Last month we discussed the serious problem of accidental and intentional opioid overdoses in the CE article “Understanding Overdose.” Unintentional overdoses are a real problem and the leading non-trauma cause of death for individuals aged 1–44. That said, there is another problem in our country: Many citizens depend on a regular supply of pain drugs to control severe and chronic unrelenting pain.

In the United States today, there are more than 116 million adults suffering from chronic pain. That is more than are affected by heart disease, cancer and diabetes combined. Among these sufferers, nearly 50 million experience pain so severe that it partially or permanently disables them.

Prehospital providers play an important role in the recognition and management of chronic pain. In a study at Minnesota’s Hennepin County Medical Center (a Level 1 trauma center), researchers found that 35% of emergency department patients experienced chronic pain, and that those with chronic pain were more likely to be homeless, have a family income below $25,000 and have limited access to primary medical care. These are populations with whom prehospital providers regularly interact. Further, consider the age group prehospital providers see most: the elderly. As many as half of those over 65 living in the community and 80% of those in nursing homes experience chronic pain.

Patients with chronic pain regularly frequent the emergency department. A Johns Hopkins study found that 40% of ED patients experience chronic pain, and 13.7% cited their chronic pain as the primary reason for their ED visit.

Chronic pain is often undertreated. This results from patients having nonspecific diagnoses, a social stigma over chronic pain and lack of effective follow-up of care. Over the last decade the importance of pain management has increased. The Veterans Health Administration became one of the first organizations to take a stand on pain undertreatment when it launched its National Pain Management Strategy in 2000. One element of this strategy was recognizing pain as the fifth vital sign. Then in 2001, the Joint Commission’s pain management standards were first enforced at healthcare facilities to address pain assessment and management. This helped facilities recognize that patients have a right to proper pain control.

**Types of Pain**

Pain is subjective and unique; any assumptions that downplay a patient’s perception of their own pain devalues the patient’s opinion and jeopardizes the patient-caregiver relationship. Rather than creating our own opinion about patients’ pain, a better option is to seek to understand the type and severity of pain being experienced.

In regards to duration, there are three types of pain:
acute, subacute and chronic. Acute pain develops at the time of an illness or injury and lasts up to two weeks. Pain persisting longer than two weeks but less than three months is subacute.

There are then several definitions for chronic pain. Depending on the reference, pain must persist for at least three or six months, or last longer than is reasonably expected for a given illness. Chronic pain may be persistent or episodic in duration and intensity, and adversely affect a patient’s functioning and well-being, but is non-malignant in nature.8 It often has an unclear etiology and poor response to pain management.2 While cancer pain can without a doubt last for much longer than six months, it is classified differently than other forms of chronic pain.

All pain can be described as either nociceptive or non-nociceptive. Nociceptive pain occurs when the nociceptive nerve fibers are stimulated as a result of heat, cold, vibration, stretch or cellular damage. Nociceptors are found in all tissues of the body except for the central nervous system.7 Nociceptor pain is described as either somatic or visceral. Somatic pain is sharp and localized by palpation and is commonly associated with musculoskeletal or skin injury. In contrast, visceral pain originates in the organs within the body cavities and is difficult to localize. It is often described with vague terms such as cramping, burning or colicky. Common causes of visceral pain include organ tissue ischemia, inflammation and tissue stretching.

Non-nociceptive pain originates within the central nervous system and is not triggered by a specific receptor. Neuropathic pain is one type of non-nociceptive pain and occurs when nerves are injured, diseased or directly affected by another disease process (e.g., tumor growth, inflammation or amputation).7

Another form of non-nociceptive pain is sympathetic pain. While the physiology of sympathetic pain is poorly understood, it is thought to be related to overactivity of the sympathetic nervous system. An example of sympathetic pain is the pain that occurs during the healing process following complex musculoskeletal injuries with significant tissue damage. Sympathetic pain is characterized by hypersensitivity around an injury site and can be so severe that a patient cannot even move a healing extremity.

Chronic Pain

Chronic pain is often non-nociceptive in nature and can develop in almost any organ system. Table 1 lists common causes of chronic pain by organ system. Regardless of where the pain develops, chronic pain is constant, unrelenting and difficult to control. In addition to those listed in Table 1, there are some common sources of chronic pain worth special mention.

Fibromyalgia is a syndrome of chronic widespread pain, stiffness and fatigue associated with unrefreshing sleep, cognitive difficulties and impairment of the activities of daily living. It typically presents in young and middle-aged women.8 While some physicians dispute that fibromyalgia is a unique illness, it is currently classified as a central sensivity syndrome with a proven neurophysiological base. Characterized by abnormal pain processing in the CNS, fibromyalgia often presents along with illnesses that manifest systemic inflammation, such as rheumatoid arthritis and systemic lupus erythematosus.8 For patients with fibromyalgia, chronic pain results from a decreased pain perception threshold and impaired ability to distinguish nociceptive pain from other sensations. Patients often complain that they hurt all over, with descriptions such as burning, aching or general soreness.

Chronic back pain can originate in the bones, muscles, nerves or tendons/ligaments. The pain is described by the region in which it is found: cervical, thoracic, lumbar or coccygeal/tailbone; it can radiate to the arms or legs, depending on the region.

The general structure of the human spine and the human lifestyle put the spine at great risk for degeneration over a lifetime as it experiences natural biomechanical forces and wear and tear from gravity. When a patient experiences a
back injury, the normal healing process occurs within 6–12 weeks; because of this, back pain is considered chronic after three months. Between 15%–20% of the U.S. population develops lower back pain throughout their lives, with 2%–8% developing chronic lower back pain.7 Chronic lower back pain can be severely debilitating and is the leading cause of disability among those under 45. It is also the third-leading cause of surgical procedures. Nonspecific causes such as neck and back strains cause most back pains, while injuries to the disks, joints, musculature and spinal ligaments are the other common causes of chronic lower back pain.8

Disk herniation is also a common cause of pain, but surgical procedures make repair relatively easy, and it no longer commonly causes chronic pain. Disk degeneration can, however, cause chronic pain. Sciatica is a specific form of lower back pain that presents with severe leg pain because of the compression and/or interruption of a lumbosacral nerve root that leaves the spine between the fourth lumbar and second sacral vertebrae.8

Patients with diabetes risk developing diabetic neuropathy, a condition where the body’s nerves are damaged from high blood sugar levels and decreased blood flow. While it is more common when blood sugar is poorly controlled, diabetic neuropathy can occur in any diabetic, and nearly 50% of diabetics will develop some form of neuropathy. While diabetic neuropathy can affect many organs, for this article we’re interested in its mechanisms for causing chronic pain.

Early in the nerve-damage process, the diabetic patient may experience regular and persistent burning and tingling in the arms and legs. As the damage worsens, deep pain becomes common. Early physician evaluation and management is imperative because as nerve damage progresses, patients develop an impaired sense of pain and may lose feeling in their extremities. Impaired sensation increases a patient’s risk for infections and impaired healing in everyday scrapes and cuts, which can become ulcerated wounds if left untreated.

Temporomandibular joint (TMJ) syndrome presents with chronic pain of one or both synovial joints where the jaw and skull connect, and can result from muscle spasm, psychological stress, teeth grinding, internal joint derangement or degenerative joint disease. The dull aching pain of TMJ is exacerbated by use of the muscles used to move the jaw and can radiate into the ear and neck. Pain is often worse when chewing or speaking, and there is often measurable limitation of jaw movement and palpable facial muscle spasms.

Chronic pain can impact every area of a patient’s life because the pain becomes so severe that the patient has difficulty completing daily activities and struggles to properly care for themselves. Studies have recently demonstrated that patients with chronic back pain and migraines have an increased suicide risk.9 Further, chronic pain and the medicines used to manage it can both cause a depressed libido. This can have deleterious effects on the psyche and an individual’s emotional health.10 Over time life with chronic pain destroys a patient’s self-image, leading to feelings of anxiety, guilt, depression and resentment. Individuals often feel as though they are not contributing to their family and society, as their family members often must assume the responsibilities the patient once completed.11 The overall result is a constant challenge to an individual’s personal health, family and marital life, and sometimes significant difficulty maintaining employment.2

**Traditional Management**

Even when the source of pain cannot be identified, patients deserve to have their pain managed. These patients will likely require analgesia. However, when managing chronic pain for geriatric patients, a good mantra is “start low and go slow.” The goal is to find the therapeutic level with the least amount of medicine necessary.4 Remember, both hepatic and renal function decline as a natural part of the aging process. This slows drug conversion and elimination, which means medicines will last longer in a patient’s body. Keep this in mind when selecting drug doses and dosing intervals.

**Over-the-counter drugs**—The American Geriatric Society recommends acetaminophen as a starting therapy for chronic musculoskeletal pain because it has few side effects as long as daily dose limits are not exceeded.4 When acetaminophen does not provide adequate pain control, the addition of a nonsteroidal anti-inflammatory drug (NSAID) helps improve pain control. For many elderly patients an opioid may be safer than a NSAID for chronic pain control, as NSAIDs may cause gastrointestinal toxicity and cardiovascular problems and can impair renal function. Chronic NSAID use has also been associated with an increased rate of atrial fibrillation for geriatric patients.4

**Opioids**—Opioid analgesics are ideal for controlling severe acute and cancer-related pain; however, their use in non-cancer chronic pain is somewhat controversial because of the surrounding risks for abuse and dependency. Opioid overdoses are a leading cause of death and emergency department visits. For geriatric patients there is also an increased risk of delirium during chronic opioid use.4 A team led by Meredith Noble of the ECRI Institute reviewed 26 studies regarding non-cancer chronic

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**Non-pharmacologic Techniques**

Whenever managing pain always include non-pharmacologic pain control techniques. Even if these techniques do not reduce pain, they will at least help keep it from getting worse. Non-pharmacologic techniques include ensuring the patient is lifted and moved gently, allowed to rest in a position of comfort with adequate cot padding, minimizing unnecessary lights and noises, and giving oxygen via nasal cannula. Positioning techniques may include providing extra pillows between the legs, behind the back or even to curl up with in a lateral position. Do not be surprised if the patient’s position of comfort is not supine or semi-Fowler’s on the stretcher.

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They have a strong benefit for diabetic peripheral neuropathic pain relief. Four classes can provide significant depression. Both of these drugs, reuptake inhibitor (SNRI) antidepressants. The trick to using patches is to get the pain under control prior to applying a patch. If it is not in control, the patch is unlikely to provide total relief—it is ideal for maintenance, not control.

Several studies have demonstrated that fentanyl patches are preferred over oral morphine by patients because of less drowsiness, fewer doses and more consistent pain control. As a lipophilic drug, fentanyl is easily dissolved in fat. With a transdermal administration there is a gradual and steady release of drug, which allows for a steady plasma concentration and avoids the fluctuation of levels that may be experienced with PO and IV medicines. The trick to using patches is to get the pain under control prior to applying a patch. If it is not in control, the patch is unlikely to provide total relief—it is ideal for maintenance, not control.

Coanalgesics—Coanalgesics are drugs that enhance the effectiveness of analgesics or provide adjunctive analgesic properties. For chronic pain management common coanalgesics include anticonvulsants and serotonin-norepinephrine reuptake inhibitor (SNRI) antidepressants. Both of these drug classes can provide significant neuropathic pain relief. They have a strong benefit for diabetic peripheral neuropathic pain and postherpetic neuralgia pain. Tricyclic antidepressants (TCAs), such as amitriptyline and nortriptyline, may be used in some instances and work by improving the inhibitory function of the central nervous system. TCAs do, however, have a narrower therapeutic window, increasing the risk for toxicity. Figure 1 lists several examples of coanalgesics.

Neurontin (gabapentin) is commonly administered to patients with chronic neuropathic pain and is both an anticonvulsant and an antineuralgic. However, its action mechanisms are unclear. While structurally similar to GABA (gamma-aminobutyric acid), it does not affect the brain’s GABA receptors. Recent animal studies suggest that gabapentin controls pain-related behaviors resulting from nerve stimulus and controls hyperalgesia—the exaggerated response to painful stimuli common in some forms of neuropathic pain. Patients taking Neurontin may take pills ranging between 100–600 mg and likely also are prescribed an opioid analgesic. Morphine is one opioid analgesic that has been shown to increase the effectiveness of Neurontin without major side effects and is a good choice when treating patients already prescribed Neurontin.

### Evaluating Pain

When evaluating chronic pain, begin by obtaining a thorough history. Ensure the patient has no new injuries or pain with a physical exam, and be sure to examine the region of the patient’s chronic pain thoroughly enough to identify any pertinent positives such as muscle spasm, hypersensitivity to touch, increased heat or diaphoresis. Take a few moments to understand how the patient normally controls their pain, and ask what’s different today that has made their pain intolerable. Seek clues such as the patient being low on drugs and spreading out their doses, having had a fever (increased metabolism) or having recently changed medicines. Also ask what does and does not work to control the patient’s pain, and determine what drugs the patient is taking and how much of each.

Use of the traditional 0–10 pain scale may or may not be helpful. Emergency departments typically use a thorough assessment to grade chronic pain on 0–4 scale. This scale, summarized in Table 2, goes beyond pain severity and also scales how significantly the pain interferes with daily functions. The entire grading system is a three-page document: however, prehospital providers can accurately grade the pain by evaluating the patient’s perception of how well they can get through the day. For example, a patient who cannot get out of bed because of their pain would have a grade of 4, while a patient experiencing sciatica pain that limits their ability to go on after-dinner walks but who can otherwise function around the house may have a grade 1 or 2.

What is the functional difference between our pain scale and the pain grading system? A patient may have a pain of 10 with a grade of 1 through 4. The difference, though, is that a patient with a grade 1 may be able to find a position of comfort for transport, while someone with a grade of 3 or 4 may require aggressive pain control prior to initiating it.

To try to distinguish if a patient’s pain is typical or if they are experiencing breakthrough pain. Breakthrough pain is a transient increase in pain beyond a patient’s well-controlled baseline. It is described as either incident pain or end-of-dose failure. Brief
increases in pain precipitated by voluntary action or movement is typical of incident pain, while end-of-dose failure develops before the next analgesic dose is due and pain raises above the patient’s normal threshold. While breakthrough pain is typically associated with patients who have chronic pain, it can occur in patients with acute pain, such as postsurgical patients recovering at home. Breakthrough pain is particularly common in patients with cancer, where it is suffered by more than 64% of patients.

Why Treat Pain?
Historically medical providers have argued that with short transports, EMS should just wait and let EDs manage patients who don’t present in severe pain from acute injuries. This is a poor practice because even in the best departments, pain management won’t start upon arrival at the ED; it can take 20–30 minutes before the first analgesics are administered. By providing analgesia even 5–10 minutes prior to ED arrival, prehospital providers can reduce a patient’s discomfort up to 30 minutes earlier than the patient may otherwise receive. Further, when a patient’s pain is so severe that they call 9-1-1, they deserve management on scene and before they are placed on a stretcher and bounced down the road.

Do not be surprised if initial doses of prehospital pain drugs do not provide significant relief. Patients with chronic pain often need an increased plasma drug concentration compared to patients who do not routinely use opioids. Breakthrough pain typically requires a single opioid dose between 10%–15% of a patient’s total daily dose. To calculate this, determine how much of the drug the patient is taking in 24 hours and divide by 6 (one-sixth is roughly 15%). For example, if a patient takes 180 mg of morphine PO over 24 hours, they may need 180/6, or 30 mg of morphine to control their breakthrough pain. While EMS providers obviously should never give this much in a single dose, the take-home message is that increased or repeated doses may be necessary for adequate pain control.

Avoid Assumptions
As prehospital providers we are called to the homes of patients with chronic pain when they can no longer manage the pain themselves. When faced with these situations, we will see patients who may take a significant amount of analgesics on a daily basis. It is important to not make assumptions about a patient’s potential opioid dependence and also not worry that the short-term administration of analgesics may lead to such dependence. Holding these fears and assumptions can mistakenly lead to patient mislabeling as difficult, morally suspect and challenging. These are dangerous labels that can affect patient care and a patient’s future desire to seek help. Worries about deception, abuse and creating opioid dependence must be balanced with the potential for ineffective patient management by denying patients drugs they may truly need. Recall the research that demonstrated an exceedingly low incidence of opioid dependency among chronic pain patients. Further, you can look for behaviors less suggestive of addiction and drug-seeking actions, such as complaints about the need for additional medicines, requesting specific drugs that work and identification of drugs that will not help, and openness admitting to the use of a drug to treat nonapproved symptoms.

Looking to the Future
Healthcare across the United States is rapidly changing, and developing community paramedicine programs have an opportunity to improve the lives of many. Many chronic pain patients lack regular primary care access. Community paramedicine and mobile healthcare may be able to serve this chronic pain patient population by providing regular visits to ensure patients stay compliant and have an appropriate supply of drugs (and prevent drug hoarding). They can also help manage breakthrough pain and in doing so decrease the frequency of emergency department visits.

REFERENCES

Kevin T. Collopy, BA, FP-C, CCEMT-P, NREMT-P, WEMT, is performance improvement coordinator for Vitalink/Airlink in Wilmington, NC, and a lead instructor for Wilderness Medical Associates. E-mail kcollopy@colgatealumni.org.

Sean M. Kivlehan, MD, MPH, NREMT-P, is a family member at the Public Safety Training Center in the Emergency Care Program at Santa Rosa Junior College, CA. E-mail scottksnyder@me.com.