



Is Your Exercise Routine Killing You?

Current research in exercise and how to use it for your
best results



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Why This Booklet is Important for Everyone

There is no question that movement is a key ingredient in good health and with good health we can be more productive and get more out of our lives.

Specific movement, such as exercise has many beneficial effects. Exercise affects our hormones, brain transmitters, chemical messengers, our immune system, and so much more. This should not be surprising because we are designed to move. It is only because of the nature of our sedentary society that we have to put aside time to "move around."

When we put aside time for exercise and it is not a natural outgrowth of our life, like hunting or farming might be, there is the question as to what we should do and how we should do it.

One natural method is to play. Children play tag; adults may play basketball or soccer, racquetball, swim and so forth. These are all excellent sources of movement because they get us moving in a fun way.

When we do something which is basically unnatural, that is, when we move for the purpose of being healthy, the question arises as to how to do it for the best outcome. If we are playing a sport or doing manual work, we are enjoying or producing and the movement is a byproduct. With "exercise" the movement itself is the product.

With anything there are three potential types of outcomes. The time you spend can be helpful, neutral or harmful.

You will see in the coming pages that unfortunately, the way many people exercise has been proven to be quite harmful.

Pages 2-6 give some of the science behind exercise and your body.
Pages 7-17 review some studies and history to explain how things have become so misunderstood and how damaging many people's exercise routines really are. Pages 18-20 offer some alternatives which are based on current research.

I hope you enjoy what follows!

What Exactly is Exercise?

There are three parts to the definition of exercise. First, exercise is defined as the exertion of the body using muscles. Secondly, during this time, exercise causes the body to work harder than it normally would. Finally, with this type of strenuous movement, there promises to be a later benefit.

To understand more about exercise, let's start with some important ideas about our bodies. Our bodies are designed to be able to change and adapt depending on our circumstances. For example, within our bodies, we make a chemical which carries messages from one part to another. This is called a hormone. We make these chemical hormones automatically depending on the needs we have at a given time. Some hormones are needed in greater numbers if our body is under stress. If our body sees that there are not enough of these stress hormones available to meet our needs, it will make more. When the amount of the hormone becomes sufficient to do the job it will slow down production. This is one way we adapt and change depending on our needs. In the same way, if we get too hot our body will begin to sweat to cool itself off. When we get cool enough, the sweating stops.

Have you ever had a time when you did something, like raking leaves, and found the next day that you had some blisters on your fingers? This is an external example of the same adapting ability of the body. If you hadn't done much work like raking for a long time, the skin on your fingers likely became soft. After a day of raking, your skin begins to wear down from the rubbing of the rake handle on your fingers. Your skin doesn't know if this raking is something you're now going to be doing on a regular basis or not. Just in case this is something you are going to want to do again, it begins to replace the soft skin with a harder or rougher type that begins with the formation of a blister. Continue raking for days and soon you will have tough skin or calluses formed on your fingers in response to the raking. This is one way that your body adapts.

When doing exercise in a way such that you perform an activity more strenuously than you normally would, the muscles involved are agitated. If a muscle is repeatedly asked to do more than it is capable of, just like your skin with the raking, it must adapt. It will break down the ineffective relatively weak muscle fibers and rebuild with stronger muscle in its place. **The replacing of weak muscle fibers with stronger muscle fibers is an adaptation. This adaptation is one of the benefits of exercise that we look for.**

This change through adaptation requires energy. During this strenuous activity we call exercise, our body breaks down sugars and fats (we hope) and protein in order to release energy. This is the energy which fuels our exercise. This is similar to the burning down of a tree - as the tree burns there is tremendous heat given off as energy. This breakdown and release of energy is called catabolism or **catabolic activity**.

After exercise, what should happen is a rebuilding of the muscle. New stronger muscle will replace that which was used. Muscle in the arms and legs and heart get stronger and oxygen delivery improves to these areas. The rebuilding is called **anabolic activity**. This also takes energy to do. Unfortunately, for the tree it does not work in this way. There is no new, stronger tree rising up from the ashes to replace the burnt tree.

A full exercise cycle should consider both phases, the tearing down during the activity itself, the catabolic phase, and the rebuilding that happens afterwards, the anabolic phase.

Nerves and Exercise

What is the nervous system?

Our nervous system includes the brain and all the wiring that brings messages back and forth between all parts of the body. It is divided into two parts. One part is called the **voluntary nervous** system. When you decide to go for a run on the treadmill, you put your hands up on the sides and begin moving your legs quickly. Or, maybe you decide to do a bicep curl, lifting weights for a while. The movement of your arms and legs is handled by your voluntary nervous system. You decide to do it and go ahead and act within your capabilities. Your voluntary nervous system is the wiring which is under your control and depends on the decisions you make.

The second part is called the **autonomic** nervous system. For the most part, this system deals with activities in the body that we do not control consciously or voluntarily. This includes, among many other actions, the digestion of food, waste elimination, and blood pressure. It also includes the activity of certain hormones. The body reactions that take place when you are under stress or begin to panic are also controlled by your autonomic nervous system. This also includes many of the reactions that take place

during exercise. So, when deciding to exercise much of the activity of exercise is under the domain of the voluntary nervous system, however, the autonomic system also has a huge influence. In fact, much of the benefit derived from exercise is more closely related to the autonomic nervous system.

Let's say, you make the conscious decision to go for a run. Your voluntary nervous system is activated first as you go to change your clothes and put on your running shoes. It is in charge of the movement of your legs, moving them more quickly as you decide to run faster. However, the body adaptations that control blood flow, temperature and breathing during this exercise are controlled by your autonomic nervous system. Both systems are working together here,

Let's look more now at the autonomic nervous system. Within the autonomic system there are two divisions. These tend to act opposite of each other. The first part is called the **sympathetic nervous system**. This is also known as the "fight or flight" response system. When there is a need for the body to run away or fight, or a person begins to exercise, the sympathetic nervous system has to get into gear. It directs blood to the muscles and brain. Heart rate and blood pressure increase appropriately, breathing changes and the pupils in our eyes widen, along with many other adaptations. We get ready to fight or run. It is a catabolic system which breaks things down in order to provide energy for the upcoming activity. When this system is working, it is not appropriate to sit down to a meal. It is the time to move, because that is the part of the nervous system that is activated.

The other part of the autonomic nervous system is called the **parasympathetic nervous system**. This system is involved with healing, regenerating and rebuilding the body. Blood pressure can drop to normal and our heart rate can relax. Its nerves stimulate digestion, the immune system and elimination. Certain hormones are also stimulated here. It is the anabolic system which builds things up, replacing what was torn down by the catabolic sympathetic nervous system cycle during exercise. This is for the time after exercise. When *this* system is working, it is *not* appropriate to exercise. This is for the time after exercise. It is a time to rest, sit down for a meal if hungry, or relax and enjoy ourselves. It is when our bodies can do the work of replacing the fibers that were broken down during the exercise. It is the time to do the *rebuilding work* of making stronger muscle in its place.

There is now a test called "heart rate variability" which measures the function of your autonomic nervous system. Exercise done properly should help you **realign** in this test. We do this test in our office

Two Types of Exercise

There are two popular forms of exercise that people do. One is commonly called aerobic exercise and includes activities such as running, swimming, biking, aerobic exercise classes, etc. These are all activities designed to increase heart rate to some moderate level to improve our heart function, burn calories and increase our overall health. They are commonly done with moderate exertion (heart rate 115-130 beats per minute) over moderate to long periods of time (usually 15-45 minutes). Many people do these daily or try to at least do them four to five times per week. The other is called **resistance training**. This is most often done with weights, where there is some form of resistance (the weights) which are pushed or pulled repetitively to improve muscle strength.

Another division people talk about is aerobic as opposed to anaerobic exercise. Aerobic means with oxygen and refers to the way the body burns fuel internally to give it energy- it uses oxygen in the process. Anaerobic means without oxygen and refers to the body finding alternative energy for fuel, usually because the demands being put on it are too great for the oxygen aerobic system to meet.

All types of exercise can be with or without oxygen depending on the intensity with which they are done. Light resistance training where the exerciser is using three pounds of weight and swinging them gently around would use oxygen and be aerobic. Doing a set of bicep curls with the maximum weight possible working to the point of exhaustion would require the anaerobic or without oxygen system, particularly towards the end of the set of curls.

Similarly, running a long slow run, as a long distance runner might, would utilize the aerobic system primarily. A sprinter going all out over a short distance would primarily use the anaerobic system to get energy. Some runners will alternate sprinting and jogging in an effort to gain the benefits of both aerobic and anaerobic systems.

Surprising News about Aerobic Exercise and Life Span

Before getting into the specific individual indicators about the benefits of one type of exercise over another, there is a sobering study that should be addressed.

Besides improving quality of life and health, exercise proponents like to talk about a longer, healthier life for those who exercise. While some studies show that people who exercise get sick less and may have a longer life span (possibly) we still have our old underlying question. Are the people who get sick less and have the constitution for longer life also the people who tend to exercise? Which is the cause and which is the effect?

While it is impossible to do studies on people that conclusively prove the point about the life span benefits of exercise, there have been interesting animal studies done. The one summarized below was reported in 2001.

A special strain of rats was used for this study. These were rats that were bred for their likelihood to run on an exercise wheel when given the opportunity. In other words, these were gym rats, exercise lovers to the maximum degree.

These animals were divided into two groups. One group was given free access to run on the wheel whenever they wanted while the other had no wheel running opportunities. Maybe they just stayed at home and played on their computer, who knows? Let's see what happened.

Unfortunately, contrary to what we might like to think, the rats that did the exercise had a *shorter* life span than those who did nothing. Part of the cause seems to be due to a chemical stress imbalance (oxidative stress) brought on by the exercise. When fed antioxidants, the exercise fanatics lived a bit longer, although still not as long as those that did nothing.

Now, this was done with controlled diets and rats who exercised voluntarily. What would have happened if the rats didn't want to exercise but only did it because they were told they should, that it was good for them? Imagine spending all the time running on the wheel and daydreaming about playing with friends or being home watching television.

Excessive exercise, even voluntarily done, left the rats with a shorter life span than those who sat around and did nothing.

Do Studies Show Exercise to be Beneficial?

It is good to hear what some people have to say about their exercise, but what do actual studies show? There is something to be said for being content with oneself, but is there actually any real measurable benefit being derived?

In the book, *Malignant Medical Myths* by Joel Kauffman, PH.D, there is a wonderful review of studies regarding exercise and other health measurements. One of the problems with most of these studies is that the type of exercise being done is not well controlled. People may say they are doing strenuous exercise, but what does that mean to them? Many of the studies, as Dr. Kauffman points out rely heavily on questionnaires. This is a big problem since we know that people want to be positive about things they spend a lot of time doing. For instance, a person who spends many hours running or at the gym is likely to speak fondly of his results and what he did. If he didn't, why would the person spend all this time doing it?

Those studies which actually do measure indicators from a variety of heart disease factors to death rate surprisingly do not show what most people assume. They do not show that more is better and that those who exercise more or smarter actually have any real benefit to speak of besides their own endorsement of their activity.

In one example, he also points out how we must be aware of media excerpts giving half truths. A University of Colorado group study showed that a group of men who did strenuous exercise had less large artery stiffness than those who didn't. That makes a good headline and is true. However, what doesn't show up in this headline is the following: this same group had less pumping ability in their hearts and they were more likely candidates for congestive heart failure. Yes, this was the group who did more exercise!

So, Is Exercise Beneficial?

There are many reasons people may choose to exercise. Whether exercise really benefits anyone physically is an interesting question. Many people who exercise regularly will tell you that they couldn't live well without it. It makes them feel good, young, strong, happy and so forth. Others will tell you it's the key to their health and well being. Yet others feel no outward benefit, but continue with the hope that it is helping them somehow to be healthier.

An early study in England in 1953 showed that transit conductors who had an active job, helping people and moving around constantly during the day had less heart disease than the drivers who sat and drove. Surely, activity level had a positive effect on their hearts. However, three years later, doing more investigating, it was found that the people who tended to choose the conductor job had better health than those who chose to be drivers. The question is found over and over again in these types of studies. Does activity and exercise make one healthy or do healthy people tend to choose more activity and exercise?

A second problem with exercise studies is that there are many types of exercise and many variables within the exercises themselves. Some of the studies use questionnaires about the type of exercise done. One person may consider the type of exercise they did as strenuous while another may not. Also, many studies are retrospective, that is, requiring a person to remember how much they did and how hard they did it.

To really know if exercise is beneficial and which type is best, it is important to have controlled studies with accurate measures. Over the last number of years, researchers have found ways to measure benefits and control for the type of exercise that is done. With these studies we can find not only if exercise is beneficial, but which type works best.

Where did the Confusion Begin?

The year was 1968. It was before cell phones, fax machines or home computers. There were no video stores. Obesity had not yet hit America in a major way. The number one killer was heart disease and no one had an answer why. It was the time of the Vietnam War, the assassination of Martin Luther King Jr., and the election of Richard Nixon as President. It was also the year that the book, "Aerobics" was written by Dr. Kenneth Cooper.

According to Dr. Cooper, a key to health was improving the maximum amount of oxygen a person could process while exercising. He called this method aerobic exercise. He thought that doing aerobic exercise would strengthen the heart so that people wouldn't get heart disease and possibly reverse it for those who already had it. In 1968, this was an unproved idea.

Cooper initially found that the more his subjects exercised the more oxygen they could process while exercising. He saw some positive changes with blood pressure also. He then created a point system, allowing a certain number of points for running, swimming, bicycling, etc. at various distances. People got excited and took to exercising like never before. Prior to Cooper, going to a gym usually meant you were a boxer going to a boxing club. Few people, if any could be seen jogging down the street and virtually no one had home equipment. Now, thanks to Dr. Cooper, people began counting their exercise points, trying to get above the magic number of 30 that Cooper had established. People felt they could have some control over their health by exercising. Those who exercised to a level less than 30 points probably lost a little weight and felt somewhat better. Those who did more probably also did a bit better still. It seemed the more exercise, the better the results.

However, over the years new ways of measuring health revealed some surprising results.

Moderate Aerobics Leads to Heart Problems

As you remember from before there are two basic types of exercise, resistance training (such as lifting weights) and aerobic exercise (such as running, biking, etc.). There has been common thought that aerobic running is a key factor in items such as how well you are able to use oxygen and overall heart strength. This is supported by the observation that runners, bikers, and the like are able to sustain long slow activity over long amounts of time, sometimes measured in hours. Resistance training is more often thought to be the domain of those trying to be and look stronger, either for cosmetic reasons or for the sake of performing activities that require additional strength.

A study done in March of 2002 measured results in people who did aerobic activity three times per week for forty minutes as a time - an amount similar to what many do regularly on treadmills or jogging down the street. With this kind of workout, certain measures got better, such as work capacity and muscle endurance. However, when it came to heart health the news was horrifying. In these same people, two measurements were done for their heart health. First, the measurement of V_{O_2} was done. This is a test to see how well they are able to use oxygen. In the heart itself there are two basic divisions. The upper division (atrium) receives blood and squeezes it down to the lower division. The lower division (ventricle) then pumps the blood either to the lungs or out to the rest of the body depending on the side of the heart involved. **For these athletes, both the measure of how well they used oxygen and the strength of their ventricles pumping decreased. Certainly, this devastating result was not expected.**

Resistance Exercise Lessens the Damage of Aerobics

In a second group of similar athletes, the workout was changed so that the aerobic exercise was cut in half and the rest of the time the workout was comprised of weight or resistance training. In this group the follow up measurements showed an increase in oxygen use and heart pumping as well as greater work capacity and muscle endurance than in the first group. **A total improvement was shown over the first group by doing less aerobics and more resistance training.**

Aerobics Causes Heart Problems Even With Well-Trained Athletes

While it seems that aerobics has many devastating effects on the body perhaps that is due to the poor conditioning of the people doing them. Maybe it is a case where aerobics are often done by those in less than optimal shape and the poor results are more about the people than an indictment of the activity itself.

However, this does not seem to be the case as a March 2005 study reported. In the study, competitive endurance athletes were measured after four hours of cycling. This obviously was done with those in good shape, because those who were not in good shape could not perform this activity for that length of time. One heart measurement is called diastolic filling. What this means is that after the lower chambers of the heart pump out the blood they receive to the rest of the body and the lungs, they then have to be refilled by the upper chambers. When this filling doesn't happen there is dysfunction and negative effects on the heart and circulation overall. The athletes in this study showed a lack of diastolic filling even after 24 hours of rest. **The next day, their hearts had not recovered from this aerobic workout!** (And how many would unknowingly go out and workout again the next day?) Further, the ones with the highest ability to uptake oxygen (the best conditioned) had the highest level of heart damage measured with echocardiographic findings.

Another study in July 2004, showed similar heart damage with highly trained triathletes during a triathlon. These athletes also showed an increase of creatine kinase and cardiac troponin, both of which are chemicals that show up in the blood when there is heart muscle damage.

Is it safe to do aerobics when you get in great shape? Apparently not!

Aerobics Can Create a Heart Failure Type Imbalance

Whatever exercise one does, there is always the question of exercise danger, particularly as people age. It seems logical that taking it easy and doing exercise slowly and building strength gradually is the safe route to take. Wouldn't hard fast intense training where one pushes their body to the limit bring potential harm, particularly to the heart? Shouldn't people be wary of doing too much too quickly?

To answer this we need to look at how muscles fatigue. While there have been many theories as to why muscles fatigue (lactic acid buildup was always a popular one) the truth is that no one knows for sure. It isn't lactic acid buildup, but the exact reason is unknown at this time.

A 1998 study does shed some light on this issue. It looks at chemical availability in fatiguing muscle. It turns out that high intensity exercise is limited by one mechanism of fatigue while long, slower aerobic exercise is affected by another.

In muscles undergoing short high intensity exercise the muscle fatigue is brought on by limitations in the exchange between sodium and potassium at the level of the muscle membrane. In low intensity aerobic type exercise, the limiting factor is the calcium and magnesium exchange in the muscle membrane. These are two entirely different mechanisms.

Where this gets very interesting is when looking at muscle fatigue in heart failure patients. They show the same imbalance of calcium and magnesium as seen in the long duration slow exercisers. **So, the same imbalance seen in aerobic type workouts is the one seen in heart failure patients.**

Couple this with the other studies mentioned elsewhere in this book and it seems clearer all the time that it is the long slow aerobic type exercise that presents the danger, particularly when it comes to heart health.

High Intensity Workouts Improve Heart Function

"Don't push that too hard, you might have a heart attack" is a familiar calling for people regarding their heart health. Reports of people dying of heart attacks while running or shoveling snow add to this concern. The conventional wisdom is to take it slow and easy for your heart's sake. Even emotions get involved in this as people are cautioned not to get too upset lest they become a victim of their fragile heart.

While there is something to this for people who already have some type of heart disease and for those who are unconditioned to exercising their hearts properly, it is not the whole story. There are doubtless other factors, such as body nutrition that go into these heart failures. Certainly proper nutrition for heart health is essential to fuel all activities that we do. Additionally, exercising the heart properly to prepare for the unexpected ups and downs of life is also necessary.

Aerobic exercise can be done lightly with a brisk walk, moderately with a steady jog or swim or intensely by pushing oneself toward exhaustion. Now with the intense aerobic exercise it is obviously not possible to sustain this for too long. If one thinks they can do intense exercise for a long period of time, well, they just aren't doing it intensely enough.

A study done in June of 2004 (with patients who have heart disease) defined training to be high intensity where the person uses oxygen at 90% of capacity. Moderate was defined as oxygen use at 50-60%. Accordingly, the more intense the exercise, the greater the oxygen use. The results were that high intensity training provided over two and a half times improvement in heart function as moderate intensity.

People who are not in good heart shape and are deficient nutritionally may have problems with shoveling snow or dealing with sudden stress. However, this study shows that there is a way to improve heart function with intense exercise.

Short Intensity Training Gives Big Results For the Weekend Warrior Including Potential Weight Loss

The group of people who are somewhere between couch potatoes (no exercise) and serious athletes (those who train regularly) includes a great number of adults. Whether it be those who run once in a while, play a little tennis or basketball when time permits or go for a semi-regular swim, these people enjoy being active, but usually don't get into "serious" shape.

In 2005 a study was done with this group using a very small amount of intense training. Over 14 days, they trained six or seven times. Each session consisted of between four and seven all out sprints with rests in between. For this program there was therefore about 15 minutes of exercise in two weeks.

Before going into results, we need to understand a little bit about how sugar is used by the body. The main energy source in the body comes from sugar. The body needs to make the sugar into a form it can use and this is called glucose. If there is too much glucose at any given time in the blood, the body needs to store it away in the cells until it is needed. This is essential, because if it doesn't store it away, glucose levels get too high in the blood and this will have deadly effects. This is what happens in diabetes. If things are working properly it is stored as fat. When the body needs some of it back, it goes into the cell, breaks the fat down and sugar is released back into the blood. This keeps the blood sugar level balanced and ready for instant energy.

The carrier that brings the sugar from the blood into the cell is known as insulin. There is a fairly common condition, related to diabetes, where insulin goes to knock on the cell door but the cell won't allow the insulin to bring the sugar inside. This is called insulin resistance. The problems with this are many as high blood sugar levels are associated with many diseases, including diabetes.

In the exercise group mentioned above, after just the fourteen day trial, blood levels showed two important findings. First, there was increased muscle oxidative potential which is associated with improved use of insulin. Secondly, there was increased fat usage. Just think, what more could be better for weight loss?? Better use of insulin is essential, because if insulin is not used effectively, the body will keep sending more and more insulin into the blood. It does this with the hope that all this excess insulin will help move the sugar into the cell. Instead of one insulin knocking at the cell door, maybe ten can knock the door down to get sugar inside. However, with this additional insulin roaming around the blood, newly eaten food is more likely to be stored as fat instead of being used for energy. Add to that the increased breakdown of fat and this workout becomes a powerful one-two punch for weight loss.

What about performance? Endurance capacity doubled in just two weeks. Weight loss and increased stamina came with short term interval training!

Great Results Can Happen Quickly with Correct Training Even If You Have Not Been Doing Anything Lately

There are a number of things that are hoped to be gained, besides cosmetic effects in an exercise program. People hope to feel stronger, increase stamina, and lose unwanted pounds. For those who are not in any kind of exercise program the question is how long it will take to start noticing some benefits. There are many ways to measure benefits and as scientific technology has improved over the years it has become possible to measure many important factors.

A study in 1998 worked with a group of untrained men over a period of seven weeks, a relatively short time to see results with people who have not been working out. Imagine a group of "couch potatoes" suddenly being given the command to workout. Over these seven weeks they worked out a total of three times per week, so the total number of workouts totaled 21. Lastly, they were only allowed to workout for 30 seconds at a time before resting 2 to 4 minutes. If added up, the total amount of workout time was likely less than 2 hours in seven weeks!

Measurements at the end of seven weeks showed amazing results with such minimal time spent in workouts. Significant increases were seen in peak power output and oxygen usage, both factors that show increases in strength and stamina. Chemically, metabolism improved as enzymes that help to detoxify the body and break down sugar more efficiently were also improved.

What if a more aerobic type of program had been followed? A 1996 animal experiment showed that unless there was an oxygen lack at the muscle level (as happens in high intensity workouts) the enzyme changes that help with metabolism were not experienced.

In summary, high intensity training provided tremendous benefits for men who had not been previously exercising in just 7 weeks-with minimal time spent.

So, Where Does That Leave Us?

We have to remember, that when aerobics became popular, it was an idea based on what was known at the time. Health measurements were limited. Now that we have sophisticated ways to measure we see the reality. Aerobics is not a healthy way to exercise. Not only isn't it healthy, it is unhealthy!

Let's look at some alternative ways to exercise, based on the updated research.

Short Burst Intervals:

This type of exercise is based on the theoretical idea of doing something/anything as fast and hard as you can for as long as you can *until* you begin to slow down.

Let's say you begin to run. You are running hard, as if a tiger was chasing you. You are running for your life! You get up to maybe fifteen miles per hour. Now, normally, you might not run that fast or sustain that for long, but given the danger of who is after you, you keep it up for one minute. Then you begin to slow to fourteen miles per hour. If you are doing strict interval training, at this point you are done. Once you slow down, it's over!

Now, it is difficult to tell exactly when that happens. So for most of us, running (or whatever) for 30-45 seconds is probably the maximum. That means after 45 seconds it is time to stop. A rest time is needed. Once you are rested you can do a second 45 second sprint. Theoretically, this assumes that you can do the second as fast as you did the first. And you continue this again. You go through a sprint and rest cycle until you can no longer reach the maximum you did the first time.

Sound confusing? It's really not, but it isn't easy to do, so here is the easier approximate method.

Since you may have limiting health problems, check what your maximum heart rate should be. You can use the method of 220 minus your age or you can look at the online chart from the American Heart Association. This will tell you any danger zone for your age—the maximum heart rate you want to keep your pulse below. Additionally, I recommend you get your personal physician to clear you for exercise.

Once that is done you can begin with the following. Find an exertion type of exercise you want to do. It can be running, climbing steps, some sort of bike—anything you want to do that can be intensely. Do it for 45 seconds as hard and fast as you can. You should not be able to speak during this and you should be physically exhausted after the 45 seconds. If not, you didn't do it hard enough. Assuming you did it hard enough you now rest for 3 minutes. If you have not caught your breath by then, wait another two minutes and repeat until you have caught your breath. You then repeat the exercise a second time, with a similar rest period as mentioned above. Repeat the sequence a third time.

This is how you do intense interval exercise. You have exercised less than three minutes totally, but intensely so that you gain maximum benefit.

Resistance Training:

This is easiest understood with weight training. Do the following. Pick one exercise (and it is important to do these properly) and find your maximum weight. For example, let's say you can do one bicep curl with 100 pounds of weight (I know that's a lot—it's just to make the math easier in this example). So your maximum weight is 100. Now go to 60% of your maximum, which is 60 pounds and do one set of bicep curls with 60 pounds. How many do you do? One more than you think you possibly can! Keeping proper form, push until you do as many in this one set as you can. Then you are done with curls for the day. Pick two or three other exercises, do the same way and then go home!

When Should These Be Done?

Every other day. That means every other day is a rest day, to gain all the important benefits of rest which were explained earlier.

This Kind of Training is Not about Socializing

Many people enjoy training with others or hanging out at the gym for hours. This training is based only on health care indicators, not social considerations. That is something different for you to work out.

Like with anything else that is new...

It's hard to evaluate until you do it. And it's especially hard to accept when it is so contrary to what you may have been told for years. But we must accept the fact that with so many people exercising and "eating better" there really has been no positive change in heart health. Perhaps, this is one of the reasons.

Now, if you have a regular racquetball game or enjoy biking, etc. this is not a recommendation to stop these social activities that are enjoyable. This is about how you exercise and the effects on your health.