

**Special Article**

# Chronic Pain Management in Older Adults: Special Considerations

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**Abstract**

*The rising prevalence of neuropathic pain and the multifaceted sequelae of pain particularly within older adults are part of the increasing challenges in providing good geriatric pain management. Aging can lead to a higher sensitivity to pain within older adults, whereas physiological changes modify the absorption, bioavailability, and transit time of pharmaceutical agents. Ultimately, these differences within older adults require clinicians treating them to provide individually tailored analgesic approaches. Progressive age increases the variance in physiology among people; thus, the management approach should reflect an individual's unique requirements and limitations based on findings at the time of assessment. J Pain Symptom Manage 2009;38:S4–S14. © 2009 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.*

**Key Words**

*Analgesia, assessment, guidelines, inappropriate prescribing, older adults, side effects*

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## ***The Epidemiology of Neuropathic Pain in Older Adults***

Neuropathic pain, defined as pain arising as a direct consequence of a lesion or disease affecting the somatosensory system, is a consequence of various diseases and conditions, most commonly diabetes, herpes zoster infections, cancer, arthritis, and back injuries.<sup>1,2</sup> Older adults are particularly prone to chronic painful conditions, especially arthritis, degenerative spine disease, peripheral neuropathies, and bone and joint disorders.<sup>3</sup> Because of the increasing prevalence of diabetes, the incidence of painful diabetic neuropathy is increasing.<sup>4</sup>

Overall, there is a distinct lack of data describing the prevalence of neuropathic pain within the general American population. Most recently, a 1998 study estimated that 3.8 million Americans suffered from this disorder.<sup>5</sup> Surveys conducted in the United Kingdom and France within the last three years indicated a 7%–8% prevalence,<sup>6</sup> and a comparable prevalence of neuropathic pain within the United States would affect as many as 24 million Americans. Predictably, as the percentage of older adults increases within the overall population because of aging of the “Baby Boomer” generation, so will the prevalence of neuropathic pain. This demographic shift is a global phenomenon, with estimates that, by the year 2025, approximately 1.2 billion people worldwide will be aged 60 years or older.<sup>7</sup> An Austrian prospective survey found an eightfold higher prevalence rate of neuropathic pain among 51- to 60-year-old

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participants (24%) than within the general Austrian population (3%).<sup>8</sup>

Furthermore, chronic pain of all causes has reached epidemic proportions within the United States, as an estimated 50 million Americans suffer from daily chronic pain and four out of 10 patients treated do not receive adequate relief.<sup>9</sup> Moreover, a survey conducted from 1999 to 2001 of 2,779 adults in home care aged 65 years or older found that approximately 48% ( $n=1,329$ ) of the participants experienced daily pain, and one-fifth (21.6%) of this group received no analgesic.<sup>10</sup> Substantial pain is often undertreated, especially in older adults and even more commonly in nursing home residents.<sup>3</sup>

Patient perceptions of suboptimal pain management have caused one out of four sufferers of chronic pain of all ages in the United States to change doctors at least three times since their initial visit.<sup>11</sup> This highlights the need for coordinated interdisciplinary care of chronic pain, especially including the involvement of primary care practitioners (PCPs). Seventy-nine percent of individuals that regularly take pain medications see PCPs.<sup>3</sup> The need to better educate family physicians and nurse practitioners about managing chronic pain in particular<sup>12</sup> is illustrated by considering the very low ratio of board-certified pain specialists to patients with chronic pain (four to six per 100,000),<sup>13</sup> demonstrating the impossibility of providing skillful pain management by pain specialists alone. Furthermore, the number of certified geriatricians—approximately one per 5,000 Americans aged 65 years and older—falls far short of the current need.<sup>14</sup> Although substantial progress has been made in the field of geriatric medicine in the past three decades, further collaborations among medical professionals of various fields will be required to meet the needs of the rapidly increasing U.S. population aged 65 years and older, which is predicted to exceed 70 million by year 2030.<sup>14</sup>

Persistent pain can have striking consequences on an individual's quality of life. A 2007 self-report questionnaire taken by 260 individuals of all ages with neuropathic pain responded that their pain "strongly/mostly" restricted daily activities and disturbed sleep in 65% and 60% of those surveyed, respectively.<sup>8</sup> Other common sequelae of chronic pain in older adults include depression and

anxiety, as well as reduced socialization and impaired ambulation.<sup>3</sup>

### *Pain and the Biology of Aging*

With advancing age, the perception of pain is altered, which may be related in part to brain atrophy.<sup>13</sup> However, studies of brain activity comparing young ( $26 \pm 3$  years) and older ( $79 \pm 4$  years) individuals after administration of noxious pressure indicate that other mechanisms also may lead to greater sensitivity to pain (i.e., a lower pain threshold) within older adults. The involvement of central endogenous pain inhibitory systems was linked to reduced tolerance to pain with advancing age by magnetic resonance imaging data, which showed the lowered activity of structures involved in pain processing, such as the contralateral caudate and putamen, in older adults.<sup>15</sup> These changes could not be fully explained by age-related reductions in tissue volumes of the striatal structures.

Aging and associated diseases affect gastrointestinal anatomy and physiological processes, including motility, secretions, blood flow, and absorptive surface.<sup>16</sup> These changes can have an effect on drug absorption, bioavailability, and transit time, as can reductions in plasma albumin, increased fat to lean mass ratios, and decreased total body water.<sup>16,17</sup> In addition, liver mass, liver blood flow, and the glomerular filtration rate of the kidneys decrease with age. Of particular clinical importance, reduced renal clearance leads to a decline in the excretion of water-soluble drugs.<sup>17</sup> Lowered activities of most of the cytochrome P450 enzymes also reduce the drug-elimination clearance rate of the liver, especially in the presence of chronic disease.<sup>15</sup>

Aging also leads to degenerative changes within all structures of the spine, involving biochemical, microstructural, and gross structural alterations that can lead to pain.<sup>18</sup> Nociceptors within degenerated discs can be a source of low back pain, whereas facet hypertrophy and enlargement of the ligamentum flavum combine to narrow the spinal canal and are the main causes of neurogenic claudication and radiculopathy in older adults. In addition, age-associated osteoporosis weakens bones by inducing remodeling and rotatory deformities.<sup>18</sup>

Finally, because aging affects individuals differently, particular attention to individualized

treatment is required in older adults based on findings at the time of assessment. Progressive age increases the variance in physiology among people; thus, the management approach should reflect an individual's unique requirements and limitations.

### ***The Assessment of Pain in Older Adult Populations***

Because of certain obstacles associated with both diagnosis and treatment, pain is *particularly* inadequately controlled in older adults. Pain assessment can be adversely affected by many factors, including patient cognitive impairment, patient reluctance to disclose relevant symptoms, and the overlap of pain-related behaviors with those of dementing illnesses and/or depression. Some older patients fail to self-report pain because of beliefs that pain is an inescapable element of aging or part of their atonement for past failings.<sup>3</sup> Some individuals avoid medical care because of fears about the implications of pain as a signal of a serious illness, or trepidation over diagnostic tests, whereas the use of strong analgesics can be hindered by patient fears of side effects or addiction.

In addition, patient cognitive impairment can have a detrimental impact on pain assessment.<sup>19–22</sup> A study of 181 nursing home patients found that individuals with various causes of dementia had significantly more pain, yet received less analgesia than cognitively healthy controls ( $P < 0.005$ ).<sup>19</sup> Another study of nursing home residents in Canada concluded that the presence of cognitive impairment did not alter the prevalence of conditions likely to cause pain, nor an individual's sensitivity to pain, but the prevalence of identified pain among patients with cognitive impairment was lower.<sup>20</sup> Moreover, patients with cognitive deficits are subject to delayed or incorrect diagnoses, and treatments to control problematic behaviors that are associated with burdensome adverse effects and complications, such as delirium, bowel dysfunction, and prolonged hospital stays.<sup>21</sup> Certainly, the potential diagnostic complications, the risk of negative outcomes, and prevalence of uncontrolled pain underscore the importance of conducting both a thorough cognitive evaluation and pain assessment.<sup>21</sup>

Despite the lack of widespread use of formal tools to assess pain in patients who have cognitive impairment, its integration into pain assessment has been supported in recent best-practice guidelines.<sup>22</sup> Selection of an appropriate pain scale is critical, as those that measure social behaviors (e.g., communication, social interactions) and symptoms shared with depression (e.g., sleep and appetite disturbance) may yield results that are confounded by delirium/depression.<sup>22</sup> A 2007 publication detailed the consensus recommendations of an interdisciplinary panel of experts for assessment of pain in older adults.<sup>23</sup> Specific recommendations were given regarding multiple potential aspects of a comprehensive diagnostic workup for an older adult, including a thorough medical and pain history with a detailed medication review, use of self-report procedures for assessing pain, special pain assessment approaches for patients with dementia, functional assessment evaluation, assessment of emotional functioning, special issues relating to neuropathic and nociceptive pain symptoms and signs, and a general and focused physical/neurological examination (Fig. 1). Commonly encountered pain problems during a physical examination of an older adult were listed according to their associated disease/condition (Table 1), and specific assessment tool recommendations were discussed.<sup>23</sup> Validated tools are available, such as the short-form McGill Pain Questionnaire and the Brief Pain Inventory, that can be administered in 10 minutes and provide a reliable assessment of pain qualities, intensity, interference with function (physical, relational, and psychological), location, medication use, and perceived relief from pain (Table 2).<sup>23</sup>

### ***Pain Treatment Guidelines for Older Adults***

Collectively, the currently available randomized controlled trial data in the literature can effectively guide the management of patients presenting with neuropathic pain. The first evidence-based algorithm for treating neuropathic pain was synthesized in 2005 by pain specialists in Denmark,<sup>24</sup> followed by a worldwide collaboration under the auspices of the International Association for the Study of Pain, which created an evidence-based set of

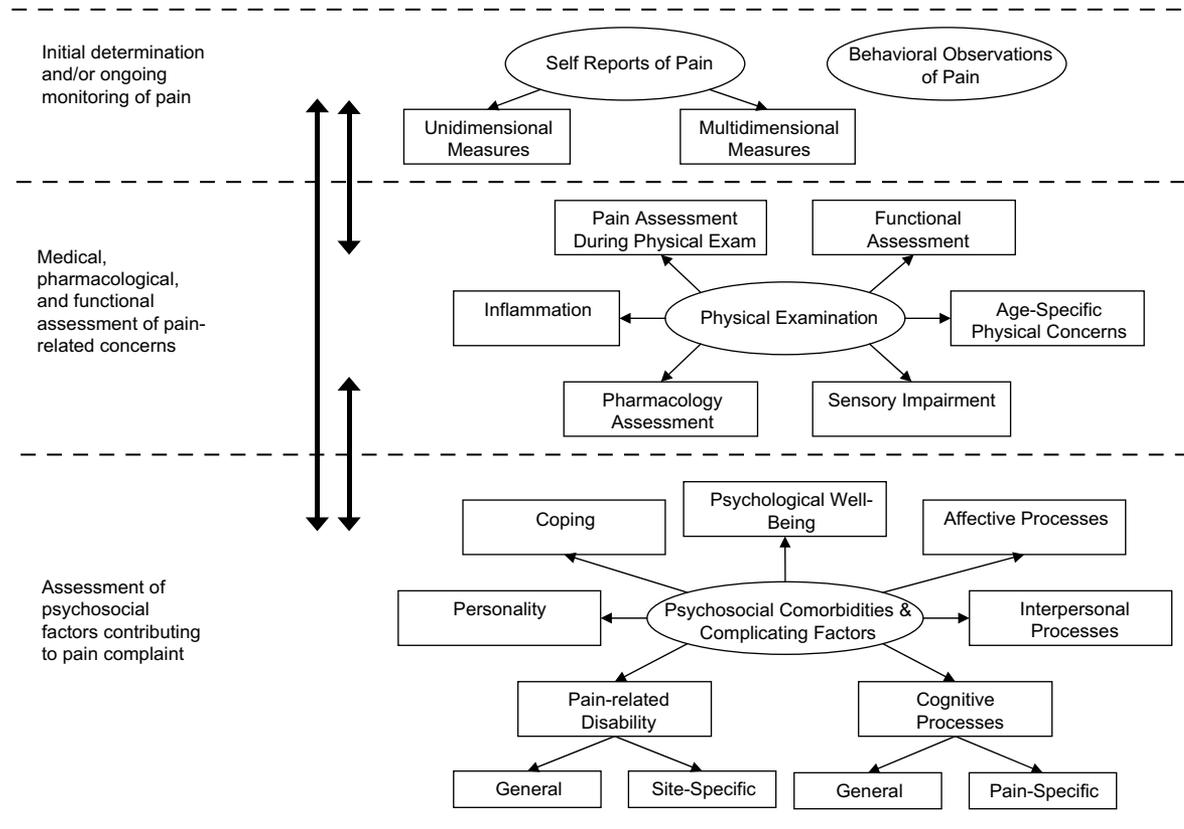


Fig. 1. Aspects of a comprehensive pain assessment.<sup>23</sup>

recommendations in 2007.<sup>25</sup> Pharmacotherapeutic recommendations include the use of anti-convulsants, sodium channel modulators, antidepressants, and  $\mu$ -receptor agonist and dual-mechanism opioid analgesics, as well as some other miscellaneous agents (Table 3). Both guidelines recommend tricyclic antidepressants (TCAs) and the calcium channel  $\alpha 2\text{-}\delta$  ligands, gabapentin, and pregabalin.<sup>24,25</sup> Tramadol and pure  $\mu$  opioids are generally recommended as second-line options because of their potential side effects, with the exception of certain clinical circumstances where they may be preferred as first-line agents.<sup>24,25</sup> Still, these recommendations were developed based on evidence mainly generated from younger cohorts; specific treatment recommendations for neuropathic pain tailored for the needs of older adults is thoroughly discussed in the following article in this supplement, "Pharmacological Management of Neuropathic Pain in Older Adults: An Update on Peripherally and Centrally Acting Agents."

Because of the highly variable signs and symptoms associated with neuropathic pain, the best management strategy derives from identifying the underlying disease process and then tailoring the treatment to the presenting pain condition, whenever possible. Toward this end, current pain management algorithms subdivide neuropathic pain into peripheral and central subtypes. Originally, topical lidocaine was recommended as a first-line agent only for postherpetic neuralgia and focal neuropathy,<sup>24</sup> but more recent guidelines expand the recommended uses of this modality to peripheral localized neuropathic pain (Fig. 2).<sup>25</sup> For central neuropathies, TCAs are considered first-line agents; however, in older adults (especially those who have had a stroke), TCAs are often not well tolerated and, therefore, gabapentin or pregabalin is recommended (Fig. 3).<sup>24</sup> It is anticipated that future editions of guidelines for pain in older patients will place strong cautions against the use of TCAs in the geriatric population because of common and potentially

*Table 1*  
**Typical Findings from the Physical Evaluation for Common Pain Issues in Older Adults<sup>23</sup>**

Common Pain Problems	Findings	Comments
Nociceptive conditions (e.g., osteoarthritis of the spine and weight-bearing joints)	Localized and referred pain; usually deep and aching. Radiographic findings are usually pathognomonic.	Depending on the disorder being evaluated, physical examination findings (i.e., reduced range of motion) may be weakly associated with pain.
Neuropathic conditions Herpetic neuralgia	Symptoms often appear before rash. Physical findings may be unrevealing before rash. Rash is an acute inflammatory skin reaction with typical nociceptive pain superimposed on neuropathic symptoms. Decreased sensory thresholds can be observed in intact skin in the area of the rash, although scarring can lead to areas of hypoesthesia.	
Postherpetic neuralgia	Diminished primary sensory modalities, greater in worst affected areas. Allodynia, hyperalgesia, and hyperpathia may be present.	Allodynia is pain elicited by gentle brushing or application of cool or warm stimuli. Hyperalgesia is increased response to a painful stimulus. Hyperpathia is associated with an increased reaction to a stimulus, especially a repetitive stimulus, and a decreased threshold. The pain is often explosive.
Central post-stroke pain	Reduction in spinothalamic function (warm and cold). Frequently associated with allodynia, hyperalgesia, and hyperpathia. Posterior column function (vibration and position sense) is preserved. There may be proximal referral of pain.	Proximal referral of pain—pressure over a distal site in hand or foot may be felt in the shoulder or upper limb or proximal thigh.
Trigeminal neuralgia	Sensory examination of the face is normal. Pain may be spontaneous or precipitated by non-noxious stimuli. Reduced range of movement of the spine.	Pain paroxysmal with short volleys.
Radicular and referred pain secondary to degenerative disease of the spine	Focal mechanical hyperalgesia, neurologic signs in affected areas. Nerve stretch, such as straight leg raises, may evoke or exacerbate pain.	
Painful peripheral neuropathy	Sensory abnormalities in affected limbs. Hyperalgesia and hyperpathia may be present. Occurs in ~20%–25% of patients. Abnormalities may be thermal only in nature.	Lower limbs are more likely to be affected than upper limbs, in a glove and stocking distribution.

Table 2

**Consensus Recommendations for Seniors with Limitations in Ability to Communicate Because of Dementia<sup>23</sup>**

## General recommendations

1. Take into account patient history, interview information, and results of physical examinations.
2. Use assessment approaches that include both self-report and observational measures when possible.
3. The CAS, the 21-point box scale or NRS and the VDS should be attempted with seniors whose cognitive functioning ranges from intact to mildly or moderately impaired. The FPS is an alternate tool that is preferred by some older persons, particularly African Americans and Asians.
4. At this point, assessment scales are under development and consensus could not be reached regarding the definitive recommendation of any particular scale. The PACSLAC seems to be a promising tool for assessing pain among persons with cognitive impairments. Nonetheless, more research regarding the psychometric properties of this tool is needed. Although the initial psychometric findings are encouraging, the scale should be used with caution until additional data become available. Among the shorter instruments, the Doloplus seems to be promising. Further research undertaking a direct comparison of various observer rated scales is needed to identify the relative strengths and weaknesses of currently available tools.
5. Pain assessment during a movement-based task is more likely to identify an underlying persistent pain problem and offers enhanced measurement sensitivity and specificity.
6. Examine whether the use of analgesic medications leads to a reduction of behavioral indicators of pain.
7. A comprehensive pain assessment also should include evaluations of other related aspects of patient functioning (e.g., mood, quality of life, coping resources, social support).
8. Among persons with dementia, it would be important to solicit the assistance of a knowledgeable informant to accomplish this goal and identify typical pain behaviors for the individual patient.
9. Several instruments contain items that need to be assessed over time (e.g., changes in sleeping, eating). With the possible exceptions of the PADE and the NOPPAIN, this should not preclude their use in primary care settings because the health care provider may solicit the assistance of caregivers in completing these tools.

## Specific recommendations following the selection of suitable assessment tools

10. Use an individualized approach collecting baseline scores for each patient.
11. Solicit the assistance of caregivers familiar with the patients.
12. If assessment tools are used to monitor pain levels over time, they must be used under consistent circumstances (e.g., during a structured program of physiotherapy, over the course of a typical evening).
13. Most of the assessment tools reviewed in this section are screening instruments and, as such, they cannot be considered to represent definitive indicators of pain.

CAS = Colored Analog Scale; FPS = Functional Pain Scale; NOPPAIN = Noncommunicative Patient's Pain Assessment Instrument; PACSLAC = Pain Assessment Checklist for Seniors with Limited Ability to Communicate; PADE = Pain Assessment for the Dementing Elderly; VDS = Verbal Descriptor Scale.

highly deleterious adverse effects (Ferrell B, American Geriatrics Society [AGS] Pain Guideline Chair, personal communication). It is noteworthy that more recent guidelines recommend selective serotonin and norepinephrine reuptake inhibitors for first-line treatment of neuropathic pain.<sup>25</sup> In many cases, combinations of the aforementioned drugs are the mainstay of current therapy for chronic pain; this strategy can allow lower doses of each class of drug, providing synergistic or additive therapeutic effects along with reductions in dose-limiting adverse effects. However, because of the increased likelihood of drug-drug and drug-disease interactions in older adults with each additional medication taken, frequent monitoring is critical within this population.<sup>3</sup> A key strategy when prescribing medications for older adults is to “start low and go slow” when initiating and titrating pharmacotherapies. Overall, the first-line agents have demonstrated similar efficacies for treating multiple types of neuropathic pain; therefore, side effects and drug interactions are a primary

consideration when choosing treatments for older adults.<sup>26,27</sup>

As a corollary, topical agents should be considered as a single therapy or a coadjuvant in particular for the older adult population, as significant analgesia can be obtained with minimal side effects.<sup>28</sup> As an example, side effects associated with the lidocaine patch 5% tend to be nonsystemic, mild to moderate in nature, and most commonly limited to application-site reactions,<sup>29,30</sup> thus making this topical analgesic a good option for older adult populations. This, and even compounded topical creams/ointments, are preferred alternatives for older adults (except, perhaps, in the treatment of an acute severe pain crisis) before trying other types of systemically active medications.

The number needed to treat (NNT) and number needed to treat to harm (NNH) statistics for agents used in the treatment of neuropathic pain offer a comparison of the efficacy and safety, respectively, of the treatment alternatives.<sup>24,31</sup> The NNT is “the number of patients needed to treat with a specific drug to obtain

Table 3  
Recommended Medication Groups  
for Treating Neuropathic Pain

Anticonvulsants
• Pregabalin
• Gabapentin
• Carbamazepine
• Lamotrigine
• Valproic acid
Antidepressants
• Tricyclics—amitriptyline, nortriptyline, desipramine, imipramine, clomipramine
• SNRIs—duloxetine, venlafaxine, desvenlafaxine
• Mirtazapine
Opioid receptor-binding analgesics
• Mixed-mechanism: tramadol, tapentadol
• Partial agonist: buprenorphine
• $\mu$ agonist: fentanyl, hydrocodone, hydromorphone, levorphanol, methadone, morphine, oxycodone, oxymorphone
Sodium channel modulators
• Lidocaine patch 5%
• Mexiletine
Other agents
• $\alpha_2$ -Receptor agonist: clonidine, tizanidine
• NMDA receptor antagonist: ketamine, memantine
• Cannabinoid receptor agonist: cannabinoids
• Vanilloid receptor ligands: topical capsaicin

SNRI = serotonin and norepinephrine reuptake inhibitors;  
NMDA = N-methyl-D-aspartate.

1 patient with a defined degree of pain relief.<sup>31</sup> Typically, NNTs range between 3.7 and 5 patients for the first-line agents, which illustrates the need to use combination therapeutic

approaches when managing patients with neuropathic pain to provide adequate analgesia. The NNT data for analgesics provided evidence toward generating a treatment algorithm for neuropathic pain, most recently in 2007.<sup>31</sup> Furthermore, NNH data for a number of analgesics have been reported in several Cochrane Collaborative reviews. The results within the 95% confidence interval (CI) for minor harm associated with anticonvulsants used to treat acute and chronic pain were: 3.7 (95% CI: 2.4–7.8) for carbamazepine; 2.5 (95% CI: 2.0–3.2) for gabapentin; and 3.2 (95% CI: 2.1–6.3) for phenytoin.<sup>32</sup> The NNH for major adverse effects (i.e., an event leading to withdrawal from a study) associated with TCA agents used to treat neuropathic pain was 28 for amitriptyline (95% CI: 17.6–68.9) and 16.2 for venlafaxine (95% CI: 8–436). The NNH for minor adverse effects was 6 for amitriptyline (95% CI: 4.2–10.7), and 9.6 for venlafaxine (95% CI: 3.5–13).<sup>32</sup> In comparison, the NNHs for opioids used to relieve neuropathic pain were calculated compared with an active control or placebo for the most common opioid-related side effects. The NNH for both nausea and constipation was 4.2 (33% opioid vs. 9% control), 6.2 for drowsiness (29% opioid vs. 12% control), 7.1 for dizziness (21% opioid vs. 6% control), and 8.3 for vomiting (15% opioid vs. 3% control).<sup>33</sup>

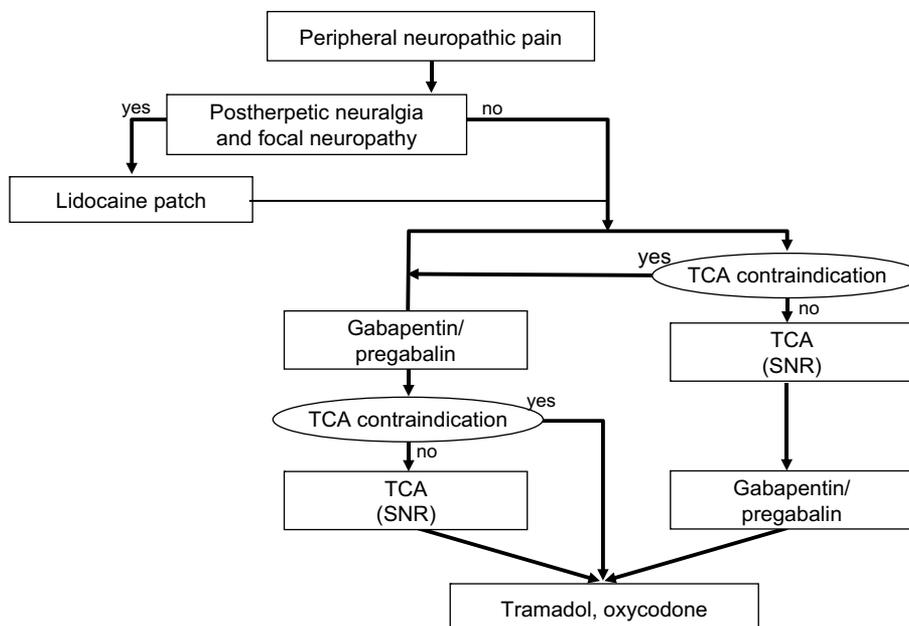


Fig. 2. An evidence-based algorithm for treating peripheral neuropathic pain.<sup>24</sup>

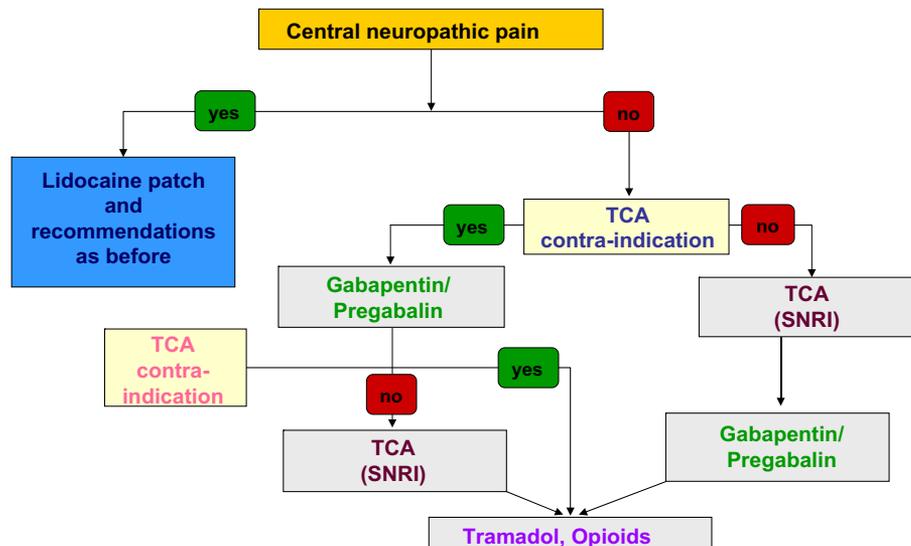


Fig. 3. An evidence-based algorithm for treating central neuropathic pain.<sup>24</sup>

A consensus statement on prescribing opioids for older adults who have pain was created by an international panel of experts in 2008.<sup>34</sup> Although no studies with older adult cohorts have been published, growing evidence supports the use of opioids for chronic noncancer pain. A sound principle of practice is that dose titration needs to be individually considered and tailored based on the pharmacokinetics of the drug, its formulation, and the specific medical/social circumstances of each patient.<sup>34</sup> Also, because renal and hepatic function typically decline with advancing age, the duration of the activity of most opioids and their metabolites may be prolonged. In older patients, the potential for drug accumulation and increased central nervous system (CNS) sensitivity increase the risks for cognitive impairment and respiratory depression, especially in conjunction with concomitant CNS medications or with an underlying pulmonary condition.<sup>34</sup>

Polypharmacy can be a confounding risk factor when prescribing pain medications, especially for older adults, as members of this population commonly require multiple medications. In fact, individuals aged 60 years or older are provided with an average of 40.8 prescriptions per year, according to the 2006 findings of a British National Health Service study.<sup>17,35</sup> With polypharmacy, dose-limiting adverse effects of pain-relieving drugs may limit the potential achievable efficacy. This tends to be the major

limitation for treating the aging population. Furthermore, the incidence of adverse effects is directly correlated to the number of prescribing physicians involved in the care of older adults.<sup>36</sup> Therefore, all medications—especially CNS active drugs—should be reviewed routinely to determine which ones, if any, could be discontinued or reduced in dosage.

Treatment adherence among older adult patients is influenced by perceptions.<sup>37</sup> For instance, the decision to take an analgesic is affected by fear of side effects, other illnesses, the characteristics of the pain, family member support, and the information provided to the patient by health care professionals and others. Among older adults, medication cost has a powerful impact on adherence to a prescription, especially with individuals who have poor health, multiple morbidities, and limited drug coverage through insurance.<sup>38</sup>

### ***Inappropriate Prescribing for Older Adults***

Inappropriate medications have been defined as “drugs that pose more risks than benefits to patients, and for which there is a good alternative drug available.”<sup>39,40</sup> The consensus guideline for inappropriate medications for older adults, otherwise known as the Beers criteria, was first published in 1991 and last updated in 2003.<sup>41,42</sup> These recommendations,

compiled by a panel of experts, list the drugs that are particularly problematic for older adults,<sup>42–44</sup> although they are not comprehensive and need updating.<sup>45</sup> According to the most current version of the Beers criteria, inappropriate analgesic medications because of age-associated increased incidences of adverse events include TCAs (particularly in patients with glaucoma), nonsteroidal anti-inflammatory drugs (especially in hypertensive patients and those who have had heart attacks or chronic renal failure), and propoxyphene.<sup>44,45</sup> Based on the details described in the most recent guidelines, the most frequently prescribed inappropriate analgesics include long-acting benzodiazepines and amitriptyline. A significantly higher risk of bone fractures has been linked to higher doses of benzodiazepines and a longer duration of use (14–90 days) in a population-based cohort study of 7,983 older adults (odds ratio: 3.45; 95% CI: 1.38–8.59).<sup>46</sup>

According to recent publications, inappropriate prescribing for older adults is a substantial problem.<sup>40,44</sup> An observational study of acute admissions of older adults found that inappropriate prescribing occurred in 32% of patients ( $n = 191$ ), and 49% of these patients were admitted with adverse effects because of the inappropriate medications.<sup>44</sup> A Norwegian study of 454 general practitioners who treated 85,836 patients aged 70 years or older found that 18.4% of these patients received at least one potentially harmful prescription.<sup>47</sup> Polypharmacy and hospitalization were associated with inappropriate prescribing. A national survey assessed the impact of inappropriate prescribing on patient outcomes using the Medical Expenditure Panel Survey data collected in 1996.<sup>39</sup> Older adults who used inappropriate prescriptions reported a significantly worse health status than individuals who were not using inappropriate medications ( $P < 0.01$ ).<sup>39</sup>

Recent studies have indicated that inappropriate prescribing can be reduced through implementation of multiple types of methodologies. A Cochrane review concluded that educational outreach is a promising approach to improve the prescribing practices of health care professionals.<sup>48</sup> A study of 2,753 outpatient veterans aged 65 years and older, who were prescribed at least one high-risk medication, considered a twofold approach to reduce inappropriate prescribing.<sup>49</sup> Real-time warnings

were combined with personally addressed letters from the chief medical officer asking prescribing clinicians to discontinue treatment with high-risk medications, along with a copy of the Beers criteria article, a list of suggested alternatives, and a list of older patients receiving the high-risk medications who had upcoming appointments. After the intervention, approximately 50% of the patients studied had their high-risk medications discontinued, which significantly decreased the number of patients prescribed high-risk medications ( $P < 0.001$ ).

Another strategy that has been demonstrated to reduce inappropriate prescribing is that of generating quarterly practice performance reports followed by onsite visits.<sup>50</sup> A recent discussion of approaches for reducing inappropriate prescribing noted that multidisciplinary teams, including a geriatrician and other health care clinicians with specialized geriatrics training, pharmacists, and computerized decision support, improved the quality of prescribing to older adults.<sup>51</sup>

### ***What We Know and Do Not Know About Pain in Older Adults***

Chronic pain has reached epidemic proportions, particularly among older adults, whereas inappropriate prescribing for older adults is a substantial, yet manageable problem. Specifically within this population, side effects, drug-drug interactions, cognitive and social problems, and patient nonadherence to treatment because of perceptions and drug cost have limited the attainment of effective analgesia. Yet, with focused skill building and attention to guideline recommendations, significant improvements in pain management for older adults are imminently achievable. Importantly, treatments should be individualized and monitored regularly in older-aged patients to account for the variance in their physiology and metabolism, and resulting differences in drug bioavailabilities and clearance.

Notwithstanding the capacity for readily achievable improvements, significant gaps in our current knowledge of chronic pain mechanisms and treatments in older adults suggest future directions for much-needed research. Clinical trials of analgesics need to be conducted in older adult populations, particularly

for long-term use, to assess their overall effectiveness and risks. Research is needed to develop more effective strategies for assessing and managing pain among older adults with cognitive impairment. Lastly, an update of the Beers criteria or a similar analysis of pharmacotherapies for older patients is overdue. With these basic considerations in mind, we can proceed now to a more detailed discussion of neuropathic pain in older individuals.

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