

36 Remedies for Pain Relief

This chapter discusses some of the different types of treatment for pain that are available, when they should be used, and when to exercise caution. It is a guide to some of the management strategies available to help resolve the symptoms of common pain syndromes and athletic injuries, but not a comprehensive discussion.

■ REST

“Take it easy.” “Take a load off.” “Chill out.” “Relax.” These are just some of the terms commonly used to describe “rest.” The human mind is stronger than the body in the sense that it can push the body beyond its physical limits, but the human body needs an adequate amount of rest. Sure, there are times when you want to push yourself as if you were running a marathon. At times, that approach is appropriate, but often it is not. This level of intensity is not always good for the body in the long run, although in the short run it may be useful. Unfortunately, many people convince themselves that every day is a mini-crisis. They push so hard that they reach the point of causing themselves harm. This is true for the athlete and stockbroker alike. Listen to your body. If it hurts, avoid the activity that causes pain rather than tolerate or embrace it. Take some time off and rest.

Rest plays an important role in providing relief from pain. Pain is the product of the inflammation that accompanies injury. (See Chapter 4.) Inflam-

mation helps us heal in many ways. Cells involved in the inflammatory process break down injured and dead tissue, clearing the way for new tissue to regenerate. Cells also release proteins that play a role in recruiting the cells that participate in the rebuilding process. The process of restoring damaged tissue is a complex one and demands the full focus of the body parts involved. Inflammation causes the pain that lets us know it is time to slow down, rest, and give the body time to heal.

Rest does not always have to mean sleep, or even absolute rest. Sometimes rest can be accomplished by reducing the level of your activity so that healing and restoration may occur. Rest can also be accomplished by cross-training, wherein you train your muscles to work in a different way by engaging in activities other than your usual routine. If the cross-training activity is well chosen, you may be able to rest the muscles that need it and engage in a rigorous exercise routine using different muscles at the same time. Many people return to harmful activities too soon, only to re-injure themselves. Rest allows you to heal before irreparable damage occurs.

■ COLD AND HEAT

The first recorded use of cold as a remedy for pain was by the Greek physician Hippocrates, who applied snow and ice to soft tissue injuries. Cold is very helpful when experiencing the hot, sharp, or aching pain that comes on right after an injury such

as a sprained ankle. It is also helpful when applied to a hot, swollen joint after an arthritic flare-up. The intense pain felt during a flare-up or immediately after an injury is called *acute* pain. Applying a cold compress for 15 to 20 minutes to the site of an acute injury may help numb the area and relieve inflammatory pain. You can use a package of vegetables from your freezer, a frozen cup of ice, or crushed ice and water in a zipper lock bag. Alternatively, placing the injured part in a bucket filled with ice slush, applying a gel-refrigerant or chemical pack, or using a coolant spray may also be effective. Applying cold for more than 20 minutes is not advisable because it may damage the skin.

Heat provides great relief of chronic pain and it is also helpful in reducing muscle spasm. A hot bath has been used since time immemorial to relieve the pain of aching joints or the back. For this reason, naturally hot mineral springs are very popular. Alternately, applying heat in the form of an electric pad can provide relief, although it is best to leave the setting on low, in the event you fall asleep with the hot pad in place. Be sure to place as many as 6 to 8 layers of towel between the hot pack and your skin when using a moist hot pack to protect yourself from a burn. While this may seem excessive, it is not. Initially, you may not feel the heat, but as the heat seeps through the towels, you will most certainly feel it.

A paraffin bath is another example of applied heat for the relief of pain. With this treatment, a smaller body joint such as those found in the hand, foot, or elbow is momentarily (for a few seconds only) placed in a tub containing liquefied paraffin and mineral wintergreen oil mixed in a 6:1 ratio that has been heated to 131 degrees Fahrenheit—do not worry; you will not be burned. The melted paraffin quickly turns hard at room temperature after the limb is removed from the container. It acts like a glove to hold in the warmth. The body part is then wrapped in wax paper or plastic to make certain that the heat is not lost and then further insu-

lated with a thick towel. After 20 minutes the glove may be peeled off.

Fluidotherapy involves circulation of heated cellulose or silicon particles that creates the sensation of a dry whirlpool. Typically, these units are located in physical therapy offices. The limb is placed in a sleeve, which is then placed inside the whirlpool for the treatment.

■ TENS

Electric current has been used to treat ailments since early Roman times in the form of electric eels, rays, and torpedo fish. The child who has a scrape learns early on that holding and rubbing the injured area brings relief. Why is this so? The pain signals may be modified many times by interactions with other parts of the nervous system between the stimulated pain receptor and the cortex of the brain. Modification of the signal begins even in the peripheral nervous system. In the early 1960s, it was noticed that stimulation of large-diameter peripheral sensory nerve fibers, not thought to be directly involved in pain sensation, decreased the responsiveness of spinal cord neurons to signals coming from pain receptors. Spinal cord neurons will respond more intensely to pain signals coming from pain receptors if the activity of these other sensory neurons is blocked. This led Patrick Wall and Ronald Melzack to propose the “Gate Control Theory of Pain Perception.” This theory maintains that pain perception may depend upon a balance between the activity of the pain-sensitive nociceptor neurons and the other, larger-diameter, better-insulated sensory neurons. Pain sensation is heightened when activity is high in the pain-receptor neurons and low in the large-fiber neurons. When the opposite is true, pain sensation is diminished.

The practical outcome of this theory is that it supplies a rationale for other non-medicinal approaches

to pain management. For example, the Gate Control Theory may explain why vigorous rubbing of the skin at the site of a minor painful injury often helps relieve the pain. Rubbing the skin stimulates the large-diameter sensory fibers. It also explains the rationale underlying a popular non-medicinal method of pain control called *transcutaneous electrical nerve stimulation* (TENS). This method involves the use of a battery-powered electrical device that stimulates the large-diameter sensory fibers. This is believed to have the effect of suppressing the transmission of pain signals. The weak TENS current is applied through electrodes placed on the skin over the painful area. TENS is particularly helpful in relieving chronic pain from osteoarthritis and bursitis. It is also sometimes used to treat neuropathic pain.

■ ULTRASOUND

Ultrasound is a form of energy with a frequency that is higher or beyond that detectable by the human ear. These frequencies are generated when electricity is passed through special, naturally occurring crystals that vibrate at ultrasonic frequencies. Dogs can hear ultrasound, which is why dog whistles can not be heard by people but are heard well by dogs. Dolphins and whales communicate via ultrasound; submarines use ultrasound waves to navigate through dark waters and avoid bumping into objects; and bats use it to fly successfully in the dark. Using a similar principle, ultrasound is used in diagnostic medicine to visualize a baby within its mother and to detect how much blood is ejected out of the heart valves in a damaged heart. Ultrasound waves penetrate deep into tissue and transfer their energy as heat, thereby healing the tissues and easing the pain associated with chronic conditions. This method of treatment should not be done during

the acute stage of injury because the heat generated may exacerbate the pain from the acute inflammatory process. Ultrasound applied in the pulsed mode (*phonophoresis*) may deliver pain-relieving medications to problem areas. Diagnostic or therapeutic ultrasound should only be administered by a health professional because improper use may cause injury.

■ WHIRLPOOL

Hydrotherapy in a whirlpool relieves pain, relaxes muscles, and is useful in the treatment of joint stiffness and arthritis. Archimedes the Greek mathematician was the first to discover that water has the property of buoyancy. His story is interesting and worth mentioning. The king suspected that a crown presented to him by the local goldsmith was alloyed with silver, and he commissioned Archimedes to figure out whether the goldsmith had hoodwinked the royal treasury. Determining whether the crown was alloyed with silver without injuring the crown was a daunting prospect. Archimedes pondered the matter while lowering himself into the water at the public bathhouse. Understanding the principle of buoyancy in a flash of sudden insight caused Archimedes, in his excitement, to run naked out of the bathhouse and into the street yelling Eureka! Eureka! (meaning, “I have discovered it”). The crown proved to be alloyed, and we can only speculate about the fate of the unlucky goldsmith.

You feel lighter in water because of buoyancy. Minimizing the constant tug of gravity provides rest to your muscles and allows inflammation to subside somewhat. Whether the water is hot, tepid, or cool, whirlpool water is usually agitated by a turbine that adds air to the water in a process known as *aeration*. This turbulence can be very relaxing and provides additional relief to sore, injured areas.

■ CONTRAST BATHS

Contrast baths involve alternating between placing the injured area in hot and cold tanks or a whirlpool bath. The hot water should be about 102 to 105 degrees Fahrenheit, and the cold water should be between 50 and 60 degrees Fahrenheit. Begin with hot water first for 5 to 10 minutes, then the cold water for 1 to 2 minutes, for a hot to cold ratio of 3:1 or 4:1. Contrast baths stimulate circulation by alternating between vasoconstriction (cold) and vasodilatation (heat) of the superficial blood vessels. This maximizes blood flow to the painful area. The entire treatment lasts 30 minutes and is always concluded with the cold bath in order to reduce swelling. Improved circulation promotes healing and may reduce pain over time, although it provides little immediate pain relief.

■ MOBILIZATION

Mobilization of body joints refers to a technique often employed by physical therapists to restore normal motion to a joint. The idea behind mobilization is that certain injuries cause stiffness at the joint from wearing a cast or brace. The joint may have trouble moving normally after removal of the immobilizing device because the joint capsule surrounding it may have become tightened in an unnatural position. Mobilization involves wiggling the joint through small, gentle, oscillations with the intention of stretching the tight ligaments and capsule. The joint will be able to move through its normal range of motion once it has been stretching in this manner.

■ MESSAGE

Ancient Chinese and Egyptian manuscripts make mention of massage as a method of treatment for

pain. Hippocrates advocated its use, and one of the Roman emperors' physicians, Galen, wrote many books relating to massage. Massage has a wonderful effect on the person being massaged, and the direct benefits include improved circulation, muscle relaxation, and stimulation of the lymphatic system. Today, the most popular style of massage that is being used is Swedish massage. It can be beneficial in alleviating stress, improving some types of low back and neck pain, and relaxing tight muscle groups. Massage involves stroking, kneading, squeezing, pounding, and striking, or applying friction to the skin or tissues below the skin. A state-licensed massage therapist or physical therapist is preferred.

■ ACUPUNCTURE

The Chinese have practiced acupuncture as a method of healing and pain relief for centuries. Acupuncture gained notoriety in the West when Western observers documented surgery performed in China without conventional anesthesia; only acupuncture was used to block pain. No one really knows how acupuncture works, although it has been hypothesized that local needling excites the endorphin system of pain control, providing pain relief for hours or days. Proponents of acupuncture see the body as a bioelectric system with energy pathways known as meridians that run throughout the body. Along these meridians are as many as 365 acupuncture points. When energy is disrupted along the meridians, pain and illness may result. Energy disruption is corrected by using needles to stimulate energy flow along these pathways and, thus, the flow of energy is brought back into balance and health is restored. It is very important to choose a well-trained acupuncturist who is either state- or county-certified. Acupressure operates along these same principles but uses applied pres-

sure that is focused at certain body areas instead of using needles. Electro-acupuncture utilizes needles that are electrically stimulated.

A frequently asked question is whether there is any objective scientific evidence that acupuncture is effective in relieving pain. This is a more difficult question to answer than might be thought. A review of the medical literature reveals a plethora of contradictory studies, some of which support the efficacy of acupuncture and others that suggest it is no better than a placebo. Some of the variability may be related to the different types of pain studied in each trial. There are suggestions in the literature that acupuncture may be effective in relieving some types of pain, but not all types. Reviews of large numbers of studies suggest that many were done improperly without an adequate number of participants or proper study design. After all this time since acupuncture was introduced to Western medicine, it still appears that no large, adequately designed, unassailable study has been conducted to provide a definitive answer to this question.

■ CREATIVE VISUALIZATION

Imagining or visualizing yourself in better health has been advocated by some people and may reduce pain and pain-related anxiety. Focusing on positive imagery in which the body is seen as free from pain and injury may make pain less prominent. Tapping into the power of suggestion may positively affect pain through a psychoimmunologic mechanism.

■ MEDICATION

Despite the non-medicinal approaches to pain control briefly discussed above, medication remains the major approach to pain control in use today. There are several different categories of drugs that are

commonly used. They differ from one another in their pharmacological properties, their mechanisms of action, the types of pain they treat, and their potential side effects. Each class of drug is discussed individually below, with the caveat that in any given situation you should rely on the specific recommendations of your doctor.

■ NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS)

Oral non-steroidal anti-inflammatory drugs (NSAIDs) are probably the most commonly used pain medications. They include drugs like aspirin and ibuprofen (Motrin® and Advil®), naprosyn (Naproxen® and Anaprox®), indomethacin (Indocin®), clinoril, and others. NSAIDs are very helpful in controlling the pain and inflammation associated with acute and chronic musculoskeletal conditions. They have both anti-inflammatory and analgesic properties and, in that respect, not only do they provide pain relief, they also address the underlying cause of the pain to some degree. As an additional bonus, they are also effective in suppressing fever. Although most of the NSAIDs are similar in structure and mechanism of action, there is a surprising amount of variability in how individuals respond to the different drugs. For example, one person may respond beautifully to ibuprofen but not at all to naprosyn. Another may have the opposite response, or respond better to a third drug. No one fully understands why this is the case or why any given individual will respond to any particular drug. However, the significance of this observation is that if one NSAID does not work, that does not mean you should give up on NSAIDs. However, if two or three do not work, then you may want to consider some other alternative.

Many NSAIDs are now available in nonprescription strength, but they are not completely benign.

Excessive use of NSAIDs can lead to gastritis, ulcers, hearing loss, bleeding disorders, and kidney damage. Everyone should limit the number of NSAIDs they take and the length of time they take them. Individuals with a medical history of any of the problems listed above should consult their doctor before taking NSAIDs at all. Even if there is no such medical history, elderly people, in particular, should be especially careful about taking large doses of NSAIDs. There are newer varieties of NSAIDs such as the Cox-2 inhibitors Vioxx® and Celebrex® that may have a lower risk for some of these side effects. These are effective NSAIDs and they have become increasingly popular. Keep in mind, however, that although the risk of complications is lower with Cox-2 inhibitors, excessive use can still be dangerous.

■ ACETAMINOPHEN

In addition to the NSAIDs, there are other medications that are highly effective in relieving pain. The most important one in common use is acetaminophen, better known by the brand name Tylenol®. Acetaminophen is similar to many of the NSAIDs in that it is effective in both relieving pain and reducing fever. It is a weak anti-inflammatory drug, however, and appears to work through a mechanism of action different from that of NSAIDs. Just how it works is still not fully understood. Acetaminophen has been shown to be effective in treating many different types of pain, although it may be less effective in treating moderate to severe pain than the classic NSAIDs.

The major advantage of acetaminophen over the typical NSAIDs is that it is safe when taken as directed. Acetaminophen will not cause ulcers, gastritis, or esophageal reflux. This does not mean that acetaminophen is safe in any quantity. High doses of acetaminophen can result in severe, even life-threatening liver failure. It is therefore important to try

to stay within the manufacturers' recommended dosing guidelines, which for the average adult is a cumulative maximum of 4,000 mg a day.

■ OPIOID ANALGESICS

Opioid analgesics—so named because they are all derived or structurally related to opium—are the most potent analgesics available. They are also referred to as narcotics. Some varieties of opioids, such as heroin and codeine, are illegal in the United States. Opioids are chemicals that bind to three types of receptors that are found naturally in the body. Although opioids themselves are not found naturally in the body, small peptides called *endorphins* are found naturally. Endorphins mediate analgesic functions at the opioid receptors. (See Chapter 4 for a more complete discussion of endogenous opioids.)

The opioids that are most effective in relieving pain all bind to the *mu* opioid receptor. Most of these are derivatives of and structurally related to morphine. Although the entire class of mu receptor opioids is similar in structure, they differ from one another in potency. This means that smaller quantities of a potent opioid may give you the same analgesic benefit as a much greater quantity of a less potent opioid. Unlike NSAIDs, however, there does not appear to be much difference between opioids in terms of individual response. If you took sufficient quantities of codeine (a relatively weak opioid) so that it would be equal to a given quantity of hydromorphone (a very potent opioid) there would likely be little difference in the degree of pain relief. There are differences among the opioids in the degree to which they bind to other types of opioid receptors and, therefore, there may be differences between them in some of their other effects.

Opioids are very powerful analgesics, and they have become the drugs of choice for severe acute

pain. There are downsides to opioid use, however. Opioids are highly addictive and can cause physical dependency. Although these two terms are frequently used interchangeably, they do not mean the same thing. Physical dependence suggests that if someone stops taking the drug, they will experience physical symptoms of withdrawal. These include restlessness, sleepiness, insomnia, irritability, shaking, tremors, nasal congestion, diarrhea, and other symptoms. Addiction implies that the person's behavior has changed in an antisocial way in order to obtain narcotics. For example, stealing, doctor-shopping, and prescription fraud are all signs of addiction. Some people may become addicted to and physically dependent upon prescription opioids such as morphine, just as they would illegal opioids such as heroin.

Opioids also have other potentially serious side effects as well. They frequently cause nausea, vomiting, constipation, sleepiness, hallucinations, impaired judgment, and abnormal thinking. At high doses they may cause coma, respiratory suppression (difficulty breathing), and death. In addition, people on longstanding therapy with opioids frequently develop tolerance to their analgesic effects. This means that over time they require larger and larger doses of the opioid to get the same analgesic effect.

Many doctors prefer to prescribe opioids only for acute pain of limited duration (often no more than 1 to 2 weeks). Doctors are likely to be more liberal in prescribing higher doses of opioids for longer periods of time in cases where there is malignant pain from cancer. There is currently a great deal of debate among doctors as to whether it is appropriate to prescribe opioids for chronic, non-malignant pain when other pain medications have failed. Several leading medical organizations have published recommendations suggesting situations where it is appropriate to do so. The issue is far from settled. Some drug companies are currently working at formulating new types of opioid drugs that will be less dangerous and

less likely to cause physical dependence or addiction. So far, few are currently on the market.

■ STEROID INJECTIONS

Steroids are natural substances made by glands within the body. Many hormones, including the sex hormones, have structures similar to steroids. One of the most important properties of a group of steroids called glucocorticoids is that they reduce inflammation. Although they have no analgesic properties per se, their ability to reduce inflammation enables them to inhibit the major cause of pain following a tissue injury. This makes steroids highly effective in reducing the pain associated with most types of stress injuries and chronic pain syndromes.

Steroids may be administered by mouth, inhaler, systemic injection (to the whole body), or by local injection directly at the site of injury. Local injections are the most effective route of applying steroids because they result in a high concentration of steroid right where you need it. In addition, using local injections avoids the side effects of systemic injections, which include weight gain, swelling, osteoporosis, abnormal hair growth and distorted features, gastric irritation, abnormally high blood sugar, and suppression of the immune system, which may lead to opportunistic infections.

One problem with local injections is that steroids are so powerful that they weaken the tissue into which they are injected. No more than two or three steroid injections should ever be administered to a single area. Too many injections, for example, into a painful tendon may cause the tendon to become weakened to the point of being unable to handle stress, and it will eventually rupture. Another problem with steroids is that because they often cause a dramatic decrease in symptoms, people often feel that they are cured and apply themselves vigorously to the same activity that caused the pain and inflammation

in the first place. This catches up with them sooner or later and they typically exacerbate the injury that caused their original symptoms. The bottom line is that when used judiciously, steroid injections can be very useful in controlling pain and aiding the healing process, but when used carelessly or cavalierly, steroids can make a bad situation much worse.

■ MEDICATIONS FOR CHRONIC PAIN

Often, the drugs that are usually effective in relieving the pain associated with an acute injury become less effective when the pain becomes chronic. Alternatively, a doctor may have good reasons not to prescribe one of the treatments for acute pain over a prolonged period of time. This may be because of the associated risks such as addiction, gastroesophageal injury, or other complications. There are drugs available that are specifically useful in dealing with chronic or chronic/recurrent pain. They may be taken on a daily basis for long periods of time with limited adverse effects and significant long-term efficacy. These drugs are not able to eliminate acute pain. However, they are effective in improving longstanding chronic pain. Although a wide variety of drugs has been tested and prescribed over the years for this purpose, the most successful and popularly prescribed drugs for chronic pain are the tricyclic antidepressants and the anticonvulsants. As you may have noticed from their names, neither class of drug was originally developed for the purpose of treating chronic pain.

■ TRICYCLIC ANTIDEPRESSANTS

As the name implies, tricyclic antidepressants were developed for the treatment of depression. They are still popularly used for that purpose, although with the introduction of so many other classes of antide-

pressant drugs they are used less commonly to treat depression than they once were. In addition to treating depression, tricyclics were discovered early on to be effective in treating chronic pain of various sorts. Why they are effective in this way is not completely understood, although many researchers believe that it may have to do with the fact that tricyclics serve to increase the effects of serotonin (a chemical transmitter in the brain) by preventing its removal from the site of activity. Serotonin is believed to play an important role in modulating chronic and recurrent pain, although precisely how is not understood.

Tricyclics are not analgesics, and they are ineffective in relieving acute pain or primary inflammatory pain. They have been reported to be effective in treating neuropathic pain (pain related to nerve injury) and many types of headache. There are many agents available in this class of drugs. Some of the more popular ones are: amitriptyline (Elavil®), nortriptyline (Pamelor®), doxepin (Sinequan®), and imipramine (Tofranil®), to name a few. They are similar in their actions, but there is some individual variation in their efficacy and the associated side effects.

The tricyclics have a number of side effects, which some people have difficulty tolerating, including daytime sleepiness, dry mouth, increased appetite, weight gain, fluid retention, bizarre dreams, and rarely, hallucinations. More serious side effects include urinary retention, abnormal heart rhythms, and acute closed-angle glaucoma. It is recommended that these drugs be used with special care in the elderly and people with cardiac histories, enlarged prostates, or a history of glaucoma or elevated ocular pressures.

■ ANTICONVULSANTS

Anticonvulsants are drugs that are generally used for the treatment of seizures in people with epilepsy.

They work by a variety of different mechanisms, but they share in common the fact that they inhibit the propagation of electrical signals in the nervous system. It is through this mechanism that they interfere with seizures in the brain, and it is likely that this mechanism also interferes with the chronic pain associated with peripheral nerve injury.

There are many different kinds of anticonvulsant drugs in common use today, but only a few have been shown to be effective in the treatment of chronic pain. The earliest anticonvulsant to be used for this purpose was carbamazepine (Tegretol®). It is still popularly used for this purpose as well as for the treatment of specific acute painful syndromes such

as *trigeminal neuralgia*. Valproic acid (Depakote®) has also proven useful for the treatment of chronic neuropathic pain. Gabapentin (Neurontin®) is a relative newcomer, but it is a drug that is quickly becoming very popular for the treatment of neuropathic pain. The anticonvulsants may be better tolerated than the tricyclics by some, but they also have side effects, and care should be taken with their use. Sleepiness, clouded thinking, dizziness, nausea, vomiting, and double vision are sometimes experienced. Carbamazepine may cause a severe form of bone marrow suppression in rare instances, so your doctor may elect to follow your blood count for a while when first starting this particular medication.