



# HRV home training – supporting material



## Elite HRV app

The “Elite HRV” app is a biofeedback app, that enables HRV-training at home. Biofeedback means “receiving feedback on body / physiological functions”.

The app measure heart rate via a Polar heart rate monitor, for example the Polar H10. The monitor can be purchased online for around €90 and can also be used at the gym and with the Polar Beat app during other activities such as walking, running, cycling, or rowing.

The Elite HRV app is free and can be downloaded from Google Play and the App store.

### What is HRV?

HRV is an acronym for Heart Rate Variability. Contrary to popular belief our heart does not beat like a metronome, but constantly responds to changes in our internal and external environment such as physical activity, work demands, relaxing, thoughts, feelings and emotions as well as digestive processes and blood pressure.

When we breath in a calm manner, our heart rate rhythm and breathing start to synchronise:

- our heart rate speeds up during the inhale
- our heart rate slows down during the exhale

A wave pattern develops as illustrated in this image by the red line which represents the heart rate.



Through a daily slow breathing practice the heart is being trained to work in synchrony with our breathing. With sustained training HRV increases over time.

An increased HRV enables our heart to be more resilient and respond faster and more effectively to events we are exposed to throughout our days. Not just during physical demands but also in response to other challenges, such as stress and performance demands. In other words our ability to cope with stress and our resilience increases!



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## Elite HRV app

When you first open the Elite HRV app you will be prompted to create an account. This is necessary in order to save your measurement results.

The app provides the following features:

- A determination of your resonant frequency (RF), refer below
- A morning HRV measurement (Morning readiness)
- HRV-training with real-time feedback of heart rate and HRV
- A short 1-minute HRV measurement (HRV snapshot)
- A series of biofeedback exercises

### Elite HRV app: Resonant frequency (RF) determination

If you don't already know your resonant frequency (RF), the first step in starting your HRV-training is determining what yours is. The RF is the breathing pace that produces the highest HRV score and is the pace you will use for your home HRV-training practice.

Note: the purpose of breathing at the RF is to train the heart, with breathing consciously at a much lower than normal breathing pace. During our normal state breathing occurs at a subconscious level and our breathing is automatically adjusted to the demands placed on us. A normal breathing pace during rest is between 8 and 12 breaths per minute.

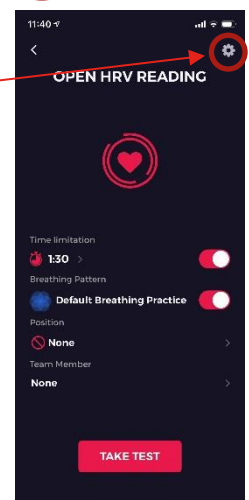
To determine your RF, you will need to be able to breath comfortably at less than 7.5 breaths per minute.

### Protocol to determine your resonant frequency (RF)

Click on the + in the menu bar to start the measurement.



Make sure to wear the heart rate monitor and turn on Bluetooth. Click on "Open reading" and select the gear icon to pair the heart rate monitor with the app (via Connect HR monitor).



Adjust the settings as follows:

Time limitation: On   
Set to: 1:30 (1 minute, 30 seconds)

Breathing pattern: On   
Select "Default Breathing Practice" to change the pacer settings.

In the screens that opens, the pacer times can be set. To determine your optimal (RF) breathing pace you will first breathe at a pace of 7 breaths/min, then at a pace of a 6 breaths/min and finally at a pace of 5 breaths/min.



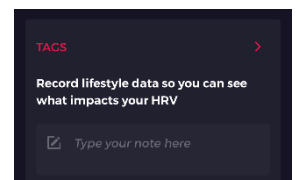
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Click on **Customize** > to change the timer settings:

Inhale	Hold	Exhale	Hold	Result
2 sec	1 sec	4 sec	1.5 sec	7 breaths p/min
3 sec	1 sec	4 sec	2 sec	6 breaths p/min
4 sec	1 sec	5 sec	2 sec	5 breaths p/min

Procedure:

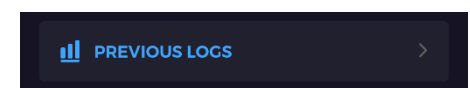
1. Set the timer to 7 breaths per minute (see above)  
Click on **SAVE PRACTICE**
2. Sit up straight. A more slumped posture results in less space for movement in your chest which makes slow breathing more difficult. Take a few slow breaths and select **TAKE TEST**
3. Follow the red breath pacer: inhale when the flower expands, exhale when the flower contracts. Allow the air to flow in (ideally through the nose) slowly and effortlessly. Exhale through pursed lips, like you are blowing the air gently and effortlessly into a straw.
4. Continue following the pacer in a relaxed manner without breathing particularly deeply and without putting in effort. Just allow your body to breathe as it already naturally knows how to do.
5. The measurement stops automatically. Scroll down to **TAGS**> and record the breathing pace in "Type your note here".
6. Click on **SAVE**



Repeat step 1 to 6 with the breath pacer times adjusted for the 6 breaths per minute pace and then repeat again for the 5 breaths per minute pace.

## RF determination: which pace is best?

Select the Home icon in the bottom of the screen.  
Scroll down and click on **PREVIOUS LOGS** >



A list appears with an overview of all measurements.

Click on a measurement to open up the data details:

- An HRV analysis
- The heart rate measurement as a line graph with your heart rate frequency



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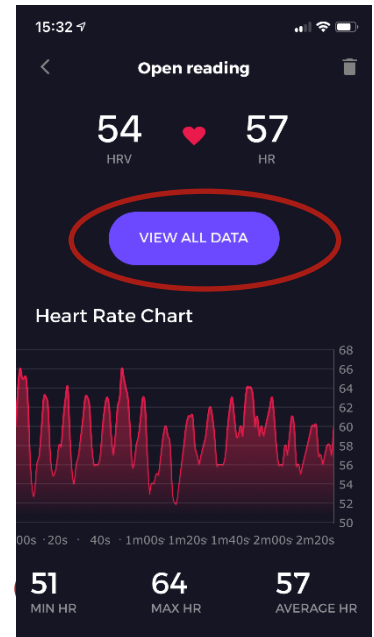
Refer to this example screen. Below the line graph you will see:

- minimum heart rate (MIN HR)
- maximum heart rate (MAX HR)
- average heart rate (AVERAGE HR)

Click on "**VIEW ALL DATA**" to show more detailed data. For RF determination the most important metrics are:

- **RMSSD**  
This is a measure of HRV that represents how well the nervous system is able to relax.
- **SDNN**  
This is a measure of HRV that represents how well the heart rate can speed up and slow down (resilience).

Compare the RMSSD and SDNN of the three measurements. The RF is the breathing pace with the highest RMSSD and SDNN. If two measurements have similar values, then select the breathing pace with the lowest minimum heart rate.



## HRV-training involves a daily breathing practice at your RF

Week 1: practice 2x per day for 5 minutes at your RF with a breath pacer app\*

Week 2: practice 2x per day for 10 minutes at your RF with a breath pacer app\*

Week 3: practice 2x per day for 15 minutes at your RF with a breath pacer app\*

Then: practice 2x per day for 20 minutes at your RF with a breath pacer app\*

\*) A **breath pacer app** helps you to breathe consistently at the right pace.

The two recommended free apps are:

Google Play:



**Paced breathing**

App store:



**Breathe+ Simple Breath Trainer**

There is no need to measure heart rate and HRV during the daily HRV breathing practice. However, a regular HRV measurement is recommended to determine progress. This HRV measurement can be done through the "HRV snapshot" feature in the Elite HRV app.

To sustain motivation you can use a habit tracker app such as "Way of life" or "Habit Share" to track whether you succeed at the twice daily practice.

Continue the HRV-training for at least 10 weeks. Notice an improvement in your ability to cope with stress, fitness or overall well-being? Why not keep going? 😊

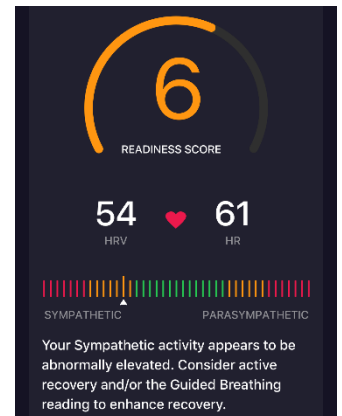
**Elite HRV app: Morning Readiness measurement**



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This is a short HRV measurement that needs to be completed within 30 minutes of waking up. When you open the app you are automatically prompted to take this measurement. You can adjust the measurement length by changing "Duration" (2-5 minutes). In addition to the HRV value, this measurement provides you with an instant "morning readiness" score that indicates your day to day nervous system state.

- A high score (between 7 and 10) indicates good balance
- A score between 0 and 6 indicates a nervous system that is either:
  - too much in sympathetic "activation" mode as a result of high stress, poor sleep or a busy mind
  - too much in parasympathetic "recovery" mode which is typically a sign your nervous system has gone into forced and deep recovery mode following a period of "overdoing"



It will take an initial week or so for the app to calculate your HRV baseline before it starts to report your morning readiness score.

## Elite HRV app: HRV snapshot

Select the "HRV snapshot" option via the + icon to complete a 1-minute measurement as a progress evaluation of the HRV-training. For example, once every two weeks.



## Elite HRV app: train with heart rate

In addition to the daily RF breathing practice, it is useful to also train based on heart rate. Select the "Open reading" option via the + icon. The app shows your heart rate, which enables you to experiment and find out how you can turn your heart rate into an even smoother wave form.

Change the settings as follows:

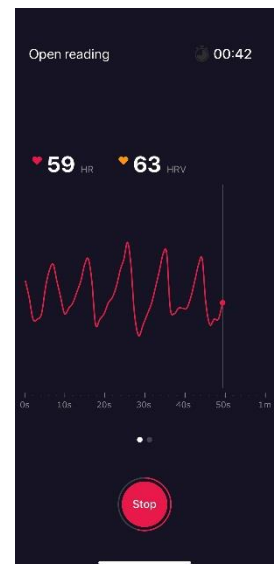
Time limitation: Off



Breathing pattern: Off



Select **TAKE TEST**



## The role of emotions and thoughts

During a breathing practice, our heart rate is also influenced by thoughts and emotions. A positive emotion that is felt in your heart, such as love, happiness or gratitude, makes a smooth wave form easier to achieve. A racing mind or worrying thoughts (particular thoughts about stressful events) tends to result in an irregular wave form. It is interesting to experiment with this!



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### Experiment with the breathing technique

Observe the heart rate pattern and the HRV score and experiment with different breathing techniques, thoughts and emotions to see what generates the highest HRV and smoothest wave form. Avoid putting too much effort into your breathing!

In the "Biofeedback" section of the app you will find various breathing techniques for specific purposes. Most are not considered HRV-training, except the "Resonance" practice which has a fixed breathing pace of 6 breaths per minute. The "Custom breathing" practice can be used to set different breath rates.

