

Brain and Body

Students both young and old are in school this time of year. Most of them are involved in full days of educational activities. In the past, some of my college students have made the comment that each teacher thinks his or her particular subject is the most important. I feel that way about the fitness classes I teach. And I hope that my students learn to appreciate and commit to exercise activity for the rest of their lives.

There is a trend in the US educational system of cutting back in physical education classes. PE requirements are being eliminated at every educational level in many areas of the country, with many classes offered only as electives or not at all. The reasons for these cutbacks include the budget, the academic priorities, and an attitude that these classes are just unnecessary in the school setting.

I think this is so very ironic in a time when the Surgeon General promotes the statement that lack of physical activity can be hazardous to your health. The very lengthy Surgeon General's Report issued several years ago detailed how important exercise is for everybody. However, you only have to sit and watch people in any public place to realize that America is getting more and more out of shape and unhealthy. Yet the educational system is trying to minimize the availability of it.

Perhaps the powers in administration have forgotten or not considered that being healthy and fit affects mental and intellectual abilities. Research studies have demonstrated that the cognitive skills improve when school children participate in 1 hour a day of vigorous physical exercise. This means that their math scores are higher. The stress reduction benefits of exercise helps individuals be more productive in less time. People who exercise get better grades!!!

Another way that regular exercise helps people is that they may avoid chronic diseases and live longer. That means that they get to use their brain and the knowledge in it for more years! And they can keep on learning well into old age.

One unique benefit to teaching fitness classes is that I have the privilege of affecting the "whole person." Through my sessions, I can help my students tap the physical, mental/emotional, intellectual, social, occupational, and spiritual/innermost self:

1. Most obvious is the physical improvements of fitness. Enough said.
2. Physical movement affects the mental/emotional part of a person when they succeed and see the improvements physical training causes. The self-esteem and confidence level goes very high.
3. I tap into the intellectual part of my students because I teach them about exercise science in the course of the semester. They learn basic anatomy and movement principles, and become very educated in the science of movement.
4. Fitness classes are very social in their structure. The students interact and form friendships during the semester. Some of the exercise sessions involve teamwork and interaction.
5. Fitness can influence the occupational part of the students' lives in several ways. Some people work in jobs that place stress on parts of their bodies. By exercising and strengthening weak areas, job related injuries might be avoided. Another way to influence the occupational aspect of fitness is the fact that this industry is one of the fastest growing career choices. After a positive exposure to fitness, some students choose it as their passion and life's work.
6. Not all exercise is hard and vigorous. Mind/body fitness is pleasant, quiet and reflective, using movement techniques that are meditative. During this experience, many students tap into the spiritual/innermost part of themselves and grow in this direction.

What a large accomplishment within one subject: health and fitness. I have the opportunity to affect all parts of my students. Does math affect the whole person? Perhaps, but it's a stretch. I do appreciate the need for academic classes in education, but without sacrificing something so important and crucial as the students' health. The educational system is one of the most powerful influences in the lives of students and therefore should encourage "Whole Person Knowledge."

If you are a parent with children in public school, request physical education requirements and support exercise activity. Encourage your children to focus on physical play before TV or computer time. Encourage teens to express themselves with exercise: dancing, playing sports, biking, skating, or whatever activity helps them get fit.

If you are a college student, take advantage of the fitness courses offered and try to fit one into each semester. Look at your schedule and use study and lunch breaks for short, brisk walks or stretching. Start or end your day with a short bout of exercise. School has started and it promises to be a great year for learning. Remember to make the most of your life by including physical EDUCATION also.

Warm-up/Cool-Down

During the years I have been a fitness instructor and personal trainer, I've noticed the tendency in many exercisers to skip two very important parts of a workout. Some students race into a fitness class 5 to 10 minutes late and begin with the "serious exercise," and/or they grab their gear right after the aerobic section and race out, their hearts still pounding. The solitary exerciser often minimizes the time spent on the warm-up and cool-down when not under the watchful eye of his or her personal trainer.

"Serious exercise" starts with a warm-up and ends with a cool-down. The first step in helping students and clients to include warm-ups and cool-downs in their workouts is educating them about the benefits:

1. Warming up raises the temperature of the body. For each degree of temperature elevation, the metabolic rate of the cells increases by about 13 percent.
2. The blood supply to the muscles increases, permitting a greater release of oxygen to feed them.
3. The speed and force of muscle contractions improve, along with a faster nerve impulse transmission.
4. Warming up helps prevent injuries. Muscle elasticity and the flexibility of the tendons and ligaments are increased. Synovial fluid, which lubricates the joints, is released during easy activity.
5. Heart function is improved and ready for the increased demand of intense exercise.

Warm-up activities are movement activities. Stretching is not a warm-up exercise because it does not raise the body temperature. In fact, an exerciser can tear cold muscles by stretching them.

To warm-up, use large movements at an easy pace to heat the entire body. Gradually increase the intensity. Some examples of warm-up are slow jogging or walking, easy biking, slow jump roping, and slow aerobic dance patterns. If you are warming up for a sport, do the movements for the sport but at a slow pace. This will produce a rehearsal effect and your muscles will remember the movement and respond faster during the sports play.

The warm-up should produce light perspiration. When this occurs, you can do some light pre-exercise stretching. However, deep stretching should be performed after the workout is over.

After heavy exercise it is time to taper off with a good cool-down, which is just as important as the warm-up.

1. Respiration, body temperature, and heart rate are gradually returned to normal, preventing an irregular heart beat that may be life threatening.
2. The cool-down assists the return of blood to your heart. Suddenly stopping aerobic activity causes blood to pool in the legs instead of circulating to the brain. This can cause dizziness or light-headedness.
3. Skeletal muscles are shielded from injured by gentle stretching.
4. Cool-downs relax you emotionally and physically.
5. Your flexibility is increased.

There are two parts to a complete cool-down. The first follows the cardiovascular exercise and allows the heart to return to 120 beats per minute or less. Activities for this resemble warm-up activities - large movements at a slow pace.

The second part of cooling down is the stretching. This increases flexibility and range of motion, and allows you to relax. Static stretching is recommended. Stretch the muscle until it feels tight, not painful, and hold it for about 30 seconds. Never bounce the stretch.

After stretching, many exercisers use progressive relaxation and deep breathing to enhance the feeling of well-being. This activity helps return the body to normal function.

Besides education, how can fitness instructors increase the number of students who include the warm-up and cool-down in their fitness routines?

1. Use a heart rate monitor or monitor the pulse manually every 60 seconds to demonstrate to the student how the heart rate gradually increases during the warm-up.
2. Make the warm-up fun and interesting.
Group exercise: Use great music.
Teach "new" steps slowly - to warm up and whet the interest for the faster version
Play warm-up games - to acquaint the participants with each other
One-to-one: Teach your clients to view the warm-up as an opportunity to set small goals about what they will accomplish during the workout
Use equipment and "toys" - play catch, easy kick a soccer ball

3. Regularly assess your students' and clients' flexibility to demonstrate the improvements in stretching ability.

The Fitness Triangle

This article discusses basic exercise principles so that you can succeed at your fitness goals. I offer you a balanced view of fitness that can be thought of as a Fitness Triangle. This is a triangle with three equal sides of equal importance, and the very important center area of the triangle.

At the base of the triangle, its foundation is cardiovascular fitness. The heart is the most active muscle in the body, which we absolutely cannot do without. As you know, the type of exercise that conditions the heart is called "aerobic." The exact kind of aerobic exercise you do is up to you. Individual aerobic activity could be walking, running, cycling, skating, or anything that you can do for an extended period of time (20 minutes or more). Group aerobic classes involve movement to music that raises the heart rate to the training zone, such as high or low impact aerobics or step training.

How can I emphasize the importance of finding an activity that is fun and you will love doing? Some people enjoy the social aspects or the student/teacher relationship that group classes offer. Others love competition and play sports that give them cardiovascular training. Many people just like individual activities that do not depend on scheduling around other people.

If you are just starting a program consider activities that you have thought, "That looks like fun!" Go for it! Start with that activity. If you decide that it doesn't really suit you, try another activity. I personally get jazzed about variety and try to offer it to my students. Sometimes the group aerobics is a mix of low or higher impact and step. Sometimes we get very "Sport Specific." Not all my cardiovascular classes are high intensity. I love to use one class a week for rhythm exercise and teach a variety of dance and movement disciplines: Country/western, Salsa and Latin, African, jazz, etc. This gives the more expressive students a chance to move with feeling. So take the challenge, consider all your options and TRY SOMETHING!

Work at a pace that suits you. Fit people are going to work harder at a higher intensity than beginners. Sedentary or new exercisers who commit and stick to a regular activity program will see results faster than an elite athlete who is working toward improvement because as people get closer to their genetic potential the rate of change slows down.

The second side of the Fitness Triangle is strength. Resistance training produces muscular endurance and strength. Strong muscles allow you to do the activities you love with increased energy and ease.

Strength training promotes independent living as a person ages. It is great for improving posture and is a key factor in changing your body composition and aiding fat loss. Adding two short, well-planned weight training sessions to your activities each week can produce pleasant results in your fitness level. Most people strength train on various forms of equipment, either in a health club or gym or at home. Most weight training is thought of as a solitary activity, but group strength training classes are a social option in many facilities. Group strength training classes allow for many fitness levels to exercise together at the same time. Each person selects the size weights that he or she needs. The instructor will also show modifications of the exercises to allow for different skill levels.

The third side of the Fitness Triangle, flexibility, is probably the most neglected part of a fitness program. Exercisers seldom schedule 10 minutes of stretching into their activities. Even instructors often get swept away with the fun of the aerobic or strength training sessions and seem to give stretching a token nod at the end of class. As a reminder, flexibility is just as important to your fitness as the strength and cardiovascular training. Endurance exercise is improved by flexibility training because it allows more freedom of movement and the ability to change directions more easily. Posture is also improved with proper stretching as tight muscles loosen up and the body becomes more relaxed.

This Fitness Triangle complements the creation of a realistic, healthy body composition. A good activity schedule will help the body lose fat and gain lean, energetic muscle.

Remember, there is no right or wrong activity, just a wide variety that allows for true individual selection. The time has never been better to start a fitness program. So find your favorite activities, schedule the time to do them, and commit to your goals!

Flexible Fitness

There is an aspect of exercise that helps increase endurance.

There is an aspect of exercise that helps increase strength.

There is an aspect of exercise that helps improve posture.

There is an aspect of exercise that helps prevent injury.

There is an aspect of exercise that helps reduce stress.

This aspect of exercise is the most often neglected. It is flexibility training or stretching. People rush to do their cardiovascular or strength training, and then rush on to other activities of living. During fitness and aerobic classes up to 1/2 of the students leave before the flexibility training.

Flexibility is the range of motion that is possible around a joint. Range of motion is affected by age, gender, physical activity, muscle temperature and individual physical structure. For many years the primary focus of fitness programs has been cardiovascular and strength training. However, flexibility is a very important part of a total fitness program. The benefits of flexibility training are becoming more apparent with current research. Flexibility classes are growing in popularity because the educated exerciser realizes that stretching is an important complement to aerobics and muscle conditioning.

Endurance exercise is improved by flexibility training because it allows more freedom of movement. Group Fitness classes require frequent changes of movement direction, which a flexible person is more capable of performing. Increased flexibility aids in reducing the impact shock of the foot landing on the floor. Tight calf muscles often limit the foot flexion needed in typical movements. Current research studies support the theory that an increase in flexibility contributes to better endurance performance and therefore the exerciser experiences better results.

Strength or resistance training is achieved with optimal muscle contraction. When one muscle contracts the opposing muscle must relax and stretch. Flexibility training will allow more efficient relaxation and lengthening of that opposing muscle and therefore the contracting muscle will obtain greater strength gains.

Posture is greatly affected by flexibility. For example, inadequate shoulder flexibility causes rounded shoulders and poor posture. Improper alignment and posture happens muscles are too short to stabilize the body in stationary positions and during movement, and when the mobility of muscles is hampered from a full range of motion. Posture depends on the length of the muscle.

The incidence of injury due to strenuous exercise may be related to inflexible muscles. A sudden stretch can cause an injury in tight muscles. Good flexibility of the low back and hamstrings may be important in the treatment and prevention of low back pain. Inflexibility is also related to the degree of muscle soreness following exercise.

Flexibility training promotes physical and mental relaxation and therefore aids with stress reduction. The full, deep breaths that accompany stretching slow some physiological responses such as heart rate and blood pressure.

Are you flexible? Unequal flexibility on the right and left sides of the body will cause the stronger side to compensate for the weaker and predispose the body to injury. An easy way to determine if you are imbalanced in your flexibility is by observing how your body contacts a hard surface when lying on your back, sitting in a chair, and standing barefoot. Observe if each side of your body's weight is distributed equally against the supporting surface. If one side presses heavier than the other side, you probably have flexibility imbalances. Look at yourself in mirror. Are your hips, knees, shoulders and hands even? Both sides of your body should be symmetrical and face forward.

Some other flexibility "norms" are: Can you reach past your toes when sitting with your legs extended straight. While lying on your back with legs straight, can you raise one up to 90% or more? While lying on your stomach, how high can you lift torso with the support of your hands?

Stretching is most effective if performed safely. Static stretching involves holding a non-moving stretch in a position that places the muscles at the greatest possible length without pain and then holding the stretch for 30-60 seconds. This low-force long-duration flexibility training produces good results with little soreness.

Ballistic stretching involves bouncing the stretch and is not recommended. Rapid bouncing stretches cause the stretch reflex that produces a vigorous contraction of the stretched muscles. This is the opposite of what is desired, and can lead to injury. Stretches can be performed passively or actively. In a passive stretch an external force is applied to the muscle to cause the stretch. Active stretches use the body's own movement to cause the stretch.

Muscles stretch best when pre-warmed, such as after aerobic training. Long-term elongation is optimal when the stretching is done while the muscles cool. Individual stretch exercises should begin with gentle range motion movement and gradually become a full static stretch. Body stabilization, alignment, and the use of abdominal muscles for support will enhance flexibility gains. Individuals vary greatly in natural flexibility and their response to training. There are a variety of positions to stretch muscles. Choose the one that best fits your flexibility level. Remember, the fittest exercisers make flexibility training a regular part of their exercise routines.

Weight Training Basics

People of all ages who begin an exercise program usually include some form of resistance training in their routine. Lifting weights has lost its "Muscle Beach" image and is established as a mainstream fitness activity.

Resistance training improves two basic fitness components: muscular strength and muscular endurance. Muscular strength is the maximal amount of force a muscle can generate. Muscular endurance is the ability to sustain repeated muscle contractions. For the most effective improvement in muscular endurance, strength training and aerobic activity are necessary. Strength training produces many benefits:

1. It increases muscle mass, bone mass and the strength of the connective tissue, helping to prevent injuries.
2. It increases the metabolic rate since muscle tissue is active and requires calories for energy.
3. It improves physical ability and athletic performance.
4. It improves self-confidence.

One of the most desirable results from resistance training is the change in body composition. Exercise programs that are called Body sculpting or Body Building reflect the fact that weight training changes the shape of the body. It has been well established by numerous studies, including one I did myself several years ago, that the most successful long-term weight loss programs include resistance training. Aerobic activity does burn calories, but does nothing to increase the amount of lean body tissue. Strength or resistance training is a high calorie-burning activity and since muscle tissue burns energy even at rest, more calories are used by a body that has an increase of lean tissue (muscle).

Individuals who are just beginning their fitness programs may wonder how to include resistance training in the most effective way. The American College of Sports Medicine has set minimum recommendations for strength programs:

- Frequency - Minimum of twice per week
- Sets - Minimum of one per muscle group
- Repetitions - 8-12 repetitions per set

Frequency is the number of times the training routine is performed each week. In studies, different groups of people who trained 2, 3, or 4 days per week all made excellent strength gains. For the new exerciser, 20 minutes of strength training exercises 2 days a week will improve muscular fitness.

The term "sets" refers to lifting a resistance a certain number of times before resting. Strength improvements can be made with 1, 2, 3, or more sets. The number of sets performed for each exercise is a personal preference. People with strict time limitations can train with single sets of each exercise and see improvements in muscle strength.

Repetitions are the number of times you lift a weight in each set. This depends on the amount of resistance used. The amount of weight lifted should be heavy enough to produce fatigue in the muscle by the last few repetitions. In general, 12 repetitions in each set will give good results.

As you go through your strength routine, work the large muscle groups, such as the chest and back, first, then work the smaller muscles, such as the biceps.

The speed that you move the resistance is very important. Strength training should be done with carefully controlled movements to prevent injury. You will see faster and better results if you lift the weight slowly in both directions. It is true that fast movements permit the use of heavier resistance, but because of the principle of momentum, fast moves require less muscular effort. So it's better to put your "poundage ego" in a drawer and aim for quality lifting speed.

Rest is part of your resistance-training program. If you are doing 2 or more sets of each exercise, rest long enough to feel recovered, but move quickly enough between sets to sustain some intensity. Rest from resistance exercise at least one day between workouts to allow sufficient recovery. Remember that resistance training is very productive and motivating, but overdoing it can lead to injuries.

Resistance machine exercises are best for beginners. They keep the body stable during the movement, allowing more controlled motion. They are effective, easy to use and safer than free weights.

Free weights are effective, but require more instruction and practice to get the technique correct. Balance is critical when lifting free weights. The skills developed can be applied to daily work tasks and sports specific actions.

Whether you choose to use machines or free weights, lift through the entire range of motion. With your breathing, exhale during the active motion and inhale when returning to the starting position.

Your goal should be a gradual progression in your program. Seriously consider using a qualified fitness instructor or personal trainer to help you plan your program and teach you proper techniques. Your enjoyment of exercise will increase and you will see great results!

Why Weight?

Weight Training - Resistance Training - Strength Training

Whatever you call the anaerobic exercise that builds muscle strength and endurance; it is a key component in a balanced fitness program. This fact is known and acknowledged by a growing number of exercisers, but some are still resistant to the idea of resistance training. There are even some "aerobics" instructors who do not see the need to include serious resistance exercises in their classes.

I think weight training should be viewed as the foundation for teaching the body to move, which is kinesthetic learning. A positive, informed approach to weight training teaches the exerciser basic movement principles that can be applied to other exercise forms. For the instructor, knowledge about weight training includes learning anatomy, kinesiology, and exercise science, all of which is critical to effective teaching.

I realize that I may be "preaching to the choir," but I am going to review the benefits of weight training and dispel a few misconceptions, and perhaps some who read this article will become believers.

Weight training can contribute to physical, mental, social, emotional, and spiritual development, affecting the "whole person."

- **Physical:** Lifetime activity including weight training will help maintain fitness levels, improve body composition, and strengthen the body, protecting it from injury during activity (even normal, every day activity)
- **Mental:** As a person learns how to weight train he or she is also learning fitness design and the proper way to plan a workout routine and schedule. Also much is learned about anatomy, muscle function, and exercise science.
- **Social:** Weight training can be a solitary activity or one can exercise with a partner or friends. Fitness is a positive activity to include in relationships.
- **Emotional:** Weight training helps relieve stress, frustration, and anger. Pumping iron helps use up the hormones produced from a hard day at work. The person's self esteem increases as the body gains strength and fitness, contributing to positive emotional stability and self-image.
- **Spiritual:** Exercise helps a person become more resilient, find an inner calm and accept the situations life presents.

Since weight training is primarily a physical activity, the contributions to physical development include:

- **Increases in muscle, tendon, ligament, and bone strength**
- **Increases in muscle size and density**
- **Increases in muscle tone**
- **Improved appearance**
- **Improved posture**
- **Increases in flexibility**
- **Increases in the body's metabolism**
- **Improved joint stability**
- **Increased muscle endurance**
- **Increased power**

There are a number of misconceptions about weight training that warrant further discussion of the benefits of weight training.

"Weight training doesn't help develop overall fitness"

Weight training is an important part of overall fitness. Cardiovascular and flexibility must be trained, too. It is desirable and possible to develop a training program that will include all aspects of overall fitness.

"Muscle turns to fat when a person stops training and I don't want that to happen, so I won't even start weight training."

Muscle tissue and fat cells are two different tissues. One does NOT become the other. When weight training is stopped, the muscles will atrophy (shrink) and due to a decreased metabolism or increased calorie consumption, fat cells will multiply. This results in a body composition ratio that is to the individuals disadvantage; he or she gains fat.

"Weight training will make me muscle-bound"

Properly designed programs will increase the joint range of motion and flexibility because opposing muscle groups will be worked through full extension and flexion. Inactive and imbalanced programs decrease mobility. The answer: Find an instructor who is qualified to design a sensible program and teach you proper training techniques.

"Weight training is unhealthy for my heart"

Weight training can increase the size and strength of the heart, making it healthier.

"Weight training is too stressful on my joints."

Proper form and technique will not stress joints; it will strengthen them. Exercises should be performed in a controlled and smooth manner, with proper posture and stabilization. A good instructor will always stress proper posture, stabilization, and movement speed during the exercise.

"If I lift weights, I could get a hernia."

The risk is small IF the proper technique is learned and used. Correct training involves proper breathing, exhaling on the exertion, and correct lifting mechanics. Respecting the amount of weight you can safely lift is also important. Good instructors insist that their clients rely on proper form and technique rather than just trying to lift very heavy weights.

"Weight training takes too much time"

Weight training can produce effective results in as little as 15-20 minute sessions done 2-3 times a week. Resistance athletes train much harder and longer, but it isn't necessary for the average exerciser.

"Weight training will make a woman look like a man."

Weight training will shape a woman's muscles while retaining the female shape. Very few women have the genetics or hormones to build huge muscles. Even those who do have to workout very hard to build that amount of muscle. The hormonal balance is what causes the secondary sex characteristics, not exercise.

"Weight training will help me spot-reduce."

Spot reduction for fat loss is a fallacy. Fat is burned from the entire body, not just one area. However, muscle tone can occur to individual muscles, which will show when there is no excess body fat covering them. Weight training raises the metabolism and helps fat loss because toned muscles burn energy all the time, even at rest. A good method of losing body fat combines weight training, aerobic exercise, and good eating habits.

"Weight training will hamper my athletic performance"

Weight training will improve athletic performance. Muscle contractions that are strong will increase speed and power. Look at the records being broken this year in baseball. Those athletes train with weights!

"If I lift weights, I will become more uncoordinated."

In the long run, weight training should improve coordination. There is some neuromuscular adjustment to an increase in strength, which can affect athletes. However, athletes do their hard weight training in the off-season and do a maintenance program during competition, which allows for peak performance and timing.

"The sports I play provide all the muscle conditioning I need"

Sport activities seldom provide a balance in the frequency, intensity, and time needed to produce fitness changes. Weight training produces faster results and helps prepare the body to participate in sports. Many personal trainers specialize in helping both professional and recreational athletes condition themselves for both fitness and the sports they play.

"I am too old for weight training"

Healthy people of any age can benefit from an individualized weight training program. Research shows that gains in strength and muscle mass can occur at any age.

"Weight training is a waste of time and energy"

Weight training can add years to your life and give you more energy than ever before.

Now that I have converted the nonbelievers to the beliefs of weight training, what should they do? Find a qualified personal trainer or instructor who can teach you the best techniques of weight training and get you started on a simple program. Take the time to really learn the techniques that will give you the best results in the safest way, and then stick to your new exercise habit!

The believers in weight training, who do it regularly, should evaluate the quality of their program design, making sure it is balanced and safe. Constantly seek to improve your form and technique, not just increasing the amount of weight you lift.

Fitness professionals have probably heard most of the misconceptions before. Think of ways that you can help counter these myths and benefit more people. Evaluate your own techniques and teaching methods, placing safety and effectiveness ahead of complicated routines. If you are one of those instructors who only gives a token nod to adding weight training in an aerobic class, increase your knowledge about weight training design and start offering your students a complete exercise experience!

Cardiovascular Fitness

Today's modern technology has produced an increase in chronic conditions related to the lack of physical activity. These conditions include hypertension, heart disease, low back pain, and obesity. These diseases are termed hypokinetic diseases; "hypo" meaning low or little, and "kinetic" meaning motion.

The cardio respiratory system functions in a cyclical pattern. Oxygen is taken into the lungs where it is picked up by the blood and pumped through the heart, which sends it into the body organs and tissues. Individual cells extract the oxygen from the blood and use it to convert energy for their functions.

Cardiovascular fitness occurs not only in the heart itself, but also at the cellular level, increasing the cells' capacities to use the provided oxygen. Aerobic exercise uses oxygen to supply energy to the cells, and thus conditions them in a sense. Aerobic exercise benefits participants in the following ways:

1. **Higher maximal oxygen uptake.** The amount of oxygen the body can use during activity increases, producing greater duration and less fatigue during exercise.
2. **Increase in the oxygen carrying capacity** of the heart as the red blood cell count increases.
3. **Decrease in the resting heart rate/Increase in the cardiac muscle strength.** The heart produces more forceful contractions, which causes more blood to be pumped with each beat.
4. **Lower heart rates at given workloads** causes a greater efficiency in the cardio respiratory system.
5. **Increase in the number and size of mitochondria** produces a greater potential to provide energy for muscular work.
6. **Increased number of functional capillaries** means more gas exchange is possible with a delayed onset of fatigue during exercise.
7. **Faster recovery time after exercise.**
8. **Lower blood pressure and blood lipids** decreases the risk of coronary heart disease and stroke.
9. **Increases in the fat-burning enzymes** will increase the ability to lose body fat.

Many people participate in various forms of cardiovascular exercise. Some of these routines are effective and some could use improvement. In order to receive all of the benefits aerobic exercise can provide, it's important to understand how to make the most of an exercise routine.

An exerciser, or an instructor who teaches exercisers, wants to know three things:

1. **Where is the exerciser at now (starting point)**
2. **Where does the exerciser want to go (fitness goal)**
3. **How will the exerciser get there (successful changes)**

To determine where the exerciser is starting from an easy fitness assessment can be performed. There are many "fitness tests" that can be performed for cardio respiratory fitness. After performing the fitness assessment, the exerciser can decide how much improvement he or she wants to make, which is the fitness goal. Then an exercise routine is set up that will help the exerciser reach that goal. After several weeks of performing the routine, the fitness assessment is repeated to see if the goal has been reached, which is the successful change!

The easiest cardio respiratory fitness assessment that I know of is to measure a one-mile "track" then see how fast the exerciser can walk (or run) it. After the walk or run is completed, you can measure the heart rate for one minute. Record both the one-minute heart rate and the time it took to walk or run the course. Determine how many fewer heartbeats the exerciser would like to strive for (3-5 is a realistic goal) or how much faster the exerciser would like to walk or run. Plan a regular workout schedule that keeps the exerciser working at his or her target heart rate. Then after several weeks of regular exercise, repeat the one-mile walk or run and record the scores, noting the improvement.

As a reminder, here is an equation for calculating the target heart rate for the exercise sessions:

Maximum Heart Rate (220 - your age) x Percent of Intensity desired (60 - 85%) x 1.15 = Target Heart Rate

These same assessment and program ideas can be applied to any activity you participate in. As I said, there are many fitness assessments and program designs that can be used.

MOVE YOUR FEET - DON'T NEED A SEAT

- Walk, don't ride. Take the stairs instead of the elevator or escalator to burn approximately 1 calorie per 5 stairs.
- Stand more often - Got a desk job? Stand 5 minutes every 1/2 - 1 hour of sitting.
- Deliver messages in person - get up from your desk and walk to your co-worker's desk instead of using the phone or e-mail.
- Walk for lunch. Eat an easy, fast lunch, and then hit the streets.
- Walk the shopping mall. Do this low cost, safe energetic form of window-shopping for 30 minutes regularly.
- Park at the far end of the parking lot and walk briskly to the store.
- At least once a week, take a peaceful walk in pleasant surroundings. It's a positive way to relieve stress.

CALORIE BURNING & EXERCISE

Many people use cardiovascular exercise equipment to burn calories. A question they often have is "What type of exercise equipment burns the most calories?"

Infomercials and ads for exercise machines make claims of exceptional calorie burning. Are these claims all true?

At rest the body uses energy to maintain the functions of all body cells. Energy demanding functions form the basal metabolic rate, which varies from person to person, roughly 800 to 1500 calories daily. Exercise adds to the energy the body uses. Research conducted in the past 10 years demonstrates that an exercise increase in caloric expenditure is mostly from the contraction of skeletal muscle (body movements of the arms or legs).

The body uses oxygen and produces carbon dioxide during calorie consumption. Most of the nutrient sources for movement are from carbohydrate and fat. The amount of carbohydrate and fat used during energy metabolism can be measured from the respiratory exchange ratio of carbon dioxide to oxygen consumption. The best measure of a change in metabolism during exercise is oxygen consumption. This can be determined by a formula based on the heart rate during exercise.

To burn more calories during exercise, a person must increase the oxygen consumption. Many exercise machines are sold on the basis that they will burn more calories than other kinds of equipment. When different types of equipment is tested keeping the heart rate at the same intensity on each piece of equipment, the results are somewhat different than many equipment manufacturers would have you believe.

In comparisons of equipment using 1) upper body only, 2) lower body only, and 3) upper and lower body combined, the lower body only equipment produces a higher oxygen consumption, therefore a greater calorie expenditure, than the upper and lower combined equipment and the upper body only equipment.

With upper and lower body combined exercise, blood cannot be pumped fast enough to adequately spread through both the lower and upper body muscles. The smaller muscle mass in the upper body causes a slower return flow of blood to the heart than large muscles do, and upper body exercise increases blood pressure because of greater resistance to blood flow. The result is that maximal oxygen consumption is somewhat lower for combined upper and lower body combined exercise than for lower body exercise alone.

The key to a lifetime of health and fitness benefits from regular cardiovascular exercise is to find activities that are enjoyable and will be done on a regular basis.

FAT CELLS

Fat cells. Millions of them make up your body fat. Each fat cell is a spherical sac filled with a droplet of oil. The size of your fat cells is relative to the balance of calorie intake and output. (What you eat vs. your activity level)

A high fat diet supplies fat cells with what is needed to grow bigger. Fat molecules are absorbed from the blood stream and stored in fat cells.

To reduce the amount of fat stored in the fat cells, it must be released into the blood and used as fuel. Regular exercise and a moderate to low fat diet help to trigger the release of stored fat. Regular exercise stimulates fat metabolism and teaches your body how to be an efficient fat burner rather than a fat storer.

INCURABLE?

Cellulite has no cure. Cellulite is made up of individual pockets of fat cells separated by fibrous bands. Exercise can help draw a little fat out of each pocket, but cellulite will not melt away as promised by the advertisements for creams, rollers, and other gadgets.

KEYS TO FAT BURNING DURING EXERCISE

1. Increase cardio respiratory fitness
2. Increase the amount of active muscle mass
3. Prolong the duration of cardiovascular exercise
4. Exercise at a heart rate intensity that is challenging but maintainable
5. There are genetic factors that determine the fuel utilization during exercise (choose your parents wisely!)
6. Older exercisers may need to work at a lower intensity and prolong the duration to maximize calorie consumption.

THE TRUTH ABOUT ABDOMINAL SHAPE & FUNCTION

One of the main activities that can be seen at any gym or health club is people doing countless amounts of sit-ups and crunches. They believe this will give them the “model look” washboard abs; they have all taken this myth as the truth, the myth that these exercises will give them this look. The reason a person does not have “shredded” abs, or a “six-pack” is because of the fat covering those muscles (oh yes, they are there, everyone has them) and sit-ups do not burn fat, they work the muscle. Often working out these muscles to extremes causes the stomach to look even bigger. The best way to stay lean and get rid of the fat layer covering your beautiful abs is to get plenty of fat burning cardiovascular exercise and eat slightly less calories than you actually use.

So, if diet and fat burning exercise is the key to showing off the “six-pack”, why should we develop our abdominal muscles, some may ask. The answer is function. Without developing these muscles your whole body can be weakened. They are a very important part of doing any movement with your body. Without them, you would not even be able to stand up! In the end, everyone wants to have well developed abs they can show off. So, work out the muscles, eat a lean, low fat diet, and get out there and make yourself sweat.

NAFC/BodyBasics, Inc. 2003

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