Putting your fitness to the test

By James Raia
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One poster hanging in the UC Davis Sports Performance Program office is a freeze frame of cyclist Andy Hampsten. While cresting Gavia Pass, he's riding alone en route to gaining the race leader's jersey and an eventual Tour of Italy victory.

The image spotlights performance in dramatic form. The now-retired cyclist is positioned slightly erect and forward as he progresses on a slick, slushy mountain road on a dark June day. His face, uniform and bike are covered in snow as he reaches the 8,500-foot summit.

Dr. Massimo Testa, a native of Italy, was Hampsten's team physician in 1988 when the Colorado cyclist became the only American to win the three-week event.

As a former sports medicine specialist for several international cycling teams, Testa has helped many professionals, including Hampsten, Lance Armstrong and Dr. Eric Heiden - now his colleague - to optimize their abilities through physiological testing. Several years ago, Heiden persuaded Testa to move to the United States.

The walls of Testa's office and the midtown Sacramento facility have a dominating cycling motif, mostly posters and computer screensavers in homage to the sport's finest.
The Hampsten poster hangs on a wall parallel to the lab's treadmill and between two pro cyclists' signed jerseys. It's where Testa and his physician and physiologist co-workers implement a medical concept prevalent in Europe but fledgling in the United States: Optimal performance is for everyone.

It was certainly beneficial for one overweight patient, a business executive whose pending overseas employer was concerned about his health. It was also beneficial for a 28-year-old Sierra Nevada foothills cyclist whose results were so impressive he's now a fourth-year professional rider.

And recently, the testing was important to me as a long-distance runner with an expanding waistline, a family history of heart disease and diabetes and with the half-century milestone on the not-to-distant horizon.

As one of an estimated 180 individuals tested per month in the third-floor lab, my athletic background fell someplace between the large, chain-smoking businessman and the unknowing cardiovascular wunderkind.

Like many of my friends, I first began running in my late 20s. High school team sports were long gone as an option, but running's simplicity provided varied, near-immediate benefits: weight loss, cardiovascular fitness and invaluable friendships.

Nonetheless, after nearly 22 years of running and completing some 75 marathons and ultramarathons, I was curious. Running is now embedded into my lifestyle, but with age 50 approaching, a closer cardiovascular assessment seemed like a good idea.

Testa and his colleagues routinely assess professional athletes, rehabilitating heart patients and variously injured others. But I'm the kind of person they'd like to see more often.

"Anyone can come in off the streets," Testa said between my two tests. "People sometimes call and say they've heard about the results of a friend and that they're interested but out of shape.

"They want to know if they should train first. No, they shouldn't. We have different levels of assessments and protocol. We can adapt the test to a
person's level of fitness and use it as a baseline for improvement."

The UCD program offers 12 options, from $75 nutrition counseling to $450 multi-sport assessments for triathletes. The $300 Endurance Package (VO2 max and lactate threshold tests) was recommended for me, and I agreed.

For runners, the tests are given on a treadmill. For cyclists, they're held on a stationary bicycle.

A test for lactate threshold (increased lactic acid in the blood) occurs first, followed by the one for VO2 max (maximal rate of oxygen consumption). Both acutely help determine fitness levels, particularly for endurance athletes seeking better performance. But the measurements can also benefit someone who, according to Testa, "wants to know how to more efficiently walk their dog."

In either case, before the tests begin, a patient provides a medical family history in questionnaire form. Body weight and height, blood pressure and a consultation with the physician and/or an exercise physiologist follow, as does an electrocardiogram.

Commonly known as an ECG or EKG, the test is given after several electrodes are attached to a patient's upper torso. The tests record electrical heart activity at rest and can detect abnormal rhythms or heart muscle damage.

My evaluation revealed something first detected more than 20 years ago, an inverted T-wave, the electrical activity in the heart's lower chambers as they begin to relax. I told Testa the condition was once described to me as "runner's heart" or an "normal abnormality." He concurred and said he would only be concerned if I wasn't a runner.

In my instance, two UC Davis student interns were also present. As the four-hour session progressed, another exercise physiologist joined the group. I felt pampered, but I was also immediately humbled as the two interns took my skinfold body-fat test with calipers.

In short, they had plenty to measure. My mark was 19.4 percent, slightly more than the average male and six percent higher than the upper range
for an athlete. Body fat of 25 percent or higher is considered obesity.

My result wasn't great, but my tests had just begun.

After Testa shaved various parts of my chest, more electrodes were attached. I then donned a tight-fitting mesh body sleeve (it holds everything together) and was asked for an estimated best running pace for a 10-kilometer race. With a 7-minute, 30-second per-mile pace established as a rough guideline and after I received some basic treadmill-use instructions, the test began at a 10-minute per-mile walking pace.

Every four minutes, I had to briefly straddle the treadmill while a painless, brief blood sample was taken from my right earlobe. (The process is similar to a diabetic who pricks his/her finger for blood-sugar testing.)

My beginning walking heart rate of 118 beats per minute steadily rose with the treadmill's increased pace. Using increments of 30 seconds per mile, I advanced well, took periodic sips of water and sweat profusely.

Running at 7 mph or an 8:30 per-mile pace, my heart rate was 163 and lactate measurement 2.9. At 8 mph or the predicated maximum pace of 7:30 per mile, my heart rate reached 170. The lactic acid concentration in my blood increased to 4.2 percent. The higher the lactic acid, the quicker the onset of fatigue, a transition from aerobic to anaerobic activity.

Jennifer Neugebauer, one of the exercise physiologists, provided constant encouragement during the test and reassurance when it was complete.

"Why didn't you push me harder?" I laughingly said when the treadmill stopped. "You should have cracked the whip a little. I could have gone longer."

"That's what everyone says," Neugebauer replied. "But that's not what the test is really about, just to get to as high as you can. It's not about exhaustion. It's about getting a reading during the various time frames."

My V02 max test began after a 45-minute rest. Testa showed me how to wear the required headgear and breathing tube, and he attached a medical clothespin to my nose. Physiologists Neugebauer and Gretchen Casazza
explained the procedure.

I would only be able to breathe through my mouth into the tube, and the more difficult intervals would be limited to two minutes. Since the breathing apparatus prevents verbal communication, hand signals are used for patients to self-assess their status after each interval. A thumbs-up means fine; a slight hand wave means OK.

Finally I gave a thumbs down. I had sufficiently drooled into the mouthpiece reservoir and onto the treadmill, and I had reached sufficient exertion.

My V02 max - my body's ability to transport oxygen from the air to the muscles to generate energy - was 45.9 milliliters of oxygen per kilogram per minute. My result was 127 percent higher than other indicators had predicted and placed me in the mid-range (40 to 50) of what Testa called "fit."

By comparison, competitive age-group athletes generally test between 50-60, national-caliber athletes between 60-70 and world-class endurance athletes 70 and above.

Grete Waitz, a nine-time New York City Marathon winner, has a V02 max of 73, among the highest recorded for women. Armstrong, a five-time and reigning Tour de France titlist, has a V02 max of 83.8.

With my tests complete, Testa provided a detailed verbal assessment and offered a sports performance workout sheet. It included speed training to long endurance run recommendations.

As a recreational endurance athlete, I'm doing fine. But to immediately improve my fitness and performance, a 3-to 4-pound weight loss and lowering of my body fat several percentage points is "an immediate and easily accomplished goal," Testa said.

Testa also said I should avoid simple sugars, discontinue late-night eating and consider consuming five smaller meals daily instead of three regular-sized meals.
If I want to become a more competitive athlete, Testa suggested a loss of 13 pounds to my ideal weight of 171.

"We don't make you feel guilty because you are overweight; we aren't judges," he said. "But eventually if your weight isn't ideal, we have to tell you that."

The rest, as in many areas of life, is an individual's choice.

**Want to be tested?**

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James Raia undergoes a test for oxygen consumption.

*Sacramento Bee/Andy Alfaro*