

11 Crucial Health Questions & Mighty Self-Quantification Ring To Rule Them All: The Official Oura Ring Q&A.

[Affiliate Disclosure \(/affiliate-disclosure\)](/affiliate-disclosure)



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I'm on a constant quest to determine how elements such as air, light, electricity, water, food, movement and more affect important variables such as a performance, fat loss, recovery, digestion, brain, sleep and hormones.

So I was understandably a bit excited when I discovered the **ŌURA** ring at a [biohacking conference in Finland](https://bengreenfieldfitness.com/biohacker2016) (<https://bengreenfieldfitness.com/biohacker2016>). This small, stylish ring promised to use state-of-the-art miniaturized electronics to track and measure a host of parameters, including sleep, heart rate, heart rate variability (HRV), activity, body temperature, movement, respiration, and more.

I decided to find out more about this thing, so in the podcast "[Could This New Ring Be The Final Frontier In Self Quantification, Biohacking, Sleep Tracking, HRV, Respiration & More?](https://bengreenfieldfitness.com/2015/09/what-is-the-oura-ring)" (<https://bengreenfieldfitness.com/2015/09/what-is-the-oura-ring>), I interviewed the Co-Founder and CEO of **ŌURA** ring: Petteri Lahtela. During our discussion, we talked about:

*-How the **ŌURA** ring identifies deep sleep, REM sleep, light sleep, and periods of wakefulness, and how accurate this data is compared to actual sleep lab measurements...*

*-Why the **ŌURA** ring is designed to allow you to completely disable the bluetooth function, and why the ring is specifically designed to not constantly transmit a signal (very important if you are concerned about electrical pollution)...*

-The infrared measurement used to analyze HRV, and why it is just as accurate at measuring HRV as wearing a chest strap...

*-How the Readiness Score you get from the **ŌURA** ring helps you identify days that are ideal for challenging yourself, and those that are better for taking it easy...*

-How something called your interbeat interval and pulse waveform can be used to accurately calculate your respiration rate...

-The important data that you can collect about your body using the built-in accelerometer inside the ring...

*-How the **ŌURA** measures temperature, and what kind of health information you can discover by monitoring your body's temperature...*

-Why the ring was designed to withstand extremes of environment and temperature, such as hot saunas, cold water, etc.

-How you can use the ring to track daily consumption (caffeine, alcohol, sugar), sleep aids you might be trying (valerian, melatonin, acupuncture) or other factors in your environment (barometric pressure, CO2, pollen count) using something called the Curious platform...

-And much more.

Anyways, you can [click here to listen to that podcast](https://bengreenfieldfitness.com/2015/09/what-is-the-oura-ring/)
(<https://bengreenfieldfitness.com/2015/09/what-is-the-oura-ring/>)...

...but since releasing that episode and subsequently getting myself an ŌURA ring, spending oodles and oodles of hours testing it, putting it through ringer (yes, a pun) and pouring over the data, I've generated a big list of my own questions and also received plenty of questions from listeners and readers like you about how to interpret and make sense of data generated by self-quantification devices.

So in this article, I'm answering 11 of the most crucial questions I've received, and you're going find out everything you need to know about parameters that drastically affect the way you look, feel and perform, but parameters you don't see talked about much these days, things like...

..."lowest resting heart rate during sleep"..."activity readiness score"..."brain pulsations" and beyond. Even if you don't own a self-quantification device, this article is going to be an information-rich resource for you to read, bookmark and use in your own pursuit of a perfect combination of sleep, activity and full body readiness for anything life throws at you.

Leave any additional comments below the post and I'll ensure you get your question answered. Also mention my name in the comments section of [any order](https://shop.ouraring.com/) (<https://shop.ouraring.com/>) for an ŌURA ring and they'll knock \$10 off after you order, whether USA or International.

Q. What is a "Sleep Score" and what kind of things contribute to it?

A. Ranging from 0-100%, your Sleep Score is simply an overall measure of how well you slept. That's it. A Sleep Score of 85% usually means that all contributors are in balance, and you meet the typical sleep needs of a person your age. Of course, sleep needs vary from person to person, so it's good to evaluate and interpret your Sleep Score in relation to your feelings and performance level. If you feel refreshed in the morning and energetic throughout the day, your Sleep Score is most likely at a good level.

So what are the most important variables that affect this Sleep Score?

-Total sleep: Total sleep refers to the total amount of time you spend in light, REM and deep sleep. The amount of sleep needed varies from person to person. As a general rule, the younger you are, the more sleep you need. Most adults need 7-9 hours to perform well and stay healthy. Getting a good amount of sleep for your age will keep your Total Sleep time in balance, approximately at 80%. If you're using the ŌURA ring to measure your sleep, you will see a full bar when your Total Sleep time reaches 9 hours.

-Efficiency: Sleep efficiency is a measurement of your sleep quality. It's the percentage of time you actually spend asleep after going to bed. For adults, a generally accepted cut-off score for good Sleep Efficiency is 85%. It's common for Sleep Efficiency to slightly decrease with age. For a maximum positive contribution to your Sleep Score, your Sleep Efficiency needs to be 95%. You'll see a lowered Sleep Score if it has taken more than 20 minutes for you to fall asleep, or if you experience one long or multiple shorter wake-ups during the night.

-Disturbances: Sleep Disturbances caused by wake-ups, get-ups and restless time during your sleep can have a big impact on your sleep quality and daytime cognitive performance. Restless sleep is less restorative than uninterrupted sleep, and it's usually the cause of daytime sleepiness. Disturbances can be caused by various different factors, such as stress, noise, partners, pets or different foods. To improve your chances of getting restful sleep, [read my article on 4 ways to hack your sleep cycles](https://bengreenfieldfitness.com/2016/04/how-sleep-cycles-work/). (<https://bengreenfieldfitness.com/2016/04/how-sleep-cycles-work/>)

-REM Sleep: REM (rapid eye movement) sleep plays an essential role in re-energizing your mind and your body, making it an important contributor to your sleep quality. REM is associated with dreaming, memory consolidation, learning and creativity. Making up anywhere between 5-50% of your total sleep time, the amount of REM can vary significantly between nights and individuals. On average REM counts for 20-25% (1,5h – 2h) of total sleep time for adults, and it usually decreases with age. REM is regulated by

circadian rhythms, i.e. your body clock. Getting a full night's sleep, sticking to a regular sleep schedule and avoiding caffeine, alcohol or other stimulants in the evening may increase your chances of getting more REM.

-Deep Sleep: Deep Sleep is the most restorative and rejuvenating sleep stage, enabling muscle growth and repair. When you're in deep sleep, your blood pressure drops, heart and breathing rates are regular, arm and leg muscles are relaxed and you're very difficult to awaken. Varying significantly between nights and individuals, Deep Sleep can make up anywhere between 0-35% of your total sleep time. On average adults spend 15-20% of their total sleep time in Deep Sleep, the percentage usually decreasing with age. Regular physical activity, avoiding heavy meals and alcohol before bed and long naps and caffeine in the afternoon can improve your chances of getting more Deep Sleep.

-Sleep Latency: Sleep Latency is the time it takes for you to fall asleep. Ideally falling asleep shouldn't take more than 15-20 minutes. Falling asleep immediately (in less than 5 minutes) could be a sign that you're not getting enough sleep for your needs. If you have trouble falling asleep, try getting out of bed and doing something relaxing, ideally in low light conditions, until you feel sleepy again.

-Sleep Timing: Your Sleep Timing is an important contributor to your sleep quality and daytime performance. Most of your body's essential processes such as your body temperature, hormone release and hunger run in 24-hour cycles called circadian rhythms. Sleeping during the night and staying awake and active during the day can help keep these internal rhythms in balance, and helps you perform better throughout the day. For example, the ŌURA ring algorithm considers your Sleep Timing to be optimal and aligned with the sun when the midpoint of your sleep falls between midnight and 3 am, allowing some variability for morning and evening types. A timing significantly earlier or later can lower your Sleep Score.

And then there's my personal favorite: the lowest resting heart rate during the night. More on that below...

Q. Why should I know when my lowest resting heart rate occurs during the night?

A. As you probably already know, your Resting Heart Rate (RHR) is the number of times your heart beats per minute when you're at rest. It's a good measurement of your sleep quality, recovery and overall health. But **OURA** measures your heart rate *throughout the night* and displays the lowest 10-minute average it has detected. Normal RHR during the night for adults can range anywhere from 40-100 BPM (*mine is 35, but I'm an endurance freak, and if you're a swimmer, cyclist, runner, triathlete, etc. then this may be the case for you too*). The best way to determine your normal level is by looking at your own data history.

This lowest RHR during the night is affected by various factors, such as physical activity, nutrition, body position, and environment. A low RHR is often associated with good fitness and overall health. An exceptionally high or low RHR is usually a sign of increased need for recovery, and here's the important thing: **if your lowest resting heart rate occurs during the night at a later time than usual, that can be a sign of an increased need for recovery or that you are sleeping at too high a temperature in your room.**

Good to know, eh?

Your RHR can be elevated after a late night workout, a heavy meal in the evening, or when your body temperature is higher than your average. For women, the menstrual cycle can cause a small increase in RHR during the second half of the cycle (ovulatory and luteal phases).

It's also normal for your RHR to be higher than usual when recovering from an intense training day. As you increase your training volumes and your fitness improves, your RHR and your lowest RHR during the night should start to decline over time.

Q. What kind of things should I think about tracking in terms of what affects my sleep in a good or bad way?

A. Exercise is a good first place to start. Data suggests not only that exercising during the day will help you fall asleep more quickly and plunge you into deeper sleep for a longer period of time, but also that exercising causes your body to produce growth hormones, which help it to repair and revitalize itself. [Many people report that based on](#)

[sleep tracking results they sleep better with regular exercise and that they feel more alert and rejuvenated the following day \(http://journals.lww.com/acsm-msse/Fulltext/2011/07000/Quantity_and_Quality_of_Exercise_for_Developing.26.aspx\).](http://journals.lww.com/acsm-msse/Fulltext/2011/07000/Quantity_and_Quality_of_Exercise_for_Developing.26.aspx)

Diet is of course another key variable to track. [Check out this excellent article to see the findings of sleep studies in relation to diet.](http://www.thesleepdoctor.com/2016/06/27/eat-matter-sleep)

(<http://www.thesleepdoctor.com/2016/06/27/eat-matter-sleep>) For example, [one study states: \(http://www.ncbi.nlm.nih.gov/pubmed/21296614\)](http://www.ncbi.nlm.nih.gov/pubmed/21296614)

“The midpoint of sleep is significantly associated with dietary intake of certain nutrients and foods and other dietary behaviors in young Japanese women. This finding may contribute to consider the relationships between chronotype and dietary intakes and behaviors.”

This is especially true for those who are sensitive to gluten (like I am) or some other foods without knowing it will have big effect on sleep and restorativeness of sleep. Also soft drinks and other drinks sweetened with fructose and/or artificial sweeteners extensively affect liver function and therefore disturb sleep, especially between 1am and 3am.

Then there is caffeine, alcohol and other stimulants and depressants. The “half-life” of a compound, which is the level at which the effect of these type of stimulants or depressants is somewhat reduced tends to vary widely based on genetics, metabolism, etc.. Many of them prevent you from either falling asleep or having good quality sleep. For example, alcohol induces sympathetic activity of autonomic nervous system, increases resting heart rate, delays the reaching of the lowest resting heart rate, increases body temperature, blood pressure, insulin levels, dehydrates the body and for any of those reason awakens you some time in the middle of the night. In general, many stimulants taken too near to sleep time practically limit the restorativeness of sleep and cause sleep debt (deprivation). It can actually take several nights of sleep and balancing daily behavior to recover both mentally and physically from one poorly slept night.

As you track these kind of variables in relation to your sleep quality, try the following:

-First, stick to a regular bedtime and wake-up time before starting other hacking experiments – this needs to be preferably a week or longer and the the time when you reach the lowest resting heart rate (RHR) during the night should not change too much.

-If the lowest RHR happens late in the night or more in the morning then you have not recovered well from either having too intensive activity late in the evening or you have had too full meal late in the evening or taken stimulants or spent too much time too late on blue light (screen time), for example. All of these mess up the sleep pattern and sleep becomes lighter.

*-Pay attention to wake-sleep cycle and circadian alignment (reflected in skin temperature being clearly higher during the night than the day – which can also be checked from the **OURA** report)*

*-Pay attention to not only the amount of deep sleep but overall sleep architecture and sleep score that **OURA** gives you, since the overall picture is more important. Also, the balance of activity, timing and intensity in relation to sleep timing is very important. If the timing of lowest RHR varies continuously then there is something in your lifestyle, diet or rhythms that challenges your sleep.*

Q. What is Sleep Timing?

A. Your Sleep Timing is an incredibly important contributor to your sleep quality and daytime performance. Most of your body's essential processes such as your body temperature, hormone release and hunger run in 24-hour cycles called circadian rhythms. Sleeping during the night and staying awake and active during the day can help keep these internal rhythms in balance, and helps you perform better throughout the day.

*The **OURA** ring considers your Sleep Timing to be optimal and aligned with the sun when the midpoint of your sleep falls between midnight and 3 am, allowing some variability for morning and evening types. A timing significantly earlier or later can lower your Sleep Score.*

So what kind of things can affect Sleep Timing (AKA circadian rhythms)?

One big factor is “social jetlag”. Millions of people today force their bodies to adjust to artificial sleep schedules, negatively affecting both their sleep and their health. Sleep jetlag is actually a new term for this, as you can see from the anecdote below taken from [this study](http://www.tandfonline.com/doi/abs/10.1080/07420520500545979) (<http://www.tandfonline.com/doi/abs/10.1080/07420520500545979>):

“Humans show large differences in the preferred timing of their sleep and activity. This so-called “chronotype” is largely regulated by the circadian clock. Both genetic variations in clock genes and environmental influences contribute to the distribution of chronotypes in a given population, ranging from extreme early types to extreme late types with the majority falling between these extremes. Social (e.g., school and work) schedules interfere considerably with individual sleep preferences in the majority of the population. Late chronotypes show the largest differences in sleep timing between work and free days leading to a considerable sleep debt on work days, for which they compensate on free days. The discrepancy between work and free days, between social and biological time, can be described as ‘social jetlag.’”

Sleeping and waking time also has effect on circadian rhythm. For example, your drive for sleep increases as a function of time elapsed since your awakening. A normal, regular sleep-wake time works as regulator for circadian drive for alertness, balancing and improving your sleep quality. Circadian drive for alertness peaks at the end of circadian day and reaches its peak at the end of circadian night, and this means that in an ideal situation, you should go to bed and wake up at similar times each night and day.

Meal time is another huge cue for your circadian rhythm. Clocks in your peripheral tissues are actually governed by feeding cycles. Thus, diurnal feeding imposes diurnal rhythms upon all these tissues in your body (Mohawk et al., 2012. Central and peripheral circadian clocks in mammals, *Annu. Rev. Neurosci.* 35 (2012) 445e462.). That study shows that chronic advances in light-dark cycles imitate jet lag and shift work, increase body weight and alter the expression of metabolic genes, whereas time-defined feeding prevents obesity without affecting caloric intake.

Yes, these results suggest that the major factor involved in obesity induced by jet-lag or shift work is fluctuating meal timing and not a shift in light-dark cycles!

Typical methods used to measure circadian rhythm are melatonin levels and core body temperature. According to several studies the skin temperature is actually an accurate marker of the circadian rhythm. [Corbalan-Tutau et al., 2011; Ortiz-Tudela et al., 2010;

Sarabia et al., 2009], and your sleep midpoint is good parameter for measuring your circadian rhythm too.

Q. How much time in each sleep phase should I get?

A. Let's start with the first: REM sleep...

REM sleep is a unique phase of mammalian sleep characterized by random movement of the eyes, low muscle tone throughout the body, and the propensity of a sleeper to have vivid or lucid dreams. This phase is also known as paradoxical sleep (PS) and sometimes "desynchronized sleep" because of its physiological similarities to a waking state, including rapid, low-voltage desynchronized brain waves – basically a combination of alpha brain waves and beta brain waves.

During a typical night of sleep, you usually experience about four or five periods of REM sleep, which are quite short at the beginning of the night and longer toward the end. The first REM episode typically occurs about 70 minutes after falling asleep. Cycles of about 90 minutes each follow, with each cycle including a larger proportion of REM sleep. REM sleep typically occupies 20-25% of total sleep in adult humans, or about 90-120 minutes of a night's sleep.

Here's the important thing to look for when evaluating the "sleep percentage" your sleep-tracking device of choice gives you: REM sleep typically occupies 20-25% of total sleep in adult humans, or about 90-120 minutes of a night's sleep. That's the number you should be shooting for.

Next comes non-REM (NREM) sleep, which is best defined as any sleep not recognizable as REM sleep. NREM consists of three separate stages: stage 1, stage 2 and stage 3, also known as N1, N2 and N3 – with N1+N2 typically being classified as light sleep, and N3 being classified as deep sleep.

Stage 1 (NREM1 or N1) is the stage between wakefulness and sleep, sometimes referred to as "drowsy" sleep, in which your muscles are still quite active and your eyes roll around slowly, and may open and close from time to time. In more scientific terms, stage 1 is the period of transition from relatively unsynchronized beta and gamma brain waves (with a

frequency of 12-30 Hz and 25-100 Hz), which is the normal range for the awake state, to more synchronized but slower alpha waves with a frequency of 8-13 Hz, and then to theta waves with a frequency of 4-7 Hz.

During N1 sleep, your breathing gradually becomes more regular and your heart rate begins to slow. Dreaming is relatively rare during this stage, but sudden twitches or jerks (sudden short micro-awakenings) are quite common, and these are simply the last gasps of waking control before sleep fully takes over. During this short period of very light, easily disrupted sleep, which usually lasts less than 10 minutes, you can be aware of sounds and conversations, but you feel unwilling to respond to them.

Typically, this stage should represent only about 5% of your total sleep time.

Stage 2 (NREM2 or N2) is the stage of sleep in which muscle activity decreases still further and conscious awareness of the outside world begins to fade completely. Brain waves during stage 2 are mainly in the theta wave range (just like N1 sleep), but N2 sleep is also characterized by two distinguishing characteristics: sleep spindles (short bursts of brain activity in the region of 12-14 Hz, lasting maybe half a second each, also known as "sigma" waves) and K-complexes (short negative high voltage peaks, followed by a slower positive complex, and then a final negative peak, with each complex lasting 1-2 minutes). Together, these two waves protect sleep and suppress response to outside stimuli, as well aid in sleep-based memory consolidation and information processing.

Because you pass through this stage several times during the night, more time is spent in stage 2 sleep than in any other single stage, and N2 should typically constitutes about 45%-50% of total sleep time. If you add up N1 (ideally 5%) and N2 (ideally 45-50%), that is what something like the ŌURA will quantify as total light sleep, so now you know that total light sleep should be around 50-55% on a sleep quantification reading.

Finally, stage 3 (NREM3 or N3) occurs, and this known as deep or delta or slow-wave sleep (SWS), characterized by delta brain waves with a frequency of around 0.5-4 Hz. During this stage, you are even less responsive to the outside environment, essentially cut off from the world and unaware of any sounds or other stimuli. Neuronal activity, brain temperature, breathing rate, heart rate and blood pressure are all at their lowest levels during stage 3 sleep. Dreaming is more common during this stage than in the

other non-REM sleep stages, and this is also the stage during which “parasomnias” such as night terrors, sleep-walking, sleep-talking and bedwetting occur. Information processing and memory consolidation also take place during this stage.

Interestingly, it is much more difficult to wake a person during stage 3 sleep, and if awakened at this stage, you will often feel very groggy. It can take up to 30 minutes before they attain normal mental performance (known as sleep inertia). Hence the advent of many new alarm clocks and self-quantification devices that sync to your phone or cause a vibration or alarm to occur during the point in the morning when you are *not* in this stage of sleep (I think that’s a quite handy feature).

This stage 3 sleep (AKA “deep sleep”) should ideally represent around 15%-20% of your total sleep time.

OK, so let’s review what kind of percentages you should be looking for when analyzing your sleep data:

-Awake time should be 1-5%

-REM sleep should be 20-25%

-Light sleep should be 50-55%

-Deep sleep should be 15-20%

As you learn in [my podcast with sleep expert Nick Littlehailes](https://bengreenfieldfitness.com/2015/09/sleep-hacking-tactics-with-nick-littlehailes/)

(<https://bengreenfieldfitness.com/2015/09/sleep-hacking-tactics-with-nick-littlehailes/>), you should ideally go through four to five of these sleep cycles from REM to NREM during any 24 hour period, or about 35 sleep cycles every week.

Q. What if my sleep tracking device shows I get really low levels of deep sleep?

A. Surprisingly, your sleep can be good even if you don't get very much N3 (=deep) sleep. Even in brain wave signals, deep sleep can be deeper or lighter in one person over the course of the night, and between people. In the sleep lab, depending on the low frequency brain wave signals at certain cut-point sleep is determined as N2 (light)

instead of N3 (deep). By the way, the term “light sleep” (as N2 has been called historically together with N1) is actually not the best word to describe N2, because stage 2 N-REM sleep is actually the very “base” sleep stage and restorative as well.

There is certainly some inter-individual variability in how breathing and HRV characteristics and the exact number of motions allowed for the point where N3 starts and N2 ends. Now, assuming somebody makes behavioral adjustments and wishes to see if they start getting more deep sleep, can they be sure that something like the ÕURA ring will show the changes? The answer is yes, because the ÕURA will react to changes when more N3 starts to accumulate. There is some quantification challenge if sleep only deepens a little (doesn't reach the criteria set for deep).

It seems that many people who see they are getting low levels of deep sleep tend to start doing some extensive hacking for getting more deep sleep but many times the most powerful hacks are actually very simple. For example, you can see some interesting stats by plotting bedtime start times against amount of deep sleep as well as the stability of your bedtime starts over past few days against your deep sleep. This indicates that the regular bedtimes and wake up times help keeping the circadian alignment and help the body learn the rhythm over the time. That leads to more stable sleep patterns and eventually to adequate amounts of deep and REM sleep as well. Your body tends to keep the rhythms and if they vary a lot, the sleep becomes lighter.

Then there's Heart Rate Variability (HRV), and how that relates to various sleep stages. I asked ÕURA if they planned on releasing much data regarding HRV *during* the night, and here was their reply:

“We will soon have great data about HRV in different sleep stages, which is reflecting the overall restorativeness better than morning HRV

(<http://circ.ahajournals.org/content/91/7/1918>

(<http://circ.ahajournals.org/content/91/7/1918>)). Morning HRV mostly reflects the overall restorativeness of sleep and state of recovery but in the context of sleep stages it correlates more with the amount of REM. The HRV characteristics varies a lot in relation to sleep stages and therefore also measuring HRV “randomly” overnight does not provide much meaning....”

Which brings me to another point: I am *constantly* in touch with the folks at ÕURA, giving them feedback about the ring, the need for even more HRV functionality and “geeked out info” for nerds like me who want to tear into every shred of data, more napping sleep

cycle info, etc. It's actually quite cool to see the app continue to evolve based on my own personal feedback.

Q. What are sleep pulsations, and why are they important with regards to sleep and recovery?

A. Recently scientists have developed a means to monitor the actual pulsation of the blood vessels in the brain (<http://www.ncbi.nlm.nih.gov/pubmed/26690495>). These pulsations are how your brain "cleanses" itself while you sleep. Researchers have developed a specific MRI in which the brain is photographed 10 times per second, from which it is possible to see any disruptions in the cleansing system.

They detected three types of physiological mechanisms affecting cerebral cerebrospinal fluid pulsations: cardiac, respiratory, and very low frequency pulsations. Since glymphatic system failure may precede protein accumulations in diseases such as Alzheimer's dementia, this methodological advance offers a novel approach to image brain fluid dynamics that potentially can enable early detection and intervention in neurodegenerative diseases. The changes may appear years before the first symptoms of a memory and behavioural diseases and it may be possible in future to prevent diseases or treat them before any long-lasting effects on the brain.

The ŌURA ring accurately detects the characteristics in body signals that associate with different sleep stages, like the regularity of breathing, restfulness, characteristic patterns in blood volume pulse wave, pulse amplitude variation, resting heart rate and variation of the heart rate. Additionally ŌURA measures and provides long term trends of multiple body signals and parameters that indicate how your body responds to your daily life choices, rhythms and activities, among others. So, in addition to holistic view on sleep ŌURA provides a view on autonomic nervous system balance. ŌURA can be used 24/7 continuously and therefore enables longitudinal access to such sleep related insights in the context of normal daily life. This has not been possible before in this level of comfort and accuracy as a longitudinal view.

Q. What is a "Readiness Score"?

A. Ranging from 0-100%, the Readiness Score given by the **OURA** helps you identify the days that are ideal for challenging yourself, and those that are better for taking it easy. The Readiness Score is affected by a variety of "Readiness Contributors", which help you to evaluate how well your recent and cumulative sleep, activity and recovery are in balance.

A Readiness Score above 85% indicates that you're well recovered. A score below 70% usually means that an essential Readiness Contributor, such as your body temperature or previous night's sleep, falls outside your normal range, or clearly differs from recommended, science-based values.

So what are the most important variables that affect readiness?

-Previous Night's Sleep: How you slept last night can have a significant impact on your readiness to perform during the day. Getting enough good quality sleep is necessary for physical recovery, memory and learning, all part of your readiness to perform. For a maximum positive contribution to your Readiness Score, your Sleep Score needs to be above 88%, and at the high end of your normal range.

-Sleep Balance: Sleep Balance shows if the sleep you've been getting over the past two weeks is in balance with your needs. Sleep Balance is based on a long-term view on your sleep patterns. It's measured by comparing your total sleep time from the past two weeks to your long-term sleep history and the amount of sleep recommended for your age. Typically adults need 7-9 hours of sleep to stay healthy, alert, and to perform at their best both mentally and physically. Insufficient sleep can eventually lead to sleep debt. Paying back sleep debt and rebuilding sleep balance takes several nights of good sleep.

-Previous Day: our level of physical activity yesterday is one of the key contributors to your Readiness Score. When Previous Day is in balance and the contributor bar is at 100%, you'll know you've balanced your need for activity and rest, and substituted a nice amount of inactive time with low activity. An exceptionally high amount of inactivity or activity leads to a drop in your Readiness Score. If your readiness is low due to intense training and increased Activity Burn, taking time to recover can pay off as improved fitness.

-Activity Balance: Activity Balance measures how your activity level over the past days is affecting your readiness to perform. A full bar indicates that you've been active, but kept from training at your maximum capacity. This has boosted your recovery and helped build up your energy levels. While easier days can have a positive effect on your readiness level, challenging your body every now and then by increasing your training volumes helps maintain and develop your physical capacity in the long run.

-Body Temperature: ŌURA tracks the variations of your body temperature by measuring your skin temperature each night. Body temperature is a well-regulated vital parameter. When you sleep, ŌURA compares your skin temperature to similar measures from your earlier nights to estimate your normal range. A full contributor bar indicates that your estimated Body Temperature is within normal variation. You'll see a lowered Readiness Score when your Body Temperature is outside your normal range.

-Resting Heart Rate: Resting Heart Rate (RHR) is the number of times your heart beats per minute when you're at rest. It's a reliable measurement of your recovery status, and an important contributor to your readiness. ŌURA evaluates the optimal level for your RHR by studying your data after active days and recovery days for a couple of weeks. Once it knows your normal range, your Readiness Score will start to become more accurate. ŌURA interprets a RHR slightly below your average as a sign of good readiness, whereas an exceptionally high or low RHR is a sign of increased need for recovery. An intense training day, a late night workout, elevated body temperature, or a heavy meal just before bed can keep your RHR elevated during the night, often resulting to a lowered Readiness Score.

-Recovery Index: Recovery Index measures how long it takes for your Resting Heart Rate (RHR) to stabilize and to reach its lowest point during the night. A sign of very good recovery is that your RHR reaches its lowest point during the first half of the night, at least 6 hours before you wake up. Alcohol, a heavy meal before bed or late exercise speed up your metabolism and keep your RHR elevated, delaying your recovery and increasing your sleep needs.

Q. What is an "Activity Score"?

A. Ranging from 0-100%, your Activity Score is an overall measure of how active you've been today, and over the past seven days. The Activity Score is affected by Activity Contributors. Before ŌURA starts collecting your personal activity data, the score is set by default at 75%. An Activity Score above 85% indicates that you're getting health and fitness benefits associated with increased physical activity.

For higher scores you need to reach your daily Activity Targets regularly, do medium and high intensity level training (Medium+) 3-5 times weekly, avoid long periods of inactivity and have 1-2 easy or recovery days weekly.

So what affects the Activity Score?

-Activity Burn. Activity Burn shows the kilocalories you've burned by daily movement and exercise. Activity Burn is an estimate of your net calorie burn. This means that it doesn't include your Basal Metabolic Rate (BMR), i.e. the calories your body would burn while resting. Activity Burn shows the additional calories burned by walking, training or doing other activities (the portion that exceeds 1.5 MET level). Tracking your Activity Burn can help you to balance out your current activity level and your calorie intake, which is key to good recovery and maintaining a healthy weight.

By the way, if you have no clue what a MET is, [then read this for the nitty gritty details \(http://www.whyiexercise.com/metabolic-equivalent.html\)](http://www.whyiexercise.com/metabolic-equivalent.html), but basically MET (or Metabolic Equivalent) is a common measure used to express the energy expenditure and intensity of different physical activities. If the MET value of a specific activity is 4, it means that you're burning 4 times as many calories as you would burn while resting. The time engaged in different activities can be expressed as MET minutes. For example:

-30 min x 5 METs = 150 MET min

-30 min x 7 METs = 210 MET min

OK, let's keep going...

-Activity Frequency. Moving around and avoiding long periods of inactivity helps you stay healthy, and keeps your metabolism active throughout the day. ŌURA measures the time you've spent sitting, standing or otherwise inactive during the past 24 hours. Inactive time doesn't include resting or sleep. Having 5-7 hours or less of inactive time per day has a positive effect on your Activity Score. ŌURA actually tracks the time you spend sitting, standing or otherwise passive, and guides you to break up long periods of

inactivity. The number of continuous one-hour periods is displayed above the sitting icon in the Activity view. An hour of inactivity will only have a small effect on the contributor, but staying still for several hours will start to lower your Activity Score.

-Daily Targets: Each day ŌURA gives you daily Activity Target based on your age, gender and readiness level. Your daily activity is measured from 4 am to 4 am. Whether it's everyday activities or intense training, all daily movement measured during this 24-hour period moves you closer to your daily target. Meet Daily Targets will be at 100% when you've met your target on 6-7 days. Falling short of your target on 3 or more days starts to lower your Activity Score.

-Training Frequency: Training frequency measures how often you've gotten Medium+ activity over the past 7 days. Optimal Training Frequency is key to maintaining and developing your cardiovascular fitness. ŌURA recommends getting at least 100 MET minutes of medium+ activity a day. This is equivalent to 20 minutes of jogging or 30 minutes of brisk walking. Yep, that's not much. [As you can read about here](http://www.quickanddirtytips.com/health-fitness/exercise/what-i-learned-from-walking-15000-steps-per-day) (<http://www.quickanddirtytips.com/health-fitness/exercise/what-i-learned-from-walking-15000-steps-per-day>), I personally go way above and beyond that and target 15,000 steps per day, and the ŌURA algorithm is constantly being updated to allow for fancy "exceptions" to the activity score based on super active people like me.

-Training Volume: Training Volume measures the amount of Medium+ Activity you've gotten over the past 7 days. Like Training Frequency, Training Volume is an essential aspect of maintaining and improving your fitness level. For your Training Volume to have a maximum positive contribution to your Activity Score, you need to get 2000 MET minutes of Medium+ Activity per week (2000-3000 kcal, depending on your body weight). When your activity level goes below 750 MET minutes a week (750-1500 kcal), your Activity Score will start to decline.

-Recovery Time. As you probably know, having a sufficient amount of easier days in your training program boosts your performance and helps speed up your recovery. No matter how much you train, the actual fitness progress takes place during Recovery Time, when your muscles have time to repair and grow. For ŌURA, an easy day means keeping the amount of medium intensity level activity below 200 MET minutes (200-300 kcal/day depending on body weight), and high intensity activity below 100 MET minutes (100-150

kcal/day depending on body weight). In practice this can mean doing lots of low intensity activities, getting healthy amounts of medium intensity activity (e.g. 30-60 min), but only a small amount of high intensity activity (e.g. below 10 min).

The **OURA** ring gives you a minimum daily Activity Target based on your age, gender and daily readiness. When your Readiness Score is above 90%, your Activity Target is usually high. Days like these are usually optimal for taking your training to the next level and developing your physical performance. On days when your readiness drops below 70%, your Activity Target is lowered, and avoiding or reducing intensive training might be in order.

Q. Can I do weight training workouts and water workouts while wearing the ring?

A. Yes. For example, I do a huge number of pull-ups, swings, deadlifts, cleans, presses, etc. while wearing my ring, and for about the first 30 days of this, my inner pinky and inner middle finger went through the normal period of developing callouses on my finger skin from the ring rubbing. Now, just like any calloused area, there are zero skin issues on the finger.

The ring is also completely resistant and functional up to 50m deep in the water.

When you first order the **OURA**, you receive a sizing kit that ensures you get a ring that fits your finger perfectly. However, for situations such as Spartan races or triathlons that involve slippery mud, cold water, etc., I remove the ring so that I don't lose it.

Q. Is there a quick "cheat sheet" on these terms I can use for a reference?

A. Yep, here you go:

Term	Description	Automatically detected by
------	-------------	---------------------------

OURA

Sleep	Sleep helps to recover from accumulated mental and physical load. It is an active and dynamic state characterized by changes in brain activity and physiological function including breathing, heart rate, blood pressure, autonomic nervous system and body temperature.	YES
Sleep Stages	Sleep is divided into rapid eye movement (REM) and non-REM sleep types. NREM sleep is composed of three different stages ranging from very light to deep. Oura detects both NREM – light and deep – and REM sleep, as well as awakenings during the sleep.	YES, very light (N1) and light sleep (N2) are combined
Sleep Architecture	Normal sleep architecture follows a cyclic pattern of sleep stages. A sleep cycle proceeds from lightest to deeper stages of NREM to the REM sleep and repeats itself about every 90 minutes. Sleep patterns can be affected by factors like age, the amount of recent sleep or wakefulness, the time of sleep, behaviors prior to sleep such as exercise, stress, jet lag, as well as environmental conditions such as temperature and light, and various chemicals.	YES
Light Sleep	During light sleep person becomes disengaged from surroundings, eyes moves slowly or stop moving, muscles relax with occasional twitches, heart rate and breathing rate are lowered, and body temperature drops. During light sleep person is easily awakened by noises and other disturbances. About 50-60% of the sleep time is spent in the light sleep stage.	YES

Deep sleep is the deepest and most restorative sleeps

Deep Sleep	stage. Blood pressure drops, heart and respiratory rates are low and regular, muscles are relaxed, energy is restored and essential hormones are released enabling tissue growth and repair. During deep sleep person is very difficult to awaken. Deep sleep is necessary for feeling well rested and energetic during the next day. Longest periods of deep sleep occur during the first half of the night. About 15-20% of sleep time is spent in deep sleep, and the amount declines with age.	YES
REM Sleep	REM sleep is associated with dreaming. A short period of REM may occurs about 90 minutes after falling asleep, and longer periods of REM typically occur during the second half of the night. During REM, eyes move rapidly, breathing becomes rapid, shallow and irregular, heart rate and blood pressure increase and arm and leg muscles are temporarily paralysed. Typically 20-25% of the sleep is spent in REM sleep, and the amount slightly decreases with age.	YES
Time in Bed	Time in bed starts when "the head hits the pillow" and ends at rise-up including awakening periods before falling asleep and during the sleep.	YES
Total Sleep Time	Sleep duration, or total sleep time, is the amount of time spent in light, deep and REM sleep stages during the night.	YES
Sleep Efficiency	Sleep efficiency is the ratio between sleep duration and time in bed. Sleep efficiency over 85% can be regarded as normal, while a number below 70% can be considered to be very low. Difficulties in initiating or maintaining sleep diminish sleep efficiency.	YES
	Sleep onset delay, or sleep latency, is the amount of time that elapses between the time the person's head hits the	

Sleep Onset Delay	pillow and the time person eventually falls asleep. Normal sleep onset delay is around 15 minutes. Very short sleep onset delay can be indirect indicator of sleep deprivation, while extended sleep onset delay is indicating difficulties of initiating sleep.	YES
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Wake after Sleep Onset (WASO)	WASO means time spent awake in bed after sleep has started, and before final awakening. It can be used to indicate the difficulties in maintaining sleep. The amount of awakenings increases the likelihood of feeling tired during the day, even though the tolerance for sleep disruptions varies. Sleep fragmentation seems to increase with age.	YES
--------------------------------------	--	------------

Sleep Debt	Feeling drowsy during a day is a sign of not having enough sleep. If sleep is too short, the body doesn't have time to complete all of the processes needed for muscle repair, memory consolidation and the release of the essential hormones. Sleep deprivation compromises cognitive, mental and physical performance. The sleep deprivation accumulated over several nights creates sleep debt. It may require several good nights to pay back sleep debt. For chronically sleep deprived it can take months to get back into the normal sleep pattern. Sleep debt that has been accumulated over extended periods of time may have irreversible negative consequences.	YES
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Sleep Score	Sleep Score is the parameter that shows your sleep quality at a glance. Oura Sleep score takes into account the positive and negative contributors for sleep quality such as total sleep time, REM and deep sleep duration, sleep onset delay and awakenings. Maximum Oura sleep score is 100% while 85% represents a level supposed to be adequate for normal daily performance. Individual tolerance to lower sleep scores may vary, but in general, lower sleep scores can be linked with impaired mental and cognitive performance and daytime sleepiness.	YES
--------------------	--	------------

Readiness Score	Oura Readiness Score indicates the ability to perform in daily life. Most essential parameters contributing to the Readiness Score are preceding sleep and physical activity, accumulated sleep debt, nocturnal heart rate and body temperature.	YES
Chronotype	Chronotype refers to person's typical time of sleep and ability to perform at different times of day. Morning type person wakes up early and is most active in the morning, whereas evening type person has later bed and wake-up times and is most energetic during afternoon and evening. Oura will utilize your daily rhythms and sleep related parameters in order to automatically learn about your chronotype characteristics.	YES
Circadian Rhythm	Several essential physiological and behavioral processes such as sleep-wake cycle, body temperature and hormone secretion follow circadian rhythms. An endogenous timing system generate and maintain circadian rhythms and is synchronized to solar rhythm mainly by external light stimuli. In addition, eating, sleeping, social behavior and physical activity synchronize the endogenous circadian rhythm. Misalignment between circadian and solar rhythms results in adverse consequences in many aspects of human health, including mental and physical performance, sleep, cardiovascular system, metabolic homeostasis and immune system. The target of Oura is to optimally align the endogenous and solar rhythms.	YES
	The sleep-wake cycle is regulated by an interaction and balance between two separate biological mechanisms in the body, homeostatic and circadian process. Homeostatic drive for sleep increases as a function of amount of time elapsed since last sleep episode and declines during sleep. The accumulation of sleep-inducing substances such as adenosine generates a pressure for	

Sleep Wake Cycle

sleep. The circadian drive for sleep peaks at the end of the biological night and reaches the lowest level at the end of the biological day. Adequate alignment between the homeostatic and circadian processes is crucial in obtaining optimal sleep and performance. Sleep-wake processes are influenced by the genes and several external factors such as medication, naps, mental and physiological strain and daily schedules.

YES

I'd also highly recommend you listen to "[Could This New Ring Be The Final Frontier In Self Quantification, Biohacking, Sleep Tracking, HRV, Respiration & More?](https://bengreenfieldfitness.com/2015/09/what-is-the-oura-ring/)" (<https://bengreenfieldfitness.com/2015/09/what-is-the-oura-ring/>), if you want to learn more about the hardware in the ring, why it doesn't produce any electrical pollution, why it's drastically different than any other self-quantification device on the face of the planet and much more.

Summary

What do you think?

Do you already track or plan on tracking your sleep, readiness and activity?

Do you have questions about sleep cycles, activity readiness, or anything else I discussed in this article? Leave your comments and questions below, and I'll reply. In the meantime, if you want to begin the process of self-quantification for yourself, you can...

-[Click here to get an ÕURA ring. \(https://ouraring.com/shop/?utm_source=bengreenfieldfitness.com&utm_medium=blog&utm_campaign=how-sleep-cycles-work\)](https://ouraring.com/shop/?utm_source=bengreenfieldfitness.com&utm_medium=blog&utm_campaign=how-sleep-cycles-work)

-[Click here to get the NatureBeat app I use to track my morning heart rate variability \(HRV\) in conjunction with the ÕURA \(https://bengreenfieldfitness.com/naturebeat\)](https://bengreenfieldfitness.com/naturebeat)

Thanks for reading and happy tracking!

[\(https://www.facebook.com/share/u=https%3A%2F%2Fbengreenfieldlife.com/quantification-articles%2Fhow-does-the-oura-ring-work/\)](https://www.facebook.com/share/u=https%3A%2F%2Fbengreenfieldlife.com/quantification-articles%2Fhow-does-the-oura-ring-work/)

[. \(https://www.instagram.com/bengreenfieldlife/Quantification%20Ring%20To%20Rule%20the%20World\)](https://www.instagram.com/bengreenfieldlife/Quantification%20Ring%20To%20Rule%20the%20World)

[\(https://www.linkedin.com/sharing?url=https%3A%2F%2Fbengreenfieldlife.com/quantification-articles%2Fhow-does-the-oura-ring-work/\)](https://www.linkedin.com/sharing?url=https%3A%2F%2Fbengreenfieldlife.com/quantification-articles%2Fhow-does-the-oura-ring-work/)

[\(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/)

(<https://telegram.me/share/url?url=http%3A%2F%2Fbengreenfieldlife.com%2Farticle%2Fself-quantification-articles%2Fhow-does-the-oura-ring-work%2F&text=11%20Crucial%20Health%20Questions%20And%20Mighty%20Self-Quantification%20Ring%20To%20Rule%20Them%20All%3A%20The%20Official%20Oura%20Ring%20Q%26A%3F>)

Ask Ben a Podcast Question

ASK NOW (<https://bengreenfieldfitness.com/ask-a-podcast-question/>)

80 THOUGHTS ON "11 CRUCIAL HEALTH QUESTIONS & MIGHTY SELF-QUANTIFICATION RING TO RULE THEM ALL: THE OFFICIAL OURA RING Q&A."

Michael Bryant says:

[January 17, 2019 at 8:56 pm](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-864796>)

Hi Ben,

I too have an Oura ring and have been tracking my sleep. I get lots of deep sleep (averaging 2h per night) however my REM sleep is usually low. My average for REM is only 40 minutes and there are frequently nights with <

30 minutes REM sleep. How could I increase my REM sleep period?

Thanks

[Reply](#)

Caleigh Magana says:

[January 11, 2019 at 10:13 am](#)

[\(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-864154\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-864154)

Sleepwalking is briefly mentioned in this article as occurring during “deep sleep.” I’m very curious if the OURA ring registers the movement during sleepwalking as an awake stage versus deep sleep? If so, how? Does it take into account other biometrics as more weight bearing in the algorithms versus the gyroscope information from movement?

[Reply](#)

Long Run Nick says:

[October 28, 2018 at 12:26 pm](#)

[\(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-855698\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-855698)

Hi Ben, very informative. Question from a 75 year old active male. I am fortunate enough to still be running 40-50 miles a week and have been at this level for over 42 years. Current total of logged road miles is 89,834 miles and counting. I just ordered the ring last Monday. Where and how do you enter personal data, ie, age, height weight,M/F?

I will continue to use my trusty Garmin FR watch(currently use the FR645 M) for my running and hope the Oura Ring will be helpful for checking sleep data and recovery. You would think a guy my age would have this all figured out. One thing I know for sure is, if I hadn’t “naturally” figured out all this I never would have been able to maintain my rigorous aerobic fitness life style.

Again, thanks for the in-depth look at the Oura Ring. Nick

.

[Reply](#)

Chris says:

[August 29, 2018 at 7:36 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-848139>)

Ben,

Looking to get my phone out of my room. I currently use sleep cycle to track my sleep and wake me up. What would you suggest to use (or currently using) in order to wake you up?

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [August 30, 2018](#)

[at 2:32 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-848323>)

Something like this: <https://amzn.to/2LIY4b4> (<https://amzn.to/2LIY4b4>)

[Reply](#)

THERESA A KARNECKI says:

[July 7, 2018 at 10:07 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-842768>)

I've both gotten & returned the new 2018 version. My recorded deep sleep oscillated between 4 & 30 %!!! Obviously the ring does not work. The email I got from Oura said "We are still improving the sleep algorithm but if you don't want to wait, please return the ring . . ."

\$300 for a product that does not work?!?!?! I returned it.

[Reply](#)

Greg white says:

[August 20, 2018 at 4:03 pm](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847092>)

The deep sleep measurements are actually not that accurate at all, but I knew this going in. Instead, I use the oura to measure how long I was asleep each night, what my RHR is (plus my recovery score), and to track steps.

[Reply](#)

Aleks says: [May 29, 2018 at 3:48 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-836924>)

This article is a really lengthy marketing pitch with lazy copy paste passages from the Oura website, whilst thin on the specifics how it measures something.

But what really up my nose is that after visiting this website with my mobile every new tab I open goes by default to this page.

NO I will not use your 5% smallest discount on the net so that you can pocket the difference.

Thanks but no thanks. Bye

[Reply](#)

Pal says: [February 2, 2018 at 1:26 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-823801>)

Is it possible to access raw IBI (inter beat interval) data for research purpose? Can EliteHrv receive from ring? Or Can the data be exported from Oura cloud?

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [February 26, 2018 at 10:36 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-826109>)

The ring isn't compatible with EliteHRV, I'm afraid. Data can be exported from Oura Cloud web service via API that allows you to integrate daily summaries of your sleep, activity and readiness data with your own applications and services. Oura will be rolling out the ability to download the data in the .csv data format from Oura Cloud at some point in the future. At first phase, it'll be partial/limited export, but eventually, all data will be enabled to be exported at once.

[Reply](#)

Stephen Errico says: [October 4, 2017 at 4:16 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-806496>)

I bought this ring because I'm interested in self quantification. It couldn't even track my sleep accurately, constantly identifying me as asleep when I wasn't so I really don't trust their other measurement indicators based on not even being able to get the basic sleep or not sleeping question answered correctly. Luckily they have a no questions asked return policy that i am now going to test. Very disappointing...and the ring fits fine and I am use to deploying technology so I don't think it is operator error.

[Reply](#)

Attila says: [May 30, 2017 at 8:34 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-795074\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-795074)

Hi Ben!

Can you tell me please what the **Ö**ura HRV score means? It is the RMSSD?

Can you tell me also if there is some possibility to find out the overnight breathing rate?

Thanks,

Attila

[Reply](#)

Marvey G says: [May 20, 2017 at 2:57 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-794278\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-794278)

Hi, can anyone confirm that this ring is compatible with Sweetbeat HRV app? Or another realtime HRV monitoring app? I contacted support and they said it's being added to their software but I see nothing about it on the website yet.

[Reply](#)

[Ben Greenfield \(https://bengreenfieldfitness.com\)](https://bengreenfieldfitness.com) says: [May 24, 2017 at 11:39 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-794601\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-794601)

Hi Marvey,

There are no plans to integrate the ring directly with any third party apps. So the answer is no, it's not compatible with Sweetbeat HRV.

Hope that helps!

[Reply](#)

Erica says: [April 24, 2017 at 3:51 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-791149\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-791149)

Underwhelmed! I've had the ring for almost two weeks, and received my first hour of inactivity while at a vigorous yoga class! Contacted support and they said this was common, and there would be upgrades by summer to either allow manual inputs and or imports from other devices, or improvements in ring's ability to identify different activities/energy expenditure. In addition, aimlessly jumping on a rebounder is labeled as high intensity, while a much more demanding but more static kettlebell workout is labeled as being low to moderate, but lower intensity than when I walk my dogs!.

But ok, I really was most interested in sleep tracking. Last night I stayed up late watching a movie, and I was totally perplexed by the sleep score I got this morning. The ring recorded my total sleep time as starting when I sat down on my couch last night to watch the 2 hour movie! I was totally awake and never fell asleep or was even drowsy. For most of the two hours I was watching the movie, the ring shows I was in deep sleep, with occasional light sleep and only one brief period of being awake!

I don't know if I can consider the ring's analytics valid at all given this measurement. I again contacted Oura support. They said they did not believe my ring was malfunctioning, and simply that "they continue to evolve their sleep analytics."

Disappointing!!!

[Reply](#)

Greg white says:

[August 20, 2018 at 4:08 pm](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847095>)

What I do is for anything other than walking or running, I don't wear the ring, and then I enter the activity manually in the app.

(Though I wouldn't expect much from yoga—it's a wonderful movement practice, but not a replacement for, say, HIIT training or heavy weights.)

[Reply](#)

Jim says:

[April 5, 2017 at 6:30 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-785585>)

Any indications if there is a new version of the hardware (smaller battery, etc) on the horizon?

Same question re the software. The data seems someone locked up (no way to dump to healthkit, etc). Would love to see what they have planned before picking up one.

Thanks for the detailed 411.

[Reply](#)

[Ben Greenfield \(https://bengreenfieldfitness.com\)](https://bengreenfieldfitness.com) says: [May 24, 2017 at 11:37 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-794600>)

Here's a response from Oura:

There are no current plans to release a smaller ring. Currently, **OURA** stores the following data to HealthKit:

Sleep Analysis, both the “in bed” and “asleep” time; “in bed” can contain more than one “asleep” period when ŌURA detects awake time while in bed

Heart Rate, in this case the lowest resting heart rate during sleep

Active Energy, i.e. calories burned in physical activity in addition to the Resting Energy (also known as idle burn or basal metabolic rate, BMR)

Weight, if the user edits it in the app

Height, if the user edits it in the app

[Reply](#)

Xin says: [February 11, 2017 at 8:28 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-769834\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-769834)

Anyone here using the Oura ring thinks that the Deep Sleep reading is very off? Both my husband and I get only single digit even 0% Deep Sleep. I will have at least one sleep study in a hospital sometime this year that I will bring my Oura ring to compare. But I want to see what Ben and others think on this issue and if I should contact Oura about it. Thanks!

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [February 15, 2017 at 8:59 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-770486\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-770486)

Hi Xin,

This would be something contact Oura directly about, you can get them at: support@ouraring.com BUT a couple of things to consider: there can be high inter-individual variability in how much deep sleep

we get (0-40%), and the share typically decreases by age.

- OURA uses several features that associate with sleep stages, such as breathing pattern, motion, pulse amplitude and heart rate variability, so any result is a measurement that is based on the parameters that have been measures during the night.
- OURA algoritms have been developed using PSG as a reference, and all further developments will be based on accumulating database of simultaneously measured PSG data and OURA ring data.

Hope that helps!

[Reply](#)

Greg white says:

[August 20, 2018 at 4:06 pm](#)

<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847094>

<https://www.frontiersin.org/articles/10.3389/fphys.2018.00743/full>

In a validation study of the OURA ring, it was shown to record similar total sleep time, sleep latency onset and wake after sleep onset, and had high sensitivity for detecting sleep (0.96). However, it had lower sensitivity for detecting light sleep (0.65), deep sleep (0.51) and rapid eye movement sleep (0.61), and relatively poor specificity for detecting wake (0.48). It also underestimated deep sleep by about 20 min, and overestimated the rapid eye movement sleep stage of sleep by about 17 min (de Zambotti et al., 2017b).

[Reply](#)

Chris says:

[August 22, 2018 at 9:18 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847364>)

“high sensitivity for detecting sleep (0.96)” & “and relatively poor specificity for detecting wake (0.48)”. Does that make sense?

[Reply](#)

Kasper Janssen (<http://www.napatwork.nl>) says: [February 6, 2017 at 12:35 pm](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-768982>)

Hi Ben,

Thanks for the valuable information on the Ouraring! The Ourateam stated that they would implement real time nap feedback (aka HRV score during napping), do you know if this function is planned in an software update soon? As sports physician I am very keen on using this ring in athletes and workers wanting to get fitter!

Thanks!

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [February 6, 2017 at 1:07 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-768990>)

Yes, very soon!

[Reply](#)

Troy says:

[January 24, 2017 at 2:50 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-766489>)

The discount with your name must have been temporary. I just ordered one...full price.

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [January 24, 2017](#)

[at 7:46 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-766663>)

Had 2 people use code "ben" today. it's not case sensitive.

Sometimes people just forget to hit "apply coupon"

Just tested now - its working

[Reply](#)

Joe in Missouri says:

[August 26, 2018 at 2:00 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847700>)

8/26/18 the code "Ben" is not valid as of today.

FYI hard to find shipping dates on that site.

The sorta obfuscate the fact that it is not shipping.

Anyone have a code that works" TIA

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says:

[August 26, 2018 at 10:59 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847735\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-847735)

It's been changed to: GREENFIELDOURA

[Reply](#)

Belena says:

[January 12, 2017 at 11:54 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-762898\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-762898)

So, I've heard you talk a lot about this ring and I am very interested in possibly getting one. However, I am wondering about the accuracy with measuring in someone who has extremely poor circulation. I have Raynaud's Syndrome and often get little circulation to my fingers and feet (especially toes). My fingers will go completely numb and turn purple or white at times, getting so cold from lack of circulation. Therefore, I am wondering if this ring would still be properly measuring my data as it quantifies the data based on blood flow through the fingers.

Thanks in advance.

[Reply](#)

Georgina says:

[January 8, 2017 at 7:34 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-761420\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-761420)

Can HRV be seen real time so you know when you need to breathe deeply etc. Considering this against Heartmath devices. Thanks.

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [January 13, 2017 at 12:47 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-763247>)

Yes, you can wear the NatureBeat and the heart rate strap I recommend at <https://greenfieldfitnesssystems.com/NatureBea...> (<https://bengreenfieldfitness.com/naturebeat>) all day long to collect data, although I don't recommend that as something you do "every day" because of the Bluetooth exposure all day long. But every once in a while it can be helpful to assess how you're doing with breathing, stress, etc.

[Reply](#)

Xin says: [January 2, 2017 at 12:27 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-759274>)

Thanks a lot for your work, Ben! I am so said Basis is discontinued that I am desperately in need of a better sleep tracker than fitbit etc. My question about the Oura ring is about the size. I am a very small women having to wear X-small gloves in lab b/c my fingers are short and thin. I am worried how would the Oura ring fit me. Any insights? Thank you very much!

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [January 2, 2017 at 2:51 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-759315>)

Yep, comes with custom sizing!

Reply

Brock says: [October 25, 2016 at 5:47 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-747505>)

Hi Ben!

Thanks for sharing! I just recently lost my wedding ring, and have been looking for a replacement. I had no idea something like this existed. It looks perfect, as I love fitness and want to track my health!

- Can I please ask, after your experience of using the Oura Ring for a while, how do you find it in-terms of EMF? I am very EMF-sensitive and have in the past had to return a Jawbone 2 and an Apple Watch due a tingling/electricity sensation running up my arm/body, often irritating enough that I had to turn the device in aeroplane mode. I also had trouble charging the Apple Watch, as the charging port side was touching the skin, and I had to ground it before I put it on my wrist. Have you noticed any of these effects whilst wearing or after charging the Oura Ring?

- Also, do you think using this as a replacement wedding band would it be OK? I'd be wearing it on my ring finger, as I know that most activity trackers on the market have to be worn on the wrist, targeting quite a few meridian points. Some experts say this is dangerous. Would this be the case if I wore the Oura Ring on my ring finger?

Reply

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [October](#)

[26, 2016](#)

[at 9:06 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-747526\)](#)

Brock – the Oura collects data in airplane mode, and this is one of the reasons why I like it so much! I haven't noticed any of those effects – no. It would be ok as a wedding band so long as you check with your wife ;)

[Reply](#)

Brock says:

[October 26, 2016 at 4:02 pm](#)

[\(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-747539\)](#)

Thanks Ben for the advice! Haha will definitely check with her first!

[Reply](#)

OURA team (<http://www.ouraring.com>) says: [August 29, 2016 at 12:57 pm](#)

[\(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-744249\)](#)

Hi DR,

The ring concentrates on whole day energy expenditure and it's overall impact to your body. During the night ŌURA measures every heart beat, which helps you to see your body reactions. During the day, the 3D-accelerometer based assesment can recognize the duration and overall intensity of activity quite well, with some exceptions: resistance, static work, and up/downhills. With regards to swimming, our preliminary experiments show freestyle is measured better than breast stroke. Regarding weightlifting, we are unable to compensate for the effect of weights.

In general, heart rate monitoring (HRM) would be a great addition to the estimation of MET levels. However, it has some limitations that are important to remember: (1) HRM needs to be accurate in order to be helpful. (2) HRM always needs individual calibration (in minimum HRrest, HRmax, Fitness level). (3) In respect to MET level, HR can be elevated for so many reasons (food, training status, mental excitement, stress, illness, ambient temperature, etc.) but it is very rarely too low (maybe chronic fatigue). (4) HR stays elevated for hours after intense exercise (or after sauna) while energy expenditure goes down to resting level within minutes (the remaining post-exercise oxygen consumption is marginal compared to the elevation in heart rate). (5) For example in swimming your heart rate is typically about 30% higher than in running at the same MET level, so your heart rate monitor may overestimate your intensity in swimming (or maybe you are a pro: competitive swimmers are exceptions, their body has adapted to upper body exercise and restricted breathing so that their heart rate is not significantly elevated in respect to MET level).

In summary, HRM would be an important addition to accelerometer if it were accurate, if you know your personal calibration values, and if you'd combine it's findings with your body status, temperature, and long-term motion data.

OURA team

[Reply](#)

Cindi says:

[April 5, 2017 at 6:24 pm](#)

<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-786104>

The main reason I need to see HRM real time is it's the only way to know if a device is calculating my heart rate, and thus whether any of the results are meaningful. I used wrist trackers in the past but I could see from the continuous monitoring that they completely missed 1/3 of my heart beats. How do I know that isn't happening with an Oura?

[Reply](#)

DR says: [August 11, 2016 at 11:39 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-743186\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-743186)

How does the ring know the type of activity your doing if its concentrating more on MET levels rather than HR monitoring? For example with MET levels fluctuating based on the type of activity (swimming with a score of 8.0 compared to weightlifting with a score of 6.0), how is the device able to tell the difference between when you are performing in either of these arenas?

[Reply](#)

Jenny says: [August 5, 2016 at 8:31 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742789\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742789)

Ben, have you noticed if it records your steps at your treadmill desk?

[Reply](#)

Donna says: [August 4, 2016 at 8:24 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742771\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742771)

Ben thanks for all the great info on the Oura ring. I backed their Kickstarter project after seeing you mentioned them. It's GREAT to see the Oura team so active in the comments here answering questions too. I haven't worn mine for a few weeks now after having intermittent issues with it not collecting any sleep data. But now you've inspired me to put it on again.

I have two questions:

Ben: how do you use the Oura with your NatureBeats app? How do you connect them or get the data from Oura imported into NatureBeats?

How accurate is the distance tracking, specifically for walking, hiking, running? I notice that the result I get from Oura is different that what other tracking devices give.

[Reply](#)

ÖURA team (<http://www.ouraring.com>) says: [August 5, 2016 at 11:38 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742804>)

Hi Donna,

Thanks for your message.

If you have had any issues with the Oura ring, especially as you describe, please contact support@ouraring.com immediately. It is of course not normal if you do not get sleep data. Our support can quickly help you to check out what is the problem.

For tracking of walking, hiking, running – please check the previous message related the activity monitoring. The distance (mi/km) representing your Activity Target and your progress towards is shown as equivalent walking distance of your daily movement and Activity Burn. This means that instead of measuring the actual distance traveled, ÖURA shows how far you could walk to burn the same amount of net calories. For example, a 5.6 mi / 9 km Activity Target could be met by getting 4 hours of low activity, 40 minutes of medium activity and 10 minutes of high intensity activity. The accuracy of the activity measurement of the Oura ring has been validated against indirect calorimeter.

ÖURA team

[Reply](#)

Betsy maldonado says:

[August 1, 2016 at 10:15 pm](#)

[. \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742643\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742643)

Just got my Oura today! Thanks to Ben's great Podcasts we decided to get Oura's for ourselves. My husbands is on back order because he got the black stealth model. I went for the white one. Thank you Ben for doing all the podcasts on it.

[Reply](#)

David Sanz says:

[July 27, 2016 at 3:24 am](#)

[. \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742286\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742286)

Hello Ben,

I have been interested in the Oura ring since I first heard about it from you, but I haven't purchased one yet because I'm still not 100% positive about the real benefits that it would bring to my athletic practice and/or mental performance on a daily basis.

In this article you explain really well all that the ring measures and how, but my main question is: What can you do with this information? Do you alter your training plan for the day/week according to what the ring tells you? If yes, how and why? In a nutshell: How do you use the information from the ring to improve your physical and mental performance?

Thank you!

[Reply](#)

[Ben Greenfield \(https://bengreenfieldfitness.com\)](https://bengreenfieldfitness.com) says:

[July 29,](#)

[2016 at](#)

[6:07 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742286\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742286)

[articles/how-does-the-oura-ring-work/#comment-742454](#))

Yes, I absolutely change my day's plan based on readiness score, sleep score, what my NatureBeat HRV score is, etc. I feed several variables into that equation to decide if it will indeed be a "hard day" or an "easy day". You can also decide other things (e.g. nap day vs. not, run day vs. lifting day, etc.)

[Reply](#)

David Sanz says:

[August 1, 2016 at 7:30 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742599>)

Hello Ben,

I really appreciate that you take the time to read your comments and answer them, thank you for that first of all!

Can you elaborate a bit more on the changes that you introduce and based on which results of sleep and/or readiness score?

If I may, I would say information about this "practical application" is what is holding people in a similar situation like me to finally decide to buy an Oura.

Thank you!

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says:

[August 1, 2016 at 3:09 pm](#) ([https://bengreenfieldlife.com/article/self-](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/)

[quantification-articles/how-does-the-oura-ring-work/#comment-742624](#))

I answered a similar question above – I change my day's plan based on readiness score, sleep score, what my NatureBeat HRV score is, etc. I feed several variables into that equation to decide if it will indeed be a "hard day" or an "easy day". You can also decide other things (e.g. nap day vs. not, run day vs. lifting day, etc.) That's mostly what I use it for.

[Reply](#)

David Sanz says: [August 2, 2016 at 6:02 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742661>)

Yes, it was my question the one you answered above and my reply was the request to elaborate on the details ;)

[Ben Greenfield \(https://bengreenfieldfitness.com\)](https://bengreenfieldfitness.com) says:

[August 2, 2016 at 2:22 pm](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742680>)

This might be a good one to call into the podcast – speakpipe.com/bengreenfield and keep it under 1 minute!

Health Vibed (<http://healthvibed.com/surthrival-colostrum-review/>) says:

[July 26, 2016 at 4:57 am](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742221) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742221>)

Okay, I'm starting to get interested in this gadget. But I have a question.

Even though it's on Aeroplane mode most of the time, is it not still emitting some level of EMF pollution?

You know what Kruse would say about this right? :) what do you think, is it worth it, for the benefits of the gadget?

Cheers

Reply

ÖURA team (<http://www.ouraring.com>) says: [August 10, 2016 at 9:26 am](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-743119) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-743119>)

Hi Health Vibed,

The ÖURA ring is a Bluetooth Smart class 2 device which has adjustable output power; 2.5 mW at maximum, but the ring actually uses lower power levels with the current design, typically 1 mW. For comparison, cell phones output power is typically 1000-2000 mW peak, approximately 120-250 mW during call. (Source: <https://en.wikipedia.org/wiki/DBm>)

The ring is not continuously transmitting the BT signal, but only for very short periods according to selected advertising intervals (well below 1% of the time) and more continuously during data syncing to app or firmware update for a few minutes altogether per day. During periods with no movements, especially when sleeping, also advertising is turned off. Flight mode turns BT completely off.

Certainly, where there is any electrical current there is electromagnetic emissions. Other than the Bluetooth transmission these emission have been negligible in our tests, much lower than typical background EMF. We will release more detailed results in our product specifications after the next EMF laboratory measurement session.

OURA team

[Reply](#)

TJ Mackey says:

[July 20, 2016 at 2:58 pm](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741914>)

Love my Oura ring, but I get little to no deep sleep. What are some other hacks or secrets to get my deep sleep?

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [July 21, 2016 at](#)

[6:04 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741981>)

These will help: <https://bengreenfieldfitness.com/2013/07/get-bett...>
(<https://bengreenfieldfitness.com/2013/07/get-better-sleep/>)
<https://bengreenfieldfitness.com/2013/07/the-last...>
(<https://bengreenfieldfitness.com/article/sleep-articles/the-last-resource-youll-ever-need-to-get-better-sleep-eliminate-insomnia-beat-jet-lag-and-master-the-nap-part-2/>)
<https://bengreenfieldfitness.com/2012/12/12-tips-...>
(<https://bengreenfieldfitness.com/2012/12/12-tips-for-sleeping-better->

than-a-baby/). <https://bengreenfieldfitness.com/2012/06/how-to-s...>
(<https://bengreenfieldfitness.com/2012/06/how-to-sleep-better/>).
<https://bengreenfieldfitness.com/2016/06/how-to-g...>
(<https://bengreenfieldfitness.com/2016/06/how-to-get-to-sleep-in-a-modern-world/>).

[Reply](#)

TJ says:

[July 22, 2016 at 8:20 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742005>)

Thanks Ben!

[Reply](#)

Stephane says:

[July 20, 2016 at 12:36 pm](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741896>)

Hi ben

I have a watch which doesn't analyse rem but separate sleep In

Awake

Light sleep

Deep sleep

My awaken Time is really minimal

Since i have my delta sleeper my deep sleep came from two Hours to 4 Hours out of 8h30 of total sleep.

I Think deep sleep there means deep sleep plus rem and then What the objective should be? 40%? 45?

Thanks for everything.

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [July 20, 2016 at 2:24 pm](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741910>)

Hi Stephane, first read this then let me know if you have any questions:
<https://bengreenfieldfitness.com/2016/04/how-slee...>
(<https://bengreenfieldfitness.com/2016/04/how-sleep-cycles-work/>)

[Reply](#)

Matt says: [July 20, 2016 at 9:25 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741884>)

Question for Ben and the Oura team. As an HRV user, I've long thought that my HRV score is overly-influenced by what's going on at the moment of measurement (e.g. deep/box breathing temporarily raises my score; thinking about my workload will instantly lower it) and the ring seems like a more fulsome option. However, I'm NOT interested in wearing the ring all the time; I like to unplug from the electronics and go about my day. With that in mind, how effective will the ring be for me if I only want to wear it at night (i.e. how crucial is the daily activity data when determining readiness scores, etc.)?

[Reply](#)

OURA team (<http://www.ouraring.com>) says: [July 22, 2016 at 6:03 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742001>)

Hi Matt,

When activity data is available, previous day + past 2 weeks constitute about 20% effect in the Readiness Score. When daily activity data is missing i.e. you are not wearing the ring during the day, the measurements and readiness score cover sleep related contributors and resting heart rate + temperature related body responses. So, activity data does not have that big effect on the score. Body responses and sleep quality are in much bigger role.

Later on we will introduce daytime functions that will motivate you use the ring during the day as well :)

ŌURA team

[Reply](#)

Karen says: [July 19, 2016 at 9:36 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741864\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741864)

I'm very attached to my OURA ring. But I do look forward to when the algorithms are updated to make it less geared towards couch potatoes. And when the information like HRV and body temperature is not hidden. And when they stop the silly messages that read "looks like yesterday was particularly active day" even if all I did was a 10k run. And when my recovery score doesn't start to fall because I worked out 2 days in a row. But like I said I still love it. Keep at them to make it more suited to active people. An athlete mode would be most welcome.

[Reply](#)

ŌURA team (<http://www.ouraring.com>) says: [July 22, 2016 at 5:48 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741999\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741999)

Hi Karen,

Thanks for your feedback.

The Readiness Score has been designed so that this kind of use is also possible. It takes the first couple of weeks for the ring to adapt certain key parameters and ranges to your personal levels. In your case the main view messages may not apply that well at this moment but in future there will be improvements in this as well. However, the detail views of sleep, activity and readiness should be useful as such.

When activity data is available, previous day + past 2 weeks constitute about 20% effect in the Readiness Score. When missing daily activity, the measurements still cover sleep, and resting heart rate + temperature related body responses. Additional HRV related parameters will be added later on after more data is available to proof it's generalizability in different conditions.

Just keep on using the ring – all the data you collect with the ring will be useful in later stages when more features are available both in app and cloud.

ŌURA team

[Reply](#)

[Ryan \(http://ryanjbaxter.com\)](http://ryanjbaxter.com) says: [July 19, 2016 at 10:10 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741841>)

Hi Ben,

As usual, another great article. I got the Oura ring about a month ago after hearing about it from you. I was already in the process of looking for something that would quantify my sleep and give me feedback about when I should push myself during my workouts so the timing was perfect.

Overall I am pretty satisfied with the ring. The data it gives me about my sleep is invaluable, I haven't seen anything come close to it. My only complaint about the ring is when it comes to tracking my activity. It seems to do really well tracking things like walking or running, however other types of exercise do not get tracked. For example, if I do a yoga session it will show up in the app that I was not active the entire time. The ring also seems to have a hard time tracking my activity if I use something like an elliptical, stair stepper, or rower at the gym. This then throws off my activity score and then starts effecting my readiness score as well. I hope in the future there is a solution to this problem via an update.

[Reply](#)

ŌURA team (<http://www.ouraring.com>) says: [July 19, 2016 at 1:14 pm](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741851>)

Hi Ryan,

Thanks for your feedback. Great that you are happy with the sleep data.

Re Activity tracking, first of all, the ŌURA ring uses the Metabolic Equivalent (MET) and its derivative MET minutes (MET min) for classifying the physical activities based on the intensity. MET is a common measure used to express the energy expenditure and intensity of different physical activities. If the MET value of a specific activity is 4, it means that you're burning 4 times as many calories as you would burn while resting. You may check the metabolic cost of various activities from the compendium of physical activities.
<https://sites.google.com/site/compendiumofphysica...>
(<https://sites.google.com/site/compendiumofphysicalactivities/>). Here

you can find great visualizations on them:

<http://www.whyiexercise.com/metabolic-equivalent....>

(<http://www.whyiexercise.com/metabolic-equivalent.html>).

Yoga is not a major dynamic sport or activity, but it is very good exercise for you deep core muscles (and body control and mental aspects etc.). Typically the intensity of Yoga is between 2-3 MET (Power yoga can be estimated to be around the 4 MET limit required for Medium+ intensity). So, not much more than standing and less than walking. Part of the time can be classified as inactive depending on style you do. Yoga in particular was studied for example by Clay, C. C., L. K. Lloyd, et al. (2005). "The metabolic cost of hatha yoga." *Journal of Strength and Conditioning Research* 19(3): 604-610.

Currently the ring uses the 3D accelerometer to measure the daytime activities and rhythms. Scientific studies have shown that accelerometer based activity measurement over a full day is actually on average more accurate at estimating your actual physical load than HR based, as HR is affected by a multitude of other factors than physical load. However, measurement based on hand movements is not accurate in all activities like elliptical and such where hands don't move. Rowing should be indicated at least as "Low" depending on the intensity. If you have detected any problems there please contact **OURA** support.

Our approach to activity tracking is quite much different and more holistic compared to other players in the market. For us it is more important to comprehensively understand how our body responds to the daytime mental and physical strain and how well we recover from that load during the night. Whatever is the load during the day it is reflected by the body during the night in several ways, one of them being the overall sleep quality and the other the physiological reactions of the body. From the perspective of your autonomic nervous

system it does not matter whether the load is physical or mental, the reaction is the same on physiological level. Therefore our first priority is to reflect the effect of all daytime doings. The next level is to reflect how well you recover from each exercise or activity. Eventually we will develop algorithms for detecting each different activities and their intensities in more detail.

Activity score is not directly affecting your readiness, only Previous Day i.e. your level of physical activity yesterday and Activity Balance i.e. your activity level over the past few days are included in the Readiness score. Their weight in the formula is much smaller than sleep and physiological reactions related parameters. So, you do not need to worry too much about these throwing off your Readiness score. In future there will be several different solutions to this. We hope this is satisfying for you for the time being.

ŌURA team

[Reply](#)

Kristie L Weyhe says:

[July 19, 2016 at 9:50 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741840>)

Does the ring count your steps?

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says: [July 19, 2016 at](#)

[10:28 am](#) (<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741843>)

yep and much more

[Reply](#)

Wendy says:

[July 18, 2016 at 6:56 pm](#)

[\(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741793\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741793)

Any ideas for those of us who have to get up two or three times per night to use the bathroom? Drinking less is not workable except in a small way since I am almost always thirsty. And after using the bathroom, I need a sip or two of water to wet my whistle. Usually, this is very little water.

[Reply](#)

Ben Greenfield (<https://bengreenfieldfitness.com>) says:

[July 20, 2016 at](#)

[2:08 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741904\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741904)

The ring will track your activity during the night including the times that you get up. It is not uncommon to wake up during the night to pee so I wouldn't worry about that too much.

[Reply](#)

Jeff says:

[July 18, 2016 at 5:58 pm \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741791\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741791)

Is there any actual lab sleep study data up against the oura data to compare? I know Oura states it is very close. just curious if any ring owners have worn it and had a sleep study on there own to compare?.

thanks

Jeff

[Reply](#)

OURA team (<http://www.ouraring.com>) says: [July 22, 2016 at 5:58 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-742000>)

Hi Jeff,

Please check <https://support.ouraring.com/support/solutions/ar...>

We are continuously collaborating with several sleep clinics, universities and research organizations to validate and further develop the algorithms. Our approach is that we validate everything from raw biosignals detection to derived data points and analysis results generated by algorithms. We will release further results when possible.

So far we have validated our sleep staging algorithms against Polysomnography, Interbeat interval (IBI) data against ECG derived R-R intervals, temperature measurement against a body temperature logger used in professional measurements and activity measurements against indirect calorimeter.

OURA team

[Reply](#)

Mark Wit says:

[July 18, 2016 at 11:02 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741780>)

thanks for this Ben, insightful.

Have you heard when they might be adding support for analyzing naps?

I'm one of those people that according to the ring gets little or no deep sleep. M-F I go to bed late and get up early (both various times), but I then nap in the afternoon, sometimes more than once. I'm really keen to see if I'm getting any deep sleep during my naps.

I do notice when I get deep sleep it is on the days during heavier activity. So I'm just trying to figure out am I already getting as much deep sleep as my body needs. It's hard to gauge based off the general recommendations.

Tweaking my sleep schedule currently isn't an option, so I'm contemplating an Earth Pulse v.5 to see if it'll give me more deep sleep, but if my body is already getting what it needs...

I'm in my 40s, quite fit and active, generally feel pretty rested, also 23 & me claims I have a gene that may mean I need less deep sleep.

any feedback appreciated.

thank you!

[Reply](#)

OURA team (<http://www.ouraring.com>) says: [July 19, 2016 at 3:02 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741812>)



Hi Mark,

(<https://bengreenfieldlife.com/>)

First of all, the OURA ring already measures your naps but the app does not show them yet. So, we have the data in the OURA app and OURA cloud already but not available for the user yet. This feature is in

development already, at the top of our list.

Even though sleep has been extensively researched since 1950s there are still plenty of unknowns in the context of sleep especially on how it varies from person to person in the context of normal daily life in relation to changing life situations, daily rhythms, circadian rhythms, different lifestyle choices and habits, diet, exposure to natural light & blue light of screens, and the amount, timing and intensity of our exercises, among others. The typical percentage values given for different sleep stages are based on the sleep patterns detected mostly in laboratory settings. Those who have tried to sleep in the sleep lab environment with several types of monitors and wires attached know that not many people can sleep normally there. Also the instructions before going to the sleep lab test are to be strictly followed. Sleeping one night (or 24-72 hours in practice) in such setting provides just a snapshot to actual sleep compared to normal daily life.

Also in the sleep lab setting the main focus is in the overall sleep architecture and scoring the sleep stages (see e.g.

<http://emedicine.medscape.com/article/1188142-ove...>

(<http://emedicine.medscape.com/article/1188142-overview>)). Even in the sleep lab setting the interscorer reliability affects the overall results and especially slow wave detection.

Additionally the sleep lab setting does not actually consider the actual restorativeness of sleep either, other than from the overall sleep architecture perspective. Due to short measurement period (1-3 nights at max) it's impossible to learn about long term trends of body's physiological reactions to you lifestyle and changes in sleep patterns and characteristics in relation to that. Getting enough restorative sleep is vital for your long term health and capacity to perform, both mentally, cognitively and physically. Sleep has important homeostatic functions, and prolonged sleep dept (deprivation) has consequences for the

brain, as well as autonomic nervous system balance and other body systems. Therefore in addition to sleep quality itself it is important to make a holistic view including also the trend of physiological reactions. The simplest and quickest indicator is the lowest Resting Heart Rate and what time of the night it's reached (like Ben wrote). Another ones are e.g. body temperature and respiration rate and their variations. HRV analysis context sensitively takes it to another level, where applicable.

Because of these facts and since we are all unique and life situations vary it's actually everyone's own job to make interpretations based on body and mind reactions and learn what affects the quality and restorativeness of sleep and what we can do to improve. You seem to be doing that interpretation already. And it sounds like you have already built a connection between heavier activity and more deep sleep after that. Depending on the timing and intensity as longer term background heavier activity tends to increase the amount of deep sleep but if it happens too late in the evening, you may actually get less deep sleep the next night and more the following night. This is highly personal.

A couple of hints:

- 1) Regularity and rhythms matter as much as the sleep schedule since our body and internal functions have good memory for rhythms. Too big variation automatically lightens the sleep like sleeping in a changing environment, for example.
- 2) Take into account the Sleep score and overall sleep architecture instead of just the amount of deep sleep. Overall restorativeness (together with your naps) matters.

Keep up doing good work in your explorations. All feedback is highly appreciated.

OURA team

[Reply](#)

Peter says: [July 18, 2016 at 10:07 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741777\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741777)

I love my Oura ring. It works great and full of useful info. I would really like if they gave HRV as a separate number as you mentioned in this Q&A. Ben, what other new features are we to possibly expect in Oura's future?

[Reply](#)

ŌURA team (http://www.ouraring.com) says: [July 19, 2016 at 2:18 am \(https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741810\)](https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741810)

Hi Peter,

We release a new version of the ŌURA app every month.

At <https://support.ouraring.com> (https://support.ouraring.com) you can find the "version descriptions" both for iOS and Android app. For each new release we publish an "ŌURA Feature Specification". At the end of each you can find "FEATURES IN THE DEVELOPMENT PIPELINE" chapter which shows what is in the current development pipeline. It's not a comprehensive list but brings up some highlights.

Here is the link to the latest iOS app Feature Specification:

<https://support.ouraring.com/support/solutions/ar...> See the PDF for full contents.

We highly appreciate all the feedback our users provide. And it's especially great to work with people like Ben to prioritize the most essential features and develop the product further.

OURA team

[Reply](#)

Lanny (<http://www.trainingforpurpose.com>) says: [July 18, 2016 at 9:49 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741774>)

I got one after your podcast and I'm completely impressed. Thank you for your work Ben. This is the best and ideal wearable on the market. I also like that it collects data in Airplane mode so that I'm not being fried with EMF pollution.

[Reply](#)

Bill Montgomery says: [July 18, 2016 at 8:06 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741772>)

I go to bed st 6 or 6:30 and get up at 2:21AM. It seems there would be no point in me getting this ring since it is calibrated for normal sleep times. Or do you think I would get enough other benefits to make it worthwhile?

Thanks.

[Reply](#)

OURA team (<http://www.ouraring.com>) says: [July 19, 2016 at 2:04 am](#)

<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741808>)

Hi Bill,

The ŌURA ring adapts to your lifestyle and rhythms and gives guidance based on that. It's not fixed or calibrated to "normal sleep times" but in case of activity measurement the "zero point" is at 4am i.e. that's where the "new day" starts for activity measurement. From the perspective of sleep measurement it works for you like for anyone else.

All the other benefits of the product are available for as well. We are all unique and life situations are different, and they tend to change over time. ŌURA adapts to your lifestyle and provides long term view and trends on changes in your sleep quality, activity patterns, daily rhythms and body's physiological reactions in relation to them. You get both short view and long term trend on how your readiness to perform develops in relation to sleep quality and lifestyle choices.

Additionally, once you start using the ring and app, you start gaining a lot rich and valuable data (in much more detail than the app currently shows) in the ŌURA Cloud. From there it will be available later on through new meaningful features we are continuously developing.

ŌURA team

[Reply](#)

Bill (<http://xtremeperformancesolutions.com>) says: [July 18, 2016 at 7:13 am](#)
(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741770>)

This device sounds really interesting. However, since I have “permanent” atrial fibrillation (constant high and irregular heart rate) and have for the last 15 years, I have been hesitant to invest in any HRV or similar devices in the past due to suspect results with a-fib. Do the folks at Oura have any experience and/or comments on this relative to the ring.

Thanks!

[Reply](#)

Chuck Hazzard says:

[July 18, 2016 at 9:53 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741776>)

Hello Bill,

The Oura Ring is not detecting a-fib and does not at the current time even show you any sort of HRV reading. The only consumer facing product I know of which detects a-fib is the AliveCor.

I highly recommend the Oura Ring for its well-balanced approach to overall wellness.

[Reply](#)

OURA team (<http://www.ouraring.com>) says: [July 19, 2016 at 1:46 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741807>)

Hello Bill,

Unfortunately the OURA ring may not be the best solution for you.

There might be a possibility for misinterpretation of your data with atrial fibrillation since the sinus node as the pacemaker of the heart is not initiating the regular cardiac cycle (heart beat). That affects not only the pulse waveform but also the Interbeat Interval (IBI, the exact time between heart beats) accuracy. They both, among others, are core sources of information for the algorithms of the ring.

Atrial fibrillation is also known to weaken your blood flow so the signal quality might get too low even though the ring automatically adjusts the amplification based on the signal strength and quality.

We have a 30 day return and refund policy if you'd like to try and see how it works on you.

ŌURA team

[Reply](#)

Chuck Hazzard says:

[July 18, 2016 at 6:17 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741768>)

Hello Ben,

How would an Oura Ring user access the "Oura report" you mention ("Pay attention to wake-sleep cycle and circadian alignment (reflected in skin temperature being clearly higher during the night than the day - which can also be checked from the ŌURA report)"? I assume this is something a user has to request from Oura.

[Reply](#)

ŌURA team (<http://www.ouraring.com>) says: [July 18, 2016 at 10:15 am](#)

(<https://bengreenfieldlife.com/article/self-quantification-articles/how-does-the-oura-ring-work/#comment-741779>)

Hello Chuck,

Thanks for the clarifying question.

The “**Ö**URA report” refers to “Send bug report” function in the **Ö**URA app, which you can use to ask clarification about readings. If you feel something is wrong or needs additional explanation.

Currently the app shows the body temperature (night time body temperature) as a contributor bar in the Readiness detail view. Additionally a temperature trend graph and related message can be shown in the message flow of the main view if the body temperature varies a lot from your personal average i.e. in abnormal situation.

ÖURA team

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