dizziness, confusion, insomnia, agitation, nausea, weight loss, urinary frequency, falls[3]	Deprescribing.org Guidelines and Algorithms GeriRxFiles Tapering Medications in Older Adults* PHN Tasmania Deprescribing Resources
Metoclopramide	Incidence of tardive dyskinesia similar or greater than that of first-generation antipsychotics; maximum duration recommended by Health Canada is 12 weeks[1]	MedStopper**
Non-Steroidal Anti-inflammatory Drugs (NSAIDs)	Gastrointestinal bleeds, hypertension, cardiovascular events, renal toxicity[1]	PHN Tasmania Deprescribing Resources
Opioids for chronic non-cancer pain	Falls, sedation, constipation, respiratory depression, risk of drug interactions/overdose[1,8]	CPSA Prescribing Resources and Tools GeriRxFiles Tapering Medications in Older Adults* Opioid Wisely - Choosing Wisely Canada

Medication / Class	Reason(s) for Concern in Older Adults	Select Deprescribing Tools & Algorithms:
		PHN Tasmania Deprescribing Resources
Proton Pump Inhibitors	Diarrhea, *C. difficile* infection, micronutrient deficiencies[1]	Digestive Health SCN (Projects tab) AHS PPI Deprescribing Backgrounder Bye-Bye PPI Toolkit (Choosing Wisely Canada) Deprescribing.org Guidelines and Algorithms PHN Tasmania Deprescribing Resources Deprescribing tools - NSW Therapeutic Advisory Group
Statins for primary prevention of cardiovascular events	Increased myalgias and pill burden, limited time-to-effect benefit seen after 75 years of age[9-11]	PHN Tasmania Deprescribing Resources
Natural Health Products/ Vitamins/Supplements	Many patients take several natural health products and supplements, most of which do not have sufficient evidence for their continued use; some of which could even cause harmful drug interactions or adverse events[12]	MedStopper**

*may require subscription **also applies to other Medications/Classes

Section References:

1. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. JAGS 67:674-694, 2019
2. GeriRxFiles – Diabetes (subscription required)
3. Deprescribing.org/resources/deprescribing-guidelines-algorithms/
4. UptoDate – Tardive Dyskinesia
5. McNeil JJ, Nelson MR, Woods RL, et al. Effect of Aspirin on All-Cause Mortality in the Health Elderly. NEJM. 2018; 379:1519-1528. DOI: 10.1056/NEJMoa1803955
6. Primary Health Tasmania. A guide to deprescribing bisphosphonates. Accessed Jan 30 2020. https://www.primaryhealthtas.com.au/wp-content/uploads/2018/09/A-Guide-to-Deprescribing-Bisphosphonates-2019.pdf
7. Black DM, Schwartz AV, Ensrud KE, et al. Effects of Continuing or Stopping Alendronate After 5 Years of Treatment: The Fracture Intervention Trial Long-term Extension (FLEX): A Randomized Trial. JAMA. 2006;296(24):2927–2938. doi:10.1001/jama.296.24.2927
8. Primary Health Tasmania. A guide to deprescribing opioids. Accessed Feb 18 2020. https://www.primaryhealthtas.com.au/wp-content/uploads/2018/09/A-Guide-to-Deprescribing-Opioids-2019.pdf
9. Choosing wisely. Cholesterol drugs for people 75 and older – when you need them- and when you don't. Accessed Jan 28 2020.
10. Martin Bødtker Mortensen and Erling Falk. Primary Prevention with Statins in the Elderly. Journal of the American College of Cardiology Volume 71, Issue 1, January 2018 DOI: 10.1016/j.jacc.2017.10.080
11. Primary Health Tasmania. A guide to deprescribing statins. Accessed Jan 28 2020. https://www.primaryhealthtas.com.au/wp-content/uploads/2018/09/A-Guide-to-Deprescribing-Statins-2019.pdf
12. Government of Canada. About Natural Health Products. Accessed Feb 18, 2020. https://www.canada.ca/en/health-canada/services/drugs-health-products/natural-non-prescription/regulation/about-products.html