FIRSTBEAT

LIFESTYLE ASSESSMENT USER TRAINING, *PART 2*

Tiina Hoffman

AGENDA

- Review
- Evaluating the reliability of results
- Special cases
- Specialist report
- Interpretation of reports: *practice*
- Group assessments


FIRSTBEAT
REVIEW
LIFESTYLE ASSESSMENT
STRESS AND RECOVERY
SLEEP
WORK
PHYSICAL ACTIVITY
ENERGY EXPENDITURE

REVIEW

1. What does Lifestyle Assessment measure?
2. What is heart rate variability / what does it tell?
3. What are the benefits of Lifestyle Assessment to a client?
4. In which conditions is Lifestyle Assessment not recommended?
5. What are some of the most typical stressors / factors that cause overload?
6. What to do if the client's result is exceptionally weak without known illnesses or another obvious explaining factor?

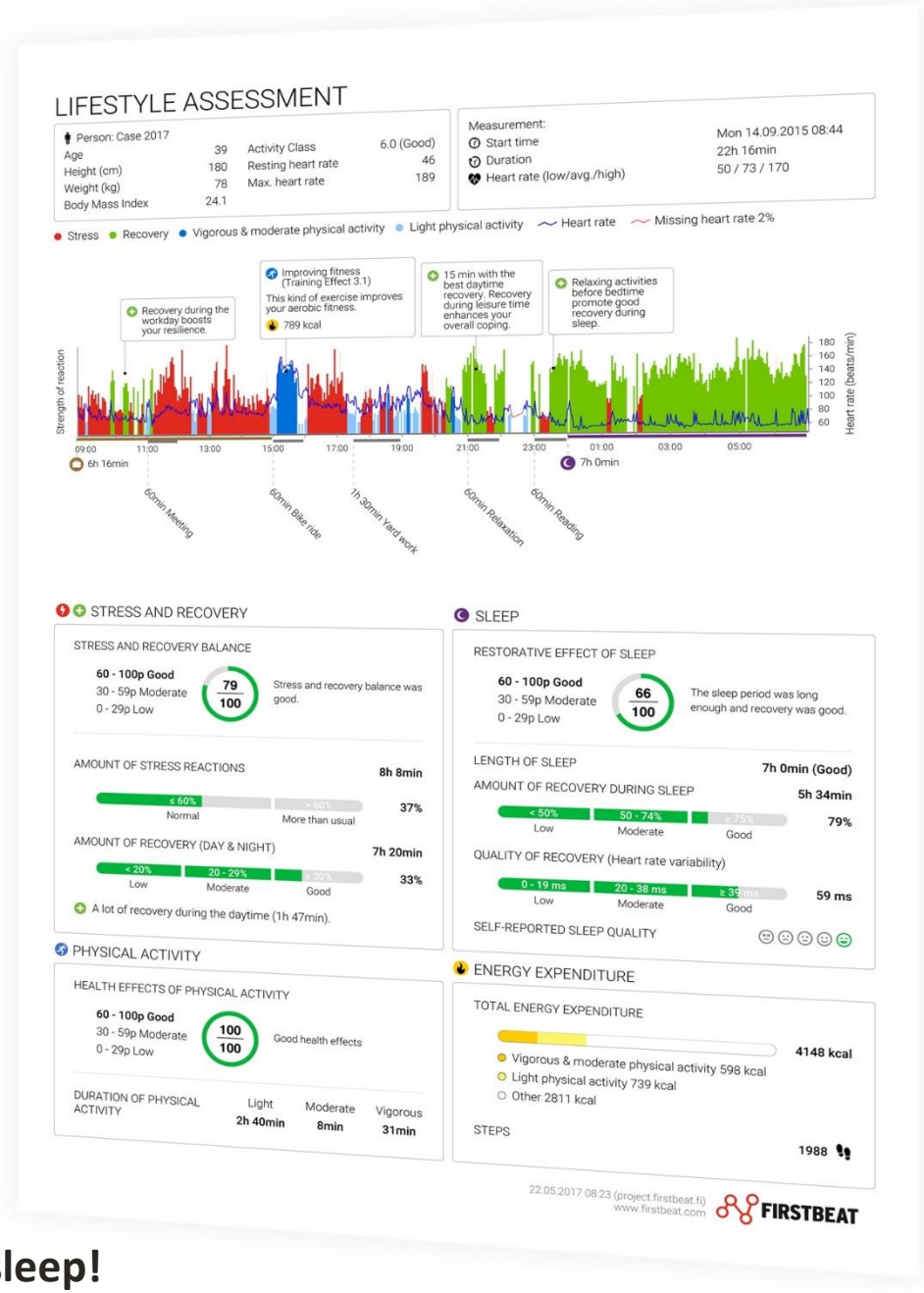
FIRSTBEAT
LIFESTYLE ASSESSMENT

Helps you understand the state of your well-being and what to do to improve it.

Manage stress
Recognize activities that cause stress

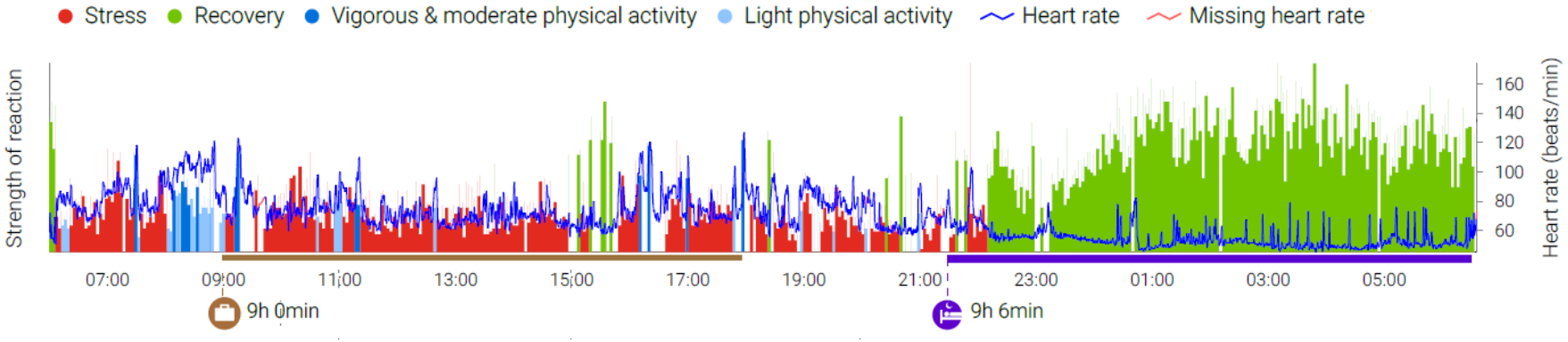
Enhance recovery
See how you recover during sleep

Exercise right
See the effect of your exercise



A comprehensive look at well-being during work, leisure and sleep!

WHAT DO THE DIFFERENT COLORS MEAN?



Stress	Recovery	Physical activity	(White)
Increased activation level in the body. The reaction can be positive or negative. Sympathetic dominance. • Heart rate ↑ • Respiration frequency ↑ • Heart rate variability ↓ • Oxygen uptake <20% of maximal capacity (VO2max)	Calming down of the body. Parasympathetic dominance. • Heart rate ↓ • Respiration frequency ↓ • Heart rate variability ↑ • Oxygen uptake <20% of maximal capacity (VO2max)	Physical load during which energy expenditure is significantly increased from the resting level (over 2 MET). • Vigorous physical activity: an intensity of over 60% • Moderate physical activity: an intensity between 40-60% • Light physical activity: an intensity between 20-40% of maximal performance	White segments are typically seen during: • Recovery from exercise • Low-level physical activity • Short awakenings during sleep • Missing data periods (for example during a shower)

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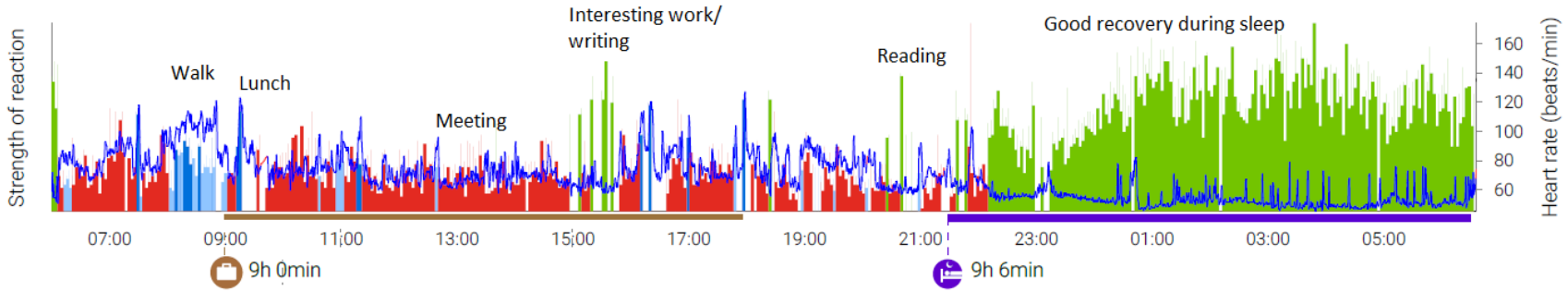
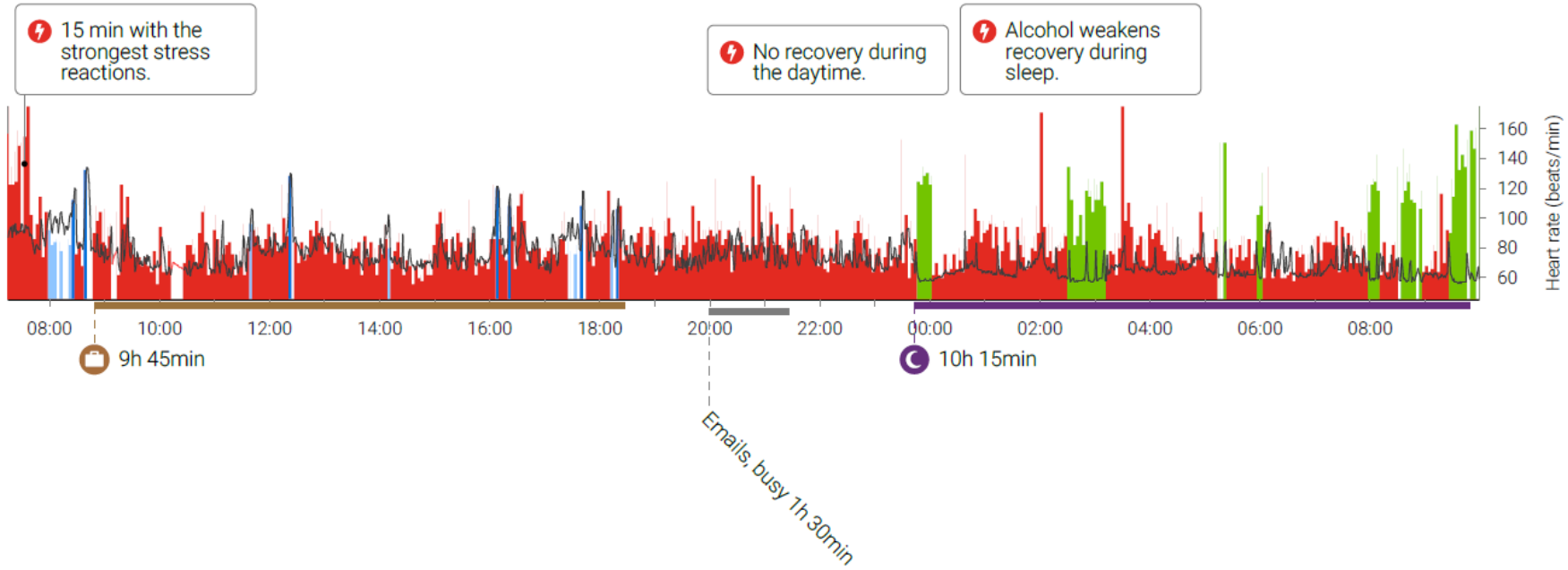
POSITIVE OR NEGATIVE STRESS?

Positive stress activates the body and improves efficiency, but in general does not disturb recovery or sleep.



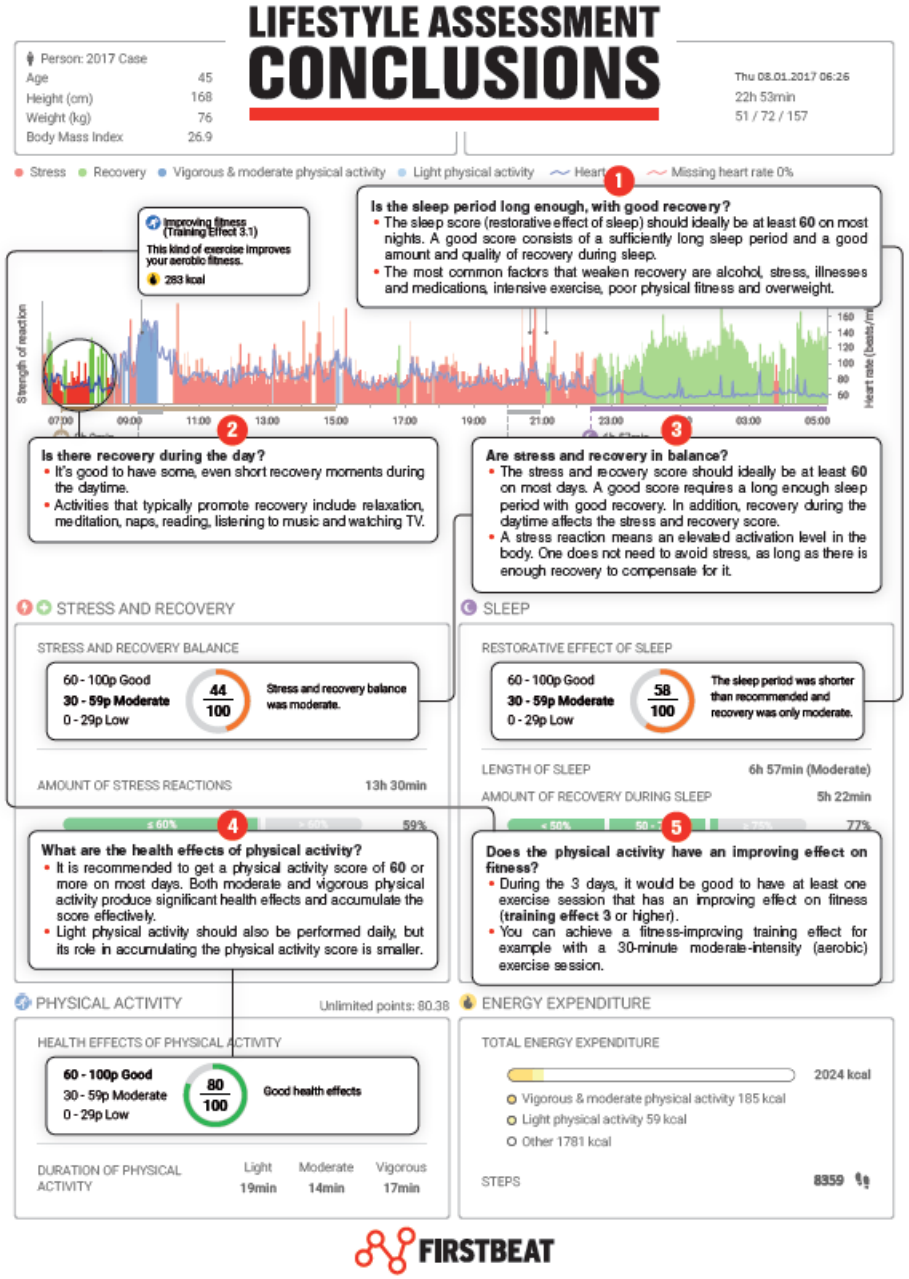
Negative stress keeps the body constantly activated (wired) and prevents recovery while resting or sleeping.



FIRSTBEAT

LIFESTYLE ASSESSMENT CONCLUSIONS

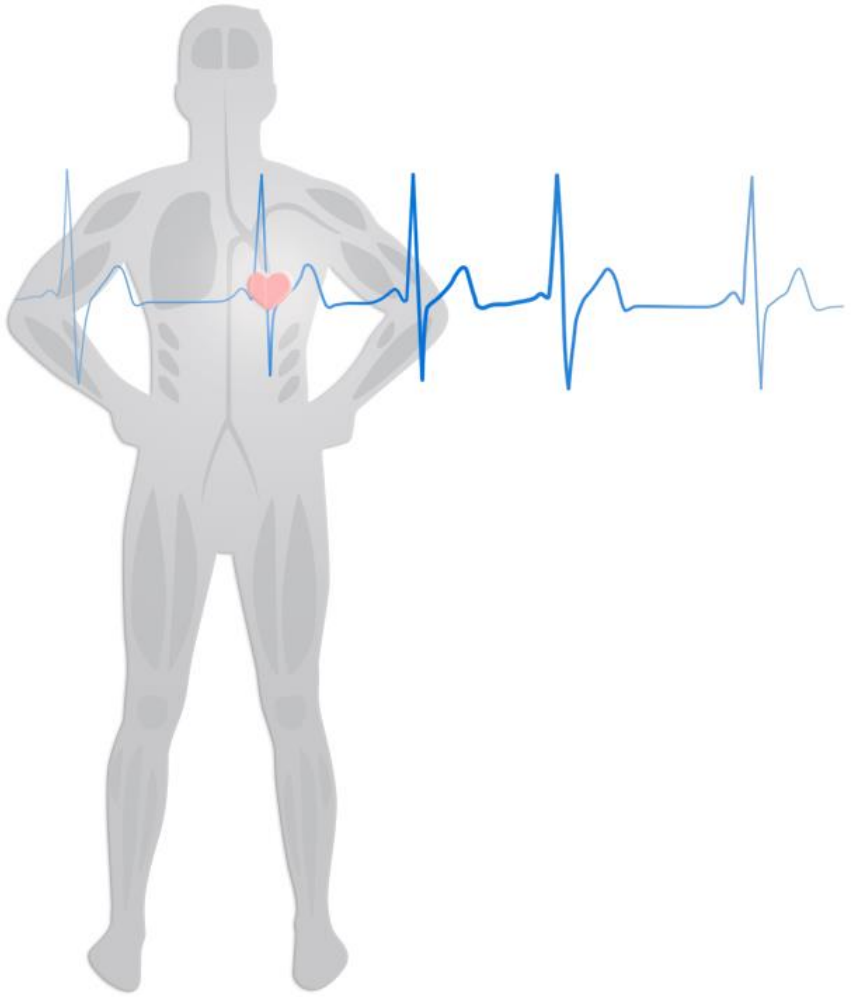
1. Is the sleep period long enough, with good recovery?
2. Is there recovery during the day?
3. Are stress and recovery in balance?
4. What are the health effects of physical activity?
5. Does the physical activity have an improving effect on fitness?




FIRSTBEAT
EVALUATING THE
RELIABILITY OF RESULTS

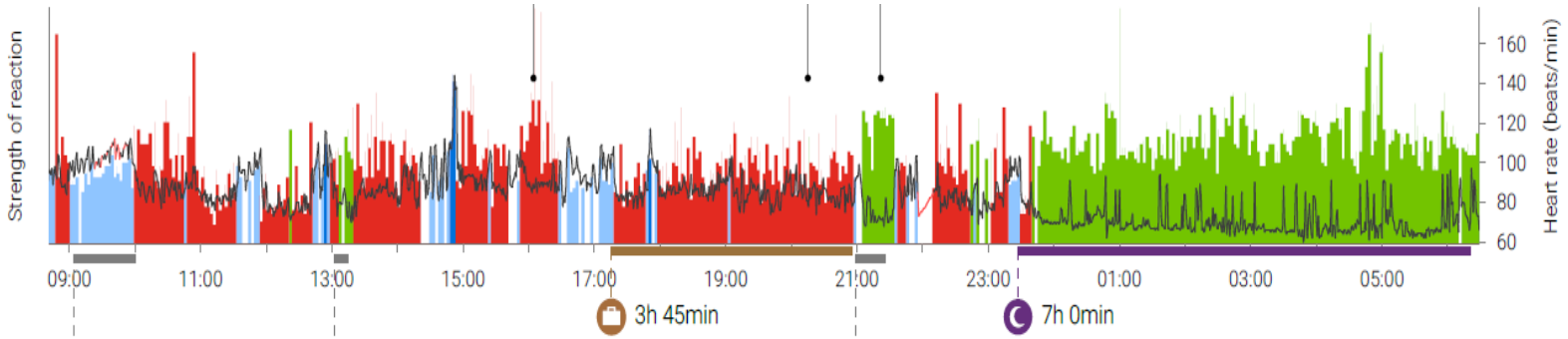
THE RELIABILITY OF RESULTS IS AFFECTED BY

- Resting heart rate
- Maximum heart rate
- Missing heart rate information / erroneus data
- Measurement length
- Illnesses
- Medications



RESTING HEART RATE AFFECTS THE AMOUNT OF RECOVERY

Measurement analyzed with a resting HR of 59



STRESS AND RECOVERY BALANCE

60 - 100p Good
30 - 59p Moderate
0 - 29p Low

70/100

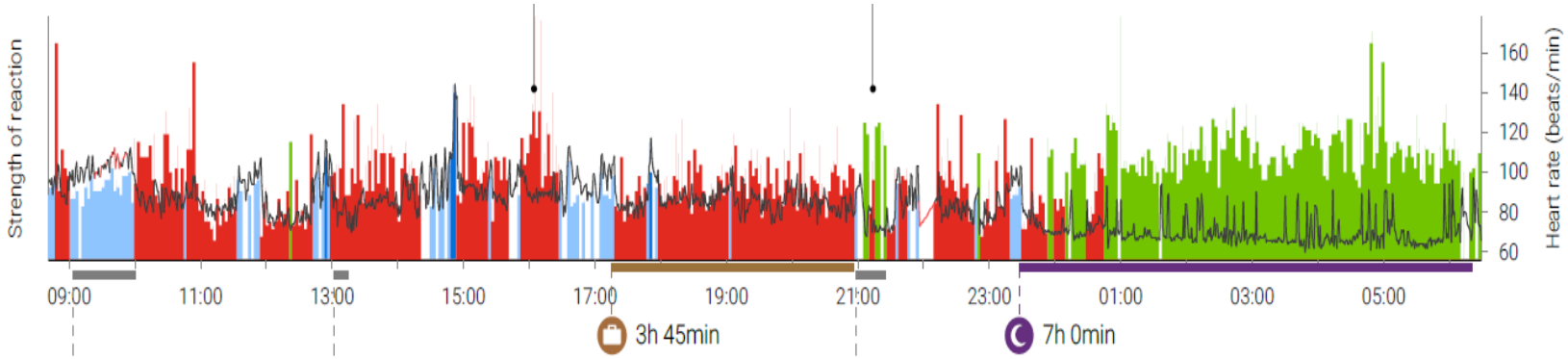
Stress and recovery balance was good.

AMOUNT OF RECOVERY (day & night) **6h 39min**

< 20% Low | 20 - 29% Moderate | ≥ 30% Good **30%**

A moderate amount of recovery during the daytime (34min).

Same measurement analyzed with a resting HR of 56



STRESS AND RECOVERY BALANCE

60 - 100p Good
30 - 59p Moderate
0 - 29p Low

53/100

Stress and recovery balance was moderate.

AMOUNT OF RECOVERY (day & night) **5h 47min**

< 20% Low | 20 - 29% Moderate | ≥ 30% Good **27%**

A small amount of recovery during the daytime (20min).

FIRSTBEAT

RESTING HEART RATE AUTOMATICS

.... to establish whether the person's general life situation is "normal" or exceptionally stressful.

- To ensure reliability of results, Lifestyle Assessment automatically drops the resting heart rate by 1-5 beats (from the lowest measured value), if certain criteria are filled.

- Criteria: at least 2 units of alcohol; the client feels stressed and not well (pre-Q); client has done intensive exercise within 1.5 hours of sleep.

- Example: Person's lowest measured heart rate is 51, but based on the pre-questionnaire (feeling stressed), the analytics dropped the resting heart rate by 1 beat to 50 bpm.

I don't generally feel stressed.	Partially disagree
My days include breaks that allow me to recover.	Partially disagree
I usually feel rested and energetic.	Completely disagree
I feel that I sleep enough.	Completely disagree

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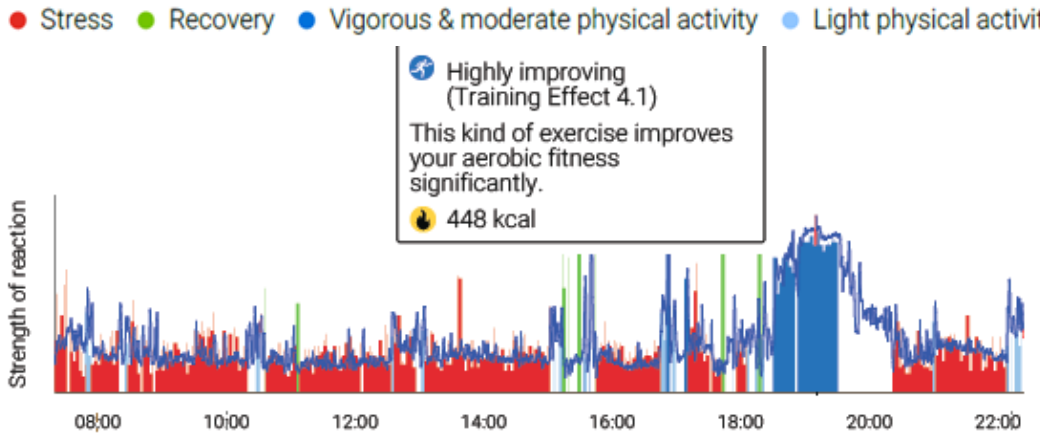
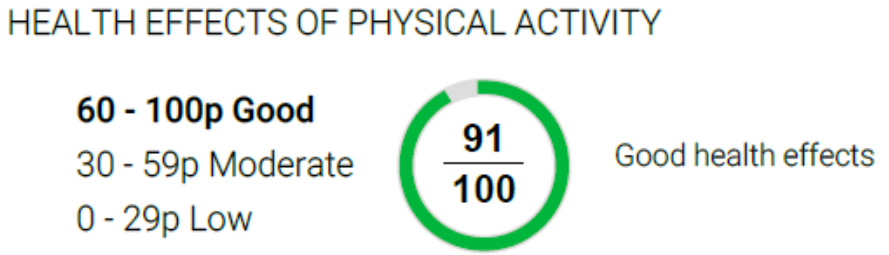
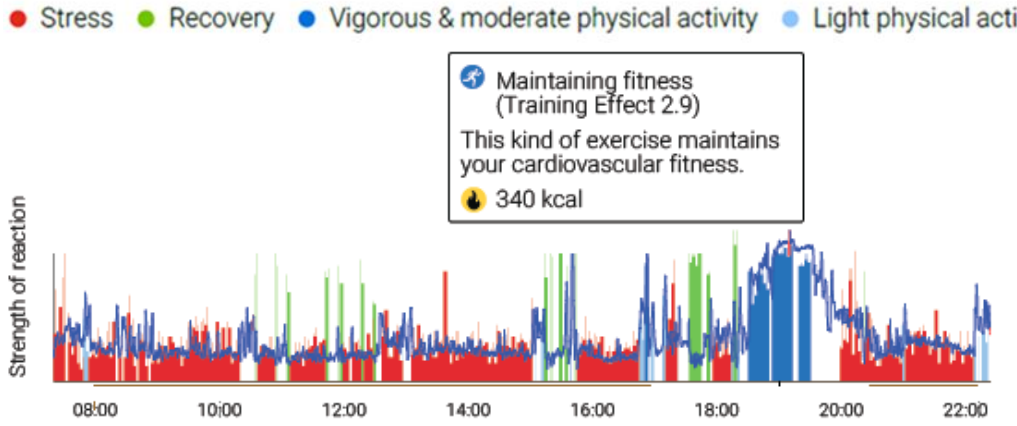
MAX HEART RATE AFFECTS THE CALCULATION OF EXERCISE (AND ENERGY EXPENDITURE)

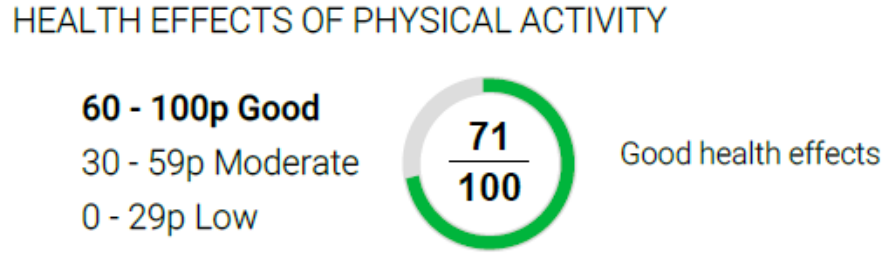
Analyzed with a max HR of 179 (automatic estimation based on age) ***Formula: 210 - (0,65 x age)***





Analyzed with a max HR of 195 (measured in a fitness test)





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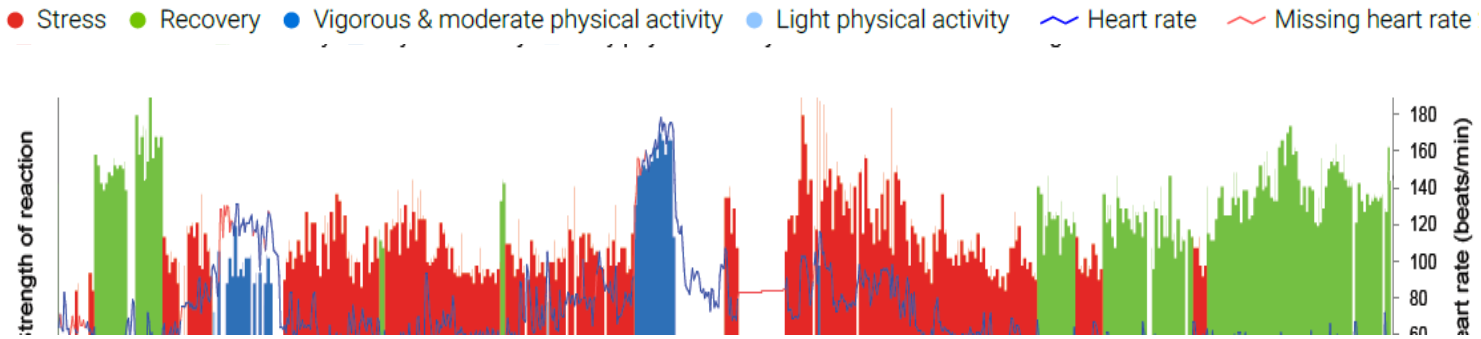
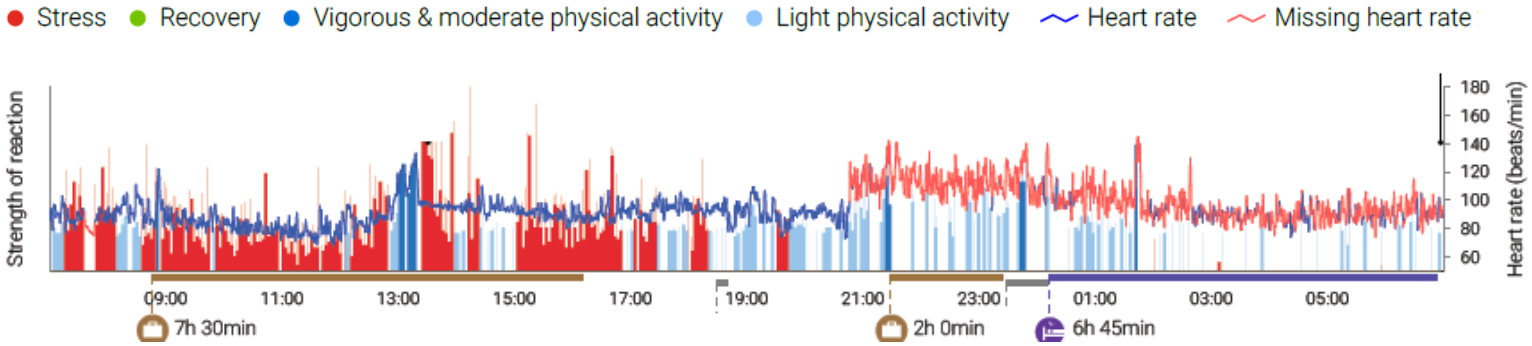
MISSING HEART RATE DATA

- ”Missing heart rate” can be caused by a measurement break, problems with the device / electrodes or an abnormal heart rhythm.
- If the amount of missing heart rate data is over 15% on 2/3 days, or over 20% over the whole measurement period, a re-measurement is recommended.



Example 1. Measurement break caused by the device being off during shower from 20 to 21 (10%). Reliability of the result is good.



Example 2. Atrial fibrillation attack that started at 21. Reliability of results in the evening / night is very poor.

FIRSTBEAT


FIRSTBEAT
SPECIAL CONDITIONS:
ILLNESSES AND
MEDICATIONS
LIFESTYLE ASSESSMENT
STRESS AND RECOVERY
SLEEP
WORK
PHYSICAL ACTIVITY
ENERGY EXPENDITURE

PLEASE NOTE THIS ABOUT ILLNESSES AND OTHER CONDITIONS

Lifestyle Assessment results can be unreliable and we do not recommend the measurement if the client has:

- A pace maker
- Heart transplant or a difficult heart condition
- Chronic atrial fibrillation / atrial flutter
- Uncontrolled thyroid dysfunction
- High fever (it's better to postpone the measurement if you have fever)

If you have one of the following conditions, you can make the measurement, but please note that the results **can** be difficult to interpret or unreliable:

- Bundle branch block
- Coronary heart disease with angioplasty or bypass surgery
- Chronic neurologic diseases (e.g. MS)
- Diagnosed severe depression or exhaustion (+medicine)
- Pregnancy

NOTE! Firstbeat Lifestyle Assessment is used to promote personal well-being, and is not designed for diagnosing illnesses.

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CHALLENGES CAUSED BY MEDICATIONS (HR & HRV)

- **Beta blockers** affect the max heart rate -> typically the person's age-estimated max heart rate should be lowered by 15-20 beats (**HRV ↓)**
- Large doses of diuretics and ACE inhibitors can **↓ HRV**
- Antiarrhytmics (tachycardia vs. bradycardia)
- **Asthma** and **allergy medicines** (large doses of corticosteroids, long-effecting sympathomimetics) **HR ↑ ja HRV ↓**
- **Thyroid medicines**: thyroxin **HR ↑ ja HRV ↓**
- Tricyclic and other activating **antidepressants HR ↑ ja HRV ↓**
- Long-effecting **sleep medications** (esp. Benzodiazepan) **HR and HRV ↓**
- Strong **pain medications (opiates) HR and HRV ↓**
- Alzheimer and Parkinson medicines **↓ HRV** (also the effect of the illness itself)

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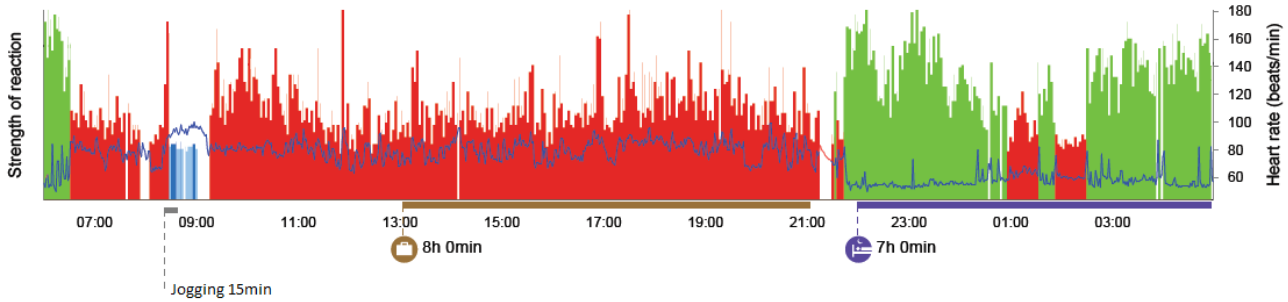
BETA BLOCKERS LOWER THE HEART RATE ESP. DURING EXERTION

- Usually the max HR should be reduced by 15-20 beats / min *(check how HR reacts during exercise)*

Analysis result with a max HR of 181



PHYSICAL ACTIVITY

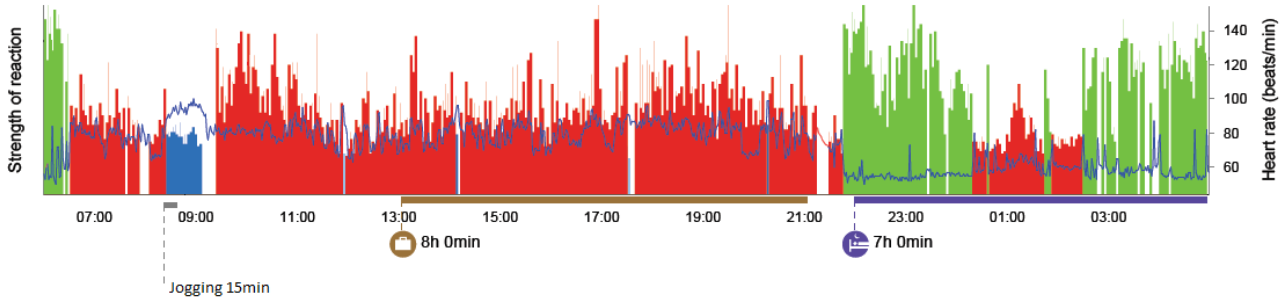
HEALTH EFFECTS OF PHYSICAL ACTIVITY

60 - 100p Good
30 - 59p Moderate
0 - 29p Low

9/100 — Minor health effects

DURATION OF PHYSICAL ACTIVITY	Light	Moderate	Vigorous
	31min	**0min**	**0min**

Re-analyzed result with a max HR of 166



PHYSICAL ACTIVITY

HEALTH EFFECTS OF PHYSICAL ACTIVITY

60 - 100p Good
30 - 59p Moderate
0 - 29p Low

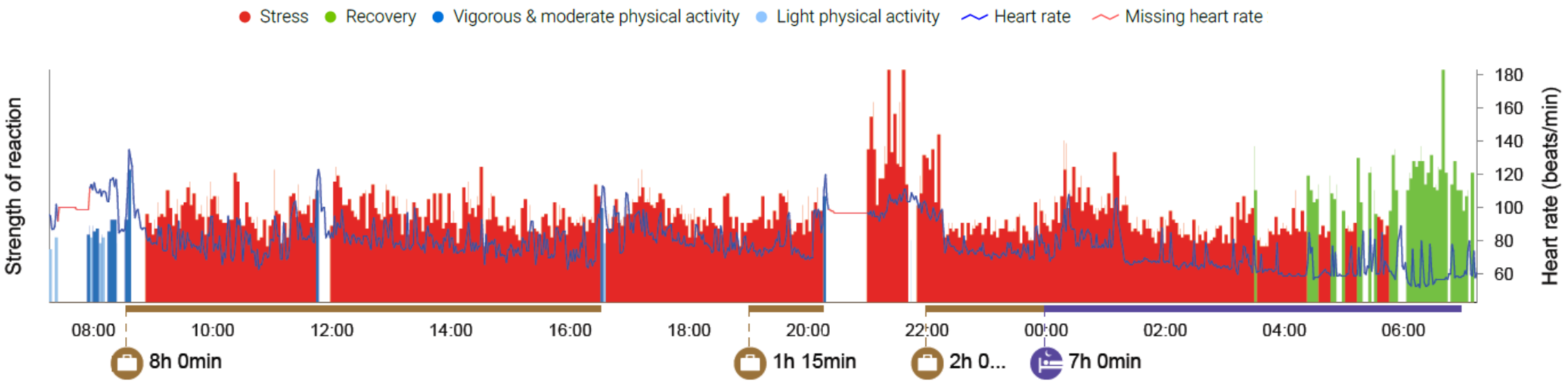
34/100 — Moderate health effects

DURATION OF PHYSICAL ACTIVITY	Light	Moderate	Vigorous
	1h 2min	**12min**	**0min**

FIRSTBEAT

CASE: STRONG BACK PAIN PAIN & HEAVY MEDICATION

- Background: 1.5 months of **serious back pain (lumbago)** that required hospitalization in the most acute stage
- Very strong pain medications (e.g. codeine based) and muscle relaxants, including injections



FIRSTBEAT

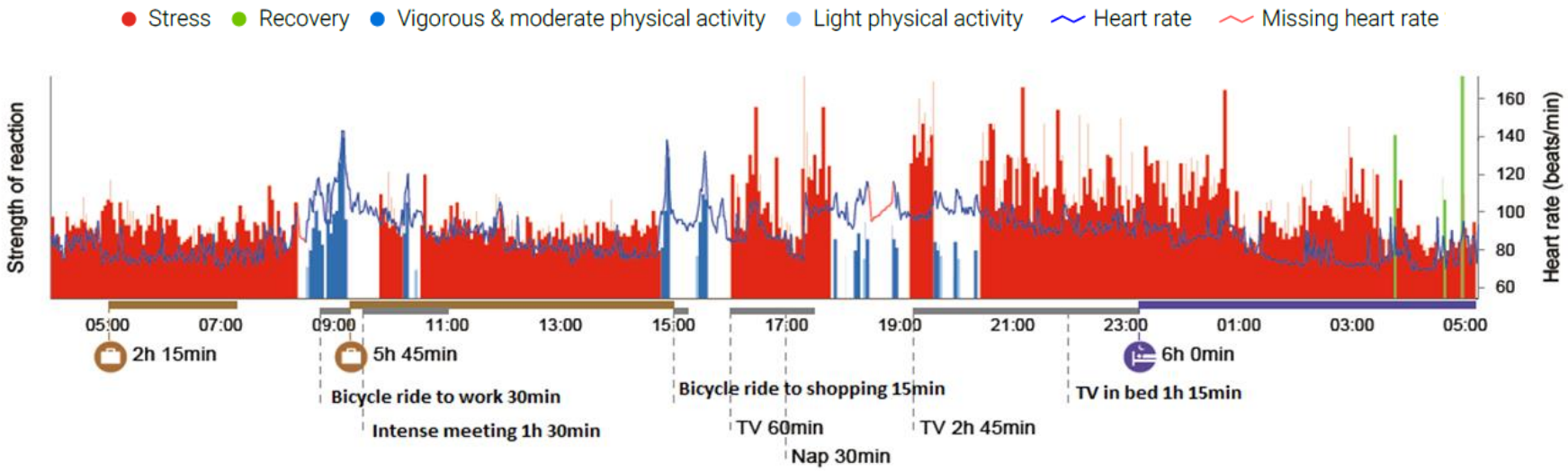
SUMMARY

- Recording medications & illnesses in the journal is very important (*emphasize in client instructions*).
- There are individual differences in resting and max heart rate; it's possible to manually adjust these afterwards, based on the result or the feedback discussion.
- Some medicines might have a negative effect on recovery, but their use can be necessary or justified to treat an illness or other condition.
- If medications have changed during the follow-up period, comparing the results can be challenging.
- The daily dosage, the medicine's half-life and the time of day when it was taken can influence the physiological reaction, in addition to individual reactivity.

FIRSTBEAT

NOTE!

- Lifestyle assessment is not a diagnostic tool!
- There are many possible explanations behind a ”red” result!
- If an obvious reason for a poor result cannot be found, it can be a good idea to recommend some further tests, e.g. a basic health check.

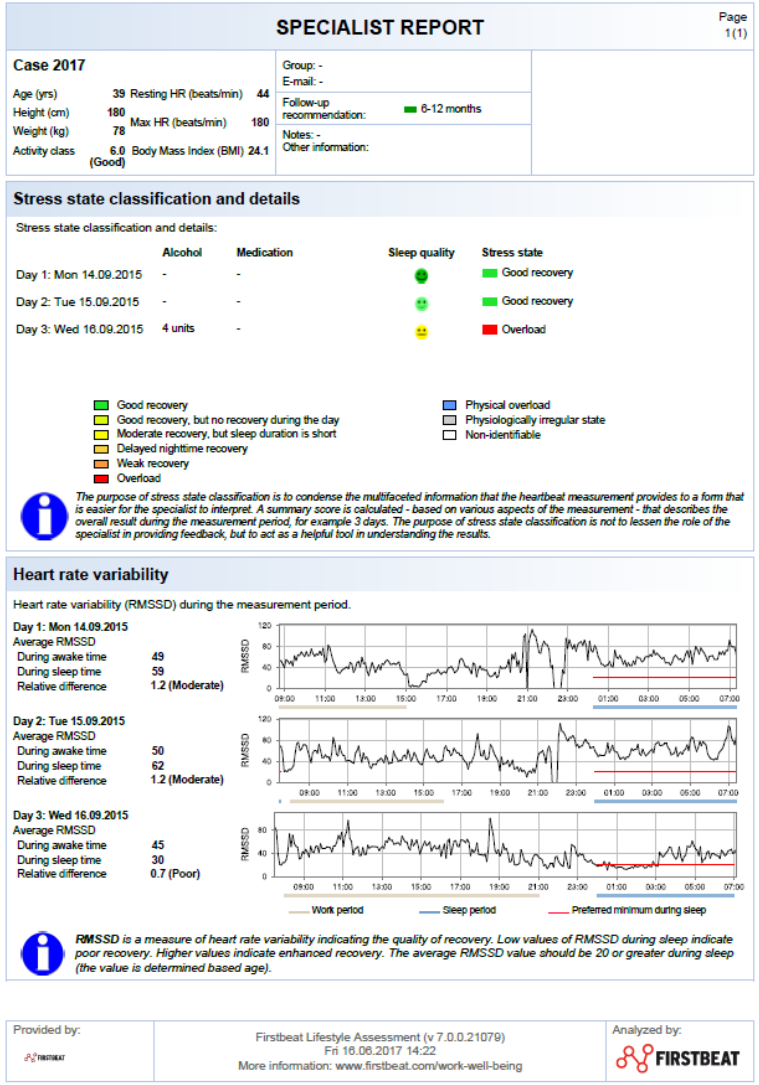


FIRSTBEAT


FIRSTBEAT
LIFESTYLE ASSESSMENT
STRESS AND RECOVERY
SLEEP
WORK
PHYSICAL ACTIVITY
ENERGY EXPENDITURE
SPECIALIST REPORT

SPECIALIST REPORT

- For the Specialist – not for the end client!
- Individual and Group Specialist report available
- Tool to help you interpret & understand the result
- Classification of stress state per each measurement day
- Includes info about client's health status, alcohol use, illnesses, medications and subjective sleep quality.
- Heart rate variability (RMSSD) trend during the measurement days



SPECIALIST REPORT

Page 1 (1)

Case 2017

Age (yrs)	39	Resting HR (beats/min)	44
Height (cm)	180	Max HR (beats/min)	180
Weight (kg)	78		
Activity class	6.0 (Good)	Body Mass Index (BMI)	24.1

Group: -
E-mail: -
Follow-up recommendation: 6-12 months
Notes: -
Other information:

Stress state classification and details

Stress state classification and details:

	Alcohol	Medication	Sleep quality	Stress state
Day 1: Mon 14.09.2015	-	-		Good recovery
Day 2: Tue 15.09.2015	-	-		Good recovery
Day 3: Wed 16.09.2015	4 units	-		Overload

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.

Heart rate variability

Heart rate variability (RMSSD) during the measurement period.

Day 1: Mon 14.09.2015
Average RMSSD
During awake time 49
During sleep time 59
Relative difference 1.2 (Moderate)

Day 2: Tue 15.09.2015
Average RMSSD
During awake time 50
During sleep time 62
Relative difference 1.2 (Moderate)

Day 3: Wed 16.09.2015
Average RMSSD
During awake time 45
During sleep time 30
Relative difference 0.7 (Poor)

Work period
Sleep period
Preferred minimum during sleep

***RMSSD** is a measure of heart rate variability indicating the quality of recovery. Low values of RMSSD during sleep indicate poor recovery. Higher values indicate enhanced recovery. The average RMSSD value should be 20 or greater during sleep (the value is determined based age).*

Provided by:

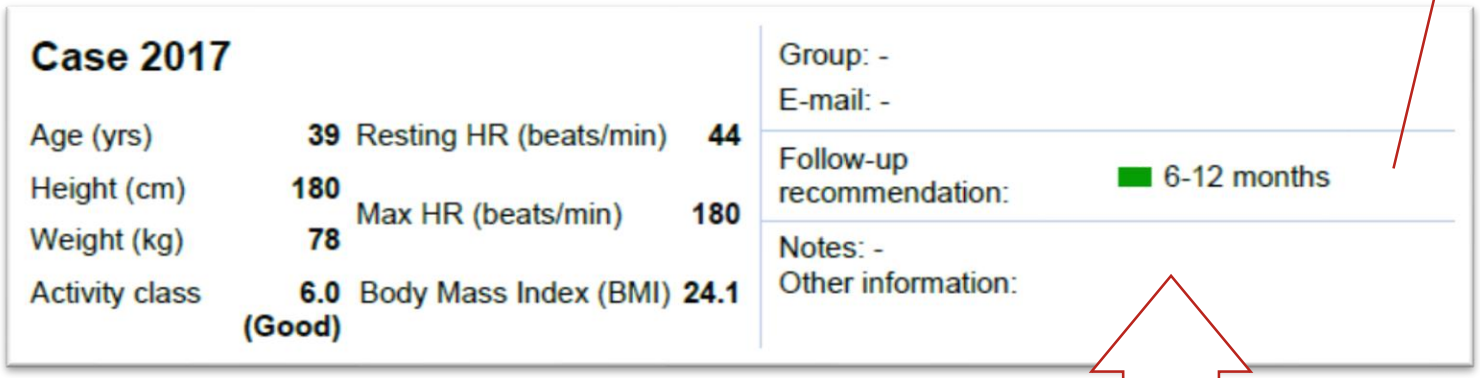
Firstbeat Lifestyle Assessment (v 7.0.0.21079)
Fri 16.06.2017 14:22
More information: www.firstbeat.com/work-well-being

Analyzed by: FIRSTBEAT

SPECIALIST REPORT – PERSONAL INFO

Follow-up recommendation

1 month	Weak recovery
2-6 months	Moderate recovery
6-12 months	Good recovery



Case 2017

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Height (cm)	180	Max HR (beats/min)	180
Weight (kg)	78		
Activity class	6.0 (Good)	Body Mass Index (BMI)	24.1

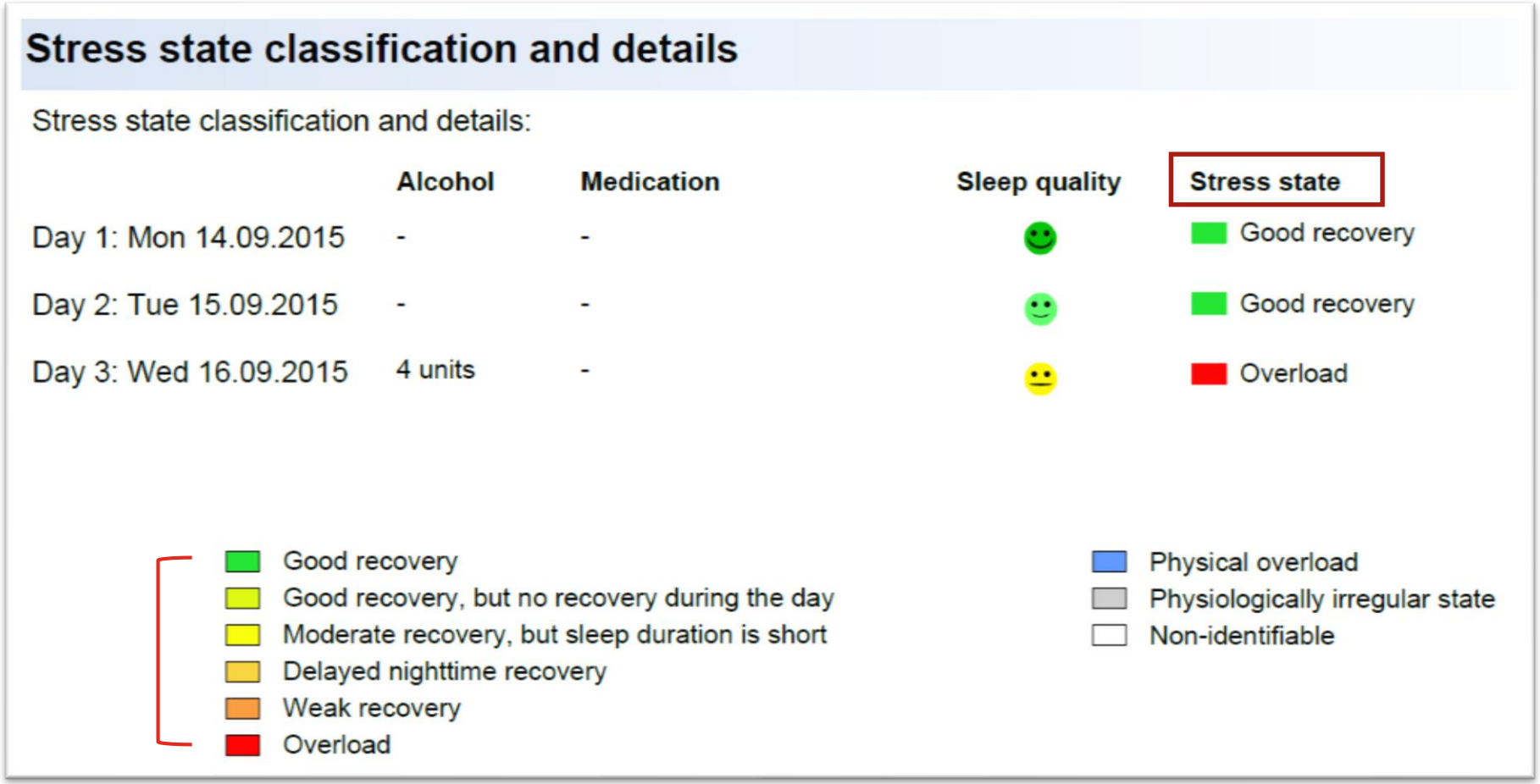
Group: -
E-mail: -
Follow-up recommendation: 6-12 months
Notes: -
Other information:

Info that the client has recorded in the Alcohol/Medications or Notes fields

****Check out the podcast on interpreting the Specialist Report: Learning Center – Manuals and Videos*

FIRSTBEAT

STRESS STATE CLASSIFICATION AND OTHER INFO



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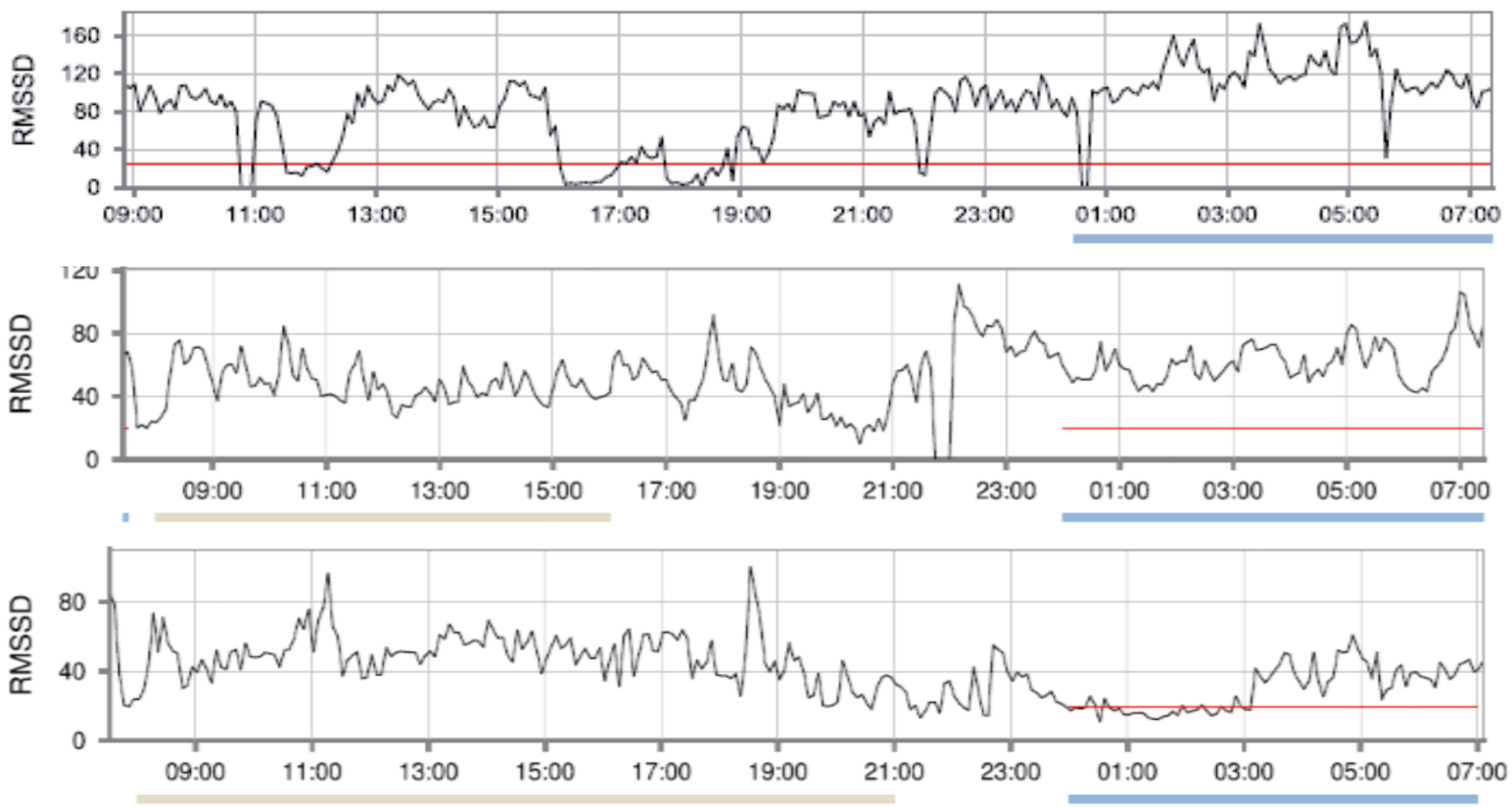
FIRSTBEAT

QUALITY OF RECOVERY: DAY / NIGHT RELATIONSHIP

Day 1:
Average RMSSD
During awake time **69**
During sleep time **118**
Relative difference **1,7 ((Good)**

Day 2: Tue 15.09.2015
Average RMSSD
During awake time **50**
During sleep time **62**
Relative difference **1.2 (Moderate)**

Day 3: Wed 16.09.2015
Average RMSSD
During awake time **45**
During sleep time **30**
Relative difference **0.7 (Poor)**



NOTE: Normally, HRV is greater during sleep than during the day, but for example acute stress (e.g. alcohol, jetlag, illness) and chronic diseases can influence / reverse the ANS regulation.

FIRSTBEAT

SPECIALIST REPORT – QUALITY OF RECOVERY

SLEEP

RESTORATIVE EFFECT OF SLEEP

60 - 100p Good
30 - 59p Moderate
0 - 29p Low

60 / 100

The sleep period was long enough and recovery was good.

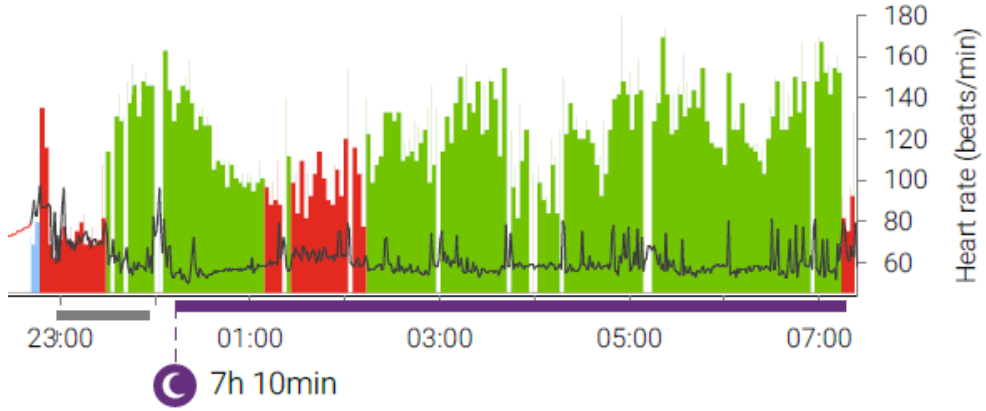
LENGTH OF SLEEP	**7h 10min (Good)**
AMOUNT OF RECOVERY DURING SLEEP	**5h 2min**

< 50% Low | 50 - 74% Moderate | ≥ 75% Good — **70%**

QUALITY OF RECOVERY (Heart rate variability)

0 - 19 ms Low | 20 - 38 ms Moderate | ≥ 39 ms Good — **59 ms**

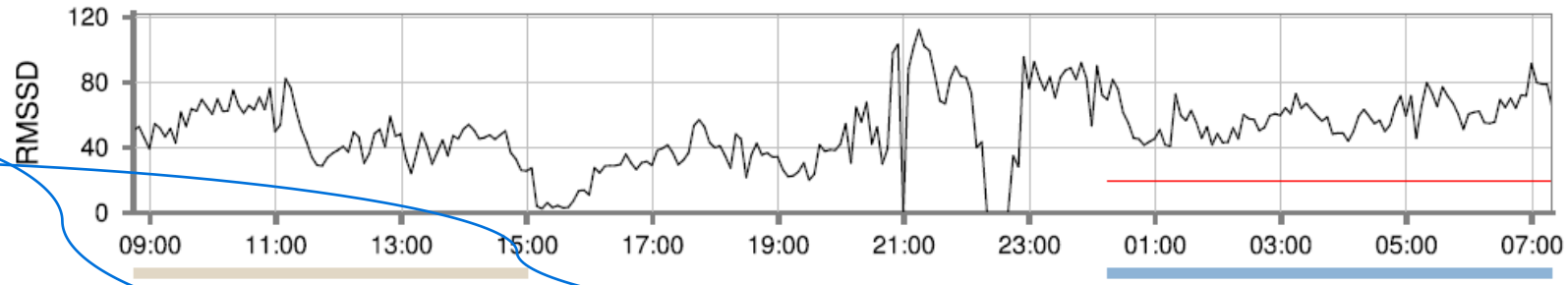
SELF-REPORTED SLEEP QUALITY



Day 1: Mon 14.09.2015

Average RMSSD

During awake time	**49**
During sleep time	**59**
Relative difference	**1.2 (Moderate)**



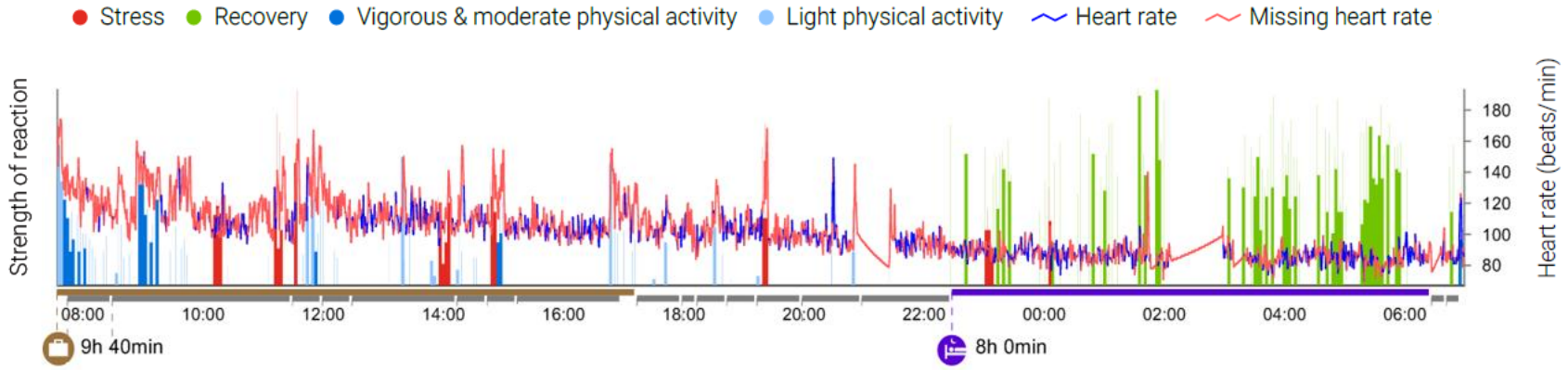
49

59

FIRSTBEAT

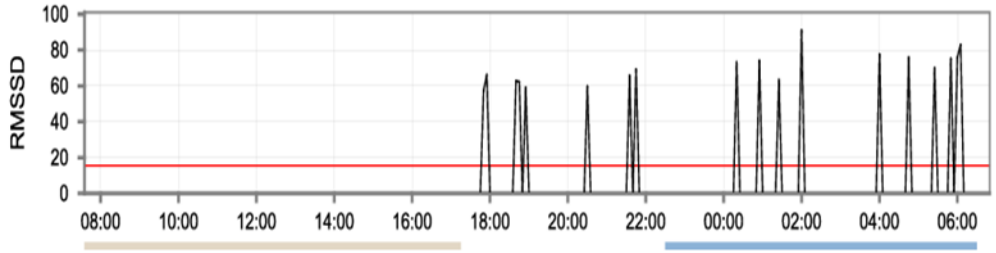
ERROR / ARTEFACT IN DATA QUALITY

Age (yrs)	50	Resting HR (beats/min)	38
Height (cm)	186	Max HR (beats/min)	179
Weight (kg)	88		
Activity class	3.0	Body Mass Index (BMI)	25.4



- The result looked similar on all 3 days
- The device worked normally when tested on a different person
- Stress state: Physical overload
- Some kind of heart-related irregularity
  → *A-FIB*

Quality of recovery (RMSSD) during the measurement period.



FIRSTBEAT

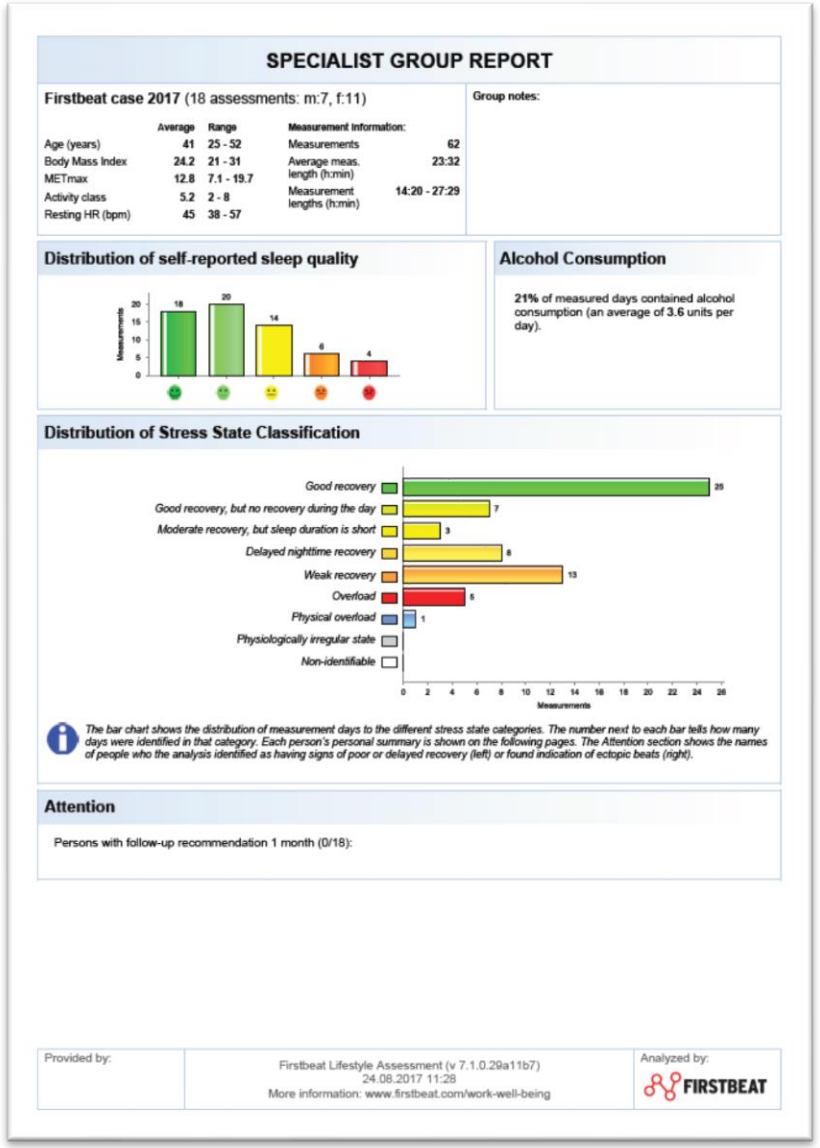
SPECIALIST GROUP REPORT

Group info and notes

Self-reported sleep quality and alcohol use

Stress state distribution at group level

Persons with a weak result (weak recovery, overload, physical overload, irregular)



SPECIALIST GROUP REPORT

Firstbeat case 2017 (18 assessments: m:7, f:11)

	Average	Range
Age (years)	41	25 - 52
Body Mass Index	24.2	21 - 31
METmax	12.8	7.1 - 19.7
Activity class	5.2	2 - 8
Resting HR (bpm)	45	38 - 57

Measurement information:

Measurements	62
Average meas. length (h:min)	23:32
Measurement lengths (h:min)	14:20 - 27:29

Group notes:

Distribution of self-reported sleep quality

Alcohol Consumption

21% of measured days contained alcohol consumption (an average of **3.6** units per day).

Distribution of Stress State Classification

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 bar chart shows the distribution of measurement days to the different stress state categories. The number next to each bar tells how many days were identified in that category. Each person's personal summary is shown on the following pages. The Attention section shows the names of people who the analysis identified as having signs of poor or delayed recovery (left) or found indication of ectopic beats (right).

Attention

Persons with follow-up recommendation 1 month (0/18):

Provided by:

Firstbeat Lifestyle Assessment (v 7.1.0.29a11b7)
24.08.2017 11:28
More information: www.firstbeat.com/work-well-being

Analyzed by: FIRSTBEAT

FIRSTBEAT


FIRSTBEAT
GROUP ASSESSMENTS

FIRSTBEAT

THANK YOU FOR PARTICIPATING!

www.firstbeat.fi

support@firstbeat.fi / www.firstbeat.com/en/support/

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