



# Annapolis Striders Winter Half Marathon Training Program

TRAINING UPDATE 04

## OUR SECOND SIX-MILER AND OUR MAKE-UP

On Saturday 27 January, of the 165 registered to date, 85 runners signed in and participated in our group run. Many logged 6 miles to the top of the East/West Boulevard Bridge, some ran to the 8-mile marker for 6.2 (a 10K), and some veterans pressed for more. Along with many of us who have and many who will register for the B&A Trail Half on April 8<sup>th</sup>; several among us are running the Coastal Delaware Running Festival Half the weekend of April 20-22, and others still will take on the Frederick Running Festival Half on May 6<sup>th</sup>.

For our second run were joined by a handful new to group, and while seemingly unrelated I want acknowledge Robert and Cindy for sharing information with us today about hydration and “singing pace”. They are actually related in that there is value in running together and sharing information, opinions and insights with each other. Each one of you brings a unique perspective with regard to what you may do to avoid injury, what you believe are running rules and practices, and things that simply do and don’t work for you. These perspectives... right, wrong and indifferent, get us thinking more about what we need to do to be self-sustaining and injury free runners.

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**NOTE** – This document conveys an interpretation of information derived from a number of sources. Always consult your doctor before implementing any training plan or regime based on perceived or calculated exertion levels; including those described here-in.

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## HEART RATE ZONES AND TRAINING IN THEM

SOOooo, why do we stress running at conversation (or singing) pace? It was in the program announcement, the training plan and we talked about it Saturday...

Fair warning...if you suffer from bouts of analysis-paralysis from time to time; skip this entire discussion and we’ll see you next Saturday. ☺

Most of you already cope with the effects discussed below as you’re already running an hour or more regularly. However, because managing your run becomes more important as we begin to extend your range toward the two hour mark; I wanted to provide you information that helps you better understand why you feel the way you do or will, as we start adding miles.

Also referred to as Training Zones, it is important you understand what Heart Rate (HR) Zone you’re operating in when you’re running so you know how long you can maintain that speed, and what’s happening to your body while you’re doing it. Unlike your car that simply stops when its fuel is depleted; your body has several fuel stores it will work its way through over the course of a long run, and we want to nibble on the first one as long as we can. While being mentally tough is important, physiology is in charge of how long your run will last at the speed you choose to do it; so, we want to help you understand how to delay the onset of

fatigue and soreness as long as you can. Your HR (zone) is the best on-the-fly indicator how hard your engine is working and there's two ways to figure that out.

**SUBJECTIVE HEART RATE ESTIMATE** - Estimate what zone you're in based on how you feel.

- **Zone 2**, also called the **Fat Burning Zone** is how you feel during a brisk walk or just breaking into a run; you feel slightly taxed, breathing is elevated but not heavy or hard.
- **Zone 3** is the **Aerobic Zone** – In this zone you'll find your “conversation” pace. You can speak in complete, not choppy sentences...and you are not gasping for air. This is Target Heart Rate for our long runs and the most effective for overall cardiovascular fitness; breathing is heavy, but not hard.
- **Zone 4** is the **Anaerobic Zone** – this zone, or pace is comfortably hard. This is a pace you can sustain for a while; but, you're pushing, or pressing. In this zone you're at your Lactate Threshold which means you're producing lactic acid faster than you can remove it, and your muscles won't last very long. You can only speak in bursts and you don't want to, you can't speak in full sentences and you hate the person running next to you who can.
- **Zone 5**; you should only operate in Zone 5 if you are very fit. Zone 5 in essence is sprinting; most often introduced when doing speed work like intervals and fartlek runs. This is operating at full, or near full speed; like running a lap around a track as fast as you can.

**OBJECTIVE HEART RATE MEASUREMENT** – Measure your HR with a Heart Rate Monitor (HRM)

A couple factors are measures of fitness:

1) **VO<sub>2</sub> Max** is a measure of pulmonary efficiency; specifically, maximum amount of oxygen your body can deliver to the organs and muscles that need it during sustained increased levels of activity. Some higher end HRM-enabled GPS watches estimate it using data they gather during a timed set of sequential runs or over time.

2) **Heart Rate** is the most common measure of exertion used in training devices and applications today. Most use theoretical values, and some allow a user to enter their own measured or estimated Maximum and Resting Heart Rate values to create target heart zone ranges for training. While rules of thumb are sufficient when exercising to stay fit; if you're interested in improving your fitness and performance, nothing beats measurements (data).

3) **Resting Heart Rate** is arguably one of the best indicators of your level of fitness. An adult in generally good health will measure a resting heart rate of 70-75 beats per minute (bpm). Fit people who get lots of aerobic exercise (like us because we're AWESOME) will likely log a resting heart rate between 50-60 bpm. If your resting heart rate is above 80, you need you change something; now. With regular aerobic workouts your resting heart rate will decrease over time as you become more fit.

iPhone Screenshots



The best time to measure your resting heart rate (also called pulse rate) is when you first wake up in the morning while you're still in bed. If you don't wear a Heart Rate Monitor (HRM) or fitness tracker with an HRM feature that you also wear to bed at night, you can download HRM apps that use the flash in your phone's camera to tell you what's going on.

I use an App Called Heart Rate by EllisApps.com. With it I can take my heart rate when I first wake up and it will log it over time. It's free.

**Table 1** below illustrates three ways most might determine target Heart Rate (HR) zones for exercise and racing. The most common method is to establish a **theoretical maximum heart rate** by subtracting one's age from 220, and then multiplying that number by range bracketing percentages to establish training zones discussed above. For example, multiply your **Theoretical Max HR** by the min and max **Bracket % values** for each zone. In Table 1 for a 50 year old male, the **blue columns** in the chart reflects 220 less his age times 60% and 70% for Zone 2, 70% and 80% for Zone 3, etc.

The second method to establish zones is to calculate upper and lower zone limits based on **maximum heart rate measurements**. Determine a Max HR by taking the average of your highest 10 heart rates measured with a Heart Rate Monitor (HRM) as shown in **Table 2**. With this method, you're using an actual set of measurements to determine your training zones based on what your heart is actually doing (**magenta columns**), rather than using a **theoretical maximum** based on your age; **Max Measured HR \* Bracket %**. This method is probably best for most runners; so long as you reestablish a Max Heart Rate periodically (snap shot a new set of 10 measurements), and verify with your doctor the resultant ranges are safe for you. Most HRM record a min, **Max**, and average HR (AHR) during a measured run or activity.

The third method to establish zones is the most aggressive. With this method you'll calculate zones using an average of both your **Resting Heart Rate** and your **Maximum Heart Rate** measurements that were gathered with an HRM over time. With those values you subtract your resting HR from your max HR before multiplying the range bracketing percentages to the remainder. Once you get those values, you add your resting HR to the product(s). The **Orange columns** show the min and max zone values with the resting HR


added back to product to bracket the zones;  $((\text{Max Measured HR} - \text{Resting HR}) * \text{Bracket \%}) + \text{Resting HR}$ . There are many opinions and perspectives; but, many coaches, including me believe this is a more accurate number, because it uses your measured max HR instead of the theoretical, and takes into account your resting HR, which decreases as your fitness improves. This is also the MOST AGGRESSIVE set of zones to work to; and absolutely should be verified as okay by your doctor.

**Table 1** is available as a spreadsheet I will post on our Training site where values are calculated automatically for you.

Heart Rate Training Zones				Using Theoretical		*Using Measured		*Using Measured	
Training Effect	Zone	What it does	% of Heart Rate Reserve	Calculated Band Min	Calculated Band Max	Calculated Band Min	Calculated Band Max	Calculated Band Min	Calculated Band Max
2	Long, slow runs, easy or recovery runs	Training in this zone improves the ability of your heart to pump blood and improve the muscles' ability to utilize oxygen. The body becomes more efficient at feeding the working muscles, and learns to metabolise fat as a source of fuel.	60-70%	102	119	120	140	138	154
3	Aerobic zone or "target heart rate zone"	Most effective for overall cardiovascular fitness. Increases your cardio-respiratory capacity: that is, the your ability to transport oxygenated blood to the muscle cells and carbon dioxide away from the cells. Also effective for increasing overall muscle strength.	70-80%	119	136	140	160	154	169
4	Anaerobic zone	The point at which the body cannot remove lactic acid as quickly as it is produced is called the lactate threshold or anaerobic threshold. It generally occurs at about 80-88% of the Heart Rate Reserve. Training in this zone helps to increase the lactate threshold, which improves performance. Training in this zone is hard: your muscles are tired, your breathing is heavy.	80-90%	136	153	160	180	169	185
5	VO2 max "Red line zone"	You should only train in this zone if you re very fit, and only for very short periods of time. Lactic acid develops quickly as you are operating in oxygen debt to the muscles The value of training in this zone is you can increase your fast twitch muscle fibers which increase speed.	90-100%	153	170	180	200	185	200

Age	50
Using Theoretical Max HR (220 - Age)	170
Measured Max HR	200
Measured Resting HR	45



Fill in values that apply to you in the cells to the left where you know them. If all you have is your age, you can exercise to that. If you have a measured min or max you can implement those.

These columns use only Theoretical Values, subtracting your age from 220 and calculating the min and max band limit values.
Uses the average of ten (10) measured Max Heart Rates, to calculate the min and max band limit values.
Min and Max band limit values calculated after subtracting your resting HR from measured max, then adding resting HR back to product.
* verify values with your doctor before you engage in any activities using the values to guide your level of exertion.

**Table 1. Determining Heart Rate Training Zones using three different Methods**

## DETERMINING MAXIMUM HEART RATE

Maximum HR is just that...the maximum number of times a human heart can beat in a minute. As we get older, our hearts simply wear out and they beat fewer times over the course of a minute; unless we exercise to sustain or improve our fitness which slows the impact of aging.

**Table 2** reflects the sample of runs where a 47 year old's Garmin Heart Rate Monitor (HRM) measured his HR each time he (my cousin's hubby) ran. Max HR was extrapolated by taking an average of the uppermost data cluster recovered from his Garmin activities (Running

only). The red dashed line indicates how 195 was established as a measured maximum for him. It isn't a guess. It is an average of the handful of **measured top maximum levels** recorded...a full 22 beats higher than the **theoretical max** (173) for the average male his age. While there isn't a ton of measurements; the cluster contains a statistically significant sample. In this case the data sample reflects his actual maximum as repeatedly measured. As each of us should seek the advice of our doctor with regard to the ranges and how long we should operate in them, once we calculate the ranges we should verify them with our doctor before increasing our exertion level to them over extended periods of time.

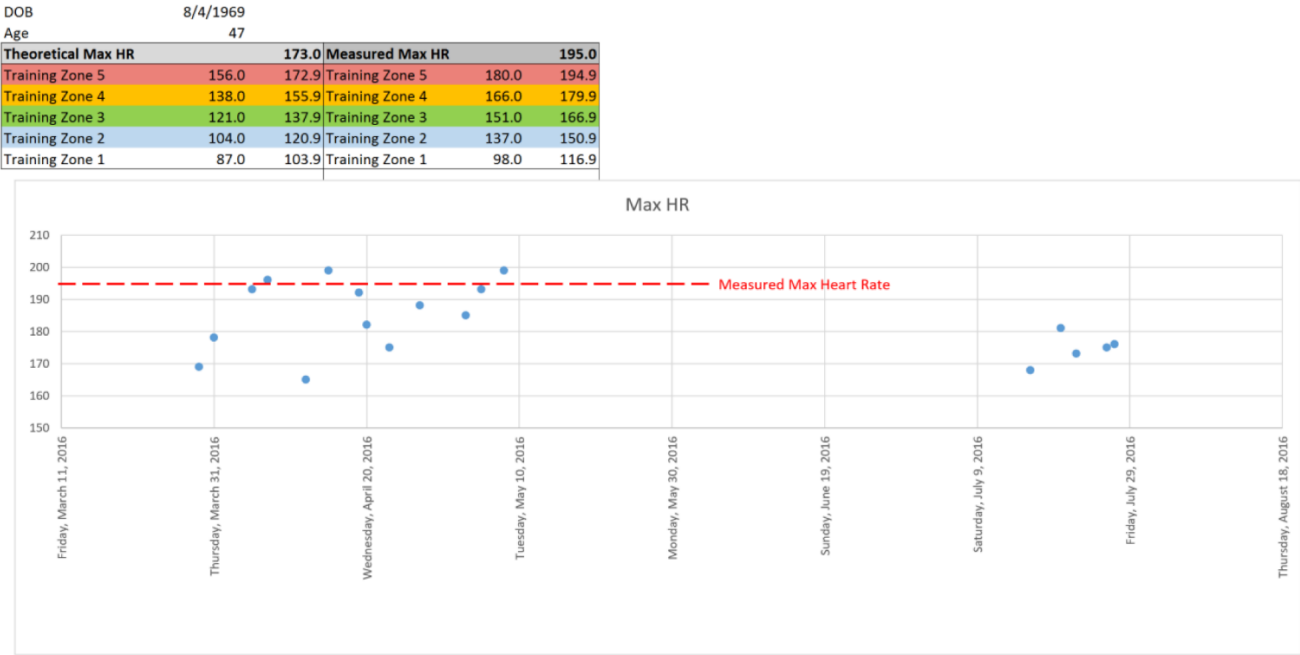


Table 2. Measured Maximum Heart Rate – 47 year old male

Note the **measured zones** are considerably higher than **theoretical**. While working to measured values is more "aggressive" than training to theoretical values; taking your **resting heart rate** into account is more aggressive still.

I know that was a lot of information and where many of you just want to run, part of our job is making sure you're informed. I am happy to help you assess information or verify results if you take a go at the math.

2018 HALF MARATHON WEEK 2 TRAINING PROGRAM STATS

As of today we are almost One Hundred Sixty-five registered, including me. As explained in Update No. 3, our group comprises a variety of folks with different starting points and goals, who've chosen to run or train together until the end of March.

Regardless of your goal, your coaches and mentors will help you prepare by offering advice and support, and by implementing a tried and true, and measured training plan.








Here's how things break out so far:

- Of **165** registered runners, **85** of us ran together Saturday morning January 27<sup>th</sup>.
- **112** female and **53** male runners registered for the program.
- **83** of **114** registered veterans, and **39** of **51** runners new to the half marathon are active in the Training Program (ran this or last weekend, or both).
- **88** of you use a **Heart Rate Monitor (HRM)**, or **non-HRM** enabled **GPS watch**, and **29** use a **GPS App** on our **phone**.

Please keep an eye on FaceBook and your email and check on Saturday before you head out, especially of the weather is iffy.

#### Severna Park, MD (21146) 10 Day Weather

12:52 pm EST  Print

DAY		DESCRIPTION	HIGH / LOW	PRECIP	WIND	HUMIDITY
TODAY JAN 28		Light Rain	51°/38°	80%	NNE 5 mph	96%
MON JAN 29		Partly Cloudy	45°/33°	10%	NNE 10 mph	69%
TUE JAN 30		AM Snow Showers	36°/21°	50%	NNW 15 mph	70%
WED JAN 31		Mostly Sunny	37°/31°	0%	SE 9 mph	46%
THU FEB 1		Partly Cloudy	49°/35°	0%	SSW 9 mph	62%
FRI FEB 2		Rain/Snow	40°/20°	90%	NNW 12 mph	70%
SAT FEB 3		Mostly Sunny	35°/27°	0%	W 8 mph	53%

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