Benefits of weight training

- Increases lean muscle mass, which in turn boosts the body’s metabolic rate, which is one of the ways to a leaner body.
- Increases bone mineral density, which can decrease osteoporosis.
- Increases overall body strength, which can improve balance and reduce the chance on injury.
- Improves overall mood and sense of well being.
- Improves body image and self confidence.
- Improves sleep and energy levels.
- Improves many health issues such as, diabetes, hypertension (blood pressure), high cholesterol levels, etc.

Different phases of effects on the body when referring to the alarm phase, the adaptation phase, and the exhaust phase (overtraining or stale phase)

Alarm Phase
During the alarm phase the body says, “What the heck is this!??” This occurs when you begin a new training program. During this phase:

- Soreness is usually the greatest.
- Movements and exercises can be awkward.
- Tolerance to that “burning sensation” in your muscles is low.

Adaptation Phase
During the adaptation phase, the body begins to recognize the repeated stress that it is being subjected to from your exercise program. At this time:
- Your body becomes stronger and more efficient.
- Movements become smoother
- Soreness decreases
- Lactate threshold increases (increased tolerance to that “burning sensation”).

**Exhaust Phase**

There are two reasons why the body may enter an exhaust phase. First, the body may become so familiar with the stress that it no longer needs to improve. This occurs when your program has grown stale, therefore halting your progress. Secondly, the body may not be receiving enough time to recover and/or adapt. This is when overtraining can set in.

**Symptoms of over-training** – to name a few

- Decreased performance (strength, power, muscle endurance, cardiovascular endurance)
- Decreased training tolerance and increased recovery requirements
- Chronic fatigue
- Sleep and eating disorders
- Menstrual disruptions
- Headaches, gastrointestinal distress
- Chronic muscle soreness and damage
- Increased resting heart rate
- Decreased self-esteem
- Decreased ability to concentrate

If you feel any of these symptoms on a regular basis, take a week off before resuming your training. However, the best prevention is to avoid over-training all together.

Structure your program to have easy, medium, and hard workouts that rotate either daily, weekly, monthly, etc to constantly stay between the alarm phase and adaptation phase. This way you won’t get stale and you’ll avoid over-training.

An exercise program should have some consistency so your body can adapt, but have enough variety to keep it guessing a little bit. Then, completely change your program after 8-12 weeks, depending on goals, individualism, training background, etc.
**Exercises taught:**

Although the exercises listed below train other muscle groups as well, the targeted muscle to be trained categorizes the specific exercises.

For example: Db chest press works your chest, front deltid, and triceps primarily. But the targeted muscle to be trained in this example is the chest. Therefore Db chest press falls under the “chest” category.

Note: The list below is by no means in any proper order; it is just a “menu” of exercises.

Db= dumbbell   BB =barbell

**Chest:** db chest press, db fly, BB bench press, chest press machine, pec dec machine

**Back:** db bent over row, lat pull down, seated cable row, row machine, assisted pull ups

**Deltoids (shoulders):** db shoulder press, db lateral raise, shoulder press machine, rear delt machine (same as pec dec machine)

**Legs:** Angled leg press, Leg press machine, lunges, and split squats (for hamstrings, quadriceps, and glutes); Leg extension (quadriceps); Seated leg curl and single-leg standing leg curl (hamstrings), Romanian Deadlifts (aka RDL’s, for hamstrings, glutes, low back)

**Calves:** Calf raises on Angled leg press, seated calf raise

**Biceps:** standing BB curl, seated (or standing) db alternate curl, cable curl

**Triceps:** db overhead extension, tricep press down, db kickback, assisted dips
Definitions of muscle adaptations via resistance training

**Muscular Endurance** - The ability of the muscle to perform repetitive contractions over a prolonged period of time.

**Muscle Strength** - The ability of the muscle to generate the maximum amount of force, usually in the form of one repetition.

**Muscle Hypertrophy** – Increase in muscle cell/fiber size (girth)

**Muscle Hyperplasia** – Increase in muscle cell/fiber number – can happen to certain animals, but has not been fully shown to take place in humans. However, fat cells can increase in number when current fat cells become full. Watch that diet!

### Rep ranges & Rest Intervals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Repetitions</th>
<th>Rest Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength</td>
<td>1-6</td>
<td>3-5 min.</td>
</tr>
<tr>
<td>Hypertrophy</td>
<td>8-12</td>
<td>1-3 min.</td>
</tr>
<tr>
<td>Endurance</td>
<td>15+</td>
<td>&lt; 1 min.</td>
</tr>
</tbody>
</table>

This is a very general chart. Goals can be somewhat blended within different rep ranges. For example: One can still gain strength in a hypertrophy range, and one can still gain size (hypertrophy) in the lower end of endurance training, and so on.

No matter what range you are working in or the goal you have mind in, **intensity** is the key to success!

**Difference between strength and power**: - The first thing to remember is that everything is power. In other words, “strength” is a form of power. Power is basically a continuum. See below.
**Power Continuum**

“Slow Power” ←--------------------------------------------→“Fast Power”

Again, everything is power- it just depends on where your training falls on this continuum that determines if you’re doing what some would call “strength training” - (where the weight is very heavy and therefore moving very slowly), or if you’re training for “explosive power”, (where the weight is lighter and therefore can be moved very quickly if desired). It is okay to use the terms “strength” and “power”, as long as you understand that it’s all power, it’s just the speed that can be changed along with the weight for a desired effect.

**Training Myths**

**Myth #1:** You can burn fat off a certain area of your body by doing specific exercises for that area. In other words, you can spot reduce.

**False** – The body loses body fat off different spots and different rates. You cannot do an exercise for a certain body part, and subsequently burn fat off that specific area.

**Myth #2:** Females will achieve abnormally large muscle development (extreme muscularity), if they lift too hard and or heavy.

**False** – Females do not have the hormone levels to get extremely large muscles. So unless they have superior genetics, years of training and diet experience, and take anabolic steroids, they will not achieve extreme muscularity. This photo below is an example of a woman with fantastic genetics, who has spent much time and effort (both in the gym and the kitchen), and has taken a variety of performance-enhancing drugs. (The same also goes for males as far as development, but they usually have a little more muscle mass than females to begin with).
Females should workout hard with intensity if they want to “tone up”, because the more muscle they have on their bodies, the lower the body fat percentage. Remember, muscle is metabolically active. The more you have, the higher your metabolism will be, and the leaner you can become.

**Myth #3:** When doing cardio, staying in the “fat burning zone” is best for losing body fat.

**False** – It *is* true that at a lower intensity - aka the fat burning zone - the body can use stored fat for energy (because oxygen is present). However, it is possible that not enough calories are burned in order to lose weight. Also, higher intensity cardio increases EPOC (exercise-post oxygen consumption), which means you’ll burn more fat after the cardio session.

Now, not everyone is capable of doing high intensity cardio, so some individuals may need to start out easy. But just like weights, intensity always trumps easy workouts.
Benefits of Aerobic Exercise

Decreased Resting Heart Rate
With aerobic training the heart muscle becomes stronger and therefore does not have to work as hard to pump a given amount of blood.

Decreased Submaximal Heart Rate
With aerobic training the heart becomes stronger and therefore does not have to work as hard to pump blood at a given work load.

Increased Stroke Volume
Stroke volume is the amount of blood ejected by the heart in one heartbeat. Because the heart muscle has become stronger with aerobic training, it can eject more blood per heartbeat.

Increased Hemoglobin
Hemoglobin is the body’s oxygen-carrying component, located within red blood cells. The more hemoglobin available, the more oxygen-carrying capacity the body has. Aerobic training results in an increased amount of hemoglobin, so a person can continue aerobic exercise for a longer period of time.

Increased Capillary Number within Muscles
An increased number of capillaries helps facilitate the exchange of oxygen and waste products in and out of the body’s muscle cells.

Increased High Density Lipoproteins (HDL’s)
HDLs can help carry damaging cholesterol away from the body’s arteries, returning it to the liver for resynthesis. Since aerobic training results in an increased number of HDLs in the body, the exerciser has less circulating cholesterol and subsequently less risk for cardiovascular disease.

Decreased Blood Pressure
A person’s blood pressure is a measure of how forcefully the blood flows through his or her arteries. This pressure is determined by a person’s heart rate (an increase in heart rate will increase blood pressure), stroke volume (an increase in the amount of blood ejected per beat will increase blood pressure), and the arteries’ resistance to blood flow (if blood must pass through a narrower vessel, the blood pressure increases). Aerobic training can reduce a person’s heart rate, increase stroke volume, and reduce the arteries’ resistance to blood flow. The overall effect is a reduction in blood pressure.

More on cardio:  The best time to do your cardio (if you are going to weight train in the same workout) is AFTER you do your weights. For three good reasons:

- Weights require much greater mental focus and a “fresh nervous system” to properly execute a complex movement. Where during cardio you can more easily space out.
• If you do your cardio first, you will be burning up some glycogen (stored carbohydrates). And since your body can pretty much only use glycogen for fuel during weights, if you did cardio first, and therefore enter your weight training session already somewhat depleted, the workout will not be very efficient.

• Similar to above, if you do your weights first, and burn up much of your glycogen stores, you’ll have less carbs available for your cardio, and therefore have to burn more fat!

THE “FIT” PRINCIPLE

<table>
<thead>
<tr>
<th>F.I.T.</th>
<th>F = frequency</th>
<th>I = intensity</th>
<th>T = time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength Training</td>
<td>Minimum 2x a week is recommended</td>
<td>Refers to who much weight is being lifted</td>
<td>Variable</td>
</tr>
<tr>
<td>Cardio/Aerobic Training</td>
<td>Minimum 3x a week is recommended</td>
<td>Refers to using either Heart Rate % or a RPE scale</td>
<td>Duration of session - at least 20 minutes is recommended if not more</td>
</tr>
<tr>
<td>Flexibility Training</td>
<td>Minimum 2x a week is recommended</td>
<td>Hold each stretch for a minimum of 10 seconds. Should be semi – uncomfortable, but w/o pain</td>
<td>Variable</td>
</tr>
</tbody>
</table>

The “FIT” Principle describes the three factors included in any training program. “F” = “frequency,” “I” = “intensity,” and “T” = “time.” Cardiovascular exercise, muscular strength and endurance exercise, and flexibility exercise differ regarding their requirements for each of the “FIT” components.

**Frequency** Refers to the number of workout performances each week.

*Muscular Strength/Muscular Endurance (Strength Training)*

Muscular strength and muscular endurance exercise should be performed at least twice per week to continue improvements. Although, 3-4 sessions of a properly structured program will yield greater results.

*Cardiovascular/Aerobic Exercise*

Cardiovascular exercise should be performed at least three times per week in order to obtain optimal health benefits. Beyond five sessions per week, few health benefits can be obtained,
while injury risk increases dramatically – Although this depends on many other factors: ones nutritional intake, sleep, training history/experience, supplementation, goals, and all three components of “FIT”.

**Flexibility**  
Flexibility training should be performed at least twice per week.

**Intensity**  
Refers to how hard the work bout is.

*Cardiovascular/Aerobic Exercise*  
Cardiovascular exercise intensity is monitored by heart rate. 60-85% of heart rate reserve is the approximate intensity range used in cardiovascular exercise. Some individuals cannot detect a heart rate when performing aerobic exercise, and/or may prefer to utilize an alternate way of gauging intensity. The Rate of Perceived Exertion (RPE) scale is a way of doing just that. During the work bout, the individual rates his/her exertion level based on a scale of 0 to 10, with 0 being no perceived work felt at all, 10 being very, very strong work perceived.

**RPE Revised Rating Scale**  
0 Nothing at All  
0.5 Very, Very Weak  
1 Very Weak  
2 Weak  
3 Moderate  
4 Somewhat Strong  
5 Strong  
6  
7 Very Strong  
8  
9  
10 Very, Very Strong  
Maximal

**Intensity cont…**  
*Muscular Strength/Muscular Endurance Intensity*  
Intensity for muscular strength and endurance conditioning is **not** dependent on heart rate. Intensity refers to the resistance, or the amount of weight lifted. Lifting heavier weights--as in STRENGTH training--is higher intensity work. Lifting lighter weights--as in MUSCULAR ENDURANCE training--is lower intensity work. (But should not mean low effort, or easy)

**Flexibility**  
Intensity for flexibility is determined by how much a muscle is stretched. Flexibility exercises are performed until the individual feels a slight stretch or pulling sensation in the muscle. The stretch is then held for at least 6-10 seconds. The exercise should **NOT** cause pain. If pain is felt, the intensity is too high--the muscle is stretched too much.
**Time** Refers to the duration of the work bout, excluding warm-up and cool-down.

**Cardiorespiratory/Aerobic Exercise**

Aerobic exercise should be performed continuously for at least 20 minutes. Recent research seems to point to the conclusion that, in order to obtain health benefits, splitting up the activity sessions can be effective, as long as the moderate-intensity physical activity totals 30 minutes throughout the day, at least 10 minutes at a time. For optimal gains, however, 20 minutes at a time is usually the minimal standard. As an individual becomes more aerobically fit, the time of the bout can and should increase.

**Muscular Strength/Muscular Endurance Exercise/Flexibility**

Time is not necessarily a factor in any of these components. As long as the entire body and all its major muscle groups receive attention, a certain amount of time is not required. Individuals who include more lifts in their program may require an hour or more per workout, while others may only require 1/2 hour per workout. Similarly, individuals who hold their stretching exercises for 30-60 seconds each will require more time per workout than those who hold their stretches for 10 seconds.

**WHAT CAN HIGH-INTENSITY INTERVAL TRAINING DO FOR YOU?**

INTERVAL TRAINING generally refers to repeated sessions of relatively brief, intermittent exercise, in which short intervals of intense exercise are separated by longer periods of recovery. Depending on the level of exertion, a single effort may last from a few seconds to several minutes, with exercise intervals separated by up to a few minutes of rest or low-intensity exercise.

High-intensity interval training is often dismissed as being only for elite athletes. However, the basic concept of alternating high-intensity and low-intensity periods of exercise can be applied to almost any level of initial fitness. In addition, interval training is often based on subjective effort and does not necessitate working out at a specific heart rate or running speed. So while intervals may mean all-out running sprints for people with high levels of fitness, intervals can mean a brisk walk for others.

**Benefits**

- High-intensity intervals are a potent training stimulus. Even though the volume of exercise is quite small, a few brief sessions of intervals can cause adaptations similar to those associated with more prolonged periods of continuous moderate-intensity exercise.
· You only need to do intervals every other day, so you have more days off. This is great news for people who are pressed for time.
· Time flies. Not only will you be able to reduce your training time, but also the actual exercise component will zip by because of the alternating periods of intensity.

Limitations
· Discomfort. Intervals are very strenuous, and your legs will feel like jelly at the end of the workout. While you don’t have to exercise at 100% intensity to see results, you will have to leave your “workout comfort zone” if you want to achieve the benefits of high intensity training.
· You will need to do an extended warm-up session if you plan on running sprints for your interval training sessions. Explosive running may increase your risk of injury compared to less weight-bearing activities such as cycling or swimming. If you run your intervals, try doing them up a hill.

The science behind interval training also helps to bury myths such as the “fat burning zone” and “it takes 30 minutes of exercise before your body begins to burn fat.” Skeptics often dismiss the fat loss potential of high-intensity exercise because the intervals are relatively short. But energy expenditure remains high during the recovery periods between exercise intervals, even though exercise intensity is dramatically reduced. To demonstrate this point, a recent study showed that only seven sessions of high-intensity interval training over two weeks increased fat burning during exercise by more than 30%.

Sample Workouts
Here’s a sample program for an absolute beginner (someone who can walk for 30 min at 3.5 mph):
· Warm up: Five minutes of walking at 3.5 mph.
· Speed up and walk at 4.0 mph for 60 seconds.
· Slow down and stroll at 3.0 mph for 75 seconds.
· Repeat steps 2 and 3 five more times.
· Finish with 5 minutes of walking at a comfortable pace to cool down.

Here’s an example of a more advanced workout for a person who is used to relatively
vigorouse exercise:
· Warm up: Five minutes of easy jogging or light cycling.
· Run or cycle for 60 seconds at about 80-90% of your all-out effort. (Assume 100% equals the speed you would run to save your life, or cycle with as high a cadence as possible at the highest possible workload setting).
· Slow down to 30% of your all-out effort for 75 seconds. (Make sure to reduce intensity to a slow pace.)
· Repeat steps 2 and 3 five more times.
· Finish with 5 minutes at 30% of your all-out effort to cool down.

As you become more experienced, you can increase the intensity of the exercise intervals. You can also use different modes of exercise to do intervals. If you like to train outdoors, you can perform hill sprints or run in waist-deep water. If you are resigned to training at a commercial gym, you can choose between the treadmill, cross-trainer, stationary bike, and even the rowing machine. It all comes down to having the ability to increase the workload for a short amount of time and then being able to back off.

COMMENT
It is unlikely that high-intensity interval training produces all of the benefits normally associated with traditional endurance training. The best approach to fitness is a varied strategy that incorporates strength, endurance and speed sessions as well as flexibility exercises and proper nutrition. But for people who are pressed for time, high-intensity intervals are an extremely efficient way to train. Even if you have the time, adding an interval session to your current program will likely provide new and different adaptations. The bottom line is that — provided you are able and willing (physically and mentally) to put up with the discomfort of high-intensity interval training — you can likely get away with a lower training volume and less total exercise time. And possibly burn more body fat!