

## Acute prescribing including acute injuries and peri-operative

Review of Literature and Summary of the Evidence

Debra Gordon, Darcy Jaffe

Goal: Prevent transition to chronic prescribing

1. Optimize pain care by involving the patient and family or caregiver in the discharge and provide clear oral and readable written instructions on:
  - The risks, safe use, and storage of opioids and proper disposal of controlled substances through [Safe Medication Return Program](#).
  - Which provider will be responsible for managing postoperative pain, including who will be prescribing any opioids.
  - Planned taper of postoperative opioids, including a timeline for return to preoperative or lower opioid dosing for those on chronic opioids.
2. Perform medication review and reconciliation at follow up visit to ensure the patient is not continuing medication that s/he no longer need

### Search terms

opioid and older adult and postoperative ( 11,076 results)  
opioid and elderly and acute pain (2116 results)  
opioid and geriatrics (967 results)  
opioid and transition and geriatrics (14 results)  
opioid and transition and older adults (405 results)  
prevention and opioid use and older adults (7463 results)  
older adults and opioid use disorder (7283 results)  
strategies and prevention of transition to chronic opioid (results 23)

### Evidence

Long-term opioid use often begins with treatment of acute pain. The probability of long-term opioid use increases most sharply in the first days of therapy, particularly after 5 days or 1 month of opioids have been prescribed (Shah A et al 2017). There is little high-grade evidence on transition to chronic opioid use specific to advancing age by decade of life. A population study of opioid naive adults ≥65 years found 6% transitioned to chronic opioid use >90 days (Musich S et al, 2019). 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 (Raman SR et al, 2019). Transition rates to chronic 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 surgical procedure (Brummett CM et al 2017). Similar rates have been reported for opioid-naive patients remaining on opioid medication 12 months after sustaining fragility fractures of the hip, proximal humerus, or distal radius (Torchia MT et al, 2019). 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 (Gold et al, 2018).

Multiple studies suggest a number of patient, prescriber and system factors contribute to unintended persistent opioid use (Kent et al 2017; Hooten et al 2017; Nguyen AV et al 2020; Lawal OD et al, 2020). Age is associated with persistent opioid use particularly age greater than 50 ( Rose AJ et al, 2018; Pugely AJ et al 2018) as is white race, higher income and Medicaid dual-eligibility (Nguyen et al, 2020). Characteristics associated with chronic opioid use include low income, older, females, in poor health, with 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 (Shah A, et al, 2017). Additional patient risk factors include comorbid posttraumatic stress, past or current nicotine use, past or current substance use disorder, social isolation and loneliness (Vyas MV et al 2020). Persistent opioid use has also been associated with presence of diabetes, pulmonary disease and heart failure (Mosher HJ et al, 2013). There is substantial variation in opioid use between states even after accounting for patient and procedure characteristics associated with opioid use (Vail D et al, 2018) 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 (Desveaux L et al, 2019). 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 (Haegerich TM et al 2019).

Bio-physiologic changes that occur with ageing, 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 used in younger adults) occur with all opioids with age (McLachlan AJ et al, 2011; Scott JC et al, 1987) leading to recommendations to start opioid therapy with about 50% of the usual adult dosage (Pergolizzi J et al, 2008). 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 them 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 (Seppala et al, 2018). 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 (Lieberman JS et al, 2019). 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 (Chen S et al, 2020). Opioid analgesics are one of the most common medications that account for all discrepant medications at time of transfer from hospital to skilled nursing facilities (Tjia et al, 2009) highlighting the importance of medication reconciliation at time of transition of care providers.

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 aged 50–70 years (Carew et al, 2018). 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 abuse, who continue to abuse as they age, while “late-onset” includes individuals who develop a new habit as elders (Roe et al., 2010). As individuals age they are less likely to obtain prescription opioids illicitly and more likely to obtain prescription opioids via the medical community (Cicero et al., 2012). One study reported that 40-50% of

adults 50 and older who misused prescription opioids obtained those medications through physicians (Schepis et al., 2018). Alcohol use among older adults is also increasing particularly among females, including past-month binge alcohol (Han et al, 2017) and is a significant safety concern for acute or persistent opioid treatment in older adults who may self-medicate loss, grief and loneliness.

Studies have demonstrated benefits of shared-decision making (SDM) in the context of opioid prescribing. SDM can reduce opioid use and increase physician satisfaction in prescribing opioids for patients with chronic pain (Hjelmaas AJ et al, 2019). A randomized-controlled trial of 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 has been shown to be feasible and to promote faster return to preoperative opioid doses and definitive opioid cessation (Hah J et al, 2020). 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 (VanDyke MM et al 2017). Thus 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 (Wu et al, 2019). Approaches used to reduce unintended transition from acute to chronic opioid use include prescribing limitations (Young BT et al, 2020), acceptance and commitment therapy delivered by a mobile phone (Anthony CA et al, 2020), motivational interviewing (Hah J et al, 2020), development of a multidisciplinary transitional pain service to identify at-risk patients and optimize pain management upon discharge from hospital (Huang A et al, 2016) and deprescribing algorithms (Lumish R et al, 2018). The practicality of implementing these types of measures is limited. However the body of evidence as a whole suggests enhanced care coordination between surgeons and primary care physicians to allow for earlier identification of patients at risk for new persistent opioid use to prevent misuse and dependence (Kleuh et al, 2018) and reduced duration of a course of acute opioid treatment. Current guidelines simply suggest using the lowest dose for the shortest duration of time for all patients. *"Transitions from acute to long-term therapy can begin to occur quickly: the chances of chronic use begin to increase after the third day supplied and rise rapidly thereafter. Consistent with CDC guidelines, treatment of acute pain with opioids should be for the shortest durations possible. Prescribing <7 days (ideally ≤3 days) of medication when initiating opioids could mitigate the chances of unintentional chronic use. When initiating opioids, caution should be exercised when prescribing >1 week of opioids or when authorizing a refill or a second opioid prescription because these actions approximately double the chances of use 1 year later"* quote from Shah A et al, 2017.

#### Recommendations

- Perform a risk assessment for severe acute pain and adverse effects of opioids prior to prescribing as outlined in 2015 BREE guidelines and 2018 AMDG perioperative supplement
- Establish realistic goals and expectations including plans to reduce and discontinue opioid therapy. Use shared decision-making to set goals to maximize quality of life, minimize risk of adverse events, side effects and persistent opioid use (Hjelmaas AJ et al 2019).
- Counsel patients about the risks, safe use, storage and disposal of unused opioids. Provide clear oral and written instructions readable with someone with imperfect eyesight and ask the patient to repeat them.

- While multi-modal approaches are important, avoid complicated regimens. Take into consideration other medications the patient is taking such as sedatives, muscle relaxers, antihistamines, anticholinergics.
- When used, opioid should be used at the lowest dose and for the briefest duration.
- Start at 25%-50% of what would be initiated in a younger adult and extend the dosing intervals (Pergolizzi J et al, 2008; Naples JG et al, 2016).
- Avoid using long-acting opioids (methadone, levorphanol, fentanyl patch or opioid delivered by extended-release forms)
- Maintain a high vigilance for exaggerated side effects including respiratory depression, constipation with need for bowel prophylaxis, delirium and psychomotor effects leading to falls (Swart LM et al, 2017).
- Track opioid use and signs of potential misuse including the development of opioid use disorder during acute recovery and related functional status with outcome measures such as mood, mobility, ADLs, sleep, appetite, cognitive impairment, weight changes

more general recs that may apply from reading on older adult for acute pain

- Avoid morphine in presence of significant renal impairment due to decreased excretion of morphine-6-glucuronide with ensuring risk of severe side effects including seizure.
- Avoid codeine due to severe nausea and constipation and up to 20% of population lacking the ability to metabolize codeine to morphine its active agent (Baldini et al, 2012)
- Avoid Tramadol in patients on serotonergic medication and in those with declining hepatic and renal function. Use specific dosing guidelines in patients with reduced glomerular filtration rates (Naples et al, 206).
- Avoid meperidine even with normal renal function because of potential accumulation of its active metabolite normeperidine causing neurotoxicity
- Avoid methadone due to its high drug-drug interaction potential and association with prolongation of the QT interval and long elimination half-life.
- Avoid combination of benzodiazepines and opioids due to risk of compounded respiratory depression leading to death

**Commented [1]:** What about a recommendation calling for additional provider education on opioid prescribing in this population/risks of opioid prescribing in this age group and/or better engagement /coordination with stakeholders to increase awareness on the risks of opioid prescribing in this age group.

**Commented [2]:** A good discussion point regarding how to divide recommendations among different sections and how best to provide practical recommendations that speak directly to an individual prescriber (versus the system)

#### Clinical Recommendations from 2015 AMDG guidelines for older adults:

1. Use opioids with short half-lives, as they are usually the best choices for older adults. Drugs with a long half-life can readily accumulate in older adults and result in toxicity (e.g. respiratory depression, sedation).
2. Weigh the individual patient's needs and clinical presentation with known risk factors when deciding whether short or long acting opioids are best.
3. Avoid the use of agonist-antagonist opioids in older adults as their psychomimetic side effects can be pronounced.
4. Be vigilant when treating patients over 65 to adequately relieve pain while minimizing the risk of delirium and other opioid-related adverse drug events.
5. Use the least invasive method of drug administration (e.g. oral).
6. Initiate opioid therapy at a 25% to 50% lower dose than that recommended for younger adults, and slowly and carefully titrate dosage by 25% increments on an individual basis, balancing pain relief, physical function, and side effects.

7. Have a plan for addressing constipation from the start of opioid therapy. Prophylaxis and/or treatment can include hydration, bulk fiber (only if hydration is maintained), activity, senna, and sorbitol (20 ml of 70% taken twice daily for 3 days per week).
8. Recognize and manage all potential causes of side effects, taking into consideration medications that potentiate opioid side effects:
  - a. Sedatives, tranquilizers, and anti-emetics can cause sedation.
  - b. Antihypertensives and tricyclics can cause postural hypotension.
  - c. Antihistamines, phenothiazines, tricyclics, and anticholinergics can cause confusion and urinary retention.
9. Avoid using more than one opioid at the same time. This makes it is easier to identify the cause of an adverse effect or toxic reaction. The incidence of delirium and other adverse reactions increases with the number of prescription drugs taken.
10. Avoid the following drugs:
  - a. Codeine: the doses required for effective pain relief in older adults are associated with an increased incidence of side effects (e.g. constipation, nausea and sedation).
  - b. Meperidine: the metabolite, normeperidine, is toxic to the CNS and can cause seizures, mood alterations and confusion; more so in older patients, especially if the patient has renal impairment.
  - c. Methadone: has a high drug-drug interaction potential and is associated with prolongation of the QT interval and a potential risk of accumulation due to a long elimination half-life. In addition, methadone is difficult to titrate because of its large inter-individual variability in pharmacokinetics, particularly in the frail elderly.

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Pharmacological Concern	Change with Normal Aging	Common Disease Effects
Gastrointestinal absorption or function	<ul style="list-style-type: none"> <li>Slowing of gastrointestinal transit time may prolong effects of continuous-release enteral drugs.</li> <li>Opioid-related bowel dysmotility may be enhanced in older patients.</li> </ul>	<ul style="list-style-type: none"> <li>Disorders that alter gastric pH may reduce absorption of some drugs.</li> <li>Surgically altered anatomy may reduce absorption of some drugs.</li> </ul>
Transdermal absorption	<ul style="list-style-type: none"> <li>Under most circumstances, there are few changes in absorption based on age but may relate more to different patch technology used.</li> </ul>	<ul style="list-style-type: none"> <li>Temperature and other specific patch technology characteristics may affect absorption.</li> </ul>
Distribution	<ul style="list-style-type: none"> <li>Increased fat to lean body weight ratio may increase volume of distribution for fat-soluble drugs.</li> </ul>	<ul style="list-style-type: none"> <li>Aging and obesity may result in longer effective drug half-life</li> </ul>
Liver metabolism	<ul style="list-style-type: none"> <li>Oxidation is variable and may decrease resulting in prolonged drug half-life.</li> <li>Conjugation usually preserved.</li> <li>First-pass effect usually unchanged.</li> <li>Genetic enzyme polymorphisms may affect some cytochrome enzymes.</li> </ul>	<ul style="list-style-type: none"> <li>Cirrhosis, hepatitis, tumors may disrupt oxidation but not usually conjugation.</li> </ul>
Renal excretion	<ul style="list-style-type: none"> <li>Glomerular filtration rate decreases with advancing age in many patients, which results in decreased excretion.</li> </ul>	<ul style="list-style-type: none"> <li>Chronic kidney disease may predispose further to renal toxicity.</li> </ul>
Active metabolites	<ul style="list-style-type: none"> <li>Reduced renal clearance will prolong effects of metabolites.</li> </ul>	<ul style="list-style-type: none"> <li>Renal disease.</li> <li>Increase in half-life.</li> </ul>
Anticholinergic side effects	<ul style="list-style-type: none"> <li>Increased confusion, constipation, incontinence, movement disorders.</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced by neurological disease processes.</li> </ul>

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