



Golden Hills

Orthopedic and Sports Physical Therapy

j o u r n a l

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Our Mission...

To further the prevention, diagnosis and treatment of movement dysfunction in order to enhance the physical health and functional abilities of our patients.

To maximize the patient's potential for regaining full physical health by providing rehabilitation through the use of advancements in physical therapy techniques and state-of-the-art equipment.

To establish a self-management program for the patient through education and a personalized home exercise program for each individual to enable the patient to maintain their physical health at home and at work.

Part I: **Resistance Training:** **Creating an Effective Patient Program**

In the May and June issues of *Golden Hills Journal*, we discussed the key role exercise training and conditioning play in helping the patient/athlete reduce his or her risk of injury while enhancing strength, endurance, speed and coordination. We also explored the many benefits training and conditioning hold for non-competitive athletes. In the following two issues, we delve into strength (i.e., resistance) training in greater detail, focusing on basic principles and providing strategies to help patients develop and stick to an effective program.

In the September and October issues, we will provide more detailed information about aerobic training and conditioning programs.

Our end goal is to provide you with a valuable set of tools to help your patients realize the many benefits of training and exercise, both in maintaining good health and in recovering from injury.

Resistance Training Defined

The term "resistance training" refers to a specialized method of conditioning that involves the progressive use of a wide range of resistive loads and a variety of training modalities (e.g., free weights, weight machines, elastic cords,

medicine balls and body weight) designed to enhance muscle function, increase muscle size, improve body composition, boost sports performance, reduce athletic injuries and aid the patient in regaining strength, flexibility and coordination following an injury. While the terms resistance training, strength training and weight training are sometimes used synonymously, the term resistance training encompasses a broader range of training modalities and a wider variety of training goals. Resistance training should be distinguished from the competitive sports of bodybuilding, power lifting and weight lifting in which individuals routinely train at high intensities to maximize muscle size, strength and power.

Resistance training therapy focuses on enhancing joint mobilization and stabilization, muscle strength and endurance, and coordination. When medically indicated, resistance training therapy can help alleviate pain and improve the patient's physical functions and overall physiologic capacities.

Fundamental Principles

Dramatic advances in the prescription of anaerobic exercise, especially over the past 15 years, have led to more effective strength training programs that are

Resistance Training: Creating an Effective Patient Program (Continued)

allowing athletes to perform at a higher level and helping patients recover from injuries more quickly.

Grounded in fundamental principles of specificity, progressive overload and variation, an anaerobic exercise prescription for strength development should be individualized to meet training goals. Physicians who know the basic principles can prescribe exercise to effectively build muscle strength in active patients and speed the process of injury recovery. Golden Hills will work with you throughout the process to ensure that an appropriate program is prescribed and that it continues to produce the desired results.

Individualization

Individualization is key to formulating training goals that are matched to each patient's needs and are designed to meet realistic and specific goals. The magnitude and rate of improvement depend on genetic endowment, training status (i.e., how much prior strength training has been performed) and effectiveness of the exercise prescription. Therefore, expectations for improvements must be framed within the physiologic context that each person brings to the training program. In addition, training programs must change as program goals are attained, and this makes exercise prescription a dynamic process.

Specificity

Specificity has a dramatic influence on almost all exercise responses and training adaptations. A high degree of task specificity is involved in

human movement, acute physiologic responses and chronic adaptations to exercise. The specific exercise stimulus is related to the:

- Muscle actions involved
- Speed of movement
- Range of motion
- Muscle groups trained
- Energy systems involved
- Intensity and volume of training

Progressive Overload

Progressive overload is a classic principle that was established by the research of DeLorme and Watkins, and refers to the need for heavier resistances to stimulate continued adaptation and improved force production.

Physiologic demands in a strength training program can be increased in several ways. The load (resistance), number of sets (completion of an exercise to its repetition maximum, or RM, constitutes a single set) or volume of exercise may all be increased. The repetition speed can be altered with submaximal loads according to goals. Rest periods may be lengthened to enhance force production in strength and power training or reduced to improve local muscle endurance.

To improve muscle strength in the shortest period of time, maximal loading will show the best results. Maximal to submaximal resistance training is best suited for athletes in competitive sports.

Repetition Maximum

Repetition maximum, or "RM,"

allows the prescription of a targeted number of repetitions for each exercise. The external resistance at which an individual can perform only one repetition, but not two, is the 1 RM. The resistance that limits the individual to 10 repetitions is the 10 RM. As resistance increases, fewer repetitions can be performed. As the athlete gets stronger, the resistance seems lighter, and the number of repetitions will increase.

Variation

Variation means that the resistance starts out light, with the volume of exercise high, and systematically progresses over time to heavier resistances with lower volumes. Periodization means that the volume of the training stimulus and intensity of training vary, and planned rest periods are incorporated. Planned periods of rest enhance recovery and eliminate any possible overtraining.

With the basic principles of resistance training in mind, next month we will discuss how Golden Hills works with you to build an effective training program for your patients, whether with an eye on optimizing performance, achieving long-term health goals or recovering from injury. Specifically, we will discuss how choice of exercise, sequence of exercise, number of sets, use of rest periods and intensity of workouts all come together to create an optimal program that can help your patients meet their individual training goals. For more specific information our patient-centered approach to resistance training, call us today at (408) 274-0888.