Foot pain, common among older adults, is associated with disability in older patients. Patients with foot pain often have impairments in functional ability and balance. The goals of pain management for patients with foot pain are the same as for all patients: relief of pain, enhanced quality of life, and improved function. To meet these goals, clinicians must simultaneously address underlying etiologies and provide appropriate analgesia. The challenge for the clinician is to achieve these goals while avoiding the many medication side effects, which are more common and more severe in older populations. This review focuses on some of the newer pharmacologic approaches to pain management for acute and persistent pain and discusses potential errors to avoid.

Management of Acute Pain

The severity of pain is the primary guide in treating acute pain. Whereas mild-to-moderate pain responds to treatment with acetaminophen or nonsteroidal anti-inflammatory drugs, moderate-to-severe pain typically requires an opioid for effective relief. Pain that follows inpatient or outpatient surgery should be treated vigorously. Relying on an as-needed schedule for severe, continuous pain results in unnecessary suffering and interferes with postoperative rehabilitation. If pain is continuous, the treatment should be continuous. At a minimum, medication administration should be scheduled before interventions that are likely to increase discomfort, such as dressing changes and physical therapy.

Some clinicians have advocated the use of semi-quantitative pain scales in an attempt to more objectively quantify a patient’s subjective pain. Although not useful for comparing one patient with another, such scales can be very useful for monitoring an individual patient’s response to therapy.

Acetaminophen versus Nonsteroidal Anti-inflammatory Drugs

Controversy persists as to the relative efficacy of acetaminophen for arthritic pain compared with nonsteroidal anti-inflammatory drugs. Early studies found that acetaminophen was as efficacious as nonsteroidal anti-inflammatory drugs, whereas more recent studies concluded that nonsteroidal anti-inflammatory drugs offer additional benefits in controlling pain caused by osteoarthritis. Because acetaminophen has a long, documented history of analgesic efficacy, it is reasonable to begin treatment of mild-to-moderate pain with acetaminophen. However, it must be taken regularly to maximize efficacy.

Acetaminophen has few side effects but has the potential for hepatotoxicity in individuals with underlying liver disease or excessive alcohol use. Most
patients will safely tolerate 650 mg every 4 hours or 1,000 mg every 6 hours. Patients without known liver disease should not receive more than 4 g of acetaminophen daily; patients with liver disease may develop toxicity with chronic ingestion of less than 2 g daily. If pain persists, acetaminophen therapy could be discontinued and nonsteroidal anti-inflammatory drug treatment begun, or an opioid could be added to the acetaminophen therapy. The theoretical advantage of combining an opioid and acetaminophen is that a lower dose of the opioid could be used, reducing the risk of opioid side effects.

Nonsteroidal Anti-inflammatory Drugs and Cyclooxygenase-2 Inhibitors

The potential gastrointestinal and renal toxicity of nonsteroidal anti-inflammatory drugs, particularly in older patients, is well documented. There was hope that newer cyclooxygenase-2 inhibitors would provide a safer analgesic alternative. Although some recent evidence suggests that the risk of gastrointestinal side effects may be less, there is still concern about potential renal toxicity, especially in the older patient. The additional cardiac risks of cyclooxygenase-2 inhibitors seem to be small. However, because this class of drugs is clearly not risk-free, caution is advised when using any nonsteroidal anti-inflammatory drug in an older patient. It is important to remember that the newer cyclooxygenase-2 inhibitors have no more analgesic efficacy than the older, non-specific nonsteroidal anti-inflammatory drugs.

Opioid Therapy

Morphine has been used to control pain for centuries. Although newer opioids have been developed, the efficacy and side-effect profiles are remarkably similar to those of morphine. The opioid agonists morphine, hydromorphone, oxycodone, hydrocodone, and fentanyl are all highly effective analgesics that, when used properly, can safely and effectively control pain. Methadone is also an opioid agonist, but its long serum half-life can complicate its use in the older patient. Tramadol is an analgesic with opioid agonist activity that is as effective as acetaminophen with codeine in treating pain. Seizures have been reported in patients taking tramadol, and the risk could increase considerably for a patient taking a medication that lowers the seizure threshold, such as an antidepressant or antipsychotic medication.

In the hospital, the oral route may be difficult if the patient cannot swallow medications reliably. Morphine and hydromorphone may be administered intravenously or subcutaneously and may be given as a scheduled dose every 4 hours. If symptoms do not warrant continuous or around-the-clock dosing, the medication can be given 30 min before dressing changes or physical therapy. If the patient can tolerate the oral route, medication can be given by mouth. In the past, patients were always started on an every 3- to 4-hours schedule, which was adjusted upward until the patient was comfortable. There is now evidence that administration of sustained-release products of morphine or oxycodone can be started and adjusted according to patient need. This approach results in fewer opioid side effects and more rapid control of pain. Patients taking sustained-release products should be provided with immediate-release medications for breakthrough pain that may occur, eg, when awakening at night with pain or during a therapy session. The breakthrough dose should be approximately 15% of the total daily dose. Although opioids can be used safely, it is imperative that both practitioner and patient understand their potential side effects.

Management of Persistent Pain

Although acute pain that develops after an injury or postoperatively may be severe and may significantly impair function, the expectation is that in time the pain will resolve as the damaged tissues heal. Pain that continues for months or longer has historically been referred to as chronic pain. Recently, owing to the negative connotations of the word chronic, the word persistent has replaced it. This usage is exemplified by the title of the 2002 comprehensive guidelines of the American Geriatrics Society, “The Management of Persistent Pain in Older Persons.”

Musculoskeletal problems, such as problems of body alignment, joint degeneration, muscle imbalance or strain, tendinitis, or bursitis, are the most common causes of foot pain in the older patient. The pain is the result of stimulation of normally functioning nerve fibers by damaged tissues. Neuropathic pain, such as diabetic neuropathy, is caused by injury to a nerve or the central nervous system and is another common cause of foot pain. To a great extent, the source of pain guides the management approach.

Musculoskeletal Pain

Many musculoskeletal problems can and should be treated biomechanically. While biomechanical problems resolve, some patients may need to use a pain medication on a long-term basis. As with acute pain, acetaminophen should be used initially on a sched-
Opioid Side Effects. Although opioids can be used safely in the older patient, this population can be at greater risk for side effects. Prevention and management of these side effects is critical. It is also imperative to educate patients about potential side effects to ensure compliance with a medication regimen.

Constipation is the most common and persistent opioid side effect. All patients who initiate opioid therapy must be apprised of this problem and begin an aggressive bowel regimen for the duration of medication use. Constipation may be a problem for a patient even before these medications are taken owing to poor fiber and fluid intake, limited activity, and the use of other medications that impair bowel function. To prevent constipation, patients are typically given a stimulant such as senna or an osmotic agent such as sorbitol. The doses of these medications can be increased and adjusted to maintain good bowel function. Stool softeners, although often useful, do not by themselves stimulate colonic activity.

Nausea and vomiting are common symptoms during the first hours or days of opioid therapy. Some patients report that they are “allergic” to opioids after experiencing these common but potentially distressing symptoms. Opioids induce nausea by directly stimulating the chemoreceptor trigger zone of the medulla. Patients with a history of motion sickness or nausea with use of these drugs are more likely to experience problems. These patients may benefit from antiemetic therapy before the first dose of opioid is administered. Typically, tolerance to this side effect develops quickly, and it is usually not an issue after the first few doses.

Sedation is more common in older patients who have not taken opioids previously. If symptoms are mild, reassurance that they should subside as tolerance develops is often enough to help the patient manage this period. If this symptom persists, another opioid can be used in the hope of reducing the sedative effect. Another option is the addition of stimulants to minimize sedation. A low dose of methylphenidate (5 mg) can be given at breakfast and at noon to reduce lethargy.

Confusion is a particular concern, especially in treating patients with underlying cognitive impairment, particularly if they live alone. It is important to remember that unrelieved pain by itself can cause confusion. When opioids are used in patients with cognitive impairment, it is essential to start with a low dose and to increase the dose slowly, watching closely for evidence of cognitive decline.

Pruritus will develop in a few patients owing to the opioid-induced release of histamine. Morphine is the opioid most often associated with this problem. Oxycodone and fentanyl are less likely to cause the problem. Although pruritus is technically not an allergic response, it is an adverse drug effect that can be problematic.

Addiction is a potential complication of opioid use, particularly long-term use. However, fear of addiction generally far exceeds the probability of this problem’s occurring. When opioids have been used to treat persistent nonmalignant pain, addiction has not been a significant clinical problem. Nevertheless, patients should be made aware of the small risk involved before beginning long-term therapy. Some patients report concerns about addiction that could prevent them from initiating what could be a very effective therapy for pain. An open discussion of patient concerns may help address exaggerated fears regarding this uncommon complication.

Addiction to opioids should not be confused with physical dependence on them. Patients taking substantial doses of opioids will develop physical dependence after weeks or months of treatment. Because of this, discontinuation of opioid use must be done slowly to avoid the development of withdrawal symptoms. Opioid doses should be tapered before the drug is discontinued, just as corticosteroid use would not be stopped suddenly in patients receiving long-term corticosteroid therapy.

Opioid Dosing Schedules. In addition to anticipating and managing side effects, medication compliance can be further enhanced by minimizing the frequency of medication administration. Because it is unrealistic to expect a patient to take a medication every 4 hours, every effort should be made to move to a simplified regimen. Sustained-release opioid preparations can be used to minimize the frequency of medication administration. As noted earlier, the patient can be started on a very low dose, such as sustained-release morphine, 15 mg twice daily, or...
sustained-release oxycodone, 10 mg twice daily. The dose can then be increased while monitoring pain relief and the development of side effects. Patients should be provided with medication for breakthrough pain. Transdermal fentanyl can be used in patients who cannot swallow the sustained-release tablets. Because the 25-µg/h fentanyl patch is the lowest-dose patch and is equivalent to approximately 50 mg of oral morphine, it would be administered only to a patient who could tolerate this amount of opioid daily.

Neuropathic Pain

Neuropathic pain can be a disabling, persistent problem for the older patient and may be difficult to control with the usual analgesic approaches. Neuropathic pain does not result from a normal pain signal from injured tissue but from an injury to the nervous system itself. Diabetic neuropathy is the most likely cause of a painful neuropathy of the feet. The patient typically describes burning, searing, shooting, lancinating pain, often associated with numbness. Whereas conventional analgesics may be of some benefit, opioids may have to be used in high doses to reduce the pain. Other adjuvant medications can be of benefit to these patients.

Tricyclic Antidepressants. Tricyclic antidepressants are an effective treatment for neuropathic pain. However, their use has been hindered by troublesome side effects, such as dry mouth, urinary retention, and change in mental status. These side effects are poorly tolerated by the older patient. Nortriptyline, a metabolite of amitriptyline, has a much more benign side-effect profile. The drug should be given at bedtime owing to its sedative properties. A dose of 10 mg can be started and gradually increased, monitoring for side effects, sedation, and anticholinergic effects. Whereas the onset of side effects may be rapid, it will take weeks to see substantial improvement in pain. Patients need to be educated about the timetable so that they do not give up on the medication long before an effect would be expected.

Gabapentin. Gabapentin is an anticonvulsant agent that has been found to be particularly effective in controlling neuropathic pain. It is usually well tolerated even in older patients, but, again, administration of the drug should be started at a low dose, 100 mg three times daily, and increased up to 300 mg three times daily. Higher doses may be required, but the side effects of dizziness, somnolence, and confusion may limit further dose increases. As with tricyclic antidepressants, the effect will not be seen overnight, and patient education is critical to effective use of this medication.

Topical Medications. Regional pain problems can often be solved by using a regional approach. Pain that is localized to the feet may be amenable to a local approach; thus neuropathic pain confined to the feet may be appropriate for a trial of topical medication.

Lidocaine, which has been shown to be effective for the treatment of neuropathic pain, is now available in a patch for transdermal use. This approach may be considered for a patient with foot pain related to diabetic neuropathy or phantom pain following a metatarsal amputation. Up to three patches can be applied for a total of 12 hours daily. The patient should place the patches where the pain is most severe. The patch must be applied to intact skin and not to heavily keratinized skin, such as the sole of the foot. Problems with toxicity would not be expected unless the patch was applied to mucous membranes or to an area of skin breakdown.

Capsaicin is also available as a topical preparation, although the evidence of its effectiveness is less conclusive. Whereas one study reported that capsaicin was a helpful adjunct in relieving neuropathic pain, another found that it was ineffective. Patients should be informed that they may experience some burning discomfort when first applying this agent and that it may be several days before effective pain relief is seen.

Common Pain-Management Errors

Physicians must be aware of the potential for acetaminophen toxicity, as outpatients may be taking one of the many products that contain acetaminophen. Patients should receive no more than 4 g of acetaminophen daily, as larger doses may be hepatotoxic. Before prescribing a combination analgesic, such as a medication containing an opioid and acetaminophen or a nonsteroidal anti-inflammatory drug, it should be clear that the patient is not already taking these medications. Also, adjustment of these combination medications is limited by the maximum dose of the acetaminophen or nonsteroidal anti-inflammatory drug.

A common error in management of acute pain is the use of meperidine. The use of meperidine has been discouraged for many years. The by-product of meperidine metabolism is the metabolite normeperidine, which accumulates and can cause seizures and delirium. In one study, meperidine was the only opioid associated with postoperative delirium. Despite its declining use, meperidine is still commonly prescribed in some hospitals.

Probably the most serious and common error in
pain management in the long-term-care setting is the undertreatment of pain. The podiatric physician may be confronted with additional challenges in managing pain in this setting. These patients often experience some degree of cognitive impairment. Obtaining a pain history from them may be difficult despite use of numerous tools, such as specially developed pain scales. These factors lead to undertreatment of pain. Reports from nursing staff, caregivers, and family members can provide valuable additional information for an effective pain assessment. Behavioral changes, such as agitation and screaming or changes in mood, may be the first indication of pain. The literature reports instances of misguided attempts to control behavioral problems that were later found to be precipitated by unrecognized and untreated severe pain.

Propoxyphene, the most commonly prescribed opioid in the long-term-care setting, has significant central nervous system side effects and modest efficacy. Because of its side effects, its use is discouraged in older patients.

Another common error in the long-term-care setting is crushing sustained-release tablets for patients who cannot swallow the tablet. Patients who cannot swallow pills often have their medication crushed and put into pudding. Crushing destroys any sustained-release property of the opioid and exposes the patient to a large immediate-onset dose that then wears off so that the pain returns, ensuring poor pain control. Sustained-release opioid tablets cannot be crushed. If the patient has difficulty swallowing the pills, transdermal fentanyl can be an effective alternative.

Another common problem in the inpatient setting is converting patients from oral to intravenous and from intravenous to oral opioids. Opioids are extensively metabolized by the liver when taken orally. Generally, three times as much drug must be given by mouth to achieve the same serum level of a dose given intravenously. Conversely, if a patient taking morphine can no longer swallow, the dose must be cut to one-third when given intravenously. Failure to make this adjustment when changing routes of administration will result in the patient receiving either an inadequate or excessive dose of medication.

The Institute for Safe Medication Practices has labeled the fentanyl transdermal system “unsafe in inexperienced hands.” The deaths and complications that have been reported with use of this system typically involve application of a moderate- to high-dose patch to a patient who has not received opioids and has developed no tolerance for the opioid dose delivered by one of these patches. When first administering this medication, care should be taken to consult equianalgesic tables (Table 1) or confer with a pharmacist to be certain that this drug is being used safely.

Conclusion

Effective management of foot pain can improve function and reduce disability in the older patient. Preventing common errors in pain management is critical to help avoid serious adverse consequences for the older patient with pain. Careful medication selection, dosage adjustment, and attention to side effects will optimize pain relief and improve quality of life.

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References


Table 1. Opioid Conversions

| Oral equivalents                          | Morphine, 10 mg = oxycodone, 10 mg = hydrocodone, 10 mg = hydromorphone, 2.5 mg |
| Intravenous–oral equivalents             | Intravenous morphine, 10 mg = oral morphine, 30 mg |
| Transdermal–oral equivalents             | Transdermal fentanyl, 25 µg/h = oral morphine, 50 mg daily |