

## What is meant by Referred Pain?

When we hurt, such as with chronic pain, there is frequently nothing wrong at the site of the pain. Instead, the problem is in another area of the body somehow associated with the painful site.

For example, it is common knowledge that much or all of the pain experienced during a heart attack is frequently felt in the left shoulder and upper arm. And almost everyone has felt pain in the forearm and hand after the elbow ("funny bone") is hit. It is also common for our foreheads to hurt ("brain freeze") when we eat or drink something very cold. In all of these examples, there is nothing wrong with the areas that hurt, and the problem is clearly some distance away. Feeling pain at an area different from the injury itself is known as referred pain.

## How Does the Spinal Cord Work?

The spinal cord carries messages to and from the brain and body. Many pathways carry certain information. Parts of the spinal cord carry sensory (temperature, pain, and touch) information and other areas carry motor (movement) information. This is how the spinal cord carries messages:

1. Something HOT is touched.
2. The message "HOT" travels from the hand-through the nerve to the spinal cord.
3. The message (from the spinal cord) does two things:
  - First, it goes back to the hand (through the nerve).
    - The hand quickly moves away from HOT. This is called a reflex
  - Second, it goes up to the brain, which receives the message "HOT"
    - The message (from the brain) travels back down spinal cord-through the nerve to the hand.
    - The hand pulls away from HOT (if the reflex has not already done it).

In summary, the spinal cord is the relay part of the system. It helps relay all messages between the brain and body. The body responds to these messages.

## **How Problems in an Organ Can Be Felt as Pain on the Skin**

When problems in an organ are felt on the skin, the pain is said to be projected or referred from the organ to the skin. This is called referred pain. Four main theories attempt to explain this phenomenon. None have been proven to be either right or wrong. Two of the theories explain how a person can feel the cold from eating ice cream as pain in the forehead: the signals from the roof of the mouth are mixed up with those from the forehead either before entering the spinal cord or someplace inside it. The other two theories require nerve signals from the mouth to stimulate the forehead itself either through a direct connection or indirectly through connections made in the spinal cord.

Stimulation of the intercostal spaces and muscles and the interspinous ligaments produces pain sensations on a variety of distant areas of the skin that are not associated with any of the usual nerve distributions. Thus, a careful evaluation of muscles and ligaments must be included in any evaluation of pain that does not appear to come from sites just below the skin.

## **How Problems in a Nerve Can Be Felt as Pain on the Skin**

Most of the nerves that pick up information about pain from the skin go into the spinal cord through spaces between the disks. The area of skin served by a particular nerve is called its dermatome, and is named after the spinal nerve. If the nerve is stimulated anywhere along its path (such as by being pinched between two spinal disks, squeezed against a hard spot by a muscle, or damaged during an accident), the pain feels as if it is coming from the skin from which the particular nerve collects its information. This is because the spinal cord directly connects to a corresponding area in the brain that represents a specific position on the body.

In simpler terms, a pinched spinal nerve root (e.g., by a muscle pressing the nerve against a bone or by the disks hitting the nerve) is felt on the skin. This is because the brain does not know where the signal begins along a nerve's path, so it always thinks the signal starts at the place it is supposed to.

Dr. Scott at Newport Pain Management can help determine if you suffer from chronic pain referred from another location. Call us at 949 759-8400 or contact [www.newportpain.com](http://www.newportpain.com) for more information.