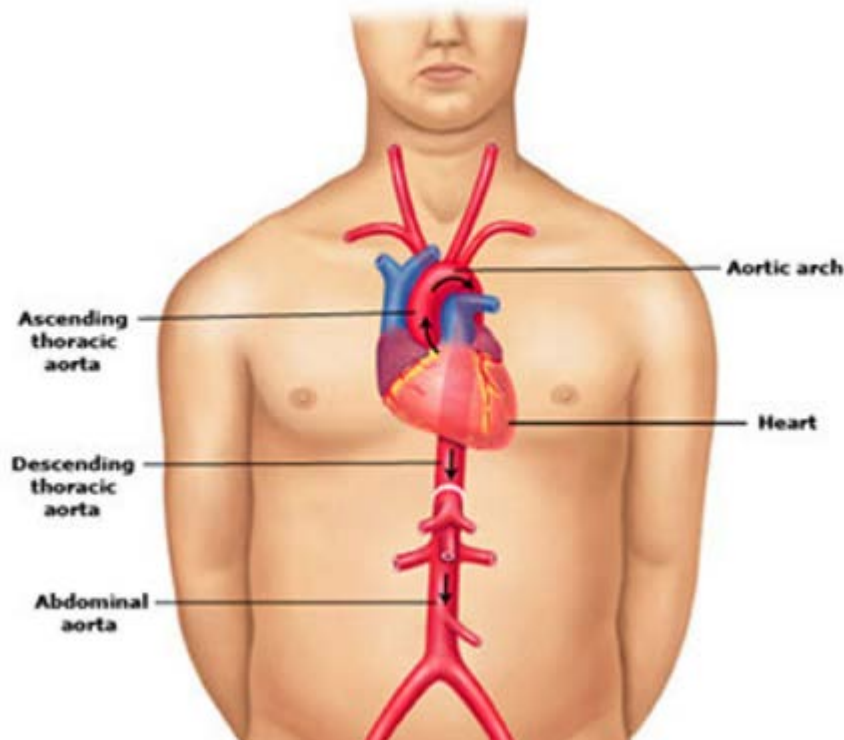




# WHAT IS AORTIC PULSE WAVE VELOCITY?

Imagine a single health metric able to identify people in their 20's at increased risk for development of Heart Disease, Stroke and Dementia. What if this health indicator could estimate how long you will live? Incredibly, for the last 20 years medical scientists have known that Aortic Pulse Wave Velocity, which is used to measure stiffness of the Aorta (shown below) is closely related to risk of death from all causes and able to define risk in young people for development of Heart Disease Stroke and Dementia.

You and your doctor probably haven't heard of Aortic Pulse Wave Velocity because this measurement has required expensive and complicated equipment with a price tag of over \$20,000 USD



Aortic Pulse Wave Velocity is closely related to and is a measure of stiffness along the spinal column. Increased stiffness of the spine results in decreased mobility of the body's core regions affecting chest wall and diaphragmatic motion. When pulse wave velocity increases in speed, Core Mobility is reduced and the Internal Organs receive less of a massaging action with each breath. This decreases organ circulation, affecting organ function, overall health and longevity.

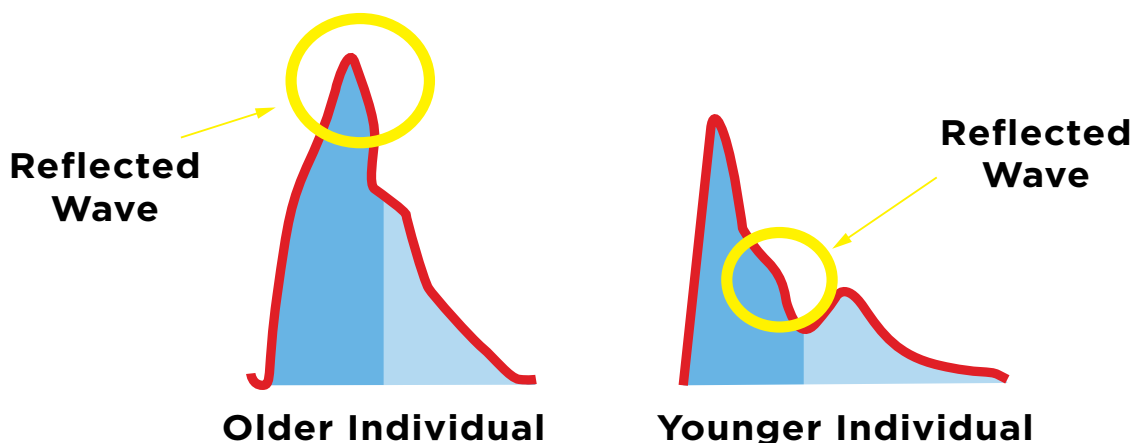
Aortic Pulse Wave Velocity not only assesses risk of illness but also shows improvement with attention to diet, exercise and stress management. Aortic Pulse Wave Velocity is a way to 'look inside' and can help people objectively appreciate the benefit of positive lifestyle choices.

[Read studies on AoPWV here.](#)

## How is Pulse Wave Velocity measured?

Measurement in the past used pressure sensors placed precisely over the Carotid artery in the neck and the Femoral artery in the groin to measure speed with which pulse waves travel down the Aorta. Aortic Pulse Wave Velocity (AoPWV) is the common way scientists measure of Aortic Stiffness.

Recently it has become possible to measure AoPWV using a single fingertip pulse sensor and application called [iHeart Internal Age](#). iHeart uses a 30-second test to locate and characterize a wave in the fingertip pulse signal that travels down the Aorta, reflects back from the distal Aorta towards the heart and then travels on to the finger. The speed with which this Reflected Wave travels is closely related to Aortic Stiffness. iHeart Aortic Pulse Wave Velocity measurement has been tested against the 'gold standard' Carotid-Femoral AoPWV measurement system and found to correlate very well. Below you can see the reflected wave in the pulse shape of both a young person, and old person.



Above you can see the wave pattern while the iHeart test is being performed.

There are other ways to measure AoPWV. One alternative method uses a pulse sensor on a finger and a toe. The distance from the heart to a fingertip and the distance from the end of the Aorta and down a leg to a toe is about the same. The difference in arrival time of the finger and toe pulses is closely related to AoPWV but age creates errors when compared to Carotid-Femoral PWV.

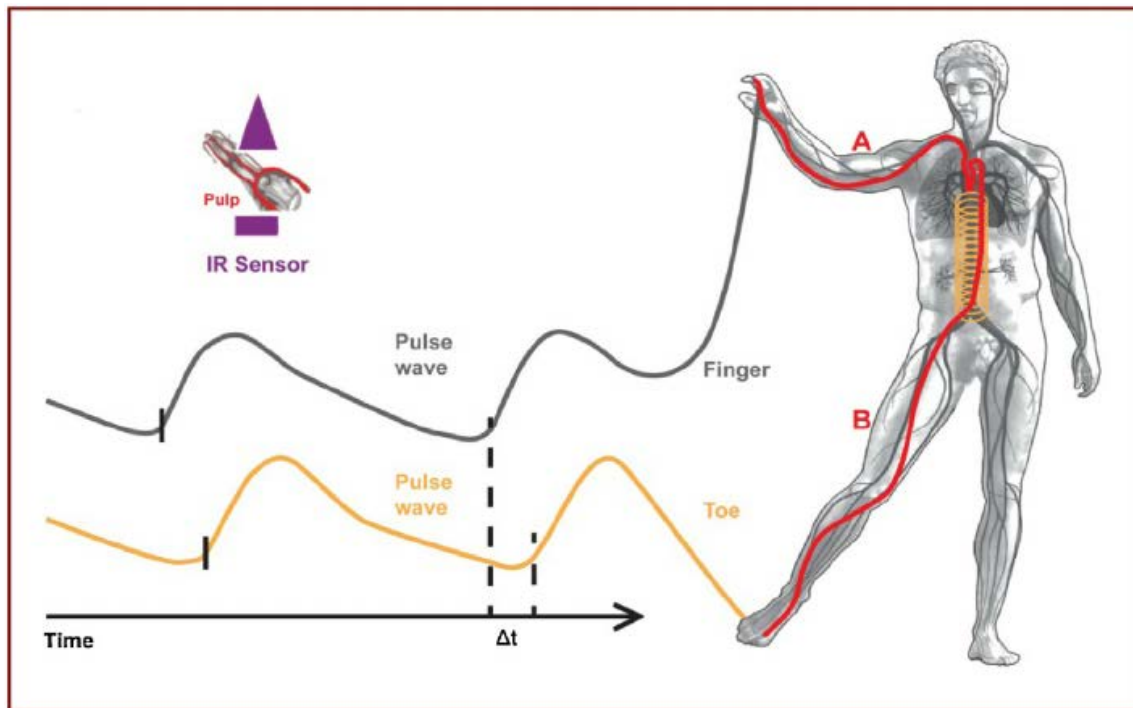


Diagram copied from 'A novel device for measuring arterial stiffness using finger-toe pulse wave velocity: Validation study of the pOpmetre' Archives of Cardiovascular Disease (2015) 108, 227–234

It is important to recognize that not all PWV measurements are good indicators of health and predictive for risk of illness. Aortic Pulse Wave Velocity is the only metric able to assess overall health and predict lifespan.

## What can be done to improve Aortic Pulse Wave Velocity and Internal Age?

Many factors can increase pulse wave velocity and Internal Age. Things like:

- sedentary lifestyle
- minimal exercise/movement
- poor diet
- high stress levels
- Smoking
- excessive drinking

Your first iHeart Internal Age/AoPWV reading is a starting point, using the iHeart device you can see how your lifestyle choices are affecting pulse wave velocity and Internal Age, and tweak your lifestyle to achieve the lowest Internal Age possible, improving health and increasing lifespan.

Lifestyle factors that may lower a user's pulse wave velocity and Internal Age:

- Increased movement/activity\*
- Improved diet
- Improved sleep quality
- Improved stress levels
- Dietary supplementation\*\*
- Increased hydration levels
- Stretching

\* Always see a doctor before changing your exercise routine to make sure it is safe

\*\* Always see a doctor before adding supplements to your diet to make sure they are safe

## How do I test correctly with my iHeart device to accurately measure Pulse Wave Velocity?

To achieve an accurate test follow these steps:

- Try to test at the same time each day
- Sit for 2 minutes before testing
- Do not talk or move while testing
- Do not test within two hours of drinking coffee, alcohol, or smoking a cigarette

Think of the pulse wave velocity test like a blood pressure cuff at the drug store, you wouldn't be moving, you would have sat there for a couple minutes while the machine prepared to test your blood pressure. iHeart pulse wave velocity testing protocol is quite similar.

## How long until I see my pulse wave velocity score change?

The great thing about iHeart and the pulse wave velocity and Internal Age test is that changes are seen quite quickly after a user begins incorporating positive choices into their lifestyle. We suggest testing at the same time each day to attain your baseline, but you can also test before and after specific activities to see how those activities or habits affect you on the inside. Use iHeart to learn how your body reacts to different stimulus and keep up with the good, and ditch the bad. Soon you'll see your pulse wave velocity score and Internal Age drop, improving health and increasing lifespan.

## What is a good pulse wave velocity score?

Below is a graph that shows optimal pulse wave velocity scores for different ages, with iHeart. Pulse wave velocity is measured in meters per second (m/s).



Click Here to Track your Pulse Wave  
Velocity with  iheart™