

Strengthening exercise is recognized by the health and medical community as a necessary ingredient for good health. It is essential for controlling body fat, maintaining muscle, joint and bone strength and preventing much of the physical deterioration previously believed to be “normal” aging.

Leg strength is the number one predictor of whether we end our lives in a nursing home, according to Dr. Walter Bortz, world renowned expert on aging.

Much of the information on what to do and how to do it is confusing and often conflicting. The following will clarify what strengthening exercise is and how to do it.

WHAT IS THE GOAL OF ANY EXERCISE PROGRAM?

Our number one goal should be to improve or to maintain our health, prevent premature death and avoid ending our days in a nursing home.

It is essential to develop an exercise program we can do *for the rest of our life.*

WHAT IS STRENGTHENING EXERCISE?

There are two distinctly different kinds of exercise: strengthening exercise and cardiovascular exercise. Each serves a very different purpose.

Strengthening exercise is the opposite of cardiovascular exercise. Despite what we are told on television or in “health” magazines, there are NO exercises that accomplish both at the same time.

Strengthening exercises are a sequence of short duration exercises. Each exercise should fatigue that muscle group within 60 to 90 seconds. It is just the opposite of cardiovascular (aerobic) exercise, which is an ongoing type of exercise that can be performed for an extended period of time, such as walking or jogging.

WHAT ARE THE BENEFITS OF STRENGTHENING EXERCISE?

It strengthens the muscles, the joints and the connective tissue. It also raises the metabolism to burn more calories each day. Raising our metabolism is the key to permanent fat loss.

Cardiovascular exercise improves the function and health of

the heart, lungs and circulatory system. It does not improve muscular strength.

With strengthening exercise, the muscles become stronger and a multitude of additional benefits occur:

- Our bones get thicker and stronger.
- Ligaments and other connective tissue in our joints are strengthened.
- The blood vessels in the muscles increase in size and number.

New research indicates that there are many other benefits such as, improvements to our cholesterol levels and a 50% reduction in colon transit time (directly associated with a reduced incidence of colon cancer.)

HOW DO I GET STARTED?

Schedule your first few exercise appointments with your coordinator or at the front desk. One of our trainers will meet with you, answer any questions and show you exactly what to do.

WHAT ARE THE BASIC STRENGTHENING PRINCIPLES TO FOLLOW?

1. Begin a strengthening program with light weights and slowly increase the weights.
2. The weight should eventually be adjusted for each exercise so that you are unable to continue for more than 60 to 90 seconds.
3. Lift slowly, using at least 4 full seconds to raise the weight, holding for a full second at the top and 4 seconds to lower it; when in doubt, slower is better.
4. Increase the weight when you can do 7 to 10 repetitions within 60 to 90 seconds in good form. With a slightly heavier weight next time, expect to do 6 or 7 repetitions.
5. Proper form should be carefully maintained to isolate the muscle being worked and prevent injury.
6. A minimum of 48 hours is required between strengthening sessions for the body to recover.
7. Eat at least 3 well-balanced meals each day.
8. Sleep 7 to 8 hours each night.
9. Measure your progress only against yourself.
10. If you have any questions or concerns, talk to one of our trainers.

With adherence to these principles, a healthy individual will gain strength at a rate faster than with any other form of exercise.

WHAT WEIGHT SHOULD I USE AND HOW LONG SHOULD EACH EXERCISE TAKE?

Initially the weight on each exercise should be light. Over the coming months the weight should gradually be increased so that we are unable to continue each exercise beyond 90 seconds.

When we are able to do one set of 7 to 10 repetitions in good form (or we reach 90 seconds) the weight should be increased slightly for our next session. Each time the weight is increased, **we should expect to do fewer repetitions** or less time. The weight should be kept at this level until we are again able to do 7 to 10 repetitions. At this point the process is repeated.

The weight should be moved slowly, but always move quickly to the next machine at the completion of each exercise.

HOW FAST SHOULD THE WEIGHT BE LIFTED?

Strengthening exercises must be done slowly, to be safe and beneficial for our joints and bone structure!

Every study that has been done on speed of movement indicates that the slower the exercise is performed, the faster the results. We recommend a full 4 seconds raising the weight, with a one-second stop at the top and 4 seconds lowering the weight.

Injuries often occur when we focus on how much we can lift, rather than aiming for effectively tiring the muscle. Rapid movement or jerking a weight will lead to slower results and injury.

SHOULD I EXPECT TO BE SORE?

Beginning with light weights and maintaining slow speed should only cause a slight amount of muscle soreness. Once we are doing the circuit regularly, we should be tired after each exercise session but should not have continued muscle soreness. Slight soreness may occur when a new exercise is added or possibly when the weight is increased.

There should never be joint pain! If joint pain does occur, see a fitness trainer to make adjustments. If soreness persists we recommend you see your doctor.

HOW OFTEN SHOULD I DO STRENGTHENING EXERCISES?

The MedX circuit should be done twice a week with at least two days off in-between.

At most it can be done three times a week with a minimum of 48 hours between strengthening sessions for the muscles to recover. Research shows that twice a week will accomplish at

least 85% of the results of three times a week. **Remember our goal is to develop an exercise program that we can do for the rest of our lives. Given the average person’s schedule most people find it is easier and more realistic to maintain a twice a week program.**

Cardiovascular exercise is a lower intensity exercise than strengthening exercise and can be done more frequently.

WHY CAN’T I DO STRENGTHENING EXERCISE EVERY DAY?

Exercise itself doesn’t benefit the body! It stresses the body! It’s the body’s healing response, **during the recovery period** that improves the body.

Without allowing our muscles to fully recover between strengthening sessions we will reduce our strength and conditioning. Generally the body requires a minimum of 48 hours between strengthening sessions to recover and grow. **Our strength improves between exercise sessions — not during them.**

WHY CAN’T I LIFT AS MUCH AS MY FRIEND WHO IS HALF MY SIZE?

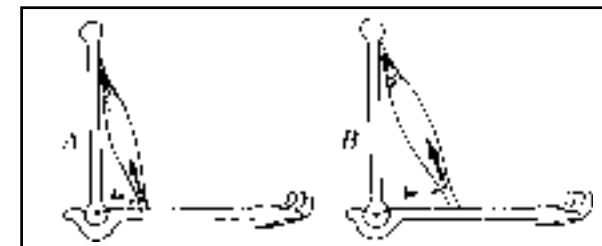
It is not possible and completely misleading to compare one person to another. There are genetic factors that pre-determine how strong each person can become.

For example, genetics determines where our biceps muscle attaches to our forearm. How important is this?

Imagine two otherwise identical individuals (as shown below). Person “A’s” biceps muscle attaches to their forearm 1 inch from the elbow and person “B’s” biceps attaches 2 inches from the elbow. The second person will be able to curl TWICE as much weight as the first person.

This difference is impossible for the naked eye to see but dramatically affects the weight each person can lift. This is only one of the many genetic differences and is the reason why it’s impossible to compare yourself to someone else.

No matter what an individual’s potential may be, everyone can improve their current strength level.



Muscle attachments are an inherited trait.

WHEN CAN I EXPECT TO SEE RESULTS?

You should begin to see and feel results within a few weeks. Research confirms that health benefits begin to accrue as soon as you start an exercise program.

The best way to measure your progress is to monitor your strength increases. Strength will begin to increase within the first few weeks. As your weights go up, your strength is increasing; this is an indicator of increased muscle tissue. When the muscle is increased, and your body weight stays the same (or decreases), you are reducing body fat and adding firm muscle tissue.

As this happens, your measurements will go down even if you don't lose weight. Muscle is compact and takes up much less space than fat. Even if you stay at the same body weight, you will lose inches.

And as you increase muscle tissue it becomes easier to keep fat off, because you are burning more calories each day, even on the days you don't exercise!

DOES STRENGTHENING EXERCISE HELP WITH FAT LOSS?

To lose fat and keep it off you need to INCREASE or at least maintain your muscle tissue. Muscle is the key to reducing body fat because each pound of muscle on our body will burn about 50 calories a day! (Each pound of fat burns only 2 to 3 calories). By adding 5 lbs. of muscle to our body, we burn an additional 250 calories each day, even on the days we are not exercising!

As muscle is added, it's not unusual to reduce dress size or waist measurement without losing weight. This is possible because muscle takes up 1/3 the space of an equal weight of fat. A pound of body fat is the equivalent in size to a one-pound package of butter (4 sticks). A pound of muscle is equal to one and a third sticks of butter!

I'M OVER 70. CAN I STILL BUILD STRENGTH AND MUSCLE SIZE?

Muscular strength can be increased at any age. In a landmark study completed by Dr. William Evans of Tufts University, a group of elderly nursing home residents, 84 to 99 years of age, increased their strength by over 100% in ten weeks on a strengthening program. New studies using MRI technology shows marked increases in lean tissue (muscle) in mature subjects as they gain strength with their strengthening program.

We can gain strength at any age! It's important to exercise when we are thirty, according to Dr. Walter Bortz, world

renowned expert on aging, but when we are fifty and over, "it's absolutely necessary."

Why? Because the number one predictor of ending our lives in a nursing home is leg strength!!

COMMON MISUNDERSTANDINGS

Should the weights be kept light to avoid injury?

It's NOT the amount of weight that causes an injury; even a "light" weight can easily cause injury IF IT IS MOVED TOO FAST! The weight being lifted can be momentarily increased 400% to 500% when the weight is jerked or moved rapidly through an exercise.

In experiments done on a computer monitored scale, a 150 pound man **slowly lifting** a 50 pound weight remained at a 200 pound total through the exercise. It was quite a different story when he was asked to rapidly jerk the weight up and down through the exercise. For part of the exercise, the total weight read well under 200 lbs., and for some periods it reached over 400 pounds! It's easy to see how we can hurt ourselves when a weight is moved rapidly.

On the contrary when a weight is moved very slowly, it becomes difficult to injure ourselves. For example, place your hands on a wall and very slowly push until you are pushing as hard as you can. If you push slowly you can push as hard as you can and you won't hurt yourself! Now imagine backing up and slamming into the wall in an effort to move it. This could easily hurt the strongest person!

Why is one movement dangerous and the other isn't? It's the same amount of weight, the wall hasn't changed. It's the way we try to move the weight that can make it dangerous.

Should I avoid strengthening exercise when I am recovering from an injury?

The medical community encourages patients to start moving soon after many injuries and medical procedures. Research has found that this significantly enhances the healing process.

The right exercises can dramatically speed the recovery process and reduce the chance of re-injury. As the muscles around the injured area are strengthened and blood flow to the area is increased, the affected area will be stimulated and strengthened, expediting the healing process.

Once your doctor has ok'd exercise we can design an exercise program that will work around an injury and strengthen the muscles in that area.

Whenever possible, exercise should be maintained before surgery for as long as possible, to minimize muscle loss that will occur during an inactive post operative recovery period

Should I do a lot of repetitions for endurance?

The purpose of strengthening exercise is to increase strength. Lowering the weight and doing more repetitions only slows muscle strengthening and at best provides a mediocre endurance exercise.

Are free weights a better workout for the muscles? Will they increase muscle and strength faster?

Actually it is just the opposite. We use the MedX equipment, the most advanced equipment in the world, and it provides dramatic improvements over free weights.

Although free weights can be an effective strengthening tool, it is physically impossible for any free weight exercise to work a muscle through its full range of motion. Free weight exercises only work a portion of each muscle and require more time to accomplish less.

Free weights are straight-line movements rather than rotational movements that follow the body's natural circular movement; as a result they are tough on the joints and have a high incidence of injury.

Free weights can be effective but they are an old technology, require more time, tougher on the joints and simply can't stimulate the entire muscle.

If we do a lot of cardiovascular exercise doesn't it increase our leg strength?

Cardiovascular exercise **does not** increase muscle strength beyond minor changes that occur when a totally sedentary person begins to exercise. Many people are surprised to know that even world-class marathon runners often have very weak legs, unless they have been doing strengthening exercises.

Do I need to do 3 sets of each exercise?

This is a mistaken belief that has been passed on for years. The point of any strengthening exercise is to completely tire the muscle out, with continuous work, over a short period of time (60 to 90 seconds). When we do this, the brain gets the message from the muscle, that it was unable to do the work it was asked to do. The brain then tells the body to increase the strength in that muscle group so that it is stronger and "better prepared next time!"

Once this message is sent to the body, further sets of the same exercise are counter-productive and can actually interfere with the body's strengthening process.

Our MedX circuit program uses one set at a higher effort level, which is always much more productive than three sets, and requires one third of the time. The less time spent the more likely we are to keep it up for the rest of our lives!!

— MIKE ARTEAGA

All Sport Owner & Founder; Health and Fitness Consultant

Strengthening Exercise

Who should, How and Why?

STRENGTHENING WILL KEEP YOUR MUSCLES YOUNG.

These are CAT scans showing the cross sections of thighs. The white is the bone, gray is muscle, and the dark grey is fat.



This is the thigh of an inactive 55 year-old woman. Lots of fat and little muscle.



This is the thigh of an active 63 year-old woman who does strengthening exercise.

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