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# 7 Different Types of Strength and Their Benefits

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by Pete McCall (/education-and-resources/professional/author/58/pete-mccall) on June 29, 2015

Are your clients following the right strength-training program to achieve their fitness goals? Increasing muscle strength is a frequently cited reason for starting an exercise program; however, not all strength training is the same and achieving a specific strength-training goal requires following the right type of workout program. For example, training for maximum strength requires heavy weights for limited repetitions, while improving explosive strength requires moving light-to-moderate weights as fast as possible.

Strength training is the functional application of Newton's second law of physics, which defines force as the product of a mass and its acceleration (Force = MA). Generally speaking, strength is the ability to accelerate a mass from a state of rest, which results in the production of muscular force. From a physiological perspective, strength is the ability to activate muscle motor neurons and their attached muscle fibers (together called a motor unit) to generate the force necessary to achieve a specific outcome. To achieve a strength-based goal, it is important to first define the specific type of strength required for success and then design an exercise program to develop that strength.

The magnitude and rate of force production are determined by the efficiency at which all of the involved muscle motor units are recruited. Both intramuscular coordination (the ability to recruit all of the motor units within a specific muscle) and intermuscular coordination (the ability to have a number of different muscles working together to generate a force) are required to achieve optimal levels of strength.

The prerequisite for any strength-training program is the structural integrity of the musculoskeletal system to control stability of the stable joints, while allowing the mobile joints to move through unrestricted, multiplanar motion. According to the principle of specificity, strength is developed in response to the amount of resistance and the type of movements used in an exercise program. Moving a heavy mass with slow acceleration will produce one type of strength, while rapidly accelerating an object with a minimal mass will produce a different type of strength. Likewise, sustaining the movement of a mass at a constant rate of velocity for a high number of repetitions results in yet another type of strength. If we have a better understanding of each type of strength and how to achieve it with exercise, we can help our clients reach their fullest potential.

Listed below are different types of strength with a brief overview of the training program required to achieve that outcome.

# Agile Strength

The ability to decelerate, control and generate muscle force in a multiplanar environment.

Traditional strength training focuses on producing a shortening muscle action to move a load through a single plane of motion; however, many tasks require the ability to move a mass through gravity in multiple planes of motion.

Examples: Picking up and carrying a young child, laundry basket or duffle bag

#### **Benefits**

Generate the force required to move objects from one location to the next.

Improve resiliency of muscle and connective tissue to reduce the risk of injuries such as sprains or muscle pulls.

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Enhance performance of specific sports or activities of daily living (ADLs).

### **Training Strategy**

Exercise selection: Multiplanar movements using a variety of free weights (dumbbells, medicine balls, sandbags, etc.) or cable machines

Intensity: Low-to-moderate, approximately 50-75% of the estimate 1 repetition maximum (1RM) for a particular exercise

Reps: 12-15+

Tempo: Variable speeds: slow to fast

Sets: 2-5+

Rest interval: 30-90 seconds

### Strength Endurance

The ability to maintain muscular contractions or a consistent level of muscle force for extended periods of time.

Relies upon aerobic efficiency to supply oxygen and nutrients to the working muscles while removing metabolic waste.

Examples: An endurance event like a 10K, marathon or triathlon; doing yard work or other vigorous household chores; high volume bodybuilding-type training

#### **Benefits**

Maintain good postural stabilization for an extended period of time.

Improve the aerobic capacity of working muscles.

Enhance ability to perform many functional tasks and ADLs.

#### **Training Strategy**

Exercise selection: Compound and single-joint movements using a variety of equipment; body-weight exercises

Intensity: Low-to-moderate, approximately 40-80% of 1RM

Reps: 10+

Tempo: Consistent: slow to moderate

Sets: 2-5+

Rest interval: 30-60 seconds

## **Explosive Strength**

Produce a maximal amount of force in a minimal amount of time; muscle lengthening followed by rapid acceleration through the shortening phase. Focus is on the speed of movement through a range of motion (ROM).

Explosive strength is based on the ability of the contractile element to rapidly generate tension, while power enhances the ability of elastic tissue to minimize the transition time from lengthening to shortening during the stretch-shorten cycle.

Examples: Throwing a shot-put, Olympic lifts such as the snatch and clean-and-jerk; quickly moving out of the way of danger

#### **Benefits**

Improve the speed of motor unit recruitment and enhance intramuscular coordination.

Reduce reaction time.

Improve the resiliency of muscle and connective tissue.

Activate type II muscle fibers.

### Training Strategy

Exercise selection: Compound and single-joint movements using a variety of free weights

Intensity: 40-75% 1RM

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Reps: 1-6

Tempo: Fast as possible

Sets: 2-5+

Rest interval: 30-90 seconds

## Maximum Strength

The highest level of muscle force that can be produced, maximum strength is the ability of a muscle or specific group of muscles to recruit and engage all motor units to generate maximal tension against an external resistance. Requires high levels of neuromuscular efficiency to enhance both intra- and intermuscular coordination.

Examples: Powerlifting, squat, deadlift and bench press and strongman competitions

### Benefits

Activate type II (fast twitch) muscle fibers capable of generating high levels of force.

Increase levels of muscle-building hormones.

Increase bone density and strength.

Improve performance in many sports and ADLs.

### **Training Strategy**

Exercise Selection: Compound and single-joint movements using free weights or selectorized machines

Intensity: 90-100% 1RM

Reps: 1-4

Tempo: Slow-to-fast (even though the lifter is attempting to use maximum speed the weight is moving slowly)

Sets: 3-4+

Rest interval: 2-4 minutes

## **Relative Strength**

Amount of force generated per unit of bodyweight. Can be increased by using all of the various types of strength training to improve the magnitude of force production while maintaining or reducing total body mass.

If neuromuscular efficiency and muscle force production increase while maintaining a consistent body mass, relative strength will increase.

Example: Two women each weigh 154 pounds. The first can do 4 pull-ups and deadlift 200 pounds, while the second can do 8 pull-ups and deadlift 220 pounds. Therefore, the second woman is capable of producing more force per pound of body weight.

### Benefits

Improve performance in many sports or ADLs.

Maximize motor unit recruitment.

Improve neuromuscular efficiency.

### Training Strategy

Relative strength results from using all different types of strength training methods to be capable of generating greater levels of force at a consistent body weight.

# Speed Strength

The maximal force capable of being produced during a high-speed movement; trained with either bodyweight or a minimal amount of resistance, allowing the movement to be executed as fast as possible.

Examples: Throwing a baseball, swinging a golf club, running a sprint

### Benefits

Minimize reaction times.

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Enhance athletic performance.

Reduce time of the stretch-shorten cycle.

### Training Strategy

Exercise selection: Compound movements using a variety of free weights; unloaded body-weight movements

Intensity: 30-50% 1RM

Reps: 1-6

Tempo: Fast, explosive

Sets: 2-6+

Rest interval: 30 seconds - 2 minutes

## Starting Strength

Produce force at the beginning of a movement without momentum or a pre-stretch to load mechanical energy; start moving from a stationary position

An isometric contraction creates tension, which allows the surrounding elastic fascia and connective tissue to lengthen and store mechanical energy for a rapid rate of force production.

Examples: A track start, a football linemen in his stance before the ball is snapped, getting up from a seated position

### Benefits

Improve the ability of muscle and connective tissue to increase the rate of force production.

Reduce starting time for sports that require an athlete to move from a stationary position.

Enhance the ability to transition from seated to standing.

### **Training Strategy**

Exercise selection: Compound and single-joint movements using a variety of types of resistance to focus on force production in the initial ROM from a stationary position.

Intensity: 50-90% 1RM

Reps: 1-6

Tempo: Fast, explosive

Sets: 2-6+

Rest interval: 45 seconds - 3 minutes