

## Steps to Successful Rehabilitation, Part 4

### DEVELOP A RESISTANCE EXERCISE PROGRAM

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If you are already using resistance exercise in practice or are planning to, there are specific procedures that must be followed in order to develop the most productive program for any patient. These procedures also hold true when developing training programs for healthy patients. Once soft-tissue healing is significant enough for tissue to be a tensile strength and a foundation in aerobic training is underway, six steps are necessary when formulating a plan for resistance exercise. Following these steps in order will assure that all bases are covered with each exercise plan.

#### 1. Needs Analysis

Determining the muscles that must be stretched and those that must be strengthened is a good first step. Evaluating the ratio between aerobic and resistive exercise is a good second step. In most cases resistive exercise should follow aerobic training. The effects on the injury or injuries being rehabbed must be considered to avoid re-injury and setbacks.

#### 2. Exercise Selection

Full-body resistance training is good for almost all patients. A mixture of core, multi-joint and assistance exercises must be considered. Exercises that are specific to the injured area or the sport in which the patient is participating are also important for improving flexibility and strength in the injured area(s). This is a key to returning the patient to health and preventing re-injury.

- *Core exercises* strengthen the chest, shoulders, back, hips and thighs. Examples are crunches, push-ups and rowing exercises.
- *Multi-joint exercises* involve movement of multiple joints and muscle groups. Examples include squats and shoulder presses.
- *Assistance exercises* involve a single joint and the primary muscle or muscles that move the joint. Doing biceps curls by moving the elbow joint only is a good example.

Core exercises are important to everyone, but especially patients with spinal conditions. Multi-joint exercises are less specific and generally work multiple areas and involve heavier resistance. Assistance exercises are more specific, placing the majority of work on a single muscle.

The type of resistance selected is also important. Free weights and machines are common but less practical than rubber tubing equipment. Look for equipment that requires minimal space and offers options for both home and office use. The use of rubber tubing at home and in the office helps the patient make the transition to at-home exercising. Also, the at-home exercises are the same as or similar to those performed in the office.

#### 3. Exercise Frequency

How often the patient will exercise is a key to effectiveness and the prevention of re-injury. Too little exercise (low frequency) will not produce the results desired, and too much exercise (high frequency) may result in re-injury. Initially the frequency should be timed to coincide with office visits. This will make the transition to exercise frequencies specifically for the home or outside gym facilities.

#### 4. Exercise Order

This is the sequence in which exercises should be performed during each session. Warm-up and aerobic exercises should be used to prepare for resistance training. In resistance training, core and multi-joint exercises are generally performed first, followed by assistance exercises. When a choice between lower body and upper body exercises is necessary, the lower body should be exercised first.

#### 5. Exercise Load and Repetitions

The *load* refers to the amount of resistance used during the exercise. *Repetition* refers to how many times the resistance will be used during a set or grouping. The load for a patient rehabbing an injury should be minimal initially. The key here is to have the patient become familiar with the exercises in the program. This helps develop muscle coordination and the movements involved.

Resistance can be added once the patient is familiar with the exercise program. Even then the resistance should increase slowly. One of the primary causes of injury during resistance training is advancing the exercise load too rapidly.

A general rule for repetitions is fewer repetitions with higher resistance for muscle building and higher repetitions with lighter resistance for muscle toning. In rehabilitation, toning is the initial focus.

When using rubber tubing, for resistance, the patient should use the smallest diameter tubing until the exercise routine is familiar. Stronger tubing can then be utilized as the patient gains strength. Thinner and longer tubing provides lower resistance. Thicker, shorter tubing provides greater resistance. Again, start light. Heavy resistance early may cause re-injury.

#### 6. Rest Periods

Rest must be factored into every rehabilitation and exercise program. This is closely related to exercise frequency and is a key factor in avoiding over-exercising, re-injury or developing new injuries. Without rest, the patient will get too much of a good thing.

Resistance exercises help in soft-tissue and scar remodeling by helping reorient the scar tissue along the lines of the original tissue to help achieve the highest degree of healing. It is vital and effective as long as soft-tissue healing is on the right path and aerobic exercise has assisted in developing a basis for the patient to continue to the point that resistance exercise is possible.

#### *Resources*

- Baechle T, Earle R. *Essentials of Strength and Conditioning, Second Edition*. Human Kinetics, 2000.
- Cotton R, Ekeroth C. *Personal Trainer Manual: The Resource for Fitness Professionals*. American Council on Exercise, 1997.
- Deuster P. *The Navy SEAL Physical Fitness Guide*. Department of Military and Emergency Medicine, Uniformed Services University of the Health Sciences F. Edward Hebert School of Medicine, August 1997.

- Siff M. *Facts and Fallacies of Fitness, 4th Edition*. Self published, 2000.
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