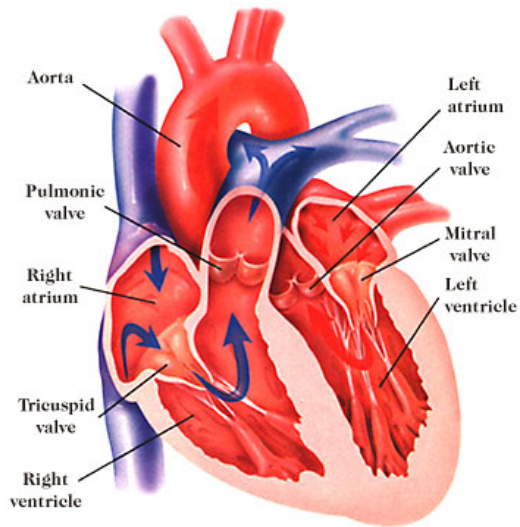


## The Efficient Heart: The Triathlete's Heart



Why do we have bigger hearts? Is it because triathletes are just more loving?

Well we are not just more loving, but our bodies are fine tuned athletic machines. For anything or anyone to be faster it has to be more efficient. This is why we train, this is why we spend \$\$\$ to jet-stream our bikes, and this is why we have such big hearts.

For as you will notice, our big hearts can put us through some of the most crazy workouts (Cardiac Hill and The Wall to name a couple), and yet at rest will beat fewer times than any of our sedentary friends. This is due to the fact that our bodies need increased amounts of oxygen during sustained exercise, so it circulates more blood which carries oxygen to our muscles. When just beginning an exercise program the heart will keep up with oxygen demand by beating more times per minute (bpm), but as we continue to workout the heart starts to adapt and become more efficient by pumping a larger volume of blood at each pulse. This is done in three ways:

First of all, our ventricle size increases (the chamber in the heart where the blood is pumped out to the body), this is because the wall of the heart will stretch and slightly thicken increasing its size, giving us triathletes such big loving hearts .

Second, our blood volume increases. With more plasma and red blood cells in the circulatory system, a higher volume of blood is returned to the heart at any moment. This adaptation is in fact quite rapid, and explains why VO<sub>2</sub> max can substantially change after only one week off the couch, but can also be lost just as fast (3-7 days).

Our blood volume per lb of bodyweight is about 15% higher than untrained folk.

Last of all, since our hearts have already started to become so efficient and can pump so much oxygen to our muscles, the heart doesn't have to pump as quickly, which decreases the heart rate, allowing the ventricle more time to fill, and thus pump even more blood.

Adding to this last fact, our heart rate decreases because the body only needs so much oxygen at any point. The average person's heart at rest will pump 70 ml per beat and beat 70 times per minute. At any one time the resting cardiac output is determined by oxygen demand and sufficient flow through the kidneys for filtration. This resting demand does not change while endurance training is heightened, though the way the oxygen is delivered does. After 6 months of training a person's efficient resting heart rate may decrease to 55 bpm, yet as we have seen the volume of blood pumped each beat will increase, and it will near 90 ml per beat to match the oxygen demand at rest. So a low resting heart rate will show how in shape a person's heart is, making a reduced resting heart rate the trademark of an endurance athlete. I know there are quite a few people on the team that have resting heart rates that are close to that of professional athletes, being in the high 30 to low 40 beats per minute. The great Miguel Indurain (5x winner of le Tour de France) had a resting heart rate of 28 bpm!

A few other facts about this great muscle that keeps us going, an average person's heart to keep up with oxygen demand must pump 75 gallons of blood an hour, 1,800 gallons every day, 657,000 gallons a year – that's enough to fill the Rec Center pool four times!

So I hope you have grown an appreciation for the organ that keeps on giving, and I hope that you are proud to have (or about to have for all you newbies) a great loving heart that is bigger and more efficient than 90% of the people out there! (this last fact was made up and may not actually be factual, but then again so are 67% of all statistics)

Coach Greg  
(low as 40 bpm resting heart rate)