Getting a grip on neuropathic pain

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IF YOUR PATIENT complains of burning, shooting, or tingling pain that seems to have no apparent cause, he may be experiencing neuropathic pain. This is a type of pain that's caused not by musculoskeletal damage, but by damage to a nerve, either in the central or peripheral nervous system. Let's take a closer look.

What a pain

Some common causes of neuropathic pain include diabetic neuropathy, peripheral vascular disease, postchemotherapy neuropathy, postherpetic and trigeminal neuralgia, postmastectomy pain syndrome, postthoracotomy pain syndrome, phantom limb pain, and complex regional pain syndrome (CRPS). Here's a review of each.

Diabetic neuropathy and peripheral vascular disease. Both conditions can cause tiny blood vessels in the hands and feet to have decreased perfusion, causing extreme ischemic pain. Patients with these neuropathies typically describe their pain as a painful numbness, burning, or feelings of sharp stabbing into their feet or hands.

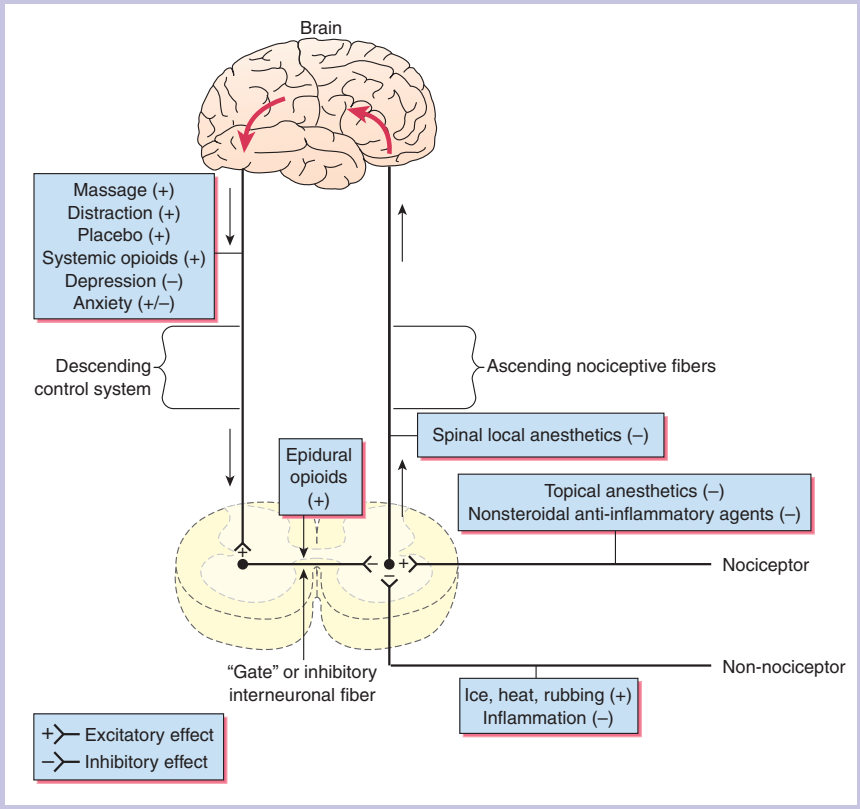
Controlling blood glucose levels and the damage caused by cardiovascular disease can lessen the incidence of diabetic neuropathy or ischemic pain, but these chronic illnesses commonly result in some level of neuropathy over the course of the disease. Key interventions for patients with peripheral neuropathy include controlling blood glucose levels and providing cardiovascular medications.

Education about the condition can also help the patient understand what's causing the pain. Adaptive equipment such as eating utensils with large handles and soft shoes can help ease some of the pain. The patient may have difficulty sleeping so a careful assessment of his sleep patterns should be included as a part of the pain assessment.

Postchemotherapy neuropathy. Patients with postchemotherapy neuropathy can be extremely sensitive to touch, heat, cold, and pressure. These neuropathies are

Who's the gatekeeper?

The gate control theory asserts that a gatelike mechanism in the spinal cord allows peripheral nerve fibers to transmit signals to the brain or inhibits their transmission. According to this theory, pain impulses travel along a small-diameter nerve fiber, pass through an open "gate" in the stantia gelatinosa, and then travel to the brain for interpretation. Impulses carried by a large-diameter nerve fiber can close the "gate" to small-fiber impulses, which blocks pain transmission. This diagram shows the gate control system and the effects of several pain treatments.



related to the dosage of some chemotherapy drugs, so if patients report neuropathic pain early, doses can be adjusted to minimize nerve damage yet effectively treat the cancer. The severity of these neuropathies may diminish over time, but many patients have some residual numbness and pain that may affect ambulation or hand dexterity. Include questions about neuropathic pain during your assessment.

Postherpetic and trigeminal neuralgia. Neuralgia is severe, brief, often repetitious attacks of lightning-like or throbbing pain that occurs along the distribution of a spinal or cranial nerve. It's usually triggered by stimulation of the cutaneous region supplied by that nerve. A complication of herpes zoster (shingles), postherpetic neuralgia is chronic pain that persists beyond the normal healing period, usually 3 to 6 months after the onset of the acute attack. It's characterized by allodynia (a perception of pain caused by a normally nonpainful stimulus, such as light touch). This condition affects 10% to 70% of patients with shingles, and the risk increases with age. Older patients are particularly prone to hyperalgesia (an increased sensation of pain in response to a normally painful stimulus).

Trigeminal neuralgia is one of the most common and severe neuralgias. It's characterized by facial tics or grimaces, accompanied by intermittent sudden attacks of stabbing pain that may be triggered by light touch. These pain attacks are usually limited to the unilateral sensory distribution of one or more branches of the trigeminal nerve.

Postmastectomy pain syndrome and postthoracotomy pain syndrome. These are caused when nerves are damaged or entrapped during surgery. From 30% to 60% of all patients who undergo a mastectomy or lumpectomy experience postmastectomy pain. Postthoracotomy pain affects 50% to 67% of all patients who undergo thoracotomy. The patient is said to have postoperative pain syndrome if he has long-term residual pain that interrupts sleep or if a patient who's undergone mastectomy has limited movement that causes muscle weakness in the operative arm.

The potential for developing postmastectomy pain is increased when breast prostheses are implanted, when the surgery includes axillary node dissection, when traction use is necessary during surgery, and after radiation therapy. The type of pain that postmastectomy patients most often report is strange prickling or itching at the operative site that may extend into the axilla.

After a patient undergoes thoracotomy, the potential for a persistent pain syndrome increases when the surgery includes rib retraction or resection or when tumor growth or bone metastases increase postoperative pain. Postthoracotomy patients may report burning pain along the surgical incision or across the side of the chest on the operative side. One patient described his pain as "a blowtorch moving across his chest."

Nurses caring for patients with these syndromes should realize that patients may be unsure about how to report the continued pain and may be embarrassed by some of the symptoms. Provide continued support and reassure these patients that treatment options and medications are available to help them deal with the continued pain.

Phantom limb pain. This occurs in 60% to 80% of patients who've undergone complete or partial limb amputation. The patient will experience pain in the amputated extremity as if it were still present. The pain is characterized by tingling, hot and cold sensations, or heaviness, followed by burning, cramping, or shooting pain that may disappear spontaneously or persist for several years. The cause of phantom limb pain is unknown, but it may be the result of a trapped regenerating nerve or the firing of spinal cord neurons that have lost sensory input from the body.

Predisposing factors for phantom limb pain include:

- preamputation pain such as from diabetic neuropathy or vascular pain
- persistent pain at the surgical site
- amputation of more than one limb
- lower limb amputation.

Nursing care for patients with phantom limb pain includes providing emotional support through the strange sensations, providing neuropathic medications that can relieve some of the pain, consistently administering pain medications to control the pain, and trying to identify and eliminate any factors that trigger the pain.

Complex regional pain syndrome (CRPS). This usually begins with tissue injury such as a crush injury or surgery, followed by chronic burning pain that's more severe than the injury warrants. The pain may be a deep ache, and it may be accompanied by skin changes such as rubor or pallor, sweating or dryness, edema, or skin atrophy. The slightest movement or touch to the affected area can trigger the pain, which may increase with repetitive stimulation. Emotional upsets can exacerbate CRPS.

Tell me where it hurts

Although the numeric pain intensity scale (with 0 indicating no pain and 10 indicating the worst possible pain) is a valuable tool to assess pain, it won't provide the best assessment in patients with neuropathic pain. The patient's verbal descriptors about his pain are very helpful to determine what type he's experiencing, such as burn-

ing pain or painful numbness in the feet signaling diabetic neuropathy, or feeling a "blowtorch" in the chest after thoracotomy. These verbal descriptors are quite distinct and should always be included in your assessment. Along with verbal descriptors, obtain a medical history, including an assessment of stimuli that could be causing the pain, abnormal sensations, pain intensity, sleep disturbances, and work-related issues.

When a patient is reporting high levels of postoperative pain, it's extremely important for him to feel that his health care provider is open to his continued complaints of pain. Only in this way can the pain be effectively treated and conditions such as CRPS identified in the early stages. Surgical patients may report pain that involves nerve damage or entrapment that occurred during the original surgery (such as postthoracotomy pain syndrome). Rather than dismissing pain complaints that are out of the normal range, the health care provider should closely examine the continued complaints and start the patient on medications to treat neuropathic pain.

Now that we know the possible causes of neuropathic pain, let's take a look at the available treatments.

Medications to treat neuropathic pain

The Centers for Disease Control and Prevention recommends these medications as first- and second-line treatments for neuropathic pain.

First-line agents

- Anticonvulsants, such as gabapentin (Neurontin) and pregabalin (Lyrica)
- Lidocaine patch (Lidoderm)
- Opioids
- The synthetic opioid tramadol
- Tricyclic antidepressants

Second-line agents

- Other anticonvulsants, such as lamotrigine (Lamictal) and carbamazepine
- SSNRIs, such as duloxetine (Cymbalta)

Other agents

- Capsaicin
- Clonidine
- Dextromethorphan
- Mexiletine

Managing neuropathic pain

Neuropathic pain can hinder your patient's ability to carry out activities of daily living, so he may have trouble walking or using utensils. His pain may increase at night, making it difficult to sleep. If his pain limits his social activity, he may develop depression. Treatment is aimed at preventing further nerve damage, decreasing pain to a tolerable level, and increasing the patient's ability to function.

The key to developing a treatment plan for a patient with neuropathic pain is frequent assessment and reassessment of the pain. According to the Centers for Disease Control and Prevention's guidelines for treatment of neuropathic pain, medications are often tried in sequence and then in combination to discover which pain control regimen works best for the patient. Here are some of the current medications available.

Opioid analgesics. Most patients who have severe, long-term pain are taking opioid medications of some type. Common opioids used to treat neuropathic pain include morphine, fentanyl, and oxycodone. Although opioids are the gold standard for treating acute and chronic pain, neuropathic pain may be less responsive to opioids than other pain types. For more information, see *Medications to treat neuropathic pain.*

Adjuvant analgesics. These medications have other primary indications but they're used as analgesics in some circumstances. They include tricyclic antidepressants (TCAs), anticonvulsants, selective serotonin-norepinephrine reuptake inhibitors (SSNRIs), and topical medications. Adjuvants can be given in combination with opioids.

- *TCAs* such as amitriptyline, nortriptyline, and desipramine inhibit the uptake of serotonin and epinephrine (pain-blocking substances) at the nerve junction and can block sodium and calcium channels. They're the first-line treatment for all neuropathies except trigeminal neuralgia. Amitriptyline is used most commonly and has indications for use with postherpetic neuralgia and postmastectomy pain. Adverse effects with these medications may limit their use, such as blurred vision, dry mouth, urine retention, constipation, and orthostatic hypotension. Because orthostatic hypotension can increase the potential for falls, these medications aren't recommended for use in older patients.
- The most commonly used *anticonvulsants* are gabapentin (Neurontin) and pregabalin (Lyrica), although they have significant adverse effects that include dizziness, sedation, ataxia, weight gain, and edema. Carbamazepine is an anticonvulsant usually used to treat trigeminal neuralgia. The mechanism of action for pain relief with anticonvulsants is to prevent the neurons from firing too quickly. Adding these drugs to a neuropathic pain regimen will decrease neuron activity and thus decrease pain stimulus.
- S*SNRIs* such as venlafaxine (Effexor XR) and duloxe-

tine (Cymbalta) are recommended for use with postherpetic neuralgia, diabetic neuropathy, and trigeminal neuralgia. Venlafaxine has been effective in reducing hyperalgesia, and duloxetine is particularly recommended for diabetic neuropathy. These medications aren't indicated for children because they've been linked to an increased suicide risk.

• A commonly used *topical medication* for neuropathic pain is the 5% lidocaine patch (Lidoderm). Originally designed to treat postherpetic neuralgia, the patch has a lidocaine compound that can penetrate deeper into the dermis to provide better pain relief. The patch can be placed directly over the painful area to help lessen pain sensation. Teach patients who are prescribed a Lidoderm patch to place the patch directly over the painful area over intact skin only, wear the patch for 12 hours, and remove and replace the patch daily.

Capsaicin, a topical preparation made from hot peppers, can reduce painful neuropathy by depleting the amount of substance P (a pain-producing substance) from the peripheral neurons. The patient must apply the compound four times a day for several weeks to get the maximum benefit. He should put on latex gloves to apply the compound because capsaicin causes a burning sensation that can be transferred to other parts of the body if he touches them after applying the capsaicin cream.

Now let's take a look at some other treatments for neuropathic pain that don't involve medications.

Other approaches to a pain drain

A patient with neuropathic pain may also benefit from some nonpharmacologic options in conjunction with drug therapy. These include:

Transcutaneous electrical nerve stimulation, which involves a battery-operated, portable generator that transmits mild electrical current through electrodes placed on the patient's skin. The current travels to the peripheral nerves or directly to the affected area, stimulating large nerve fibers and blocking nerve transmission to the brain, which may reduce pain. It's often used for CRPS and phantom limb pain.

Massage, if the patient can tolerate touch, can be used to stimulate nonpain receptors, which are thought to block or decrease the transmission of pain impulses. It also relaxes the muscles, which promotes comfort.

Ice and heat therapy may be effective in relieving pain in some circumstances. Ice (applied for no longer than 20 minutes at a time) may reduce the amount of analgesic medication the patient needs to feel relief. Heat can increase blood flow to the area, decreasing pain.

Patients may also benefit from alternative therapies such as acupuncture, guided imagery, and meditation. To understand how these treatments are thought to relieve pain, see *Who's the gatekeeper?*

What you can do

To help your patient manage neuropathic pain, it's important to reassure him that you know his pain is real and you'll help him deal with it. Then follow these tips:

• Teach your patient about the correct doses of his prescribed medications and the proper times to take them. Make sure he and his family understand the potential adverse effects of prescribed medications, and which ones to report to his health care provider.

• Teach him additional strategies to help relieve his pain. These include distraction techniques such as slow, rhythmic breathing.

• Ask your patient to keep a "pain journal" in which he'll record the location of the pain; its intensity, duration, and frequency; and what, if anything, helps relieve it. This can help you determine the best treatment.

• Most importantly, monitor your patient's pain. If his current treatments aren't working, make sure other options are explored.

Finding relief

Good pain assessment is the key to identifying and treating neuropathic pain. Always ask your patient for specific pain descriptors to help identify any neuropathic component to the pain. If the patient talks about burning pain that feels like a hot poker, sensitivity to temperature, or painful itching/prickling, neuropathic pain is probably the source. Selecting medications that can decrease the generation of the neuropathic pain, along with other nonpharmacologic treatments, can make a tremendous difference in helping your patient find relief. **LPN**

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