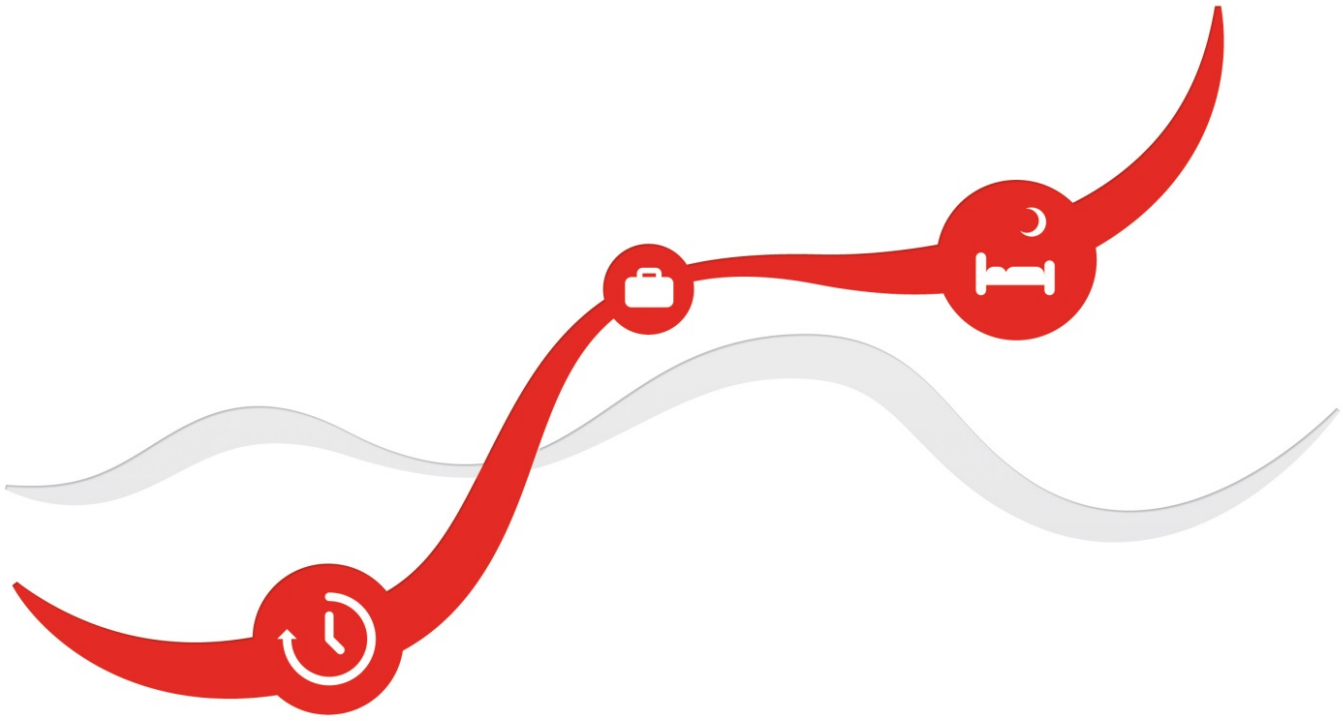
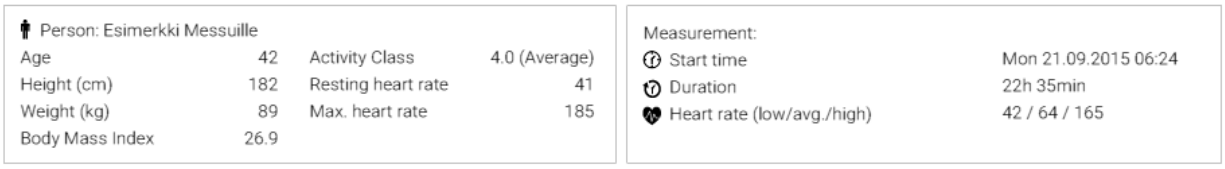


Firstbeat
Lifestyle Assessment
Report Interpretation Guide

September 2018

Contents

1. Background information



Person: Esimerkki Messuille			
Age	42	Activity Class	4.0 (Average)
Height (cm)	182	Resting heart rate	41
Weight (kg)	89	Max. heart rate	185
Body Mass Index	26.9		

Measurement:	
Start time	Mon 21.09.2015 06:24
Duration	22h 35min
Heart rate (low/avg./high)	42 / 64 / 165

Description

The background information includes important basic information about the person being assessed and about the measurement period.

Contents

Person's background information
Person's name
Age
Height
Weight
Body mass index
Activity class (0–10)
Resting heart rate
Maximum heart rate

Measurement data
Start time
Duration
Heart rate (low/average/high)
Additional information (alcohol use and medication)

Purposes of use

Presentation of basic information relevant to the measurement.

Note!

Before providing any feedback, make sure that the background information is correct, the measurement time is accurate and the same resting heart rate and maximum heart rate values are entered for each measurement day, if the measurements have been conducted within a short time period (e.g. one week)

1.1. Personal information

Interpretation

Age
Person's age in years.
Height
Person's height in centimeters.
Weight
Person's weight in kilograms.
Body mass index (BMI)
The body mass index is a ratio for the estimation of the proportion of body height and weight. The value is defined as the body mass divided by the square of the body height. For example, the index for a person who weighs 90 kg and is 188 cm tall is calculated as follows: $90/1.88^2$ = 25.5 (slight overweight)
Activity class
A value describing a person's physical activity level (0–10) / fitness level. The activity class is divided into four ranges:
0–2 Poor
3–5 Moderate
6–7.5 Good
8–10 Top condition
Resting heart rate
The heart rate when a person is resting, in other words, the lowest heart rate level that the person reaches during the measurement period. The resting heart rate is calculated as an average of the lowest heart rate values detected during the measurement period (50 consecutive heartbeats). For measurements around the same time point, the same resting heart rate should be used. The resting heart rate can either be the lowest measured heart rate or a heart rate re-estimated by the specialist performing the analysis. According to the Firstbeat database, the average resting heart rate is approx. 50 beats/min, and a few beats lower for men than for women. A low resting heart rate is usually associated with good physical condition, whereas a high resting heart rate (more than 65 beats/min) can indicate poor fitness or weaker recovery.

Maximum heart rate
The maximum heart rate during maximal physical effort. The exact maximum heart rate can be determined, for example, in a maximal fitness test (VO2 max test). If the maximum heart rate is not known, which is typical with most people, the Lifestyle Assessment software estimates the rate on the basis of the person's age (210–[person's age*0.65]). The fitness level has no effect on the maximum heart rate.

Other information

Body mass index classes:

< 18.5	Underweight
18.5—24.9	Normal weight
25—29.9	Slight overweight
30—34.9	Obesity
35—39.9	Severe obesity (class II)
> 40	Severe obesity (class III)

1.2. Measurement data

Interpretation

Start time

The time point when the measurement was started on the first day of recording or, respectively, the time of waking up as recorded in the journal during the following measurement days.

Duration

The length of data contained in the relevant report, usually the length of one day + night.

Heart rate (low/average/high)

The lowest, average and highest heart rate recorded during the period. The lowest and highest heart rate has been calculated on the basis of the average of the lowest and highest consecutive 50 heartbeats during the measurement day. The lowest and highest heart rate can never be smaller or greater than the resting heart rate and maximum heart rate values entered in the person's background information.

Additional information

The amount of consumed alcohol marked in the journal by the person being assessed and the medication recorded for the day.

Other information

The person's heart rate during the period (low, average and high) functions as a basis for evaluating the need to make changes to the person's background information. For example, a high average heart rate during the work day can indicate an unusually high heart rate level, and this might require raising the person's maximum heart rate as recorded in the background information.

2. Lifestyle Assessment report

Description

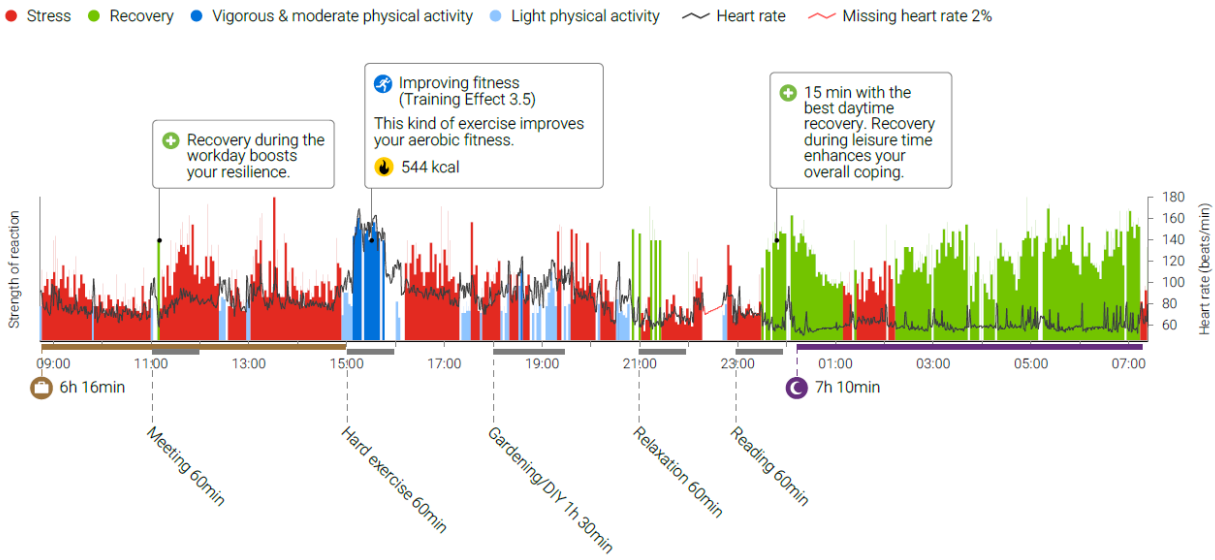
The report compiles the results from each day for stress, recovery, physical activity and energy expenditure. All the most relevant data for the client is recorded on one page and the results are assessed in relation to the recommendations set for each variable.

Contents

Graph on stress and recovery
Sleep
Physical activity
Energy expenditure

Purposes of use

Identification of stress reactions and recovery moments
Assessment of the sufficiency of recovery
Assessment of the amount and quality of sleep
Assessment of the sufficiency of exercise regarding health and fitness benefits.
Assessment of the total energy expenditure and energy expenditure via physical activity



2.1. Stress and recovery graph

Interpretation

The diagram presents the occurrence of stress and recovery during the measurement period. The measurement journal completed during the recording is an efficient way of visualizing the connection between physiological states and daily events. The entries recorded for the day are shown below the diagram. The boxes present the most stressful and the most restoring time periods during the day, sleep evaluation, and other interesting observations about the day. In the analysis phase, it is important to make sure that the work and sleep periods have been marked in the journal (shown under the diagram as brown and blue lines). By associating the time with an occurred state (such as recovery) in the diagram, it is possible to form an impression on how different activities affect a person's physiological reactions.

The diagram does not differentiate between "good" and "bad" stress; the red color indicates sympathetic dominance and an elevated level of alertness. The red stress state can be a result of negative reactions, such as stress or protracted load, or it can just as well be a reaction to positive excitement or focusing on a demanding situation. The state describing recovery (green) indicates a reduced level of activation and situations where physiological reactions that restore the body's resources have occurred.
Physical activity describes the points in time where oxygen consumption has been greater than 40% of the person's maximal oxygen uptake. Activity periods when a level of at least 2 METs has been reached, but oxygen uptake remains below 40% of the person's maximal capacity are identified as *light physical activity*.
Physical activity disturbs the body's inner balance and resembles a stress reaction physiologically. After a very intensive exercise performance, the body's homeostasis, or balance state, has been shocked, and it is natural that recovery may only start many hours after going to bed. However, regular exercise that stresses the body moderately produces positive effects in the area of stress management.

White segments refer to time periods where the state of stress, recovery or physical activity could not be reliably determined. This state can be, for example, an "in-between" state between two states, or periods where the identification of physiological states was not possible due to weakness or lack of a heart rate signal (such as while taking a shower or bathing). In addition, directly after strenuous physical activity, the body is in a state of physical stress. This is a time when EPOC (see section on Training Effect Report) is still elevated, but no actual physical activity is being performed, and it shows up as white in the report.

Usually there are more stress reactions during the day than recovery. The amount (%) of recovery during a 24-hr period is recommended to be more than 30%. An absolute comparison of stress and recovery levels between two persons cannot be performed due to individual differences in the functioning of the autonomic nervous system. Instead, intra-individual comparison of the strength of different states within a day is possible. Stress and recovery reactions have been scaled separately for each day, so comparison of the peak values between different measurement days is not recommended.
A good starting point for the evaluation of recovery is to examine whether recovery occurs during events when it is meaningful (especially during the night and during breaks and relaxing moments). The body's ability to recover, or an overall stress situation, can also be evaluated by examining how quickly the body starts to recover after going to bed. In a balanced situation, the body reacts efficiently to moments of recovery and recovery starts quickly at bedtime, or preferably even slightly earlier. If the delay between going to bed and the start of recovery is several hours, this often suggests an elevated level of stress and a weakened ability to recover. The black line in the diagram indicates the person's heart rate during the measurement and the scale from the resting heart rate to maximum heart rate can be seen along the Y axis. The heart rate graph further illustrates the body's ability to recover: in a stress situation, the heart rate remains high after going to bed and might even increase during the first hours of sleep. In restful and restorative sleep, the heart rate drops quickly towards the person's resting heart rate level and remains there without any prolonged activity spikes during the sleep period.

> **Note!**
> The purpose is not to make the days completely stress-free: the essential thing is to see whether recovery occurs when it is meaningful and possible (such as breaks, relaxing moments, and especially during sleep).

Other information

For training sessions that the analysis identifies, the boxes over the diagram indicate the training effect and the consumed energy during the relevant session. More information on training effect can be found in the *Training Effect Report* section.
The percent share of missing heart rate due to poor signal quality or measurement breaks is shown in the upper right corner. In a good-quality measurement, there is less than 5% of missing heart rate. 5–15% of missing heart rate is still considered a moderate result, whereas over 15% is considered a significant amount (incl. breaks or other data interruptions).
For more detailed information on the analysis stages and state recognition, refer to http://www.firstbeat.com/science-and-physiology/white-papers-and-publications/ (Stress and Recovery Analysis Method Based on 24-hour Heart Rate Variability)

2.2. Stress and recovery

Interpretation

This chapter looks at the balance between stress and recovery over day + night (app. 24 hours). The top part – **Stress and Recovery Balance** – shows a daily score that the person gets for that day. The scale for this score is 0 -100. The points scale is shown to the left of the score and the actual score is shown inside the circle on top of the line. In addition, the color of the line around the circle and the text on the right-hand side provide information about the score for that day. Stress and Recovery Balance is influenced most heavily by the amount of recovery during the 24-hour period, but the amount of stress reactions and amount of recovery during the awake time also affect the score.

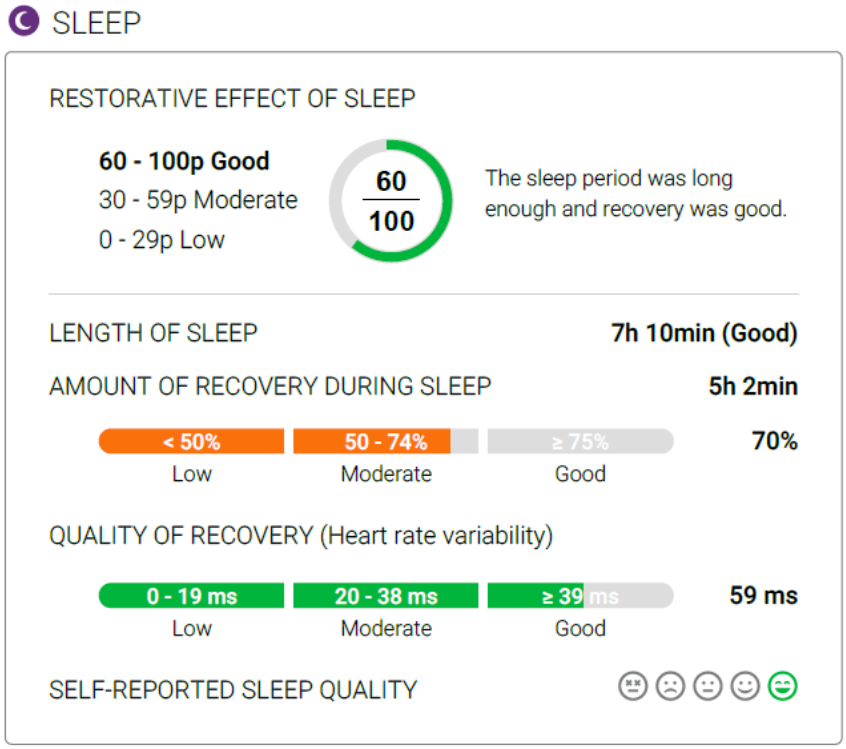
Amount of stress reactions / day shows the amount and relative share of stress on that day. The amount of stress is more than usual if the amount of stress is over 60%. If the amount of stress is less than 60%, the result is in the normal range and the variable shows as green.

Amount of recovery (day + night) shows the amount and relative share of recovery on that day. The result is considered good, if the value is at least 30%. If the amount of recovery is 20-30%, the result is considered moderate, whereas less than 20% of recovery is considered a low amount. With regard to time, the result is considered poor if the amount of recovery per day is less than five hours.

At the bottom of this segment there is a statement that shows how many hours / minutes of recovery there was during the awake time.

Other information

The intensity of the reaction is not considered in the result. The only determining factor with each identified state is its temporal occurrence. Defining the different states is explained in more detail in the report's definitions page, in the *Lifestyle Assessment Guide for Specialists* and in a more scientific manner in the White Paper found on our website under *Science.* The average result based on the Firstbeat database is 58 points.



2.3. Sleep

Interpretation

This section shows the restorative effect of sleep score, length of sleep, amount of recovery during sleep (in hrs/mins and as a % value) and quality of recovery during sleep. The person's self-reported sleep quality is also shown, based on what was marked in the journal for this sleep period.

The top part, **Restorative Effect of Sleep**, shows an overall score that the person gains for this sleep period. The scale is 0 – 100. The points scale is shown to the left of the score and the actual score is shown inside the circle on top of the line. In addition, the color of the line around the circle and the text on the right-hand side provide information about the score for that day.

Length of sleep is based on the time that the person recorded in the journal. If sleep time has not been recorded, it is estimated automatically based on the recorded movement data. The scale is static; the result is considered weak if the sleep period was less than 5h30 min, moderate if it was 5h30min – 7h and good if it was over 7h. However, it's good to keep in mind

that due to individual differences, there can be significant fluctuations in the sufficient amount of sleep.

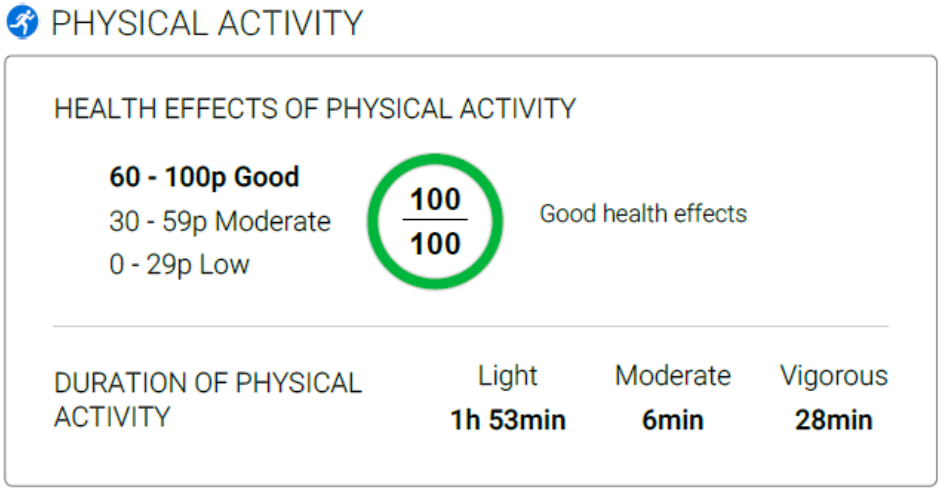
Amount of recovery during sleep indicates the amount of recovery state in hours and minutes and as percent share during the sleep period. During restful sleep, most of the sleeping time should be identified as recovery, and in order to receive a good result, there should be at least 75% of recovery. The result is poor when the percent of recovery remains under 50%. Only time periods when the data was of good enough quality for our analysis is taken into consideration when calculating this result. In other words, if there was a break in the data during sleep, due to for example an electrode becoming loose, the result will be calculated only from the time periods with a good-quality signal.

Quality of recovery (heart rate variability) describes the amount of heart rate variability during sleep. The scale is based on the person's reference group in accordance with his or her age and sex. The result is poor if the night's average is in the weakest 10% of the respective age group. The result is moderate when it is between the lowest 10%-50% of the respective age group. In order to reach a good result (green bar), the person must be above the average (>50%) of his or her reference group. The Specialist Report section includes a more detailed description of heart rate variability as a reflection of sleep quality.

The classification of the self-reported quality of sleep has five increments. The green smiley faces indicate a good sleep period, the yellow ones a moderate sleep period, and the red ones a poor or very poor sleep period.

Other information

There are significant individual differences in the length of sleep and in the quality of recovery. This is why particularly the quality of recovery values should mainly be compared with the person's own, previously conducted measurements. The average sleep duration according to the Firstbeat database is 7h 45min. The restorative effect of sleep score is influenced by 5 variables. The biggest determinant is the absolute amount of recovery during sleep. In addition, the score is influenced by length of sleep, percent of recovery during sleep, quality of recovery and the time of going to bed. The average score according to the Firstbeat database is 58 points.



2.4. Physical activity

Interpretation
This section presents the amount of physical activity during the measurement day and how sufficient it is considering the general health recommendations.

The top part – Health Effects of Physical Activity – shows the score (points) that the person gets for that day. The scale for this score is 0 -100. The points scale is shown to the left of the score and the actual score is shown inside the circle on top of the line. In addition, the color of the line around the circle and the text on the right-hand side provide information about the score for that day.

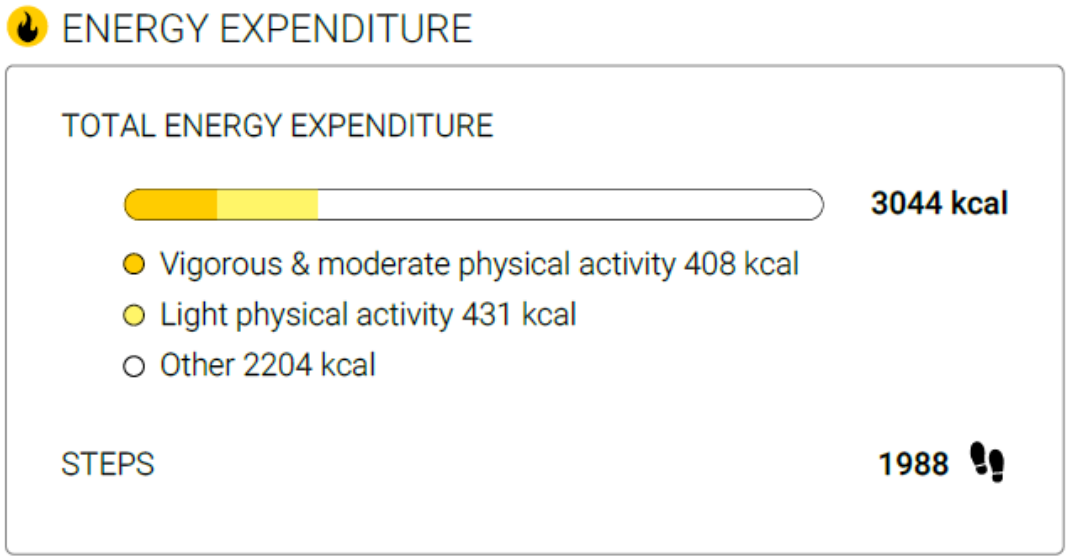
The duration of physical activity segment categorizes the periods identified as physical activity into different intensity areas. Light physical activity means time periods when oxygen uptake was under 40% of the person's maximal capacity, but at least twice the person's basal metabolic rate (>2MET). Moderate physical activity means the amount of activity when oxygen uptake was 40-60% of the person's maximal capacity and vigorous physical activity when the oxygen uptake was over 60%.
The physical activity score describes how well the amount of physical activity and the intensity level fulfil the recommendations set for health promotion. The recommendations are adapted from the exercise targets set by the ACSM (American College of Sports Medicine). The recommended target has been attained when the result is 60 points or more. This result can be achieved, for example, by performing moderate physical activity for app. 30 minutes, vigorous for app. 20 minutes or light physical activity for a longer period of time.

Other information
The strenuousness of exercise is assessed in relation to the person's fitness level. This means that an identical workload can mean a very different result for two people of varying fitness levels, with regard to the effects produced by the exercise session.

An assessment based on heart rate variability cannot directly consider the positive effects

produced by physical activity directed at improving muscular strength, mobility, or body control. The result will also not do justice for those performing aquatic exercise because the Firstbeat Bodyguard device cannot be used in water. The main focus is, thus, on the health effects produced by physical activity on the respiratory and cardiovascular system.

The physical activity score is influenced by both the duration and intensity of physical activity. The score accumulates most effectively with higher intensity exercise, but it's possible to get a moderate to good score also with lighter intensity activity of sufficient duration. The average result in the Firstbeat database is 41 points.



2.5. Energy expenditure

Interpretation

This section presents the total energy expenditure during the measurement period. The orange color in the diagram shows the contribution to total energy expenditure during moderate and vigorous physical activity, the yellow during light physical activity, and the white indicates all other energy expenditure. More information on calculating the energy expenditure can be found at https://www.firstbeat.com/science-and-physiology/white-papers-and-publications/

Daily steps are shown in the bottom right-hand corner or the report. A generally recommended number of steps for excellent health benefits is 10 000 steps, but already 7000-8000 steps characterize a reasonably active day. If the person's starting level is very low (passive), it's good to start approaching the recommended level with gradual increases in activity. The analysis identifies moving, sequential steps; thus, stepping in place or small sideways/backwards steps are not considered in this step count.

Other information

A person's gender and weight has a significant effect on his or her level of energy expenditure.

If the person is using medication that significantly affects the heart rate or he or she has a heart rate that is unusually reactive, the measurement result must be assessed critically.

The average result in the Firstbeat database is 3900 steps.

3. Lifestyle Assessment Summary

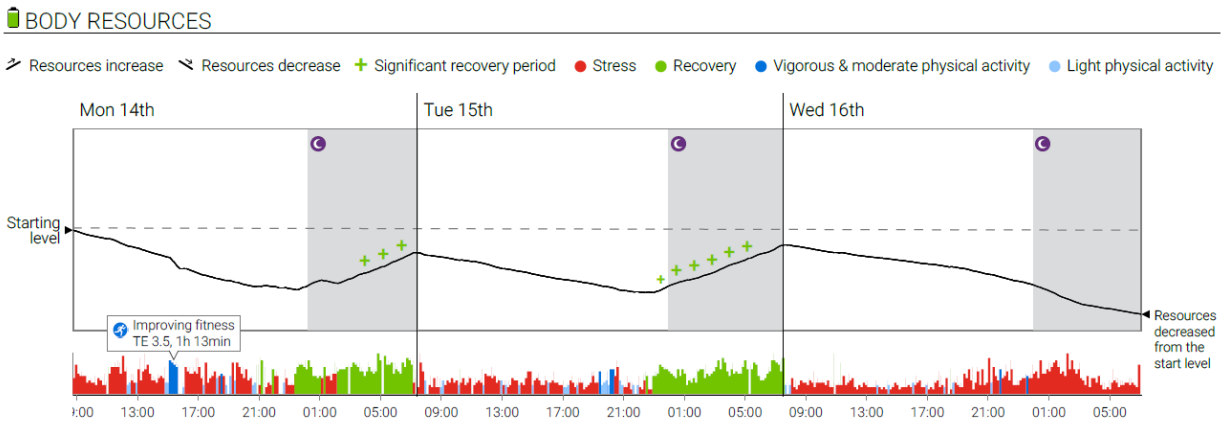
Description

The summary report is a summary of the Lifestyle Assessment measurement result. The report summarizes the measurement results from 1–7 days, indicating the results for stress and recovery balance, sleep and physical activity in relation to recommendations and reference values of the person's own reference group. The report also shows the energy expenditure and number of steps taken during the assessment.

Contents

Purposes of use

The report functions as an overall summary of the assessment, and a summary for the balance between stress and recovery, restorative effect of sleep, health effects of physical activity and energy expenditure.



3.1. Body resources

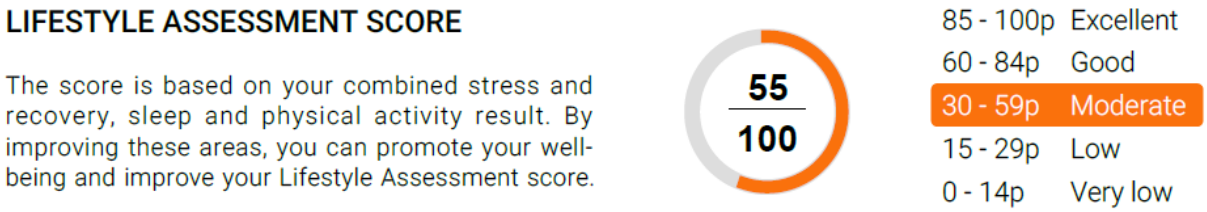
Interpretation

The graph is a resource diagram for the entire measurement period. The starting point of the diagram is always on the left, in the middle of the scale. The starting level is illustrated as a horizontal dash line running through the middle of the diagram, and you can compare the resource line to this level during the measurement period. An averaged illustration of stress

and recovery reactions during the entire recording period is presented below the diagram. The resource diagram ascends during time periods when recovery is present. During stress and physical activity, the resource diagram descends. The form of the diagram is also affected by the intensity of the reaction: the stronger the recognized reaction (stress or recovery), the more rapidly the graph ascends or descends.
The basic principle for a balanced result is a situation, where during the sleep period (the area marked in grey), the resource diagram ascends above the starting level, i.e., to the level of the previous morning, or higher. Due to the different nature of days, it is typical that there is not enough recovery on every measurement day, which shows up as a negative result, i.e. the diagram ends up lower than the starting level that morning. This naturally emphasizes the significance of the other measurement days in maintaining a balanced situation.

Other information

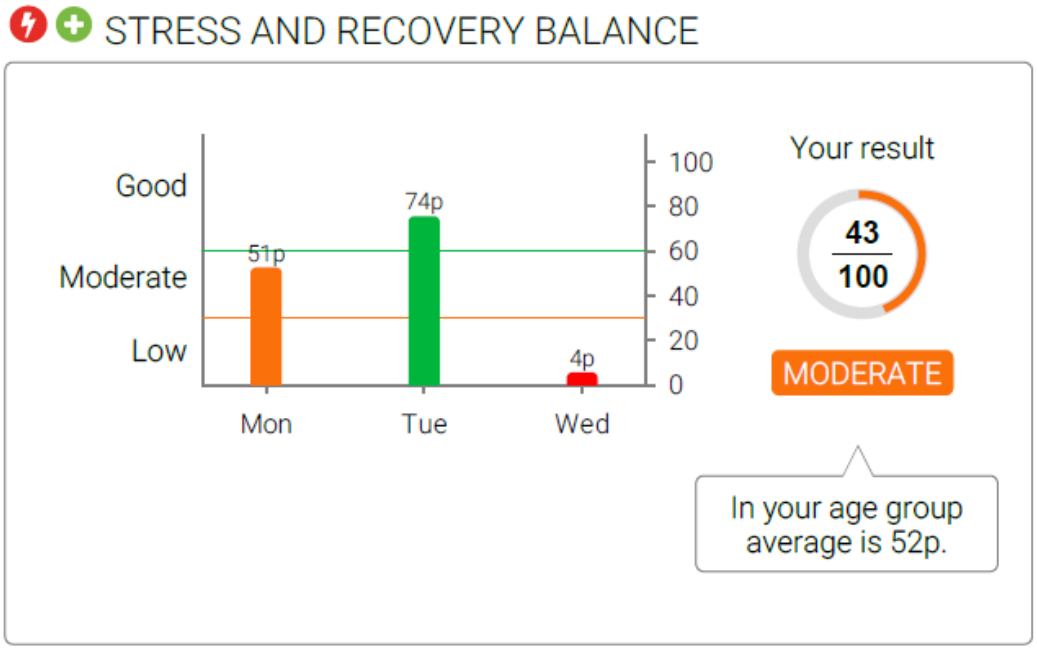
The green + signs above the resource diagram indicate periods of good, consistent recovery. The most significant periods of recovery are usually during sleep, but according to our recommendations, some recovery should also occur during the time when a person is awake.



3.2. Lifestyle assessment score

Interpretation

The Lifestyle Assessment Score is an aggregated average of three main assessment areas. The score is based on the average result of the daily average value for stress and recovery balance, restorative effect of sleep and health effects of physical activity. Each of these three areas carries equal weight in the calculation of the overall score. The 5-point scale is shown to the right of the score. The actual score is shown inside the circle on top of the line. In addition, the color of the line around the circle and the text on the right-hand side provide information about the score. The average value based on the Firstbeat database is 52 points.



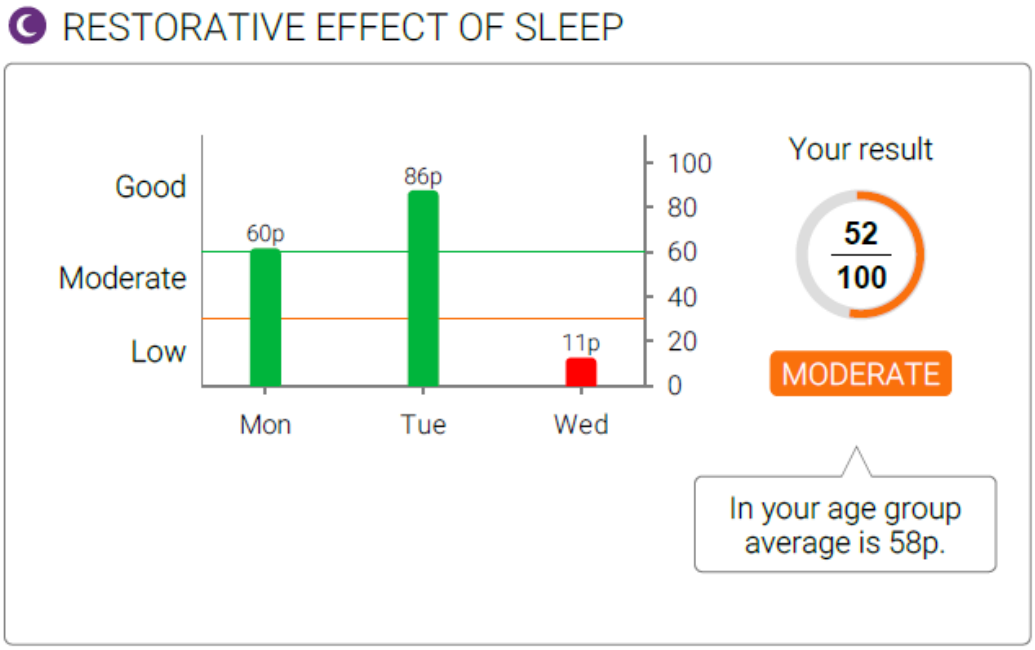
3.3. Stress and recovery balance

Interpretation

This section shows the score for stress and recovery balance for each measurement day. The color and height of the bar for each day indicate what the result is on the 3-point scale. The score to the right of the bars shows the average result and how it's rated on the 3-point scale. The accumulation of the daily score is explained in more detail in the relevant paragraph under the Lifestyle Assessment report chapter.

Other

The age group average is shown in a box underneath the average score.



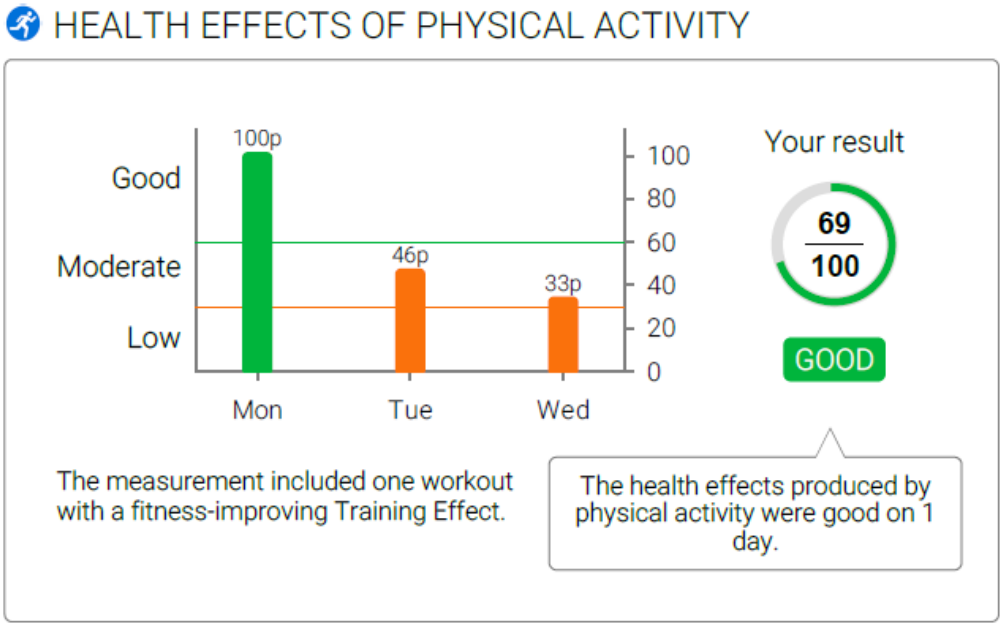
3.4. Restorative effect of sleep

Interpretation

This section shows the score for the restorative effect of sleep for each measurement day. The color and height of the bar for each day indicate what the result is on the 3-point scale. The score to the right of the bars shows the average result and how it's rated on the 3-point scale. The accumulation of the daily sleep score is explained in more detail in the relevant paragraph under the Lifestyle Assessment report chapter.

Other

The age group average is shown in a box underneath the average score.



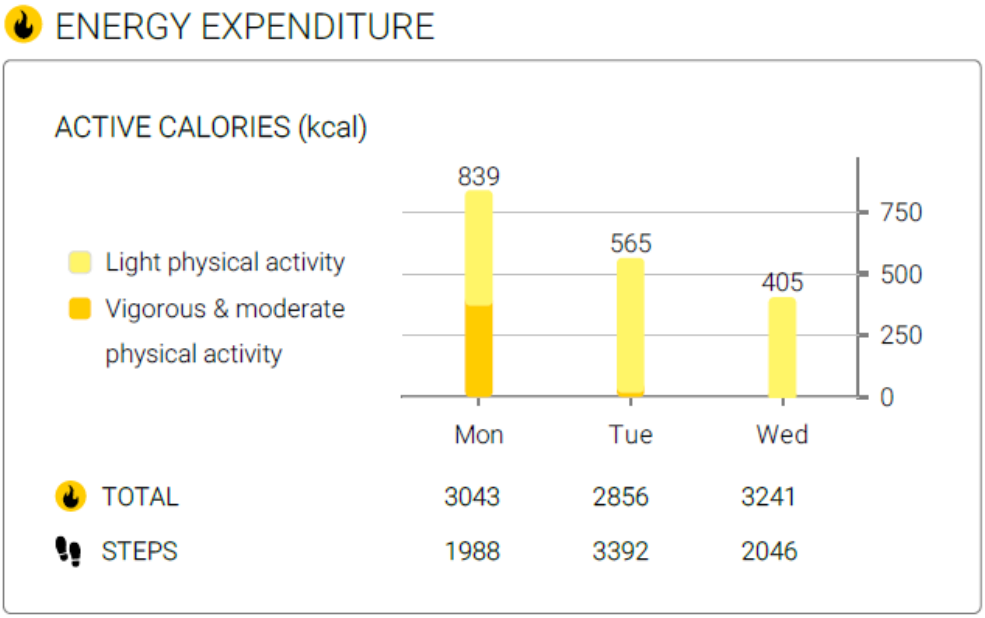
3.5. Physical activity

Interpretation

This section shows the health effects of physical activity score for each measurement day. The color and height of the bar for each day indicate what the result is on the 3-point scale. The score to the right of the bars shows the cumulative average and how it's rated on the 3-point scale. The accumulation of the daily health effects of physical activity score is explained in more detail in the relevant paragraph under the Lifestyle Assessment report chapter.

Other information

Below the main table is a text that tells how many fitness-improving exercise sessions were found during the assessment. In addition, there is a mention of how well the health effects produced by physical activity were fulfilled.



3.6. Energy expenditure

Interpretation

The section on energy expenditure indicates the consumed calories during light physical activity and during moderate + vigorous physical activity. The numerical figures below the bar indicate the amount of total energy expenditure and the number of steps for each day.

Other information

The amount of consumed calories presented in the report may differ significantly from the actual level if a person's background information, especially with regard to maximum heart rate is incorrect or the effect of certain medications on the heart rate level has not been considered (such as beta blockers). This will typically cause the energy expenditure results to be too low in comparison to the actual situation.

4. Training effect report

Description

The report verifies the effect of exercise on the maximal performance of the respiratory and cardiovascular system. The recommendation is to create this report from individual workout sessions, rather than from an entire day.
The report is suited for all persons interested in physical activity who wish to gain more specific information about the effect that training has on endurance characteristics. Suited both for athletes in individual and team sports that require endurance characteristics, and for beginning exercisers for the purpose of determining suitable intensity levels.
When providing feedback, it is good to note that due to the diversity of different sports and different demands, the report is not designed to guide training in any specific direction. The report provides an assessment about the improvement of endurance characteristics (especially maximal aerobic power). The reliability of results is significantly improved if the person's maximum heart rate and oxygen uptake are known based on a reliable fitness test conducted previously.

Contents

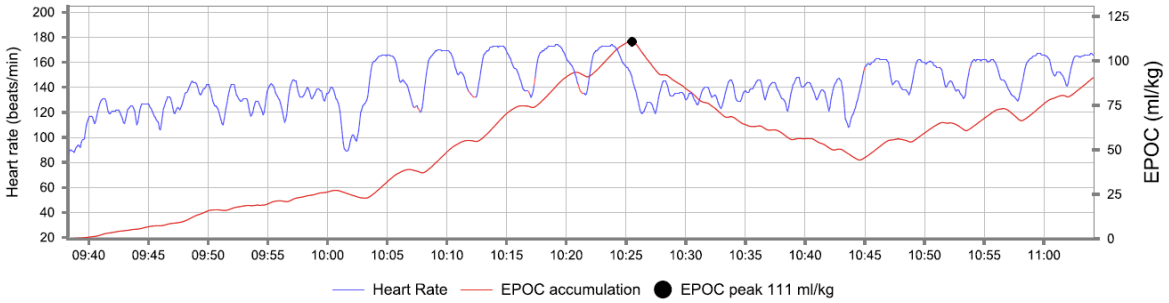
Training effect chart
Training effect assessment
Training classification

Purposes of use

Assessment of training effect and load
Determination of an appropriate training level
Analysis and comparison of different types of exercise
Comparison of workouts of different level of intensity and duration

EPOC AND TRAINING EFFECT CHART

EPOC (ml/kg) accumulation during the measurement. The effect of training on maximal aerobic power (VO2max) is based on the EPOC peak.



Training Effect: Improving fitness

3.4

Benefits: This workout improves cardiorespiratory fitness.
Recommended: Two to four times per week for those training regularly. These workouts are the basis of a good training program.

Exercise key figures

EPOC	111	ml/kg
Energy Expenditure	647	Kcal

EPOC (Excess Post-exercise Oxygen Consumption) *is a physiological measure of training load. The amount of EPOC achieved during exercise is directly proportional to the training load and recovery required.*

4.1. Training effect chart

Interpretation

The heart rate graph is shown in blue in the diagram. The scale for the heart rate graph is shown on the Y axis on the left.
The dark red graph indicates the EPOC accumulation during the session. EPOC is a physiological measure that describes the disturbance of the body's balance (homeostasis) caused by training. During recovery periods, EPOC will decrease. The scale for EPOC is on the Y axis on the right. The black point on the red graph indicates the peak EPOC level and time point (X axis).
Training effect, i.e. the achieved training effect category, is shown in the chart as a numerical figure marked in bold. The training effect is divided into five categories (1–5) in accordance with how much the exercise improves maximal aerobic power and resistance to fatigue during an endurance workout. The closer the figure is to 5, the more intensive the workout has been.
The levels of training effect from the lightest to the most intensive are:

1. Easy recovery workout
2. Fitness-maintaining workout
3. Fitness-improving workout
4. Highly improving workout
5. Temporary overreaching / overload

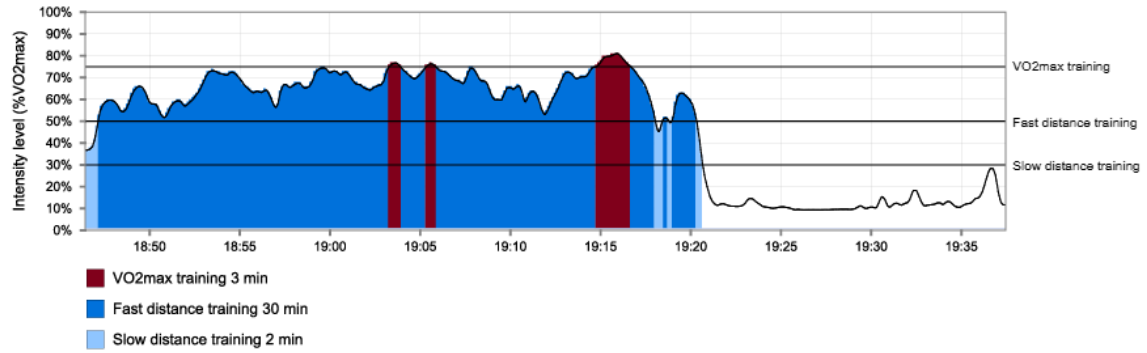
Other information

In the report, the effects produced by training are primarily examined in relation to aerobic training. This means that with regard to performance, workouts that improve muscle strength,

speed or mobility do not necessarily produce an improving effect in the training effect graphs. For the purpose of improving fitness, the aim is not always to reach a maximum training effect level; an optimal workout for improving one's performance can also have a restorative (1) or maintaining (2) training effect. The same workout can have very different effects, depending on the person's physical condition and background variables. And even if for example stretching after a workout slows down the EPOC decrease somewhat, stretching does promote recovery from physical activity and is thus recommended.
More information about EPOC and the calculation of training effect can be found at
https://www.firstbeat.com/science-and-physiology/epoc-and-training-effect/
and in the white paper section at
https://www.firstbeat.com/science-and-physiology/white-papers-and-publications/

TRAINING CLASSIFICATION

Classification of the exercise to different endurance training types.



4.2. Training classification

Interpretation

The diagram indicates changes in the level of intensity (load) over time. The Y axis on the right side of the diagram indicates training classification and the Y axis on the left indicates the intensity level (%VO_{2max}).

In easy recovery workouts, the workout should mostly consist of periods within the light blue area of basic endurance. If the body reacts strongly to even a small load and "light exercise" shows up in the red maximum endurance (VO2max) category, this suggests poor physical condition or, possibly, accumulated overload. If the heavy overload has existed for a long time, the body may be in a chronic, so-called parasympathetic overload state. In this situation, the heart rate and oxygen consumption do not increase to the maximum endurance range even during more intensive exercise, and performing intensive workouts is not sensible or beneficial.

Other information

The intensity levels of endurance training are categorized as follows:

slow distance training	30–50% VO2max
fast distance training	50–75% VO2max
VO2max training	75–100% VO2max.

Especially with endurance athletes, the limit (cut-off) values for the different intensity levels can be significantly higher than these default values.

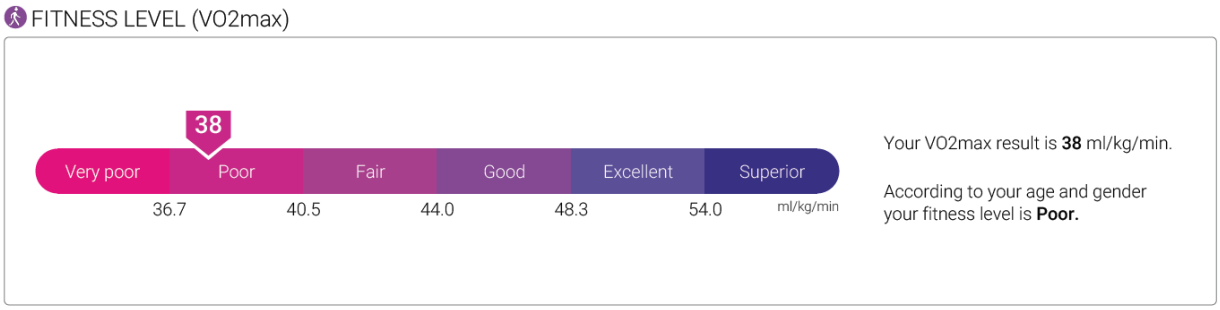
5. Fitness level

Description

The report provides an estimate of the person's fitness level. Fitness level is determined based on the calculated maximal oxygen uptake (VO2max ml/kg/min) value. The result is shown in relation to the person's own reference group (age and gender). The fitness level can be determined if the measurement includes at least 30 minutes of continuous walking on mostly flat terrain. Maximal oxygen uptake is estimated by looking at the relationship between load (heart rate) and walking speed during one or more walks detected in the measurement.

Application areas

- Estimating a person's fitness level
- Setting appropriate, focused goals
- Monitoring fitness development



Maximal oxygen uptake (VO2max) – A measure of aerobic fitness

Maximal oxygen uptake (VO2max) describes the ability of the cardiorespiratory system to deliver oxygen to working muscles and the ability of the body to utilize oxygen to produce energy during exercise. High maximal oxygen uptake means good endurance, which research has shown to be associated with better health and performance and smaller mortality risk.

Maximal oxygen uptake is traditionally measured in the laboratory by analyzing respiratory gases, and its unit is milliliters of oxygen per minute per kilogram of body weight (ml/kg/min). Firstbeat Lifestyle Assessment estimates the maximal oxygen uptake by comparing the body's load to walking speed during walking segments detected in the measurement. The result is compared to people of the same age and sex. Typically, maximal oxygen uptake ranges between 20-70 ml/kg/min.

**VO2max reference values used with permission from the Cooper Institute, Dallas, Texas*

5.1. Interpretation of Fitness Level

Maximal oxygen uptake (VO2max) describes the ability of the cardiorespiratory and circulatory systems to provide oxygen for muscles and the ability of the body to utilize oxygen to produce energy during exercise. High VO2max reflects good aerobic fitness or endurance, which has been shown to be associated with better health and performance and a lower risk of mortality.

The person's fitness level is shown on a 7-point scale (Very poor – Superior). In addition to the scale, fitness level is shown as a maximal oxygen uptake value. This value typically ranges between 20-70 ml/kg/min.

Fitness level is a valuable addition to the standard Lifestyle Assessment report. It provides accurate information about the person's current fitness, allowing for more appropriate and customized goals to be set to promote health and well-being. Fitness level correlates with work ability and general mortality risk. Improved fitness level results in significant benefits both for the individual and for the company:

- In the lowest fitness categories, fitness can be improved quickly, with small changes to physical activity habits
- Work ability -related risks can be reduced significantly with improved fitness level
- When staff fitness improves (Moderate – Good – Excellent), it can enhance wellness and better coping at work – effectiveness, quality, motivation, sick leave days, presenteeism
- Positive feedback from the least fit – a motivator for people of all fitness levels

Other

If data quality is not sufficient or an appropriate walking segment is not detected in the measurement, fitness level cannot be calculated. The measurement can include several separate walks, in which case the result is a weighted average of these walks, as long as each walk fulfills the criteria (is at least 30 mins in duration). The mean error to lab results has been approximately 7%, which means that the average difference to lab results is +/- 3 ml/kg/min. Detailed guidelines for how to ensure reliable Fitness Level estimation have been provided in our Info Meeting slide presentation and on the Fitness level website. The Lifestyle Assessment can be done without Fitness Level estimation, as before.

6. Physical workload report

Description

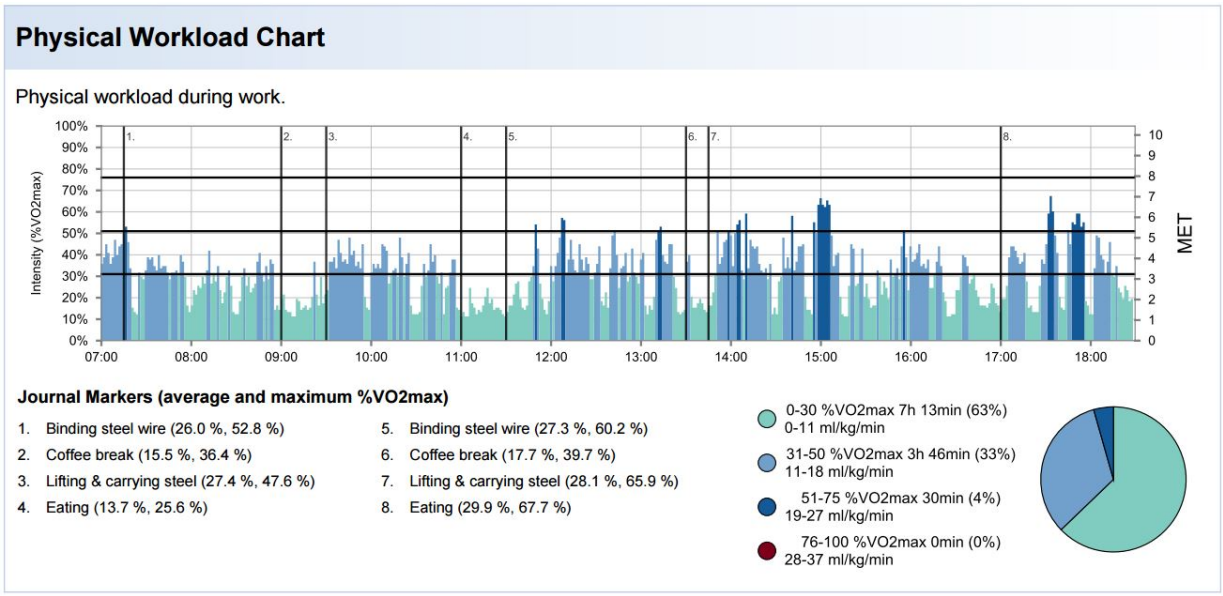
The report verifies the amount of physical load and the load level, using key figures and diagrams related to physical workload. The report is especially suited as a tool for occupational physiotherapists for assessing the physical workload of work tasks, in order to verify the load caused by various tasks.

Contents

Physical workload chart
Distribution of the physical workload into different load levels (pie diagram)
Physical workload analysis
Physical workload key figures
Heart rate variability index (RMSSD)

Purposes of use

Evaluation of the physical load of work tasks
Analysis of individual work tasks
Comparison of different work methods
Comparison of work tasks with different levels of intensity and duration
Assessment of recovery from physical workload



6.1. Physical workload chart

Interpretation

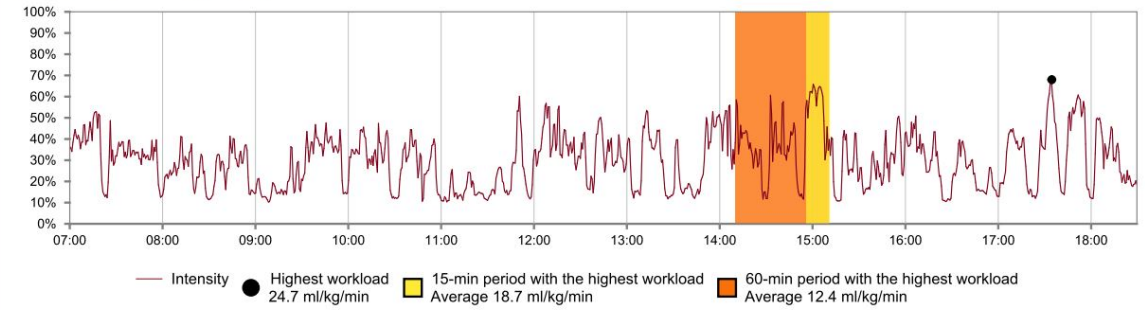
The diagram enables the analysis of physical workload during the time period. The chart is divided into four ranges in relation to the intensity level (0–30%$VO2_{max}$, 31–50%$VO2_{max}$, 51–75% $VO2_{max}$, 76–100%$VO2_{max}$).
The scale indicating the intensity of the physical workload is presented on the Y axis on the left. The Y axis on the right indicates the person's MET level (1 MET is roughly equivalent to the energy cost of sitting quietly).

Other information

The peak MET values of a person in good physical condition are better than those of a person in poor condition. The MET value is indicated either in the person's background information (optional) or the value is estimated based on other background information (such as age, gender, and activity class). The personal MET value is calculated by dividing the person's oxygen uptake by 3.5.
The oxygen consumption levels (ml/kg/min) matching the limit values are indicated under the chart, next to the pie diagram.
In order for the work tasks to be shown in the report, they need to be entered via the *Journal* function before the report is created.

Physical Workload Analysis

Physical workload during work.



a. Physical workload analysis

Interpretation

With regard to physical workload, the diagram indicates the most significant
single time point with a black dot
15-minute period with an area colored in yellow
60-minute period with an area colored in orange

The black dot indicates the time point when the physical workload was the highest with regard to oxygen consumption. The colored 15- and 60-minute periods indicate the time periods when the physical workload was the highest for the duration of time in question.

Other information

The figures for the *Highest workload* time point indicate the maximum oxygen consumption values (ml/kg/min and %VO_{2max}) during the period. The values for the 15- and 60-min periods indicate the average values for these variables during these time periods.

Physical Workload Indexes

Heart rate parameters	Average	Range
Heart rate (bpm)	109	79 - 141
Heart rate (%HRmax)	60 %	44 % - 78 %
%HRR	47 %	26 % - 71 %

Other	Average	Range
Energy expenditure (kcal/min)	4	1 - 10
Ventilation (l/min)	25	6 - 63
Respiration rate (breaths/min)	19	12 - 32
RMSSD	27	12 - 49

Oxygen consumption	Average	Range
VO2 (ml/kg/min)	9.7	3.3 - 24.7
%VO2max	27 %	9 % - 68 %
MET	2.8	1 - 7.1

	Cumulative values
Energy expenditure (kcal)	2730
EPOCpeak (ml/kg)	21

6.2. Physical workload key figures

Interpretation

Heart rate (bpm)
The heart's pulse rate as beats per minute.
Heart rate (%HRmax)
Percent of heart rate from the maximum heart rate.
%HRR
Percent of heart rate from the pulse reserve.
Energy expenditure (kcal/min)
Energy expenditure in calories per minute.
Ventilation (L/min)
Pulmonary ventilation in liters per minute.
Respiration rate (breaths/min)
Rate of inhalations and exhalations per minute.
RMSSD
Figure indicating the amount of heart rate variability.
VO2 (ml/kg/min)
Oxygen consumption
%VO2max
Percentual share of oxygen consumption from a person's maximal oxygen consumption.
MET
Figure indicating the energy expenditure rate (1 MET = basic metabolic rate).
Energy expenditure
Value indicating the cumulative total calorie consumption.
EPOCpeak (ml/kg)
Load accumulation which indicates the disturbance of the body's homeostasis. EPOCpeak indicates the highest EPOC value during the period, so it is not necessarily located at the end of the period.

Other information

If the period contains a large amount of incorrect heart rate data (with artefacts), the physiological key figures may be distorted. If you want to use the above-mentioned key figures for examining the average load during the work day, you need to ensure that the length of the measurement period corresponds with the desired time. If the report created from the measurement also includes sleep periods and leisure time, both the lowest and average values of the range will be distorted considering work time.

Note!

In addition to oxygen consumption, there are recommendations that are based on a person's heart rate and energy expenditure during the work day. The following presents a few examples of such recommendations:

- the average heart rate during an 8-hour work day must not exceed 100 bpm
- the week should only have 6 hours of work during which the heart rate exceeds 140 bpm
- regular health examinations are recommended for people whose heart rate is elevated to an average of more than 120 bpm during an 8-hour shift or even momentarily to more than 150 bpm

Recovery heart rate:

the work tasks have too much load, if

- the heart rate is more than 110 bpm one minute after the work has ended
- the heart rate does not drop to a value of 90 bpm during the first three minutes after the work has ended

The time-weighted energy expenditure during work should be

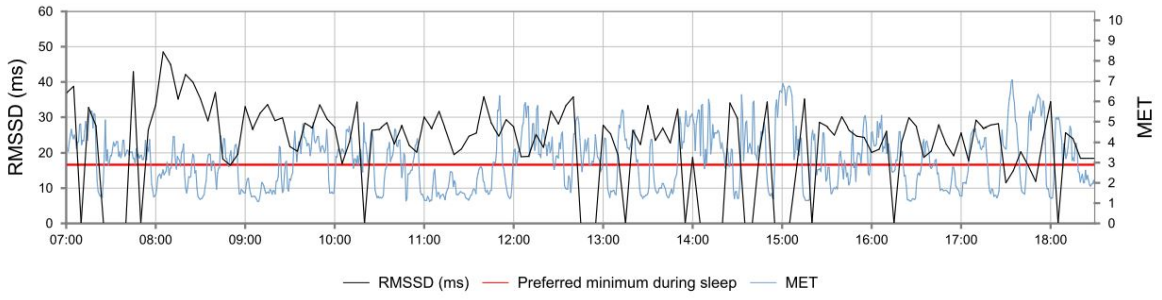
- less than 2.9 MET for women
- less than 3.3 MET for men

The load level of the physical workload should not increase to

more than 60%VO2max for more than 19 minutes

more than 70%VO2max for more than 7 minutes

Heart Rate Variability Index



RMSSD (RootMean Square of Successive Differences in R-R intervals) *reflects the function of the parasympathetic nervous system. The index can be used to determine recovery from physical workload. High index values are related to increased activity of the parasympathetic system, and low values indicate poor recovery from physical work.*

6.3. Heart rate variability index (RMSSD)

Interpretation

A high index value is associated with elevated activity of the parasympathetic nervous system and efficient recovery. If the index value remains very low after physical activity, no recovery occurs.

The red reference line indicates the (risk) level, during sleep, under which an average of 10% of people are in their own reference group results. It is natural that the RMSSD value decreases during physical activity or heavy load because the heart rate increases and heart rate variability decreases (sympathetic activation). For the purposes of interpretation, the red line is only meaningful during the sleep period.

With regard to recovery, the RMSSD value should be approximately 1.5 times higher during sleep than during the time when the person is awake.

Other information

If heart rate data includes a lot of error or the measurement has been completely interrupted, the RMSSD value will not be shown and it will not affect the calculation of the average and range values of the key figures. Because RMSSD is calculated from five-minute average values, occasional level drops may occur due to interruptions in night-time measurements. This is why it is good to monitor the MET diagram at the same time.

1) Is the MET elevated due to physical activity, when the heart rate is clearly elevated and RMSSD is thus lower?
2) Is the MET level a straight line at the bottom of the diagram due to the above-mentioned contact interference?

In such situations, interpretation of these reference values is not sensible.

RMSSD values are directly based on the amount of heart rate variability, so resting and maximum heart rates, which are essential for identifying stress and recovery, do not affect the result.

Note!

When interpreting the RMMSD values and other variables related to physical workload and stress, the situation should be assessed comprehensively. Various illnesses relating to the function of the autonomic nervous system and some medications may cause abnormal results.

7. Lifestyle Assessment Follow-up

Description

The report provides information about the changes in essential Lifestyle Assessment variables at individual level. The report is an easy way to demonstrate how the results related to stress, recovery and physical activity have changed. In addition to physiological changes, the report also lists changes in background information (resting heart rate, activity class, body mass index, and the well-being experienced by the person). Up to four separate measurements (assessments) can be selected to be compared in the follow-up report.

Contents

Background information
Stress and recovery
Sleep
Physical activity

Purposes of use

Follow-up tool
Indication of changes occurring at individual level
Long-term follow-up of the most essential variables

Follow-Up Case

Date	Fri 04. - Mon 07.10.2013	Fri 26. - Mon 29.06.2015	Fri 18. - Mon 21.03.2016	Thu 19. - Mon 23.05.2016
Resting heart rate	33	34	34	34
Activity Class	7.0 (Good)	7.0 (Good)	7.0 (Good)	7.0 (Good)
Body Mass Index	26.0 (Overweight)	26.0 (Overweight)	26.0 (Overweight)	26.0 (Overweight)
"I feel well at the moment."	Cannot say	Partially agree	Partially agree	Completely agree

7.1. Background information

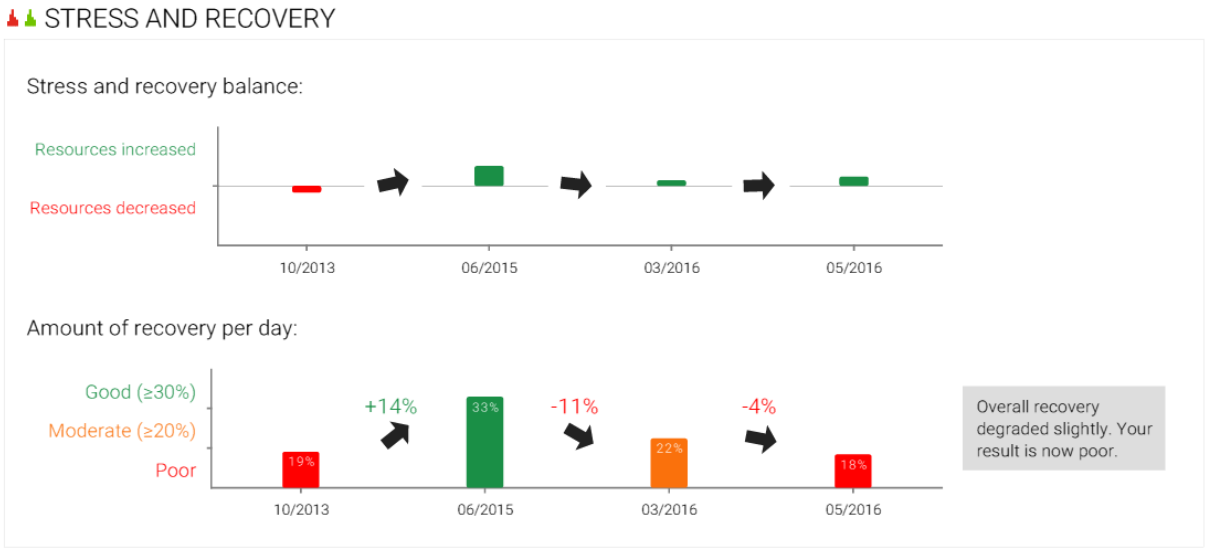
Interpretation

The table indicates the most essential background information values and the direction of change for each measurement event. The followed variables are measurement time, resting heart rate, activity class, body mass index, and the last question in the pre-questionnaire, "I feel well at the moment".

A positive development would include a lower resting heart rate, an elevated activity class, placement of body mass index within the normal range (20–25), and a positive feeling about one's own health.

Other information

A maximum of four measurement events can be included in the follow-up report. The Lifestyle Assessment user manual describes the stages related to the technical implementation of the report in more detail.



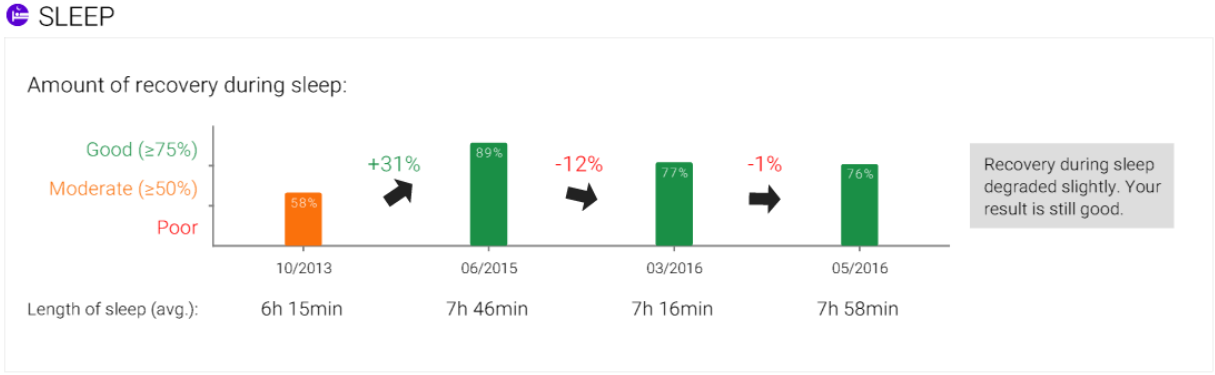
7.2. Stress and recovery

Interpretation

Stress and recovery balance during the day indicates whether the resource balance described in the Lifestyle Assessment Summary was increasing or decreasing. A green result, rising above the line, is reached when the average result of the individual days was positive. A red result, remaining below the line, is reached when the average of the individual days was negative. The *Amount of recovery per day* indicates the average amount of recovery for the measurement periods (days+ nights) included in the assessment. The scale is presented in the left border of the diagram (Poor <20%, Moderate 20–30%, Good >30%).

Other information

The arrow between the measurement events indicates the direction of change and its percentual amount (the latter only for the lower section on recovery). The steeper the angle of the arrow, the more significant the occurred change. The box on the right contains a short verbal summary and feedback on the occurred change.



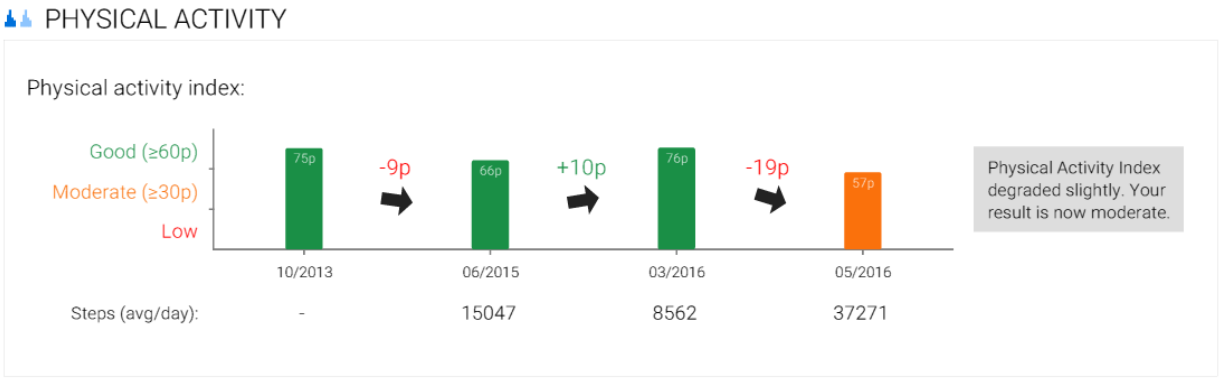
7.3. Sleep

Interpretation

The *Sleep* section indicates the average amount of recovery during sleep for the measurement periods (days) included in the assessment. The scale is presented in the left border of the diagram (Poor <50%, Moderate 50–75%, Good >75%).

Other information

The arrow between the measurement events indicates the direction of change and its percentual amount. The steeper the angle of the arrow, the more significant the occurred change. The box on the right contains a short verbal summary and feedback on the occurred change.



7.4. Physical activity

Interpretation

The *Physical Activity* section indicates the average number of physical activity points for the measurement periods (days) included in the assessment. The scale is presented in the left border of the diagram (Low <30 p, Moderate 30–60 p, Good >60 p).

Other information

The arrow between the measurement events indicates the direction of change and its percentual amount. The steeper the angle of the arrow, the more significant the occurred change. The box on the right contains a short verbal summary and feedback on the occurred change.

8. Specialist report

Description

The Specialist report is designed to be a collection of important information that the specialist can take into consideration when interpreting the results and giving feedback. The report includes information about daily alcohol consumption and medication, sleep quality, stress state classification and its reliability.
The report is intended for the sole use of the specialist, and its purpose is to provide additional information that is significant for the interpretation of the results in the feedback discussion.

Contents

Contact information
Long-term medication and illnesses
Alcohol consumption and medication during the measurement
Stress state classification
Diagram on the quality of recovery (RMSSD) and key figures for the measurement periods

Purposes of use

Background data for the specialist to use during the feedback session.
A tool for initial, follow-up and final measurements.

SPECIALIST REPORT

Page 1 (1)

Esimerkki Messuille

Age (yrs)	42	Resting HR (beats/min)	41
Height (cm)	182	Max HR (beats/min)	185
Weight (kg)	89		
Activity class	4.0 (Moderate)	Body Mass Index (BMI)	26.9

Group: -
E-mail: -

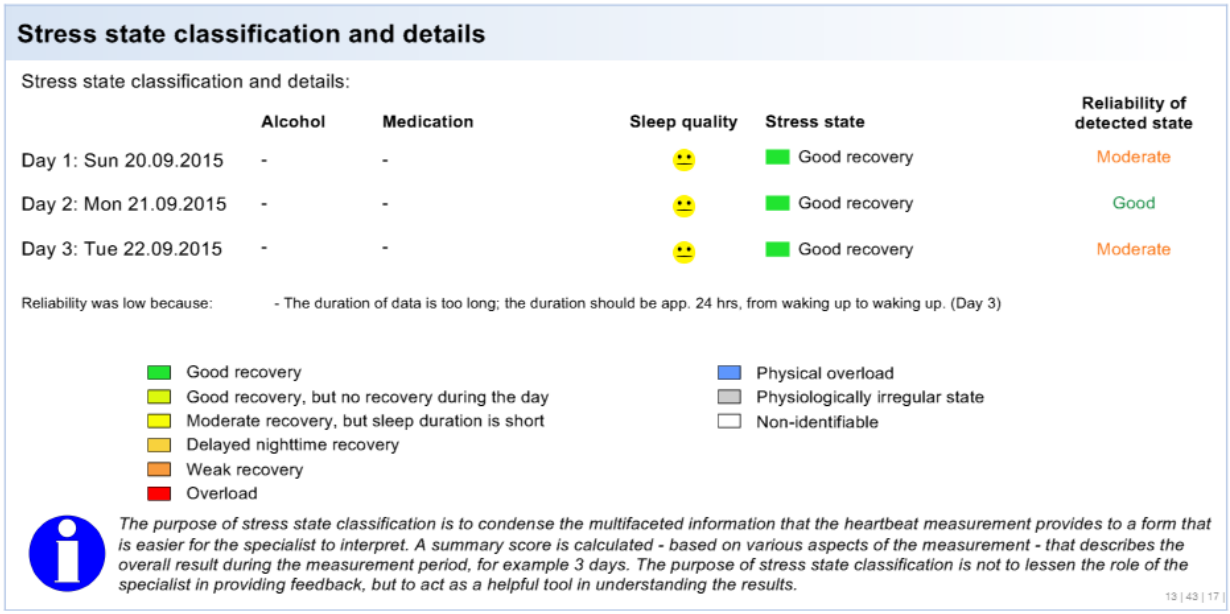
Follow-up recommendation: 6-12 months

Notes: -
Other information:

8.1. Personal information (upper section)

Interpretation

In addition to the basic background information, this section includes information on whether the person belongs to a specific group, and an e-mail address provided by the person.
The follow-up recommendation suggests a suitable time interval for a repeat measurement. The alternatives are:
Red / 1 month, orange / 2–6 months, and green / 6–12 months. If data quality or measurement duration do not enable a reliable assessment, the software will provide a notification on this during the reporting phase, and the relevant section will state “Repeat”.
The follow-up recommendation can include an estimate on how acute the situation is. If the result is very weak regarding recovery throughout the measurement, the follow-up recommendation is one month. The need for a repeat measurement is then more acute and the main goal is to find out if the situation is related to an exceptionally poor measurement time point or something more chronic. Already a few weeks will provide more information on whether the recovery situation has started to correct itself. When the follow-up recommendation is 6–12 months, the recovery situation is good in all respects.
This information is included only in the Specialist report, so the decision on implementing a follow-up measurement will always be left to the specialist and client to agree upon together.



Stress state classification and details

Stress state classification and details:

	Alcohol	Medication	Sleep quality	Stress state	Reliability of detected state
Day 1: Sun 20.09.2015	-	-	😐	Good recovery	Moderate
Day 2: Mon 21.09.2015	-	-	😐	Good recovery	Good
Day 3: Tue 22.09.2015	-	-	😐	Good recovery	Moderate

Reliability was low because: - The duration of data is too long; the duration should be app. 24 hrs, from waking up to waking up. (Day 3)

- Good recovery
- Good recovery, but no recovery during the day
- Moderate recovery, but sleep duration is short
- Delayed nighttime recovery
- Weak recovery
- Overload
- Physical overload
- Physiologically irregular state
- Non-identifiable

The purpose of stress state classification is to condense the multifaceted information that the heartbeat measurement provides to a form that is easier for the specialist to interpret. A summary score is calculated - based on various aspects of the measurement - that describes the overall result during the measurement period, for example 3 days. The purpose of stress state classification is not to lessen the role of the specialist in providing feedback, but to act as a helpful tool in understanding the results.

13 | 43 | 17 |

8.2. Stress state classification and details

Interpretation

The purpose of stress state classification is to condense the multifaceted information that the heart rate variability measurement provides to a form that
is easier for the specialist to interpret. The classification is a summary of several stress and recovery variables. The identified alternative states are:

1. Good recovery
   - The night is mostly recovery and heart rate variability reacts normally. There is some recovery also during the day.
2. Good recovery, but no recovery during the day
   - The difference to state 1 is that there are no recovery moments during the daytime.
3. Moderate recovery, but the sleep duration is short
   - The total recovery time is weak or moderate due to the short nighttime sleep. The night's resource balance and RMSSD (heart rate variability), however, are at least moderate. Typical example: a person in good condition who sleeps too little.
4. Delayed nighttime recovery
   - The first part of sleep is poor (stress), but resources are restored by the morning. Recovery at work, during the day and in total is moderate. The night's resource balance and heart rate variability is moderate.
5. Weak recovery
   - A considerable amount of stress reactions during the night, but still a good or moderate amount of heart rate variability. As a whole, recovery is insufficient. When evaluating this state, one should

particularly consider the person's own feelings on stress: for some, the parasympathetic function (RMSSD) can remain quite good, despite a stressful situation. There is a need to respond if the person feels stressed or overloaded. With weak recovery state, there are more nighttime stress reactions than in states 3 and 4.

6. Overload
   - As a whole, recovery is insufficient and heart rate variability is poor. The night period mostly shows up as stress.
7. Physical overload
   - The result shows physical activity at other times than during actual exercise. In addition, the number of periods identified as other physiological state have increased. Heart rate variability and recovery are poor, which leads to an increased risk of long-term stress. Differs from state 6 in that this state includes a lot of periods identified as physical activity or other state, and this will lead to a relative decrease in the total amount of stress state. Typical example: a person in poor physical condition and/or an overweight person performing hard work.
8. Exhaustion / Physiologically irregular state
   - It is important to examine the background particularly with this state because a range of factors could explain this state. Characterized by an inconsistent recovery result: mostly recovery during the night, but very low heart rate variability. Possible explanations for this could be a regulation disorder of the autonomic nervous system or a severe case of exhaustion, which results in low activation of both the sympathetic and parasympathetic nervous systems (the body no longer initiates stress reactions). Underlying causes can include certain illnesses and strong medications that affect the heart function.
     The difference to state 6 and P. is that even if the state is physiologically weaker (sympathetic nervous system is fatigued), there is also a great deal of "green" present. Thus, the result can look close to state 1, with the difference, however, that RMSSD is very low
9. Non-identifiable
   - Either the measurement data is of poor quality or the results are inconsistent with regard to the physiological variables to the extent that the measurement cannot be identified as any of the first eight states.

Other information

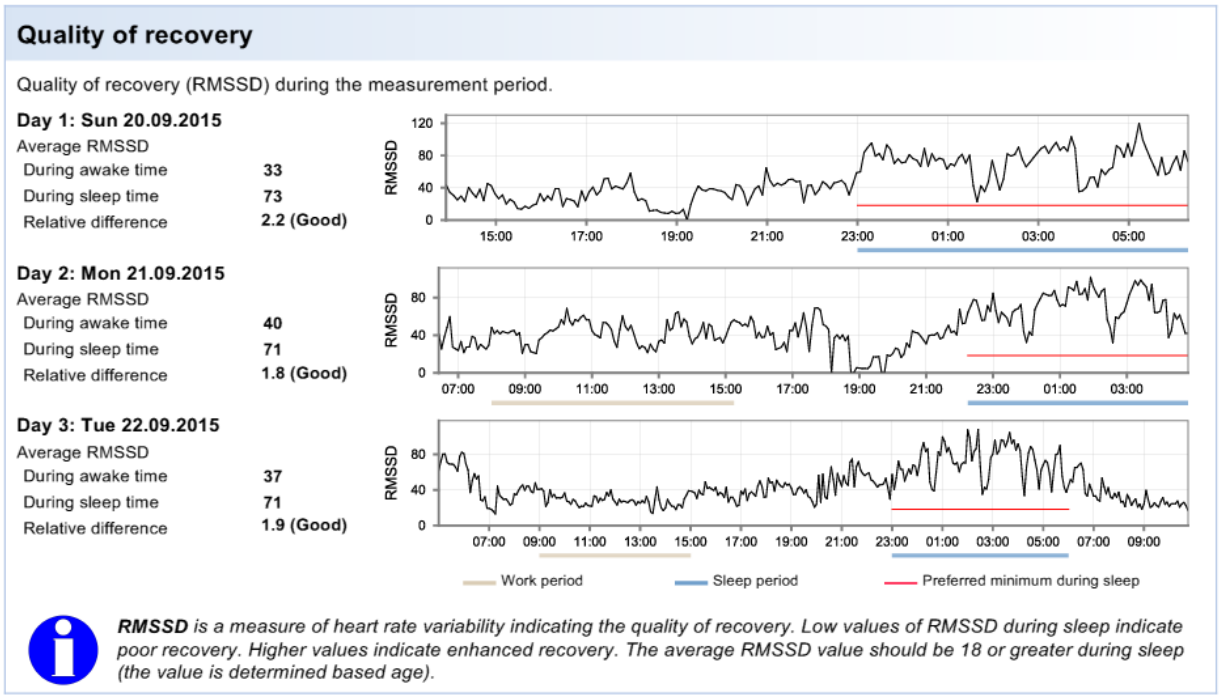
Use of alcohol and medication has been obtained from the person's journal entries. Sleep quality is obtained from the subjective estimation marked in the journal.
The bottom row of the summary indicates the total number of consumed alcohol units. With regard to sleep, the bottom row indicates the average result for the measured days.
Stress state classification provides an overview of the stress and recovery result with consideration to the entire period and each individual measurement day. Behind the identification, there is a total of 11 differently weighted stress and recovery variables based on which the state that receives the largest relative number of points is selected as the stress state.

Variables affecting the stress state classification:

- Resource balance (during sleep)
- RMSSD, i.e. the amount of heart rate variability (during sleep)
- The difference in heart rate variability between the day and night
- Time spent sleeping (as recorded in the journal)
- Amount of recovery during the day
- Amount of recovery during the day and night
- Amount of stress reactions during the day and night
- Amount of unidentified state during the day and night
- Amount of physical activity during the day
- Share of recovery during the time spent sleeping
- Time spent on recovery that starts after going to bed

Note!

The purpose of stress state classification is not to decrease the role of the specialist in providing feedback, but to act as a helpful tool in understanding the results. Despite comprehensive examination of reports and information, it is still vitally important to consider the client's personal experience and feelings when interpreting the results during the feedback discussion.



8.3. Quality of recovery

Interpretation

The black graph (RMSSD=Root Mean Square of Successive Differences in RR intervals) indicates the amount of heart rate variability during the measurement period. The diagram shows the average heart rate variability during the period. Each individual point in the diagram indicates the heart rate variability as a 5-minute average value for that time point. For a good result, it is not so relevant that the graph should include large spikes; instead the focus should be on the overall level of the graph, especially during the night. If the measurement has been interrupted or the heart rate signal has not been found sufficiently reliably, the graph will not be drawn for those time periods.

A high index value is connected to elevated activity of the parasympathetic nervous system and good recovery. The red cross-line indicates a level that expresses an increased risk of overload or fatigue, if the result during sleep remains under this line. This level indicates the value under which 10% of the results in the relevant age category are found.

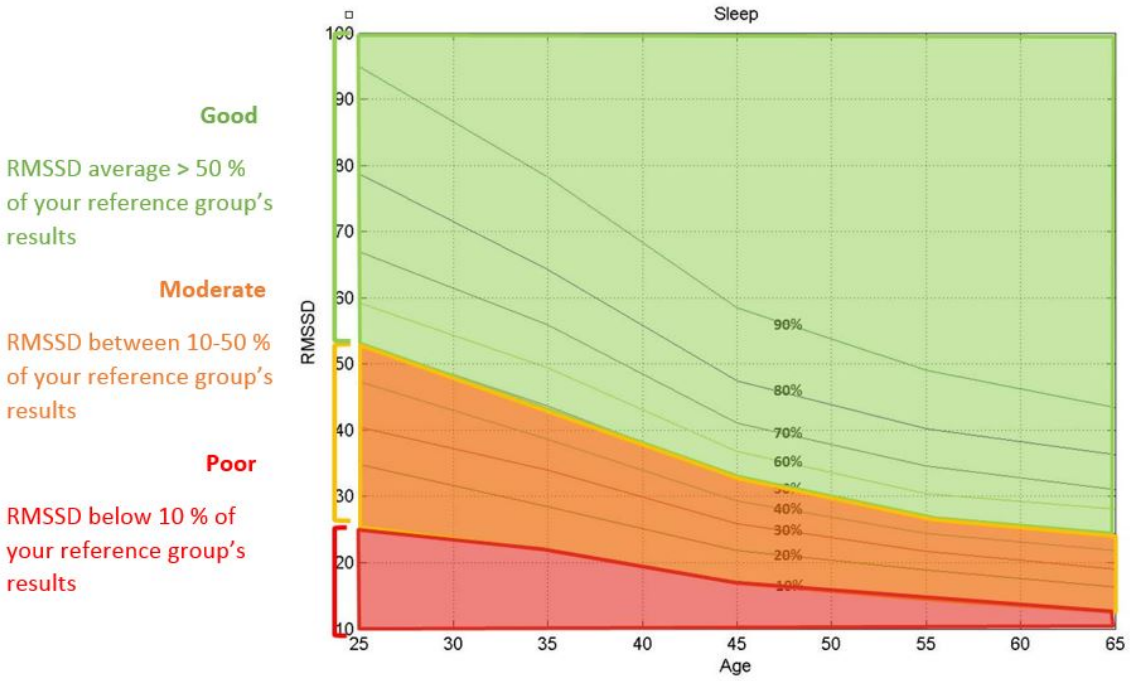
Different factors can cause decreased heart rate variability. In addition to accumulated stress, overload or weak recovery, for example diabetes or another regulation disorder related to glucose metabolism can explain low heart rate variability. Several diseases related to heart function have also been found to be connected to reduced heart rate variability. Age and poor physical condition are known to reduce heart rate variability. Resting and maximum heart rate values do not affect the result, so the results between different measurements are comparable with one another.

During physical activity, the heart rate increases and heart rate variability decreases, which is a natural explanation of very low heart rate variability during those time periods.

On the left side of the diagram, the day-specific averages are indicated for times when the person is awake and asleep. There are no specific recommendations for daytime variability, but during sleep, variability should increase higher than the red cross-line. The red cross-line indicates the level under which the sleep time results for the lowest 10% of the person's reference group are. It is also a positive result when heart rate variability is higher during the night than during the day, considering normal functioning of the parasympathetic nervous system. The relationship between the night and day values can be examined with the Relative difference variable.

Other information

Heart rate variability correlates strongly with age. Below is a summary compiled from the extensive Lifestyle Assessment database, which presents the significant effect that age has on the reduction of heart rate variability. Genetics is also recognized as having a significant effect on the amount of heart rate variability.



The effect and distribution of age on heart rate variability (RMSSD) in different age groups.

9. Specialist group report

Description

A summary of the individual specialist reports for a specific group. The report is intended for the sole use of the specialist. The purpose of the report is to compile information that is significant with regard to stress and recovery and to function as an aid in making conclusions. The report gathers information about factors that can have an effect on the stress and recovery results (such as illnesses, alcohol consumption, medication and sleep quality) at group level. In addition, the report also includes a list of persons who, on the basis of the assessment result, are recommended to undergo more thorough measurements or further tests, for example due to very poor recovery. After the front page, the report includes each person's individual Specialist report (the same as the individual Specialist report).

Contents

Group's background information
Group notes
Distribution of self-reported sleep quality
Alcohol consumption
Distribution of stress state classification
Attention

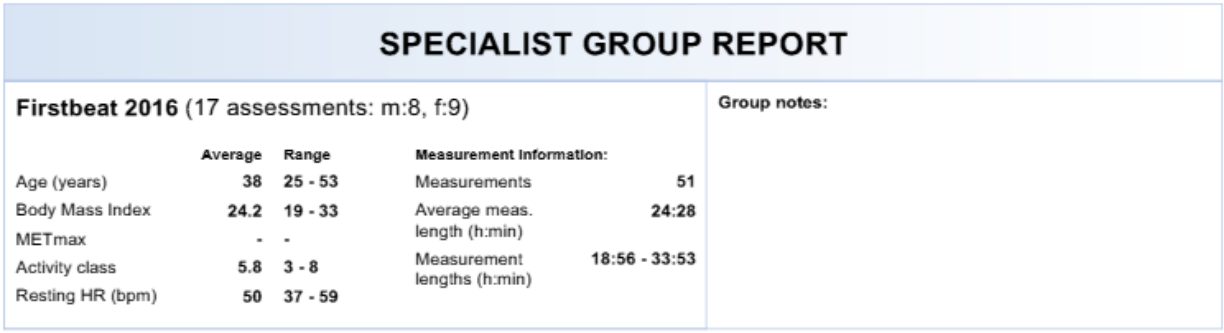
Purposes of use

Background data for the specialist to use during the feedback session.
As a tool for initial, follow-up and final measurements in projects.
To identify the persons with signs of poor recovery for further action.

Note!

The purpose of the report is in no situation to function as a diagnostic tool. However, the report can be utilized in group projects to identify the people whose results indicate a need for more specific examinations or tests.

If an individual person's results indicate clear signs of weakened recovery on each day, it is good to discuss possible further actions together with the client. When interpreting the result, it should be noted that the result is based purely on the physiological reactions that occurred during the recording days. Abnormal events during the measurement and changes in general health status can have a strong effect on the results, as assessed by the stress state classification.



SPECIALIST GROUP REPORT

Firstbeat 2016 (17 assessments: m:8, f:9)

	Average	Range
Age (years)	38	25 - 53
Body Mass Index	24.2	19 - 33
METmax	-	-
Activity class	5.8	3 - 8
Resting HR (bpm)	50	37 - 59

Measurement Information:

Measurements	51
Average meas. length (h:min)	24:28
Measurement lengths (h:min)	18:56 - 33:53

Group notes:

9.1. Group's background information (upper section)

Interpretation

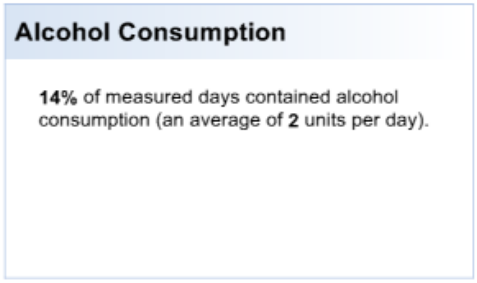
Conveys general information about the group

- number of included assessments (there can be several assessments from one person)
- number of measurements (typically measurement days)
- age (average)
- body mass index (average)
- range of measurement lengths

Possible group-specific notes are on the right-hand side of this field.

Other information

The figures are generated on the basis of the group's journal markings.

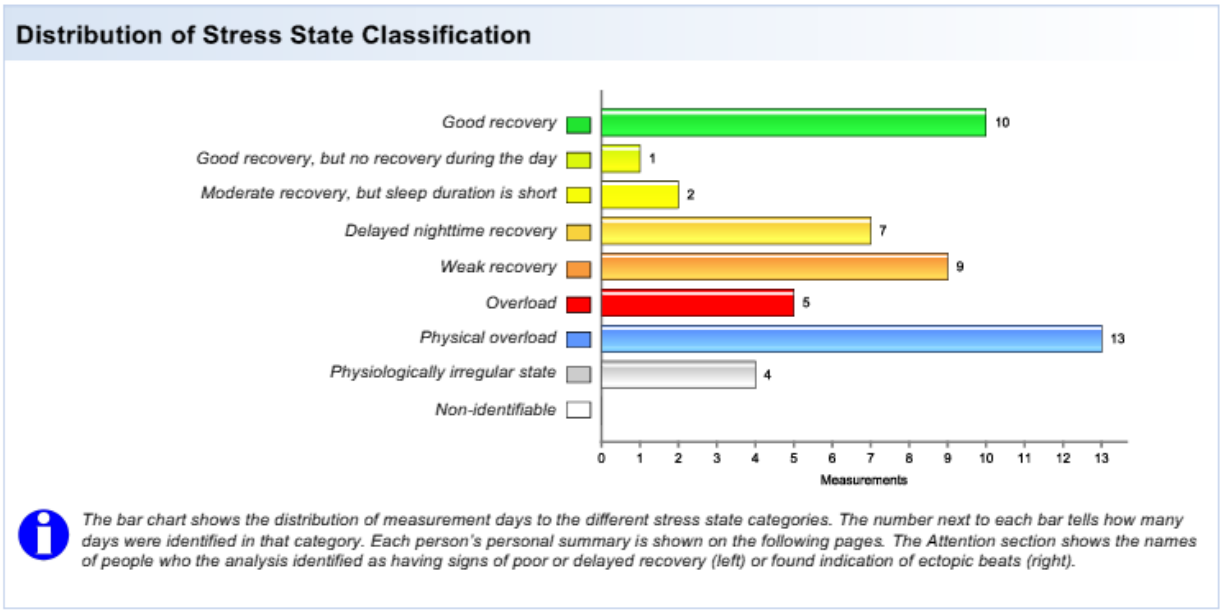


9.2. Distribution of sleep quality and consumption of alcohol

Interpretation

The distribution of sleep quality shows how the group's subjective sleep quality values from the measurement days are distributed. The subjective assessment of sleep quality is based on the "score" that the person entered in the journal. If the distribution is concentrated towards the left half of the diagram, the experienced sleep was on average good. If, on the other hand, the distribution is concentrated towards the right half of the diagram, the people in the group had, on average, rated their sleep as not good or poor.

Alcohol consumption is presented as a percentual share of days when the persons in the group had consumed alcohol. The section also indicates the average number of units for the relevant days.
Because the entries were made by the users themselves, they should be considered critically, with this in mind.



9.3. Distribution of stress state classification

Interpretation

The bar chart shows the distribution of measurement days to the different stress state categories. The figure next to the bar indicates the number of measurement days in that category. More detailed background of the information in this section is discussed in chapter 7, Specialist report.

9.4. Attention

Interpretation

The left-hand column lists the names of persons whose results indicate obviously weakened recovery. The criteria set for this is based on the day-specific result of the stress state classification: if the classified state is either 5, 6, P, E, or N/A on each day of the period, it is recommended to perform a repeat measurement and/or conduct more detailed examinations to assess the person's general health status.

10. Project Summary

Description

This report contains important conclusions about the project, including information about the group itself, physiological variables, as well as summaries of the pre-questionnaire and set goals. Project Summary shows how the group is doing compared to general reference values. In addition, the report shows the percent of people who show signs of compromised or weak recovery.
The summary does not reveal any individual results, so if the group size is sufficient, the report can be used to describe the group's overall situation to the service provider or company management. The report can be created as a summary of a single assessment project, to compare 2 different groups, or after a follow-up project, with 2 separate measurements, providing valuable and interesting information about the effectiveness of the project.
The recommended minimum number of participants to create a Project Summary is 10 people.

Contents

Cover page
Firstbeat Lifestyle Assessment
Stress – measurement results
Sleep – measurement results
Exercise – measurement results
Goals
Recommendations
Group-level changes

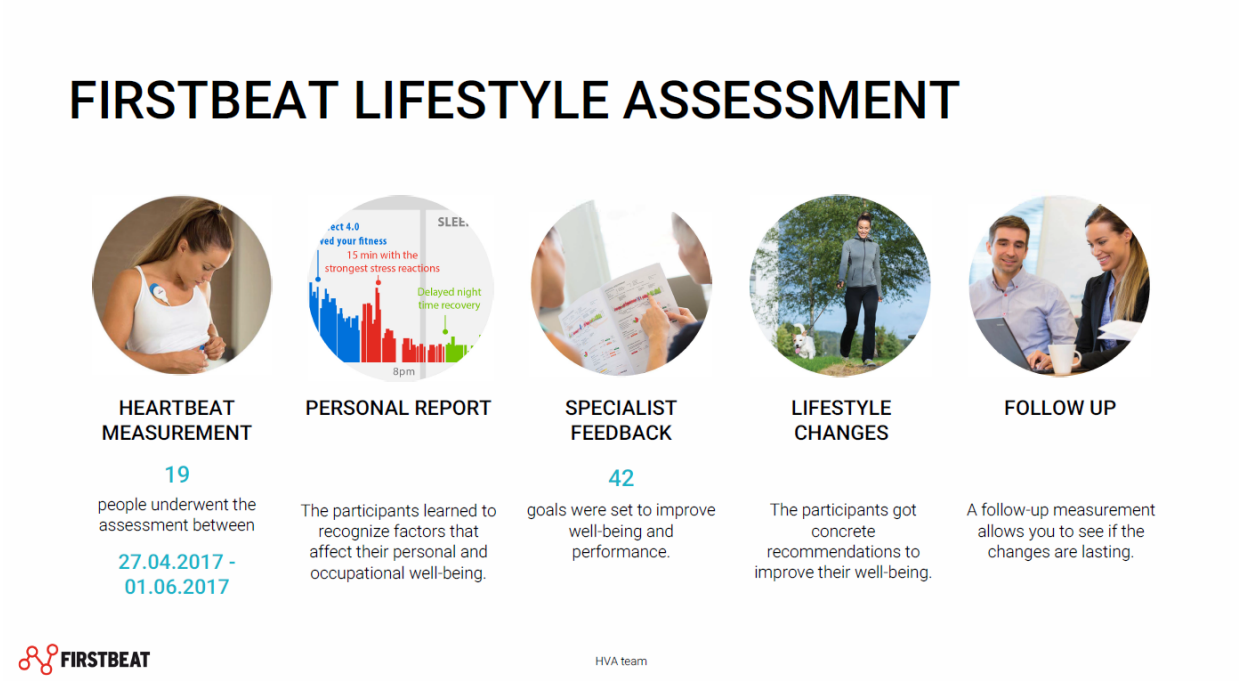
Purposes of use

Information about the effectiveness of the project
Summary of key group results for the participants
Comprehensive summary about the success of the project

10.1. Cover page

Note

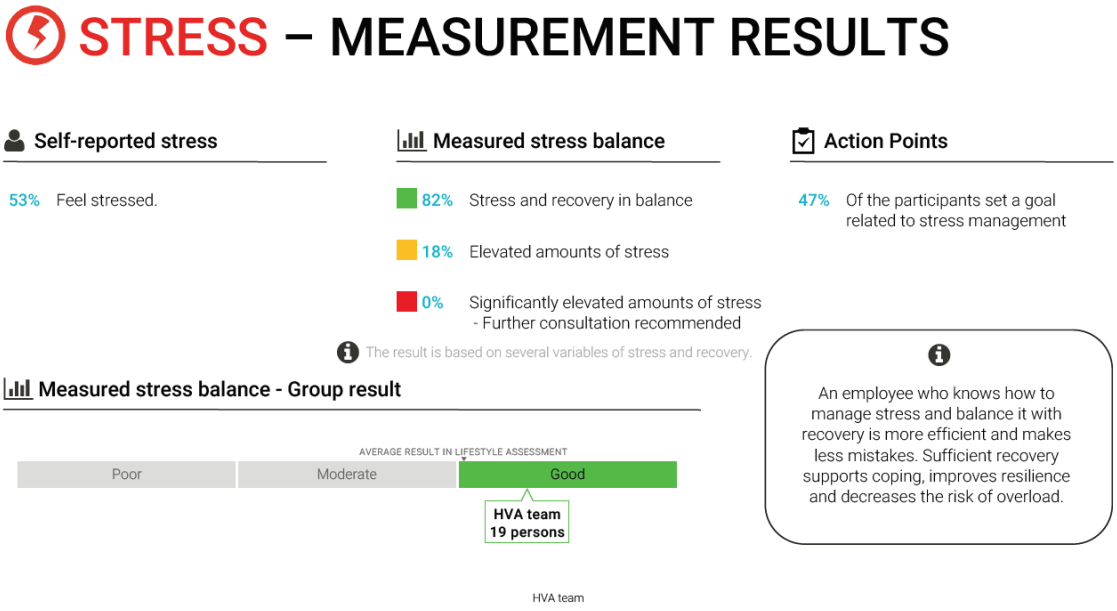
The title of the cover page can be determined by the user when creating the report.



10.2. Firstbeat Lifestyle Assessment

Interpretation

Under the header *Heartbeat Measurement*, the report shows the number of participants and the timeline of the measurements.
Under *Specialist Feedback*, you can see how many goals the participants set altogether. This can be interesting, even if a high number of goals is not necessarily an indicator of a good project. It's also good to keep in mind that some providers might use a different tool for setting goals, or the goals might be recorded after the summary is created. Other titles on this page are static and simply clarify the key steps of the process.



10.3. Stress – Measurement results

Interpretation

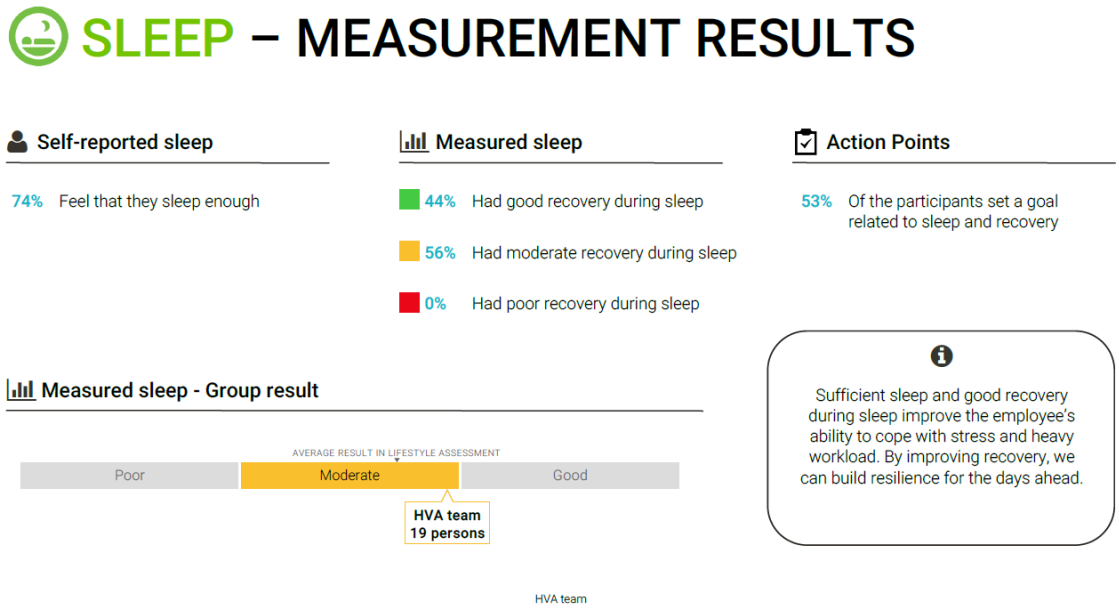
Self-reported stress shows the percent of participants who had responded *completely disagree* or *partially disagree* to the pre-questionnaire statement *I don't generally feel stressed*. According to the entire Firstbeat database, the share of these people is 41%.
Measured stress is based on the recommendation for a follow-up measurement shown in the Specialist report. The *Stress and recovery in balance* group includes all people who got the follow-up recommendation of 6-12 months. *Elevated amount of stress* includes people who got the follow-up recommendation in 2-6 months and *Significantly elevated amount of stress* the people with the 1-month follow-up recommendation due to weak recovery or some other irregularity. The segment *Action points* shows the percent of participants who set goals related to stress management.
Measured stress – Group result shows the distribution of the group result on a poor – to good continuum. The graph also shows the average value of the Firstbeat database, and if selected,

the results of two assessments (either 2 separate groups or 2 separate assessments for the same group).

Other

According to the Firstbeat database (2016), people are distributed as follows in the area of stress balance:

- Stress and recovery in balance 63%
- Elevated amount of stress 29%
- Significantly elevated amount of stress 8%



10.4. Sleep – Measurement results

Interpretation

Self-reported sleep shows the percent of people who had completely or partially agreed with the Pre-questionnaire statement of *I feel that I sleep enough*. The Firstbeat database average for this is 51%.

Measured sleep is based on the amount (percent) of recovery during the sleep period. The result is based on the average result (usually of 3 nights) of the participants. The *Had good recovery during sleep* group includes assessments where the result was good, or 75% or more of recovery during sleep. *Had moderate recovery* means that the amount of recovery during sleep was 50-75% and *Had poor recovery* includes the assessments where the amount of recovery was less than 50% of the sleep time.

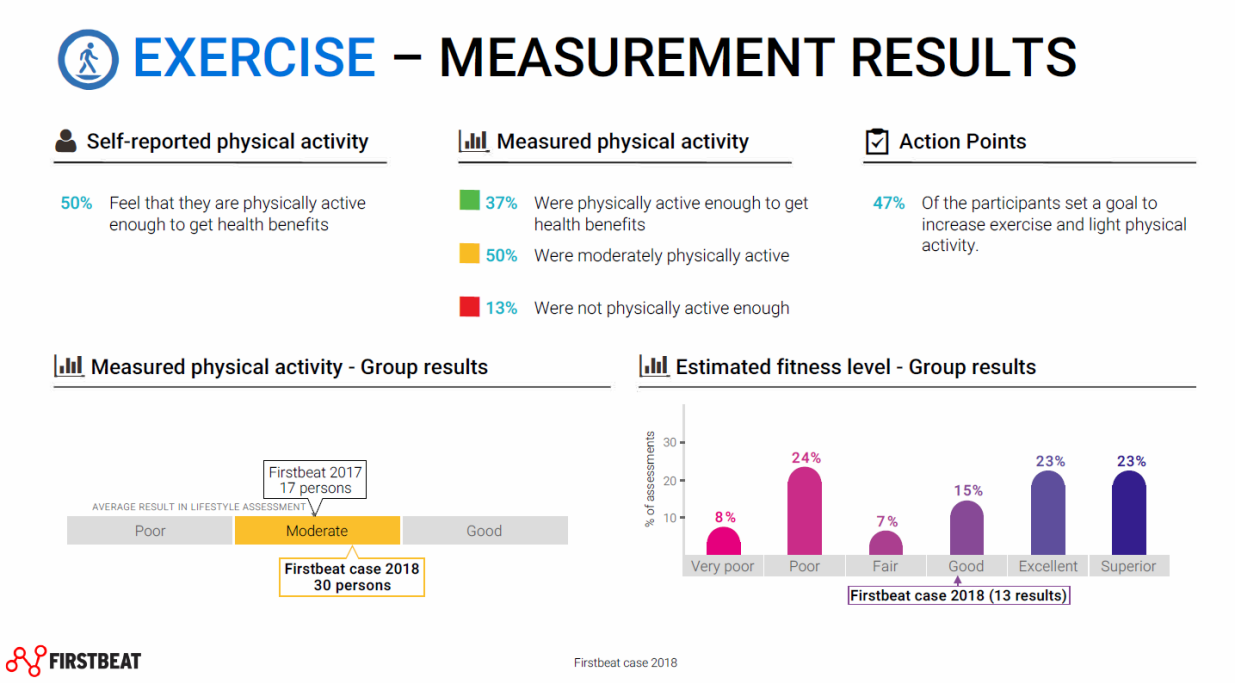
Action points shows the share of people who set goals related to sleep.

Measured sleep – Group result shows the distribution of the group result on a poor – to good continuum. The graph also shows the average value of the Firstbeat database, and if selected, the results of two assessments (either 2 separate groups or 2 separate assessments for the same group).

Other

According to the Firstbeat database (2018), people are distributed as follows in the area of measured sleep:

- Had good recovery during sleep 51%
- Had moderate recovery during sleep 32%
- Had poor recovery during sleep 17%



10.5. Exercise – Measurement results

Interpretation

Self-reported physical activity shows the percent of people who had completely or partially agreed with the Pre-questionnaire statement of *I'm physically active enough to get health benefits.* According to Firstbeat database, the share of these people is 63%.
Measured physical activity is based on the amount of physical activity that is of sufficient intensity to provide health benefits. The result is based on the average scores of the group participants. The group *Is physically active enough to get health benefits* includes assessments that fulfill the recommended amount of physical activity (i.e. get a good score; see more closely under the Lifestyle Assessment report chapter, the section on physical activity). The group *Is moderately physically active* includes assessments where the amount of physical activity is moderate and the *Is not physically active enough* group includes assessments where the amount of physical activity is low compared to the recommended value.
Action points shows the share of people who set goals related to physical activity.
Measured physical activity – Group result shows the distribution of the group result on a poor (little physical activity)– to good (sufficient physical activity) continuum. The graph also shows

the average value of the Firstbeat database, and if selected, the results of two assessments (either 2 separate groups or 2 separate assessments for the same group).
Estimated fitness level – the group result shows the distribution of fitness levels in the group. The percent figure above the bars shows the % of people who were in that category and the arrow under the graph points to the average category for the whole group.

Other

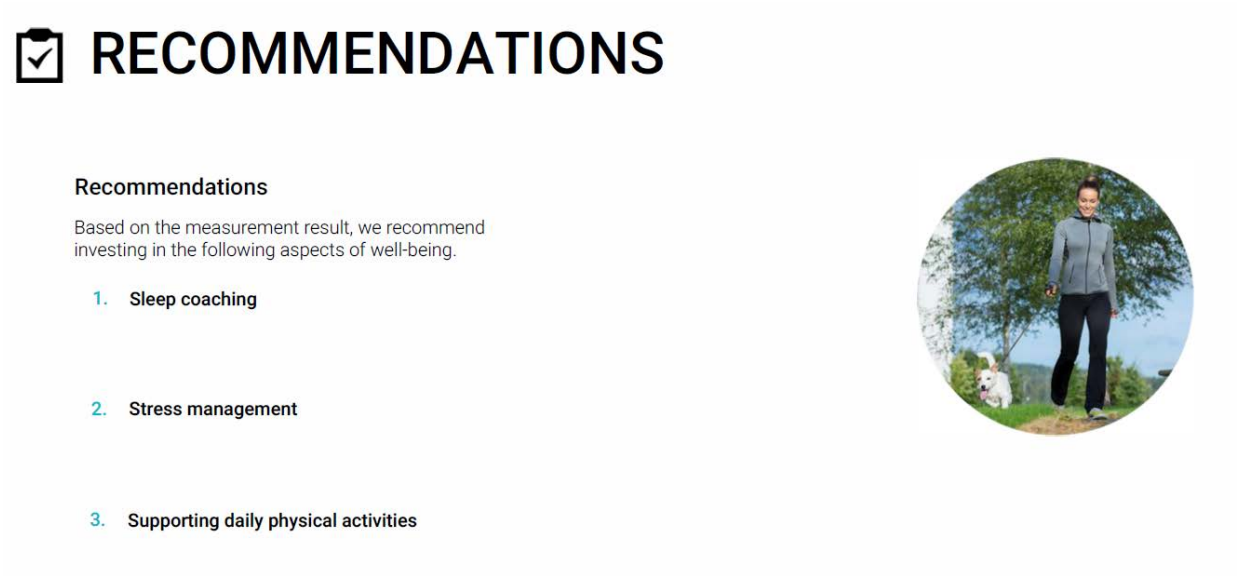
According to the Firstbeat database (2018), people are distributed as follows in the area of measured physical activity:

- Is physically active enough for health benefits 37%
- Is moderately physically active 23%
- Is not physically active enough 40%

10.6. Goals

Interpretation

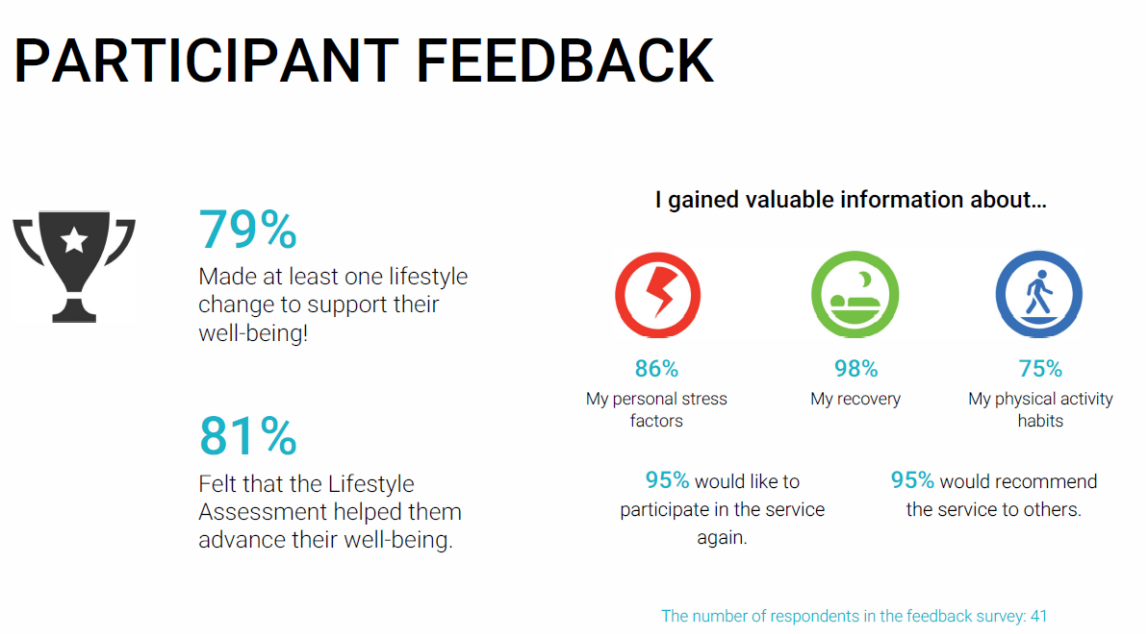
The *Number of goals* segment shows the total number of set goals for the whole group and relative to one person.
Goal segmentation illustrates how many people set a goal in the listed categories.
TOP 3 most popular goals lists the goals that were the most popular in this group.



10.7. Recommendations

Interpretation

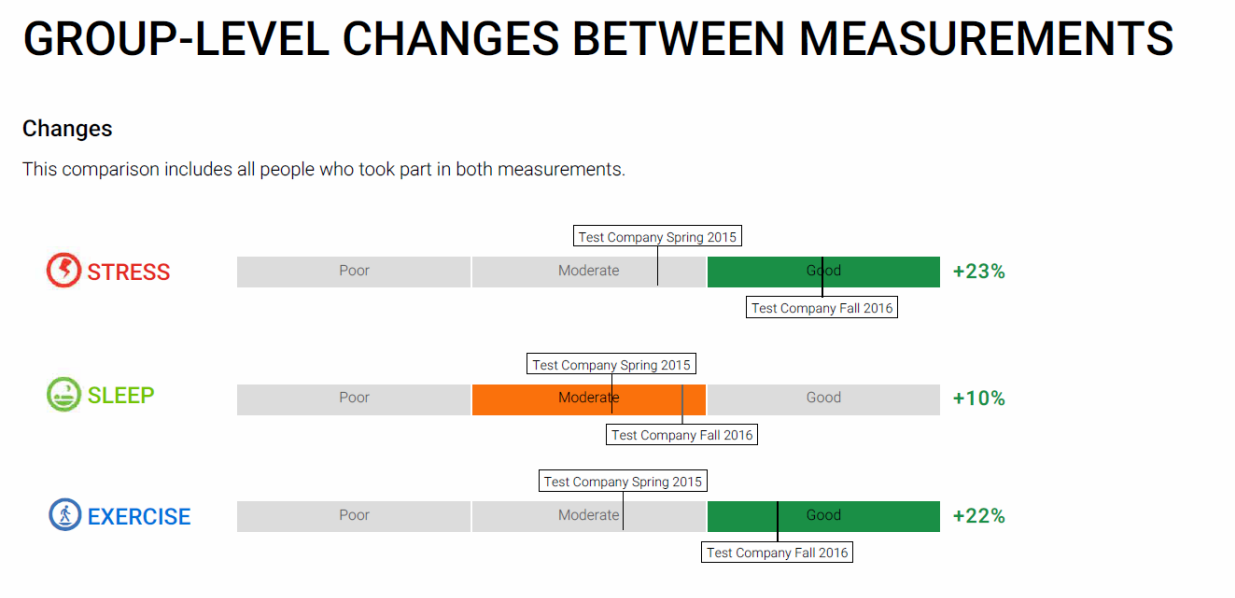
When creating the report, the professional user can list recommended action points for the group, reflecting and prompted by the group result.



10.8. Participant feedback

Interpretation

The results on this page are drawn from the feedback questionnaire that was sent to the participants. As a default, the questionnaire is sent 2 weeks after the assessment was completed. The number of people who answered the questionnaire is shown at the bottom of the page.



10.9. Group-level changes

Interpretation

If this was a follow-up assessment, the last page of this report compiles some of the changes that were achieved during the project. The listed variables (stress, sleep, physical activity) have been explained earlier in this chapter. If this is the first assessment, this page is not included in the report.

The result only includes those people who took part in both assessments.