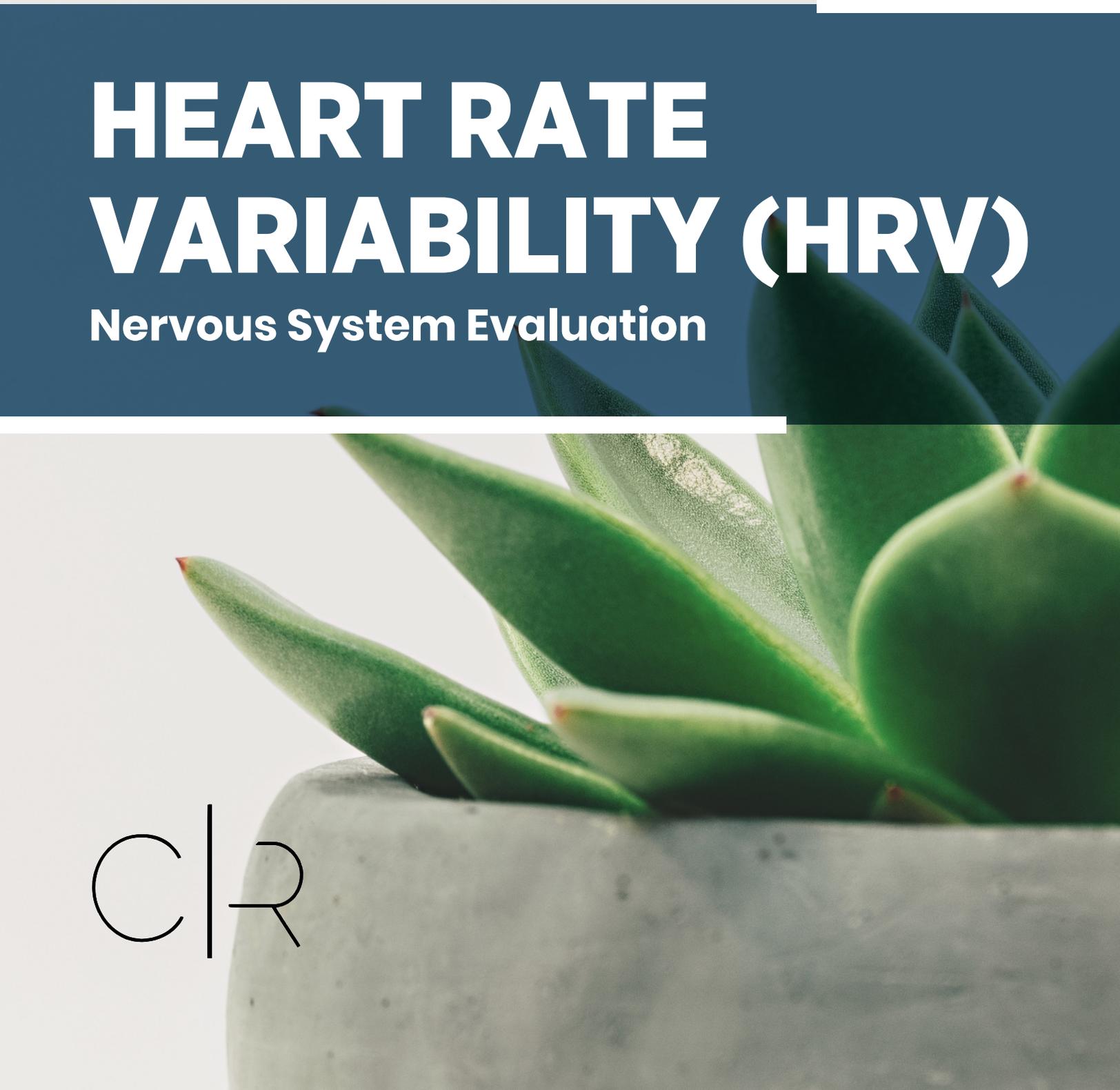


# HEART RATE VARIABILITY (HRV)

Nervous System Evaluation

C | R



# Table of Contents

Current Research	02
Far Reaching Effects of the Nervous System	03
Measuring Heart Rate Variability	04
What is measured by the Oura ring	04
Readiness Score	04
Heart Rate Variability	05
Resting Heart Rate	06
Sleep	07
Activity	09
How to get started	10
1) Purchasing an Oura Ring	10
2) Setting up your Oura ring	10
Oura Ring Data Sharing	11
Tips on Improving your HRV	12

Heart Rate Variability (HRV) works as a tool to provide a snapshot into the health of the nervous system by accurately measuring the two components of the autonomic nervous system. HRV functions by assessing the change in time intervals between adjacent heartbeats as you breathe in and out. This technology is currently being used by world renowned physicians and cardiologists, olympic athletes and Fortune 500 CEOs. At ChiRho Wellness we utilize this same advanced technology with all of our patients to achieve optimal health.

The nervous system is the most complex system of the body. It impacts every other system such as hormones, digestion, detoxification and acts as the primary coordinator between these systems. In many cases how we feel does not accurately reflect the state of our health because we are in this state day after day for years and it becomes our new normal. How we feel is often a LATE manifestation of what the nervous system has been telling us for days, months or even years. A great example of this is Alzheimer's Disease. A primarily nervous system (brain) disease in origin, often begins decades before memory loss starts. The nervous system has several components that are interconnected with each other and ultimately that interconnect with the immune system:

- 01) Central Nervous System (CNS) - brain, brainstem, spinal cord, nerve roots
- 02) Autonomic Nervous System (ANS) which has two branches - sympathetic (known as the fight or freeze flight branch) and parasympathetic (rest, repair, adapt, repopulate)
- 03) Enteric Nervous System (ENS): "Gut Brain"
- 04) Skin-Sensory nerves
- 05) Cardiac Intrinsic Nervous System

## Sympathetic

The sympathetic system is responsible for our "fight or flight" response and to get the body moving much like the gas pedal in a car. Today's high paced, go-go-go society often leads to sympathetic dominance and can come in many forms both external (fights, work, finances) or internal (toxins, mold, infections). It has been shown that an argument with a spouse can increase sympathetic stimulation for up to 4 days! Research has linked this increase of sympathetic burden to health issues ranging from high blood pressure and chronic fatigue to hormone imbalance and even cancer.

## Parasympathetic

Parasympathetic nervous system acts like the brake to counteract the sympathetic gas pedal. While we cannot always control the stressors in our lives, we can take positive steps towards promoting our parasympathetic "rest and digest" system. Through activation of the Vagus nerve, a primary input into the parasympathetic system, our body is able to move from a state of sympathetic stress to parasympathetic relaxation. Parasympathetic function is critical for EVERY function in our body ranging from hormones to preventing accelerated brain degeneration and cancer.



# Current Research

“In conclusion, healthy longevity depends on preservation of autonomic function, in particular, parasympathetic function represents a marker predictive of longevity.”

-The American Journal of Cardiology 2010 Apr 15; 105(8): 1181-5

“HRV parameters could reflect the disease severity in hyperthyroid patients” demonstrating the ability of numerous conditions to impact the nervous system as well as HRV’s ability to monitor progression or improvement of symptoms”.

-Clinical Endocrinology 12 April 2006; 64 (6) 611-616

“It is now well-established that the sympathetic and parasympathetic arms of the ANS play key roles in orchestrating neuroimmune (hormone and immune) interactions”

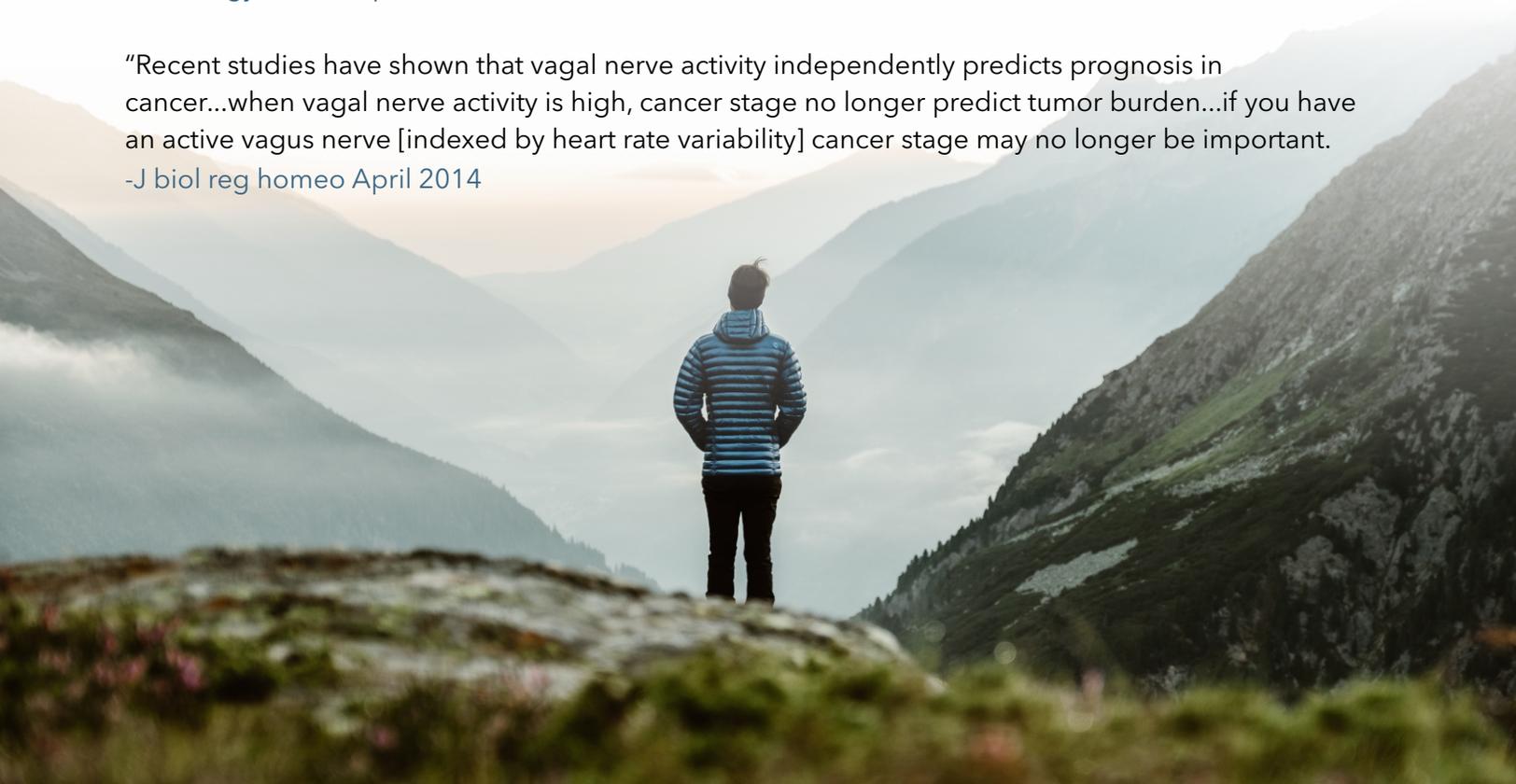
-Journal of Comprehensive Physiology (2014)

“There now has been discovered a direct connection between the nervous system and tumor cells. The nervous system modulates the process of metastasis, cancer cell invasion, colonization, angiogenesis, bone marrow, immune functions, and inflammatory pathways”.

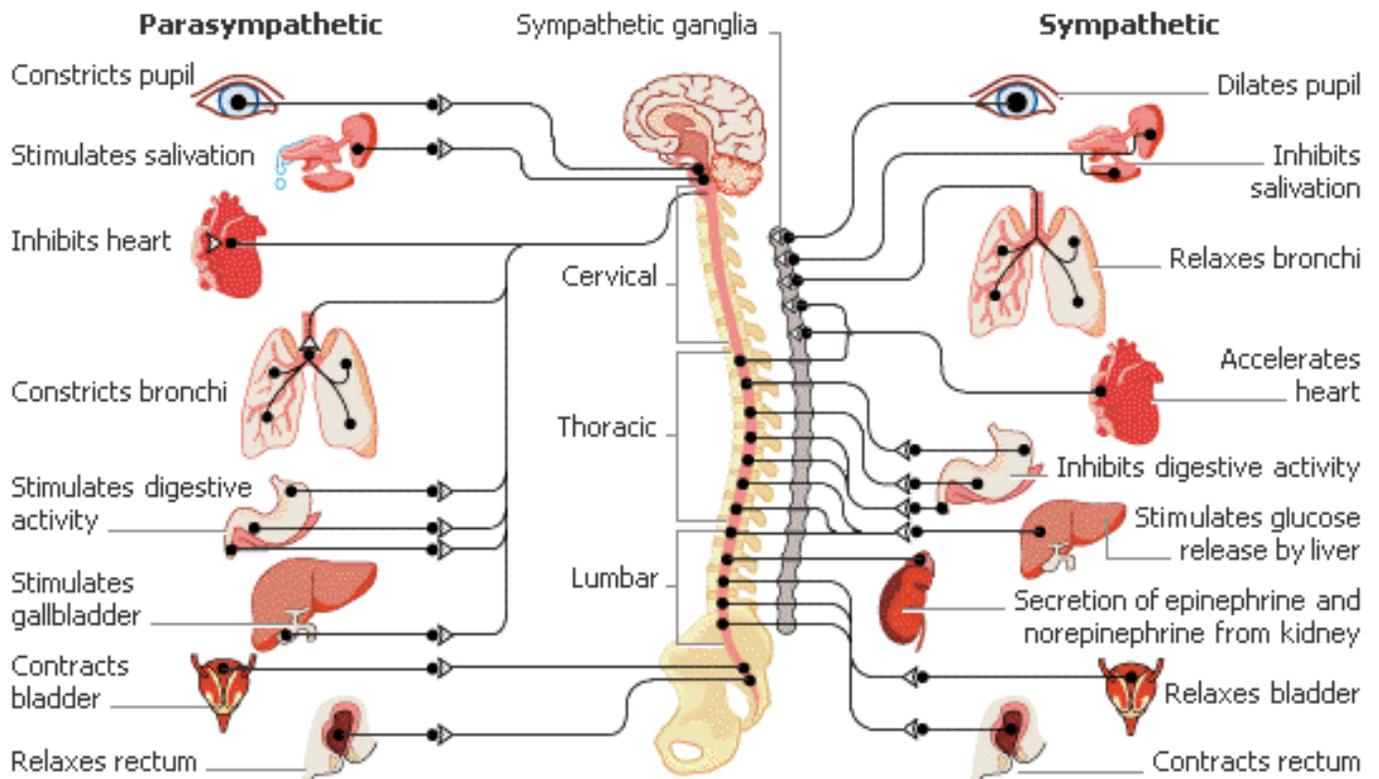
-Oncology Letters April 2013

“Recent studies have shown that vagal nerve activity independently predicts prognosis in cancer...when vagal nerve activity is high, cancer stage no longer predict tumor burden...if you have an active vagus nerve [indexed by heart rate variability] cancer stage may no longer be important.

-J biol reg homeo April 2014



# Far Reaching Effects of the Nervous System



This image illustrates the far reaching impact of the nervous system within the body. From head to toe, the nervous system controls function meaning that if your nervous system is not healthy, any symptom can result. Whether your focus is to reverse disease, prevent disease or simply live at your highest level of health, it is vital to assess and continually improve the health of your nervous system.

# Measuring Heart Rate Variability



Oura  
Ring



The most advanced way to monitor your daily health and Heart Rate Variability is through the use of an Oura ring. The Oura Ring is a biofeedback device that tracks several fitness/health metrics. This ring uses sophisticated technology to give you scores in readiness, sleep and activity. We love Oura here at Chi Rho because it provides invaluable information that can be directly funneled into crafting your health habits into a personalized health game-plan.

Oura works by storing information in the ring until it can be synched by Bluetooth to a corresponding Apple or Android application. The ring has a battery life of approximately 5-7 days and only needs to be charged for ~2 hours.

## What is measured by the Oura ring

### Readiness Score

The readiness score that Oura provides is alluding to how “ready” someone is to take on the day and all that it entails: whether that is how ready someone is for a workout, to make a big decision or any concurrent event that might stress the body in its own way. The readiness score uses an algorithm that combines heart rate variability, body temperature, resting heart rate, previous night sleep and previous day activity.

The research indicates that when readiness is high, a person is at an advantage to challenge themselves in a strenuous workout. When readiness is low, it is best to participate in activities that restore and activate parasympathetic nervous system activity (yoga, time in nature, meditation, art, playing music, etc). Rest and restore looks different for every person, but the good thing about the Oura ring is that you can identify what activities are working the best for you and which ones don't necessarily move the needle.

The body temperature feature is a readiness contributor that can indicate several different things: including oncoming illness, menstrual cycle stages and the nature of your sleep environment. What I mean by that is if your body temperature is consistently high during the night, that can indicate that it would behoove you to keep the temperature at a lower degree. Cold sleep environments promote a lower resting heart rate and therefore better restfulness. For a cycling woman, the luteal phase or second half of the cycle is often characterized by naturally higher body temperature. While this is a normal side-effect of a healthy cycle, higher body temperature still disrupts restfulness. A couple ways to combat this is to take a cold shower before bed, adjust the thermostat appropriately



## Heart Rate Variability

Heart Rate Variability or HRV is an extremely insightful piece of the Oura ring model that is what ultimately turned us at Chi Rho on to Oura in the first place. Heart Rate Variability is a measurement of the amount of variation between heart beats and it indicates the robustness and adaptability of the autonomic nervous system. HRV is a metric that morphs based on how activities of daily life are impacting the nervous system. While determining what has negative or positive effects on your nervous system and HRV are different for every person there are several that are known to impact everyone.

A broad overview of things that can boost or lower HRV are thoughts, trauma and toxins. These are the foundational components of health that encompass all other aspects. Thoughts include mindset, fear response and perceived stress. How you perceive your life directly relates to the level of your life. We have used the example of how an argument with someone significant in your life can increase your hormonal stress response for DAYS after the actual event. If we examine our life and identify these times of increased stress we may find that there are daily occurrences that increase our stress above and beyond a healthy level. While in many cases you can not quit your job, ignore your children or stop paying bills, you can begin to practice techniques that help you to process these events in healthy ways. These may include practices of meditation, yoga, journaling, music or whatever it is that puts you at ease. We often recommend prioritizing 10 minutes, 3 times per day at least to simply reset your mindset and reframe your day.

Trauma could be spinal subluxations, blows to the head, or a traumatic emotional issue. Just how the quality of your thoughts can impact your physical well-being, your physical well-being will additionally effect the health of your nervous system. Taking care of your physical being through mobility practices, exercise and daily movement are critical.

Toxins encompass everything from fluoride in drinking water, to residual round-up on produce. This area of health has grown exponentially in the past years and transcend beyond the scope of simply lead based paint or abestos floor tiles. Though it is impossible to escape toxins completely in our modern society, we can work to lower total load. Think of a bucket and all the toxins you are exposed to is the water. Our body can handle a certain degree of toxins just like the bucket can hold a certain amount of water. Once the bucket begins overflowing with water or our body has been exposed to more toxins than it can handle; disease begins.

It is hard to qualify what specific number is considered a "good" HRV score, because it is different for every person. A general estimate is that you want to be above 50 to be in a healthy neurological state and above 100 is thriving. The overall goal is to continue to increase your HRV no matter where you are at and be patient. To help determine factors that may be impacting you, utilize the journal on the last page of this guide.



## Resting Heart Rate

Resting heart rate is another readiness contributor that can be somewhat "hacked" with intervention. RHR is often affected by the body still trying to digest food or detox any number of toxins while someone is sleeping. Resting heart rate is designed to fall during sleep and promote restfulness once it drops, but if you eat a significant amount of food 2 hours or less before bedtime, your resting heart rate may stay elevated for longer than necessary. This is when you see several awake periods on the Oura app during the first few hours of sleep time. It is important to note that you may not even realize you are awaking.



In many cases, this also leads to waking up around 2-3am feeling “wide awake” with trouble falling back to sleep. This has to do with the blood sugar fluctuation impacting cortisol and other hormones. Waking up several times during the night is degrading to a persons readiness score and ability to do the activities of daily life involved with that.

## Sleep

The Oura Ring uses several metrics including the total sleep time, sleep quality, how many times you awoke during the night, sleep timing and amounts of REM and deep sleep to calculate an overall sleep score.

REM sleep is Rapid Eye Movement sleep, and it is the stage of sleep where the brain detoxes and restores itself. It is also the stage of sleep that occurs move heavily in the second half of your sleep time. It is important to note that you may be skimming yourself on the benefits of REM if you are repeatedly cutting off your sleep time early. We have also found that REM is more sensitive to the effects of non-native EMFs and emotional welfare. For many people who are early risers (4:00-5:00am), REM sleep can be difficult to achieve. If you are not achieving at least 20% REM and 20% deep sleep you should reassess morning and evening habits to begin to make improvements.



Deep sleep is the stage of sleep where the body detoxes and restores. This type of sleep occurs more during the first half of your sleep cycle. While there are many factors that impact deep sleep, going to bed late or having an irregular bedtime is one of the most common reasons for impaired deep sleep.

The other metric that the Oura ring provides is insight into how many times you wake up throughout the night. Waking up is oftentimes not even realized or remembered however this still cuts into the time that could be spent in productive sleep states. These are indicated by the white bars in your Oura app. Ideal sleep eliminates these periods of wakefulness.

Latency indicates the time that it takes between laying in bed and actually falling asleep. Ideally, this period is short so that your time in bed is most efficient. Having regular night time routines and habits are the best way to facilitate improvement. Sleep efficiency is a measurement of your sleep quality. It is the percentage of tie you actually spend asleep after going to bed. For adults, a generally accepted cut off score for good sleep efficiency is 85%. The goal is to be above 85% with a maximum goal of 95%.

One factor that affects overall sleep quality is blue lights after dark. Artificial blue light at night disrupts the circadian rhythm by suppressing the production of melatonin. Melatonin is the body's sleep hormone and is produced by the pineal gland and mitochondria. Blue light can be avoided with blue-light blocking glasses: [click here](#) for which ones we recommend. It can also be better avoided by reducing screen time two hours before predicted bedtime. Replace nighttime screen time with parasympathetic activating activities such as reading (paper book), Epsom salt baths, and time with family. Not only is this practice healthier for circadian rhythm, but most people find it more rewarding as well

As artificial lights are destructive at night, natural sunlight can be very restorative. Getting organic sunlight exposure at different times during the day (sunrise, midday and sunset) without sunglasses is very regulatory for circadian health. The body regulates melatonin by which type of light the eye is perceiving and in ancestral times, that would only have been natural light. It is good practice to avoid screens and blue lights once the sun goes down and if you are going to be exposed to these, blue light blocking glasses can be helpful.

Another important topic to mention for sleep is supplementation. Supplements can be really beneficial in resetting a sleep pattern that is disrupted and giving you the extra edge to get great sleep. Supplements that we recommend include [Sleep support](#), Insomnitrol Chewables, [Glyco Supreme](#), [Opti-Metabolic](#) and [Adapt Synergy](#). Adapt Synergy and Sleep Support contain adaptogenic herbs that help balance the body before sleep. Sleep Support contains 3mg of Melatonin per serving, which is a relatively low dose for adults, but in conjunction with the other herbs is very effective. Glyco Supreme is excellent at balancing blood sugar levels for sleep.

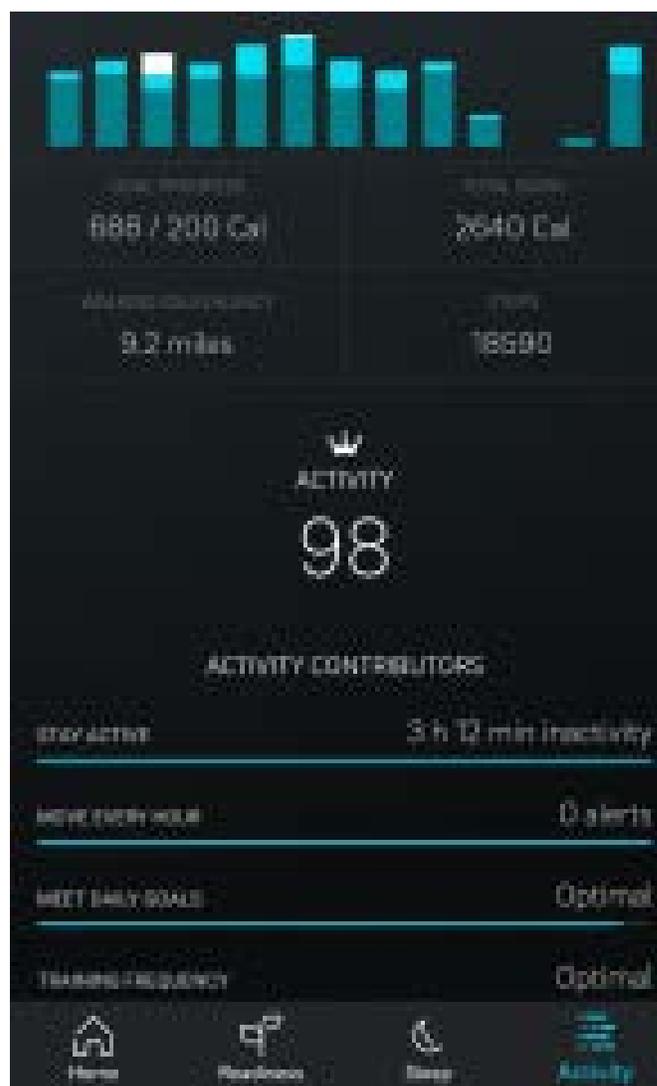


## Activity

The activity section of Oura takes into account several factors including recovery, how well you slept, number of steps per day, amount of inactive time, and different intensities of movement based on heart rate. The data is comparable to a FitBit or similar device with the difference being that it takes into effect how well you are recovered and how well you slept. These factors are vital to how effective movement can be and the score adjusts accordingly.

One unique factor about the ring is that it gives you feedback on how effective a workout is on getting heart rate elevated. If you wear the ring while working out, you can see how stressed your body was during the workout thus raising heart rate. This is important to pay attention to because it may surprise you. The ring gives you more actionable data with aerobic exercise, as opposed to strength training and yoga but there are still metrics to look at for those as well. Everyone should strive to get 10+ minutes of registered high intensity exercise each day, though how to get that looks different for different people. Most people have found that running will register as high intensity on the Oura Ring.

Activity and HRV have an interesting relationship that can look different for different people. Generally speaking, strength training and high intensity exercise will temporarily suppress HRV, only for it to go up higher than previously two-three days later. It is also important in this time frame to make sure exercise recovery is being enforced: ice baths, infrared sauna, foam rolling, etc. Parasympathetic inducing exercise (i.e Yoga) can raise HRV immediately. It is interesting to note that HRV and heart rate generally have an inverse relationship - when resting heart rate is





# How to get started

## 1) Purchasing an Oura Ring

» Go to [www.chirhochiropractic.com](http://www.chirhochiropractic.com)

HOME

ABOUT US

NEW PATIENT

SERVICES

SHOP

PATIENT RESOURCES

- » Go to "Shop" then "Recommended Products"
- » Scroll down until you see "oura ring"
- » Click "Shop"
- » Purchase Oura ring and enter "ChiRho50" for discount code

\*You will need to know your size to order the ring. If you do not know your size, Oura will send you a free sizing kit.

\*\*There are multiple styles and finishes to choose from. These will all provide the same information and selection is based on personal preference.



SHOP

### Oura Ring

The most accurate sleep and activity HRV tracker available. Enter "ChiRho50" at checkout for a \$50 dollar discount

## 2) Setting up your Oura ring

**Step 1:** Download the Oura app from the App Store

**Step 2:** Connect the USB cable to the Oura charger

**Step 3:** Connect the USB cable to any USB port

**Step 4:** Place the Oura ring into the charger

**Step 5:** Check that the light appears on the charger

**Step 6:** Open the Oura app

Follow the instructions in the app: Tap Create account

Read and accept the Terms of Use and Privacy Policy Choose a working email and a password for your account Tap Create account

Tap Connect to search for your ring. It should be nearby, in the charger. Make sure you have turned your phone's Bluetooth on.

When you see your ring, tap Connect. Note: connect your ring via the Oura app, not in the phone settings.

Choose your notification preferences

Add your personal info. We recommend doing this to get the most accurate feedback from the app. Tap Done.

**Step 7:** Follow the instructions in the app:

**Step 8:** Start wearing the Oura ring

\*It can take 2-6 months for you to dial in the things that improve/worsen your HRV, readiness and sleep score.

For further instructions or troubleshooting you can visit the Oura ring website or the Chi Rho Chiropractic Youtube Channel for videos on setting up your Oura Ring.

## Oura Ring Data Sharing



To allow our doctors access to your Oura Ring data we utilize the Oura Cloud. This is a secure platform that only our doctors can view. While this provides an incredible opportunity to improve your health results, there are a few steps that must be completed.

- 1) Please inform a member of the Chi Rho staff when you have completed setting up your Oura Ring by emailing [rehab@chirhowellness.com](mailto:rehab@chirhowellness.com). You can also do this at your consultation with the doctor.
- 2) You will then receive an invitation to the Oura Cloud via email

Simply follow the prompts in the e-mail to grant access to the doctors to view your Oura Ring data.

# Tips on Improving your HRV



- » Regular chiropractic adjustments
- » Consistent daily mobility routine
- » Daily Sun Exposure (morning is best)
- » Cold thermogenesis (cold showers/ice bath)
- » Sweating/sauna
- » Epsom Salt Baths
- » Utilizing whole tone sound frequencies
- » Limiting screen time (especially after dark)
- » Social interaction/purposeful family time
- » Limiting nEMF's and others toxins
- » Drink 1oz of clean/purified water per every 2 lbs of body weight
- » Grounding/barefoot in nature daily
- » Smart Supplementation (work with your doctor to identify the optimal plan for you)
- » Functional medicine testing (identifying underlying factors that are sabotaging your health)
- » Utilize essential oils
- » Exercise daily (variety to include strength training, high intensity burst training and daily movement)
- » Mindfulness/meditation practice
- » Practice gratitude daily
- » Prioritizing 7-8 hours of deep uninterrupted sleep nightly
- » Sing/gargle water (Parasympathetic stimulation)





# Improvements

# Detriments

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