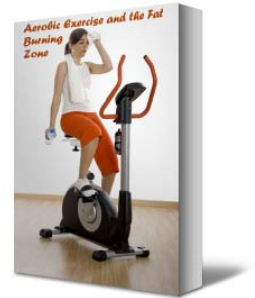


The background is a vibrant blue with abstract, glowing white and light blue lines that create a sense of motion and depth. A prominent feature is a path of small white dots that starts from the top left, curves into a loop, and then extends towards the right. Other lines radiate from the center, some appearing as bright, glowing streaks. The overall aesthetic is clean, modern, and energetic.

Aerobic Exercise And the Fat Burning Zone

AEROBIC EXERCISE AND THE FAT BURNING ZONE



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Without exception before undertaking any exercises or changes in your diet you must discuss it thoroughly with your medical practitioner. If you are unfamiliar with any exercises you must be shown the correct technique by a certified trainer. If, whilst carrying out any exercises, you feel giddy or faint you must stop immediately. If symptoms persist then request medical assistance immediately. Never undertake any form of exercise without another person being present.

The suggestions, and techniques contained in this publication do not make any claims whatsoever. If you think that any ideas or suggestions put forward in this booklet may help you to regain control of your weight you must first discuss it thoroughly with your medical practitioner before implementing any changes, in order to ensure that it is safe for you to do so.

AEROBIC EXERCISE AND THE FAT BURNING ZONE



Many people who want to lose weight or increase their stamina turn to aerobic type exercises to fulfil this need. The focus of this book is to look at first what is aerobic exercise, why is it called aerobic, how it may differ from other forms of exercise and does it work?

If you wander into gyms up and down the country you are almost certain to see at least one person on a treadmill idly passing the time of day by plodding along fairly slowly. Or they may be on an exercise bicycle, or they may be on a cross trainer but they are all very slow. Usually there is no obvious increase in their breathing rate; they may even be reading a book or magazine. They do this under the misapprehension

that they are going to lose loads of weight and become a lot fitter. They wont, they will just waste their own time.

For exercise to be effective a certain amount of effort has to be expended. But as with all things effort should be properly directed, otherwise there will be a huge waste of time and energy. The right effort in the right direction can produce wonderful results. Huge amounts of effort may achieve something but if directed inefficiently simply wastes time.

We all want the most effective result for the least amount of effort. A big effort in the right direction results in a huge achievement. A big effort misdirected will not achieve as much, if anything at all.

Aerobic Exercise and Anaerobic Exercise, What's the Difference?

Everybody has heard about aerobics or aerobic exercise, but what does it mean?

The word aerobic means **requires oxygen** and refers to how we burn food breakdown products to produce energy for the body using oxygen. The opposite of this is anaerobic which means without oxygen.

To clarify what is meant by that let's look at the method used by the body to produce energy. Without energy to power our muscles or nerves we wouldn't be able to exist.

Energy is produced from glucose that is transported into the cell. First of all it is converted to **pyruvic acid** through a series of steps that produces a small amount of energy. This is referred as anaerobic respiration as oxygen is not required.

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If **oxygen** is present and we shall see where that comes from in a minute, the pyruvic acid is oxidised to another compound called **acetyl coA** which then via a series of reactions in which a large amount of energy is released is broken down to carbon dioxide and hydrogen.

The hydrogen is moped up by the oxygen to produce water. This is a huge simplification of a very complicated process but it is just to get the basics over to you.

So if oxygen is present in the cell, then the release of energy to power the cell mechanisms is a **two fold process**. The first which occurs without oxygen is anaerobic and produces pyruvic acid. Only a small amount of energy is produced in this way.

The pyruvic acid then passes through another series of steps that releases much more energy and is converted to carbon dioxide and water. This is an efficient use of the molecule of glucose that first entered the cell. The total energy produced coming from the small anaerobic first part and then the larger aerobic part. You will notice however that the anaerobic portion of respiration comes before the aerobic portion.

When glucose is broken down for energy therefore respiration isn't anaerobic or aerobic. Both processes occur at the same time and what alters is the proportion of each that is providing energy at any one time. More about this later.

The oxygen is transported from air in our lungs via the red blood cells to all the cells of the body. Similarly the waste products of respiration, carbon dioxide and water are carried away by the blood to the lungs and are breathed out or exhaled. The speed at which oxygen is transferred from our lungs to our cells is dependant on a large number of factors, but two major ones are the rate we can breathe and the speed at which blood can travel around our body, which is dependant on our heart and circulatory system.

So what does this all mean? Well let's suppose you go for an easy walk. Because the leg muscles are now working they require more energy. Glucose enters the cell and is converted to pyruvic acid releasing small amounts of energy. The lungs and heart are providing enough oxygen to the muscle cells so the pyruvic acid enters the second or aerobic part of the system and a larger amount of energy is released to help power the muscles.

Now suppose you pick up the pace a bit. In order to keep energy production efficient then the lungs and circulatory system has to provide more oxygen to the cells to oxidise the pyruvic acid. Consequently the heart has to pump the blood around a little bit faster, the lungs have to expand a little bit more and consequently heart rate and blood pressure may rise a little.

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So far so good. OK let's speed up the walk a bit faster or climb a hill. Now the leg muscles are demanding even more energy. Again the heart rate goes up, the circulation increases; breathing becomes a bit deeper as the lungs are made to work harder. But this time not enough oxygen enters the cell to oxidise all the glucose. In other words the demand for energy has outstripped the ability of the circulation to provide enough oxygen to the muscles.

However glucose is still entering the cell and the first part of respiration the anaerobic bit is still continuing perhaps even at an increased rate. The problem is that this part produces only a small amount of energy, and the final product here is pyruvic acid.

As oxygen is in short supply this is converted not to *acetyl coA* but to **lactic acid**.

Provided this is removed quickly from the muscle and the energy produced can still power the muscles, all well and good, you can probably continue at the walking pace for quite a while.

If however you then up the pace a bit more although the anaerobic portion of respiration has increased it is very inefficient at producing energy. Don't forget you're still breathing hard and your heart is beating like a water hammer, but it still can't get enough oxygen into the cells to satisfy the muscles demand for energy from the aerobic part of energy production.

This together with the accumulation of lactic acid results in the muscles starting to fatigue, and eventually you will be forced to slow down and even stop until the lactic acid has been cleared and energy levels in the muscle cells replenished.

To compound the problem, it will not just be the leg muscles demanding more energy and therefore oxygen. Not only have they increased their work load but the muscles of the thorax and diaphragm that expand the lungs and the heart which is also a muscle, are working harder and they will also be requiring more energy and oxygen.

So you do not burn glucose aerobically or anaerobically. They are both being carried out simultaneously. What alters is the contribution each makes to the energy requirements of the cell at any one time.

But conventionally we like to split them up into aerobic and anaerobic exercise. After all you don't walk around breathing normally carrying out an aerobic activity. Then as you increase the effort and start running flat out you don't suddenly stop breathing and switch to anaerobic activity.

So that is the technical side over **but what does it all mean** to you, as a person who wants to carry out aerobic exercise to either get fitter, lose weight or both.

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Let's take a look.

For an exercise to be aerobic it usually has to satisfy the following.

- It must raise the heart rate of the individual.
- It must involve large muscle groups, usually those of the legs.
- It must be sustainable over a period of time at about the same rate, usually in the region of forty minutes.
- It usually involves a repetitive action or a series of repetitive actions.

So let's take a look at some aerobic activities.

- **Walking.**
- **Running.**
- **Rowing.**
- **Cycling.**
- **Cross training.**
- **Swimming.**
- **Aerobics exercise classes.**

All of these nicely fit into the category of aerobic exercises. They are repetitive, use lots of different muscle groups, and they can all be done at a nice steady pace raising your resting heart rate and most of the energy will be provided by the second part of the energy producing system that requires oxygen.

In reality as you have just seen, any aerobics activity can become an anaerobic activity simply by increasing the effort you put in. A slow jog can be continued almost indefinitely and is an aerobic activity.

But if we were to up the pace to a 400 metre sprint, then the aerobic part of the system would soon be unable to meet the required muscle energy demands, even though heart would be pumping fast and hard and the lungs would be pulling in huge gasps of air. The anaerobic part of the system would increase and lactic acid would soon accumulate in the muscles. This would lead to rapid muscle fatigue and the leg muscles would feel like jelly and action would soon come to a halt. In fact if lactic acid accumulates rapidly in a demanding event, or major surge of action then the lactic acid build up can cause acidosis resulting nausea, headaches, and difficult and painful gulping of air.

So the difference between aerobic exercise and anaerobic exercise is the amount of effort expended over time put in. The exercise or action may be exactly the same, but aerobic is low intensity over a long period whilst anaerobic is high intensity over a short time span.

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Aerobic or Anaerobic?

So how do you gauge if you are exercising aerobically or anaerobically?

As a good guide if whilst you are carrying out the activity you can carry out a conversation, even if your breathing rate has increased then you are carrying out aerobic exercise.

If you can hold a conversation although it is very difficult and deep breaths break it up you are starting to increase the anaerobic component of the energy production, and if you can barely answer “yes” or “no” to questions then the anaerobic energy production is in full swing and you won't be able to keep that level of effort up for very long. Don't forget one of the big distinctions between aerobic and anaerobic exercise is the length of time it can be carried out.

But for the purpose of this mini book we want to concentrate on the aerobic exercises. **The purpose of aerobic exercises is to increase the body's metabolic rate by increasing the intake of oxygen.** This then burns calories and therefore encourages weight loss and it causes the body to make adaptive changes so that you become fitter.

So for aerobic exercise pick any repetitive activity and put in enough effort but ensure that you can hold a conversation.

As a general rule aerobic exercise is generally carried out for about forty minutes excluding any warming up cooling down or stretching. Before any exercise session there should be a period of gentle exercise to warm up the muscles ready for action. This is usually about ten minutes in duration. Similarly to cool down at the end of the session which should also incorporate gentle stretches.

Summary.

- **Aerobic exercises are low intensity exercises.**
- **They involve repetitive movements and large muscle groups.**
- **They involve elevating the heart rate and increasing the body's demand for oxygen.**
- **They can be carried out for long periods of time.**
- **You should be able to talk at the same time even if it is slightly difficult.**
- **Aerobic exercises are usually carried out for about 40 minutes but if losing weight is your goal then this may be lot longer. (See later.)**

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The advantage of aerobic exercise is that they can be carried out fairly easily. The disadvantages are:

- People get very bored with them. Repetitive action over a period of time can be very time consuming and boring, so many people just give up.
- Progress can be very slow.
- Rhythmic movements over a long time period can cause repetitive overstrain to muscles, ligaments and joints.

Aerobic exercise can be split into two categories, for weight loss and fitness.

Now what follows is a bit of a generalisation and of course whilst carrying out aerobic activity you will be burning calories and getting fitter. But it is generally accepted that if your primary goal is to get fitter then your heart rate should be increased to a certain level normally considered to be about 75% of your maximum heart rate.

But if your main aim is to lose weight your heart rate should be kept at a lower level, in the region of 60% of your maximum heart rate. This rate is the famous **“fat burning zone”** and is the heart rate at which your body is supposed to burn more fat as fuel. So how do you know, which part of aerobic exercise you are concentrating on? The heart rate gives it away which means that you will need to invest in a heart rate monitor.

This consists of a strap that attaches around the chest wall which picks up the heart beat as an electrical signal and transmits the rate to a receiver usually on a machine or a watchstrap.

This makes monitoring your heart rate, that is the number of heart beats per minute, very easy. Some monitors are very complex in that they can give computer readouts of your heart rate over time, but if you are just starting out an economical standard one is all that is required.

The first thing that you must do is calculate your maximum heart rate and this is usually calculated as 220 minus your age. So if you are 25 your maximum heart rate will be in the region of 195 beats per minute. If you are 50 your maximum heart rate would be in the region of 170 beats per minute and so on. As you can see as you get older your maximum heart rate decreases.

- **20 years of age maximum heart rate= 200bpm.**
- **30 years of age maximum heart rate= 190bpm.**
- **40 years of age maximum heart rate= 180bpm.**
- **50 years of age maximum heart rate= 170bpm**
- **60 years of age maximum heart rate= 160bpm.**

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If your primary goal is to lose weight you should be exercising in the region of **60 to 65% of your maximum heart rate, the fat burning zone.**

If it is to become fitter and develop stamina you should be exercising at approximately **75 to 80% of your maximum heart rate.**

To train for fitness you should aim to keep your heart rate at the following level and try to maintain this for 30 to 40 minutes.

- **20 years of age; approximately 150 to 160bpm.**
- **30 years of age; approximately 142 to 152bpm.**
- **40 years of age; approximately 135 to 144bpm.**
- **50 years of age; approximately 127 to 136bpm.**
- **60 years of age; approximately 120 to 128bpm.**

The increase in fitness is due to the body's ability to improve or increase its delivery of oxygen to the muscle cells, and remove the by-products of water and carbon dioxide. This may be achieved by increasing the efficiency of the lungs to take in air, in an increase in the output of heart, and an increase in the ability of the blood to carry oxygen.

To exercise for weight loss it is usual to train at the lower heart rate levels.

- **20 years of age; approximately 120 to 130bpm.**
- **30 years of age; approximately 114 to 123bpm.**
- **40 years of age; approximately 108 to 117bpm.**
- **50 years of age; approximately 102 to 110bpm.**
- **60 years of age; approximately 96 to 104bpm.**

If weight loss is your primary goal then you can continue carrying out aerobic exercises at this rate for quite a long while, well in excess of forty minutes.

So far so good. To lose weight you need to keep your heart rate at a reasonable level for quite a considerable period of time. When you finish exercising your metabolism will probably stay elevated for between one and four hours afterwards, so you will still be burning a few calories even if you are doing nothing.

But is this the most efficient use of your time and effort if weight loss is your primary goal? And the answer to that is unfortunately **probably not**. In fact weight loss via aerobics is so slow that most people give up. There is a saying amongst sports and athletics trainers referring to aerobics classes and that is "Chubby aerobics instructor syndrome".

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This unfortunate saying refers to the fact that many aerobics instructors even though they may take several classes a day, several hours in total, are still chubby. So what chance have you got of losing all that weight? You may lose some but the chances are that you will give up as progress is so slow.

Many joggers and even marathon runners are chubby even though they must have put in **hours and hours and hours** of aerobic exercise to train for the event. To lose weight aerobic exercise is not the best use of your time or energy.

But do not despair if fitness and weight loss are your major goals there are other exercises you can do that will have dramatic effects on both. They will turbo charge your weight loss efforts and rapidly improve your fitness.

They are described in detail in the flagship program “**Feel Great by Losing Weight**” available from the web site of the same name, and shown at the bottom of each page.

“**Feel Great by Losing Weight**” is a fully integrated program and is a must for anybody serious about losing weight. It is packed full of vital information and covers everything you need to know about successful, sustained weight loss.

For example did you know that diets actually program your body to put on weight? Or did you know that increasing your fat intake may actually help you lose weight!?

To find out more about this exiting program go to the web site and select the *info/order* page, where you will find a full description of it, and if you like what you see do yourself a big favour and order a copy. But even if you don't want to purchase our brilliant program have a look at the website. It is full of free information and digital downloads to help you in your quest for weight loss.