

## 220 – Age: One Formula Does Not Fit All

by Jennifer Klau, Spinning Master Instructor

Two cardiologists were on a plane, poring over their data...


Although it sounds like the beginning of a joke, it's really the story of how the Max Heart Rate, (220 – age) equation came to be. En route to a conference, two cardiologists developed the equation for use by their peers in conducting stress tests. Although they never intended for 220 – age to be applied outside the medical field, it was and still is. In fact, most exercise physiology textbooks, ACSM guidelines, AFAA, and the Spinning Instructor Manual all recommend it for determining and monitoring exercise intensity, often without mentioning some of its inherent flaws.

Although the 220 – age (or 226 – age for females) equation can sometimes be an adequate estimate for some people, it's quite inaccurate for most. The reason? It doesn't account for the vast differences in individuals' fitness levels. That's why using the formula to recommend exercise intensity can be confusing—even frustrating. For example, sometimes you'll see a rider who is seated upright, pedaling contently on a flat road, reporting that his heart rate is at 85% of max. Obviously, the formula didn't work in his case. If he were at 85% of MHR he would be sweating, breathing hard and exerting considerable effort. The bottom line: since maximal heart rate is determined by a variety of factors, including, but not limited to genetics, physical condition, fitness level and age, using a simple equation simply based on age just can't work for every individual.

Since we monitor exercise intensity using percentages of max heart rate, starting with an accurate MHR is critical. When that number is off, the whole training plan is off. How can you ensure that you're burning fat effectively if you're unwittingly training in the anaerobic zone? Similarly, how can you build high-end endurance if you're not pushing your anaerobic threshold?

The good news is that there actually is an accurate way to safely determine max heart rate and come up with individuals' true target heart rate ranges for each Energy Zone™. Years ago when the 220-age formula was developed, only a stress test conducted by a physician could safely determine the data. In recent years, sub max testing has been available through qualified fitness professionals as well, but the testing equipment was prohibitively expensive for most health clubs. Paul Robbins, often spotted at WSSC performing VO<sub>2</sub> testing, uses an affordable, yet impressively accurate testing unit that any health club staff can learn to use. The tests are safe because they're sub-maximal—the athlete being tested is never asked to go very far beyond his/her anaerobic threshold. That's the point when the body can no longer flush lactic acid from the muscles as fast as it is being produced. Lactic acid accumulates in the blood, the rider fatigues and is literally forced to slow down. AT can occur anywhere between 80% and 92% of an athlete's MHR – but pinpointing precisely where it occurs is difficult, unless you measure oxygen uptake as Robbins does.

In the absence of sophisticated testing, we've found creative ways to estimate AT. Generally speaking, if an individual can carry on a conversation during exercise, he or she is in an aerobic zone. Alternatively, if one's breathing is labored and it's a struggle to talk during a workout, it's anaerobic. The benefit of understanding how and when this shift occurs is obvious. A rider who knows his AT can tailor training to maximize his/her time in the saddle. Since AT rises closer to MHR as fitness improves, and drops with improper training or time off, it is relatively easy to monitor progress over time.

Balancing the hard workouts with the easy, finding the right intensity, and putting it all together is science. By personalizing fitness goals, we can harness the abilities of each competitive athlete and everyday Spinning® enthusiast, factoring in individual differences and specific needs, without training at high intensities every workout, every day. 

*For information on the VO<sub>2</sub> analyzer that you can easily use in your Spinning facility, call 1.800.WOODWAY, extension 114. Be sure to ask about the special pricing available to Spinning facilities.*

