

## **Reflex Sympathetic Dystrophy (RSD)/Complex Regional Pain Syndrome**

**Overview:** Reflex sympathetic dystrophy is a syndrome that may develop when the body has been injured. This injury can result from a motor vehicle accident, a gunshot wound, an accident around the house or even after surgery. Any sort of wound can result in reflex sympathetic dystrophy. Normally, the nerve signals pain when the body is injured. This causes a reflex, which makes the body pull away from the painful stimulus. The blood vessels will then protect the body by constricting to reduce blood loss. In patients without reflex sympathetic dystrophy, these responses gradually disappear, blood vessels open up, the fear and suffering decreases and the body takes appropriate actions to heal the wound. In patients with reflex sympathetic dystrophy, however, the body never gets quite back to normal. The nerves stay hyperactive causing increased pain because of continual blood vessel spasms. This tightening of the blood vessels causes swelling of the limb, discoloration and increased pain. This pain from the reduced blood flow keeps the nerves excited, which then keeps the blood vessels tight and continues in a cycle. Increased pain and reduced blood flow are the hallmark of this disorder.

**Diagnosis:** The patient will note hypersensitivity. Patients with reflex sympathetic dystrophy do not like the limb being touched at all and will seek to protect it from even casual encounters or the wind. The slightest touch can be interpreted as pain. The doctor will note objective changes in the limb such as discoloration and increased sweating. The limb will feel two degrees cooler, the pain will increase in cold weather, and there may be alterations in the appearance of the hair on the limb. In addition, the skin becomes shiny, the bones lose their calcium and nail growth may change in appearance. X-rays and bone scans can help demonstrate reduction in blood flow and reduction of calcium in the bones. Overall, the limb may appear to be wasting away. This wasting is called dystrophy and develops as a consequence of low blood flow. In late stages of RSD, the hand or foot becomes withered and nonfunctional, virtually a useless appendage.

**Treatment:** Reflex sympathetic dystrophy is divided into three stages. Stage one is the least severe and three is the most severe. Depending on the stage, the treatment will vary.

**Stage One:** There may be some slight swelling, hypersensitivity and occasional discoloration following an injury. The skin will appear normal and there will be a minimal loss of calcium from the bones. Patients in this stage are very treatable with a combination of medications, injections and physical therapy. Neurotin is the medication of choice given to decrease activity in the overactive nerves. Other medications may be used as well to help open the blood vessels. Physical therapy is important to keep the limb from wasting away and also to decrease the sensitivity in the limb. A skilled physical therapist can design a program to help the limb recover. It is important that the nervous system returns to normal. This can be done with a sequence of nerve blocks that can help treat the underlying condition by interrupting the reflex arc of pain in the nervous system. The nerves are temporarily put to sleep with a local anesthetic causing them to forget the memory of the injury. Usually nerve blocks are given as a sequence of 3 to 10 injections.

**Stage Two:** Significant wasting of the limb occurs. Calcium is very low in the bones, the skin is shiny and the blood vessels are in significant spasm all the time. Surgery becomes an option to permanently interrupt the nerves so the blood vessels can open and nourish the limb. The nerves can also be injected with drugs to permanently disrupt their function. Another alternative is the placement of a spinal stimulating device. This can interrupt the nerves without destroying them and help reverse the changes of stage two sympathetic dystrophy. In addition, another alternative is the placement of a morphine or local anesthetic pump for temporary or permanent use in order to decrease activity in the nerves.

**Stage Three:** The tendons and muscles have wasted away and the limb cannot be used at all. The bones are virtually demineralized and the skin is very shiny. Unfortunately, in stage three, there is no treatment. Cutting the nerves or treating the patient with spinal narcotic infusion or with spinal stimulation will not cause the limb to regenerate. Fortunately, in this day and age, with the development of advanced pain management centers, few patients progress to stage three.