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**About.com Sports Medicine****Basic Strength Training Principles**

Weight Training for Muscle Strength

By Elizabeth Quinn, About.com Guide Updated October 03, 2007

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There are many different ways to build muscle strength, but they all boil down to some very basic principles. These four principles are the foundation upon which to build an [efficient and productive strength training routine](#)<sup>1</sup>.

**1. Strength Exercise Selection**

What exercises you choose to do are the starting point for creating an optimal workout. You have to make wise selections that make the most of each exercise. My advice is to choose strength exercises that are multi-joint exercises rather than single joint movements. For example, choose a squat over a leg extension and you get far more return on your exercise investment. Additionally, this sort of exercises selection is much more likely to simulate real life or real sports movements. In real life we use many muscles and joints in very rapid succession to move. Working out this way eliminates the need for isolated movements like bicep curls. Keep this in mind when you select your exercises during training.

Keep the number of exercises manageable. Three to five high intensity exercises is about right. Don't think you can do 15 strength exercises in one session and still get a high intensity workout. With too many exercises, you tend to fatigue before you finish or lower your overall output and get a lesser quality workout.

The optimal time for a full strength training workout at high intensity is about 30 minutes.

**2. Frequency of Strength Training Session**

The two factors that determine your strength gains are the intensity of the exercise performed and allowing an appropriate rest and recovery period after the workout. For this reason, most strength workouts are built around the concept of short, high intensity weight workouts followed by one to two days of rest to let the muscles rebuild and become stronger.

Research shows that muscles continue to build fibers and become stronger for up to a week after a workout that is performed to muscle failure. This underscores the importance of alternating a high training intensity with adequate rest periods in order to build muscle.

**3. Number of Sets Performed**

There is a lot of discussion about how many sets of an exercise to do. The bottom line is if you can do one set to exhaustion, that is probably enough. The reason many people need to do multiple sets is that they didn't perform the first one at maximum intensity.

There are other reasons to perform multiple sets and the biggest one is safety. Performing one set of maximum effort can increase your risk of injury if you haven't thoroughly warmed up or if you don't use perfect lifting technique. Sometimes it's smart to use a set to make sure you don't over-lift (lift more than you are capable of lifting in a safe manner).

If you are experienced and skilled at weight lifting, go ahead and perform the first set at max effort and work to failure.

Research backs up the idea that one set training produces the same strength gains as multiple sets and it does this in less time.

**4. Number of Repetitions Performed per Set**

There are a lot of different recommendations regarding how many reps to perform during weight training. How many you should do depend on your training goals and current level of fitness. Keep in mind that strength training promotes increases in both functional strength (how much you can lift) and muscle hypertrophy (how big your muscles grow).

Higher repetition during weight lifting sessions stimulate the slow twitch muscle fibers and promote muscle endurance. Lower repetitions during weight training (at a higher intensity) activate the fast twitch muscle fibers and increase strength and muscle size. One simple way to get the best of both of these training methods is to vary your training repetitions. Because both are important for overall athletic conditioning, and many strength training experts will recommend varying the number of repetitions through a 8-10 week training cycle. Keep in mind that performing high intensity lifts is still necessary even if you are performing 50 repetitions. The weight must be heavy enough that you reach fatigue at the last repetition in order to promote functional muscle growth.

Reference Kraemer WJ, Adams K, et al. American College of Sports Medicine. American College of Sports Medicine position stand. *Progression models in resistance training for healthy adults.*<sup>2</sup> *Medicine & Science in Sports & Exercise.* 2002 Feb;34(2):364-80. [Online Abstract](#)<sup>3</sup>

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