

7 things patients should know about VO2 max

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Athletes are known to seek out any type of competitive advantage to become just a little bit faster, stronger or better.

NBA all-time scoring leader LeBron James studies film of opponents so much that he routinely calls out an opposing team's play—including where certain players will be—before the play even happens.

The late Kobe Bryant, seeking a way to strengthen his ankles and prevent future injury during his basketball career, turned to tap dancing.

Today, many athletes are starting to look inward for that advantage. Specifically, they're focused on their VO2 max.

VO2 max is a number that measures a person's maximum volume of oxygen intake. A higher number represents better physical fitness, a lower risk of cardiovascular disease, and an increased likelihood for living a longer life. The number is affected by all types of health factors, and historically physicians have used it to help patients in need of a heart transplant or with unexplained shortness of breath.

So why are everyday athletes now becoming obsessed with their VO2 max?

The new AMA podcast [“Health vs. Hype”](#)—produced in partnership with iHeartRadio—tackles that very question.

“Health vs. Hype” takes on medical misinformation, viral health trends, DIY medicine, and common health myths to help listeners understand what’s real, what’s risky, and what’s

backed by science. Host Trace Dominguez fact-checks popular health claims, explains how medical misinformation spreads, and reveals the real-world consequences of getting it wrong.

In the [latest episode](#), [Robert Maynard, MD](#), director of the cardiac rehabilitation unit at Henry Ford Providence Hospitals in Detroit, breaks down what VO2 max is, how it's measured, and why it's a good indicator of long-term health.

[Henry Ford Health](#) is part of the [AMA Health System Member Program](#) that provides enterprise solutions to equip leadership, physicians and care teams with resources to help drive the future of medicine.

Your VO2 max is a helpful number to know

"It's a wonderful overall indicator of health," Dr. Maynard said. "It's one of the more validated techniques to assess health and wellness. We, in medicine, use various techniques to validate procedures. We use statistics to decide which variables influence the outcomes the most, and when we look at things that are important, even blood pressure and cholesterol status and all these other very commonly used health metrics, VO2 max comes out on top as one of the best predictors of longevity and outcome."

"It's a great metric for health variables," he added. "It helps distill those complex issues into a single number. So I don't think people are wrong to be talking about it as an important health metric."

What the average VO2 max is

VO2 max measures the oxygen consumption per-unit mass, noted Dr. Maynard. Specifically, it is the milliliters of oxygen consumed per kilogram per minute (mL/kg/min).

"The average ranges of VO2 max are between 35 and 55" mL/kg/min, he said. "And they're very much related to a person's age, their weight, their heredity, their training status," said Dr. Maynard. "And what we'll see is a general decline in VO2 max from our 20s moving through the decades."

Your VO2 max is only one number

"It's a very important number," Dr. Maynard said. "It's not the only way that one person should [use to] assess their health and wellness."

"Too often, people do get wrapped up in one particular variable, and I think that could be problematic," he said.

Dr. Maynard likened putting too much emphasis on VO2 max to a student lamenting over a poor test score. "You have kids and ... they're just distraught because they got a 'B' on a test. As a parent, you're sitting there going, 'Listen, life is more than just one test.' It's more than just one variable. What I want to tell people is: There's a whole gamut of elements that go into how well you feel, how well you perform your daily tasks, what your wellness is. When people get too influenced by one particular variable or they train to that test and they fail to forget all the other components of health and wellness, I think that's a little bit problematic."

How to improve your VO2 max number

To boost your VO2 max, the key is additional training that is more intense. "There's a training volume," said Dr. Maynard, which could include activity such as high-intensity interval training (HIIT), which involves minute-or-less bursts of very intense exercise mixed with lower-intensity periods for recovery.

Or, he added, the approach could be "a more steady-state exposure to training. Each of these things, collectively, are going to move your VO2 max up as we become more conditioned, as our muscle mass increases and as our ability to extract oxygen increases from the muscle level."

VO2 max is not an indicator of how well you will perform

"Understand that your athletic performance is more than a single number," Dr. Maynard said. "I think people might falsely ascribe to the test how well they're going to do in a particular athletic event. People compare themselves to other people with this one metric and they're bothered that their VO2 max might be a little bit better than someone else's, yet (that other person is) performing better on a physical feat or a task or an athletic endeavor. The person who crosses the finish line first may or may not be the person with the best VO2 max."

Wearables tend to underestimate VO2 max

"Wearable technology is going to have fidelity issues," he said. "It's not going to be perfect each time. So let's not get too wrapped up in a particular number. Let's look at this with more than just one or two pieces of data. Let's get a sample size over a longer period of time and then put it in context."

Wearables are still good VO2 max indicators

"If someone is a weekend warrior-type athlete who's just trying to [see where they are] compared to other people, undergoing a full formal cardiopulmonary fitness examination is expensive, not necessarily easy to do, and it would probably be overkill in that particular situation," Dr. Maynard said. "You're going to be wanting to be able to track where your performance is going and it's just not super easy to repeat these [formal tests] on a regular basis in a cost-effective manner."

"Using a wearable technology to kind of get directionally which way they're going with their fitness" would be fine, he said.

What Dr. Maynard recommended is to use that wearable technology as a "tool on a more routine basis, and be very understanding that the tool is not perfect and that they shouldn't get so hung up on a particular number. [They should] be more interested in how they're doing directionally with their training plan, and how they're moving at their other health

variables, and maybe how this could guide them to a healthier position."