

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Table of Contents

Background	2
Recommendations for Individual Prescribers	4
Acute Prescribing (i.e., Acute Injuries and Perioperative Pain)	4
Intermittent Opioid Use.....	5
Co-Prescribing with Opioids.....	5
Prior to initiating opioids	5
Patients already using long-term opioids with other CNS-active drugs.....	6
Non-Opioid Pharmacologic Pain Management.....	6
General recommendations	Error! Bookmark not defined.
Medication recommendations	Error! Bookmark not defined.
Non-Pharmacologic Chronic Pain Management.....	8
Tapering/De-prescribing of Long-Term Opioid Therapy	9
Recommendations for Healthcare Delivery Sites and Systems	11
Evidence.....	13
Acute Prescribing	13
Intermittent Opioid Use.....	16
Co-Prescribing Opioids.....	16
Interventions.....	Error! Bookmark not defined.
Non-Opioid Pharmacologic Pain Management:	19
Non-Pharmacologic Pain Management	19
Tai chi.....	22
Yoga	24
Chiropractic therapy	25
Mindfulness-Based Stress Reduction (MBSR).....	27
Heat therapy.....	28
Acceptance and Commitment Therapy (ACT).....	28
Tapering/Deprescribing Long-Term Opioid Therapy	30
References	32

Background

The 2015 update of the Washington State Agency Medical Director's Group's (AMDG) *Guideline on Prescribing Opioids for Pain* included a brief section on specific risks and challenges related to opioid use in the older adult population.¹ The challenges of treating this population are multifactorial, including changing pharmacodynamics and pharmacokinetics, increasingly complex drug interactions, especially with other central nervous system (CNS)-active drugs, presence of severe co-morbidities, declining cognitive function, increasing social isolation, and complex care support needs.²

The treatment of chronic pain and prescribing of opioids in older adults is an increasingly relevant topic given the aging of the US populations. In 2019, there were 54.1 million Americans over the age of 65. From 1900 to 2019 the percentage of Americans over 65 in the population has almost quadrupled from 4.1 % to 16 % while the number of those over 65 has increased more than 17 times. The percentage of older adults in the population is projected to continue to increase to 21.6% of the population by 2040 (Administration for Community Living, "2020 Profile of Older Americans," May 2021, at https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2020ProfileOlderAmericans.Final_.pdf).

The need to focus on this topic has become compelling with the publication of a 2018 report from the Agency for Healthcare Research and Quality that highlighted increasing rates of opioid-related hospitalizations amongst older adults, with the highest reported median rates in Oregon and Washington.³ While opioid prescribing and mortality specific to prescribed opioids have fallen in recent years, between 2017-2018, the CDC reported a 4.8% **relative increase in the** opioid-related mortality rate for persons ≥65 years between 2017 and 2018.⁴

Unique challenges in this population must be recognized and addressed to avoid severe harm, especially in frail older adults. Normal aging is associated with multiple, non-uniform changes throughout the nervous system that may each contribute to age differences in the pain experience. Aging is associated with increases in baseline inflammatory activity and prevalence of neuropathies, along with potential impairment of visual acuity, and changes in pain threshold and tolerance. However, the impact of age differences on pain intensity and qualities are unclear, with conflicting reports of increases, decreases and no change across age groups. Aging also leads to changes in pharmacokinetics that may lead to alterations in absorption, distribution, protein binding, metabolism, and excretion. This may result in higher peak drug levels, delayed clearance, longer duration of action and higher rates of side effects.

One possible approach to address this is the Medication Therapy Management Program under Medicare. The intent of this program is to optimize therapeutic outcomes and reduce adverse outcomes through improved medication monitoring and use. For eligible Medicare patients, this program provides for an annual Comprehensive Medical Review with consultation between the prescriber and reviewer, as well as quarterly Targeted Medication Reviews, as necessary.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Many psychosocial influences from advancing age, such as social isolation and losing one's spouse can lead to depression and anxiety, which can impact the perception of pain. Fear of re-injury, for example, may play a strong mediating role between catastrophizing and depression and pain disability among older patients. In addition, there is widespread acknowledgement of the integral role of psychological and social factors in the treatment of pain. Taken as a whole, an integrated, coordinated, and individualized approach may be particularly important in the Medicare population to assure optimal pain management.

As a whole, published evidence (for both older adults and for the general populations) supports interventions using multidisciplinary teams that may not always be available to providers or delivery systems. The availability of these type of services may be particularly important in cases of tapering or deprescribing of opioids.

Areas of focus are organized around clinical decision points as shown in **Table 1**. This guideline focuses on specific concerns regarding opioid use in older adults, but does not encompass all aspects of opioid prescribing. For additional guidance on opioid prescribing, refer to previous [Bree opioid guidelines](#).

Table 1: Focus Areas

Focus Area	Goal(s)
Acute prescribing, including acute injuries and peri-operative	Prevent transition to long term opioid use
Intermittent opioid therapy	Allows minimal use of opioids for older adults with severe flare-ups of chronic pain
Co-prescribing with opioids with CNS-active medications	Reduce impacts on cognition, falls, delirium
Non-opioid pharmacologic pain management	Evidence base and risk/benefit
Non-pharmacologic pain management	Evidence base and risk/benefit (e.g., CBT, active exercise)
Tapering/deprescribing	Differentiators with recent Bree recommendations for patients on long-term opioid therapy

Recommendations for Individual Prescribers

Acute Prescribing (i.e., Acute Injuries and Perioperative Pain)

Prior to Procedure and Prescribing

- Perform a risk assessment for the **development of** severe acute **postoperative** pain and adverse effects from opioids prior to prescribing (risk factors are outlined in the table below from the [2015 Washington State Agency Medical Directors' Group \(AMDG\) guidelines](#) and [2018 Bree Collaborative Guidelines on Prescribing Opioids for Postoperative Pain](#)).
- Engage in proactive pain management planning, including pharmacologic and nonpharmacologic methods of pain management. Establish realistic goals and expectations with the patient and family or caregiver (if present) including:
 - Control of pain while maximizing function,
 - Minimizing adverse events,
 - Planning for and addressing side effects, and
 - Plans to reduce and discontinue opioid therapy to avoid long-term opioid use (≥ 3 months).
- Designate a provider to be responsible for managing ongoing acute or postoperative pain, including reassessing the patient, establishing policy for opioid refills, and prescribing additional opioids, if indicated.

Table 2: Risks for Difficult-to-control Postoperative Pain

History of severe postoperative pain
Opioid analgesic tolerance (daily use for months)
Current mixed opioid agonist/antagonist treatment (e.g. buprenorphine, naltrexone)
Chronic pain (either related or unrelated to the surgical site)
Psychological comorbidities (e.g. depression, anxiety, catastrophizing)
History of substance use disorder
History of "all over body pain"
History of significant opioid sensitivities (e.g. nausea, sedation)
History of intrathecal pump use or nerve stimulator implanted for pain control

When Considering Initiating Opioids

- Start at 25% to 50% of what would be initiated in a younger adult and extend the dosing intervals.
- Use lowest dose for shortest duration possible, prescribing <7 days (ideally ≤ 3 days) (consistent with CDC guidelines and WA pain rules).
- Avoid complicated regimens. Consider the patient's other medications (e.g., muscle relaxants, antihistamines, anticholinergics).
- Use caution with morphine due to variable renal function and potential accumulation of active metabolites.
- Avoid long-acting opioids for acute pain (methadone, levorphanol, fentanyl patch or opioids delivered by extended-release formulations).

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

During Discharge and Follow-up

- Maintain a high vigilance for opioid side effects (e.g., respiratory depression, constipation with need for bowel prophylaxis, delirium, psychomotor effects that may increase risk of falls) and signs of potential misuse.
- Track opioid use and signs of potential misuse and related functional status with outcome measures (e.g., mood, mobility, activities of daily living, sleep, appetite, cognitive impairment, and weight changes).
- Be attentive to varying degrees of cognitive impairment that may impact opioid and other medication safety. Provide clear oral and **written instructions that are legible for older adults with vision changes** on:
 - Risks, safe use, and storage of opioids and proper disposal of **unused** controlled substances through [Safe Medication Return Program](#) or [Take Back Your Meds](#)
 - How to contact the designated provider who is responsible for managing ongoing acute or postoperative pain, including who will be prescribing any opioids, the policy for refills and follow-up evaluations.
 - Plans for tapering of acute opioids, including a timeline for return to preoperative or lower opioid dose for those on chronic opioids.

Intermittent Opioid Use

There is a **dearth of** mostly indirect published evidence on this topic. Thus, the following recommendations are based primarily on a consensus of expert opinion:

- Consider prescribing intermittent opioid therapy for chronic conditions with sporadic flares of severe pain **only if it is likely to improve physical and social function.**
- Use the lowest-dose of short-acting opioids possible, avoiding prolonged (more than a few days) and continuous (**around-the-clock**) use.
- Re-evaluate frequently for risk of falls, sedation, and other opioid-related adverse effects, as risk changes with advancing age and use of other CNS-active medications and alcohol.

Co-Prescribing with Opioids

Prior to Initiating Opioids

- Consider non-pharmacologic **modalities** for pain management to prevent co-prescribing opioids with CNS-active medications, especially benzodiazepines, **benzodiazepine receptor agonists (BZRAs)**, skeletal muscle relaxants and gabapentinoids. **See page XX** for non-pharmacologic chronic pain management.
- If opioids are determined to be necessary, perform a targeted medication review for benzodiazepines, **BZRAs**, skeletal muscle relaxants, and gabapentinoids. Identify reason for use and determine whether medication(s) are still needed. Taper other medications, if possible, prior to prescribing opioids to limit exposure to co-prescribing. If available, use a collaborative team-based approach.
 - If a CNS-active drug is prescribed by another provider, consult with that provider to develop a coordinated care plan.
 - If benzodiazepines are prescribed by a provider who is not a behavioral health specialist, consult with a psychiatrist or psychiatric ARNP.
 - Although a combination of opioids and gabapentinoids is not recommended in older adults, guidelines make exceptions for co-prescribing when transitioning from opioid

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

therapy to gabapentinoids or when using gabapentinoids to reduce opioid dose.

Carefully monitor patient for potential harmful side effects.

- Educate patients and caregivers on the risk of opioids in combination with benzodiazepines, BZRAs, skeletal muscle relaxants, and gabapentinoids, including instructions to be vigilant for adverse drug effects (e.g. falls, driving impairment, sedation). Use teach-back methods to ask that adverse drug effects be reported to the prescriber.
- Deprescribe CNS-active drug combinations, whenever possible. See [page XXX](#) for tapering and deprescribing.

Patients Already Using Long-term Opioids with Other CNS-active Drugs

- Re-evaluate chronic pain care plan with patient and their family, if available, at a **frequency** based on risk assessment (e.g., at least quarterly for high risk, biannually for moderate and annually for low risk) and look for opportunities to deprescribe targeted CNS-active drug combinations.
- For qualifying Medicare patients, encourage participation in a [Medication Therapy Management Program](#), thereby ensuring access to annual Comprehensive Medication Review and quarterly Targeted Medication Reviews, as indicated.
- Monitor for adverse effects from opioids and other CNS-active medications. When an adverse effect is identified, re-evaluate risks vs potential benefits and the chronic pain care plan.
- Review non-pharmacologic **modalities** for pain management with the patient, especially prior to deprescribing CNS-active drugs.
- Educate older patients and caregivers on the risk of opioids in combination with benzodiazepines, **BZRAs**, skeletal muscle relaxants and gabapentinoids. Provider, patient and/or caregiver should participate in shared decision-making to minimize risk of drug-related adverse outcomes.

Non-Opioid Pharmacologic Pain Management

General Recommendations

- While the primary goal of managing chronic non-cancer pain is improvement in function and quality of life rather than a focus on pain relief, this is especially true in the older adult population. Working together with the patient and their caregiver to establish goals and expectations for pain control is essential. Providers should continually seek to understand the individual's treatment goals and monitor those goals regularly.
- Avoid systemic polypharmacy whenever possible ([see page XX](#) for co-prescribing with opioids).
 - Adequate pain management, especially for neuropathic pain, frequently results in the use of more than one medication and may lead to polypharmacy. This practice must be carefully scrutinized in the older adult to weigh the potential benefits for improved pain management against the potential harms, such as an increased risk of falls, confusion, and development of “prescribing cascades” – the use of additional medications to treat the adverse side-effects of previously prescribed medications.
- Using shared decision-making strategies, providers must consider existing co-morbidities and current medications when selecting non-opioid medications for pain.
- When considering non-opioid medications for chronic pain, provide older patients and their caregivers with information about evidence-based chronic pain treatments and educational materials on the harms of polypharmacy and the benefits of deprescribing.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

- Since age does not always correlate with physiology, give particular attention to renal function (estimated glomerular filtration rate) when prescribing non-opioid medications for pain.
- Older adults are more susceptible to adverse drug effects (ADEs) and are at higher risk of serious consequences from the ADEs. Regularly assess functional status. Screen for and assess the risk for medication-related adverse events such as falls, sedation, and changes in cognition.

Drug Selection & Initiation

- Consult professional resources such as the Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults for guidance in selection and dosing of non-opioid medications for pain.
- In general, initiate therapy with systemic medications at 25-50% of the typical starting dose used for a younger adult. Use longer dosing intervals and titrate slowly with close observation.

Medication Recommendations

- Initial Non-opioid Medications – give first-line consideration to:
 - Acetaminophen
 - Acetaminophen is a safe, effective, and well tolerated first-line treatment for acute and chronic mild to moderate pain in older adults. It potentiates other analgesics, including opioids. Maximum daily dose of acetaminophen is 4 grams per day for short-term use in adults, and 2-3 grams per day for frail older adults. To prevent liver toxicity, patient education on the maximum daily dose is important, as acetaminophen is available over-the-counter (OTC) and is contained in many OTC combination products such as Nyquil® and Contact® cold and flu products.
 - Topical Analgesics
 - Non-systemic topical medications, including topical non-steroidal anti-inflammatory drugs (NSAIDs), such as diclofenac 1% gel, topical lidocaine and topical capsaicin are recommended. These agents are effective for many conditions, are well-tolerated, and are useful for multi-modal pain management approaches.
- Medications to Use with Caution:
 - Oral NSAIDs
 - Oral NSAIDs are particularly dangerous for long-term use by older adults due to risk of gastric bleeding, renal impairment, development of cardiovascular disease, and fluid retention, which can lead to worsening of heart failure and hypertension. However, oral NSAIDs may be used with caution for short-term use (1-2 weeks) for acute pain that is amenable to anti-inflammatory therapy (such as gout), with careful assessment of the harm-to-benefit ratio and specific contraindications. Educate patients that oral NSAIDs are for short-term use only and to avoid OTC combination preparations that contain NSAIDs.
 - Serotonin Norepinephrine Reuptake Inhibitors (SNRIs)
 - Consider SNRI agents, such as venlafaxine and duloxetine, for adjuvant treatment of neuropathic pain, fibromyalgia, and low back pain if other therapies are ineffective, as there is good evidence of effectiveness. Utilize care in patient selection, initiate at a low dose with slow titration, and monitor carefully for side effects such as falls or changes in cognition.
The Beers Criteria® has a weak recommendation to avoid this class of drugs in older adults, and thus, they should be used with caution.
 - Gabapentinoids

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

- Gabapentin and pregabalin **may be carefully considered** when managing neuropathic pain, back pain, and fibromyalgia in older adults if other therapies are ineffective. However, they may be problematic due to increased risk of falls and cognitive impairment. Careful patient selection, initial low dose, slow titration, and close monitoring for side effects such as falls or changes in cognition is essential. Dose reduction is required if GFR is <60 mL/min. Combining gabapentinoids with opioids and benzodiazepines **should be avoided**, especially in frail older adults, as there is “evidence of substantial harm” with this combination.
- Medications to Avoid:
 - Tricyclic Antidepressants
 - Although multiple studies have demonstrated good evidence for tricyclic antidepressants (TCAs), such as amitriptyline, desipramine, and nortriptyline, to reduce the pain of postherpetic neuralgia and painful diabetic peripheral neuropathy in older populations, these drugs may have substantial **anticholinergic side effects resulting in dry mouth, blurred vision, constipation, urinary retention, postural hypotension, and cognitive problems**. TCAs also may increase the risk for syncope, falls, fractures, and bradycardia. Thus, the Beers Criteria® strongly recommends against TCA use in older adults.
 - Muscle Relaxants
 - Skeletal muscle relaxants, such as methocarbamol and cyclobenzaprine are poorly tolerated by older adults due to anticholinergic side effects. In addition, carisoprodol is metabolized to meprobamate, a controlled substance. The Beers Criteria® recommends avoiding these drugs.

Nonpharmacologic Chronic Pain Management

Non-pharmacologic modalities can be effective in managing chronic pain conditions, but they are subject to variable coverage by insurers and can be limited by which pain condition a patient has, based on limited supportive evidence. Nonetheless, the workgroup strongly recommends making at least several of the non-pharmacologic modalities available as a safer alternative to pharmacologic therapy for addressing pain in older adults. Some of these modalities may be accessed either through insurance mechanisms or through alternative resources such as community organizations (e.g., senior center programs, YMCAs). Cognitive-behavioral therapy and exercise have the strongest support for multiple chronic pain conditions. However, providers should consider which multimodal combinations of the following therapies may have added benefits beyond improving pain and function. For example, exercise and tai chi may help both pain and balance, thus reducing fall risk in older adults.

- Recommend:
 - Cognitive-behavioral therapy (CBT) for multiple chronic pain syndromes. Amongst the non-pharmacologic modalities, CBT has the strongest evidence of effectiveness.
 - Regular exercise. **All older adults should do multicomponent physical activity that includes balance training, as well as aerobic and muscle-strengthening activities. Older adults should start at their current level of fitness, pain condition and recommendations from physical therapy and gradually increase activity to improve fitness. Remind patients that any physical activity is better than none.**
- Consider:

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

- Chiropractic care, including spinal manipulation, in-office and home-based therapeutic exercise, for pain reduction, medication reduction and functional improvement in musculoskeletal pain conditions.
- Mindfulness-Based Stress Reduction (MBSR) to help patients be aware of behavior patterns related to stressful situations and choose how to respond. While the time commitment required for a full program may not be feasible for all patients, incorporating mindfulness practice into daily living can help patients develop an awareness of how they respond to and live with chronic pain.
- Regular tai chi practice (~~approximately 60 minutes twice weekly~~) for pain reduction in multiple chronic pain syndromes.
- Yoga, either alone or coupled with other pain management strategies, such as mindfulness-based stress reduction, for pain reduction in multiple chronic pain syndromes and settings.
- ~~Recommend nutritional counseling and lifestyle education~~
 - Heat therapy, both as adjunctive therapy with other complementary therapies (e.g., massage) and as a self-care measure at home, for pain reduction in multiple chronic pain syndromes in addition to other non-pharmacologic pain management strategies.
 - Acupuncture for pain management, either alone or in combination with other therapies, for chronic neck pain, chronic low back pain, and for chronic migraine. In addition, emerging evidence supports the use of acupuncture for acute post-surgical pain.
 - Therapeutic massage, either alone or coupled with multi-modal pain management strategies, for pain reduction and functional improvement associated with specific pain syndromes commonly seen in the geriatric population.
 - Acceptance and Commitment Therapy (ACT) can help patients with chronic pain improve their functional status despite the experience of pain by moving away from controlling pain. This can be recommended as an adjunctive therapy with multidisciplinary pain management, as well as other complementary therapies for chronic pain (e.g., tai chi).

Tapering/De-prescribing of Long-Term Opioid Therapy

Tapering (reducing dosage or deprescribing) of long-term opioid therapy (LTOT) is possible and beneficial for many patients, but can be risky depending on how quickly the dose is being reduced and on the characteristics of the patients themselves. Potential risks of tapering include: illicit opioid use, opioid overdose, suicide or other mental health crisis.

- Review the [2020 Bree Collaborative Guideline on Long-Term Opioid Therapy](#) that builds on the [HHS Guide for Clinicians on the Appropriate Dosage Reduction or Discontinuation of Long-Term Opioid Analgesics](#) and walks clinicians through:
 - Establishing a relationship: patient engagement
 - Assessment, and
 - Three possible treatment pathways:
 - Maintain and monitor
 - Tapering or discontinuation of opioids
 - Transition to medications for opioid use disorder (MOUD)

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

- As for all populations, tapering or deprescribing for older adults should be supported, gradual and as patient-centered as possible.
- Increase use of motivational interviewing approaches to draw on intrinsic motivations to taper.
- Talk to the patient and their family or caregivers about **any negative or disappointing experiences** with long-term opioid therapy **and the potential benefits of an opioid taper**. ~~for developing a taper plan. how this experience has been for them including benefits and whether they have experienced any side effects or harms (e.g., increased sedation, cognitive slowing, and other side effects).~~
- Ensure that tapers are negotiated with patients, and the speed of the taper does not exceed guideline-recommended taper speeds.
- Ensure that all providers offer patients a variety of nonpharmacologic pain treatments.
- Ensure that all providers assess for opioid use disorder (OUD) and offer OUD/MOUD treatment to older adults, when indicated.
- Increase use of motivational interviewing approaches to draw on intrinsic motivations to taper.
- If possible, connect the patient to others who have successfully tapered for peer-to-peer support.
- Assess each patient for anxiety, depression, suicidality, and insomnia. Refer to behavioral health, preferably integrated. Use CBT and non-addictive psychotropic medications, when indicated.
- Develop tapering/deprescribing plans that are collaborative and multidisciplinary, including in collaboration with pharmacy, behavioral health, and patient/caregiver. Follow patients closely during taper process.
- Consider transition to buprenorphine for patients at high risk who are unable or unwilling to taper regular opioids.

Recommendations for Healthcare Delivery Sites and Systems

Healthcare systems and health plans can adopt many policies and strategies to support safe, patient-centered, and evidence-informed opioid prescribing practices.

Accountability

- Track prescribing practices and drug-related adverse outcomes.
 - Develop a plan to monitor opioid-related adverse outcomes (e.g. falls, impaired cognition) and key prescribing/tapering metrics.
 - Use peer comparison reports and transparent benchmark data reporting that leadership can use to talk with prescribers.
- Set the expectation that providers will perform and document a standardized medication review, including reviewing the Prescription Monitoring Program (PMP), for all opioid prescribing visits.

Comprehensive Medication Review

- Provide clinical decision support tools within the EHR that consider age, current medications, and comorbidities when prescribing medications to older adults to treat pain.
- Integrate the PMP into the EHR to identify older adults with co-prescribing of opioids and selected CNS-active drug classes for medication review. Be aware of need to coordinate care when the co-prescribing is from multiple providers.
- Establish the infrastructure for providing Medication Therapy Management, including annual Comprehensive Medication Reviews and quarterly Targeted Medication Reviews, for qualified Medicare patients.
- Provide adequate resources to perform comprehensive medication review during care transitions and at frequent intervals during follow-up outpatient visits.

Team-based Approach

- Develop multidisciplinary, collaborative teams to support older adults with acute or chronic pain.
 - Designate a responsible care coordinator (e.g., health service coordinator, nurse case manager) to facilitate smooth and safe transitions specific to the opioid and pain management plan.
 - Consider including a pharmacist to co-manage older adults on opioids and to support tapering plans.
- Improve access to specialty care (e.g., pain management specialist or psychologist) for patients attempting to begin tapering, especially for patients unable to taper in primary care due to complex care needs.
 - Support close follow-up of patients to help ensure the taper is occurring safely over time.
 - Establish processes to enable warm handoffs of patients between primary and specialty providers when they are not located in the same system.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

- Consider creating or collaborating with a multidisciplinary pain treatment program, such as a Structured Intensive Multidisciplinary Program (SIMP), to ensure access to intensive, multimodal treatment options, when indicated. This can be a helpful venue for patients being tapered off long-term opioids.

Education

- Educate older persons and their caregivers about non-opioid pharmacologic pain management options, including associated risks and benefits. This should include education on the potential dangers of polypharmacy and potential benefits of deprescribing. Ensure that written materials are legible for older adults with vision changes.
- Train or provide access to training for motivational interviewing and shared decision-making regarding health risks from long-term opioid therapy and reasons to taper.
- Educate providers and staff about pain management and other issues particular to the older adult patient population, including:
 - Age-related changes in pain perception and pain thresholds
 - Differential aging effects, resulting in the need for a more individualized approach
 - Responses to medication
 - Comorbidities (medical and psychological), resulting in polypharmacy
 - Psychosocial concerns
 - Importance of avoiding co-prescribing of CNS-active drugs

Expand Access

- Provide adequate access to at least some nonpharmacologic modalities to manage pain, improve patient self-efficacy, and address sleep disturbances for older adults.
- Expand coverage for topical medications.
- Connect older adults to community resources (e.g., senior centers, YMCAs) for nonpharmacologic strategies, such as exercise and tai chi, for both physical benefits and decreased social isolation.

Evidence

Acute Prescribing

Optimal pain control following surgery is important for functional recovery and for reducing the risk of post-surgical complications, and persistent postsurgical pain and is best managed using a multimodal approach.⁵ While opioids serve as the cornerstone for severe acute postoperative pain management, the need for persistent use is rare. Long-term opioid use often begins with treatment of acute pain. Though not a harm per se, long-term opioid use may increase the risk of harms if not appropriately managed (AHRQ). “The largest increments in probability of continued opioid use were observed after the fifth and thirty-first days on therapy; the second prescription; 700 morphine milligram equivalents cumulative dose; and first prescriptions with 10- and 30-day supplies.”⁶ There is little high-grade evidence on risk of transition to long-term opioid use specific to advancing age by decade of life. A population study of opioid naive adults ≥65 years of age found 6% transitioned to persistent opioid use >90 days.⁷ In a separate study, during a 1-year follow-up period of Medicare beneficiaries new to opioids, 6.5% had transitioned to long-term opioid use.⁸ Transition rates to long-term opioid use following minor and major surgical procedures appear similar (5.9% and 6.5% respectively), and it appears that individual patient characteristics were more important than the characteristics of the surgical procedure.⁹ Similar rates have been reported for opioid-naïve patients remaining on opioid medication 12 months after sustaining fragility fractures of the hip, proximal humerus, or distal radius.¹⁰ In comparison, 12-24% of patients with new back pain remained on opioids at 12 months, though this may, in part, represent chronic pain care.¹¹

Multiple studies suggest a number of patient, prescriber, and system factors contribute to unintended, persistent opioid use.^{12,13,14,15} Age is associated with persistent opioid use, particularly age greater than 50,^{16,17} as is white race, higher income and Medicaid dual-eligibility.¹³ Characteristics associated with long-term opioid use include low income, older, females, poor health, new/chronic back pain, opioid initiations with long-acting opioids or tramadol, prescriptions for other pain, sleep or antipsychotic medication and pre and/or post mental health issues.⁵ Additional patient risk factors include comorbid posttraumatic stress, past or current nicotine use, past or current substance use disorder, social isolation and loneliness.¹⁸ Persistent opioid use has also been associated with presence of diabetes, pulmonary disease and heart failure.¹⁹ There is substantial variation in opioid use between states, even after accounting for patient and procedure characteristics associated with opioid use,²⁰ suggesting influence of individual prescriber behavior and local conditions. Prescriber characteristics potentially associated with prescribing of prolonged opioid treatment include personal attitudes, knowledge, beliefs and former training.²¹ Systems level factors that may facilitate or reduce unintended prescribing include health organizations’ structure, culture and processes, prescriber education and legislative rules and policies.

Bio-physiologic changes that occur with aging, accumulation of comorbidities, co-prescriptions of medication, frailty, and psychosocial changes increase risk of opioid treatment. Pharmacokinetic changes and enhanced pharmacodynamic sensitivity (i.e., more pronounced effects at equivalent doses

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

used in younger adults) occur with all opioids with age,^{22,23} leading to recommendations to start opioid therapy with about 50% of the usual adult dosage.²⁴ Age-related pharmacokinetic changes are especially important to consider when using drugs with active metabolites. In the case of morphine, declining renal function may result in accumulations of the active metabolite, morphine-6-glucuronide, resulting in toxicity. The American College of Surgeons Best Practices Guidelines for Acute Pain Management in Trauma Patients (2020) recommends a decrease in the initial dose of an opioid by 25% in 60-year-old patients, and by 50% for 80-year-old patients; but to administer at the same intervals.

Initiation of opioid and antiepileptic use and polypharmacy in older adults are significantly associated with increased risk of falling in meta-analyses.²⁵ A case series of more than 500,000 adults reported a nearly four-fold increase in the risk of fracture associated with periods of opioid exposure compared to non-use.²⁶ Though no differences were found by age, the associated risk for fracture was highest in the first seven days of opioid initiation (adjusted incidence rate ratio: 7.81, 95% confidence interval). Long-term postoperative opioid use is associated with decreased use of planned healthcare utilization, such as follow-up with medical appointments and participation in postoperative rehabilitation sessions.²⁷ Older adults with prolonged use of central nervous system depressant medication such as opioids report lower scores on self-reported health-related quality of life and have higher odds of having more problems performing usual activities.²⁸

Exposure to opioids for the purposes of acute pain relief can progress to physical dependence and/or the onset of opioid use disorder (OUD). Older drug users are growing in number with many presenting for substance use treatment for the first time at the age of 50–70 years.²⁹ There are two distinct types of problem substance users among older people; “early-onset” and “late-onset” users. “Early-onset” refers to those who have a long history of substance use, who continue to use as they age, while “late-onset” includes individuals who develop a new OUD as elders.³⁰ As individuals age, they are less likely to obtain prescription opioids illicitly and more likely to obtain prescription opioids via the medical community.³¹ One study reported that 40-50% of adults 50 and older who misused prescription opioids obtained those medications through physicians.³² Alcohol use among older adults, including past-month binge alcohol, is also increasing, particularly among females, and is a significant safety concern for acute or persistent opioid treatment in older adults who may self-medicate loss, grief and loneliness.³³

A range of comprehensive system-level strategies have been utilized in various settings to alleviate the problem of inappropriate prescribing of opioids.³⁴ These include organizational support, automated decision support systems, and tools for individual feedback. Systems level interventions studied to address the opioid epidemic at large include (1) state legislation and regulation, (2) prescription drug monitoring programs (PDMPs), (3) insurance strategies, (4) clinical guideline implementation, (5) provider education, (6) health system interventions, (7) naloxone education and distribution, (8) safe storage and disposal, (9) public education, (10) community coalitions, and (11) interventions employing public safety and public health collaborations. A 2020 Agency for Healthcare Research and Quality (AHRQ) evidence review focused on reducing harm associated with opioid use in older adults reported interventions aimed at use of screening tools to predict opioid-related harms, but none of these tools

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

was tested in clinical practice to assess real-world results. Other studied interventions included use of the prescription monitoring program, multidisciplinary pain education for patients, an educational pamphlet for patients, implementation of an opioid safety initiative, provision of patient information and pain management training for clinicians, a bundle of educational modalities for clinicians, free prescription acetaminophen, a nationally-mandated tamper resistant opioid formulation, and motivational interview training for nursing students.

Well-executed patient handoffs at all points of care transition, patient and caregiver education attuned to the patient's cognitive status, and care coordination provide opportunities for patient safety and prevention of unintended long-term prescribing. Opioid analgesics are one of the most common medications that account for discrepant medications at time of transfer from hospital to skilled nursing facilities highlighting the importance of medication reconciliation at time of transition of care providers. One intervention that has been shown to be feasible and to promote faster return to preoperative opioid doses and definitive opioid cessation is a telephone-based motivational-interviewing intervention focused on providing opioid tapering reductions of 25% of the total opioid dose every seven days for patients with preexisting pain and opioid use who underwent orthopedic surgery.³⁵ However, many elderly patients experience cognitive impairment, memory loss and confusion that can be confounded by sight and hearing impairment. This can lead to problems with patient counseling and adherence to medication instructions. Medication hoarding is a problem for some older adults, with prevalence of hoarding behaviors increasing with age.³⁶ Thus, the caregivers' perspective is important for assessing medication and when providing instructions to discontinue and properly dispose of unused quantities of opioids.

In summary, there are insufficient data based on age, risk factors and specific acute pain conditions to recommend a specific strategy for prevention of persistent acute or postoperative opioid use.³⁷ Specific approaches used to reduce unintended transition from acute to long-term opioid use include prescribing limitations,³⁸ acceptance and commitment therapy delivered by a mobile phone,³⁹ motivational interviewing, development of a multidisciplinary transitional pain service to identify at-risk patients and optimize pain management upon discharge from hospital⁴⁰ and deprescribing algorithms.^{41,42} The practicality of implementing these types of measures is limited, as is the likelihood of a single intervention being successful. However, the body of evidence as a whole suggests that enhanced care coordination between surgeons and primary care physicians allows for earlier identification of patients at risk for new persistent opioid use in order to prevent misuse and dependence⁴³ and to reduce the duration of acute opioid treatment. The majority of acute opioid prescribing should be ended within days for all patients but particularly for older adults due to numerous risks. For patients whose acute opioid tapering has not begun by six weeks after surgery or injury, Washington state [rules](#) require a provider to reevaluate the patient based on opioid effects on function and pain control and determine whether opioids should be continued, tapered, or discontinued. In addition to a clear understanding of the patient's treatment goals and expectations, comorbidities and medication risks, cognitive and

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

functional status, a consistent prescriber and care coordination of community resources and family support are important for pain treatment in later life.^{44,45}

Intermittent Opioid Use

Very few published studies have specifically addressed the use of opioids intermittently for presumably chronic painful conditions, and even fewer have done so among older adults.

Paulozzi et al⁴⁶ assessed the risk of adverse health outcomes in a nationally representative commercial insurance database among those 18-64 years old who (1) took no opioids, (2) took opioids daily, and (3) took opioids less than daily. In this population of patients followed between 2008 and 2010, the proportion using opioids intermittently (43.6%) exceeded the proportion who used opioids daily (25%). Daily users accounted for 25.0%, less than daily users for 43.6%, and nonusers for 31.4% of opioid analgesic overdoses. These authors concluded that intermittent users are also at increased risk of overdose and that guidelines should address this subset of opioid users specifically.

Cooper et al⁴⁷ conducted an experimental trial among a small group of normal human volunteers using the cold pressor test. Over a five-day period, intermittent dosing with oxycodone was associated with greater subjective effects associated with abuse liability.

In a large prospective study at Group Health Cooperative, Turner et al⁴⁸ assessed patterns of opioid use among patients >45 years of age (mean age 63-65 years) with chronic non-cancer pain, and collected survey data on pain and activity interference at baseline, and at 4 and 12 months after opioid initiation. Patients with either no or low opioid use (opioid use once/week or less) reported better pain and pain interference than either the intermittent/lower dose group (5-<15 mg MED AND opioid use at least 2X/week) or the regular/higher-dose use group (>= 15 mg MED AND opioid use at least 2X/week).

In a study of critical illness admissions to the ICU in Ontario among patients >65 years of age, both chronic and intermittent opioid users had increased in-hospital mortality compared to non-opioid users; however the definitions of chronic vs intermittent use of opioids both included potentially high dose chronic use.⁴⁹

Co-Prescribing Opioids

Adverse drug reactions are a significant public health concern. According to the Centers for Disease Control and Prevention (CDC), adverse drug reactions result in approximately 1.3 million emergency department visits each year, with 350,000 patients requiring hospitalization.⁵⁰ It has also been estimated that hospitalized patients suffer over 2 million serious adverse drug reactions, resulting in over 100,000 deaths, annually. The associated cost of drug-related morbidity and mortality in the US is estimated to be \$136 billion, annually.⁵¹

Older adults are at increased risk for drug-related harm. One reason for this is that they often suffer from multiple chronic conditions, which may result in polypharmacy (i.e., use of five or more medications) and other potentially inappropriate medication use. In addition, age-related changes in

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

pharmacodynamics and pharmacokinetics from factors such as reduced hepatic and renal function and altered body composition make older adults more vulnerable to drug-related side effects. CNS-active drugs, such as opioids, benzodiazepines, skeletal muscle relaxants and gabapentinoids, are especially problematic for older adults due to a heightened risk for impaired cognition and falls.^{52,53,54} As such, the 2019 Beers criteria⁵⁵ recommends to avoid: (1) combining opioids with benzodiazepines because of increased risk of overdose, (2) combining opioids with gabapentin/pregabalin because of increased risk for severe sedation-related adverse events, including respiratory depression and death; and (3) to avoid combining three or more CNS-active drugs because of increased risk for falls and fractures. As such, prescribing for older adults poses unique challenges, and providers must use caution when prescribing for this population.

Polypharmacy involving central nervous system (CNS)-active drugs leads to increased risk for impaired cognition, fall-related injury, and death.^{52,53,54} This risk is especially high amongst older adults on opioids, for whom the use of CNS-active medications such as benzodiazepines, BZRAs, gabapentinoids, and skeletal muscle relaxants add additional risk.^{55, 56} The combination of opioids with benzodiazepines (increased risk of overdose) or gabapentinoids (increased risk of respiratory depression and death) may be inappropriate due to established risks. Evidence suggests **comprehensive medication review** is a key strategy in limiting inappropriate polypharmacy and exposure to drug-related adverse effects in this population.^{57,58,59,60,61,62,63}

Despite these concerns, polypharmacy remains high amongst older adults, with approximately 36% of community-dwelling older adults using at least five prescription medications and 15% being at risk for a major drug-drug interaction.⁶⁴ In a community-dwelling Medicare population, 13.9% of older adults with dementia met the criterion for CNS-active polypharmacy (defined as exposure to ≥ 3 medications for longer than 30 consecutive days from the following drug classes: antidepressants, antipsychotics, antiepileptics, benzodiazepines, nonbenzodiazepine receptor agonist hypnotics and opioids).⁶⁵

Polypharmacy may be an even greater concern in the inpatient setting. One study found that, on average, hospitalized older adults who were discharged to skilled nursing facilities were prescribed 14 medications, 40% of which are associated with geriatric syndromes, such as cognitive impairment, delirium, falls, reduced appetite or weight loss, urinary incontinence and depression.⁶⁶

Co-prescribing of opioids with CNS-active medications is increasing among older adults in the US. Co-prescribing of opioids and opioid potentiators, such as benzodiazepines, BZRAs and gabapentinoids, among US adults ≥ 65 years increased from 29.6 per 1,000 people in 2007-2008 to 35.8 per 1,000 people in 2017-2018.⁶⁷ The most common type of co-prescribing across all age groups in 2007-2008 was an opioid and benzodiazepine, but this was replaced with an opioid and gabapentinoid combination by 2017-2018. A Canadian population-based study found that, among those who received opioid prescriptions, 24% also received concurrent prescriptions for a benzodiazepine or BZRA.⁶⁸ Higher co-prescribing occurred in those patients older than 65. Amongst a population of US veterans with Alzheimer's disease and related dementias and severe pain, one in three have an increased likelihood

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

for a potentially inappropriate CNS-acting medication and/or opioids.⁶⁹ Another study in the Veterans Health Administration population found that 77% of veterans who received chronic opioid therapy also received psychotropics.⁷⁰ An analysis of data from the 2015 National Ambulatory Medical Care Survey found that 40% of medical encounters that involved a gabapentinoid also had an opioid co-prescription, and predictors for this included age, peaking at age 55-64 years.⁷¹

A study of Medicare recipients insured by UnitedHealthcare found that the same provider, generally a primary care provider, prescribed 60% of concurrent use of opioids with other CNS-active medications (benzodiazepines, BZRAs, muscle relaxants, gabapentinoids or antipsychotics) among older adults. In addition, concurrent use with ≥ 2 CNS-active medications increased the likelihood of falls/fractures by 18% and three or more ER visits by 21%.⁷²

There are a number of potential approaches for reducing risk of harm from polypharmacy in older adults, including medication review, enhanced care coordination, patient education/outreach, and system-based efforts via electronic health records (EHR), combined with deprescribing of CNS-active drugs. Several studies have examined the impact of medication review. In one study, a team composed of a geriatrician, a resident physician, and a pharmacist used two screening tools (2 STOPP and START) to assess the drug therapy of 52 residents of a French nursing home. A total of 101 drugs were stopped and 34 drugs were started.⁵⁷ In a study at the second largest teaching hospital in the Netherlands, the authors assessed the differences between medication reviews performed by a geriatrician, versus those performed by a pharmacist, and reports generated by a clinical decision support system software. The clinical decision support system and pharmacist both noted potential problems in significantly more categories than the geriatrician did, while the geriatrician provided more remarks in the “medication without indication” category. The authors concluded that the geriatrician, pharmacist, and clinical decision support system provide different insights, so combining these efforts could create a more effective and comprehensive report on medication profiles.⁵⁸ Another study examined medication review performed by a pharmacist, using STOPP, a drug-drug interaction database (SFINX), and Renbase® (renal dosing database) in older patients in the emergency department. A geriatrician received the medication review and decided which recommendations should be implemented. The median Medication Appropriateness Index score decreased from 14 at admission to 8 at 30-days post-discharge ($p < 0.001$), and during this same time, the number of patients with an Assessment of Underutilization Index score ≥ 1 was reduced from 36% to 10% ($p < 0.001$). Thirty days after discharge, 83% of the changes were sustained and 72% of the patients had one or more medications discontinued.⁵⁹

Toivo et al. assessed coordination of care to reduce medication risks in older home care clients in Finland. Home care nurses assessed medication risk during home visits and reported findings to the pharmacist, who prepared the cases for a triage meeting with the home care nurse and the physician. Each patient’s physician made the final decisions on medication changes. As a control, half of the participants with a recommended medication change had none of the medication changes actually implemented. This intervention showed a tendency for effectiveness in optimizing central nervous

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

system medication use.⁶⁰ Another study of care coordination retrospectively analyzed drug information inquiries (DIIs) from prescribing clinicians of Programs of All-Inclusive Care for the Elderly (PACE) to pharmacists during routine patient care. More than half of the 414 DIIs (53.9%) were due to medication safety concerns, and 38.6% of the inquiries involved CNS medications. In response, pharmacists made 389 recommendations for drug therapy change, and prescribers implemented at least 79.3% of those recommendations.⁴⁶ An investigation of pharmacist outreach to prescribers on patients with co-prescription of opioids and benzodiazepines among a Medicare population found that 66% of pharmacists' recommendations resulted in a medication discontinuation by the provider (40.2% benzodiazepines; 59.8% opioids).⁴⁷ Significant differences were seen in opioids discontinuation based on patient age ($p < 0.001$) and prescriber geographical region ($p = 0.0148$).

Martin et al. (2018) compared the effectiveness of a consumer-targeted, pharmacist-led educational intervention vs usual care on discontinuation of inappropriate medication among community-dwelling older adults. At 6 months, 106 of 248 patients (43%) in the intervention group no longer filled prescriptions for inappropriate medication compared with 29 of 241 (12%) in the control group. No adverse events requiring hospitalization were reported, although 29 of 77 patients (38%) who attempted to taper sedative-hypnotics reported withdrawal symptoms.⁴⁸ A newly emerging model for drug therapy assessment and intervention is the use of **targeted consultant pharmacist services**, who could serve multiple outpatient clinics within a healthcare system or provider group.⁴⁹

To investigate the effectiveness of a system-based approach, Zaman et al. evaluated an electronic intervention to improve safety for patients co-prescribed chronic opioids for pain and benzodiazepines in the VA Health Care System. A clinical dashboard identified 145 eligible patients prescribed chronic opioids and benzodiazepines. Individualized taper and safety recommendations were communicated to prescribers via electronic medical record progress note and encrypted e-mail. The number of patients co-prescribed significantly decreased from 145/145 (100%) at baseline to 93/139 (67%) at 6-month follow-up. Mean opioid and benzodiazepine doses significantly decreased from 85 to 66 mg and from 16 to 13 mg, respectively, from baseline to 6-month follow-up. The proportion of patients prescribed ≥ 100 mg morphine equivalent daily dose significantly decreased from 39/145 (26.8%) at baseline to 26/139 (18.7%) at 6 months, and patients with a combination of opioid overdose education and naloxone distribution significantly increased from 3/145 (2.1%) at baseline to 46/139 by the end of study.⁵⁰

Non-Opioid Pharmacologic Pain Management:

Evidence for Recommendations of Non-opioid Medications

The evidence for this section relies significantly on information published in the American Geriatrics Society (AGS) Beers Criteria.⁵¹ This is a list of *Potentially Inappropriate Medications* (PIM) that are usually best avoided by older adults (65 years and older) in most situations or under certain circumstances. Initially published by geriatrician Mark H. Beers in 1991,⁵² the Beers Criteria[®] is updated every 3 years, last in 2019. The authors are an interdisciplinary expert panel of 13 clinicians (physicians,

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

pharmacists, nurses). The literature search methods used for the 2019 update Beers Criteria Literature Review are described in the article on p. 675.⁵³

With a goal to improve the medical care for older adults by reducing the usage of PIMs that have an unfavorable risk benefit profile compared to alternative treatments, the 2019 Beers Criteria® update focused on five criteria. These include:

- Potentially Inappropriate Medications for most older adults
- Medications that should be avoided in older adults with certain conditions
- Drugs to be used with caution in older adults
- Drug-drug interactions to avoid
- Dose adjustment based on kidney function

Give First Line Consideration to Acetaminophen and Topical Agents

Acetaminophen

Acetaminophen (paracetamol) is a widely used first-line treatment for acute and chronic mild to moderate pain in older adults. In addition, it potentiates other analgesics. It is not included on the Beer's list of potentially inappropriate medications for older adults and is generally believed to be safe and effective in older adults. It is included on the World Health Organization's List of Essential Medicines, the most effective and safe medicines needed in a health system.

Maximum daily dose of acetaminophen is 4 grams per day for short-term use in older adults, and 2-3 grams per day for chronic use and for frail older adults.^{54,55} Liver toxicity is a potential risk with chronic use at the higher dose range, especially with older adults therefore lower daily doses are advised.⁵⁶ In addition, dose should be reduced by 50-70% in persons with hepatic insufficiency or alcohol abuse.⁵⁷ Patient education on the maximum daily dose is important to avoid liver toxicity, especially as acetaminophen is contained in combination with many prescription and OTC drugs.

Topical Analgesics

Topical applications are an option to provide analgesia for frail elders, as there is minimal to no systemic absorption of the drug.^{58,59} A potential drawback of topical analgesics is the need to apply directly to the painful area (in many cases, several times a day), which may be a challenge for some older adults with limited range of motion, functional skills, or cognition. Although found to have low effect sizes in management of pain from peripheral neuropathy, topical agents rate high for values, preferences and tolerability.⁶⁰

A systematic review and meta-analysis of 229 studies on pharmacotherapy for neuropathic pain was authored by the Neuropathic Pain Special Interest Group of the International Association for the Study of Pain. It included reviews of several topical agents. A "weak recommendation" was given for capsaicin 8% patches (high quality evidence) and lidocaine 5% patches (low quality evidence).⁶¹ (See table below from Finnerup et al.).

A 2021 review by Kocot-Kepska, et al. examined 23 randomized controlled trials (RCTs) and multiple case series and other reports on topical therapies were examined, with a focus on mechanistic features of various therapies.⁶² The highest quality data supported lidocaine 5% patches, capsaicin 8% patches and botulinum toxin-A injections for localized neuropathic pain conditions. The authors advocate the

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

use of topical agents due to excellent safety profiles and patient tolerability, especially for frail patients. Additionally, topical agents may target the underlying mechanisms of peripheral sensitization, which, if reduced early in the disease state, may reduce the development of central sensitization and overall worsening of the neuropathic pain condition.⁶³

Lidocaine 5% patches were developed in the 1990's and are FDA-approved for postherpetic neuralgia.⁶⁴ Small studies have tested them in other conditions, including knee osteoarthritis and low back pain.^{65,66} They are generally considered safe to use, with minimal systemic absorption.⁶⁷

Wolf et al. performed an analysis of 32 publications to determine the analgesia effectiveness and side effect profile of lidocaine 5% patches compared to pregabalin, gabapentin, capsaicin and placebo. They determined that lidocaine 5% patch is similar in efficacy to gabapentin, and more effective than capsaicin and pregabalin (when assessing change in pain from baseline). The lidocaine 5% patch had fewer clinically significant adverse effects than the systemic agents.⁶⁸ Although given a “weak” recommendation in the Finnerup (2015) meta-analysis, the authors indicate that topical agents such as lidocaine 5% patches may be a first-line therapy for older and frail adults who cannot tolerate systemic effects of oral therapies.⁶⁹ Lidocaine 5% patches require a prescription and are not always covered by insurance.

Capsaicin topical has been shown to be effective for neuropathic pain, such as postherpetic neuralgia, in multiple older studies. It reduces function of hyperexcitable nociceptors in the periphery, resulting in temporary destruction of peripheral nerve endings and reduction of pain.⁷⁰ Because it causes burning, topical cream application should be started with the lower OTC dose of 0.01% before increasing to the higher doses of 0.075% to 0.1%, applied four times a day. A high dose capsaicin 8% patch (Qutenza®) is also available. It is applied for 30 to 60 minutes, in clinic, after a topical local anesthesia pre-medication, and is effective for up to 3 months. In a RCT of 559 patients aged 18 to 90, suffering from peripheral neuropathic pain, capsaicin 8% patch was non-inferior to an optimized dose of pregabalin at 8 weeks.⁷¹ The authors report the high dose capsaicin patch provided rapid onset of action, few systemic side effects, and greater patient satisfaction. The systematic review and meta-analysis of medications for neuropathic pain by Finnerup, et al. (2015) gave a “weak” recommendation for high-strength capsaicin and consider it for second-line therapy for neuropathic pain, and “inconclusive” recommendation for OTC topical capsaicin cream.⁷²

Diclofenac 1% gel has been shown to be effective for treatment of knee osteoarthritis.⁷³ It is available OTC in the United States, and is applied three to four times a day for a week. Topical diclofenac patch 1.3% (Flector®, prescription only) is approved for acute sprain and strain. Although topical NSAIDs are safer than oral NSAIDs (significant fewer severe ADEs), some may report application site adverse effects such as dry skin, rash, or itching, which usually self-resolve when discontinued.

Non-opioid Adjuvant Analgesics to Use with Caution

Nonsteroidal anti-inflammatory drugs (NSAID)

The Beers Criteria® recommends avoiding chronic NSAID use unless alternative drugs cannot be used, and if used, gastric protective agents should be taken.⁷⁴ Likewise, the OARSi guidelines for management

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

of knee, hip and polyarticular osteoarthritis indicate oral NSAIDs are not recommended in patients with frailty or cardiovascular comorbidities.

Serotonin-norepinephrine Reuptake Inhibitors (SNRIs)

Serotonin-norepinephrine reuptake inhibitors (SNRIs) such as venlafaxine and duloxetine are frequently used as an adjuvant with other analgesics and with some evidence of effectiveness in the management of a wide variety of pains, including neuropathic pain, low back pain, and fibromyalgia.⁷⁵ In older adults, however, SNRIs may lead to increased gastric adverse drug effects and may cause or exacerbate hyponatremia or SIADH. Therefore, the Beers Criteria® lists a weak recommendation to avoid this drug class in older adults, especially those with eGFR <30 mL/min or have a history of falls or fractures.⁷⁶ If utilized, there is a strong recommendation to use SNRIs with caution.

Gabapentinoids

Gabapentinoids, such as gabapentin and pregabalin, are commonly used as adjuvant agents for management of neuropathic pain, low back pain, and fibromyalgia. However, these agents may be problematic in older adults, due to increased risk of falls and cognitive impairment. Dose reduction is advised, and is required if GFR is <60 mL/min. Gabapentinoids continue to be recommended only in low doses by the Beers Criteria due to ataxia and falls. In addition, the most recent version of the Beers Criteria® states: "...there is evidence of substantial harm when opioids are used concurrently with benzodiazepines or gabapentinoids. Such combinations are not recommended in frail elders."⁷⁷

Non-opioid Adjuvant Analgesics to Avoid

Despite robust robust evidence in older studies for reducing the pain of postherpetic neuralgia and painful diabetic peripheral neuropathy in older populations,^{78,79,80,81} tricyclic antidepressants (TCAs) such as amitriptyline, desipramine, and nortriptyline are high risk for syncope, falls, fractures, cognitive changes and bradycardia in older adults. Thus, the Beers Criteria® has a strong recommendation against their use in older adults. Likewise, skeletal muscle relaxants, such as methocarbamol, cyclobenzaprine and carisoprodol are poorly tolerated by older adults, and the Beers Criteria® has a strong recommendation against the use of these drugs.⁸²

Nonpharmacologic Pain Management

Cognitive Behavioral Therapy (CBT)

CBT was reviewed for the 2015 AMDG Opioid Guidelines (hyperlink): " There is good evidence that cognitive behavioral therapy is effective in reducing subacute or chronic low back pain and other chronic pain conditions, including chronic orofacial pain, chronic pain in children, fibromyalgia, persistent pain in the elderly, and inflammatory bowel disease. ^{14,76-85} The treatment of depression was shown to have significant benefits in terms of pain reduction, improved functional status and quality of life in a group of older individuals with depression and arthritis. ⁸⁶ Other psychological therapies, such as progressive relaxation and biofeedback aimed at muscle relaxation, have not been shown to be superior to active exercise therapies in large cohorts for most outcomes, in systematic reviews of low back pain treatment ¹⁴ although both do provide benefit."

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

More recent reviews, including the two recent AHRQ reviews, support the broad use of CBT. In addition, a systematic review of psychological interventions, including CBT, in older adults with chronic pain found consistent but small benefits on reducing pain and catastrophizing beliefs, and improving pain self-efficacy for managing pain. (Niknejad B et al. Association between psychological interventions and chronic pain outcomes in older adults. A systematic review and meta-analysis. JAMA Intern Med 2018; 178: 830-839). Results were strongest when psychological therapies were delivered in group-based settings. Further research on sustainability of benefits is recommended.

Exercise

In 2020 the Agency for Healthcare Research and Quality updated its systematic review and report on noninvasive nonpharmacological treatment for chronic pain. The systematic review evaluated multiple interventions for five of the most common chronic pain conditions including chronic low back pain, chronic neck pain, osteoarthritis, fibromyalgia, and chronic tension headache. The focus of the systematic review was on the durability of the effect defined as the persistence of the impact for at least once month after treatment completion.

For chronic low back pain, when compared with usual care, attention control, or placebo, exercise was associated with a small improvement in short-term function (10 trials). However, there was no effect on function in the intermediate (5 trials) or long-term (1 trial). The strength of evidence was moderate for short term while it was low for intermediate and long term. For pain, exercise was found to have moderate effectiveness in the short and long-term with a small effect at intermediate-term follow up (SOE: low).

For chronic neck pain, there was no improvement in pain or function in the short or intermediate term. In the long term, in 1 trial exercise was associated with a small improvement in function but no benefit in pain in 3 trials (SOE: low).

For knee osteoarthritis, in 8 trials, exercise was associated with a small improvement in function in the short term (SOE: moderate). While there was moderate improvement in function in the intermediate term in 11 trials and a small improvement in the long term in 4 trials (SOE: low). In the short term, in 8 trials, exercise was associated with a small improvement in pain (SOE: moderate). There was a moderate improvement in pain in the intermediate term and a small improvement in the long term (SOE: low).

For hip osteoarthritis, exercise was associated with a small improvement in function in the short term in 3 trials and in the intermediate term in 2 trials (SOE: low). For pain, there was a small improvement in the short-term but the results were not significant at the intermediate time period (SOE: low).

In addition to this condition specific data for pain, a randomized trial of a community-based exercise and behavioral program among older adults with reduced lower limb physical functioning demonstrated that over a 12 month period the intervention reduced functional mobility decline. (Stathi A, et al. Effect of a physical activity and behavior maintenance programme on functional mobility decline in older adults: the REACT (Retirement in Action) randomized controlled trial. Lancet Pub Health 2022; doi: 10.1016/S2468-2667(22)00004-4).

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

A recent Cochrane review reveals that various types of exercise and Tai Chi reduce falls, likely by improving balance (Sherrington C, et al. Exercise for preventing falls in older people living in the community. 2019. RL: https://www.cochrane.org/CD012424/MUSKINJ_exercise-preventing-falls-older-people-living-community).

Tai Chi

Tai chi is a gentle form of mind-body exercise that may be an effective treatment for chronic pain conditions.⁸³ Recent RCTs have explored the efficacy of tai chi interventions for improving pain in individuals with conditions including osteoarthritis^{84,85,86,87,88,89,90}, chronic multisite pain^{91,92}, chronic lower back pain^{93,94,95}, fibromyalgia^{96,97}, neck pain⁹⁸, heart failure⁹⁹, depression¹⁰⁰, arthritis¹⁰¹, and sedentary lifestyles¹⁰². In some trials, participants who receive tai chi interventions have shown pain reduction along with other benefits like improved strength and flexibility. Pain is typically measured in tai chi trials using a visual analog scale (VAS) for pain or pain score of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Tai chi has been studied (for fall prevention, not pain reduction) and found to be safe in older populations.¹⁰³

Some tai chi intervention trials also investigated potential mechanisms for how tai chi can reduce pain via secondary analysis, and found that beta-endorphin levels were decreased.¹⁰⁴ Participants reported psychological benefits, like more empowerment and sense of personal control,¹⁰⁵ and tai chi reduced pain catastrophizing¹⁰⁶ and increased mindfulness.^{107,108,109}

Overall, recent RCTs and related secondary analyses assessing the efficacy of tai chi for pain reduction suggest that tai chi is effective as a non-pharmacological treatment for many conditions with pain symptoms. Further investigation is needed to determine how tai chi can be used together with other pain relief treatments for optimal results. Links for evidence-based tai chi practice include:

<https://www.youtube.com/watch?v=jxpKT6Rr9i8&t=82s> and

<https://www.youtube.com/watch?v=tAOuEpa01j4>.

Yoga

Yoga involves physical and mental exercises and can be used to improve strength and flexibility. Recent RTCs have found that the practice of yoga significantly improved pain for the following populations/conditions: older women (no specific pain condition),¹¹⁰ people with chronic low back pain^{111,112,113,114}, osteoarthritis^{115,116,117,118,119}, chronic pain (no specific pain condition)¹²⁰ chronic neck pain¹²¹, musculoskeletal conditions in the workplace¹²², cancer^{123,124,125,126,127,128}, and onsite at a treatment program for opioid use disorder.¹²⁹ Studies measure either the degree of pain interference with activities, severity of pain, or both. Some studies showed reduction in use of opioid medications.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Yoga practice was sometimes the only intervention, and sometimes coupled with other pain management modalities, such as mindfulness- based stress reduction. Even chair yoga showed pain reduction in older adults with arthritis.

A few studies did not show meaningful reductions in pain following yoga interventions. In a study comparing effects of 12-weeks interventions of music to movement or adapted yoga versus control in persons with multiple sclerosis, there were no significant group differences in pain interference.¹³⁰ Another trial compared qigong, yoga, and no intervention, and found no group differences for pain intensity in patients with chronic low back pain.¹³¹

Most studies suggest that yoga could be used to support pain management for a variety of conditions and settings. Further research with larger and older populations are needed to confirm this effectiveness.

Chiropractic Therapy

The strongest evidence for spinal manipulative therapy is for chronic low back pain in dozens of randomized controlled trials. Recent observational studies and systematic reviews of large cohort studies on acute and chronic musculoskeletal pain have pointed toward the effectiveness of interventions utilized by Doctors of Chiropractic, which include spinal manipulative therapy, therapeutic exercise instruction, lifestyle education and nutritional advice.^{132,133,134,135,136,137}

Best practices have been established for the evaluation, management, and manual treatment of older adult patients using a 37-member interdisciplinary Delphi Panel.¹³⁸

Use of chiropractic care within the older population is widespread and has been a topic of research within the profession.^{139,140,141,142} The older population makes use of a large variety of chronic pain management strategies, between 5-28 modalities, including chiropractic.^{143,144,145,146}

The safety of chiropractic has been studied in all age groups and was found to have no significant difference in adverse events between the treatment rendered by chiropractors and primary care physicians. Several large systematic reviews have looked at safety in the older population and found it to have similar risk to other nonpharmacologic treatments and often less risk than pharmacologic interventions.^{147,148}

In a large systematic review and meta-analysis, chiropractic users were shown to have significantly lower (64%) odds of receiving an opioid prescription than non-users. Across multiple large observational cohort studies, chiropractic care appears to have a positive outcome in the reduction of opioid use across multiple population groups, including veterans and Medicare beneficiaries.^{149, 150, 151} The reduction of the risk is greater among those who consult a Doctor of Chiropractic within the first 30

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

days of diagnosis.^{152,153} Initial opioid prescription length has been shown to be the strongest risk factor for long term opioid use,¹⁵⁴ and chiropractic was found to have a significant effect in reducing long-term opioid use,¹⁵⁵ with early access to chiropractic care demonstrating the greatest effect.¹⁵⁶

General practice patterns of Doctors of Chiropractic are aligned with evidence-based, guideline-concordant therapies which support their role on a multidisciplinary pain team.^{157,158,159} There is data for both positive patient outcomes and healthcare system cost effectiveness that supports inclusion of chiropractors into health systems and insurance coverage to help end healthcare inequalities.^{160,161,162}

Integrating Doctors of Chiropractic into primary care settings has been shown to lower monthly prescribing rates of opioid therapy.¹⁶³

Accupuncture

There is a large body of research on the use of including high-quality systematic reviews and evidence-based practice guidelines that support the use of acupuncture to treat a variety of reduce pain and improve function for conditions which commonly occur occurring commonly in the geriatric population, including lower back pain,^{164,165,166,167,168,169,170,171} osteoarthritis,^{172,173,174,175,176} chronic shoulder pain,^{177,178,179,180} chronic neck pain,^{181,182,183,184} chronic headache,^{185,186,187} non-specific musculoskeletal pain, including myofascial pain syndromes,^{188,189,190} and post-surgical pain.^{191,192} However, the 2018 AHRQ systematic review and 2021 and 2022 surveillance update on noninvasive nonpharmacologic treatment for chronic pain found low to moderate strength evidence for treatment of chronic low back pain, chronic neck pain and fibromyalgia and the authors found insufficient evidence for other common pain conditions. There are a number of studies with contradictory results due to methodological diversity and clinical variability.^{193,194,195,196} Future high-quality primary studies that draw on all clinically relevant outcomes are needed.

There is evidence that acupuncture consistently improves function and/or pain improvements from acupuncture persist beyond the course of therapy for specific chronic pain conditions^{197,198} with one meta-analysis finding and that the effects of acupuncture persist over time, with only a small decrease, approximately 15%, in treatment effect at one year.¹⁹⁹ When use Strong evidence exists for acupuncture as a complementary treatment for chronic pain, acupuncture has been shown to decrease the usage of opioids.²⁰⁰ There is also evidence that acupuncture is effective in reduces opioid consumption after total knee arthroplasty²⁰¹ and reduces post-surgical opioid-related side-effects.²⁰² Studies have shown that opioid use was reduced significantly after using integrative medicine (IM), which combines pharmacological and complementary and alternative medicine (CAM), including acupuncture.²⁰³ Multi-modal treatment is recommended, particularly in community dwelling populations.^{204,205}

Acupuncture is considered safe and is well-tolerated with a low risk of adverse effects.^{206,207} Across trials, adverse events associated with acupuncture were few in number with the most common complaints

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

being pain at the needling site and muscle soreness that resolved soon after the treatment session ended.²⁰⁸

~~There is also a strong body of anecdotal and clinical evidence to suggest that acupuncture is an effective form of pain management for patients with chronic musculoskeletal pain, and that patients utilize acupuncture for poly-chronic conditions that are not adequately represented in the literature.~~

Massage

Massage is a form of manual therapy that has wide variations in treatment. As presented in the literature, the general terms “massage” and “massage therapy” are used most often. However, there are a number of studies that specify a specific type of massage, such as Tai Massage or Swedish Massage. In addition, manual therapy and massage may be used in tandem or specified as individualized treatment modalities.

Massage has shown to be safe and effective for a number of chronic pain conditions, many of which are prevalent in the geriatric population. Recent RTCs and systematic reviews have found significant improvements in pain and function, with the largest body of evidence supporting massage as a treatment for acute, sub-acute and chronic low back pain,^{209,210,211,212} chronic neck pain,^{213,214} 1,5 osteoarthritis of the knee,^{215,216,217,218,219,220} and fibromyalgia.^{221,222} Massage is tolerated well with reported adverse effects to be both temporary and mild when performed by a trained clinician.^{223,224} In addition to functional improvement and the reduction of pain, massage has a number of beneficial effects that may contribute to the overall well-being of the geriatric population, including the reduction of anxiety and depression,²²⁵ reduction of stress, agitation, and pain in individuals with dementia,^{226,227} reduction of constipation,^{228,229} improved emotional health and social functioning,²³⁰ improved health-related quality of life,²³¹ as well as improved activities of daily living.²³²

Massage may have a lasting effect beyond the treatment duration,²³³ and the therapeutic benefits may be most pronounced when this treatment is included in a multi-modal approach to pain management.^{234,235,236}

Mindfulness-Based Stress Reduction (MBSR)

Mindfulness-Based Stress Reduction (MBSR) was developed in the late 1970s to help individuals with chronic health conditions cope with the impact of these conditions on their daily lives. MBSR helps people to become aware of their behavior patterns related to situations that are stressful and choose how to respond to them. A standard MBSR program consists of 8 weekly in-person sessions of 2 to 3

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

hours each, one full day retreat, and daily at home practice of 30 to 45 minutes. The techniques generally employed in MBSR are a combination of body scan, gentle yoga, and sitting meditation.

The use of MBSR for chronic pain management has been studied across a variety of conditions: non-specific chronic pain^{237,238,239}, chronic lower back pain^{240,241,242,243}, hip/knee arthritis²⁴⁴, fibromyalgia^{245,246}, and migraine²⁴⁷.

While studies to assess the use of MBSR for chronic pain have included some older adults, very few studies have focused specifically on the use of MBSR in older adults. Across studies identified in this review, participants were largely self-identified as white and female. Authors noted the following challenges:

- The full 8-week MBSR course created time commitment challenges for participants. In-person courses also faced challenges related to needs for transportation, childcare, etc.
- Lack of participant engagement in daily home practice during and after the 8-week course.

Studies using a standard MBSR program (8-week in-person course) showed significant improvement in pain acceptance^{3,6}, pain bothersomeness^{4,5}, and pain-related functional limitation^{4,5}. However, improvement in pain severity/intensity^{2,3,6,7,8,11}, pain self-efficacy^{7,8}, and pain catastrophizing^{3,9,10} varied by study. MBSR proved to be more effective than usual care, but demonstrated similar outcomes to Cognitive Behavioral Therapy (CBT) and other patient education programs. A computerized MBSR program¹ demonstrated significant improvement in pain acceptance, pain interference, and pain catastrophizing over baseline, but demonstrated similar outcomes to another computerized patient education program.

Heat therapy

The use of heat treatments for pain management has been explored across several conditions, including knee osteoarthritis^{248,249,250}, rheumatoid arthritis⁴, neck pain^{251,252}, knee pain²⁵³, chronic low back pain²⁵⁴, and chronic nonspecific pain.²⁵⁵ Applying heat is thought to reduce pain by increasing blood flow to tissue and improving healing⁵. Heat treatments for pain management range from hot packs or pads on the skin, hot mud packs, dry heat treatment, and heated wraps. Results reflecting the efficacy of heat treatments for pain varied, and heat was never directly compared to placebo.

There is a range of efficacy results for heat use in pain management, and more research is needed to determine when and how best to utilize heat to benefit patients. Most studies found significant reductions in pain due to heat use, while a smaller number found no meaningful differences compared to controls. Many studies compare heat therapies with or against other alternative and complementary treatments. No studies compare heat directly to pain medications.

Acceptance and Commitment Therapy (ACT)

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Different from the traditional CBT, which is centered on the change in the content of patients' maladaptive thoughts and beliefs, ACT focuses on approaches of acceptance, mindfulness, and activation so that the impacts of the thoughts and beliefs on individuals can be changed for more adaptive behavioral performance.^{256,257} Specifically, ACT aims to foster individuals' psychological flexibility by creating their "openness, awareness, and active engagement to living".^{258,259} ACT helps people to focus on acceptance, mindfulness, and activation so that they can still live well by coexisting with negative experiences by incorporating values in the person's life. More specifically, for patients with chronic pain, ACT does not aim to eliminate or control the pain perception; but instead, it aims to modify the "relationship" with the thoughts by fostering their psychological flexibility and accelerating their behavior change which is in line with their life values.^{260,261} ACT aims to improve the functional status of patients with chronic pain conditions, despite the pain experience.^{262,263}

There is a growing body of literature that highlights problems with treatment adherence and completion of the traditional weekly, in-person, psychotherapy.^{264,265,266,267} However, a brief format of ACT is more accessible to surgical patients who have conflicting demands on their time. Three RCTs of brief ACT interventions in the prevention of post-surgical pain have been conducted.^{268,269,270} One of the RCTs showed improved pain scores, and two of the RCTs showed both a reduction in pain and opioid use with the brief ACT intervention.

There is evidence of an association between several psychological flexibility processes, particularly pain acceptance, and adaptation to chronic pain.²⁷¹ However, there are relatively few studies on the relationship between pain acceptance and opioid misuse in chronic pain patients.²⁷² Associations have been found between higher pain acceptance and lower levels of anxiety, depression, pain catastrophizing, pain intensity, and disability.²⁷³ Esteve and colleagues created and tested their hypothetical model in which pain acceptance would regulate pain sensations and pain-related thoughts and emotions, which would be related to opioid misuse. The results suggest that levels of anxiety, depression, and pain acceptance must be assessed before opioids are prescribed.²⁷⁴ Moreover, pain acceptance has been associated with lower medication intake. This finding is relevant, given that there is a growing body of evidence to suggest that prescribed opioid medication misuse is alarmingly frequent in chronic pain patients.²⁷⁵ In this regard, ACT may be a promising strategy for managing chronic pain patients.²⁷⁶ However, upon review of several systematic reviews and metaanalyses conducted through 2020, previously published evidence regarding ACT was regarded as being moderate to very low quality, so investigators were very uncertain about benefits and or lack of benefits of ACT for adults with chronic pain.²⁷⁷ Only a few studies compared ACT to active treatments and, while the evidence is promising for ACT in the treatment of chronic pain, further methodologically robust trials are required.

Tapering/Deprescribing Long-Term Opioid Therapy

Tapering long-term opioid therapy is a potential strategy for reducing the risks associated with opioid use. Taper plans, however, bring their own risks related to the taper characteristics and who is being selected for the taper. Evidence from pilot projects demonstrates that multiple interventions are available to facilitate opioid tapering, but many bring implementation challenges, especially within primary care. Despite these challenges, developing taper plans in primary care is associated with an increased likelihood of sustained opioid taper.²⁷⁸

Several RTCs on the efficacy of interventions to promote tapering of long-term opioid therapy have been completed or are currently underway. In 2017, researchers at the University of Washington implemented a pilot trial of prescription opioid taper support (POTS) in patients without OUD.²⁷⁹ In interviews with patients, researchers noted that the psychology of the taper was at least as important as the pharmacology, and they developed a taper plan in two phases: engagement and training. The intervention employed a combination of engagement videos, motivational interviewing, psychiatric consultations, and CBT-based skills training. This pilot project was extended to a multi-center primary care-based study of telephonic pain self-management training to support opioid taper and adapted for telephone administration to allow deployment in multiple Seattle-area Kaiser primary care clinics.²⁸⁰ This second pilot project, named STRIPE (Strategies to Improve Pain and Enjoy Life) faced various challenges, including low consent rates, older patients with comorbidities, low taper initiation rates, and communication challenges among providers.

A third intervention study, the Facilitating Lower Opioid Amounts through Tapering (FLOAT) study out of Kaiser Permanente Northwest's Support Team Onsite Resource for Management of Pain (STORM) program demonstrated a reduction in daily opioid dose mean for 56% of participants.²⁸¹ This intervention employed a pain medicine physician, social worker, nurse, and multiple pharmacists to train and support primary care providers for opioid taper and pain management. Pharmacists were essential partners in the intervention, providing taper guidance and support to PCPs.²⁸² Interviews with participants in the STORM tapering program revealed that efficacy was influenced by PCP, patient, and health system perception of the importance of tapering.²⁸³

Additional pilot trials are ongoing. One study funded by PCORI examined the role of cognitive behavioral therapy and shared decision-making on taper plans. The interventions were delivered via Zoom, increasing recruitment and retention, but involved challenges with building relationships between prescribers and participants. Another ongoing study uses the EPIC electronic health record to deliver Best Practice Alert "nudges" to providers, a technique that has been proven effective to reduce antibiotic overprescribing.²⁸⁴ The ongoing study involves five total "nudge" prompts that includes justification for opioid prescriptions for opioid-naïve patients and enhancing the option to choose a taper plan for chronic high-dose patients.²⁸⁵

While the above studies demonstrate the efficacy of tapering plans and examine potential interventions, taper plans are not without risk. There are risks associated with abrupt or short-sighted implementation

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

of opioid dose-reduction or developing plans that are not patient-centered. Specific risks include an increased risk for emergency room or hospital encounters for drug overdose, withdrawal, or mental health crises.^{286,287,288,289} Medicaid opioid reimbursements in states that are dose-limited have led to involuntary tapers.²⁹⁰ There is broad professional opposition to involuntary tapers,²⁹¹ with professional pain treatment guidelines advising caution.^{292,293} Updated recommendations from the Centers for Disease Control (CDC) and Department of Health and Human Services (HHS) explicitly recommend individualized tapering plans.^{294,295}

Emerging claims data demonstrates the risks and benefits associated with tapering plans. Studies on state policies demonstrate that both strong state policies that involve dose limits and those without dose limits lower overall opioid use by 15% but do not change high-dose use.²⁹⁶ However, one previous study in Washington showed that dosing policy lowered high-dose use in the Medicaid population.²⁹⁷ An analysis of commercial insurance claims showed within-individual risk for acute substance-related morbidity events was higher for high-dose patients, but reduced when the dose was tapered.²⁹⁸ Finally, an analysis of VA claims data demonstrated that new substance use disorder diagnoses did not differ between patients discontinuing vs. continuing long-term opioid therapy, yielding inconsistent results.²⁹⁹

Long-term opioid therapy destabilizes patients, both when starting opioid therapy and when tapering.³⁰⁰ This is partially because opioids function as general stress-modulators, balancing corticosteroid and catecholamine effects, integrating aversive inputs and rewards to promote survival.³⁰¹ Most opioids support and mediate human social bonding and emotional function,³⁰² while exogenous opioids may disrupt those functions.³⁰³ Fully adherent long-term opioid therapy patients may develop a syndrome of Complex Persistent Opioid Dependence (CPOD) that is distinct from OUD.^{304,305} These patients may show poor pain control and poor physical and social function. With opioid taper, withdrawal symptoms are not limited to transient physical symptoms, but can include persistent insomnia, anxiety, anhedonia, irritability, and anger. Buprenorphine appears to be a good treatment option for CPOD.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

References

- ¹ The Washington State Agency Medical Director's Group. Interagency guideline on prescribing opioids for pain. 3rd Edition, June, 2015. URL: <http://www.agencymeddirectors.wa.gov/Files/2015AMDGOpioidGuideline.pdf>. Accessed 4/1/21.
- ² Gazelka HM, Leal JC, Lapid MI, Rummans TA. Opioids in older Adults: Indications, prescribing, complications, and alternative therapies for primary care. *Mayo Clin Proc* 2020; 95: 793-800, URL: [www.mayoclinicproceedings.org/article/S0025-6196\(20\)30145-2/fulltext](http://www.mayoclinicproceedings.org/article/S0025-6196(20)30145-2/fulltext), Accessed 4/1/21.
- ³ Weiss AJ, Heslin KC, Barrett ML, Izar R, et al. Opioid-related inpatient stays and emergency department visits among patients aged 65 years and older, 2010 and 2015: Statistical Brief #244. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. Rockville (MD)2018. URL: <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb244-Opioid-Inpatient-Stays-ED-Visits-Older-Adults.jsp>
- ⁴ Wilson N, Kariisa M, Seth P, et al. Drug and opioid-involved overdose deaths, United States, 2017-2018. *Morb Mortal Wkly Rep* 2020; 69:290–297. URL: <http://dx.doi.org/10.15585/mmwr.mm6911a4>external icon, Accessed 4/1/2021
- ⁵ Chou, R., Gordon D.B., de Leon-Cassasola, O, Rosenberg, J.M., Bickler, S., Brennan, T., Carter, T., Cassidy, C.L., Chittenden, E.H., Griffith, S., Manworren, R., McCarberg, B., Montgomery, R., Murphy, J., Perkal, M.F., Suresh, S., Sluka, K., Strassels, S., Thirlby, R., Viscusi, E., Walco, G.A., Warner, L., Weisman, S.J, Wu, C., Management of postoperative pain: a clinical practice guideline from the American Pain Society, The American Society of Anesthesiologists, and the American Society of Regional Anesthesia and Pain Medicine. *Journal of Pain*, 17(2):131-57, 2016.
- ⁶ Shah A, Hayes CJ, Martin BC. Characteristics of Initial Prescription Episodes and Likelihood of Long-Term Opioid Use - United States, 2006-2015 *MMWR Morb Mortal Wkly Rep* 2017 Mar 17;66(10):265-269.
- ⁷ Musich S, Wang SS, Slindee L, Kraemer S, Yeh CS. Characteristics associated with transition from opioid initiation to chronic opioid use among opioid-naïve older adults. *Geriatric Nursing* 2019;40:190-196.
- ⁸ Raman SR, Bush C, Karmali RN et al. Characteristics of New Opioid Use Among Medicare Beneficiaries: Identifying High-Risk Patterns *J Manag Care Spec Pharm*. 2019 Sep;25(9):966-972.
- ⁹ Brummett CM, Waljee JF, Goesling J. et al. New persistent opioid use after minor and major surgical procedures in US adults. *JAMA Surg* 2017;152(6):e170504.
- ¹⁰ Torchia MT, Munson J, Tosteson TD, et al. Patterns of opioid use in the 12 months following geriatric fragility fractures: a population-based cohort study. *JAMDA* 2019;20:208-304.
- ¹¹ Gold LS, Hansen RN, Avins AL. et al. Associations of early opioid use with patient-reported outcomes and healthcare utilization among older adults with low back pain. *Clin J Pain*. 2018 Apr;34(4):297-305.
- ¹² Kent M. et al American Society for Enhanced Recovery and Perioperative Quality Initiative-4 Joint Consensus Statement on Persistent Postoperative Opioid Use: Definition, Incidence, Risk Factors, and Health Care System Initiatives. *Anesth Analg* 2019;129:543–52.
- ¹³ Hooten WM, Brummett CM, Sullivan MD, et al. A conceptual framework for understanding unintended prolonged opioid use. *May Clin Proc* 2017;92(12):1822-1830.
- ¹⁴ Nguyen AV, Ross E, Westra J., et al. Opioid utilization in geriatric patients after operation for degenerative spine disease. *J Neurosurg Anesthesiol* 2020; 2020 Feb 21;10.1097.
- ¹⁵ Lawal OD, Gold J, Murthy A et al. Rate and risk factors associated with prolonged opioid use after surgery: a systematic review and meta-analysis. *JAMA Netw Open*. 2020 Jun 1;3(6):e207367.
- ¹⁶ Rose AJ, McBain R, Schuler MS. et al. Effect of age on opioid prescribing, overdose, mortality in Massachusetts, 2011 to 2015. *JAGS* 2019;67:128-132.
- ¹⁷ Pugely AJ, Bedard NA, Kalakoti P, Hendrickson NR, Shillingford JN, Laratta JL, Saifi C, Lehman RA, Riew D. Opioid use following cervical spine surgery: trends and factors associated with long-term use. *The Spine Journal* 2018;18:1974-1981.
- ¹⁸ Vyas MV, Watt JA, Yu AYY, Straus SE, Kapral MK. The association between loneliness and medication use in older adults. *Age Ageing*. 2020 Sep 14;afaa177. doi: 10.1093/ageing/afaa177. Online ahead of print.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ¹⁹ Mosher HJ, Jiang L, Vaughan Sarrazin MS, Cram P, Kaboli PJ, Vander Weg MW. Prevalence and characteristics of hospitalized adults on chronic opioid therapy. *J Hosp Med*. 2014 Feb;9(2):82-7.
- ²⁰ Vail D, Azad TD, O'Connell C., et al. Postoperative opioid use, complications, and costs in surgical management of lumbar spondylolisthesis. *Spine* 2018;43(15):1080-1088.
- ²¹ Desveaux L, Saragosa M, Kithulegoda N, Ivers NM. Understanding the behavioural determinants of opioid prescribing among family physicians: a qualitative study. *BMC Fam Pract*. 2019 May 10;20(1):59.
- ²² McLachlan AJ, Bath S., Naganathan , et al. Clinical pharmacology of analgesic medicines in older people: impact of frailty and cognitive impairment. *Br J Clin Pharmacol* 2011;71:351-364.
- ²³ Scott JC, Stanski DR. Decreased fentanyl and alfentanil dose requirements with age: A simultaneous pharmacokinetic and pharmacodynamic evaluation. *J Pharmacol Exp Ther*. 1987;240:159-166.
- ²⁴ Pergolizzi J, Boger RH, Budd K., et al. Opioid and management of chronic severe pain in the elderly: consensus statement of the international expert panel with focus on the six clinically most often used World Health Organization step III opioids (buprenorphine, fentanyl, hydromorphone, methadone, morphine, oxycodone). *Pain Pract*. Jul-Aug 2008;8(4):287-313.
- ²⁵ Seppala LJ, van de Glind EMM, Daams JG, Ploegmakers KJ, de Vries M, Wermelink AMAT, van der Velde N; EUGMS Task and Finish Group on Fall-Risk-Increasing Drugs. Fall-Risk-Increasing Drugs: A Systematic Review and Meta-analysis: III. Others. *J Am Med Dir Assoc*. 2018 Apr;19(4):372.e1-372.e8.
- ²⁶ Peach EJ, Pearce FA, Gibson J, Cooper AJ, Chen LC, Knaggs RD. Opioids and the Risk of Fracture: a Self-Controlled Case Series Study in the Clinical Practice Research Datalink. *Am J Epidemiol*. 2021 Feb 19:kwab042.
- ²⁷ Lieberman JS, Samuels LR, Goggins K., et al. Opioid prescriptions at hospital discharge are associated with more post-discharge healthcare utilization. *J Am Heart Assoc*. 2019;8:e010664.
- ²⁸ Cheng S, Siddiqui TG, Gossop M et al. Health-related quality of life in hospitalized older patients with versus without prolonged use of opioid analgesics; benzodiazepines, and z-hypnotics: a cross-sectional study. *BMC Geriatrics* 2020;20:425.
- ²⁹ Carew AM, Comiskey C. Treatment for opioid use and outcomes in older adults: a systematic literature review. *Drug Alcohol Depend*. 2018 Jan 1;182:48-57.
- ³⁰ Roe B, Beynon C, Pickering L, Duffy P. Experiences of drug use and ageing: health, quality of life, relationship and service implications. *J Adv Nurs*. 2010 Sep;66(9):1968-79.
- ³¹ Cicero TJ, Surratt HL, Kurtz S, Ellis M, Inciardi JA, 2012 Patterns of prescription opioid abuse and comorbidity in an aging treatment population. *J Subst Abuse Treat*. 42, 87–94.
- ³² Schepis TS, McCabe SE, Teter CJ, 2018 Sources of opioid medication for misuse in older adults: results from a nationally representative survey. *Pain*. 159, 1543–1549.
- ³³ Han BH, Moore AA, Keyes K, Palomar JJ. Demographic trends of binge alcohol use and alcohol use disorders among older adults in the United States, 2005-2014. *Drug and Alcohol Dependence* 2017;170:198-207.
- ³⁴ Losby J, Hyatt JD, Kanter MH, Baldwin G, Matsuoka D. Safer and more appropriate opioid prescribing: a large healthcare system's comprehensive approach. *J Eval Clin Pract* 2017;23(6):1173-1179.
- ³⁵ Hah JM, Trafton JA, Narasimhan B, et al. Efficacy of motivational-interviewing and guided opioid tapering support for patients undergoing orthopedic surgery (MI-Opioid Taper): A prospective, assessor-blind, randomized controlled pilot trial. *EClinicalMedicine*. 2020 Oct 16;28:100596.
- ³⁶ VanDyke MM, Steffen AM. Medication Saving Behaviors of Older Adults: Scale Developed to Assess Family Caregiver Perspectives *Clin Gerontol* 2017;40(4):258-267.
- ³⁷ Wu C., et al. American Society for Enhanced Recovery and Perioperative Quality Initiative Joint Consensus Statement on Perioperative Opioid Minimization in Opioid-Naïve Patients. *Anesth Analg* 2019;129:567–77.
- ³⁸ Young BT, Zolin SJ, Ferre A., et al. Effects of Ohio's opioid prescribing limit for the geriatric minimally injured trauma patient. *The American Journal of Surgery* 2020;219:400-403.
- ³⁹ Anthony CA, Rojas EO, Keffala V., et al. Acceptance and commitment therapy delivered via a mobile phone messaging robot to decrease postoperative opioid use in patients with orthopedic trauma: randomized controlled trial. *J Med Internet Res* 2020;22(7):e17750.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ⁴⁰ Huang A, Azam A, Segal S, Pivovarov K, Katznelson G, Ladak SS, Mu A, Weinrib A, Katz J, Clarke H. Chronic postsurgical pain and persistent opioid use following surgery: the need for a transitional pain service. *Pain Manag.* 2016 Oct;6(5):435-43.
- ⁴¹ Hah JM, Trafton JA, Narasimhan B, et al. Efficacy of motivational-interviewing and guided opioid tapering support for patients undergoing orthopedic surgery (MI-Opioid Taper): A prospective, assessor-blind, randomized controlled pilot trial. *EClinicalMedicine.* 2020 Oct 16;28:100596.
- ⁴² Lumish R, Joshana G, Brandt NJ. Optimizing pain management through opioid deprescribing. *Journal of Gerontological Nursing.* 2018-01-01, Vol.44 (1):9-14.
- ⁴³ Klueh MP, Hu HM, Howard RA, Vu JV, Harbaugh CM, Lagisetty PA, Brummett CM, Englesbe MJ, Waljee JF, Lee JS. Transitions of Care for Postoperative Opioid Prescribing in Previously Opioid-Naïve Patients in the USA: a Retrospective Review. *J Gen Intern Med.* 2018 Oct;33(10):1685-1691.
- ⁴⁴ Makris UE, Abrams RC, Gurland B, Carrington M. Management of persistent pain in the older patient: a clinical review, *JAMA* 2014;312(8):825-36.
- ⁴⁵ Lagisetty P, Bohnert A, Goesling J, Hu HM, Travis B, Lagisetty K, Brummett CM, Englesbe MJ, Waljee J. Care Coordination for Patients on Chronic Opioid Therapy Following Surgery: A Cohort Study. *Ann Surg.* 2020 Aug;272(2):304-310.
46. Paulozzi L, Zhang K, Jones CM, Mack KA. Risk of adverse health outcomes with increasing duration and regularity of opioid therapy. *J Am Board Fam Med* 2014; 27: 329-338
47. Cooper ZD, Sullivan MA, Vosburg SK, et al. Effects of repeated oxycodone administration on its analgesic and subjective effects in normal, healthy volunteers. *Behav Pharmacol* 2012; 23: 271-279
48. Turner JA, Shortreed SM, Saunders KW, LaResch L, Von Korff M. Associations of levels of opioid use with pain and activity interference among patients initiating chronic opioid therapy: a longitudinal study. *Pain* 2016; 157: 849-857
49. Wang HT, Hill AD, Gomes T, et al. Trends in opioid use before critical illness among elderly patients in Ontario. *J Crit Care* 2020; 55: 128-133
50. Centers for Disease Control. 2017. Medication Safety Program: Adverse Drug Events in Adults. https://www.cdc.gov/medicationsafety/adult_adversedrugs.html
51. Food and Drug Administration. 2018. Preventable Adverse Drug Reactions: A Focus on Drug Interactions. <https://www.fda.gov/drugs/drug-interactions-labeling/preventable-adverse-drug-reactions-focus-drug-interactions#ADRs:%20Prevalence%20and%20Incidence>
52. Spence MM, Shin PJ, Lee EA, Gibbs NE. Risk of injury associated with skeletal muscle relaxant use in older adults. *Ann Pharmacother.* 2013 Jul-Aug;47(7-8):993-8. doi: 10.1345/aph.1R735. Epub 2013 Jul 2
53. Golden AG, Ma Q, Nair V, Florez HJ, Roos BA. Risk for fractures with centrally acting muscle relaxants: an analysis of a national Medicare Advantage claims database. *Ann Pharmacother.* 2010 Sep;44(9):1369-75. doi: 10.1345/aph.1P210. Epub 2010 Jul 6.
54. Musich S, Wang SS, Slindee LB, Ruiz J, Yeh CS. Concurrent Use of Opioids with Other Central Nervous System-Active Medications Among Older Adults. *Popul Health Manag.* 2020 Aug;23(4):286-296. doi: 10.1089/pop.2019.0128. Epub 2019 Nov 25. PMID: 31765280; PMCID: PMC7406999.
55. By the 2019 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatr Soc.* 2019 Apr;67(4):674-694. doi: 10.1111/jgs.15767. Epub 2019 Jan 29. PMID: 30693946.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
56. Dowell D, Gaegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. *Morb Mort Weekly Rep* 2016; 65: 1-49.
57. Gaubert-Dahan M, Sebouai A, Tourid W, Fauvelle F, Aikpa R, Bonnet-Zamponi D. The impact of medication review with version 2 STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment) criteria in a French nursing home: a 3-month follow-up study. *Ther Adv Drug Saf*. 2019; 10: 2042098619855535. Published online 2019 Jun 9.
58. Zwietering NA, Westra D, Winkens B, Cremers H, van der Kuy PHM, Hurkens KP. Medication in older patients reviewed multiple ways (MORE) study. *Int J Clin Pharm*. 2019; 41(5): 1262–1271. Published online 2019 Jul 13.
59. Houlind MB, Andersen AL, Trelldal C, Jørgensen LM, Kannegaard PN, Castillo LS, Christensen LD, Tavenier J, Rasmussen LJH, Ankarfeldt MZ, Andersen O, Petersen J. A Collaborative Medication Review Including Deprescribing for Older Patients in an Emergency Department: A Longitudinal Feasibility Study. *J Clin Med*. 2020 Feb; 9(2): 348. Published online 2020 Jan 27.
60. Toivo T, Airaksinen M, Dimitrow M, Savela E, Pelkonen K, Kiuru V, Suominen T, Uunimäki M, Kivelä S, Leikola S, Puustinen J. Enhanced coordination of care to reduce medication risks in older home care clients in primary care: a randomized controlled trial. *BMC Geriatr*. 2019; 19: 332. Published online 2019 Nov 27.
61. Bingham JM, Taylor AM, Boesen KP, Axon DR. Preliminary Investigation of Pharmacist-Delivered, Direct-to-Provider Interventions to Reduce Co-Prescribing of Opioids and Benzodiazepines among a Medicare Population. *Pharmacy (Basel)* 2020 Mar; 8(1): 25. Published online 2020 Feb 21.
62. 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 Nov 13;320(18):1889-1898.
63. Armistead LT, Hughes TD, Larson CK, Busby-Whitehead J, Ferreri SP. Integrating targeted consultant pharmacists into a new collaborative care model to reduce the risk of falls in older adults owing to the overuse of opioids and benzodiazepines. *J Am Pharm Assoc (2003)*. 2021 Jan-Feb;61(1):e16-e18. doi: 10.1016/j.japh.2020.08.038. Epub 2020 Sep 12. PMID: 32933865.
64. Qato DM, Wilder J, Schumm LP, Gillet V, Alexander GC. Changes in Prescription and Over-the-Counter Medication and Dietary Supplement Use Among Older Adults in the United States, 2005 vs 2011. *JAMA Intern Med*. 2016 Apr;176(4):473-82.
65. Maust DT, Strominger J, Kim HM, et al. Prevalence of Central Nervous System–Active Polypharmacy Among Older Adults With Dementia in the US. *JAMA*. 2021;325(10):952–961.
66. Saraf AA, Peterson AW, Simmons SF, Schnelle JF, Bell SP, Kripalani S, Myers AP, Mixon AS, Long EA, Jacobsen MJ, Vasilevskis EE. Medications Associated with Geriatric Syndromes (MAGS) and their Prevalence in Older Hospitalized Adults Discharged to Skilled Nursing Facilities. *J Hosp Med*. 2016 Oct; 11(10): 694–700.
67. Rhee TG, Maust DT, Fiellin DA, Olfson M. Trends in Co-Prescribing of Opioids and Opioid Potentiators Among U.S. Adults, 2007-2018. *Am J Prev Med*. 2021 Mar;60(3):434-437.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

68. Sharma V, Weir D, Samanani S, Simpson SH, Gilani F, Jess E, Eurich DT. Characterisation of concurrent use of prescription opioids and benzodiazepine/Z-drugs in Alberta, Canada: a population-based study. *BMJ Open*. 2019 Sep 6;9(9):e030858.

69. Husebo BS, Kerns RD, Han L, Skanderson M, Gnjdjic D, Allore HD. Pain, Complex Chronic Conditions and Potential Inappropriate Medication in People with Dementia. Lessons Learnt for Pain Treatment Plans Utilizing Data from the Veteran Health Administration. *Brain Sci*. 2021 Jan; 11(1): 86. Published online 2021 Jan 11.

70. Barry DT, Sofuoglu M, Kerns RD, Wiechers IR, Rosenheck RA. Prevalence and correlates of co-prescribing psychotropic medications with long-term opioid use nationally in the Veterans Health Administration. *Psychiatry Res*. 2015 Jun 30;227(2-3):324-32. doi: 10.1016/j.psychres.2015.03.006. Epub 2015 Mar 16. PMID: 25863822.

71. St Clair CO, Golub NI, Ma Y, Song J, Winiacki SK, Menschik DL. Characteristics Associated With U.S. Outpatient Opioid Analgesic Prescribing and Gabapentinoid Co-Prescribing. *Am J Prev Med*. 2020 Jan;58(1):e11-e19.

72. Musich S, Wang SS, Slindee LB, Ruiz J, Yeh CS. Concurrent Use of Opioids with Other Central Nervous System-Active Medications Among Older Adults. *Popul Health Manag*. 2020 Aug;23(4):286-296. doi: 10.1089/pop.2019.0128. Epub 2019 Nov 25. PMID: 31765280; PMCID: PMC7406999.

⁴⁶ Bankes DL, Schamp RO, Knowlton CH, Bain KT. Prescriber-Initiated Engagement of Pharmacists for Information and Intervention in Programs of All-Inclusive Care for the Elderly. *Pharmacy (Basel)* 2020 Mar; 8(1): 24. Published online 2020 Feb 21.

⁴⁷ Bingham JM, Taylor AM, Boesen KP, Axon DR. Preliminary Investigation of Pharmacist-Delivered, Direct-to-Provider Interventions to Reduce Co-Prescribing of Opioids and Benzodiazepines among a Medicare Population. *Pharmacy (Basel)* 2020 Mar; 8(1): 25. Published online 2020 Feb 21.

⁴⁸ 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 Nov 13;320(18):1889-1898.

⁴⁹ Armistead LT, Hughes TD, Larson CK, Busby-Whitehead J, Ferreri SP. Integrating targeted consultant pharmacists into a new collaborative care model to reduce the risk of falls in older adults owing to the overuse of opioids and benzodiazepines. *J Am Pharm Assoc (2003)*. 2021 Jan-Feb;61(1):e16-e18. doi: 10.1016/j.japh.2020.08.038. Epub 2020 Sep 12. PMID: 32933865.

⁵⁰ Zaman T, Rife TL, Batki SL, Pennington DL. An electronic intervention to improve safety for pain patients co-prescribed chronic opioids and benzodiazepines. *Subst Abuse*. 2018;39(4):441-448.

⁵¹ American Geriatrics Society Beers Criteria® Update Expert Panel, Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., ... & Sandhu, S. (2019). American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 67(4), 674-694. DOI: <https://doi.org/10.1111/jgs.15767>

⁵² Harding, A. (2009). Obituary: Mark H Beers. *The Lancet*, 373(9674), 1518. DOI:[https://doi.org/10.1016/S0140-6736\(09\)60846-1](https://doi.org/10.1016/S0140-6736(09)60846-1).

⁵³ American Geriatrics Society Beers Criteria® Update Expert Panel, Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., ... & Sandhu, S. (2019). American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially

inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 67(4), 674-694. DOI: <https://doi.org/10.1111/jgs.15767>

⁵⁴American Geriatrics Society Panel on the Pharmacological Management of Persistent Pain in Older Persons. (2009). Pharmacological management of persistent pain in older persons. *J Am Geriatr Soc*. 57(8):1331–1346. DOI: 10.1111/j.1532-5415.2009.02376.x

⁵⁵ Cornelius, R., Herr, K. A., Gordon, D. B., Kretzer, K., & Butcher, H. K. (2016). Acute pain management in older adults. *Journal of gerontological nursing*. cSomay Center for Gerontological Excellence, College of Nursing. University of Iowa. Retrieved January 28, 2022 from: https://geriatricpain.org/sites/geriatricpain.org/files/2021-03/2016_acute_pain_guideline_electronic.pdf

⁵⁶ Conaghan PG, Arden N, Avouac B, Migliore A, Rizzoli R. Safety of Paracetamol in Osteoarthritis: What Does the Literature Say? *Drugs Aging*. 2019 Apr;36(Suppl 1):7-14. doi: 10.1007/s40266-019-00658-9. PMID: 31073920; PMCID: PMC6509082.

⁵⁷ American Geriatrics Society Panel on the Pharmacological Management of Persistent Pain in Older Persons. (2009). Pharmacological management of persistent pain in older persons. *J Am Geriatr Soc*. 57(8):1331–1346. DOI: 10.1111/j.1532-5415.2009.02376.x

⁵⁸ Reisner, L. (2011). Pharmacological management of persistent pain in older persons. *The Journal of pain*, 12(3), S21-S29.

⁵⁹ Kocot-Kępska, M., Zajączkowska, R., Mika, J., Kopsky, D. J., Wordliczek, J., Dobrogowski, J., & Przeklasa-Muszyńska, A. (2021). Topical Treatments and Their Molecular/Cellular Mechanisms in Patients with Peripheral Neuropathic Pain—Narrative Review. *Pharmaceutics*, 13(4), 450. DOI: <https://doi.org/10.3390/pharmaceutics13040450>

⁶⁰ Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., ... & Wallace, M. (2015). Pharmacotherapy for neuropathic pain in adults: a systematic review and meta-analysis. *The Lancet Neurology*, 14(2), 162-173. DOI: 10.1016/S1474-4422(14)70251-0

⁶¹ Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., ... & Wallace, M. (2015). Pharmacotherapy for neuropathic pain in adults: a systematic review and meta-analysis. *The Lancet Neurology*, 14(2), 162-173. DOI: 10.1016/S1474-4422(14)70251-0

⁶² Kocot-Kępska, M., Zajączkowska, R., Mika, J., Kopsky, D. J., Wordliczek, J., Dobrogowski, J., & Przeklasa-Muszyńska, A. (2021). Topical Treatments and Their Molecular/Cellular Mechanisms in Patients with Peripheral Neuropathic Pain—Narrative Review. *Pharmaceutics*, 13(4), 450. DOI: <https://doi.org/10.3390/pharmaceutics13040450>

⁶³ Kocot-Kępska, M., Zajączkowska, R., Mika, J., Kopsky, D. J., Wordliczek, J., Dobrogowski, J., & Przeklasa-Muszyńska, A. (2021). Topical Treatments and Their Molecular/Cellular Mechanisms in Patients with Peripheral Neuropathic Pain—Narrative Review. *Pharmaceutics*, 13(4), 450. DOI: <https://doi.org/10.3390/pharmaceutics13040450>

⁶⁴ Davies, P. S., & Galer, B. S. (2004). Review of lidocaine patch 5% studies in the treatment of postherpetic neuralgia. *Drugs*, 64(9), 937-947.

⁶⁵ Galer, B. S., Gammaitoni, A. R., Oleka, N., Jensen, M. P., & Argoff, C. E. (2004). Use of the lidocaine patch 5% in reducing intensity of various pain qualities reported by patients with low-back pain. *Current Medical Research and Opinion*, 20(sup2), S5-S12.

⁶⁶ Burch, F., Coddington, C., Patel, N., & Sheldon, E. (2004). Lidocaine patch 5% improves pain, stiffness, and physical function in osteoarthritis pain patients: a prospective, multicenter, open-label effectiveness trial. *Osteoarthritis and cartilage*, 12(3), 253-255.

⁶⁷ Campbell, B. J., Rowbotham, M., Davies, P. S., Jacob III, P., & Benowitz, N. L. (2002). Systemic absorption of topical lidocaine in normal volunteers, patients with post-herpetic neuralgia, and patients with acute herpes zoster. *Journal of pharmaceutical sciences*, 91(5), 1343-1350.

⁶⁸ Wolff RF, Bala MM, Westwood M, Kessels AG, Kleijnen J. 5% lidocaine-medicated plaster vs other relevant interventions and placebo for post-herpetic neuralgia (PHN): a systematic review. *Acta Neurol Scand*. 2011 May;123(5):295-309. doi: 10.1111/j.1600-0404.2010.01433.x. Epub 2010 Oct 10. PMID: 21039364.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ⁶⁹ Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., ... & Wallace, M. (2015). Pharmacotherapy for neuropathic pain in adults: a systematic review and meta-analysis. *The Lancet Neurology*, 14(2), 162-173. DOI: 10.1016/S1474-4422(14)70251-0
- ⁷⁰ Kocot-Kępska, M., Zajączkowska, R., Mika, J., Kopsky, D. J., Wordliczek, J., Dobrogowski, J., & Przeklasa-Muszyńska, A. (2021). Topical Treatments and Their Molecular/Cellular Mechanisms in Patients with Peripheral Neuropathic Pain—Narrative Review. *Pharmaceutics*, 13(4), 450. DOI: <https://doi.org/10.3390/pharmaceutics13040450>
- ⁷¹ Haanpää M, Cruccu G, Nurmikko TJ, McBride WT, Docu Axelarad A, Bosilkov A, Chambers C, Ernault E, Abdulahad AK. Capsaicin 8% patch versus oral pregabalin in patients with peripheral neuropathic pain. *Eur J Pain*. 2016 Feb;20(2):316-28. doi: 10.1002/ejp.731. Epub 2015 Nov 19. PMID: 26581442; PMCID: PMC4738436.
- ⁷² Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., ... & Wallace, M. (2015). Pharmacotherapy for neuropathic pain in adults: a systematic review and meta-analysis. *The Lancet Neurology*, 14(2), 162-173. DOI: 10.1016/S1474-4422(14)70251-0
- ⁷³ Reisner, L. (2011). Pharmacological management of persistent pain in older persons. *The Journal of pain*, 12(3), S21-S29.
- ⁷⁴ American Geriatrics Society Beers Criteria® Update Expert Panel, Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., ... & Sandhu, S. (2019). American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 67(4), 674-694. DOI: <https://doi.org/10.1111/jgs.15767>
- ⁷⁵ Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., ... & Wallace, M. (2015). Pharmacotherapy for neuropathic pain in adults: a systematic review and meta-analysis. *The Lancet Neurology*, 14(2), 162-173. DOI: 10.1016/S1474-4422(14)70251-0
- ⁷⁶ American Geriatrics Society Beers Criteria® Update Expert Panel, Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., ... & Sandhu, S. (2019). American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 67(4), 674-694. DOI: <https://doi.org/10.1111/jgs.15767>
- ⁷⁷ American Geriatrics Society Beers Criteria® Update Expert Panel, Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., ... & Sandhu, S. (2019). American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 67(4), 674-694. DOI: <https://doi.org/10.1111/jgs.15767>
- ⁷⁸ Barohn, R. J., Gajewski, B., Pasnoor, M., Brown, A., Herbelin, L. L., Kimminau, K. S., ... & Cash, T. (2021). Patient Assisted Intervention for Neuropathy: Comparison of Treatment in Real Life Situations (PAIN-CONTRoLS): Bayesian Adaptive Comparative Effectiveness Randomized Trial. *JAMA neurology*, 78(1), 68-76.
- ⁷⁹ Finnerup, N. B., Attal, N., Haroutounian, S., McNicol, E., Baron, R., Dworkin, R. H., ... & Wallace, M. (2015). Pharmacotherapy for neuropathic pain in adults: a systematic review and meta-analysis. *The Lancet Neurology*, 14(2), 162-173. DOI: 10.1016/S1474-4422(14)70251-0
- ⁸⁰ Max MB, Lynch SA, Muir J, Shoaf SE, Smoller B, Dubner R. Effects of desipramine, amitriptyline, and fluoxetine on pain in diabetic neuropathy. *N Engl J Med*. 1992 May 7;326(19):1250-6. doi: 10.1056/NEJM199205073261904. PMID: 1560801.
- ⁸¹ Rowbotham M, Harden N, Stacey B, Bernstein P, Magnus-Miller L. Gabapentin for the treatment of postherpetic neuralgia: a randomized controlled trial. *JAMA*. 1998 Dec 2;280(21):1837-42. doi: 10.1001/jama.280.21.1837. PMID: 9846778.
- ⁸² American Geriatrics Society Beers Criteria® Update Expert Panel, Fick, D. M., Semla, T. P., Steinman, M., Beizer, J., Brandt, N., ... & Sandhu, S. (2019). American Geriatrics Society 2019 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 67(4), 674-694. DOI: <https://doi.org/10.1111/jgs.15767>
- ⁸³ Kong LJ, Lauche R, Klose P, et al. Tai Chi for Chronic Pain Conditions: A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Sci Rep*. 2016;6(1):25325. doi:10.1038/srep25325

-
- ⁸⁴ Wang C, Schmid CH, Iversen MD, et al. Comparative Effectiveness of Tai Chi Versus Physical Therapy for Knee Osteoarthritis: A Randomized Trial. *Ann Intern Med*. 2016;165(2):77. doi:10.7326/M15-2143
- ⁸⁵ Lee AC, Harvey WF, Price LL, et al. Dose-Response Effects of Tai Chi and Physical Therapy Exercise Interventions in Symptomatic Knee Osteoarthritis. *PM&R*. 2018;10(7):712-723. doi:10.1016/j.pmrj.2018.01.003
- ⁸⁶ Li L, Cheng S, Wang G, Duan G, Zhang Y. Tai chi chuan exercises improve functional outcomes and quality of life in patients with primary total knee arthroplasty due to knee osteoarthritis. *Complement Ther Clin Pract*. 2019;35:121-125. doi:10.1016/j.ctcp.2019.02.003
- ⁸⁷ Lee AC, Harvey WF, Han X, et al. Pain and functional trajectories in symptomatic knee osteoarthritis over up to 12 weeks of exercise exposure. *Osteoarthritis Cartilage*. 2018;26(4):501-512. doi:10.1016/j.joca.2018.01.016
- ⁸⁸ Liu J, Chen L, Chen X, et al. Modulatory effects of different exercise modalities on the functional connectivity of the periaqueductal grey and ventral tegmental area in patients with knee osteoarthritis: a randomised multimodal magnetic resonance imaging study. *Br J Anaesth*. 2019;123(4):506-518. doi:10.1016/j.bja.2019.06.017
- ⁸⁹ Lee AC, Driban JB, Price LL, Harvey WF, Rodday AM, Wang C. Responsiveness and Minimally Important Differences for 4 Patient-Reported Outcomes Measurement Information System Short Forms: Physical Function, Pain Interference, Depression, and Anxiety in Knee Osteoarthritis. *J Pain*. 2017;18(9):1096-1110. doi:10.1016/j.jpain.2017.05.001
- ⁹⁰ Liu J, Chen L, Tu Y, et al. Different exercise modalities relieve pain syndrome in patients with knee osteoarthritis and modulate the dorsolateral prefrontal cortex: A multiple mode MRI study. *Brain Behav Immun*. 2019;82:253-263. doi:10.1016/j.bbi.2019.08.193
- ⁹¹ You T, Ogawa EF, Thapa S, et al. Effects of Tai Chi on beta endorphin and inflammatory markers in older adults with chronic pain: an exploratory study. *Aging Clin Exp Res*. 2020;32(7):1389-1392. doi:10.1007/s40520-019-01316-1
- ⁹² You T, Ogawa EF, Thapa S, et al. Tai Chi for older adults with chronic multisite pain: a randomized controlled pilot study. *Aging Clin Exp Res*. 2018;30(11):1335-1343. doi:10.1007/s40520-018-0922-0
- ⁹³ Liu J, Yeung A, Xiao T, et al. Chen-Style Tai Chi for Individuals (Aged 50 Years Old or Above) with Chronic Non-Specific Low Back Pain: A Randomized Controlled Trial. *Int J Environ Res Public Health*. 2019;16(3):517. doi:10.3390/ijerph16030517
- ⁹⁴ Hall AM, Kamper SJ, Emsley R, Maher CG. Does pain-catastrophising mediate the effect of tai chi on treatment outcomes for people with low back pain? *Complement Ther Med*. 2016;25:61-66. doi:10.1016/j.ctim.2015.12.013
- ⁹⁵ Zou L, Zhang Y, Liu Y, et al. The Effects of Tai Chi Chuan Versus Core Stability Training on Lower-Limb Neuromuscular Function in Aging Individuals with Non-Specific Chronic Lower Back Pain. *Medicina (Mex)*. 2019;55(3):60. doi:10.3390/medicina55030060
- ⁹⁶ Wang C, Schmid CH, Fielding RA, et al. Effect of tai chi versus aerobic exercise for fibromyalgia: comparative effectiveness randomized controlled trial. *BMJ*. Published online March 21, 2018;k851. doi:10.1136/bmj.k851
- ⁹⁷ Wong A, Figueroa A, Sanchez-Gonzalez MA, Son W-M, Chernykh O, Park S-Y. Effectiveness of Tai Chi on Cardiac Autonomic Function and Symptomatology in Women With Fibromyalgia: A Randomized Controlled Trial. *J Aging Phys Act*. 2018;26(2):214-221. doi:10.1123/japa.2017-0038
- ⁹⁸ Lauche R, Stumpe C, Fehr J, et al. The Effects of Tai Chi and Neck Exercises in the Treatment of Chronic Nonspecific Neck Pain: A Randomized Controlled Trial. *J Pain*. 2016;17(9):1013-1027. doi:10.1016/j.jpain.2016.06.004
- ⁹⁹ Yeh GY, Chan CW, Wayne PM, Conboy L. The Impact of Tai Chi Exercise on Self-Efficacy, Social Support, and Empowerment in Heart Failure: Insights from a Qualitative Sub-Study from a Randomized Controlled Trial. Pizzi C, ed. *PLOS ONE*. 2016;11(5):e0154678. doi:10.1371/journal.pone.0154678
- ¹⁰⁰ Liu X, Williams G, Kostner K, Brown WJ. The Effect of Tai Chi on Quality of Life in Centrally Obese Adults with Depression. *J Altern Complement Med*. 2019;25(10):1005-1008. doi:10.1089/acm.2019.0050
- ¹⁰¹ Callahan LF, Cleveland RJ, Altpeter M, Hackney B. Evaluation of Tai Chi Program Effectiveness for People with Arthritis in the Community: A Randomized Controlled Trial. *J Aging Phys Act*. 2016;24(1):101-110. doi:10.1123/japa.2014-0211

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ¹⁰² Qi M, Moyle W, Jones C, Weeks B. Effects of Tai Chi Combined With Theraband Training on Physical Fitness, Psychological Well-being, and Pain in Older Sedentary Office Workers: A Pilot Randomized Controlled Trial. *Top Geriatr Rehabil*. 2019;35(4):255-265. doi:10.1097/TGR.0000000000000244
- ¹⁰³ Li F, Harmer P, Fitzgerald K, Eckstrom, E, Akers, L, Chou, L, Pidgeon, D, Voit, J, Winters-Stone, K. Effectiveness of a Therapeutic Tai Ji Quan Intervention vs a Multimodal Exercise Intervention to Prevent Falls Among Older Adults at High Risk of Falling: A Randomized Clinical Trial. *JAMA Intern Med*. 2018;178(10):1301–1310.
- ¹⁰⁴ You T, Ogawa EF, Thapa S, et al. Effects of Tai Chi on beta endorphin and inflammatory markers in older adults with chronic pain: an exploratory study. *Aging Clin Exp Res*. 2020;32(7):1389-1392. doi:10.1007/s40520-019-01316-1
- ¹⁰⁵ Yeh GY, Chan CW, Wayne PM, Conboy L. The Impact of Tai Chi Exercise on Self-Efficacy, Social Support, and Empowerment in Heart Failure: Insights from a Qualitative Sub-Study from a Randomized Controlled Trial. Pizzi C, ed. *PLOS ONE*. 2016;11(5):e0154678. doi:10.1371/journal.pone.0154678
- ¹⁰⁶ Hall AM, Kamper SJ, Emsley R, Maher CG. Does pain-catastrophising mediate the effect of tai chi on treatment outcomes for people with low back pain? *Complement Ther Med*. 2016;25:61-66. doi:10.1016/j.ctim.2015.12.013
- ¹⁰⁷ Lee AC, Harvey WF, Price LL, et al. Dose-Response Effects of Tai Chi and Physical Therapy Exercise Interventions in Symptomatic Knee Osteoarthritis. *PM&R*. 2018;10(7):712-723. doi:10.1016/j.pmrj.2018.01.003
- ¹⁰⁸ Lee AC, Harvey WF, Han X, et al. Pain and functional trajectories in symptomatic knee osteoarthritis over up to 12 weeks of exercise exposure. *Osteoarthritis Cartilage*. 2018;26(4):501-512. doi:10.1016/j.joca.2018.01.016
- ¹⁰⁹ Lee AC, Harvey WF, Price LL, et al. Mindfulness Is Associated With Treatment Response From Nonpharmacologic Exercise Interventions in Knee Osteoarthritis. *Arch Phys Med Rehabil*. 2017;98(11):2265-2273.e1. doi:10.1016/j.apmr.2017.04.014
- ¹¹⁰ Seguin-Fowler R, Graham M, Ward J, Eldridge G, Sriram U, Fine D. Feasibility of a yoga intervention to decrease pain in older women: a randomized controlled pilot study. *BMC Geriatr*. 2020;20(1):400. doi:10.1186/s12877-020-01818-y
- ¹¹¹ Cherkin DC, Sherman KJ, Balderson BH, et al. Effect of Mindfulness-Based Stress Reduction vs Cognitive Behavioral Therapy or Usual Care on Back Pain and Functional Limitations in Adults With Chronic Low Back Pain: A Randomized Clinical Trial. *JAMA*. 2016;315(12):1240. doi:10.1001/jama.2016.2323
- ¹¹² Saper RB, Lemaster C, Delitto A, et al. Yoga, Physical Therapy, or Education for Chronic Low Back Pain: A Randomized Noninferiority Trial. *Ann Intern Med*. 2017;167(2):85. doi:10.7326/M16-2579
- ¹¹³ Groessl EJ, Liu L, Chang DG, et al. Yoga for Military Veterans with Chronic Low Back Pain: A Randomized Clinical Trial. *Am J Prev Med*. 2017;53(5):599-608. doi:10.1016/j.amepre.2017.05.019
- ¹¹⁴ Highland KB, Schoomaker A, Rojas W, et al. Benefits of the Restorative Exercise and Strength Training for Operational Resilience and Excellence Yoga Program for Chronic Low Back Pain in Service Members: A Pilot Randomized Controlled Trial. *Arch Phys Med Rehabil*. 2018;99(1):91-98. doi:10.1016/j.apmr.2017.08.473
- ¹¹⁵ Park J, McCaffrey R, Newman D, Liehr P, Ouslander JG. A Pilot Randomized Controlled Trial of the Effects of Chair Yoga on Pain and Physical Function Among Community-Dwelling Older Adults With Lower Extremity Osteoarthritis. *J Am Geriatr Soc*. 2017;65(3):592-597. doi:10.1111/jgs.14717
- ¹¹⁶ Cheung C, Wyman JF, Bronas U, McCarthy T, Rudser K, Mathiason MA. Managing knee osteoarthritis with yoga or aerobic/strengthening exercise programs in older adults: a pilot randomized controlled trial. *Rheumatol Int*. 2017;37(3):389-398. doi:10.1007/s00296-016-3620-2
- ¹¹⁷ Kuntz AB, Chopp-Hurley JN, Brenneman EC, et al. Efficacy of a biomechanically-based yoga exercise program in knee osteoarthritis: A randomized controlled trial. Martinuzzi A, ed. *PLOS ONE*. 2018;13(4):e0195653. doi:10.1371/journal.pone.0195653
- ¹¹⁸ Park J, Newman D, McCaffrey R, Garrido JJ, Riccio ML, Liehr P. The Effect of Chair Yoga on Biopsychosocial Changes in English- and Spanish-Speaking Community-Dwelling Older Adults with Lower-Extremity Osteoarthritis. *J Gerontol Soc Work*. 2016;59(7-8):604-626. doi:10.1080/01634372.2016.1239234
- ¹¹⁹ McCaffrey R, Park J, Newman D. Chair Yoga: Feasibility and Sustainability Study With Older Community-Dwelling Adults With Osteoarthritis. *Holist Nurs Pract*. 2017;31(3):148-157. doi:10.1097/HNP.0000000000000184

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ¹²⁰ Schmid AA, Fruhauf CA, Sharp JL, Van Puymbroeck M, Bair MJ, Portz JD. Yoga for People With Chronic Pain in a Community-Based Setting: A Feasibility and Pilot RCT. *J Evid-Based Integr Med*. 2019;24:2515690X1986376. doi:10.1177/2515690X19863763
- ¹²¹ Dunleavy K, Kava K, Goldberg A, et al. Comparative effectiveness of Pilates and yoga group exercise interventions for chronic mechanical neck pain: quasi-randomised parallel controlled study. *Physiotherapy*. 2016;102(3):236-242. doi:10.1016/j.physio.2015.06.002
- ¹²² Hartfiel N, Clarke G, Havenhand J, Phillips C, Edwards RT. Cost-effectiveness of yoga for managing musculoskeletal conditions in the workplace. *Occup Med*. 2017;67(9):687-695. doi:10.1093/occmed/kqx161
- ¹²³ Galantino ML, Tiger R, Brooks J, Jang S, Wilson K. Impact of Somatic Yoga and Meditation on Fall Risk, Function, and Quality of Life for Chemotherapy-Induced Peripheral Neuropathy Syndrome in Cancer Survivors. *Integr Cancer Ther*. 2019;18:153473541985062. doi:10.1177/1534735419850627
- ¹²⁴ Morishima T, Miyashiro I, Inoue N, et al. Effects of laughter therapy on quality of life in patients with cancer: An open-label, randomized controlled trial. Buchowski MS, ed. *PLOS ONE*. 2019;14(6):e0219065. doi:10.1371/journal.pone.0219065
- ¹²⁵ Adair M, Murphy B, Yarlagadda S, Deng J, Dietrich MS, Ridner SH. Feasibility and Preliminary Efficacy of Tailored Yoga in Survivors of Head and Neck Cancer: A Pilot Study. *Integr Cancer Ther*. 2018;17(3):774-784. doi:10.1177/1534735417753540
- ¹²⁶ Huberty J, Eckert R, Dueck A, et al. Online yoga in myeloproliferative neoplasm patients: results of a randomized pilot trial to inform future research. *BMC Complement Altern Med*. 2019;19(1):121. doi:10.1186/s12906-019-2530-8
- ¹²⁷ Pasyar N, Barshan Tashnizi N, Mansouri P, Tahmasebi S. Effect of yoga exercise on the quality of life and upper extremity volume among women with breast cancer related lymphedema: A pilot study. *Eur J Oncol Nurs*. 2019;42:103-109. doi:10.1016/j.ejon.2019.08.008
- ¹²⁸ Eyigor S, Uslu R, Apaydin S, Caramat I, Yesil H. Can yoga have any effect on shoulder and arm pain and quality of life in patients with breast cancer? A randomized, controlled, single-blind trial. *Complement Ther Clin Pract*. 2018;32:40-45. doi:10.1016/j.ctcp.2018.04.010
- ¹²⁹ Uebelacker LA, Van Noppen D, Tremont G, Bailey G, Abrantes A, Stein M. A pilot study assessing acceptability and feasibility of hatha yoga for chronic pain in people receiving opioid agonist therapy for opioid use disorder. *J Subst Abuse Treat*. 2019;105:19-27. doi:10.1016/j.jsat.2019.07.015
- ¹³⁰ Young H-J, Mehta TS, Herman C, Wang F, Rimmer JH. The Effects of M2M and Adapted Yoga on Physical and Psychosocial Outcomes in People With Multiple Sclerosis. *Arch Phys Med Rehabil*. 2019;100(3):391-400. doi:10.1016/j.apmr.2018.06.032
- ¹³¹ Teut M, Knilli J, Daus D, Roll S, Witt CM. Qigong or Yoga Versus No Intervention in Older Adults With Chronic Low Back Pain—A Randomized Controlled Trial. *J Pain*. 2016;17(7):796-805. doi:10.1016/j.jpain.2016.03.003
- ¹³² Chou R, Deyo R, Friedly J, et al. Noninvasive Treatments for Low Back Pain. Comparative Effectiveness Reviews, No. 169 Rockville (MD): Agency for Healthcare Research and Quality (US) ; 2016 Feb Report No.: 16-EHC004-EF.
- ¹³³ Wong JJ, Cote P, Sutton DA, et al. Clinical practice guidelines for the noninvasive management of low back pain: A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration. *Eur J Pain* 21 (2017) 201-216.
- ¹³⁴ Hawk C, Whalen W, Farabaugh R, Daniels C, et al. Best Practices for Chiropractic Management of Patients with Chronic Musculoskeletal Pain: A Clinical Practice Guideline J Altern Complement Med 2020 Oct;26(10):884-901. doi: 10.1089/acm.2020.0181. Epub 2020 Jul 30.
- ¹³⁵ Lin I, Wiles, L, Waller R, et al. What does best practice care for musculoskeletal pain look like? Eleven consistent recommendations from high-quality clinical practice guidelines: systematic review *British Journal of Sports Medicine* 2020;54:79-86.
- ¹³⁶ Dougherty PE, Hawk C, Weiner, DK, et al. The role of chiropractic care in older adults. *Chiropr Man Therap* 20, 3 (2012). <https://doi.org/10.1186/2045-709X-20-3>.
- ¹³⁷ Corcoran K, Bastian L, Gunderson C, et al. Association Between Chiropractic Use and Opioid Receipt

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Among Patients with Spinal Pain: A Systematic Review and Meta-analysis *Chiropr Man Therap* 20, 3 (2012). 10.1186/2045-709X-20-3.

¹³⁸ Hawk C, Schneider MJ, Haas M, Katz P, Dougherty P, Gleberzon B, Killinger L, Weeks J. Best Practices for Chiropractic Care for Older Adults: A Systematic Review and Consensus Update *J Manipulative Physiol Ther.* 2017 May;40(4):217-229. doi: 10.1016/j.jmpt.2017.02.001. Epub 2017 Mar 14.

¹³⁹ Dougherty PE, Hawk C, Weiner, DK, et al. The role of chiropractic care in older adults. *Chiropr Man Therap* 20, 3 (2012). <https://doi.org/10.1186/2045-709X-20-3>.

¹⁴⁰ Learman K, Showalter C, Halloran B, Cook C Thrust and nonthrust manipulation for older adults with low back pain: an evaluation of pain and disability *J Manipulative Physiol Ther.* 2013 Jun;36(5):284-91. doi: 10.1016/j.jmpt.2013.05.007. Epub 2013 Jun 12.

¹⁴¹ DeLuca K, HungFang S, Ong J, et al. The Effectiveness and Safety of Manual Therapy on Pain and Disability in Older Persons With Chronic Low Back Pain: A Systematic Review *J Manipulative Physiol Ther.* 2017 Sep;40(7):527-534. doi: 10.1016/j.jmpt.2017.06.008. Epub 2017 Oct 25.

¹⁴² Maiers M, Evans R, Hartvigsen J, Bronfort G. Adverse events among seniors receiving spinal manipulation and exercise in a randomized clinical trial. *Man Ther.* 2015 Apr;20(2):335-41. doi: 10.1016/j.math.2014.10.003. Epub 2014 Oct 14.

¹⁴³ Elder C, DeBar, L, Ritenbaugh, C, et al. Acupuncture and chiropractic care: utilization and electronic medical record capture *Am J Manag Care.* 2015 Jul 1;21(7):e414-21.

¹⁴⁴ Axon D, Patel M, Martin J, Slack M. Use of multidomain management strategies by community dwelling adults with chronic pain: evidence from a systematic review. *Scand J Pain.* 2019 Jan 28;19(1):9-23. doi: 10.1515/sjpain-2018-0306.

¹⁴⁵ Weeks WB, Leininger B, Whedon J, Lurie J, Tosteson T, et al. The association between use of chiropractic care and costs of care among older Medicare patients with chronic low back pain and multiple comorbidities *J Manipulative Physiol Ther.* 2016 Feb; 39(2): 63–75.e2. Published online 2016 Feb 19. doi: 10.1016/j.jmpt.2016.01.006.

¹⁴⁶ Tick H, Neilsen A, Pelletier K, et al. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore (NY).* May-Jun 2018;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1.

¹⁴⁷ DeLuca K, HungFang S, Ong J, et al. The Effectiveness and Safety of Manual Therapy on Pain and Disability in Older Persons With Chronic Low Back Pain: A Systematic Review *J Manipulative Physiol Ther.* 2017 Sep;40(7):527-534. doi: 10.1016/j.jmpt.2017.06.008. Epub 2017 Oct 25.

¹⁴⁸ Whedon J, Song Y, Mackenzie T et al. Risk of Stroke Following Chiropractic Spinal Manipulation in Medicare B Beneficiaries Aged 66–99 Years with Neck Pain. *J Manipulative Physiol Ther.* 2015 February; 38(2): 93–101. doi:10.1016/j.jmpt.2014.12.001.

¹⁴⁹ Lisi A, Corcoran K, Derycke E, Bastian L, et al. Opioid Use Among Veterans of Recent Wars Receiving Veterans Affairs Chiropractic Care *Pain Med.* 2018 Sep 1;19(suppl_1):S54-S60. doi: 10.1093/pm/pny114.

¹⁵⁰ Louis C, Herrera CN, Garrity B, et al. Association of Initial Provider Type on Opioid Fills for Individuals With Neck Pain. *Arch Phys Med Rehabil.* 2020 Aug;101(8):1407-1413. doi: 10.1016/j.apmr.2020.04.002. Epub 2020 May 11.

¹⁵¹ Wedon J, Toler A, Goehl J, Kazal L. Association Between Utilization of Chiropractic Services for Treatment of Low-Back Pain and Use of Prescription Opioids. *J Altern Complement Med.* 2018 Jun;24(6):552-556. doi: 10.1089/acm.2017.0131. Epub 2018 Feb 22.

¹⁵² Louis C, Herrera CN, Garrity B, et al. Association of Initial Provider Type on Opioid Fills for Individuals With Neck Pain. *Arch Phys Med Rehabil.* 2020 Aug;101(8):1407-1413. doi: 10.1016/j.apmr.2020.04.002. Epub 2020 May 11.

¹⁵³ Wedon J, Toler A, Goehl J, Kazal L. Association Between Utilization of Chiropractic Services for Treatment of Low-Back Pain and Use of Prescription Opioids. *J Altern Complement Med.* 2018 Jun;24(6):552-556. doi: 10.1089/acm.2017.0131. Epub 2018 Feb 22.

¹⁵⁴ Durand Z, Nechuta S, Krishnaswami S, Jurwitz E, McPheeters M. Prevalence and Risk Factors

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Associated With Long-term Opioid Use After Injury Among Previously Opioid-Free Workers JAMA Netw Open. 2019 Jul 3;2(7):e197222. doi: 10.1001/jamanetworkopen.2019.7222.

¹⁵⁵ Azad T, Vail D, Bentley J, Han S, et al. Initial Provider Specialty Is Associated With Long-term Opiate Use in Patients With Newly Diagnosed Low Back and Lower Extremity Pain. Spine (Phila Pa 1976) . 2019 Feb 1;44(3):211-218. doi: 10.1097/BRS.0000000000002840.

¹⁵⁶ Kazis L, Ameli O, Rothendler J, et al. Observational retrospective study of the association of initial healthcare provider for new-onset low back pain with early and long-term opioid use. BMJ Open. 2019 Sep 20;9(9):e028633. doi: 10.1136/bmjopen-2018-028633.

¹⁵⁷ Leach R. Full-Coverage Chiropractic in Medicare: A Proposal to Eliminate Inequities, Improve Outcomes, and Reduce Health Disparities Without Increasing Overall Program Costs. J Chiropr Humanit. 2020 Dec 7;27:29-36. doi: 10.1016/j.echu.2020.10.002. eCollection 2020 Dec.

¹⁵⁸ Kligler B, Bair M, Banerjee R, et al. Clinical Policy Recommendations from the VHA State-of-the-Art Conference on Non-Pharmacological Approaches to Chronic Musculoskeletal Pain. J GEN INTERN MED 33, 16–23 (2018). <https://doi.org/10.1007/s11606-018-4323-z>

¹⁵⁹ Prater C, Tepe M, Battaglia P. Integrating a Multidisciplinary Pain Team and Chiropractic Care in a Community Health Center: An Observational Study of Managing Chronic Spinal Pain. J Prim Care Community Health. Jan-Dec 2020;11:2150132720953680. doi: 10.1177/2150132720953680.

¹⁶⁰ Leach R. Full-Coverage Chiropractic in Medicare: A Proposal to Eliminate Inequities, Improve Outcomes, and Reduce Health Disparities Without Increasing Overall Program Costs. J Chiropr Humanit. 2020 Dec 7;27:29-36. doi: 10.1016/j.echu.2020.10.002. eCollection 2020 Dec.

¹⁶¹ Kligler B, Bair M, Banerjee R, et al. Clinical Policy Recommendations from the VHA State-of-the-Art Conference on Non-Pharmacological Approaches to Chronic Musculoskeletal Pain. J GEN INTERN MED 33, 16–23 (2018). <https://doi.org/10.1007/s11606-018-4323-z>

¹⁶² Prater C, Tepe M, Battaglia P. Integrating a Multidisciplinary Pain Team and Chiropractic Care in a Community Health Center: An Observational Study of Managing Chronic Spinal Pain. J Prim Care Community Health. Jan-Dec 2020;11:2150132720953680. doi: 10.1177/2150132720953680.

¹⁶³ Rosa J, Burke J, et al. Changes in Opioid Therapy Use by an Interprofessional Primary Care Team: A Descriptive Study of Opioid Prescription Data. J Manipulative Physiol Ther . 2021 Mar;44(3):186-195. doi: 10.1016/j.jmpt.2021.01.003. Epub 2021 Apr 18.

¹⁶⁴ Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.

¹⁶⁵ Chou R, Deyo R, Friedly J, Skelly A, Hashimoto R, Weimer M, Fu R, Dana T, Kraegel P, Griffin J, Grusing S, Brodt E. Noninvasive Treatments for Low Back Pain. Comparative Effectiveness Review No. 169. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2012-00014-I.) AHRQ Publication No. 16-EHC004-EF. Rockville, MD: Agency for Healthcare Research and Quality; February 2016.

¹⁶⁶ Qaseem A, Wilt TJ, McLean RM, Forciea MA; Clinical Guidelines Committee of the American College of Physicians, Denberg TD, Barry MJ, Boyd C, Chow RD, Fitterman N, Harris RP, Humphrey LL, Vijan S. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. Ann Intern Med. 2017 Apr 4;166(7):514-530. doi: 10.7326/M16-2367. Epub 2017 Feb 14. PMID: 28192789.

¹⁶⁷ R.L. Nahin, R. Boineau, P.S. Khalsa, B.J. Stussman, W.J. Weber Evidence-based evaluation of complementary health approaches for pain management in the United States Mayo Clin Proc, 91 (9) (2016), pp. 1292-1306

¹⁶⁸ Sutton D, McCormack S. Acupuncture for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness, Cost Effectiveness and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019 Oct 29. PMID: 31877002.

-
- ¹⁶⁹ Xiang Y, He JY, Tian HH, Cao BY, Li R. Evidence of efficacy of acupuncture in the management of low back pain: a systematic review and meta-analysis of randomised placebo- or sham-controlled trials. *Acupunct Med*. 2020 Feb;38(1):15-24. doi: 10.1136/acupmed-2017-011445. Epub 2019 Sep 16. PMID: 31526013
- ¹⁷⁰ MacPherson H, Vertosick EA, Foster NE, et al. The persistence of the effects of acupuncture after a course of treatment: a meta-analysis of patients with chronic pain. *Pain*. 2017;158(5):784-793. doi:10.1097/j.pain.0000000000000747
- ¹⁷¹ Huang JF, Zheng XQ, Chen D, Lin JL, Zhou WX, Wang H, Qin Z, Wu AM. Can Acupuncture Improve Chronic Spinal Pain? A Systematic Review and Meta-Analysis. *Global Spine J*. 2021 Oct;11(8):1248-1265. doi: 10.1177/2192568220962440. Epub 2020 Oct 9. PMID: 33034233; PMCID: PMC8453671.
- ¹⁷² R.L. Nahin, R. Boineau, P.S. Khalsa, B.J. Stussman, W.J. Weber Evidence-based evaluation of complementary health approaches for pain management in the United States *Mayo Clin Proc*, 91 (9) (2016), pp. 1292-1306
- ¹⁷³ Sutton D, McCormack S. Acupuncture for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness, Cost Effectiveness and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019 Oct 29. PMID: 31877002.
- ¹⁷⁴ MacPherson H, Vertosick EA, Foster NE, et al. The persistence of the effects of acupuncture after a course of treatment: a meta-analysis of patients with chronic pain. *Pain*. 2017;158(5):784-793. doi:10.1097/j.pain.0000000000000747
- ¹⁷⁵ Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne P, Zador V; Pain Task Force of the Academic Consortium for Integrative Medicine and Health. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore (NY)*. 2018 May-Jun;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1. PMID: 29735382.
- ¹⁷⁶ Zhang Y, Wang C. Acupuncture and Chronic Musculoskeletal Pain. *Curr Rheumatol Rep*. 2020 Sep 25;22(11):80. doi: 10.1007/s11926-020-00954-z. PMID: 32978666.
- ¹⁷⁷ R.L. Nahin, R. Boineau, P.S. Khalsa, B.J. Stussman, W.J. Weber Evidence-based evaluation of complementary health approaches for pain management in the United States *Mayo Clin Proc*, 91 (9) (2016), pp. 1292-1306
- ¹⁷⁸ Sutton D, McCormack S. Acupuncture for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness, Cost Effectiveness and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019 Oct 29. PMID: 31877002.
- ¹⁷⁹ Xiang Y, He JY, Tian HH, Cao BY, Li R. Evidence of efficacy of acupuncture in the management of low back pain: a systematic review and meta-analysis of randomised placebo- or sham-controlled trials. *Acupunct Med*. 2020 Feb;38(1):15-24. doi: 10.1136/acupmed-2017-011445. Epub 2019 Sep 16. PMID: 31526013
- ¹⁸⁰ Yuan QL, Wang P, Liu L, et al. Acupuncture for musculoskeletal pain: A meta-analysis and meta-regression of sham-controlled randomized clinical trials. *Sci Rep*. 2016;6:30675. Published 2016 Jul 29. doi:10.1038/srep30675
- ¹⁸¹ Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.
- ¹⁸² MacPherson H, Vertosick EA, Foster NE, et al. The persistence of the effects of acupuncture after a course of treatment: a meta-analysis of patients with chronic pain. *Pain*. 2017;158(5):784-793. doi:10.1097/j.pain.0000000000000747
- ¹⁸³ Huang JF, Zheng XQ, Chen D, Lin JL, Zhou WX, Wang H, Qin Z, Wu AM. Can Acupuncture Improve Chronic Spinal Pain? A Systematic Review and Meta-Analysis. *Global Spine J*. 2021 Oct;11(8):1248-1265. doi: 10.1177/2192568220962440. Epub 2020 Oct 9. PMID: 33034233; PMCID: PMC8453671.
- ¹⁸⁴ Yuan QL, Wang P, Liu L, et al. Acupuncture for musculoskeletal pain: A meta-analysis and meta-regression of sham-controlled randomized clinical trials. *Sci Rep*. 2016;6:30675. Published 2016 Jul 29. doi:10.1038/srep30675
- ¹⁸⁵ MacPherson H, Vertosick EA, Foster NE, et al. The persistence of the effects of acupuncture after a course of treatment: a meta-analysis of patients with chronic pain. *Pain*. 2017;158(5):784-793. doi:10.1097/j.pain.0000000000000747

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ¹⁸⁶ Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne P, Zador V; Pain Task Force of the Academic Consortium for Integrative Medicine and Health. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore* (NY). 2018 May-Jun;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1. PMID: 29735382.
- ¹⁸⁷ Vickers AJ, Vertosick EA, Lewith G, MacPherson H, Foster NE, Sherman KJ, Irnich D, Witt CM, Linde K; Acupuncture Trialists' Collaboration. Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis. *J Pain*. 2018 May;19(5):455-474. doi: 10.1016/j.jpain.2017.11.005. Epub 2017 Dec 2. PMID: 29198932; PMCID: PMC5927830.
- ¹⁸⁸ R.L. Nahin, R. Boineau, P.S. Khalsa, B.J. Stussman, W.J. Weber Evidence-based evaluation of complementary health approaches for pain management in the United States *Mayo Clin Proc*, 91 (9) (2016), pp. 1292-1306
- ¹⁸⁹ Sutton D, McCormack S. Acupuncture for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness, Cost Effectiveness and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019 Oct 29. PMID: 31877002.
- ¹⁹⁰ Vickers AJ, Vertosick EA, Lewith G, MacPherson H, Foster NE, Sherman KJ, Irnich D, Witt CM, Linde K; Acupuncture Trialists' Collaboration. Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis. *J Pain*. 2018 May;19(5):455-474. doi: 10.1016/j.jpain.2017.11.005. Epub 2017 Dec 2. PMID: 29198932; PMCID: PMC5927830.
- ¹⁹¹ Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne P, Zador V; Pain Task Force of the Academic Consortium for Integrative Medicine and Health. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore* (NY). 2018 May-Jun;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1. PMID: 29735382.
- ¹⁹² Wu MS, Chen KH, Chen IF, Huang SK, Tzeng PC, Yeh ML, Lee FP, Lin JG, Chen C. The Efficacy of Acupuncture in Post-Operative Pain Management: A Systematic Review and Meta-Analysis. *PLoS One*. 2016 Mar 9;11(3):e0150367. doi: 10.1371/journal.pone.0150367. PMID: 26959661; PMCID: PMC4784927.
- ¹⁹³ Sutton D, McCormack S. Acupuncture for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness, Cost Effectiveness and Guidelines [Internet]. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; 2019 Oct 29. PMID: 31877002.
- ¹⁹⁴ Huang JF, Zheng XQ, Chen D, Lin JL, Zhou WX, Wang H, Qin Z, Wu AM. Can Acupuncture Improve Chronic Spinal Pain? A Systematic Review and Meta-Analysis. *Global Spine J*. 2021 Oct;11(8):1248-1265. doi: 10.1177/2192568220962440. Epub 2020 Oct 9. PMID: 33034233; PMCID: PMC8453671.
- ¹⁹⁵ Mu J, Furlan AD, Lam WY, Hsu MY, Ning Z, Lao L. Acupuncture for chronic nonspecific low back pain. *Cochrane Database Syst Rev*. 2020 Dec 11;12(12):CD013814. doi: 10.1002/14651858.CD013814. PMID: 33306198; PMCID: PMC8095030
- ¹⁹⁶ Furlan AD, Yazdi F, Tsertsvadze A, Gross A, Van Tulder M, Santaguida L, Cherkin D, Gagnier J, Ammendolia C, Ansari MT, Ostermann T, Dryden T, Doucette S, Skidmore B, Daniel R, Tsouros S, Weeks L, Galipeau J. Complementary and alternative therapies for back pain II. *Evid Rep Technol Assess* (Full Rep). 2010 Oct;(194):1-764. PMID: 23126534; PMCID: PMC4781408.
- ¹⁹⁷ Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.
- ¹⁹⁸ MacPherson H, Vertosick EA, Foster NE, et al. The persistence of the effects of acupuncture after a course of treatment: a meta-analysis of patients with chronic pain. *Pain*. 2017;158(5):784-793. doi:10.1097/j.pain.0000000000000747
- ¹⁹⁹ Vickers AJ, Vertosick EA, Lewith G, MacPherson H, Foster NE, Sherman KJ, Irnich D, Witt CM, Linde K; Acupuncture Trialists' Collaboration. Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis. *J Pain*. 2018 May;19(5):455-474. doi: 10.1016/j.jpain.2017.11.005. Epub 2017 Dec 2. PMID: 29198932; PMCID: PMC5927830.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ²⁰⁰ Lin YC, Wan L, Jamison RN. Using Integrative Medicine in Pain Management: An Evaluation of Current Evidence. *Anesth Analg*. 2017 Dec;125(6):2081-2093. doi: 10.1213/ANE.0000000000002579. PMID: 29189365.
- ²⁰¹ Tedesco D, Gori D, Desai KR, et al. Drug-Free Interventions to Reduce Pain or Opioid Consumption After Total Knee Arthroplasty: A Systematic Review and Meta-analysis [published correction appears in *JAMA Surg*. 2018 Apr 1;153(4):396]. *JAMA Surg*. 2017;152(10):e172872. doi:10.1001/jamasurg.2017.287233184777; PMCID: PMC7854390.
- ²⁰² Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne P, Zador V; Pain Task Force of the Academic Consortium for Integrative Medicine and Health. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore (NY)*. 2018 May-Jun;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1. PMID: 29735382.
- ²⁰³ Hassan S, Zheng Q, Rizzolo E, Tezcanli E, Bhardwaj S, Cooley K. Does Integrative Medicine Reduce Prescribed Opioid Use for Chronic Pain? A Systematic Literature Review. *Pain Med*. 2020 Apr 1;21(4):836-859. doi: 10.1093/pm/pnz291. PMID: 31755962.
- ²⁰⁴ Tang SK, Tse MMY, Leung SF, Fotis T. The effectiveness, suitability, and sustainability of non-pharmacological methods of managing pain in community-dwelling older adults: a systematic review. *BMC Public Health*. 2019 Nov 8;19(1):1488. doi: 10.1186/s12889-019-7831-9. PMID: 31703654; PMCID: PMC6842175.
- ²⁰⁵ Axon DR, Patel MJ, Martin JR, Slack MK. Use of multidomain management strategies by community dwelling adults with chronic pain: evidence from a systematic review. *Scand J Pain*. 2019 Jan 28;19(1):9-23. doi: 10.1515/sjpain-2018-0306. PMID: 30375350.
- ²⁰⁶ Huang JF, Zheng XQ, Chen D, Lin JL, Zhou WX, Wang H, Qin Z, Wu AM. Can Acupuncture Improve Chronic Spinal Pain? A Systematic Review and Meta-Analysis. *Global Spine J*. 2021 Oct;11(8):1248-1265. doi: 10.1177/2192568220962440. Epub 2020 Oct 9. PMID: 33034233; PMCID: PMC8453671
- ²⁰⁷ Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne P, Zador V; Pain Task Force of the Academic Consortium for Integrative Medicine and Health. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore (NY)*. 2018 May-Jun;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1. PMID: 29735382.
- ²⁰⁸ R.L. Nahin, R. Boineau, P.S. Khalsa, B.J. Stussman, W.J. Weber. Evidence-based evaluation of complementary health approaches for pain management in the United States. *Mayo Clin Proc*, 91 (9) (2016), pp. 1292-1306
- ²⁰⁹ Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.
- ²¹⁰ Elder W, Munk N, Love M et al. Real-World Massage Therapy Produces Meaningful Effectiveness Signal for Primary Care Patients with Chronic Low Back Pain: Results of a Repeated Measures Cohort Study. *Pain Med*. 2017 Jul 1;18(7):1394-1405. doi: 10.1093/pm/pnw347.
- ²¹¹ Chou R, Deyo R, Friedly J, Skelly A, Hashimoto R, Weimer M, Fu R, Dana T, Kraegel P, Griffin J, Grusing S, Brodt E. Noninvasive Treatments for Low Back Pain. Comparative Effectiveness Review No. 169. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2012-00014-I.) AHRQ Publication No. 16-EHC004-EF. Rockville, MD: Agency for Healthcare Research and Quality; February 2016.
- ²¹² Qaseem A, Wilt TJ, McLean RM, Forciea MA; Clinical Guidelines Committee of the American College of Physicians, Denberg TD, Barry MJ, Boyd C, Chow RD, Fitterman N, Harris RP, Humphrey LL, Vijan S. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. *Ann Intern Med*. 2017 Apr 4;166(7):514-530. doi: 10.7326/M16-2367. Epub 2017 Feb 14. PMID: 28192789.
- ²¹³ Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ²¹⁴ R.L. Nahin, R. Boineau, P.S. Khalsa, B.J. Stussman, W.J. Weber. Evidence-based evaluation of complementary health approaches for pain management in the United States. *Mayo Clin Proc*, 91 (9) (2016), pp. 1292-1306
- ²¹⁵ Nelson N, Churilla J. Massage Therapy for Pain and Function in Patients With Arthritis: A Systematic Review of Randomized Controlled Trials. *Am J Phys Med Rehabil*. 2017 Sep;96(9):665-672. doi: 10.1097/PHM.0000000000000712.
- ²¹⁶ Pehlivan S, Karadakovan A. Effects of aromatherapy massage on pain, functional state, and quality of life in an elderly individual with knee osteoarthritis. *Jpn J Nurs Sci*. 2019 Oct;16(4):450-458. doi: 10.1111/jjns.12254. Epub 2019 May 30. PMID: 31144450.
- ²¹⁷ Perlman A, Fogerite SG, Glass O, Bechard E, Ali A, Njike VY, Pieper C, Dmitrieva NO, Luciano A, Rosenberger L, Keever T, Milak C, Finkelstein EA, Mahon G, Campanile G, Cotter A, Katz DL. Efficacy and Safety of Massage for Osteoarthritis of the Knee: a Randomized Clinical Trial. *J Gen Intern Med*. 2019 Mar;34(3):379-386. doi: 10.1007/s11606-018-4763-5. Epub 2018 Dec 12. PMID: 30543021; PMCID: PMC6420526.
- ²¹⁸ Abbasi Z, Hakimi Najaf Abadi M, Ganji R, Asali R, Nabavi SH, Rezaeean SM, Poorbarat S. The Effect of Effleurage Massage Therapy on Symptoms of Osteoarthritis in Elderly Women with Osteoarthritis: A Cross-Clinical Trial. *Open Access Maced J Med Sci [Internet]*. 2021 Nov. 12 [cited 2022 Feb. 1];9(G):244-50. Available from: <https://oamjms.eu/index.php/mjms/article/view/7236>
- ²¹⁹ Q. Xu, B. Chen, Y. Wang, et al. The effectiveness of manual therapy for relieving pain, stiffness, and dysfunction in knee osteoarthritis: a systematic review and meta-analysis. *Pain Physician*, 20 (4) (2017), pp. 229-243
- ²²⁰ Ali A, Rosenberger L, Weiss TR, Milak C, Perlman AI. Massage Therapy and Quality of Life in Osteoarthritis of the Knee: A Qualitative Study. *Pain Med*. 2017 Jun 1;18(6):1168-1175. doi: 10.1093/pm/pnw217. PMID: 27590465; PMCID: PMC6279287.
- ²²¹ Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Kantner S, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review Update [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Apr. Report No.: 20-EHC009. PMID: 32338846.
- ²²² Yuan SL, Matsutani LA, Marques AP. Effectiveness of different styles of massage therapy in fibromyalgia: a systematic review and meta-analysis. *Man Ther*. 2015 Apr;20(2):257-64. doi: 10.1016/j.math.2014.09.003. Epub 2014 Oct 5. PMID: 25457196.
- ²²³ Perlman A, Fogerite SG, Glass O, Bechard E, Ali A, Njike VY, Pieper C, Dmitrieva NO, Luciano A, Rosenberger L, Keever T, Milak C, Finkelstein EA, Mahon G, Campanile G, Cotter A, Katz DL. Efficacy and Safety of Massage for Osteoarthritis of the Knee: a Randomized Clinical Trial. *J Gen Intern Med*. 2019 Mar;34(3):379-386. doi: 10.1007/s11606-018-4763-5. Epub 2018 Dec 12. PMID: 30543021; PMCID: PMC6420526.
- ²²⁴ Tick H, Nielsen A, Pelletier KR, Bonakdar R, Simmons S, Glick R, Ratner E, Lemmon RL, Wayne P, Zador V; Pain Task Force of the Academic Consortium for Integrative Medicine and Health. Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore (NY)*. 2018 May-Jun;14(3):177-211. doi: 10.1016/j.explore.2018.02.001. Epub 2018 Mar 1. PMID: 29735382.
- ²²⁵ Effectiveness of Aromatherapy Massage and Inhalation on Symptoms of Depression in Chinese Community-Dwelling Older Adults. Mei Xiong, Yanzhang Li, Ping Tang, Yuping Zhang, Min Cao, Junwei Ni, and Mengmeng Xing. *The Journal of Alternative and Complementary Medicine* 2018 24:7, 717-724
- ²²⁶ Anderson A, Deng J, Anthony R, et al. Using complementary and alternative medicine to treat pain and agitation in dementia: A review of randomized controlled trials from long-term care with potential use in critical care. *Crit Care Nurs Clin North Am*. 2017 Dec; 29(4): 519–537. doi: 10.1016/j.cnc.2017.08.010
- ²²⁷ Dimitriou TD, Verykoui E, Papatriantafyllou J, Konsta A, Kazis D, Tsolaki M. Non-pharmacological interventions for agitation/aggressive behaviour in patients with dementia: a randomized controlled crossover trial. *Funct Neurol*. 2018 Jul/Sept;33(3):143-147. PMID: 30457967.
- ²²⁸ Okuyan CB, Bilgili N. Effect of abdominal massage on constipation and quality of life in older adults: A randomized controlled trial. *Complement Ther Med*. 2019 Dec;47:102219. doi: 10.1016/j.ctim.2019.102219. Epub 2019 Oct 16.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

-
- ²²⁹ Yıldırım D, Can G, Köknel Talu G. The efficacy of abdominal massage in managing opioid-induced constipation. *Eur J Oncol Nurs*. 2019 Aug;41:110-119. doi: 10.1016/j.ejon.2019.05.013. Epub 2019 Jun 1. PMID: 31358243.
- ²³⁰ Munk N, Zanjani F. Relationship between massage therapy usage and health outcomes in older adults *J Bodyw Mov Ther*. 2011 Apr;15(2):177-85. doi: 10.1016/j.jbmt.2010.01.007. Epub 2010 Feb 20.
- ²³¹ Crawford C, Boyd C, Paat, C et al. The Impact of Massage Therapy on Function in Pain Populations-A Systematic Review and Meta-Analysis of Randomized Controlled Trials: Part I, Patients Experiencing Pain in the General Population. *Pain Med*. 2016 Jul 1;17(7):1353-1375. doi: 10.1093/pm/pnw099.
- ²³² Ali A, Rosenberger L, Weiss TR, Milak C, Perlman AI. Massage Therapy and Quality of Life in Osteoarthritis of the Knee: A Qualitative Study. *Pain Med*. 2017 Jun 1;18(6):1168-1175. doi: 10.1093/pm/pnw217. PMID: 27590465; PMCID: PMC6279287.
- ²³³ Keeratitanont K, Jensen M, Catchawan U et al. The efficacy of traditional Thai massage for the treatment of chronic pain: A systematic review. *Complement Ther Clin Pract*. 2015 Feb;21(1):26-32. doi: 10.1016/j.ctcp.2015.01.006. Epub 2015 Jan 31.
- ²³⁴ Kaye, A. D., Baluch, A. R., Kaye, R. J., Niaz, R. S., Kaye, A. J., Liu, H., & Fox, C. J. (2014). Geriatric pain management, pharmacological and nonpharmacological considerations. *Psychology & Neuroscience*, 7(1), 15-26. <http://dx.doi.org/10.3922/j.psns.2014.1.04>
- ²³⁵ Hooten M, Thorson D, Bianco J, Bonte B, Clavel Jr A, Hora J, Johnson C, Kirksson E, Noonan MP, Reznikoff C, Schweim K, Wainio J, Walker N. Institute for Clinical Systems Improvement. Pain: Assessment, Non-Opioid Treatment Approaches and Opioid Management. Updated August 2017.
- ²³⁶ Borsheski R, Johnson QL. Pain management in the geriatric population. *Mo Med*. 2014 Nov-Dec;111(6):508-11. PMID: 25665235; PMCID: PMC6173536.
- ²³⁷ Dowd H, Hogan MJ, McGuire BE, Davis MC, Sarma KM, Fish RA, Zautra AJ. Comparison of an Online Mindfulness-based Cognitive Therapy Intervention With Online Pain Management Psychoeducation: A Randomized Controlled Study. *Clin J Pain*. 2015; 31(6): 517 - 27.
- ²³⁸ Wong SYS. Effect of mindfulness-based stress reduction programme on pain and quality of life in chronic pain patients: a randomised controlled clinical trial. *Hong Kong Med J*. 2009; 15 Suppl 6:13 - 14.
- ²³⁹ la Cour P, Petersen M. Effects of mindfulness meditation on chronic pain: a randomized controlled trial. *Pain Med*. 2015; 16(4): 641-652.
- ²⁴⁰ Cherkin DC, Sherman KJ, Balderson BH, Cook AJ, Anderson ML, Hawkes RJ, Hansen KE, Turner JA. Effects of Mindfulness-Based Stress Reduction vs Cognitive Behavioral Therapy and Usual Care on Back Pain and Functional Limitations Among Adults with Chronic Low Back Pain: A Randomized Clinical Trial. *JAMA*. 2016; 315(12): 1240 - 1249.
- ²⁴¹ Cherkin DC, Anderson ML, Sherman KJ, Balderson BH, Cook AJ, Hansen KE, Turner JA. Two-Year Follow-up of a Randomized Clinical Trial of Mindfulness-Based Stress Reduction vs Cognitive Behavioral Therapy or Usual Care for Chronic Low Back Pain. *JAMA*. 2017; 317(6): 642 - 644.
- ²⁴² Morone NE, Greco CM, Weiner DK. Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study. *Pain*. 2008 Feb; 134(3): 310–319.
- ²⁴³ Morone NE, Greco CM, Moore CG, Rollman BL, Lane B, Morrow LA, Glynn NW, Weiner DK. A Mind-Body Program for Older Adults With Chronic Low Back Pain. *JAMA Intern Med*. 2016; 176(3): 329 - 337.
- ²⁴⁴ Dowsey M, Castle D, Knowles S, Monshat K, Salzberg M, et al. The effect of mindfulness training prior to total joint arthroplasty on post-operative pain and physical function: A randomised controlled trial. *Complement Ther Med*. 2019; 46: 195 - 201.
- ²⁴⁵ Perez-Aranda A, Feliu-Soler A, Montero-Marin J, et al. A randomized controlled efficacy trial of mindfulness-based stress reduction compared with an active control group and usual care for fibromyalgia: the EUDAIMON study. *Pain*. 2019; 160: 2508 - 2523.
- ²⁴⁶ Schmidt S, Grossman P, Schwarzer B, Jena S, Naumann J, Walach H. Treating fibromyalgia with mindfulness-based stress reduction: results from a 3-armed randomized controlled trial. *Pain*. 2011; 152(2):361-369.

-
- ²⁴⁷ Seminowicz DA, Burrowes SAB, Kearson A, Zhang J, Krimmel SR, Samawi L, et al. Enhanced mindfulness-based stress reduction in episodic migraine: a randomized clinical trial with magnetic resonance imaging outcomes, *Pain*. 2020; 161(8): 1837-1846.
- ²⁴⁸ Karadağ S, Taşci S, Doğan N, Demir H, Kiliç Z. Application of heat and a home exercise program for pain and function levels in patients with knee osteoarthritis: A randomized controlled trial. *Int J Nurs Pr*. 25(5):e12772. doi:doi:10.1111/ijn.12772
- ²⁴⁹ Rezasoltani Z, Azizi S, Najafi S, Sanati E, Dadarkhah A, Abdorrazaghi F. Physical therapy, intra-articular dextrose prolotherapy, botulinum neurotoxin, and hyaluronic acid for knee osteoarthritis: randomized clinical trial. *Int J Rehabil Res*. 2020;43(3):219-227.
- ²⁵⁰ Király M, Kővári E, Hodosi K, Bálint PV, Bender T. The effects of Tizsasüly and Kolop mud pack therapy on knee osteoarthritis: a double-blind, randomised, non-inferiority controlled study. *Int J Biometeorol*. 2020;64(6):943-950. doi:10.1007/s00484-019-01764-4
- ²⁵¹ Petrofsky JS, Laymon M, Alshammari F, Khowailed IA, Lee H. Use of low level of continuous heat and Ibuprofen as an adjunct to physical therapy improves pain relief, range of motion and the compliance for home exercise in patients with nonspecific neck pain: A randomized controlled trial. *Back Musculoskelet Rehabil*. 2017;30(4):889-896.
- ²⁵² Shin H-J, Kim S-H, Hahm S-C, Cho H-Y. Thermotherapy Plus Neck Stabilization Exercise for Chronic Nonspecific Neck Pain in Older: A Single-Blinded Randomized Controlled Trial. *Int J Env Res Public Health*. 2020;17(15):5572.
- ²⁵³ Petrofsky JS, Laymon MS, Alshammari FS, Lee H. Use of Low Level of Continuous Heat as an Adjunct to Physical Therapy Improves Knee Pain Recovery and the Compliance for Home Exercise in Patients With Chronic Knee Pain: A Randomized Controlled Trial. *J Strength Cond Res*. 2016;30(11):3107-3115. doi:10.1519/JSC.0000000000001409
- ²⁵⁴ Hicks GE, Sions JM, Velasco TO, Manal TJ. Trunk Muscle Training Augmented With Neuromuscular Electrical Stimulation Appears to Improve Function in Older Adults With Chronic Low Back Pain: A Randomized Preliminary Trial. *Clin J Pain*. 2016;32(10):898-906. doi:10.1097/AJP.0000000000000348
- ²⁵⁵ Lauche R, Schuth M, Schwickert M, et al. Efficacy of the Alexander Technique in treating chronic non-specific neck pain: a randomized controlled trial. *Clin Rehabil*. 2016;40(3):247-258.
- ²⁵⁶ 1. Wetherell JL, Petkus AJ, Alonso-Fernandez M, Bower ES, Steiner AR, Afari N. Age moderates response to acceptance and commitment therapy vs. cognitive behavioral therapy for chronic pain. *Int J Geriatr Psychiatry*. 2016 Mar;31(3):302-8. doi: 10.1002/gps.4330. Epub 2015 Jul 28. PMID: 26216753.
- ²⁵⁷ Du S, Dong J, Jin S, Zhang H, Zhang Y. Acceptance and Commitment Therapy for chronic pain on functioning: A systematic review of randomized controlled trials. *Neurosci Biobehav Rev*. 2021 Sep 15;131:59-76. doi: 10.1016/j.neubiorev.2021.09.022. Epub ahead of print. PMID: 34536462.
- ²⁵⁸ 1. Wetherell JL, Petkus AJ, Alonso-Fernandez M, Bower ES, Steiner AR, Afari N. Age moderates response to acceptance and commitment therapy vs. cognitive behavioral therapy for chronic pain. *Int J Geriatr Psychiatry*. 2016 Mar;31(3):302-8. doi: 10.1002/gps.4330. Epub 2015 Jul 28. PMID: 26216753.
- ²⁵⁹ Du S, Dong J, Jin S, Zhang H, Zhang Y. Acceptance and Commitment Therapy for chronic pain on functioning: A systematic review of randomized controlled trials. *Neurosci Biobehav Rev*. 2021 Sep 15;131:59-76. doi: 10.1016/j.neubiorev.2021.09.022. Epub ahead of print. PMID: 34536462.
- ²⁶⁰ 1. Wetherell JL, Petkus AJ, Alonso-Fernandez M, Bower ES, Steiner AR, Afari N. Age moderates response to acceptance and commitment therapy vs. cognitive behavioral therapy for chronic pain. *Int J Geriatr Psychiatry*. 2016 Mar;31(3):302-8. doi: 10.1002/gps.4330. Epub 2015 Jul 28. PMID: 26216753.
- ²⁶¹ Du S, Dong J, Jin S, Zhang H, Zhang Y. Acceptance and Commitment Therapy for chronic pain on functioning: A systematic review of randomized controlled trials. *Neurosci Biobehav Rev*. 2021 Sep 15;131:59-76. doi: 10.1016/j.neubiorev.2021.09.022. Epub ahead of print. PMID: 34536462.
- ²⁶² Du S, Dong J, Jin S, Zhang H, Zhang Y. Acceptance and Commitment Therapy for chronic pain on functioning: A systematic review of randomized controlled trials. *Neurosci Biobehav Rev*. 2021 Sep 15;131:59-76. doi: 10.1016/j.neubiorev.2021.09.022. Epub ahead of print. PMID: 34536462.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

²⁶³ Vasiliou VS, Karademas EC, Christou Y, Papacostas S, Karekla M. Mechanisms of change in acceptance and commitment therapy for primary headaches. *Eur J Pain*. 2021 Aug 10. doi: 10.1002/ejp.1851. Epub ahead of print. PMID: 34375444.

²⁶⁴ Clarke HA, Manoo V, Pearsall EA, Goel A, Feinberg A, Weinrib A, Chiu JC, Shah B, Ladak SSJ, Ward S, Srikandarajah S, Brar SS, McLeod RS. Consensus Statement for the Prescription of Pain Medication at Discharge after Elective Adult Surgery. *Can J Pain*. 2020 Mar 8;4(1):67-85. doi: 10.1080/24740527.2020.1724775. PMID: 33987487; PMCID: PMC7951150.

²⁶⁵ Hadlandsmyth K, Dindo LN, Wajid R, Sugg SL, Zimmerman MB, Rakel BA. A single-session acceptance and commitment therapy intervention among women undergoing surgery for breast cancer: A randomized pilot trial to reduce persistent postsurgical pain. *Psychooncology*. 2019 Nov;28(11):2210-2217. doi: 10.1002/pon.5209. Epub 2019 Aug 30. PMID: 31430830.

²⁶⁶ Dindo L, Zimmerman MB, Hadlandsmyth K, StMarie B, Embree J, Marchman J, Tripp-Reimer T, Rakel B. Acceptance and Commitment Therapy for Prevention of Chronic Postsurgical Pain and Opioid Use in At-Risk Veterans: A Pilot Randomized Controlled Study. *J Pain*. 2018 Oct;19(10):1211-1221. doi: 10.1016/j.jpain.2018.04.016. Epub 2018 May 17. PMID: 29777950; PMCID: PMC6163061.

²⁶⁷ Anthony CA, Rojas EO, Keffala V, Glass NA, Shah AS, Miller BJ, Hogue M, Willey MC, Karam M, Marsh JL. Acceptance and Commitment Therapy Delivered via a Mobile Phone Messaging Robot to Decrease Postoperative Opioid Use in Patients With Orthopedic Trauma: Randomized Controlled Trial. *J Med Internet Res*. 2020 Jul 29;22(7):e17750. doi: 10.2196/17750. PMID: 32723723; PMCID: PMC7458063.

²⁶⁸ Hadlandsmyth K, Dindo LN, Wajid R, Sugg SL, Zimmerman MB, Rakel BA. A single-session acceptance and commitment therapy intervention among women undergoing surgery for breast cancer: A randomized pilot trial to reduce persistent postsurgical pain. *Psychooncology*. 2019 Nov;28(11):2210-2217. doi: 10.1002/pon.5209. Epub 2019 Aug 30. PMID: 31430830.

²⁶⁹ Dindo L, Zimmerman MB, Hadlandsmyth K, StMarie B, Embree J, Marchman J, Tripp-Reimer T, Rakel B. Acceptance and Commitment Therapy for Prevention of Chronic Postsurgical Pain and Opioid Use in At-Risk Veterans: A Pilot Randomized Controlled Study. *J Pain*. 2018 Oct;19(10):1211-1221. doi: 10.1016/j.jpain.2018.04.016. Epub 2018 May 17. PMID: 29777950; PMCID: PMC6163061.

²⁷⁰ Anthony CA, Rojas EO, Keffala V, Glass NA, Shah AS, Miller BJ, Hogue M, Willey MC, Karam M, Marsh JL. Acceptance and Commitment Therapy Delivered via a Mobile Phone Messaging Robot to Decrease Postoperative Opioid Use in Patients With Orthopedic Trauma: Randomized Controlled Trial. *J Med Internet Res*. 2020 Jul 29;22(7):e17750. doi: 10.2196/17750. PMID: 32723723; PMCID: PMC7458063.

²⁷¹ Esteve R, Marcos E, Reyes-Pérez Á, López-Martínez AE, Ramírez-Maestre C. Pain Acceptance Creates an Emotional Context That Protects against the Misuse of Prescription Opioids: A Study in a Sample of Patients with Chronic Noncancer Pain. *Int J Environ Res Public Health*. 2021 Mar 16;18(6):3054. doi: 10.3390/ijerph18063054. PMID: 33809628; PMCID: PMC8002364.

²⁷² Esteve R, Marcos E, Reyes-Pérez Á, López-Martínez AE, Ramírez-Maestre C. Pain Acceptance Creates an Emotional Context That Protects against the Misuse of Prescription Opioids: A Study in a Sample of Patients with Chronic Noncancer Pain. *Int J Environ Res Public Health*. 2021 Mar 16;18(6):3054. doi: 10.3390/ijerph18063054. PMID: 33809628; PMCID: PMC8002364.

²⁷³ Esteve R, Marcos E, Reyes-Pérez Á, López-Martínez AE, Ramírez-Maestre C. Pain Acceptance Creates an Emotional Context That Protects against the Misuse of Prescription Opioids: A Study in a Sample of Patients with Chronic Noncancer Pain. *Int J Environ Res Public Health*. 2021 Mar 16;18(6):3054. doi: 10.3390/ijerph18063054. PMID: 33809628; PMCID: PMC8002364.

²⁷⁴ Esteve R, Marcos E, Reyes-Pérez Á, López-Martínez AE, Ramírez-Maestre C. Pain Acceptance Creates an Emotional Context That Protects against the Misuse of Prescription Opioids: A Study in a Sample of Patients with Chronic Noncancer Pain. *Int J Environ Res Public Health*. 2021 Mar 16;18(6):3054. doi: 10.3390/ijerph18063054. PMID: 33809628; PMCID: PMC8002364.

²⁷⁵ Esteve R, Marcos E, Reyes-Pérez Á, López-Martínez AE, Ramírez-Maestre C. Pain Acceptance Creates an Emotional Context That Protects against the Misuse of Prescription Opioids: A Study in a Sample of Patients with

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

Chronic Noncancer Pain. *Int J Environ Res Public Health*. 2021 Mar 16;18(6):3054. doi: 10.3390/ijerph18063054. PMID: 33809628; PMCID: PMC8002364.

²⁷⁶ Esteve R, Marcos E, Reyes-Pérez Á, López-Martínez AE, Ramírez-Maestre C. Pain Acceptance Creates an Emotional Context That Protects against the Misuse of Prescription Opioids: A Study in a Sample of Patients with Chronic Noncancer Pain. *Int J Environ Res Public Health*. 2021 Mar 16;18(6):3054. doi: 10.3390/ijerph18063054. PMID: 33809628; PMCID: PMC8002364.

²⁷⁷ Williams ACC, Fisher E, Hearn L, Eccleston C. Psychological therapies for the management of chronic pain (excluding headache) in adults. *Cochrane Database Syst Rev*. 2020 Aug 12;8(8):CD007407. doi: 10.1002/14651858.CD007407.pub4. PMID: 32794606; PMCID: PMC7437545.

²⁷⁸ Sullivan MD BD, Ichikawa L, Cronkite D, Albertson-Junkans L, Salgado G, VonKorff M, Carrell DS. Primary Care Opioid Taper Plans Are Associated with Sustained Opioid Dose Reduction. *J Gen Intern Med*;35:687-95.

²⁷⁹ Sullivan MD, Turner JA, DiLodovico C, D'Appollonio A, Stephens K, Chan YF. Prescription Opioid Taper Support for Outpatients With Chronic Pain: A Randomized Controlled Trial. *J Pain* 2017;18:308-18

²⁸⁰ Wartko PD BD, Turner JA, Cook AJ, Wellman RD, Fujii MM, García RC, Moser KA, Sullivan MD. STRategies to Improve Pain and Enjoy life (STRIPE): Protocol for a pragmatic randomized trial of pain coping skills training and opioid medication taper guidance for patients on long-term opioid therapy. *Contemp Clin Trials* 2021;110:106499.

²⁸¹ Kuntz JL SJ, Firemark AJ, Dickerson JF, Papajorgji-Taylor D, Reese KR, Hamer TA, Marsh D, Thorsness LA, Sullivan MD, Debar LL, Smith DH. A Pharmacist-Led Program to Taper Opioid Use at Kaiser Permanente Northwest: Rationale, Design, and Evaluation. *Perm J* 2020;24:216.

²⁸² Kuntz JL DJ, Schneider JL, Firemark AJ, Papajorgji-Taylor D, Slaughter M, Reese KR, Thorsness LA, Sullivan MD, Debar LL, Smith DH. Factors associated with opioid-tapering success: A mixed methods study. *J Am Pharm Assoc* (2003) 2021.

²⁸³ Firemark AJ SJ, Kuntz JL, Papajorgji-Taylor D, Dickerson JF, Thorsness LA, Reese KR, Sullivan MD, Debar LL, Smith DH. Interviews with Clinicians and Pharmacists About Use of a Pharmacy-Led Opioid Tapering Program. "We Need to Taper.". *Pain Med* 2021;22:1213-22.

²⁸⁴ Linder JA, Meeker D, Fox CR, et al. Effects of Behavioral Interventions on Inappropriate Antibiotic Prescribing in Primary Care 12 Months After Stopping Interventions. *JAMA* 2017;318:1391-2.

²⁸⁵ Kelley MA PS, Linder JA, Friedberg MW, Meeker D, Fox CR, Goldstein NJ, Knight TK, Zein D, Rowe TA, Sullivan MD, Doctor JN. The protocol of the Application of Economics & Social psychology to improve Opioid Prescribing Safety Trial 1 (AESOPS-1): Electronic health record nudges. *Contemp Clin Trials* 2021;103:106329.

²⁸⁶ James JR, Scott JM, Klein JW, et al. Mortality After Discontinuation of Primary Care-Based Chronic Opioid Therapy for Pain: a Retrospective Cohort Study. *J Gen Intern Med* 2019;34:2749-55.

²⁸⁷ Binswanger IA GJ, Faul M, Shoup JA, Quintana LM, Lyden J, Xu S, Narwaney KJ. . The Association between Opioid Discontinuation and Heroin Use: A Nested Case-Control Study. *Drug Alcohol Depend* 2020;217:108248.

²⁸⁸ Oliva EM BT, Manhapra A, Kertesz S, Hah JM, Henderson P, Robinson A, Paik M, Sandbrink F, Gordon AJ, Trafton JA. . Associations between stopping prescriptions for opioids, length of opioid treatment, and overdose or suicide deaths in US veterans: observational evaluation. *BMJ* 2020;368.

²⁸⁹ Agnoli A XG, Tancredi DJ, Magnan E, Jerant A, Fenton JJ. Association of Dose Tapering With Overdose or Mental Health Crisis Among Patients Prescribed Long-term Opioids. *JAMA* 2021;326:411-9.

²⁹⁰ Hartung DM AL, Leichtling G, Korthuis PT, Hildebran C. A statewide effort to reduce high-dose opioid prescribing through coordinated care organizations. *Addict Behav* 2018;86:32-9.

²⁹¹ Darnall BD, Juurlink D, Kerns RD, et al. International Stakeholder Community of Pain Experts and Leaders Call for an Urgent Action on Forced Opioid Tapering. *Pain Med* 2019;20 429-33.

²⁹² Kroenke K, Alford DP, Argoff C, et al. Challenges with Implementing the Centers for Disease Control and Prevention Opioid Guideline: A Consensus Panel Report. *Pain Med* 2019.

²⁹³ Covington EC AC, Ballantyne JC, Cowan P, Gazelka HM, Hooten WM, Kertesz SG, Manhapra A, Murphy JL, Stanos SP Jr, Sullivan MD. Ensuring Patient Protections When Tapering Opioids: Consensus Panel Recommendations. . *Mayo Clin Proc* 2020;95:2155-71.

Bree Collaborative Opioid Prescribing in Older Adults Guidelines

Updated: March 30, 2022

²⁹⁴ Letter from James Madara, M.D., CEO of the American Medical Association, to Deborah Dowell, M.D. Chief Medical Officer, National Center for Injury Prevention and Control, U.S. Centers for Disease Control and Prevention. 2020. (Accessed February 4, 2021, 2021,

²⁹⁵ Dowell D, Haegerich T, Chou R. No Shortcuts to Safer Opioid Prescribing. *N Engl J Med* 2019;380:2285-7.

²⁹⁶ Heins SE CR. Changes in Opioid Prescribing Following the Implementation of State Policies Limiting Morphine Equivalent Daily Dose in a Commercially Insured Population. 2021.

²⁹⁷ Sullivan MD, Bauer AM, Fulton-Kehoe D, et al. Trends in Opioid Dosing Among Washington State Medicaid Patients Before and After Opioid Dosing Guideline Implementation. *J Pain* 2016;17:561-8.

²⁹⁸ Quinn PD CZ, Bair MJ, Rickert ME, Gibbons RD, Kroenke K, D'Onofrio BM. Associations of opioid prescription dose and discontinuation with risk of substance-related morbidity in long-term opioid therapy. *J Pain* 2021.

²⁹⁹ Hayes CJ KE, Brown J, Li C, Hudson T, Martin BC. Impact of transitioning from long-term to intermittent opioid therapy on the development of opioid-related adverse outcomes: A retrospective cohort study. *Drug Alcohol Depend* 2021;231:109236.

³⁰⁰ MD S. Long-term opioid therapy unsettles us both coming and going. *J Pain* 2021.

³⁰¹ Ballantyne JC, Sullivan, M.D. The discovery of endogenous opioid systems: what it has meant for understanding pain and its treatment. *Pain* 2017;158:2290-300.

³⁰² Dunbar RI. Bridging the bonding gap: the transition from primates to humans. *Philos Trans R Soc Lond B Biol Sci* 2012;367:1837-46.

³⁰³ McDonald S, Darke S, Kaye S, Torok M. Deficits in social perception in opioid maintenance patients, abstinent opioid users and non-opioid users. *Addiction* 2013;108:566-74.

³⁰⁴ Ballantyne JC, Sullivan MD, Koob GF. Refractory dependence on opioid analgesics. *Pain* 2019;160:2655-60.

³⁰⁵ Manhapra A SM, Ballantyne JC, MacLean RR, Becker WC. Complex Persistent Opioid Dependence with Long-term Opioids: a Gray Area That Needs Definition, Better Understanding, Treatment Guidance, and Policy Changes. *J Gen Intern Med* 2020;35:964-71.