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Mark Allen on Heart Rate Training

from Mark Allen

 Website: <http://www.markallenonline.com/Default.asp?partner=dua> on January 7, 2002
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Working Your Heart

 The secret of training smart
Updated Summer 2009

During my 15 years of racing in the sport of triathlons I searched for those few golden tools that would allow me to maximize my training time and come up with the race results I envisioned. At the top of that list was heart rate training. It was and still is the single most potent tool an endurance athlete can use to set the intensity levels of workouts in a way that will allow for long-term athletic performance. Yes, there are other options like lactate testing, power output and pace, but all of these have certain shortcomings that make them less universally applicable than heart rate.

In our sport there are three key areas of fitness that you will be developing. These are speed, strength and endurance. Strength is fairly straightforward to do. Two days per week in the gym focusing on an overall body- strengthening program is what will do the trick. More time for a triathlete usually ends up giving diminished returns on any additional strength workout. These two key days are the ones that will give you the strength in your races to push a high power output on the bike, to accelerate when needed on the run and to sustain a high speed in the water.

Next are the focused workouts that will give you raw speed. This is perhaps the most well known part to anyone's training. These are your interval or speed sessions where you focus on a approaching a maximal output or your top speed at some point in each of these key sessions. But again, developing speed in and of itself is a fairly simple process. It just requires putting the pain sensors in neutral and going for it for short periods of time. A total of 15-20 minutes each week in each sport of high intensity work is all it takes.

Now for the tougher part the endurance. This is where heart rate training becomes king. Endurance is THE most important piece of a triathlete's fitness. Why is it tough to develop? Simply put, it is challenging because it usually means an athlete will have to slow things down from their normal group training

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pace to effectively develop their aerobic engine and being guided by what is going on with your heart rate rather than your will to the champion of the daily training sessions with your training partners! It means swimming, cycling and running with the ego checked at the door. But for those patient enough to do just that, once the aerobic engine is built the speedwork will have a profound positive effect their fitness and allow for a longer-lasting improvement in performance than for those who blast away from the first day of training each year.

What is the solution to maximizing your endurance engine? It's called a heart rate monitor.

Whether your goal is to win a race or just live a long healthy life, using a heart rate monitor is the single most valuable tool you can have in your training equipment arsenal. And using one in the way I am going to describe will not only help you shed those last few pounds, but will enable you to do it without either killing yourself in training or starving yourself at the dinner table.

I came from a swimming background, which in the 70's and 80's when I competed was a sport that lived by the "No Pain, No Gain" motto. My coach would give us workouts that were designed to push us to our limit every single day. I would go home dead, sleep as much as I could, then come back the next day for another round of punishing interval sets.

It was all I knew. So, when I entered the sport of triathlon in the early 1980's, my mentality was to go as hard as I could at some point in every single workout I did. And to gauge how fast that might have to be, I looked at how fast the best triathletes were running at the end of the short distance races. Guys like Dave Scott, Scott Tinley and Scott Molina were able to hold close to 5 minute miles for their 10ks after swimming and biking!

So that's what I did. Every run, even the slow ones, for at least one mile, I would try to get close to 5 minute pace. And it worked sort of. I had some good races the first year or two, but I also suffered from minor injuries and was always feeling one run away from being too burned out to want to continue with my training.

Then came the heart rate monitor. A man named Phil Maffetone, who had done a lot of research with the monitors, contacted me. He had me try one out according to a very specific protocol. Phil said that I was doing too much anaerobic training, too much speed work, too many high end/high heart rate sessions. I was forcing my body into a chemistry that only burns carbohydrates for fuel by elevating my heart rate so high each time I went out and ran.

So he told me to go to the track, strap on the heart rate monitor, and keep my heart rate below 155 beats per minute. Maffetone told me that below this number that my body would be able to take in enough oxygen to burn fat as the main source of fuel for my muscle to move. I was going to develop my aerobic/fat burning system. What I discovered was a shock.

To keep my heart rate below 155 beats/minute, I had to slow my

pace down to an 8:15 mile. That's three minutes/mile SLOWER than I had been trying to hit in every single workout I did! My body just couldn't utilize fat for fuel.

So, for the next four months, I did exclusively aerobic training keeping my heart rate at or below my maximum aerobic heart rate, using the monitor every single workout. And at the end of that period, my pace at the same heart rate of 155 beats/minute had improved by over a minute. And after nearly a year of doing mostly aerobic training, which by the way was much more comfortable and less taxing than the anaerobic style that I was used to, my pace at 155 beats/minute had improved to a blistering 5:20 mile.

That means that I was now able to burn fat for fuel efficiently enough to hold a pace that a year before was redlining my effort at a maximum heart rate of about 190. I had become an aerobic machine! On top of the speed benefit at lower heart rates, I was no longer feeling like I was ready for an injury the next run I went on, and I was feeling fresh after my workouts instead of being totally wasted from them.

So let's figure out what heart rate will give you this kind of benefit and improvement. There is a formula that will determine your Maximum Aerobic Heart Rate, which is the maximum heart rate you can go and still burn fat as the main source of energy in your muscles. It is the heart rate that will enable you to recover day to day from your training. It's the maximum heart rate that will help you burn those last few pounds of fat. It is the heart that will build the size of your internal engine so that you have more power to give when you do want to maximize your heart rate in a race situation.

Here is the formula:

1. Take 180
2. Subtract your age
3. Take this number and correct it by the following:
 - If you do not workout, subtract another 5 beats.
 - If you workout only 1-2 days a week, only subtract 2 or 3 beats.
 - If you workout 3-4 times a week keep the number where it is.
 - If you workout 5-6 times a week keep the number where it is.
 - If you workout 7 or more times a week and have done so for over a year, add 5 beats to the number.
 - If you are over about 55 years old or younger than about 25 years old, add another 5 beats to whatever number you now have.
 - If you are about 60 years old or older OR if you are about 20 years old or younger, add an additional 5 beats to the corrected number you now have.

You now have your maximum aerobic heart rate, which again is the maximum heart rate that you can workout at and still burn mostly fat for fuel. Now go out and do ALL of your cardiovascular training at or below this heart rate and see how your pace improves. After just a few weeks you should start to see a dramatic improvement in the speed you can go at these lower heart rates.

Over time, however, you will get the maximum benefit possible from doing just aerobic training. At that point, after several months of seeing your pace get faster at your maximum aerobic heart rate, you will begin to slow down. This is the sign that if you want to continue to improve on your speed, it is time to go back to the high end interval anaerobic training one or two days/week. So, you will have to go back to the ♦NO Pain, NO Gain♦ credo once again. But this time your body will be able to handle it. Keep at the intervals and you will see your pace improve once again for a period. But just like the aerobic training, there is a limit to the benefit you will receive from anaerobic/carbohydrate training. At that point, you will see your speed start to slow down again. And that is the signal that it is time to switch back to a strict diet of aerobic/fat burning training.

At the point of the year you are in right now, probably most of you are ready for this phase of speed work. Keep your interval sessions to around 15-30 minutes of hard high heart rate effort total. This means that if you are going to the track to do intervals do about 5k worth of speed during the entire workout. Less than that and the physiological effect is not as great. More than that and you just can♦t maintain a high enough effort during the workout to maximize our benefit. You want to push your intervals, making each one a higher level of intensity and effort than the previous one. If you reach a point where you cannot maintain your form any longer, back off the effort or even call it a day. That is all your body has to give.

This is what I did to keep improving for nearly 15 years as a triathlete and it is the basis for the coaching methodology at my coaching web site markallenonline.com where since 2001 Luis Vargas and I have coached hundred of triathletes to great results. It is certainly a challenging methodology for many but the rewards are huge. I invite you to become one of our athletes. Luis and I will personally answer any questions you may have about this methodology and how to overcome many of its challenges. See you at the races.

Mark Allen
6 Time Ironman World Champion
Mark Allen coaching services are available at
www.markallenonline.com

Below:
Mark Allen
Photo by Tony Svenson



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Mark Allen on Heart Rate Training

[Reply](#)

by [couretp](#) on January 7, 2002

[Mail this to a friend!](#)

I was first told this by a triathlete/scientist by the name of Chris Eschbach. He tested my anaerobic threshold and VO2 Max, and explained exactly why this stuff works. Now Carmichael and The Grip. This must be the way to go, the results speak for themselves. How many of you guys actually follow this regimen though? Any good results/stories?

Mark Allen on Heart Rate Training

[Reply](#)

by [DRDUATHLON](#) on January 7, 2002

[Mail this to a friend!](#)

Great article. Being a competitive "Type A" person can certainly make this sort of training difficult. But it is very useful.

Mark Allen on Heart Rate Training

[Reply](#)

by [yosundy](#) on January 7, 2002

[Mail this to a friend!](#)

I agree, with those credentials behind it - and many, many, many others - one has to give it a whirl. However, you absolutely must be extremely patient. It does take time, especially if you have never done it before. It's a painfully slow pace at the beginning, and if you like trail runs w/ hills, you'll either have to stay away from them, or even WALK up the hills! Mark Allen himself told me that is what one needs to do to stay in the proper "zone."

Mark Allen on Heart Rate Training

[Reply](#)

by [MarkLemmon](#) on January 7, 2002

[Mail this to a friend!](#)

Can anyone explain how the HR formula works the same for everyone when there is such a variation in maximum HR between individuals? I have a friend who is comparable in conditioning, race times and age to me who will be working significantly harder at 145 HR than me, because his max is lower.

I'd also like to hear from experienced athletes who have tried this type of training and have made improvements. Thanks.

Mark Allen on Heart Rate Training[Reply](#)by [amart](#) on January 7, 2002[Mail this to a friend!](#)

One more question to add is, How do you equate for body weight? Is the 200 pounder suppose to train at the same HR as the avg 160lbs athlete. (and just for those who wonder, 5 lbs less and call me skeletor)

Mark Allen on Heart Rate Training[Reply](#)by [couretpt](#) on January 8, 2002[Mail this to a friend!](#)

I believe that (and I could be wrong, and I hope Mr. Maffetone doesn't get bent out of shape over this, but...) the training would be more accurate and personalized if it was based on your actual anaerobic threshold or lactate threshold. Meaning that you would train at a percentage (i.e., 60%) of your lactate threshold, not some formula based on age (not that there is anything wrong with that if you don't have the opportunity to get LT testing), which is pretty generic.

RE: Mark Allen on Heart Rate Training[Reply](#)by [TRI3](#) on January 8, 2002[Mail this to a friend!](#)

IMO the formula Mark suggests is basically useless for many athletes. I have been using a HR monitor since the late 80's/early 90's. Since that time I have never seen my HR past 180. 10 years later and my max is about HR 165. Based on Marks formula I have a aerobic HR of 149 ($180 - 36 + 5$), which is way over my aerobic HR. My Aerobic HR based on testing with those hoses you stick in your mouth and then run on a treadmill is around 118 - 123. If I were to train around the 149 value, I would never see the aerobic effect Mark is talking about. Instead each workout would be pretty tiring.

My Max HR is 165

My Wife's Max HR is 210 and she is 38.

My Roommates Max HR is 190 and he is 32.

So you can see from above that using Mark's formula wouldn't work for this group.

Mark Allen on Heart Rate Training[Reply](#)by [yomc](#) on January 8, 2002[Mail this to a friend!](#)

I have always wondered whether or not Mark Allen would have achieved those results through Aerobic Training if he hadn't already put in all those years of anaerobic training. If he had started out in the beginning of his career using Maffetone's philosophy would he have had the amount of success he did? I agree that aerobic training can work and is the safest way to train injury free, but can you reach your full potential without pushing yourself to your absolute limits at times?

RE: Mark Allen on Heart Rate Training[Reply](#)by [march66](#) on January 8, 2002[Mail this to a friend!](#)

Don't forget that he said to start with the slower aerobic work then move to some anerobic workouts to help get over the slide you get from only doing aerobic workouts. I have tried this training and it is extremely boring but it has worked for me. I am slow any way but within 3 weeks my speed was up by over 1/2 mile an hour and things were getting easier. It is very hard to go slow to go fast but remember it's only for a few months then you can add in your speed work. Good luck everyone.

Mark Allen on Heart Rate Training[Reply](#)by [drghs](#) on January 10, 2002[Mail this to a friend!](#)

The Maffatone method that Mark Allen described has some virtue and some vices. I think athletes should embrace the virtues and ponder the vices.

Virtue 1. It holds athletes back. Most endurance athletes train too hard, and not because they are ambitious. Much overtraining is a product of nerves and insecurity and a lack of emotional self control.

Any method that holds athletes back a little will tend to reduce overtraining, injuries and illness.

Virtue 2. It backfills the aerobic "tank." When, as adolescents, most of us started athletics, we had a "base" of years of aerobic play. Then as we age, and over time, school, work and later family devour play time, we increasingly have only the time to carve out a few hours a day for more intense workouts. With this our aerobic tank "empties." You see testimony to this in the descriptions of the fitness of athletes when they started maffatone. Mark allen's 8:15 aerobic pulse is bad, a sign of poor aerobic development, especially for a guy who could run around 46 minutes for 15k. Same with Jan Ripple. Since the anerobic and threshold will tend to linger for a time, the return to slower running "backfills" the aerobic tank, while the others remain developed (at the very least from occasional races.) So they race well.

Vice 1. The method misses the point sorta. The real lesson of the Maffatone method is that training should be balanced. That really means lots of aerobic, both low and high quality, and prudent doses of anaerobic.

Many athletes are unbalanced or do too much anaerobic because they set arbitrary training paces ("I run my distance runs at 6:30 no slower") with no real relationship to their physiological capacities. Since many athetes are doing schedules not in balance, backfilling the aerobic simply creates what should have been in place from the outset - balance! When the Maffatone method then adds back in more quality work later, it is ending up where it should have started - with balance. (However, I do think that as a remedial program to fix a program out of balance, it is good to go back to aerobic only for a time. In addition all athletes should have a low quality period each year.)

2. Vice 2. Arbitrary pulses. The cookie cutter approach to pulses overlooks enormous individual variations in pulse ranges, and thus may undercut the very goal of the system. For example, I am 43 and have a low pulse of 40 and a high of 178. My friend is 45 and has a low of 41 and a high of 210 (we are both

male). Thus, if he trains at the Maffatone 140 he is at around 66%, while I would be at 79% at that same pulse. Notice that both of these pulses would be in the aerobic zone, so the goal of keeping training aerobic is accomplished for both of us, but his 140 is lower quality aerobic and my 140 is high quality aerobic. The difference is important.

Although a 66% pulse is fine for long runs of 6-15 miles, I think workouts like aerobic intervals (like 6-8 x1K at 80% pulse with 1 minute rest) are better when one is pushing the aerobic envelope. If my friend and I go out and try to run together in a distance run at 140 pulse, we will be running more easily than I will be. Over time, if I push that high quality aerobic level too often, I risk injury just as I would if I did too much anaerobic work. In this way, the cookie cutter pulses may actually make training too hard for athletes with low max pulses, even though the training would remain marginally aerobic.

So it would appear that the high pulse and low pulse figures do matter and that something like the Karvonen pulse rate might be a better bet. I think most athletes would be better served to use the age adjusted Karvonen pulses in their training (not the maffatone) but use that non-Maffatone pulse to accomplish the Maffatone goals - to fill or backfill aerobic capacity and to make training reasonable and balanced.

Vice 3. Arbitrary Paces. In his book, Maffatone has a chart of Max aerobic paces for given performance levels. These are wildly out of whack. The maffatone pulse for some of the levels are close to 80% pulse and some are as low as 70%. These variations could lead athletes to underpredict or overpredict races or to underpredict or overpredict training paces.

Bottom Line - There is much to be said for the maffatone idea of making most training more comfortable and largely aerobic, especially for athletes training too hard and too anaerobic. However, the cookie cutter and arbitrary pulses and paces hurt the system. The same system - much aerobic, a little anaerobic - with Karvonen pulses that allow for individual variations in high and low pulse may be a better bet. Notice the latter is much more like what Chris Carmichael recommends. Chris C. warns that the same pulses do not work for Lance and Hincapie for example. Maffatone would have them training at the same pulse.

RE: Mark Allen on Heart Rate Training [Reply](#)
by [thegrip](#) on January 16, 2002 [Mail this to a friend!](#)
Mark Lemmon wanted to know from some experienced triathletes if my system of training worked. I would consider myself pretty experienced and 6 Ironman titles enough to know that it works.

The concern he had over different max heart rates is a good concern to raise. However, your switch to anaerobic is not directly linked to max heart rate, and for those who train too high too often, their max will be very high, but without having any

faster times.

His friend who is going faster and has a lower max at 145 is exactly the results that my style of training gives. And the formula is not the same for everyone. It is adjusted to your current and past fitness. It works. The Grip

RE: Mark Allen on Heart Rate Training [Reply](#)
by [thegrip](#) on January 16, 2002 [Mail this to a friend!](#)
A reply to amart....

The 200 pounder is going to train at exactly the same heart rates. And if that person is aerobically fit, I hate to say it, but they are going to kick some xz=x## on those skinny guys who do not have an aerobic base.

The Grip

RE: Mark Allen on Heart Rate Training [Reply](#)
by [thegrip](#) on January 16, 2002 [Mail this to a friend!](#)
Reply to courtpt.

The formula is based on age and on level of fitness. A lactate test is actually not that accurate because it is influenced by a huge number of factors that can drive it up or down on the day.

The formula that I use is based partly on age, which none of us can change, and fitness which we can all influence. The more fit a person, the higher the formula will give them for a training zone.

But the question is a very good one, and is one of the ongoing debates in coaching circles. The most accurate method of determining zones is expelled gas analysis while exercising. And this actually gives almost exactly the same numbers as you get from the formula. The Grip

RE: Mark Allen on Heart Rate Training [Reply](#)
by [thegrip](#) on January 16, 2002 [Mail this to a friend!](#)
Reply to yomc:

I used the heart rate training from 1984-1996. I put in two years of poor training and 13 of smarter training. I did my share of anaerobic work during that time, and there was only one guy crazy enough to go as hard as I went during my speed phase and that was Ken Souza. Hail to the king of duathlon!

The Grip

RE: Mark Allen on Heart Rate Training [Reply](#)
by [MarkLemmon](#) on January 17, 2002 [Mail this to a friend!](#)
Thanks for the response, Grip. I AM NOT WORTHY!!!!

RE: Mark Allen on Heart Rate Training [Reply](#)
Anonymous post on August 19, 2003 [Mail this to a friend!](#)
test

RE: Mark Allen on Heart Rate Training [Reply](#)
Anonymous post on August 20, 2003 [Mail this to a friend!](#)
yes

RE: Mark Allen on Heart Rate Training [Reply](#)by [kzod](#) on August 17, 2004 [Mail this to a friend!](#)

If anyone is still reading this, just curious, how would we adjust this formula for days where we do long distances? Not sure how much lower we can go on these days, since Mark says work at that number or below.

The number I get is consistent with 78% of my Max HR, or 71% of My HRR (heart rate reserve), is this consistent with the numbers others are getting maximal benefits from? Given the source, it's good enough for me, my main concern is for long run days (I'm just training for my first Marathon)

KZ

RE: Mark Allen on Heart Rate Training [Reply](#)by [aw1839](#) on January 27, 2005 [Mail this to a friend!](#)

Well i read it all it not much more to say BUT about HR is all ways something. I red a book called BETTER TRAINING FOR DISTANCE RUNNERS. It tell you that the best way to find your max HR is to do two 800m easy on the first one and really pushing the second one. Far as aerobic they tell you that should be 60% of the weeks work living 40% as anaerobic. Just to say something. armando

RE: Mark Allen on Heart Rate Training [Reply](#)by [francoispl](#) on December 26, 2008 [Mail this to a friend!](#)

I started Mark Allen's aerobic training (after reading this article that was initially published in 2001) at the end of 2001 preparing for the next season of triathlons.

I can say that it requires a lot of patience, and it often means solo training.

But i have to say that it worked for me. Coupled with strength training and speed training, it allowed to improve significantly on the bike especially. On IM Austria for example, i improved my swim split time by 7mn (1h05' -> 58'), bike split time by 30mn (6h -> 5h30') with less fatigue. I felt much feshier at the start of the marathon. If i had managed in a better way the run i would have improved dramatically my overall time (10h57' -> 10h39'). On that day i consider that my performance should have been between something like 10h15', which makes a potential improvement of 42mn.

Adding to that i felt much less tired at the end of the day than i did on my first IM Austria race.

I dont compete anymore, but i still use a HRM and train mostly in aerobic zone. I participate to local trail runs from time to time, i can tell i can still feel the benefit of that type of training.

Thats my experience. Best of luck to all of you.

RE: Mark Allen on Heart Rate Training [Reply](#)by [MtBiker77](#) on February 13, 2011 [Mail this to a friend!](#)

I am confused about the final outcome of such aerobic (re)conditioning really is. Suppose I run a 10k pegged at 180bpm now. If I were Mark Allen and retrained myself to train aerobically at ≤ 155 bpm, then at the end of such reconditioning, would I expect to run a 10k in the same time at 155bpm instead of 180, or would I simply have 25bpm of headroom to run that much

faster? Or would it be a combination of the two, in which case I would see <180bpm as my new 10k max, yet my time would still improve somewhat(?).

Jamie

RE: Mark Allen on Heart Rate Training [Reply](#)
by [DevonH](#) on April 15, 2011 [Mail this to a friend!](#)

I think he means that if you stay at the aerobic heart rate long enough (a few months) you will eventually get a lot faster, but will not have to work as hard at it. For example, some people that are able to run fast may only be able to do so if their heart rate is in anerobic mode, while others who have done aerobic training may be able to run at the same pace with much less effort and lower heart rate, and therefore will have more energy to complete longer milage. I hope that is what the article was trying to say anyway, that is how I understood it.

RE: Mark Allen on Heart Rate Training [Reply](#)
by [musicmatt](#) on May 24, 2011 [Mail this to a friend!](#)

Hi Mark,

Just found this article after using a HRM for the first time ans seeing a whopping HR!!! Anyway I am really inspired by your techniques, was just wondering if I can still mix it up with fast group rides, or is it a strict diet of controll!??

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