

# Pain Management

Back and neck pain are among the leading causes of lost work, affecting 65-85% of the population of the United States at some point in their lives. The most common cause is sprain, strain, or spasm usually brought on by poor lifting techniques, improper posture, or an unhealthy ergonomic environment. Another common cause is disc problems brought on by injury, wear and tear, or age.

Untreated back or neck pain can impede the rehabilitation process by interfering with activities of daily living which can lead to significant psychological distress. While the great majority of these types of pain resolve on their own, the risk of recurrence and development of chronic disease is significant. Chronic pain tends to be difficult to treat, especially in cases of failed back surgery. These considerations have led to a proliferation of services available to patients who seek medical and alternative treatments for their pain. As such, pain management is rapidly becoming the preferred approach in many professional communities. This often requires a multidisciplinary approach toward minimizing or eliminating pain. The goals include increasing physical activity, eliminating unsafe medication use, and learning lifestyle behaviors that work toward wellness.

In spine and musculoskeletal cases, pain management is usually distinguished from surgical treatment, and is employed as an alternative to surgery as part of an aggressive conservative care program, or after surgery to cope with residual or recalcitrant pain. Pain management and the techniques it uses also help to identify the source of neck and back pain, determine the areas to be addressed surgically, and rehabilitate the patient after surgery by using a wide variety of techniques to address pain and painful disorders. The scientific basis for these approaches varies from those that are completely without experimental support to those whose effectiveness has been well demonstrated in clinical trials. In view of the diverse uses and methods of pain management and pain medicine, an overview of this fast-developing field is needed.

## Types of Back and Neck Pain

While it may sometimes be difficult to distinguish, there are several distinct types of back and neck pain. This distinction is important when treating pain, since different management modalities need to be employed for each type in order to achieve the best results. The major types of pain in the neck and back are as follows:

- ❖ **Acute Pain:** This can be defined as severe short-term pain, such as post-operative pain. Acute pain is generally self-limiting; however, the more intense and prolonged an acute pain episode is, the more likely it will lead to chronic pain. This is partly due to the fact that in response to prolonged pain, neurons that transmit pain grow more connections to other nerves, become more sensitive, and react more strongly to painful stimuli. Through this process the nervous system *learns* or *remembers* pain, leading to the development of chronic pain.
- ❖ **Chronic Pain:** Rather than being the symptom of a disease process, chronic pain is itself a disease process. It tends to be unrelenting and not self-limiting, and can persist for years and even decades after the initial injury. There are many factors that affect the development of chronic pain such as age, level of disability, depression, or the presence of nerve damage.
- ❖ **Neuropathic Pain:** This type of pain is usually described by patients as burning, electric, tingling, or shooting in nature. Often this type of pain cannot be controlled using traditional pain killing oral drugs. Management of neuropathic pain may include other medications (that are often not thought of as pain medicines) and multiple treatment modalities such as physical therapy, physical rehabilitation, relaxation training, trigger point injections, epidural steroid injections, sympathetic blocks, spinal cord stimulators, morphine pump systems, and various surgical techniques.
- ❖ **Nociceptive Pain:** This is localized pain, which is usually described by patients as sharp, aching, or throbbing and examples include post-operative pain, pain associated with trauma, and arthritic pain. Nociceptive pain usually responds to non-steroidal anti-inflammatory drugs (NSAIDs) and opioids (strong prescription pain killers).

## Pain Management Modalities

### Non-Invasive Non-Pharmacologic Pain Management

There is an immense variety of noninvasive non-drug pain management techniques available for treating back and neck pain. A few of the most widely accepted in comprehensive pain management programs are the following:

- ❖ **Exercise:** This involves physical exertion with the aim of training or improvement and includes the McKenzie method, water therapy, flexion exercises, aerobic routines, among others. This may involve active, passive, and resistive elements, which are necessary for cardiovascular, spine, and musculoskeletal health.
- ❖ **Manual Techniques:** This involves manipulation of the affected areas by means of osteopathy, massage therapy, and other techniques.
- ❖ **Behavioral Modification:** This involves the use of behavioral methods to optimize patient responses to back pain and painful stimuli. Cognitive therapy involves teaching the patient to alleviate back pain by means of relaxation techniques, coping techniques, and other methods. Biofeedback involves the gradual alteration of neuromuscular signals for symptomatic improvement.
- ❖ **Cutaneous Stimulation:** Superficial heating or cooling of skin can also lead to pain relief. This pain management method includes cold and hot packs, and should be used in conjunction with exercise.
- ❖ **Electrotherapy:** The most commonly known form of electrotherapy is transcutaneous electrical nerve stimulation (TENS). This therapy attempts to reduce back pain by means of a low-voltage electric stimulation that interacts with the sensory nervous system. Randomized controlled trials have yielded either positive or neutral results regarding the efficacy of TENS as a treatment for back pain.

### Non-Invasive Pharmacologic Pain Management

Pain relievers and related drugs are used at every stage of the medical treatment of back pain, from the initial onset of acute pain to facilitation of rehabilitation, treatment of chronic back pain, and alleviation of pain in cases of failed back surgery. The most common noninvasive pharmacologic treatments for chronic back pain are:

- ❖ **Analgesics:** Includes medications, such as Tylenol, which reduce pain without anti-inflammatory effects.
- ❖ **Non-steroidal Anti-inflammatory Agents (NSAIDs):** Includes aspirin, ibuprofen, naproxen, and several newer medications. These medications are valuable analgesics (pain relieving medications) that do not alter the patient's cognitive functions, cause respiratory depression, or nausea. However, NSAIDs are associated with significant side effects, such as stomach upset and ulcers, especially with long-term use.
- ❖ **Muscle Relaxants:** Used to treat muscle spasms which can exist due to pain or as part of the body's protective mechanisms.
- ❖ **Nerve Pain Relievers:** This includes a class of medications that decrease pain attributed to abnormal impulses from damaged or irritated nerves.
- ❖ **Anti-depressants:** There is considerable evidence that certain anti-depressants are effective for the treatment of a variety of pain conditions such as migraine headache and neuropathic pain.
- ❖ **Narcotic Medications:** These medications tend to be the most appropriate for acute or post-operative pain; however, they carry a significant risk of habituation or addiction if the use is not properly supervised. For this reason they are not often used for chronic conditions.

### Invasive Pain Management

Invasive techniques in pain management involve minor procedures for injection or placement of devices into the body. However, this should be distinguished from surgery, which generally involves a greater degree of permanent alteration of tissue. A multitude of invasive pain management therapies have been used to treat neck and back pain. Some of the most popular include:

- ❖ **Epidural Steroid Injections:** This technique involves the placement of a needle between the spinal vertebrae, usually under fluoroscopic (X-ray) guidance, and injection of anti-inflammatory medication directly over the affected area or nerve. Injections of steroids into the lumbar epidural space are particularly useful to alleviate

pain that radiates from the lower back into legs or from the neck into the arms. This pain may be caused by disc herniation or spinal stenosis (narrowing), which triggers nerve root irritation, inflammation, and pain.

- ❖ **Facet Joint Injections:** These involve the injection of steroid medications into the affected spinal joint to reduce inflammation and pain. Injections into these joints or blocks of the nerves that feed the joints can often be very helpful in relieving pain. This problem is more common in the lumbar spine than in the cervical spine.
- ❖ **Trigger Point Injections:** Muscles chronically tense or in spasm become tender and painful. This pain triggers more spasm that can develop into a vicious cycle. Trigger point injections are administered directly into this muscle to help break the cycle.
- ❖ **Nerve Blocks:** These are injections of medication onto or near nerves. The medications that are injected include local anesthetics, steroids, and opioids. Blocks are used to control acute pain and can provide periods of dramatic pain relief, which promotes the desensitization of sensory pathways. Steroids can help reduce nerve and joint inflammation, and the abnormal triggering of pain signals from injured nerves. Further, blocks are used to provide diagnostic information such as helping to determine the pain source.
- ❖ **Peripheral Nerve Blocks:** These injections affect the peripheral nerves which are outside of the brain and spinal cord. These nerves transmit sensation and motor (movement) signals.
- ❖ **Sympathetic Nerve Blocks:** Chronic pain conditions often involve sympathetic nerve malfunctions. These nerves regulate blood flow, sweating, and gland function. Sympathetic nerve blocks administered in different areas of the spine help to reduce pain that involves the face, arm, hands, legs, and feet.
- ❖ **Prolotherapy:** This involves the injection of a solution to stimulate blood circulation and ligament repair at the affected site. The effectiveness of this technique is not known.
- ❖ **Surgically-implanted Electrotherapy Devices:** These involve surgical procedures to implantable spinal cord stimulators and implantable peripheral nerve stimulators which are devices that provide electrical stimulation to the spinal cord and nerves in order to decrease pain sensation. Clinical data offers inconclusive findings on the effectiveness of these devices.
- ❖ **Implantable Opioid Infusion Pumps:** This involves surgically implanted pumps that deliver opioid medications directly to the affected nerve. The appropriateness and effectiveness of these devices for treating chronic back pain is controversial.
- ❖ **Radiofrequency Ablation:** This procedure involves destruction of painful nerves via heat produced by a needle-like device that is inserted over the affected nerve through the skin. Efficacy of this treatment is mixed.

## **Pain Management Specialists**

Health professionals in many fields can complete specialized training in pain management. Currently, there is no single field of medicine or health care that represents the preferred approach to pain management, but these specialists are most commonly found in anesthesiology, physiatry (also called Physical medicine and rehabilitation), interventional radiology, neurology, physical therapy, osteopathy, and primary care medicine. Specialists in psychology, psychiatry, behavioral science and other areas may also play an important role in a comprehensive pain management program. Most pain management specialists are seen by referral from a physician, and are most often called upon to treat severe back pain, challenging chronic pain, and patients with failed back surgery syndrome. Patients should keep in mind that there are many varieties of pain management programs to explore. This process can be confusing or frustrating at times, but the important point is to work proactively with your health professionals and not to give up if one initially encounters an unsatisfactory result. While this can be a significant challenge for patients enduring pain, most people generally feel significant improvement once they find an approach that works for them.

**Nouzhan Sehati, MD**

13320 Riverside Drive, Suite 208

Sherman Oaks, CA 91423

Phone: (818) 783-4949

Fax: (818) 783-7537

[www.sehati.org](http://www.sehati.org)

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