

# VO2 Max Accuracy in Smartwatches TESTED! (Apple Watch, Garmin, Polar, COROS, Suunto, and More!)

<https://www.youtube.com/watch?v=MzMZ6ynDxE4>

today we are in the city of Boston Massachusetts on Marathon weekend Monday is the Boston Marathon uh today's Saturday so we're a couple of days away from that but we're here for a whole different reason we are here to test our VO2 max at a place called dxa metrics that's what we're doing today right Jen I'm here with Jen by the way my wife Jen she's very excited about this [Music] all right [Music] [Applause] this is Alex he's going to be helping us today he works for dxa metrics and he's got all these fancy gadgets behind him are you ready [Music] [Applause] [Music] thanks hey there I'm Dave from Chester Summit and as you just saw during that intro Montage a couple of days ago my wife Jen and I traveled to the city of Boston here in Massachusetts to get our VO2 max tested and we did this for the sole purpose of making this video and comparing a real VO2 max lab test to the estimated vo2max that come on a lot of sports and fitness watches out there to see which one's more accurate before we get to the results though some of you might be wondering what the heck is VO2 max and what is it for well in short view max is a measurement of the maximum rate of oxygen your body is able to use during exercise in that word VO2 max the v stands for rate O2 stands for oxygen and Maxwell that stands for Max in the unit of measure when it comes to VO2 max is typically measured in milliliters of oxygen consumed per minute per kilogram of body weight and yes that's all very confusing but the good news is you don't actually need to know what via2 Max is and how it works all you need to know the moral of the story is that the higher your VO2 max is is a direct indication of how fit you currently are when it comes to cardio exercises like running and cycling at this point you might be wondering what is a good VO2 max score what's a good measurement and what should you be aiming for well that really depends because the scale from poor to excellent VO2 max is directly tied to your age and gender as well for example if you're a year old male like myself and had a VO2 max below it would be considered poor while above is considered Superior or Elite and for women in that same exact age bracket of to years old a poor VO2 max would be below in a superior VO2 max would land somewhere above 47.

and for one more data point a world-class marathon runner like Elliot kipchoge for example can have a VO2 max as high as which is just Bonkers at this point you might be looking down at your Garmin or koros watch and seeing a very low VO2 max and getting down on yourself but don't because the good news is you can increase or improve VO2 max by doing strategic workouts and typically to improve VO2 max you're going to want to push that heart rate up into that really high heart rate zone like to percent of your max heart rate to improve your VO2 max I'm not going to dive too deep on how to train to improve your VO2 max in your Fitness because I'm not a coach or a doctor I'm just some guy on YouTube you can do some Googling and find your own training plans for that now that we know what VO2 max actually is and what it means let's talk about how it's measured the first and most accurate way would be with a lab test a VO2 max test is typically conducted at a special

facility using special equipment so of course this is not for everybody and it can be a little bit expensive in my case like I said I went to Boston here in Massachusetts to a facility called d x a metrics at dxa metrics a VO2 max test cost about bucks at the time of filming this video so it's not super expensive and it only takes about minutes to complete before we move on I do want to give a quick shout out to the team over at dxa metrics for helping me out with this video and putting up with my cameras being in their face at their facility they were a huge help and it was a great experience there and if you live in the New England area I'll drop a link to their facility down below if you want to get a lab test go check them out a VO2 max lab test can be done on a treadmill or a stationary bike in my case it was a stationary bike you'll wear an ECG heart rate sensor on your chest along with a mask on your face they'll be connected to a hose that connects to a special machine this machine is able to measure how much oxygen is going in and how much carbon dioxide is coming out and by comparing that gas exchange it can know exactly how much oxygen your body is utilizing during exercise during the VO2 max test the technician will incrementally increase the intensity of the exercise until you can no longer sustain that set intensity and ultimately fail and yes it's a pretty painful test it really pushes you to the limits now that we've talked about the gold standard which is a lab test the other way that VO2 max is commonly measured these days is via the Smartwatch on your wrist unlike a lab test these devices use a variety of information like your age gender GPS tracks for pace and speed and of course your heart rate information during exercise to produce an estimated VO2 max and the good news is almost all modern day wearables from Apple Garmin polar Suunto Fitbit and more will generate an estimated VO2 max based on all of this data however as the name implies this is an estimated VO2 max and not in absolute measurement since the watches on your wrist can't detect how much oxygen is actually being inhaled into your lungs through your mouth and nose all of that blabbing brings us to the purpose of this video just how accurate are sports watches and the algorithms inside when it comes to generating an estimated VO2 max as it turns out spoiler some of them are pretty darn good let's get down to brass tacks and talk about the test results and of course let the cat out of the bag when it comes to that lab test in the results so when I got tested at dxa metrics my VO2 max came in at 51.

and for my age at years old that puts me in the excellent bracket I do wish it was a little bit higher but I'll take that given my lack of training recently now let's talk about how that 51. value compares to what I'm getting from all of these different GPS watches that I've been testing for several months for the purpose of this YouTube channel first up is going to be Garmin in the Garmin Connect platform where I'm getting a VO2 max estimate of which is pretty good compared to the lab test next up is going to be koros in their training Hub I've got an estimated VO2 max of as well just like on Garmin the next device in the lineup is my Apple watch Ultra with my Apple watch Ultra in apple health I'm getting an estimated VO2 max of 51.

and on my Suunto 9p geek Pro in the Suunto app I'm getting an estimated VO2 max of 49. and as you can see all these numbers are looking pretty good so far compared to the lab test now that we've gone through some of the top performers when it comes to estimated VO2 max let's talk about a couple of platforms that didn't do so well in my testing so far when it comes to Polar I've done some testing with the ignite I have here and the interesting thing about polar is that there's two different VO2 max scores so there's one called a running index that's per activity and then there's one called a fitness test that's kind of a stationary test you just kind of sit still and it gives you a VO2 max based on your resting heart rate so for the polar

running index I'm getting an estimated VO2 max of and for my polar fitness test I'm getting an estimated VO2 max of which is significantly higher than the results from all of these other platforms next up I want to talk about a maze fit I've been doing a bunch of testing with the GTR 4if here and on this watch I've got an estimated VO2 map of which is substantially lower than all these other devices all of those results I just talked about is my data but what about my wife Jen like I said I brought her with me to get tested as well and make her suffer just like me and she wears a Garmin of the time so we don't have a whole bunch of samples and different results for her just Garmin but her VO2 max at the lab came in at 49.

while her Garmin venue sq2 gave her an estimated VO2 max of 51. so there's slightly bigger deviation there when it comes to Garmin in the lab test compared to mine but that's just another data point to consider now that we've gone through all the data what does it all mean well first I want to mention that these are just my test results a sample of one or two with my wife and because Optical heart rate sensors have so many variables and can produce different results based on your skin color or body fat percentage or arm hair density whether or not you have tattoos or how tight the watch is and other variables just take that for what it's worth because all these factors play into how accurate your estimated VO2 max will be on any of your devices with that disclaimer out of the way in my testing so far it does seem like Garmin appleorros and Suunto are all doing a pretty big on job when it comes to estimating VO2 max and I was actually pretty surprised by this so should you go out and get a VO2 max test or should you just trust what you're seeing on your watch in terms of estimated VO2 max I guess that really depends I think you probably don't need to go get tested in a lab unless you're a serious or professional athlete or Runner or just like a data geek like myself then you might find it interesting if you've got like to to spare there are some other benefits to getting a lab test like you do get your heart rate zones so you can actually take your real heart rate zones from the lab test and input that into something like Garmin connect to help you identify your real heart rate zones during your activity when you're actually out on a run or run another interest testing detail from that lab test is that it can actually break down what fuel sources you're using at different heart rate zones and intensities whether or not you're burning fat or carbs and this can be super useful information to know before a big race for example if you want to know how to fuel a different heart rate intensities at the end of the day though judging by how close these numbers all are together and the estimated values from the real lab values I think they're pretty darn close and it certainly gives me more confidence and faith in using my Garmin for my training when it comes to estimated VO2 max that said even though these numbers are lining up now down the road in a few months when my fitness increases hopefully from training I do plan to get tested again to see if the numbers still add up over time and that's really it for this video I just want to share all this data in the results from all this testing because I found it super interesting and hopefully you did too and now's the point in the video where I want to hear from you have you been lab tested for VO2 max how does it compare to the results you're seeing on your watch let me know in the comments down below I would love to hear from you and finally we're here the real end of the video if you're still watching you probably enjoyed this video and if you did please consider going down and hitting that thumbs up button and the Subscribe button down below so you don't miss more videos from me in the future that would be great helps my channel grow and if you are planning on picking up the chorus Apex Pro or the Suunto Peak Pro or the Apple watch Ultra or any watch or platform that I showed off in this video check out the links in the description

down below because they do help support this Channel and they cost nothing extra to you so you might as well use them and with that I'm really gonna go now I'll see you next time bye  
[Music] thank you