

Athlete education: You feel your heart...beat...

Classical formula heart rate max formula (HRmax) = 220 - your age.

Where did the 220 come from? It is the theoretical maximum that an infant's heart can beat in one minute, and presumably for every year we lose a beat. This has been used since the beginning of time (not really but you get the gist) but it has been found to be, while an easy calculation, inaccurate especially for those of us over 40. You will find that a lot of the online heart rate calculators still use "220 - your age" instead of a more precise equation.

The American College of Sports Medicine (ACSM, 2010) actually recommends, when possible, to use the newer equation. As you see, this is a little bit more complicated and requires either a calculator, or a spreadsheet.

$$\text{HRmax} = 206.9 - 0.67 \times \text{your age}$$

I like to get as precise as I can since we have an inaccurate tool to begin with, so when I program heart rates for my athletes I use the newer formula. I have it set it up in a spreadsheet, I know my athlete's age, and *away we go!* My spreadsheet provides both run and bike numbers.

As I mentioned above, the theory is that you can lose one heartbeat per year, however if you've been athletic all your life, or if you genetically have a higher heart rate, or other genetic and lifestyle considerations, this may not apply to you. Henceforth in the new formula our age is not as weighted. Medications, stress, how well you slept, if you just ate, what you ate, when you're training & caffeine can also influence HR considerably.

The next variable of heart rate is **resting heart rate (RHR)**. This is the lowest that your heart rate can go at any time, otherwise you'd be dead. You get to the lowest point when you are the most relaxed in your deep sleep, some point during the middle of the night. The most accurate way to take this is to wear a heart rate monitor to bed, and then find out what your lowest number was as you slept. The other way to find it: wake up without the alarm and without moving around too much, find your pulse in your wrist or in your neck, and count for a full minute. Counting for that full minute gives you much more accuracy than 10 or 15 seconds, which tends to be more common. What's the advantage of knowing your RHR? It shows change over time as it relates to fitness, ie, the more fit you are, the lower your RHR. If you get up one morning and find your heart rate is elevated 5 to 10 beats, look at lifestyle factors and influences going on, but it may be that you need to do a recovery session that day, or even take it off. Having the RHR elevated for a few days in a row can be indicative that you are getting over trained, and again something to check in with and see what's really going on. Use resting heart rate in conjunction with other variables to give you a picture of what's happening. If you have a good feel of your RHR, it can also be plugged into your HR Zone calculations, but then we'd have a whole new spreadsheet.

So now into your training Zones, and what you should be doing in each of them.

Zone 1: 65 to 74% heart rate max

This zone is used for Recovery, as well as longer aerobic training. Part of your warm-up and stuff in between your quality sets would be in this range. Recovery runs might even be in this range.

Zone 2: 75 to 85% of heart rate max

This stone is your higher end aerobic training, the very top is what we refer to as your sweet spot. The Sweet Spot is a heart rate or Pace even that you can maintain for an extended. Of time without too much effort, it just feels easy. This is the Zone where you develop the physiology to go longer & faster. Yes, it takes a good long while to really build it, to understand it, but once you do - you're GOLDEN.

Zone 3: 86 to 89% of heart rate max

The dreaded "No Man's Land" where, typically, people who are not used to working with heart rate end up - it's too hard for your long runs and too easy for your quality runs. It takes discipline to stay out of this Zone. Obviously you're going to pass through it on your way to Zone 4, but minimize hanging out unless it is specifically programmed into your training plan.

Zone 4: 90 to 95% of heart rate max

You could sustain this HR for about an hour, and then you'll have to drop your intensity. This is your "quality" work section, keeping in mind that if the set is under 3 min, HR may not be the best indicator.

Zone 5: 95% & above

This is your max zone - however, you typically aren't in this zone long enough to get a true HR read - it takes 3 min for your HR to respond & stabilize to effort, and most of the work in this zone... you're not lasting that long. If you are, we need to re-adjust.

Use these for running, if you are cycling you're going to be 5% lower - so take whatever number you got for the heart rate from above, and multiply by 0.95 (that spreadsheet is looking pretty good about now, eh?).

Now that you know your training zones, take a look at where you upload your data. What are the training zone numbers that system is using, and what are the formulas? I personally feel you need to know your numbers - memorize them - and go by that vs. what Garmin tells you. Update your Training Peaks or other apps if you are able.

So, the caveat with HR training... It's a guess. Some people have a naturally lower or higher RHR, so it can influence your zones. Take them with a grain of salt. If you're training in the middle, you're probably going to be in the right area. As you gain experience using HR, and it feels too easy, bump your numbers up a few beats. If you're using a program like Training

Peaks, it may actually say you've set a new threshold (it does all your tracking over time), and then you have to go make sure it's really a new threshold. Explore your data. Maybe it is, maybe it isn't. Maybe HR was high because of temps, in which case, pace would be a better indicator.

Not training with HR yet? That's ok. It's the next level for when you are ready to improve. People starting out use time - how long they were out exercising/training, how often. Next is being aware of & controlling the intensity (HR). And yes, there's more beyond this... when you're ready: Pace... Power...