This e-book has been specially created for CSX customers who have purchased a CSX Heart Rate Monitor.

We would like to help all of our customers get active, fit and healthy and the book is designed especially for you to help you get the most from your workouts and your CSX Heart Rate Monitor. The book is suitable for all fitness levels.

Please feel free to share this e-book with anyone you think would enjoy it!

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Safety – Please Read Before Exercising

IMPORTANT – Before starting any form of exercise program, consult your doctor or therapist. If at any time during your exercise you experience discomfort or pain, stop the exercise immediately and consult your doctor.

Always Warm up – Cool down and stretch before and after exercising. This will help prevent straining muscles.
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1. Introduction – Why use a Heart Rate Monitor?

I remember very clearly and fondly my first ever heart rate monitor. It was back in the late 1980s and it was very big and chunky and had just one solitary function – it displayed your current heart rate! It had no timer or stopwatch so as well as wearing the heart rate monitor you also had to wear a watch. It had no programmable or audible alarms so you had to keep looking at it to view your readings, no backlight which meant you had to wait until you passed under a street lamp to view it at night and the chest strap was so bulky and big it could probably have stopped a bullet!

Despite being such an unwieldy piece of kit, I embraced training with my new heart rate monitor and soon found that any disadvantages were completely outweighed by the advantages of being able to monitor my heart rate during exercise.

Why is a heart rate monitor such a useful, even indispensable, training tool? It’s all about accuracy.

While you could just go out for a run, bike ride or any other cardiovascular workout, and without a doubt you’d experience some benefits from doing so, knowing exactly how fast your heart is beating ensures that you are working at precisely the right level of intensity to maximise your training results. Exercising too hard or, conversely, not hard enough can reduce the effectiveness of your workouts and that means wasted effort. I don’t know about you but if I am going to spend time, effort and sweat exercising, I want to get the best results possible. Time and energy, being such a valuable and limited commodities, should be spent wisely – not flittered away on unproductive workouts!

Knowing your heart rate during exercise ensures that you train at the right level according to what you are trying to achieve. If you want to improve your baseline aerobic fitness, you need to work at your aerobic threshold whereas if you want to increase your high end aerobic fitness, you need to work at your anaerobic threshold. Both of these thresholds are individual and are best identified by your
exercising heart rate; using a heart rate monitor takes the guess work out of cardiovascular exercise prescription and makes each exercise session specific to your personal fitness needs.

Weight lifting programs, the good ones at least, are designed around specific percentages of your one repetition maximum or 1RM for short. For example, you might be instructed to perform five sets of five reps using 80-percent of your 1RM so that you develop strength and muscle mass in equal measure. While you could just hit the gym and lift any old weights, lifting a lighter load will be as ineffective as using a heavier one – in Goldilocks’ terms, 80-percent is “just right”.

The same is true of cardiovascular exercise – depending on your fitness goal, there is a level of intensity that is “just right” for ensuring you get the best results for your training efforts – usually in the least amount of time. A heart rate monitor is like being a banker who has insider trading knowledge as it ensures your efforts will always be profitable!

Heart rate monitors have come a very long way since I strapped on that early version. They are smaller, lighter, more compact, packed with many useful features and functions and some barely look like heart rate monitors at all. However, despite all of these technological advances, they still have the same core function – they measure and display how fast your heart is beating during exercise and this is powerful information that will help you not only get more from your training time, it will allow you to reach greater levels of fitness and performance.

Heart rate monitors are like having a very knowledgeable coach or trainer with you every time you exercise. They’ll make sure you are working hard enough but also tell you when to slow down, when you need to take a rest day and even tell you how much your fitness has improved. I think heart rate monitors are invaluable and once you use one, I’m sure you’ll agree!
2. Other Ways of Monitoring Exercise Intensity

While this book is all about heart rate monitors, it’s worth discussing the other methods available for monitoring exercise intensity so, if for no other reason, you can dismiss them safe in the knowledge that heart rate monitors trump them virtually every single time! In actuality, some of these methods can be used in conjunction with your heart rate monitor to really dial in your training intensity level and can also act as a handy stand in if your heart rate monitor goes on the fritz – something that is not always avoidable and is explained in chapter five. Anyway, as I was saying...

There are several methods you could use to monitor your exercise intensity level but, the main problem is, where using a heart rate monitor provides OBJECTIVE data, these other methods provide SUBJECTIVE data. While subjective data is undoubtedly valuable, it can’t be viewed as reliably or constantly accurate. In contrast, a heart rate monitor, which uses the same technology as a medical device called an electrocardiogram or ECG, simply measures and displays what your heart is doing. There is no interpretation, no ifs, buts or maybes – a heart rate monitor just tells it like it is!

However, these subjective methods are not completely without merit and their use has resulted in some amazing physical feats – the four-minute mile was broken without the aid of a heart rate monitor after all – but when it comes to pin-point accuracy, a heart rate monitor is hard to beat. By all means use some, a few, none or even all of the following subjective methods but do so at the same time as using your heart rate monitor so you have at least one accurate yardstick for your exercise performance.

Breathing pattern

When you perform aerobic exercise such as jogging, cycling or rowing, your muscles use more oxygen and produce carbon dioxide. Carbon dioxide levels are monitored by chemoreceptors in your blood vessels which send messages to your lungs via your brain to increase the speed and depth of your breathing. As you increase the
intensity of your workout, you switch from nose breathing to mouth breathing and, as exercise intensity climbs, so too does your breathing rate. This initial switch from nose to mouth breathing is an automatic response to the increased levels of carbon dioxide and the associated demand for oxygen and occurs at around 60 percent of your maximum heart rate.

However, as the observer effect frequently demonstrates, now you KNOW that your breathing should switch from nose to mouth breathing as 60 percent of your maximum heart rate, dollars to donuts that’s exactly what will not happen! I remember teaching this monitoring method to a group of students before taking them through a treadmill-based fitness test. Virtually every one of the participants modified their breathing pattern because they knew what we were trying to observe. They weren’t doing this to be difficult – it’s just that people often modify expected behaviours when being observed so the fact you KNOW how this monitoring method works means you can’t really use it!

**Appearance**

Like a bad gambler, you have an exercise “tell”. You may go red, sweat at a certain exercise intensity, develop an intense “thousand yard stare”, clench your fists or demonstrate a host of other signs that happen when you hit your training sweet spot. Once you know what your “tells” are, you can use them to monitor the intensity of your workout. This method, like breathing mentioned earlier, is a subconscious indicator of how you are feeling but now, because you are aware of it, you need to relax and just “let it happen”. However, the main issue with this monitoring method is that appearance is a very inaccurate way to assess how hard you are working and there is no way to use this information for exercise programming purposes. How laughable would it be to find that the exercise program you are following says something like “run at a speed that makes you red in the face”!

Additionally, your appearance is exactly that – YOUR appearance. It cannot be compared to anyone else’s as your physiological response to exercise is probably quite different to any other exerciser. I have some personal training clients who go red (or even pale!) at the very thought of exercise and, living in Cyprus as I do, I’m often sweating before I even set out for a workout. As for other body language “tells” – as before, now we know what we are looking for, we probably won’t see the same response. You might be able to guess roughly how hard someone is exercising by looking at them but that’s all it will be – a guess and not an especially educated one at that.
Talk test
Talking is reliant on your ability to breathe—specifically exhale. As you already know, when you exercise your breathing rate increases as your need for oxygen increases too. The faster your breathing rate, the harder it is to talk. Next time you are working out, try chatting to a friend and monitor your speech patterns. If you can tell them where you are going for your holiday, what you are going to pack, the time of your flight, who you are traveling with, what you are hoping to see and the colour of your swimsuit without pausing for breath you probably aren’t working hard enough! If, however, you are reduced to monosyllabic words and grunts, you are probably working too hard...certainly beyond your anaerobic threshold. One or two breaths per sentence would suggest that you are working aerobically and will get plenty of benefit from your workout.

Of course, like our other subjective tests, the results of a talk test will be affected by any prior knowledge of what is being observed. It’s amazing how many words you can churn out in a single breath if you really have to! However, I do believe that being able to talk freely during almost any form of exercise strongly suggests a lack of necessary intensity which is why I’m always astounded at how many people happily chat away to their friends or on the phone when they go to the gym. Mind you, that does explain why so few exercisers see any meaningful results from their workouts however I digress...

Rating of perceived exertion
Attributed to Swedish sports doctor Gunner Borg, the rating of perceived exertion scale, or RPE for short, is a method of monitoring intensity based on how you feel while exercising. Borg’s original scale runs from 6 to 20 which may seem a little odd but Borg was working with very fit athletes, cross country skiers as it happens, who on average had a resting heart rate of around 60 bpm (beats per minute) and a maximum heart rate of 200 bpm. By simply “knocking off” a zero, he devised a scale that was linked to heart rate but didn’t actually require his athletes to monitor their pulses. Instead of working at, for example 140 bpm, Borg would have his athletes exercise at level 14.
<table>
<thead>
<tr>
<th>RPE level</th>
<th>How does it feel?</th>
<th>% of MHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>At rest</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Very easy</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Moderate – can talk easily</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>More purposeful – breathing is faster</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Starting to become warm – sporadic conversation</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Challenging but sustainable for 20 minutes +</td>
<td>60</td>
</tr>
<tr>
<td>7</td>
<td>Very challenging – short sentences only</td>
<td>70</td>
</tr>
<tr>
<td>8</td>
<td>Very tough – one word answers only</td>
<td>80</td>
</tr>
<tr>
<td>9</td>
<td>Almost flat out</td>
<td>90</td>
</tr>
<tr>
<td>10</td>
<td>Absolute limit – maximum heart rate, only sustainable for a few seconds</td>
<td>100</td>
</tr>
</tbody>
</table>
When I explain this scale to my clients, I tell them that “level one is equal to being sat at home, feet up, watching TV whilst level ten is sprinting after a bus that just won’t stop” and for general exercisers I encourage them to find level five or six.

However, the main issue with RPE is that exercisers often overestimate their RPE because of increased levels of discomfort. If you are a cyclist but are currently running on a treadmill, you will probably perceive a higher level of exertion simply because you aren’t used to running and it feels unnatural. Boredom can also increase the perceived rate of exertion – if your mind is wandering and you aren’t enjoying the activity you are performing, the RPE will undoubtedly increase – not because you are working harder than normal but because you’d really rather be doing something else.

**Prior Performance**

Comparing your exercise performance today to a previous workout is good way to measure improvement and can even be used to measure your current performance. For example, say your best time for running five-miles is 40 minutes, this gives you an average mile pace of 8 minutes per mile. Using this information you can plan and prescribe future runs based on this pace. For example, you could run three miles at 7 minutes 30 seconds per mile to increase your fitness or run eight miles at 9 minutes per mile for an easy recovery or to develop basic aerobic fitness. In fact, this was the most common method of prescribing exercise intensity until the increased availability of heart rate monitors. Runners especially would head out and run at their 10 km pace or their half-marathon pace for example.

The main disadvantage with this method is that, unless you are running on a track or treadmill or have a speedometer fitted to your bike or rower, it can be very hard to judge your pace that precisely. More often than not, you only find out if you have been running faster or slower as you approach the end of your route and see how much time has elapsed. So, while prior performance is undoubtedly a good way to monitor improvements in performance, it is much less effective for monitoring exercise intensity.
Conclusion
So does this mean that subjective monitoring methods like the talk test and RPE are completely worthless – no, not exactly.

I think you can still make use of these methods but that you should always reinforce your subjective data with the objective data provided by a heart rate monitor. If, for example, running at 8 minutes per mile leads you to believe you are working at RPE 7, make a mental note of your heart rate too. That way you have double the feedback and by combining subjective and objective data you get the best of both worlds. That way, should you forget your heart rate monitor or it has a technical glitch and fails to function properly, you have a backup method that you can use.
3. How to Calculate Your Maximum Heart Rate

Cardiovascular exercise is inevitably prescribed by the heart rate training zone which is a percentage range based on your maximum heart rate. For example, to develop basic aerobic fitness, the common prescription is to exercise at 60 to 75 percent of your maximum heart rate. How do you calculate your maximum heart rate? That’s a good question and one that comes with several possible answers...

The first and arguably the most accurate way to determine your maximum heart rate is to perform a maximal heart rate test. As the name suggests this entails heading out, warming up and then increasing exercise intensity until it peaks and you can work no harder. Painful? Yes, but this somewhat low-tech method usually produces the most meaningful and accurate maximum heart rate results and only needs to be performed every few years – providing the test is performed correctly of course.

As your maximum heart rate will undoubtedly vary from one type of exercise to another it is important that your maximum heart rate test – often known as a stress test – reflects your chosen activity; runners should run, cyclists should cycle, rowers should row and so on.

Once you have chosen your preferred exercise modality, you should perform a thorough warm up to ensure you are properly prepared for what you are about to do. Once you are warm, it’s time to put the pedal to the metal so to speak.

Ideally, you should start exercising at a low level of intensity, progress to a moderate level of intensity and then finish with a sustained, flat-out sprint. This should, theoretically, result in a maximal heart rate reading. You need to note your heart rate the very second you stop exercising so that it is not given the chance to drop so it pays to have an assistant on hand to do this as you should be very fatigued and may be somewhat incapacitated. Ideally, so that muscle fatigue does not reduce exercise intensity, you should reach your maximal heart rate in five to eight minutes.
There are several formalised maximal heart rate tests that you can use such as running twice around a running track – the first lap at close to top speed and the second lap flat out, but really any maximal effort cardio activity will get the job done. If you want to know more about stress tests please see http://www.brianmac.co.uk/hrm2.htm

“Do not undertake a stress test:

- With any hint of an injury. Ensure all old injuries are fully repaired before deciding to undertake stress test
- If you have less than one year’s running experience and are sport active for less than three hours a week. It is possible you will not be fit enough to take the strain of a stress test let alone achieve a reliable result

Anyone who is overweight or over the age of 35 is advised to see their doctor before undergoing a stress test.”

Stress tests are probably the most accurate way to establish your maximum heart rate but they are not always the best option. Novice or unfit exercisers, for example, may well find the demands of a full-blown stress test too much to handle. Luckily, for those people, there are several ways to predict your maximum heart rate without any physical exertion.

It should be noted that the term PREDICTED needs to be emphasised when discussing any mathematical method for establishing maximum heart rate. These types of calculations provide a best guess and are never 100-percent accurate as there are simply too many unaccounted variables. However, for a large percentage of the exercising population, these predictions are close enough.

The most common way to calculate your maximum heart rate is called the Karvonen method...

220 – age in years = maximum heart rate

e.g. for an exercise who is 33-years old

220 – 33 = 187 bpm maximum heart rate

This calculation is based on the idea that your heart rate, at birth, is 220 beats per minute and that, theoretically, your maximum heart rate decreases by one beat per year. Simple to use and accurate for enough users that its popularity is assured, the Karvonen method is probably the most widely used method used to determine maximum heart rate, however it is not without its critics. In my own experience, I
had a 30-year old client who was comfortably able to exceed her age-adjusted maximum heart rate for several minutes at a time. For her at least, the Karvonen formula failed to deliver the goods!

Some experts have postulated that women have a higher maximum heart rate than men and should therefore use the following modified version of the Karvonen method...

226 – age in years = maximum heart rate

e.g. for a female who is 45-years old

226 – 45 = 181 bpm maximum heart rate

Neither of these variations take into account that a fitter person’s heart responds differently to exercise when compared to a less fit person and that’s where heart rate reserve (HRR) comes in.

Heart rate reserve links your resting heart rate to your maximum heart rate and makes the assumption that the lower your resting heart rate, the fitter and stronger your heart must be. While this is true in the majority of instances, things like hypothermia and some heart conditions can cause a low resting heart rate (properly called bradycardia) but in most cases the correlation between fitness and a low resting heart rate holds true.

To calculate your maximum heart rate using heart rate reserve complete the following simple calculation...

220 – resting heart rate = maximum heart rate

e.g. for an exerciser with a resting heart rate of 70 bpm

220 – 70 = 150 bpm
A more recent variation of the predictive maximal heart rate calculation was developed by Tanaka, Monahan and Seals working out of the Department of Kinesiology and Applied Physiology at University of Colorado in Boulder.

**Maximum heart rate = 208 – (0.7 x age)**

e.g. for a 28-year old exerciser

\[
208 - (0.7 \times 28) = 188.4 \text{ bpm}
\]

So, as you can see, there are several predictive methods for estimating your maximum heart rate. They are all backed by research and have been right enough times for them to be widely accepted. In addition to the methods listed, there are several other methods that you could consider but the reality is that each method will produce a broadly similar result and for most exercisers, a variance of plus or minus 10 bpm is pretty much inconsequential.

If you really want to dig deeper into predictive heart rate calculations, please see [http://www.brianmac.co.uk/maxhr.htm](http://www.brianmac.co.uk/maxhr.htm)

So, by hook, crook, stress test or predictive formula, you should now know your maximum heart rate. Let’s move on to what you can do with that number...
4. Heart Rate Training Zones for Different Goals

In all things fitness related, one of the most important things to grasp is the rule of specificity. The law of specificity relates directly to how the training you choose to do will affect your results and how the results you want are best achieved by adopting a certain type of training.

When you exercise, your body responds to that exercise by adopting so that, next time, that same workout is not so challenging. For example, if you run five-miles, your body will instruct your heart to grow bigger and stronger, your blood to improve its ability to transport oxygen and your muscles to develop greater endurance so that five miles of running gets easier. The adaptations are specific to the type of training you do.

In a similar vein, if you want to develop strength, lifting light weights is not the answer however, if you lift heavy weights, your body will respond by building muscle, improving your nervous system and increasing your ability to generate force. In short, lifting heavy weights makes you better at lifting heavy weights!

Conversely, if you want to develop a particular type of fitness, for example your ability to run a fast 5km, your training has to be specific to this task.

A lot of runners and other exercisers simply turn up and plod away at a moderate level of intensity for a moderate length of time. This results in moderate levels of fitness – all because of specificity.

If, however, you want to go beyond moderate and get the results you really crave, you need to align your training to your goals and that is where training zones come in.

Most runners – and I don’t mean to pick on the pavement pounders but they are usually the most guilty of this – do a large majority of their training runs at LSD pace which is short for long, slow distance. LSD is great for developing a basic level of aerobic fitness and for getting “miles in the bank” but, and remembering the rule of specificity, LSD training teaches your body to run a long way slowly.
If you want to train yourself to run faster, then you need to run faster in training. Sounds obvious but so many people fail to grasp this essential concept and fall into the trap of doing the same type of training week after week, month after month and year after year and then wonder why they aren’t seeing any progress.

There is an old saying in fitness – if you always do what you have always done, you’ll always get what you always got. In other words, if you want to see your fitness improve, you’ll need to step up and away from what you normally do and step toward a method of training that is more alighted to your fitness goals. Remember; if you want to run faster, you have to run fast!

And all this talk of specificity leads us nicely onto training zones.

Training zones are intensity bands in which specific things happen to your body and, as your cardiovascular exercise program should reflect your fitness needs, you should do most of your exercise in the zone most specific to your goals.

There are five broad and slightly overlapping training zones...

**Training zone 1 – recovery**
As the name suggests, this training zone is very low intensity and will put more into your body than it takes out. Your pace will be slow and your heart rate will be around 50 to 60-percent of your maximum. In terms of RPE (using the more accurate 6 to 20 scale of perceived exercise intensity) you should feel as though you are working at around 6 to 9 and you should have no problem chatting with a friend while you exercise. Training in zone one should allow you to exercise for a long period of time – potentially many hours. This type of training is ideal for the days following a very intense training session or race and is also ideal for deconditioned individuals. For very fit individuals, zone one will barely feel like exercise at all, but that’s okay as its aim is not to improve fitness but facilitate recovery. Note: exercising below 50 percent of maximum heart rate does very little in terms of fitness improvement or calorie burning but it can still be beneficial as any physical activity has the potential to improve health – walking is a prime example.

**Training zone 2 – aerobic threshold**
This zone will develop your basic long-haul fitness and is the cornerstone of most endurance athlete’s training. In this zone, your heart rate should be around 60 to 75-percent of your maximum. This type of training is, as previously mentioned, commonly called long, slow distance training – LSD for short. This zone is the most commonly used training zone and many people fall into the LSD trap by doing too
much of their training at this level. Although beneficial, training at LSD speed will train your body to run/cycle/swim etc. a long way slowly. LSD workouts can last several hours depending on your fitness which means that training in zone 2 is not always very efficient. If you want to increase your fitness levels, you need to move up and out of this zone from time to time. Your RPE should be around 11 – 12 when exercising in this zone and while talking will be punctuated by your regular need to breathe, you should still be able to hold a reasonably fluent conversation.

Training zone 3 – lactate/anaerobic threshold
Also known as speed endurance, zone 3 elevates your heart rate to between 75 to 90-percent of your maximum. Your RPE should be around 13 to 15 out of 20. This causes a significant rise in lactic acid which is the stuff that makes your muscles burn. Used for a type of fast, sustained training called tempo training, exercising in zone 3 will increase your top-end fitness where level 2 increases your ability to just keep on keeping on. Zone 3 workouts are generally shorter than zone 1 and 2 workouts because the intensity is much higher; 20 to 40 minutes is typical. When training in this zone, you should feel you are working at close to your maximum sustainable pace and that going any faster will force you to slow down because of fatigue. Think of zone 3 as being race pace workouts.

Training zone 4 – anaerobic 1
In this zone, you are dipping your toe into anaerobic (or without oxygen) energy production. You aren’t quite flat out but you are very close. Your pace should be sustainable for up to three minutes but only just. In athletics, this zone is representative of 400 and 800 meter running and boxing is also a good example of a zone 4 activity. RPE for this zone should be 16 to 17 and your heart rate will probably hit 95 percent of maximum. Training in zone 4 usually involves interval training – periods of intense exercise interspersed with periods of low intensity rest. For example, you may run 400 meters as fast as you can and then rest three minutes before repeating.

Training zone 5 – anaerobic 2
Where zone 4 is sustainable for several minutes, zone 5 is only sustainable for several seconds; think flat-out sprinting. This means that your heart rate might not actually get chance to respond to your sudden short burst of RPE 19+ activity. However, as you are (or should be) working as hard as you possibly can, your heart rate may well hit 100 percent of your maximum heart rate once you stop your sprint and your circulatory system starts its work to clear away the accumulated lactic acid in your body. A 100 meter track sprint is a good example of a zone 5 activity. Like
zone 4, interval training is the name of the game for level 5 although work periods will be shorter; ten seconds of work alternated with 60-second recoveries are appropriate for this training zone.

Summary
That’s quite a lot of information to contrast and compare so to make things a little more straightforward, here is a chart that summarises all of this zoning information...

<table>
<thead>
<tr>
<th>Zone</th>
<th>%MHR *</th>
<th>RPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Recovery</td>
<td>50-60 %</td>
<td>&lt;10</td>
</tr>
<tr>
<td>2 Aerobic threshold</td>
<td>60-75 %</td>
<td>11-12</td>
</tr>
<tr>
<td>3 Anaerobic threshold</td>
<td>75-90 %</td>
<td>13-15</td>
</tr>
<tr>
<td>4 Anaerobic 1</td>
<td>90-95 %</td>
<td>16-17</td>
</tr>
<tr>
<td>5 Anaerobic 2</td>
<td>95-100 %</td>
<td>19-20</td>
</tr>
</tbody>
</table>

*Percentage of maximum heart rate

But what about the so-called fat burning zone?

A common myth associated with heart rate training zones is the existence of the fat burning myth. It is often believed that exercising at a low heart rate percentage (around 60-70 percent of maximum heart rate) results in a higher rate of fat metabolism.

The thing is, while you are burning predominately fat in the fat burning zone, you aren’t burning a lot of it. At 60 percent of your maximum heart rate, you are exercising very economically and a little fat goes a very long way; you’ll only use around 100 calories to jog/run a mile. That means that you’ll need to jog/run 35 miles to burn one single pound of body fat. No wonder that people who rely on the fat burning zone do it day after day, week after week and see little or no benefit from their workouts.

In contrast, exercising at 80 percent of your maximum heart rate or higher uses a lower percentage of fat but a higher number of calories in total and a higher calorific deficit is much more important than the amount of fat you actually burn while exercising. Plus, higher intensity workouts trigger an after burn effect called EPOC which is short for excess post-exercise oxygen consumption and simply means that your metabolism remains elevated for hours after your more intense workout. This is not the case with exercising in the fat burning zone because, on cessation of exercise, your metabolic rate rapidly returns to normal. The popularity of the fat
burning zone has a lot to do with how easy it is to exercise at this level but when it comes to exercise, easy is seldom best.

So, while exercising at 60-70 percent of maximum heart rate does result in fat burning, so too does working at 80 percent or even 90 percent. The truth is that there is no singular “fat burning zone” and, actually, the higher the intensity the more calories are burnt and that is much more important than the amount of energy coming from fat.

So, now you know a little more about training zones, here are a couple of example programmes so that you can see how you can use this information to plan your own weekly training schedule...

<table>
<thead>
<tr>
<th>Example 1 – General Exerciser</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 year old male</td>
</tr>
<tr>
<td>New to exercise</td>
</tr>
<tr>
<td>Wants to improve his basic fitness</td>
</tr>
<tr>
<td>Maximum heart rate based predictive heart rate calculation 175 bpm</td>
</tr>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
<tr>
<td>Saturday</td>
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<tr>
<td>Sunday</td>
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<tr>
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</tbody>
</table>
**Example 2 – Distance Runner**

25 year old female  
Experienced exerciser  
Wants to improve her 10,000 meter time  
Maximum heart rate based on stress test result 190 beats per minute

<table>
<thead>
<tr>
<th>Day</th>
<th>Activities</th>
</tr>
</thead>
</table>
| Monday   | Zone 1 – recovery  
• Easy run outside – 40 minutes at 50 to 60% MHR |
| Tuesday  | Rest day                                                             |
| Wednesday | Zone 4 – anaerobic 1  
Interval session on treadmill – duration 40 minutes  
• Warm up 5 minutes gradually increasing heart rate  
• 3 minutes at 90% followed by 2 minute recovery at 60% MHR x 6  
• Cool down at 10 km/h down to walking |
| Thursday  | Rest day                                                             |
| Friday   | Zone 3 – Anaerobic threshold  
• Run outside – duration 30 minutes at 75-90% MHR |
| Saturday  | Rest day                                                             |
| Sunday   | Zone 2 – Aerobic threshold  
• Run outside – duration 60 minutes at 60-75% MHR |

Note that although each plan uses several training zones, the zones selected are the ones that border the exerciser’s main training goal. Also, adequate rest is built into each programme to ensure that training quality can remain high. Rest and recovery are essential components that must be respected if meaningful progress is to be made – more on that later.
5. Considerations When Using a Heart Rate Monitor

Heart rate monitors are, by and large, very reliable and accurate; they are, after all, using the same technology as electrocardiogram (ECG) machines that are used to monitor a patient’s heart rates in hospital. However, that being said, sometimes external forces can interfere with your heart rate monitor or particular circumstances can conspire to make your readings less than accurate so if you are getting weird and wonderful readings (why is my heart really beating 250 times a minute before I go for a run?! or why has my heart stopped?!) this section is for you!

Firstly, make sure you get your chest strap fitted properly and that the sensors are clean. It should be snug without constricting your chest and positioned so the sensor is directly over your sternum and below your pecs/breasts. It needs to be directly in contact with moist skin to ensure maximal conductivity so that your monitor can pick up the electrical pulse generated by your heart each time it beats. Making sure your chest strap is correctly fitted usually fixes the majority of heart rate monitor issues but assuming you are wearing it properly and your batteries are in tip-top shape, there are a few other reasons for inaccurate readings...

1) Poor skin/sensor connectivity: In the winter, when the weather is sometimes cold and dry, you are much less likely to have moist skin and even less likely to be generating any sweat right from the start of your workout. This in turns lowers your conductivity and can negatively affect your heart rate readings. Simply introducing any moisture to the sensors will usually remedy this situation – at least until you begin sweating enough that your skin moistens itself.

There are a couple of solutions to this lack of conductive moisture...

Lick it: This is the simplest option – and quite honestly what most people do 99 percent of the time. Just give it a big lick – the two chest strap sensors I mean and not the receiver watch! This will usually tide you over until you start perspiring enough to keep everything properly moistened with sweat.
Heart Rate Monitor Training

www.csxpro.com

Heart Rate Gel: If you suck at licking, or simply prefer a more hygienic way to moisten your heart rate monitor sensors, then you can use electrode gel to improve conductivity instead. This is what is typically used in medical situations such as an ECG where you’re trying to get a better reading/conductivity. Electrode gel is ideal for winter use because when the weather is really cold you may never warm up sufficiently to produce enough sweat to moisten the sensors and where sweat can evaporate, causing you to lose your conductivity, HR gel is designed to last considerably longer on your skin/monitor strap. Electrode gel is very cheap and long lasting and you can usually pick it up at your local running store, or online, for about £5-10 per bottle or tube.

2) Static electricity: While synthetic exercise clothes make for comfortable workouts as they don’t soak up sweat like cotton can, an unfortunate side effect is that those same synthetic shirts can produce a static electricity build-up that may interfere with your heart rate monitor readings. This is most common when your skin and the air are both a little on the dry side. In almost all cases, simply applying moisture to the sensors will immediately resolve this issue. You can also try rubbing the strap, your shirt or both with an antistatic agent such as a “Bounce”-type tumble dryer sheet. Alternatively, you can revert to wearing a less technical material like cotton but then you may end up bogged down in a sweaty t-shirt as a result. Static electricity can also be caused by strong winds blowing against your clothes – particularly when you are cycling. Needless to say, if you are riding fast or in traffic it is NOT a good idea to try and adjust your heart rate monitor. Instead, pull over and do it while you are safely stationary.

3) Electrical interference: Low power lines, electromagnetic fields from exercise machines, low ceiling lighting and any other overly close source of electricity or magnetism can interfere with your heart rate monitor. I used to train at a gym that was a) well-stocked with treadmills and b) had low fluorescent lighting everywhere and my heart rate monitor only actually worked in the changing rooms! If you experience wildly fluctuating readings check out your surroundings for potential

Editors Note: You can also place just the sensor section of the chest strap under a slow running tap to moisten the sensors
interference. Move away from the source of interference and you should see your readings stabilise.

4) Cardiac drift: Have you ever noticed that, when you are using a heart rate monitor, your heart rate increases over the duration of your workout despite the fact that you are not working any harder than when you started? Weird eh? That upward trending heart rate is commonly called cardiac drift and is a common occurrence during sustained cardiovascular exercise. Knowing a little about cardiac drift will ensure that, if you experience an upward trending heart rate, you don’t mistakenly put it down to a monitor malfunction.

Cardiac drift can occur any time after ten-minutes or more of exercise but is more commonly associated with the latter stages of lengthy workouts and is more frequently seen when the weather is warm or you are working closer to the high end of your heart rate scale. Warm temperatures and high intensity exercise are inextricably linked to fluid loss and dehydration which, unsurprisingly, is the commonly-accepted reason that cardiac drift, occurs. Cardiac drift is usually accompanied by a rise in the rate of perceived exertion too. In other words, despite not working any harder, the activity being performed feels more demanding.

When you sweat, you lose fluid – specifically water – and that water has to come from somewhere. As your water reserves become depleted, your body turns to blood plasma – plasma is the carrier fluid in which your red and white blood cells as well as your platelets are suspended. As your blood plasma levels decrease, the viscosity of your blood increases which makes it harder for your heart to circulate blood around your body and also reduces stroke volume and cardiac output or, in simple terms, the amount of work being done by your heart goes up. This is reflected in your elevated heart rate.

Cardiac drift is not in itself dangerous but it could cause your heart rate to move up and out of the training zone you are supposed to be working in which could reduce the effectiveness of your workout or may cause you to stop your workout prematurely. If you simply end up moving from zone 1 to zone 2 this is no big deal but if you are working in zone 3 and start nudging into zone 4, this could mean you are forced to stop because fatigue sets in.

You have a couple of options if you start experiencing cardiac drift...

1) Stop your workout and move into your cool down – chalk it up as a bad workout
2) Tough it out even though your heart rate is higher than it ought to be
3) Slow down so your heart rate falls back into the desired training zone
Training in warm weather as well as long or intense workouts increase the likelihood of experiencing cardiac drift but you can reduce the chances of it happening to you very easily. As cardiac drift is caused by fluid loss, it can be prevented or, at least, minimised, by ensuring you start each workout well-hydrated and you take fluids on board while you exercise to prevent dehydration occurring in the first place. Remember, if your urine output is reduced or dark in colour or you feel thirsty, you are already well on your way to being dehydrated. Ideally, your urine output should be frequent and copious, light coloured and not too smelly. As little as 10 percent dehydration can severely impede performance. So, now you know why your heart rate increases despite your work rate remaining constant.

5) Different heart rate responses while doing different activities: Your heart rate responds differently to different types of exercise – even if you are working at the same level of exertion. For example, you might run at RPE 14 and that results in an exercising heart rate of 155 bpm. However, swimming at that same level of intensity could result in an exercising heart rate closer to 140 bpm but rowing pushes it up to 160 bpm.

Different forms of exercise affect your body in different ways which means if you cross train (do different types of activity as part of your training week) you will need to perform maximal heart rate tests for each type of exercise. Of course, because the difference in heart rate response between different forms of exercise only amount to a handful of beats per minute, such precision is not necessary for the average exerciser but if you really want to dial in the accuracy of your heart rate training, this is worth doing.

So why the heart rate response for different activities? Good question. It all comes down to two things; body position and the muscles being used.

When you run, blood must be pumped against gravity from your legs and back up to your heart. This gravity-defying feat is hard work which is reflected in your heart rate. Also consider that every time your foot strikes the ground, your muscles have to absorb and overcome around eight times your body weight in force. Needless to say, this adds up to a lot of work which is reflected in the relatively high heart rates commonly associated with running.

Swimming, on the other hand, involves keeping your body all but horizontal which makes vascular return (the correct term for blood being pumped back toward your heart) somewhat easier. This means that you’ll have to swim much harder to get a
similar heart rate response to running or your heart rate will be lower if you put out the same degree of effort.

Cycling, because you are sat down and the force produced is not as great as for running, also usually produces a lower heart rate but that all changes when you get up out of the saddle and produce more force. Rowing, because it use your arms and legs simultaneously and your body is not vertical, will produce similar heart rates to swimming.

Remember however, before you dive into the water wearing your new heart rate monitor make sure it is rated as being “water proof” and not simply “water resistant”. Water proof means it can be submerged safely whereas water resistant means it will survive exposure to sweat and rain but not complete immersion!

So what does this all mean? Simply that the heart rate you achieve when running cannot easily be compared to other exercise modalities and vice versa so while you CAN use the same heart rate training zones for all of your cardiovascular training, this could result in different heart rate responses depending on the type of training you are doing.
6. Monitoring Recovery with a Heart Rate Monitor

So far, I have focused on using your heart rate monitor during exercise and as your heart rate monitor is like having a coach attached to your chest this makes a certain amount of sense. However, what a lot of people fail to realise is that your body only adapts to exercise while you are resting and that means that rest is a vital component of the process of improving your fitness.

Exercise is undoubtedly good for you but too much or chronic exercise as well as several other factors can actually inhibit your fitness improvements and may even make you unwell. Thankfully, it’s easy enough to monitor your rate of recovery using your trusty heart rate monitor.

Before I explain how that all works, let’s explore a little about what is commonly referred to as over training syndrome.

Exercise is a stress. Exercise that is matched with sufficient rest and recovery will result in positive adaptations or, in other words, you get fitter. This type of stress is properly called eustress and is obviously positive.

However, if exercise exceeds your ability to recover, the stress becomes distress – a term that most people are familiar with. This essentially means that exercise is taking out more than the body can cope with and while initially fitness may continue to improve, ultimately the systems of the body will become overtaxed and problems will arise.

There are several signs and symptoms commonly associated with over training syndrome including …

- Persistent muscle soreness
- Persistent fatigue
- Increased susceptibility to infections
- Increased incidence of injuries
- Irritability
• Depression
• Excessive weight loss
• Excessive loss of body fat
• Decreased muscular strength
• Increased exercising heart rate
• Reduced maximal heart rate
• Inability to complete workouts
• Constipation or diarrhoea
• Absence of menstruation
• Insomnia
• Heart palpitations
• Lower testosterone levels
• Higher cortisol levels
• Loss of appetite
• Irritability
• Loss of motivation
• Loss of enthusiasm
• Loss of competitive drive
• Elevated resting heart rate

Treatment for overtraining syndrome inevitably involves rest and significantly reduced training intensity and volume but as avoidance is the best policy you should endeavour to...

• Follow a sensible training program
• Take periodic days off
• Alternate easy and hard workouts
• Get enough sleep
• Respect the need for recovery
• Follow a healthy and nutritious diet
• Avoid exercise if you are feeling unwell
• Monitor your resting heart rate...

Your resting heart rate is, as the wording suggests, your heart rate at rest. The best time to measure your resting heart rate is just after waking and before you get up. Your resting heart rate will naturally decline as you get fitter because a stronger, more capacious heart does not need to pump as many times per minutes as a less fit heart. However, when you are tired, have not recovered from previous workouts, are starting to be unwell or are overtrained, your resting heart rate will increase. This indicates that not only your heart but your entire body is working harder than
normal and you really should consider taking a rest day or two until things go back to normal.

Before you start checking your resting heart rate, you need to establish your baseline so you have something to compare your readings to. Monitor your resting heart every day for a week, writing down the heart rate each morning. You will then get an idea of what your average resting heart rate is. Once an average resting heart rate has been established, it becomes easy to determine your physiological state.

Once you have your baseline, compare your morning readings to this number. If your morning resting heart rate is seven or more beats or ten percent higher than your baseline you are not fully rested and need more training like you need a hole in the head!

Of course, the easiest way to measure your heart rate is to wear a heart rate monitor but you can also get accurate readings by taking your carotid (neck) or radial (wrist) pulse for 60 seconds. It is, however, common practice to take a reading for 15 seconds and then multiply the result by four or take it for 10 seconds and multiply the result by six however, while this does save time, it can mean you end up multiplying any errors by the power of four or six respectively. Eliminate this margin for error by counting for the full 60 seconds.

**To try and convince you how serious overtraining syndrome can be, let me tell you a story about my friend and one-time training buddy Gregg...**

Gregg was always a keen exerciser but generally worked out for fun and for its health benefits. He flirted with endurance sports in the form of distance running and even ran a half-marathon for charity but only ever treated these pursuits as occasional hobbies.

That all changed when he met a group of die-hard triathletes and was encouraged to train with them.

Initially, Gregg found the training hard but, with perseverance, gradually improved and, over a few months, got fitter and fitter. Spurred on by his new friends, he entered a local triathlon and, to his surprise, had a good race and finished high up in the field.

Encouraged by his result, Gregg redoubled his training efforts and got serious about the sport of triathlon. What was initially a casual interest became a full-on obsession.
and Gregg committed to training between 9 to 12 times a week so he could do the number of running, swimming and cycling workouts he thought he needed to do.

More good race results followed and so Gregg increased his training volume further and began to pride himself on having long, unbroken, periods of training. Rest days, he thought, were a waste of time.

As time passed, Gregg became very lean but also lost a lot of muscle and began to take on a skeletal appearance. His many months of unbroken training left him feeling tired all the time and his training began to suffer. But, rather than cut back on his workouts and take some well-needed rest, Gregg increased his training volume even more – mistakenly thinking that more exercise was what was needed to get him out of his rut.

Diet wise, he sustained himself on fast-acting carbs, caffeine, sugar and sports drinks which, he felt, were necessary to keep his energy levels up for the twice-a-day training regimen he was determined to stick to.

This high volume of training left Gregg feeling sore but, miraculously, he suffered no more than a few minor nigling injuries. However, he told me, on waking in the morning, he had to slide down the stairs on his butt because his knees were always stiff and took a while to “warm up”. This is never normal behaviour but consider that Gregg was only 24 at the time.

Despite feeling tired all the time, Gregg found sleep very difficult and slept badly which further compounded his training efforts. He seldom slept more than 5 hours per night and his sleep was never unbroken.

With all of his energy committed to training, work began to suffer as too did his relationship with his wife. He was either out training, getting ready to go training, recovering from training or thinking about training. After several months of being all-but ignored, his initially supportive wife moved out and they later divorced. He had several severe reprimands at work and was very close to losing his job too.

The next competitive season rolled around and the results that Gregg hoped for failed to materialise. Instead of feeling strong and fast, he felt weak, slow and tired. He went from racing at top speed to barely being able to complete races at all. The final straw came when he had to get off his bike and push it up a hill because he didn’t have the strength to ride it.
Gregg quit triathlon then and there and, as if his body finally knew a rest was coming, he spent the next 12 months suffering from a long string of illnesses and infections. All the training had left his immune system in the doldrums and he was fair game to just about every bug and germ around.

It took over a year before Gregg was able to even contemplate short workouts and he never regained his previous high level of fitness. Even now, many years later, he finds long-duration exercise very tiring.

In retrospect, Gregg knows he attempted the impossible by trying to outrun fatigue and ignore recovery and openly admits to doing far too many “junk miles” for the sake of it.

His training was built around arbitrary goals like running 40-miles per week, swimming five-miles per week and cycling 120-miles a week; very little consideration placed on training quality. He didn’t use a heart rate monitor either...

Sadly, at the time, triathlon was a relatively new sport and very little training information was available so, needless to say, lots of other wannabe triathletes fell into the “more is better” mind set and never reached their competitive potential as a result.

Checking your morning pulse is one of the best ways to monitor how well recovered you are. If you find your morning pulse is often elevated, it may be that you are habitually over exercising, have too much stress in your life, are not getting enough sleep, your diet is lacking in essential nutrients or there is some other underlying medical condition that warrants investigation.
7. Testing Your Fitness With and Without a Heart Rate Monitor

A lot of heart rate monitors have a very useful additional feature – built-in fitness tests. The fitness test or tests vary from unit to unit but provide a simple and convenient way to assess your current fitness level. In addition to telling your current level of fitness, fitness tests can also help reveal if your current training program is working, help you set goals, monitor progress and can even be used in the design of future workouts. However, to get the most from these built-in tests you need to ensure you follow certain guidelines which will help ensure accurate results.

For a fitness test to be reliable, you need to ensure that consistency is the name of the game. This rule of consistency needs to be applied to several parts of the fitness testing protocol...

a. Consistent test methodology
If the test you are performing is going to be accurate and so that subsequent tests can be fairly compared, each test you complete should be performed in the same way. If a test calls for you to run at 10 kph and a one percent incline then that’s what you must do! You can’t expect to produce comparable results if you run at a different speed or incline for subsequent tests. The only variable should be your current level of fitness. For this reason, you cannot compare results obtained from different types of exercise because, as you know, your heart rate response can differ significantly from treadmill to exercise bike to rower etc. Do everything you can to remove any potential inconsistencies.

b. Consistent physical state
If you perform a fitness test while you are suffering a cold and then perform your next test when you are healthy and cold-free, the results cannot be accurately compared. Similarly, if you have a large coffee before one test and then no coffee when you retest yourself, the results will also be skewed because caffeine has a significant impact on both energy and heart rate readings. Make sure that you are in the same physical state from one test to the next and if anything is going on that is out of the usual such as an injury, mild illness, medication, severe fatigue or anything similar, you should postpone your test until everything is back to normal. For some people, this even means ensuring that tests are carried out at the same time of day because they aren’t at their best in the mornings.
c. Consistent environment
Weather, temperature and equipment used can all affect consistency. Hot weather can lead to dehydration, cardiac drift and skewed heart rate readings while extremes of cold or strong headwinds (assuming an outside test) can affect performance too. Not all exercise bikes, treadmills etc. run at exactly the same speed – even if they are the same make so try to use the same bike, treadmill, rower etc. when performing fitness tests to eliminate another possible source of inconsistency.

While the test or tests that are built into your heart rate monitor are fine, there are several other tests that you can perform to assess your fitness level and that are much easier to do using your heart rate monitor. Do not try and compare your results from one test to another – that won’t work. Instead, pick the test that is most appropriate to you and stick with it.

1. Resting heart rate
Good for: Those who want a quick and easy fitness test
Not so good for: Very fit individuals
Equipment: Heart rate monitor

A normal resting heart rate can range anywhere from 40 to 100 beats per minute. Below is a chart relating resting heart rate and fitness level. As can be seen on this chart, your resting heart rate can vary with your fitness level and with age — the fitter you are, generally the lower the resting heart rate. This is due to the heart getting bigger and stronger with exercise, and getting more efficient at pumping blood around the body so, at rest, more blood can be pumped around with each beat and therefore less beats per minute are required.

These ratings provide only a generalisation of your fitness and health, there are many other factors which may account for variations in heart rate such as medications, illness, caffeine and stress so make sure you remove any potential inconsistencies to ensure you get an accurate measure.
### Resting Heart Rate for MEN

<table>
<thead>
<tr>
<th>Age</th>
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<th>26-35</th>
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<th>46-55</th>
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### Resting Heart Rate for WOMEN

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2. Queen’s College Step Test

Good for: Those who want to test their fitness without having to run
Not so good for: Very fit individuals
Equipment: 16.25 inch (41.3 cm) step, stop watch, heart rate monitor, calculator and a metronome

Method: Using a 16.25 inch step perform step ups for 3 minutes at the prescribed tempo (96 bpm for males and 88 bpm for females).

Exactly 5 seconds after the completion of the 3 minutes, make a note of the participant’s heart rate

Perform the following calculation to reveal your VO₂ max – the measure of the amount of oxygen you can take in, transport and utilise and the measure of aerobic fitness...

Males: 111.33 – (0.42 x heart rate)

Females: 65.81 – (0.1847 x heart rate)

3. Rockport Fitness Walking Test

Good for: Those who prefer not to run
Not so good for: The very fit and the very unfit, those for whom fast walking is uncomfortable
Equipment: 400 meter running track or treadmill, stop watch, heart rate monitor, calculator, weighing scales

Method: After a warm up, walk one mile (four laps of the 400 meter track) as fast as possible without breaking into a run – one foot MUST be on the floor at all times. Record the time taken and the participant’s heart rate immediately on completion. Perform the following calculation...

\[ VO_2 = 132.853 - (0.0769 \times \text{weight}) - (0.3877 \times \text{age}) + (6.315 \times \text{gender}) - (3.2649 \times \text{time}) - (0.1565 \times \text{heart rate}) \]

Calculation notes: weight is in lbs, for gender enter 1 for male and 0 for female, time is minutes and hundredths of minutes so 12 minutes 45 seconds would be 12.75.

If maths is not your strongest suit (no – me neither!) here is a handy Rockport walking test calculator... [http://www.exrx.net/Calculators/Rockport.html](http://www.exrx.net/Calculators/Rockport.html)

There are also several tests you can perform to assess your fitness that do not require your heart rate...
4. Balke Treadmill Test

Good for: Those who want to test their fitness without having to run
Not so good for: Very fit individuals
Equipment: Treadmill with an incline function, calculator

Method: Set treadmill to 3.3 mph/5.3 kph and 2 percent gradient. Walk in the centre of the belt and do not hold on to handrails. At the start of each subsequent minute, increase the incline by 1 percent and continue until you are unable or unwilling to continue the test. Note – this may be 20 or more minutes if you are very fit. Because of this, the Balke treadmill test is only suitable for low to moderate fitness levels as very fit individuals will be able to exceed the incline of the treadmill.

On completion, perform the following calculation to reveal your VO\(_2\) max – the measure of the amount of oxygen you can take in, transport and utilise and the measure of aerobic fitness...

\[
VO_2 = 1.444 \times \left(\frac{\text{time in seconds}}{60}\right) + 14.99
\]
5. Bruce Treadmill Test

Good for: Exercisers wishing to assess their fitness by walking or running
Not so good for: Those who prefer a less demanding fitness assessment
Equipment: Treadmill, stop watch, calculator

Method: Using the incline/speed chart below, spend three-minutes at each of the designated stages. The test stops when the participant is unable/unwilling to continue. Note the total elapsed time on completion (and the heart rate as it should be a maximal heart rate reading) and perform the following calculation...

\[ \text{VO}_2 \text{max} = 14.76 - (1.379 \times T) + (0.451 \times T^2) - (0.012 \times T^3) \]

Note: T equals time

<table>
<thead>
<tr>
<th>Stage</th>
<th>Speed (km/hr)</th>
<th>Speed (mph)</th>
<th>Gradient (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.74</td>
<td>1.7</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>4.02</td>
<td>2.5</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>5.47</td>
<td>3.4</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>6.76</td>
<td>4.2</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>8.05</td>
<td>5.0</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>8.85</td>
<td>5.5</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>9.65</td>
<td>6.0</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>10.46</td>
<td>6.5</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>11.26</td>
<td>7.0</td>
<td>26</td>
</tr>
<tr>
<td>10</td>
<td>12.07</td>
<td>7.5</td>
<td>28</td>
</tr>
</tbody>
</table>

6. Multi-stage Fitness Test

Good for: Fitter individuals who want to assess their fitness for running
Not so good for: Non-runners
Equipment: Marker cones, instruction CD, tape or MP3, tape measure.

Method: Mark out a 20 meter track with clear markers at either end. Follow the commands on the tape/CD/MP3 and begin running slowly when instructed to do so by the voice on the audio. Keep in time with bleeps on tape – do not go too fast too soon. Continue running as the bleep intervals speed up. Keep going until you are unable or unwilling to continue. Note the level reached and compare to normative
tables provided with the test. The multi-stage fitness test should also reveal your maximum heart rate.

You can download the multi-stage fitness test here: http://www.scrrs.net/updates/multi-stage-fitness-test-audio-file-updated/

7. The Cooper 12-minute swim test
Good for: Competent swimmers
Not so good for: Less competent swimmers
Equipment: Swimming pool of known length, stop watch

Method: Using any stroke, swim as far as you can in 12 minutes. Have a partner count laps as it’s easy to lose count when you are on your own. Try to keep a steady pace so that you swim continuously for the full 12 minutes. On completion, compare the distance covered to the chart below...

<table>
<thead>
<tr>
<th>Age</th>
<th>Very poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>274-365</td>
<td>457-548</td>
<td>549-639</td>
<td>&gt;640</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>&lt;365</td>
<td>366-456</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>&lt;279</td>
<td>274-365</td>
<td>366-456</td>
<td>457-548</td>
<td>&gt;549</td>
</tr>
<tr>
<td>30-39</td>
<td>320-411</td>
<td>412-502</td>
<td>503-593</td>
<td>&gt;594</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>&lt;319</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>&lt;228</td>
<td>229-319</td>
<td>320-411</td>
<td>412-502</td>
<td>&gt;503</td>
</tr>
<tr>
<td>40-49</td>
<td>274-365</td>
<td>366-456</td>
<td>457-548</td>
<td>&gt;549</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>&lt;273</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>&lt;182</td>
<td>183-273</td>
<td>274-365</td>
<td>366-456</td>
<td>&gt;457</td>
</tr>
<tr>
<td>50-59</td>
<td>229-319</td>
<td>320-411</td>
<td>412-502</td>
<td>&gt;503</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>&lt;228</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>&lt;136</td>
<td>137-228</td>
<td>229-319</td>
<td>310-411</td>
<td>&gt;412</td>
</tr>
</tbody>
</table>

So there you have it – seven ways to assess your current fitness level. All you have to do now is test, train and re-test to assess and track your improvements. No improvements? Either your programme isn’t quite right or you are not resting and eating as you should.
8. Heart Rate-Based Workouts

You now know why it makes sense to use a heart rate monitor, how to establish how hard you should be exercising according to your fitness goals and how to accurately assess your current fitness level so, in this chapter, I am going to provide you with a variety of heart rate-based workouts to try. Simply adjust the workout parameters (intensity/volume/duration) to keep you within the specified heart rate training zones. Heart rate too low – crank things up a little. Heart to high – back off and live to fight another day!

Just to remind you, here is the heart rate training zone chart...

<table>
<thead>
<tr>
<th>Zone</th>
<th>%MHR</th>
<th>RPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Recovery</td>
<td>50-60 bpm</td>
<td>&lt;10</td>
</tr>
<tr>
<td>2 Aerobic threshold</td>
<td>60-75 bpm</td>
<td>11-12</td>
</tr>
<tr>
<td>3 Anaerobic threshold</td>
<td>75-90 bpm</td>
<td>13-15</td>
</tr>
<tr>
<td>4 Anaerobic 1</td>
<td>90-95 bpm</td>
<td>16-17</td>
</tr>
<tr>
<td>5 Anaerobic 2</td>
<td>95-100 bpm</td>
<td>19-20</td>
</tr>
</tbody>
</table>

1. Three-Minute Rounds

Of all the sports in the world, boxing is arguably the most demanding. Not only do you have to face an aggressive opponent intent on punching your head off, you have to do it within the confines of a work to rest ratio seemingly designed by Dante himself! In a nutshell, boxing is an anaerobic sport and where the anaerobic energy system lasts around one to two minutes, boxing involves multiple rounds of three minutes which means that boxers are pushed to the very limits of anaerobic endurance and only given a measly 60 seconds to recover between rounds. Needless to say, this decidedly hellish work to rest ratio means that boxers develop incredible levels of fitness and are usually very lean too.

You too can develop very high levels of fitness by exercising in three minute rounds. Simply choose a high intensity activity that takes your heart rate up to zone 4 – 90-95 percent of your maximum heart rate. Good exercises of choice include jumping rope with high knees, running, rowing or cycling. Alternatively, hitting a heavy bag or speed bag or doing some sparring with a willing partner will deliver a much more authentic boxing workout.
2. Tabata Intervals

Interval training involves alternating periods of high intensity work with low intensity recovery. In traditional interval training, rests are long enough to allow you to recover sufficiently so that you can start the next interval feeling reasonably composed and ready. For example, if you ran 400-meters, you’d probably get two or even three-minutes to rest. However, with Tabata intervals, the rests are purposely very short but, then too, so are the work periods...

Tabata interval training was invented by Japanese sports medicine doctor Izumi Tabata who, in working with Olympic-level speed skaters, discovered that very high intensity but brief workouts not only increased anaerobic fitness but aerobic fitness too. What was more astonishing was that Tabata’s workouts lasted no more than four-minutes!

Before you write Tabata training off as being all show and no go, understand that this protocol was used to increase the fitness of already advanced athletes, many of whom went on to win medals in the Winter Olympics.

Tabata intervals involve 20 seconds of exercise in zone 5 (95 to 100 percent of your maximum heart rate) and very brief 10 second rests. These purposely short rests are more mental than physical and allow you to keep your intensity level well above what would normally be sustainable. The 20 second work/10 second recovery periods are repeated a total of eight times to deliver a workout lasting only four minutes. Allowing for a warm up and a cool down, you’ll be all done in 15 minutes or less.

The main caveat of Tabata training is you have to go all out for each interval – pacing is not allowed. And while your heart rate might not top out for the first couple of intervals, by interval four, you should be hitting your maximum and then sustaining it for a couple more minutes. Because of this intent of maximal intensity, the exercise you choose for Tabatas needs to be sufficiently demanding to allow yourself to really “go for it”. Kettlebell swings, burpees, double unders (two rope turns per jump when skipping), sprinting, and thrusters (front squat to overhead press) are all good choices. You can’t do Tabata jogging but you definitely can do Tabata sprinting. Bear in mind though that Tabata training is extremely intense and that is a euphemism for painful. Tabatas are not for the faint of heart.
3. The Spartan Circuit

The Spartan circuit has nothing to do with elite Greek warriors and everything to do with a sparsity of exercise equipment and a simplistic workout that really gets the job done.

The basic framework of the Spartan circuit is alternating periods of two minutes of cardio done at zone 2 or around 60-75 percent of your maximum heart rate with 60 seconds at zone 4 or at around 90-95 percent. This fast/slow system means you’ll develop both aerobic and anaerobic fitness while burning a lot of calories at the same time.

There are several ways to perform the Spartan circuit but my favourite three are outlined below. Each workout lasts 30 minutes so feel free to add or subtract intervals to adjust the total workout time...

<table>
<thead>
<tr>
<th>Interval</th>
<th>Workout 1</th>
<th>Workout 2</th>
<th>Workout 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Kettlebell swings</td>
<td>Press-ups</td>
<td>Chest press</td>
</tr>
<tr>
<td>2</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Thrusters</td>
<td>Sit-ups</td>
<td>Leg press</td>
</tr>
<tr>
<td>3</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Kettlebell swings</td>
<td>Squats</td>
<td>Seated row</td>
</tr>
<tr>
<td>4</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Burpees</td>
<td>Press-ups</td>
<td>Chest press</td>
</tr>
<tr>
<td>5</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Kettlebell swings</td>
<td>Sit-ups</td>
<td>Leg press</td>
</tr>
<tr>
<td>6</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Thrusters</td>
<td>Squats</td>
<td>Seated row</td>
</tr>
<tr>
<td>7</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Kettlebell swings</td>
<td>Press-ups</td>
<td>Chest press</td>
</tr>
<tr>
<td>8</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Burpees</td>
<td>Sit-ups</td>
<td>Leg press</td>
</tr>
<tr>
<td>9</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Kettlebell swings</td>
<td>Squats</td>
<td>Seated row</td>
</tr>
<tr>
<td>10</td>
<td>2 minutes</td>
<td>Skipping</td>
<td>Jogging</td>
</tr>
<tr>
<td>1 Minute</td>
<td>Thrusters</td>
<td>Press-ups</td>
<td>Chest press</td>
</tr>
</tbody>
</table>
4. Running Equivalents

Running equivalents is a great workout for runners trying to get a lot of mileage done but who don’t actually want to run lots of miles! Training for a marathon, for example, requires a lot of running but all that running can result in injury. However, if you want to run a good marathon, you need to have miles in the bank. The answer to this conundrum is running equivalents. Simply run a few miles at level 2 or 60-75 percent of your maximum heart rate and then switch exercise modalities and continue your workout at the same heart rate to clock up the workout duration you had planned.

For example, run two miles at 140 bpm, which for the purpose of this example we’ll say took you 15 minutes or 7.5 minutes per mile, and then hop on a bike and pedal hard enough to get your heart rate to that same 140 bpm and keep it there for a further 30 minutes. This would equate to six miles – two of which were real running four miles of which were running equivalents.

5. 3 x 3 x 3 Workout

This workout uses multiple exercise modalities and multiple intensity levels to deliver a short but intense workout...

Exercises are listed for example purposes only – feel free to substitute your preferred alternatives...

**Exercise Bike**
1 minute zone 1 (slow)
1 minute zone 3 (moderate)
1 minute zone 5 (fast)

**Treadmill**
1 minute zone 1
1 minute zone 3
1 minute zone 5

**Rower**
1 minute zone 1
1 minute zone 3
1 minute zone 5

Repeat the entire sequence twice more to total 27 minutes. Move quickly from one exercise to the next to keep your heart rate elevated.
6. Peripheral Heart Action Training (PHAT)

PHAT is a form of training that uses weight training exercises to deliver a cardiovascular workout. It’s effectiveness is all down to the sequencing of the exercises...

When you do any exercise, oxygenated blood is diverted away from non-essential areas of your body and preferentially sent to the muscles doing the work and blood is pumped by your heart. If you do a leg exercise such as lunges, blood is pumped to your legs but then, if you do an upper body exercise immediately after, blood has to be pumped back up your body to the muscles that are now doing the work. By placing the exercise in a specified order, you can keep shunting blood from one area to another which will deliver a cardio workout without doing any actual cardio exercise. This makes for an ideal workout for those who prefer a faster pace when doing exercises in the gym or do not enjoy regular steady-paced cardio.

Simply move quickly from one exercise to the next until the entire sequence of six exercises is complete. Do multiple laps back-to-back or punctuate each lap with a five minute burst of cardio where indicated. Make sure you keep your heart rate in zones three to four for best results!

<table>
<thead>
<tr>
<th>Movement</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   Legs</td>
<td>Squats</td>
<td>Leg press</td>
</tr>
<tr>
<td>2   Upper body push</td>
<td>Shoulder press</td>
<td>Bench press</td>
</tr>
<tr>
<td>3   Legs</td>
<td>Step ups</td>
<td>Lunge</td>
</tr>
<tr>
<td>4   Upper body pull</td>
<td>Pull ups</td>
<td>Seated rows</td>
</tr>
<tr>
<td>5   Legs</td>
<td>Leg extensions</td>
<td>Leg curls</td>
</tr>
<tr>
<td>6   Core</td>
<td>Cable wood chop</td>
<td>Hanging knee raises</td>
</tr>
<tr>
<td>7   Optional cardio</td>
<td>Treadmill – zone 3</td>
<td>Stepper – zone 3</td>
</tr>
</tbody>
</table>
7. Anaerobic Corners

Other than walking, running and cycling outside, many people draw a blank when it comes to exercising in the great outdoors which is a shame because outdoor workouts can be very rewarding and a lot of fun. For players of team sports such as rugby or football, outdoor workouts are also more sport-specific. Another important consideration for outdoor workouts is that, by and large, they are free – an important consideration if you are watching the pennies as well as minding the lbs!

Of course, inclement weather can be a problem and you should always make sure you have permission to exercise in your chosen location but, those things aside, outdoor exercise makes for a nice change of pace compared to gym-based workouts or simply pounding the pavement.

For this workout, you need a football pitch or similar. If you want to increase the aerobic demand of this workout, transfer it to a 400 meter running track.

Simply do laps of the following workout e.g. ten laps against the clock or as many laps as you can in 30-minutes. Use your heart rate monitor to ensure you are working in zone 1 or 2 on the long sides, zone 3 or 4 on the short sides and zone 5 in the corners...

![Diagram of the workout](image-url)
8. The Pyramid Workout

This workout has a warm up built in and takes you through all five heart rate training zones to develop all round fitness in one simple workout. It can be performed using any cardiovascular exercise modality – so long as you can control the intensity of the exercise you are performing it doesn’t matter whether you are running, rowing or swimming...

Work up one side of the pyramid and stop at the top or, if you want a longer and more demanding workout, work your way back down the other side too!
9. Indoor Triathlon

Time trials are a great way to test your fitness and mental fortitude and are generally performed against the clock rather than an opponent. The aim is to complete the course as fast as possible and, as the highest sustainable heart rate that is still aerobic is zone 3, your heart rate monitor can guide you to the right level of intensity. At zone 3, especially as your heart rate approaches 90 percent, you should feel as though you are going as fast as you can and that going faster would simply cause you to have to slow down. You should be right on the threshold of wanting to stop but just be able to hang on in there.

The indoor triathlon consists of...

1. Row 2,000 meters
2. Cycle 5,000 meters
3. Run 2,000 meters

Remember, in addition to completing each distance as fast as you can, the transitions from one exercise to the next are also included in your total time so no dilly-dallying or your finishing time will suffer as a result.

10. Burst Training

Burst training is similar to anaerobic high intensity interval training (called HIIT by those in the know) but differs in one very important way; where HIIT involves very prescriptive work to rest intervals, burst training is guided by your heart rate and therefore your individualised fitness level. This means that burst training is 100 percent customisable to your unique fitness requirements and will change as you get fitter.

It is suggested that burst training may actually be more effective than plain old interval training because it works in sympathy with your current fitness level rather than against it. This means that you will never do more exercise than you are capable of recovering from which should deliver better results in less time. I don’t see much wrong with regular HIIT but can see its limitations for less fit individuals which is why burst training is a good workout to add to your armoury.

In simple terms, you do an exercise of your choice as hard as you can so that you hit heart rate zone 5 within 30 to 60 seconds. If you don’t hit zone 5 in 60 seconds you are not working hard enough but if you hit it before 30 seconds you are working too hard. Once your heart rate peaks, rest until your heart rate returns back to zone 1. As soon as it does, go again. Do five to ten repeats or until your recovery is taking longer.
than is practical. Burst training workouts should take no more than 30 to 40 minutes in total although of that time, only 10 minutes or so will be actual work.

As you get fitter, you should find it takes longer to elevate your heart rate and less time for it to drop back down. These adaptations generally happen quite quickly.

As far as exercise choice goes – you are limited only by the equipment you have available and your athletic ability. Some of my personal burst training favourites include...

1. Double unders (two rope turns per jump) with a speed rope
2. Punching a heavy bag
3. Burpees
4. Kettlebell swings
5. High knee sprints with or without a speed rope
6. Squat jumps
7. Box jumps
8. Squat thrusts
9. Stair sprints
10. Exercise bike sprints
11. Rower sprints
12. Speed squats
13. Shuttle sprints
14. Heavy load carries
15. Swimming sprints

Whatever exercise you choose just make sure your heart rate hits zone 5 (95 to 100% of your maximum heart rate) in 30 to 60 seconds and then rest as long as it takes for your heart rate to drop back down to zone 1 – 50 to 60 percent of your maximum heart rate. Simple, but effective.
11. Graded Exercise Protocol (GXP)

Most cardiovascular training methods involve both intensity and duration or, in other words, it’s not just how hard you are working but how long you are working for. Graded exercise protocol or GXP for short is somewhat different in that it is based on the notion that duration is much less important providing you hit the right level of intensity – specifically 80 to 85 percent of your maximum heart rate. Proponents of GXP believe that, so long as you hit the right level of intensity (measured by your heart rate response) then you will get great benefits even if you maintain that heart rate for a very short time. Basically, it’s intensity and not duration that are responsible for developing your cardiovascular fitness.

A GXP workout is made up of three stages...

1. **The warm-up phase** involves taking about five minutes to elevate your heart rate from normal and up to your 80 percent level. If, for example, you are using a stationary bike get on it and start pedalling slowly. Gradually increase the speed at which you are pedalling over several minutes until you hit your 80 percent level.

2. **The work phase** involves adjusting the speed of pedalling so that you are maintaining your heart rate between the 80 and 85 percent levels for three to five minutes.

3. **The cool-down phase involves** taking about five minutes to lower your heart rate back to normal. Simply decrease the speed at which you are pedalling for several minutes until your heart rate is back to normal. (In practice, I stop my cool down once my heart rate decreases from triple to double digits.)

GXP can be performed using any type of cardio exercise so long as you can precisely adjust the intensity level. Exercise machines such as bikes, steppers and treadmills are ideal but there is no reason you can’t do GXP running outdoors so long as you can effectively alter your pace to hit the 85% percent of your heart rate maximum.

If you add up these three phases, you’ll see that a GXP workout should last no more than 15 minutes which, if performed thrice weekly, gives you a total workout time including warm ups and cool downs of 45 minutes – that’s less that what a lot of people do per session! GXP is certainly time efficient and while such short workouts may result in fewer calories being burnt, if you want to increase your fitness but have very little time to dedicate to exercise, GXP is certainly worth considering.
12. Out and Back Heart Rate Run
The out and back heart rate run is a variation of an old standard military fitness test called the BFT or Basic Fitness Test. In a true BFT, you simply run 1.5 miles at a slow speed and then run a second 1.5 miles as fast as you can. However, I think that using a heart rate monitor and heart rate training zones can make this out and back run more effective.

For the first 1.5 miles, run and elevate your heart rate to zone 2 – 60-75% of your maximum. This will provide an easy warm up, improve your aerobic fitness and prepare your body for the more demanding run that follows. Ideally, run out from your starting location to a predetermined point 1.5 miles away. This will ensure your return leg is the same distance.

On completion of the first 1.5 miles, spend a few minutes stretching and catching your breath – five-minutes should do it.

Then, run back the way you came but push the pace so your heart rate climbs to zone 3 or 75 to 90 percent of your maximum heart rate. Remember, the aim is to complete this second 1.5 miles as fast as possible so push your heart rate up to the high end of this zone.

This modified BFT not only develops your fitness – it’s also an effective way to measure it. If you complete the return leg in a shorter time with the same heart rate or the same time at a lower heart rate, your fitness has definitely improved.

So, there you have it – 12 different heart rate-controlled workouts to try.
Remember to always warm up before and cool down after each one and adjust durations and intensity levels to suit your current level of fitness and experience. By using a heart rate monitor, you can personalise almost all workouts; where a fit person may need to run at 8 miles per hour to hit 75 percent of their maximum heart rate, a less fit person might only need to walk at 4 miles per hour. Despite the difference in speed, both exercisers will be working at the same level of intensity and both will experience benefits and fitness improvements by exercising at the correct level of intensity.
9. Conclusion

Advances in technology are not always a good thing. For example, it could be argued that technological advancements are at least partially responsible for the current obesity crisis as they have all but removed the need for much of the physically demanding activity that used to keep us slim and healthy and has changed the food we eat almost out of all recognition. Walking for transport, manual labour, locally grown foods and unprocessed meals made from nutrient dense foods have, because of technology, been replaced with cars, machinery, pre-prepared microwave meals and foods that simply didn’t exist until relatively recently.

It’s ironic then that technology has also delivered one of the most useful tools for keeping fit and healthy, for making sure that not only you do enough exercise but the exercise you do is hard enough to be beneficial but no harder than it needs to be and that you are properly recovered from one workout to the next. Of course, I’m talking about heart rate monitors.

A heart rate monitor, be it a very basic model or top-of-the-range, is like an attentive, insightful, knowledgeable 24/7 personal trainer whose sole job is to make sure you get the most from each and every workout. By measuring your heart rate, a heart rate monitor knows more about you than you know yourself and can guide you to developing a level of fitness that you might not otherwise reach without one.

By combining the information in this book with regular use of a heart rate monitor you will get fitter, faster and being that time is such a valuable commodity, means that training with a heart rate monitor is a very good idea indeed!

Patrick Dale
Cyprus
August 2015
10. About the Author

Born in Bristol, England, in 1968, Patrick Dale realized at a very early age that sports and fitness was "his thing" and has devoted almost all of his life to these pursuits.

After studying physical education in college, Patrick began working as a gym instructor and aerobics class teacher before quickly progressing to facility management. He was soon personal training a select group of clients before Personal Training became a recognized job title.

He took a five year break from the Health & Fitness industry to join the Royal Marine Commandos - one of the most elite fighting forces in the world. The Marines have a reputation for "training hard and fighting easy" and Patrick's high level of fitness was tested to the extreme during his service. Patrick saw active duty in many parts of the world including Northern Ireland.

Patrick left the Marines to resume his Health & Fitness career first as a fitness manager and then he began teaching other people how to become personal trainers and gym instructors. He now has his own training company in Cyprus called Solar Fitness Qualifications which provides professional certification courses for those wishing to follow in his footsteps in to the rewarding industry of Health & Fitness.

As an enthusiastic sportsman, Patrick has been involved with and competed in a wide variety of activities including athletics, rugby, rock climbing, weightlifting, bodybuilding, triathlon, martial arts, trampolining and gymnastics. He is currently training to compete in his first powerlifting competition.

His main areas of professional interests are strength and conditioning for improved sports performance, nutrition, fitness psychology and weight management as well as family health and fitness - an area he is very passionate about promoting. Believing that prevention is better than cure, he wants to help people of all ages to get the benefits of a healthy lifestyle and reduce their risk of the common chronic diseases associated with poor nutrition and inactivity. Patrick has written three books – ‘Military Fitness Training’, ‘Live Long, Live Strong’ and ‘No Gym? No Problem! The Home Workout Bible’ which are available from Amazon:

http://www.amazon.co.uk/Patrick-dale/e/B00B5HPLRO/ref=sr_n tt_srch_lnk_3?qid=1390912860&sr=1-3&tag=csxpedeb-21
When he isn’t researching and writing health & fitness related articles for various international magazines, lecturing, or writing books, Patrick enjoys spending his free time reading fiction, taking photographs, watching movies, cooking, walking his three great Danes and making the most of the sunny climate of Cyprus.