

## The Contralateral Approach to Exercise Rehab

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Early physical activity has been found to stimulate healing after injury and decrease disability, even when a patient is in pain. But exercising a recently damaged area too soon can slow the healing process, perpetuate symptoms and even cause continuing problems. The question then arises: How can I start my patient exercising when I'm not sure if they can tolerate it?

One way to provide the stimulus of early exercising to an injured area, while avoiding excessive irritation, is by using contralateral exercise. This neurological phenomenon (also called "cross education" or "cross transfer") has been identified for many years, yet rarely is used by clinicians treating acute injuries. While this procedure is particularly helpful in the treatment of shoulder and ankle injuries, it can be used successfully for many areas of the body.

Doctors, therapists and researchers have found that when a muscle performs resistance exercise, a neurological stimulus crosses the spinal cord and is received in the corresponding muscle group on the other side of the body. When done repeatedly, there is a training effect that produces an adaptation in the nervous system, probably at the level of the spinal cord.<sup>1</sup> The best technical description of this phenomenon is "neural integration of interlimb coordination."<sup>2</sup> As chiropractors who want to help our patients, it is a very important concept to master, since we can use it to help patients recover more rapidly from an acute injury or from chronically painful movement patterns.

### Research Findings

Several studies have updated our basic knowledge of cross education by testing the concept on human volunteers and investigating the various parameters. In the first investigation, both quadriceps muscles of each study volunteer were tested for strength, and then progressive resistance exercising was performed with the left leg only. At the end of 12 weeks, significant strength gains were measured in the unexercised right legs. Researchers found the most significant improvement and the greatest gains in strength in the group that used lengthening (eccentric) exercises.<sup>3</sup>

In a more recent study, scientists examined the changes in maximum voluntary isometric contraction (MVC) in the contralateral untrained limb during unilateral resistance training. They found that progressive unilateral resistance training significantly increased the MVC, and also the electromyographic activation in both the trained and contralateral untrained limbs. Their results suggest the mechanisms underlying cross education of muscular strength are explained primarily by the activation of central neural factors during contralateral training.<sup>4</sup>

The improvements in strength that are gained with contralateral exercising are very comprehensive, as shown by another study. Twenty healthy young adults (10 men and 10 women) were first tested for strength of their quadriceps and hamstring muscles using dynamometers. Then, 10 subjects were

chosen at random to train using one leg three times a week for seven weeks, while the other 10 subjects served as controls.

During week eight, the strength tests were repeated on both groups. Both the quadriceps and the hamstring muscles of the trained subjects showed a cross-transfer effect from the trained limb to the untrained side, while there was no change noted in the control group. These researchers reported that unilateral exercising produced increases in the strength, power and endurance characteristics of the contralateral (unexercised) muscles.<sup>5</sup>

### How to Use Contralateral Exercises

Start by identifying the strengthening exercises your patient needs to do for the injured area. Before beginning to exercise the area of injury, the patient should perform the desired exercises on the uninjured side. This can be done while the patient is receiving pain-reducing and anti-inflammatory modalities such as electrotherapy and cooling.

In a significant acute injury (or directly following surgery), specific exercising of only the uninjured region should continue for several days up to two weeks, depending on the extent and severity of the damage. The contralateral exercises can (and should) be done whenever an injured region is immobilized, whether casted or pinned; and also when there is too much pain or inflammation to consider direct exercising.

As the patient begins to respond and healing progresses, they should begin to perform the exercises with the injured region in a careful and controlled manner. Even at this point, the patient should start and finish each session with exercises for the uninjured side. This procedure will allow a more rapid recovery by permitting aggressive exercising without irritating or causing further damage to the injured region.

### Take Advantage of Early Exercise

Start your acute-injury patients on an exercise program immediately following injury, but avoid direct exercising of the injured area initially. Recommend contralateral exercises to supply the stimulus necessary to take advantage of the early exercise phenomenon, while avoiding the potential for re-injury of the damaged area. Show the patient which exercises to do, but start the exercises on the opposite side of the body for the first several days. Make sure patients focus on the lengthening (eccentric) part of the exercise movement, in order to make rapid and consistent improvement. As they progress and the injury begins to heal, the symptomatic region can be safely exercised, as long as the "good" side is exercised first and last during each session.

An appropriate and progressive rehab exercise program should be started early in the treatment of patients with injuries. When you incorporate early rehabilitative exercises using these specific procedures, your patients will recognize you are a knowledgeable expert. They will be excited to follow your recommendations and their rapid progress will be a tremendous motivating factor. The result will be more consistent chiropractic results and patients who recognize your expertise and leadership in the field of musculoskeletal problems.

### References

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