

Complex regional pain syndrome (CRPS) encompasses a group of symptoms that can include pain, swelling, and stiffness. It usually affects one arm or leg and can even affect just a part of the limb. CRPS often arises after injury, such as a fracture (broken bone) or sprain. It can even arise after surgery. There are two types of CRPS, one associated with nerve injury (Type II CRPS) and one without nerve injury (Type I CRPS). In both types of CRPS, people affected have worse pain than would be expected for the underlying problem.

Causes

The exact cause of CRPS is unknown. It is thought that CRPS results from dysfunction in the central and peripheral nervous systems. This leads to an overactive pain response without ongoing injury. CRPS can begin after a minor injury such as a sprain or cut, after major trauma or surgery, or without any known injury. CRPS is three times more likely to occur in women than men. An estimated 60,000 Americans are affected by CRPS.

Signs and Symptoms

The key symptom of CRPS is continuous, intense pain. This pain may be out of proportion relative to what is expected for a particular injury or surgery recovery. CRPS most typically starts in one of the arms or legs. Symptoms may include:

- Pain that can be severe (burning, tingling, throbbing or aching)
- Swelling of the limb
- Trouble moving the arm or leg with joint stiffness
- Changes in skin temperature (warmer or cooler)
- Changes in skin color (can be blotchy, purple, pale or red)
- Changes in skin texture (shiny and thin, and sometimes excessively sweaty)
- Changes in nail or hair growth

The pain may spread to include the entire arm or leg, even though the initiating injury might have been only to a finger or toe. Pain can sometimes even travel to the opposite extremity, but this is uncommon. CRPS may be heightened by emotional stress.

Diagnosis

There is no single test to confirm whether someone has CRPS. The diagnosis is made through observation of signs and symptoms. Patients must be seen by a qualified physician who does a thorough history and a physical exam. Other tests like X-rays, MRI or bone scans may show changes to the bones, joints or skin that could be attributed to CRPS. Generally, it is thought that the chance of recovery from CRPS improves the earlier the diagnosis of CRPS is made and treatment is started.

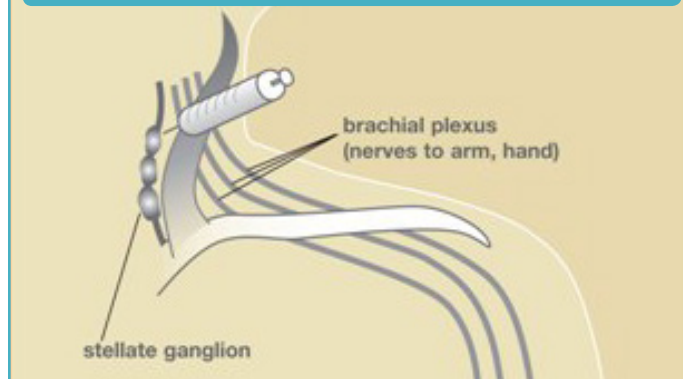
Treatment

Treatment is varied and depends on both the severity of the symptoms and the duration of the problem. Aerobic conditioning, relief of sleep disorders, and treatment of psychological problems can be helpful. Some patients may have a physical problem that needs to be addressed, such as a compressed or entrapped nerve. Since there is no simple cure for CRPS, treatment is intended to relieve painful symptoms so that patients can resume their normal lives, as well as optimize use of the hand or extremity.

Any of the following may be employed to treat CRPS, often in combination:

- **Occupational/Physical Therapy:** An increasing exercise program to help with motion may help preserve or restore mobility and function to the affected hand. Overall aerobic conditioning is also important to improve coping ability, sleep and pain control.
- **Psychotherapy:** CRPS can have profound psychological effects on patients and their families. Many people with CRPS have depression, anxiety or post-traumatic stress disorder. A psychologist or psychiatrist may be able to improve coping ability and motivation as well as detect and address any substance dependency issues.
- **Nerve Blocks:** Many patients experience significant relief from nerve blocks, in which local anesthetic is injected to make nerves numb. By relieving pain, blocks can enable more effective therapy, improve mood, and improve level of activity. Stellate ganglion blocks may be used to numb the stellate ganglion, which is a cluster of sympathetic nerves at the base of the neck, in an effort to reduce the over-activity of the sympathetic nerves seen in CRPS (see Figure 1).
- **Medications:** Many different drugs are used to treat CRPS and associated conditions, such as sleep disorders, depression and anxiety. Medications may include topical analgesics, anti-seizure drugs, antidepressants, corticosteroids, muscle relaxants, opioids and sleeping medications.
- **Surgery:** If the CRPS is from a compressed nerve, such as with carpal tunnel syndrome, then surgery to release pressure on the nerve may be needed (e.g. carpal tunnel release). Rarely, an operation known as sympathectomy is used to injure the sympathetic nerves in patients who are helped by nerve blocks, but use of sympathectomy is controversial.
- **Other options include:** Spinal cord stimulation and intrathecal drug pumps, in which pain medications are injected continuously into the space around the spinal cord. Deep brain stimulation and Electrotherapy (ECT) have also been used, and new therapies continue to emerge.

Figure 1: A stellate ganglion block is an injection used to numb nerves in those with complex regional pain syndrome.



Prognosis

Each patient with CRPS responds differently to treatment. Spontaneous improvement occurs in some people. Others may have long-term changes despite treatment. Most doctors believe that early treatment is helpful to limit the disability from CRPS, but even this is not entirely clear. More research is needed to understand the causes and development of CRPS, along with how treatment can alter its course.