

## **Physical Therapy**

### **Part -I**

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"There have been references in the literature that physical therapy can aggravate pain and CRPS. Yet in every outline of treatment for CRPS, the use of physical therapy is emphasized. These two statements seem to be contradictory."

Both statements are absolutely true. Excessive exercise and physical therapy that causes fatigue, pain, and distress to any part of the body, will only flare-up and aggravates the inflammation and pain of CRPS. On the other hand, the commonest aggravators of CRPS are bed rest, inactivity, application of ice, and the use of assistive devices. In CRPS, the best treatment is eustress not distress.

Distress refers to the stress of prolonged bed rest and inactivity on one extreme, and stress of overdoing exercise on the other. Like any other machine, prolonged idling of the body is distressful and causes damage to the body. Especially in CRPS, the prolonged bed rest results in aggravation of pain and insomnia. The CRPS patients suffer from severe chronic insomnia due to the constant allodynic pain as well as due to the constriction of blood vessels secondary to inactivity. One of the earliest signs of CRPS is a restless night with the patient constantly being fidgety and changing position all night as well as having to get up and walk to get some relief. The second form of distress is too much exercise, prolonged physical therapy.

The CRPS victim has to learn that they will have pain with too much exercise, and with too much inactivity. The patient will have to find a happy medium. The patient will have to rest and move around alternatively and frequently. Monotherapy applied three days a week in a Physical Therapy Department is not enough, the patient should follow the instructions of the physical therapist and should carry on self-applied physical therapy (proprioceptive therapy), from morning to night with equal periods of rest and exercise.

Depending on the sub-specialist physician, the treatment may be limited to only pain medications by one specialist, only antidepressants by another specialist, or only nerve blocks by a third specialist. The treatment should be attacking the disease in a multidisciplinary fashion from all angles addressing all the four pathogenic factors aggravating the pain:

1. For prevention allodynic pain, the patient should receive Trazodone. Amitriptyline (Elavil) should be avoided because it has a tendency to aggravate obesity, fatigue, low blood pressure and, in rare cases cardiac irregularities.

2. For the problem of cold extremity, (vasoconstriction), and movement disorder, ice should never be applied. The patient should be treated with warm water and Epsom salt bath. The Epsom salt is a hyperosmolar salt, and relieves the inflammation by acting as a calcium channel blocker. Ice should never be used on any CRPS patient because the use of ice aggravates vasoconstriction in the chronic CRPS. It causes further hypothermia of the skin, and accelerates further deterioration. It expands the mechanoreceptors zone of recruitment and hypersensitivity causing intolerance to touch (allodynia) over the area surrounding the lesion (Torebjork Principle). The so-called "ice and heat challenge" with alternate application of ice and heat is of no use. There is no therapeutic value for the alternate use of the two extremes of temperatures (hot or cold). The stress of the alternate treatment only aggravates the disease further.

The use of ice or Capsaicin has been shown to cause inflammation and death of the nerve fibers, especially the larger myelinated nerve fibers. Then the unmyelinated nerves are left uninhibited and unopposed with acceleration of CRPS pain (large myelinated fibers stop conducting at 20c, but unmyelinated fibers keep conducting down to zero degrees).

3. To counteract the hypothermia in the extremity due to the abnormal function of the sympathetic system, it is essential to encourage the patient to get rid of assistive devices (wheelchair, walker, cane, and crutches). The patient should be instructed to follow the golden rule of perpetual motion. In CRPS the condition gets worse with prolonged inactivity or the stress of too much activity.

4. The patient should learn from the human heart which beats approximately once a second for 90 years without taking a vacation. The reason is the heart beats half a second and rests half a second. The same principle should apply to physical therapy in RSD. So of the 90 years heart span the heart works 45 years and rest for 45 years.

The same principle should apply for physical therapy. The patient should be instructed not to do any extensive resting or exercise for a long span of time, but to constantly keep changing position and alternating exercise with rest. If sitting up cause's pain, then walk. If walking causes pain, then lie down. If lying down cause's pain, then go back to the other forms of exercise, etc.

Inactivity gives the signal to the sympathetic system to preserve the circulation in the inactive extremity by vasoconstriction, which aggravates the CRPS.

In 1995, Doctor Koltzenburg had shown that inactivity and immobilization of the extremity, such as the use of cast, a brace, a wheelchair, etc., stimulates the so-called "sleeping nociceptors." Such small c-fibers nociceptors are usually dormant but with inflammation or increased muscle and deep tissue circulation, secondary to CRPS, they become activated and aggravate the pain. These "sleeping nociceptors" are mainly chemoreceptors c-fibers and comprise about 25% of all the chemoreceptors c-fibers in subcutaneous and deep structures of the extremity. They become hyperactive, and cause severe, intolerable deep pain if the patient is not alternating rest and exercise. If the patient wakes up with severe pain, he or she should get up and walk around.