



Lifestyle Assessment Group Feedback Meeting



Firstbeat Technologies

- ▶ Specialist organization developing heartbeat information –based solutions.
- ▶ Founded in 2002, based in Jyväskylä, Finland.
- ▶ Based on extensive multidisciplinary research in the areas of physiology, mathematical modeling, and behavioral sciences.
- ▶ We offer solutions and technology for
 - ▶ Preventive medicine
 - ▶ Occupational well-being
 - ▶ Elite sports



Firstbeat Technology & Products



Preventive health

- Occupational and general healthcare, service providers in the wellness sector, rehabilitation centers

Consumer products

- Garmin, Suunto, Firstbeat Athlete, FRWD



Professional sports

- Firstbeat SPORTS



Goals of the Assessment

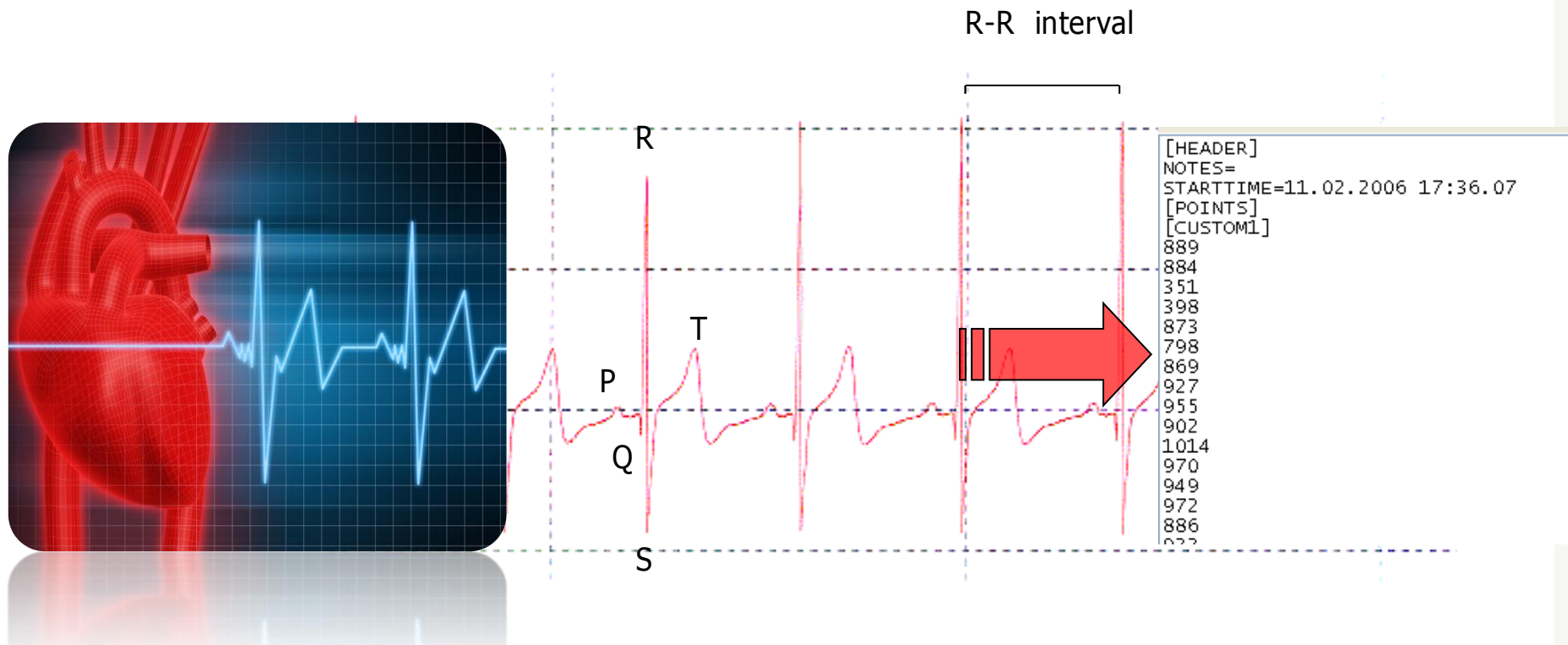
- Support coping at work and personal well-being
 - Improve self-knowledge
 - Demonstrate health-supporting lifestyle factors & encourage a more active lifestyle
 - Reduce the number of sick leave days
- Identify and recognize strengths and development areas → *Set personal goals*



We Measure Each Heartbeat

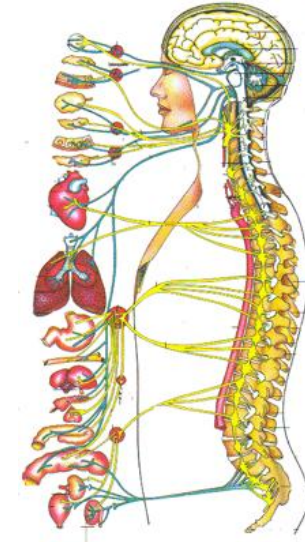
R-R interval = time between consecutive heartbeats (ms)

Heart rate variability (HRV) = beat-to-beat variation in R-R interval



Many Factors Affect the Heartbeat / R-R Interval

- Breathing rhythm, metabolism
- Physical activity, recovery
- Emotions and thoughts
- The effects are shown via the autonomic nervous system
 - Sympathetic nervous system
 - Parasympathetic nervous system



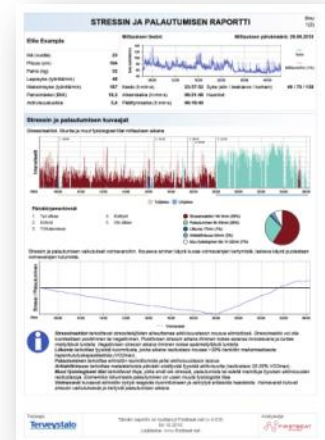
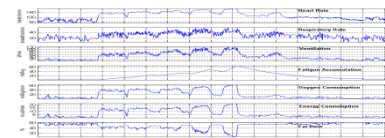
The Firstbeat method interprets the language of the heart, which tells about changes in the body's physiology and various functions.



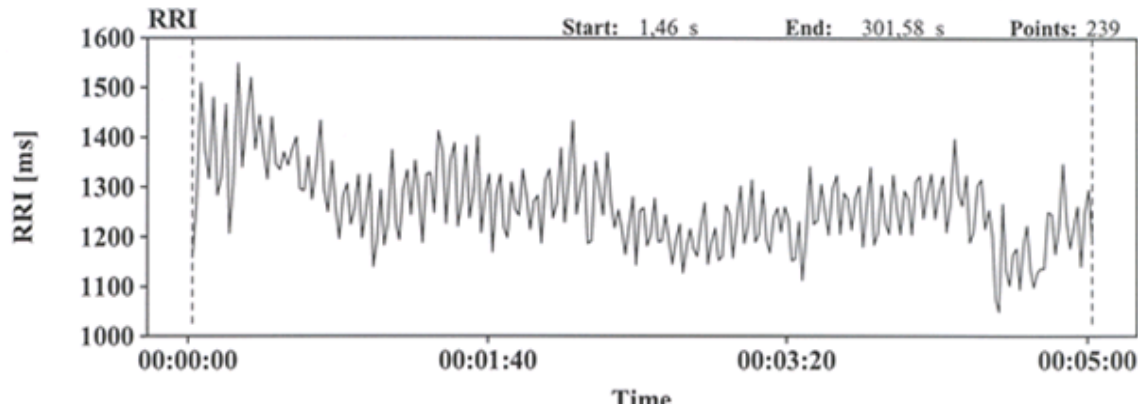
$$\frac{\partial \hat{F}(k, t)}{\partial g(k, t)} = \hat{F}(k, t) \log F(k, t),$$

$$\frac{\partial E}{\partial w_{ij}} = \frac{1}{T} \sum_{t=1}^T \frac{\partial E(t)}{\partial w_{ij}},$$

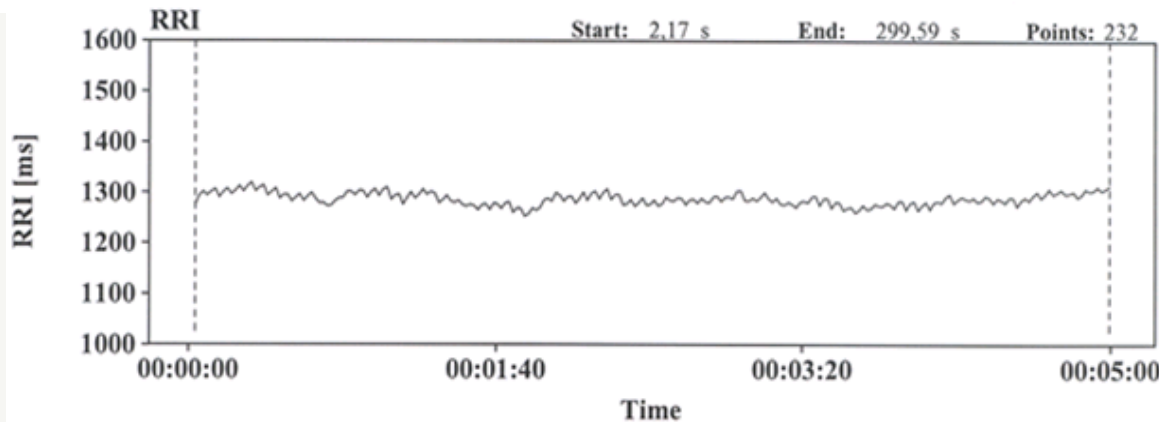
$$\delta_j = r(g_j(x) - e) \frac{w_j - y(x) + b}{\sum_{k=1}^K g_k(x)}.$$



Heart Rate Variability Tells More Than Heart Rate

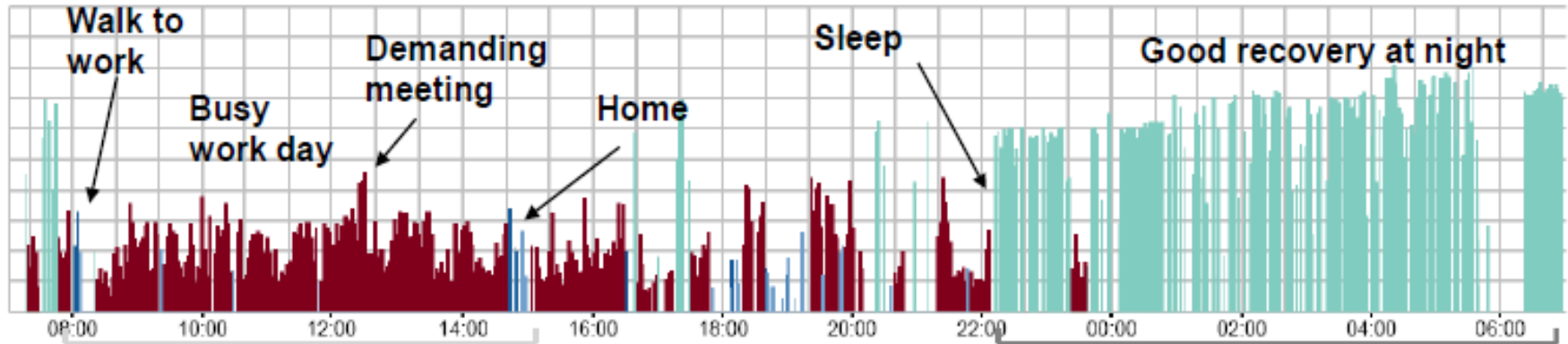


- Avg. HR 48
- Avg. HRV 80 ms
- HRV is great, indicating good recovery and health



- Avg. HR 47
- Avg. HRV 12 ms
- HRV dramatically reduced; not a healthy situation

The Program Interprets the Body's Reactions

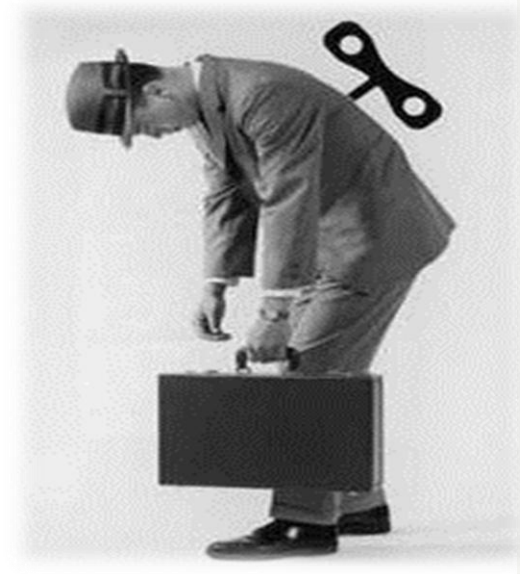


Stress reactions	11h 41min	(51%)
Recovery	6h 56min	(30%)
Physical activity	1h 24min	(6%)
Light physical activity	5 min	(0%)
Other physiological states	2h 45min	(12%)

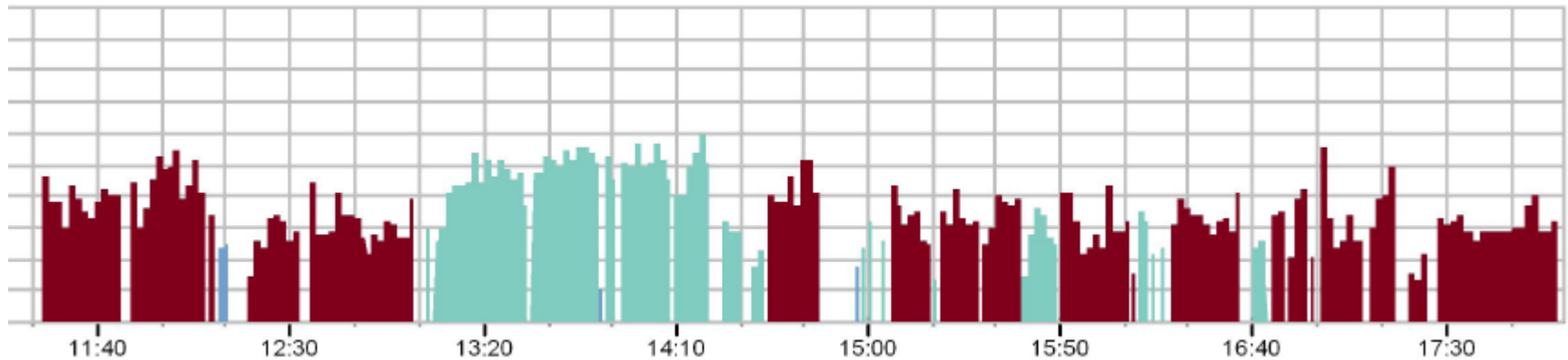
- Does work overload you?
- Is your stress and recovery in balance?
- Are you physically active enough?
- A comprehensive look at your daily life!

What Is Stress?

- Stress is a physical, psychological and social phenomenon.
 - **Natural part of life**
 - **With stress, the body is able to respond to the demands of the environment.**
- A stress reaction originates from internal or external stress factors.
- In the short term, stress is useful, making us function more effectively.
- Long-lasting stress overloads the body.
 - **Wears out the body's resources.**
 - **Can lead to exhaustion / physical illnesses.**



Definition of Stress and Recovery



Stress

An elevated activity level in the body caused by external or internal factors (excluding immediate physical demands).

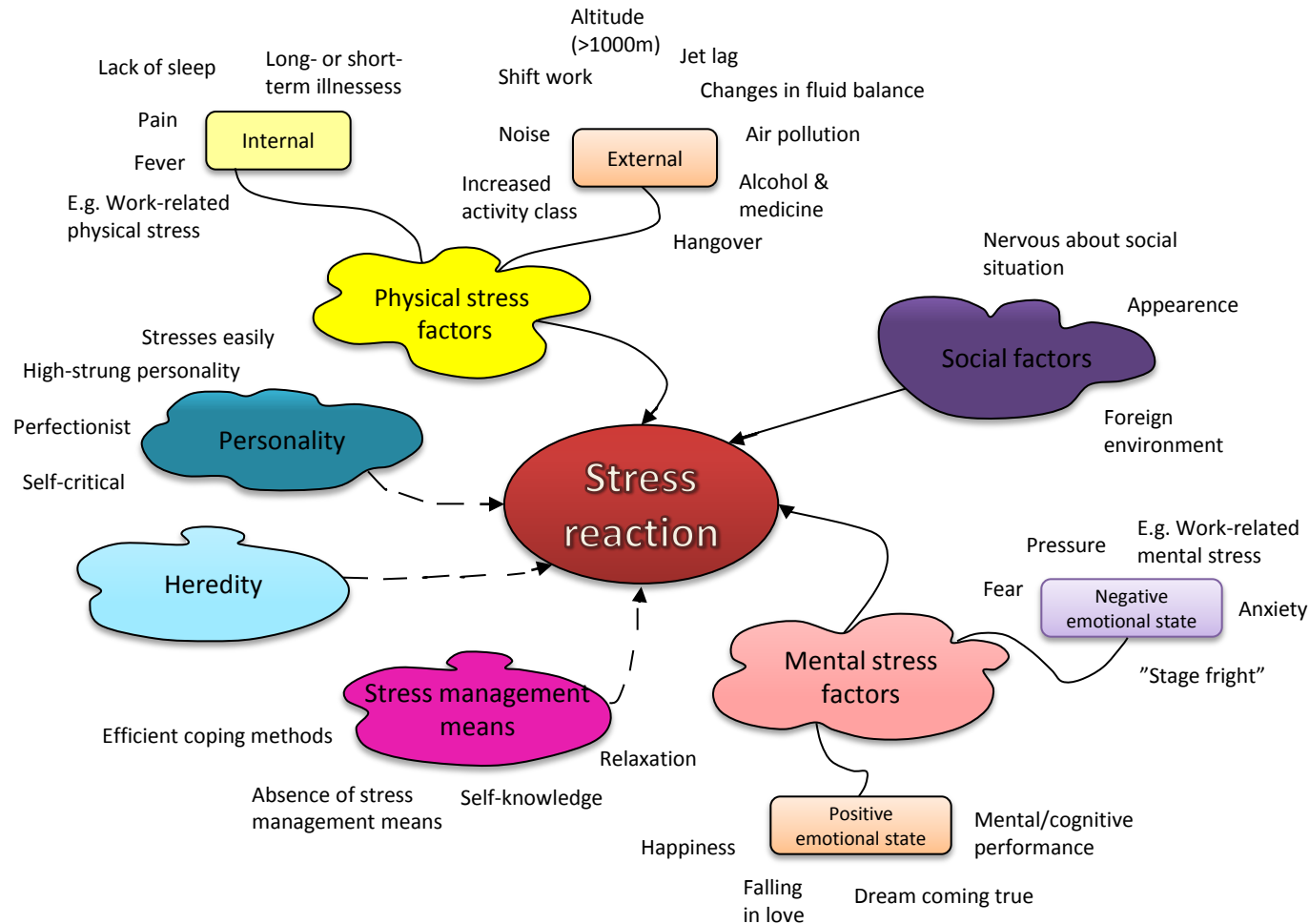
High heart rate and low HRV.

Recovery

A lowered activity level in the body caused by reduction of external or internal stress factors.

Low heart rate and high HRV.

Factors That Can Cause Stress



Take Into Account When Interpreting the Reports

- Make sure your background information is correct
- Acute and beginning illnesses (fever, flu, pain)
- Medication can affect the result
 - **E.g. Blood pressure medicine Beta-blockers**
- Alcohol weakens your recovery significantly!
- Results are very individual
 - **Effect of age, physical condition and heredity**
 - **The idea is not to compare reports and see "who has the best result" but to focus on one's own pluses and minuses!**

Interpretation of Reports:

Personal and Measurement-Related Information

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Practice 1 Nurse

Age (yrs)	54	Resting HR (beats/min)	41
Height (cm)	153	Max HR (beats/min)	175
Weight (kg)	66	Body Mass Index (BMI)	28.2
Activity class	3.0		

Measurement information:

Day 1

Start time:
06.03.2011 06:10:55
Duration: 22h 34min
HR: (low/avg/high)
49 / 75 / 142

Day 2

Start time:
07.03.2011 04:45:00
Duration: 22h 15min
HR: (low/avg/high)
43 / 57 / 108

Day 3

Start time:
08.03.2011 03:00:59
Duration: 25h 15min
HR: (low/avg/high)
41 / 68 / 141

Background information
based on which analysis
is made.

Measurement-specific
information (by day)

Page 2(2)

Additional information:

Day 1

Alcohol: 4 units
Self-reported sleep:
Medication
Burana



Day 2

Alcohol: 0 units
Self-reported sleep:
Medication



Day 3

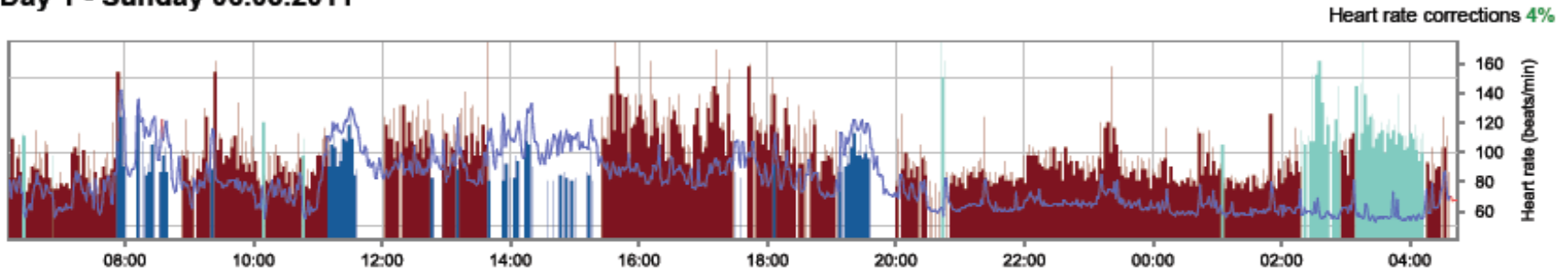
Alcohol: 0 units
Self-reported sleep:
Medication



Stress and Recovery Overview

Stress and Recovery Charts

Day 1 - Sunday 06.03.2011



Journal Markers

How quickly does recovery begin after going to sleep?

Result

- 14h 40min (65%)
- 1h 30min (7%)
- 1h 32min (7%)
- 4h 52min (22%)

Recommendation

Less than 55%
More than 30%

Is there any recovery during the workday or during leisure time?

Note! The height of the bars indicates the strength of the reaction.

”Other physiological state” (white color) = recovery from physical activity or measurement error / break or a state that cannot be identified as stress or recovery or physical activity.

Is There Recovery ...?



Journal Markers

1. Teaching
2. Lunch
3. Teaching
4. Baking
5. Massage
6. Housework

Weekends?
Longer holidays?

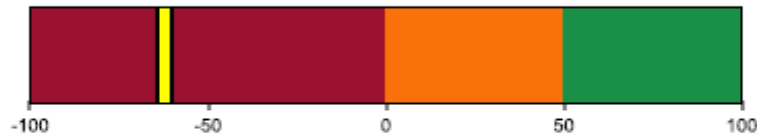
Stress is not only a negative phenomenon; it belongs to life and in the short term, makes us perform better.

In contrast, we should also have time periods when we have a chance to recover!

Overview of Sleep

Day 1 - Sunday 06.03.2011

The balance of resources during sleep.

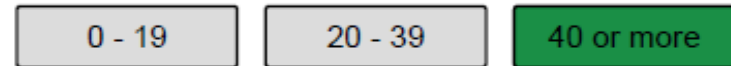


The resource index for the measurement is **-62**.

The index is calculated based on the duration of stress and recovery reactions.

Your sleep time was **8h 0min**. It is recommended to sleep 7 hrs or more per night.

Quality of recovery during sleep.

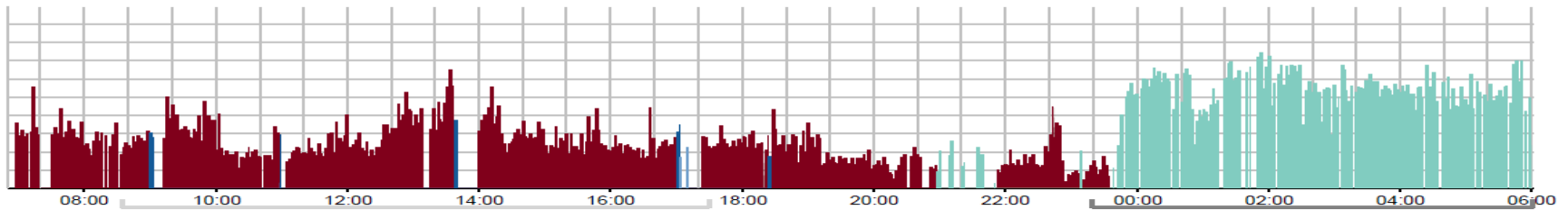


Your sleep quality index based on heart rate variability (RMSSD) is **49 ms**. The average value for your age is 27 ms.

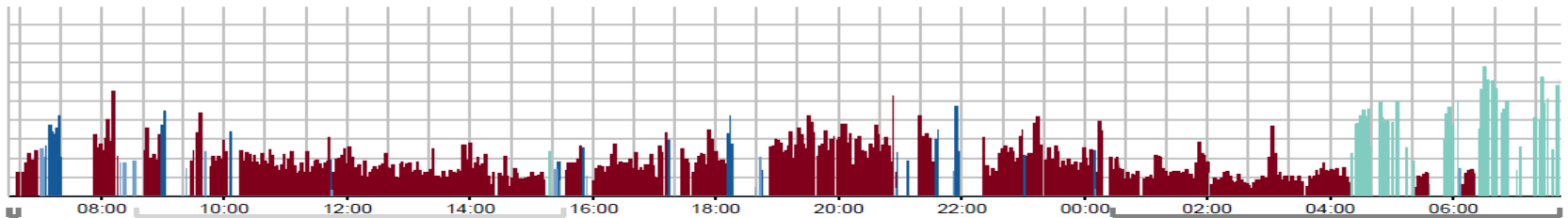
The resource index is negative (red) if there is less recovery during sleep than there is stress. The green area can be reached if >75% of sleep time is recovery.

If the result during sleep time is below 20, you should evaluate your health situation and overall load and pay attention to sufficient recovery. Note! Normal RMSSD value decreases with age.

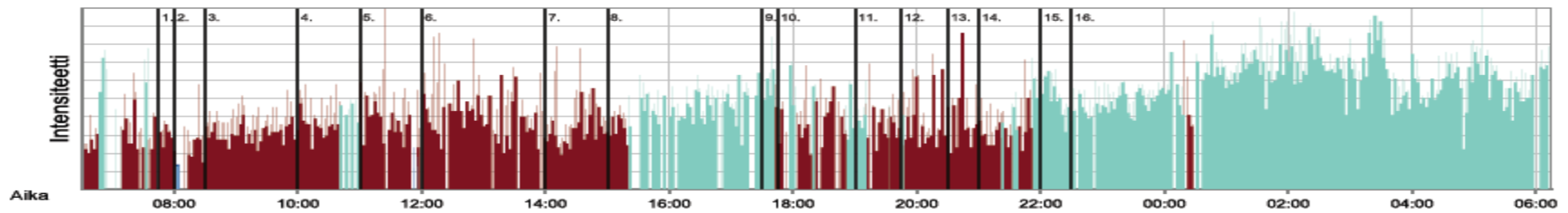
Stress and Recovery Charts



A busy day shows up mostly as stress, but recovery begins quickly after going to sleep. A few moments of recovery during the evening. "Normal day".

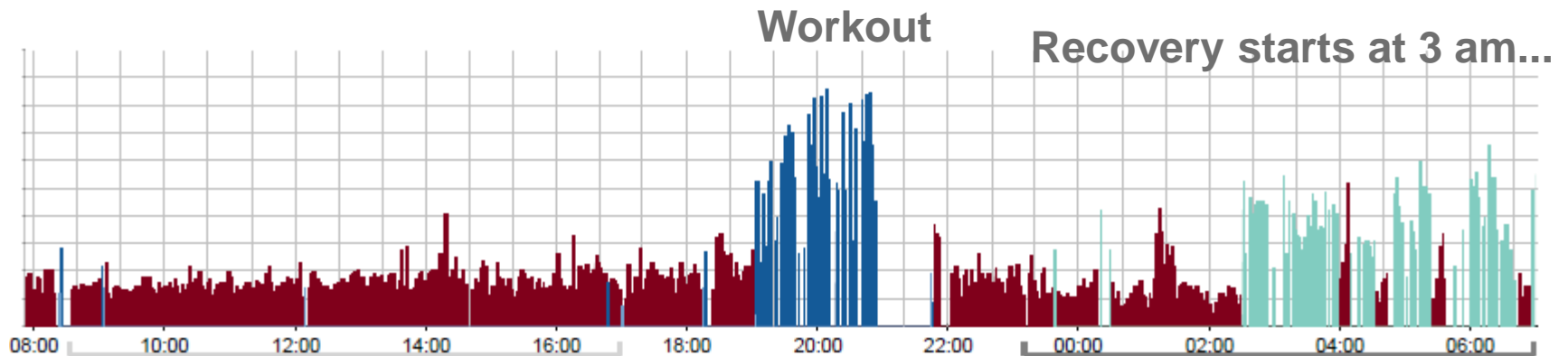
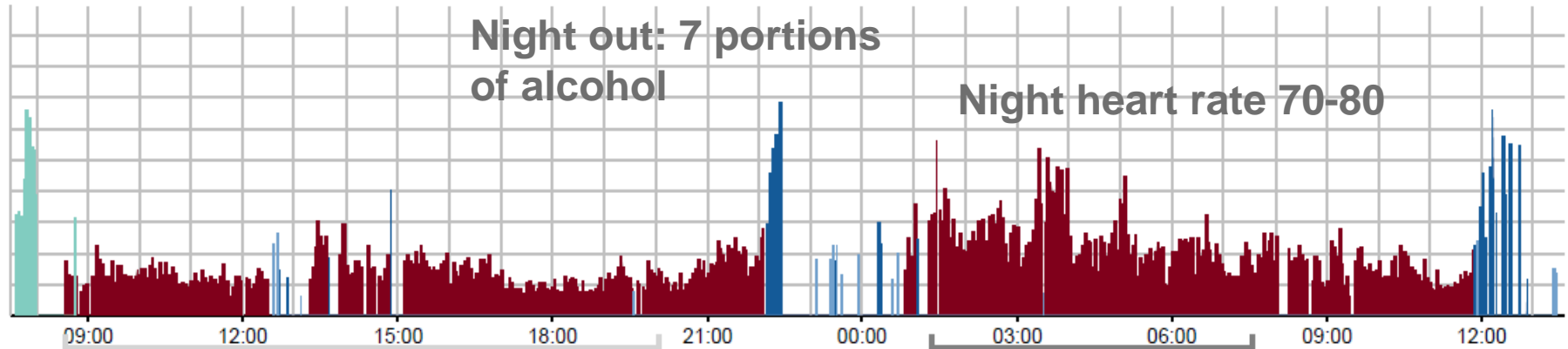


A steadily loaded work day+work continuing in the evening (calls, e-mails) → the body stays wired, heart rate is elevated and sleep quality is not optimal.

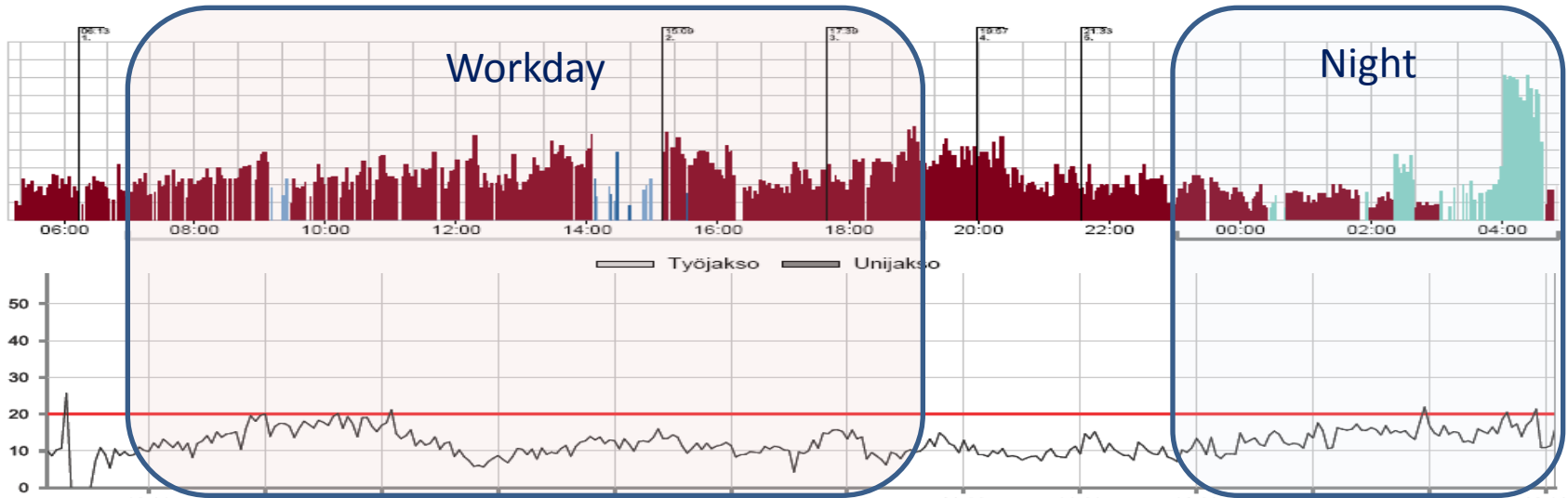


We are different as individuals. Some people can "recover" during peaceful work periods, whereas others need an actual rest period for that. The focus of recovery is on sleep time.

Effect of Alcohol & Exercise on Recovery



Overloaded CEO



The person was taken to the hospital a couple of weeks after the measurement due to heart irregularities.

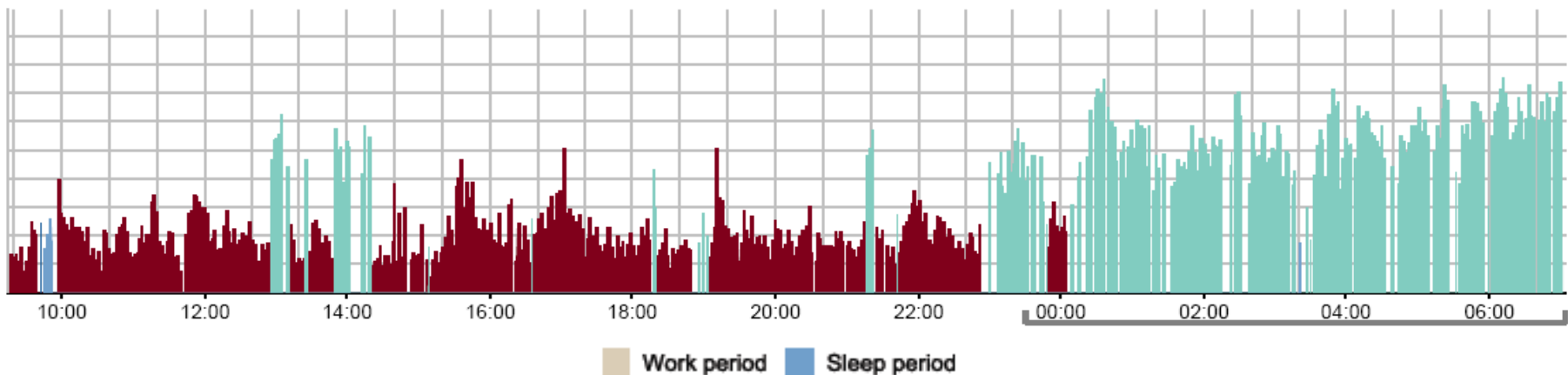
In the background: prolonged stress, overload and poor recovery.

A Day-Off Does Not Need To Be All Recovery

Even if the weekend and leisure time is relaxing and filled with enjoyable activities, it does not need to show up as only recovery (green) in the reports.

"Positive stress reactions" (e.g. enjoyable hobbies / activities) are often followed by good-quality recovery during sleep.

Stress and Recovery Charts



TOP 5

Ruiners of Recovery

Poor physical
condition

Intensive late
night physical
activity / heavy
meal

Constant
hurry and
stress

Alcohol

Chronic /
acute
illnesses



TOP 5

Promoters of Recovery

Exercise and
music

Joga /
Pilates

Relaxation

Making
love

Healthy
lifestyle

Good health
and physical
fitness

Reading / TV

"Own
time"

Support from
friends /
family / work

Possibility to
affect one's
timetables



How Can You Promote Recovery During Work?

- Make sure you take a few unrushed breaks during the day.
- Keep your schedule realistic and leave some space for unplanned delays.
- A short stretching break or a walk refreshes your mind & body.
- Hydration / drinking enough helps maintain your energy level.
- Hold on to your leisure time → set a "no later than" time for leaving work & limit doing work tasks from home when you are on your leisure time.
- Manage your workload: after especially busy & demanding periods, schedule in some lighter days and sufficient recovery.

Replenishment During Leisure Time

- Engage in activities that you enjoy.
- Family and friends can help you cope with challenges.
- Learn to say NO!
- Physical activity energizes your body and your mind.
- A fit body recovers faster and more effectively.
- Relaxation exercises, short naps and listening to music can promote recovery.
- During especially busy periods it is recommended to reduce other stress factors. Don't try to do too much!

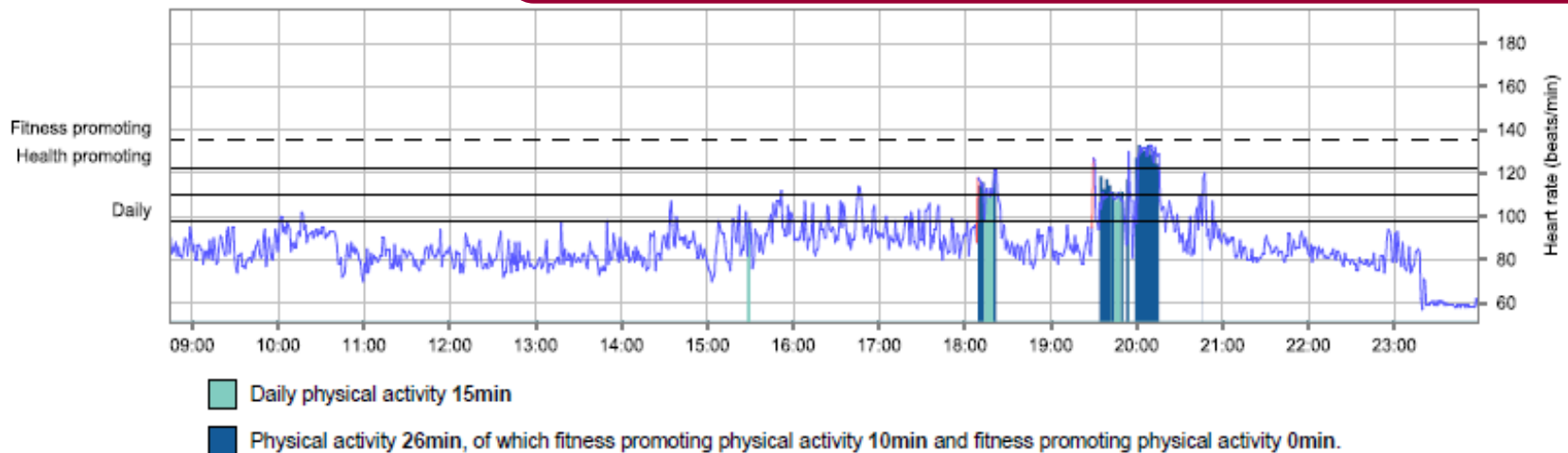
Tips for Better Recovery During Sleep

- Avoid high-intensity exercise late at night.
- Slow down (activities, thoughts) before going to sleep.
- Try to go to bed early enough to allow sufficient sleep (7-9h).
- When the overall load is heavy, with a lot of stressors, the need for recovery & sleep also increases.
- Engage in activities that you find relaxing, e.g. music / reading / joga / making love.
- Be aware of the negative effect of alcohol on sleep quality.
- Avoid heavy meals just before bedtime.

Health-Promoting Physical Activity Summary

Note! The analysis does not take into account the effect of strength and flexibility training on health / fitness!

Day 1 - Sunday 12.02.2012

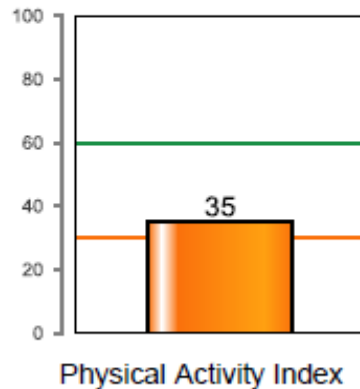


- Does your daily activity increase your heart rate sufficiently?
- Is your physical activity intensive enough to promote health and/or fitness?
- "Real exercise" vs. "exercise" caused by poor fitness or being too busy?

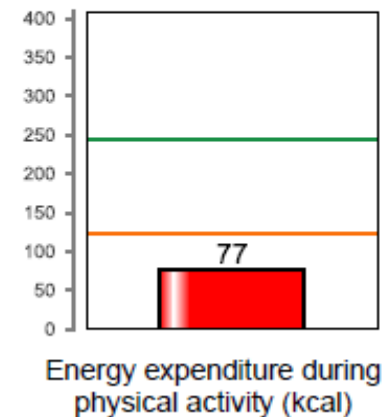
Health-Promoting Physical Activity Summary

Health Effects and Energy Expenditure

Day 1 - Sunday 12.02.2012



GOOD
MODERATE
POOR



Physical Activity Index

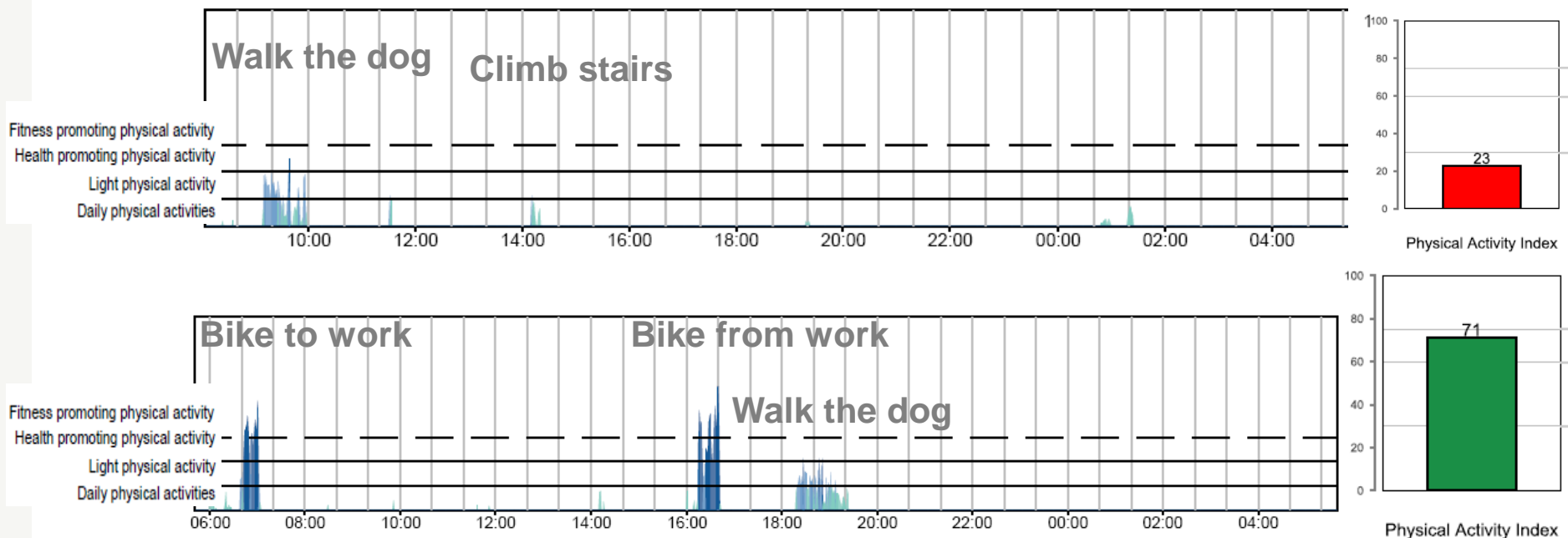
In order to achieve a GOOD score, you should perform approximately 30 mins of health promoting (moderate intensity) physical activity. Physical activity performed at light to moderate intensity or < 30 mins will result in a MODERATE to POOR score.



Energy expenditure during physical activity

The energy expenditure value indicates the consumed energy (kcal) during physical activity above basal energy expenditure. The recommended levels shown in the figure are determined based on body weight.

More Health Benefits With Small Changes



How To Get More Health Benefits Out Of Exercise?

- To get good health benefits, 30 mins of moderate intensity physical activity is sufficient.
- Easy walking in flat terrain might not be sufficient to improve the fitness of healthy adults who are in reasonably good shape.
 - **Look for some hills**
 - **Take your ski poles → Nordic walking**
 - **Increase your pace / alternate with light jogging / running**
- Good fitness and health are a result of many-sided activity: endurance-type exercise, strength, stretching ... together with good nutrition and rest!
- Endurance-type exercise is the most important for the health of your cardiovascular system!
- **FIND THE KIND OF EXERCISE / ACTIVITY THAT YOU ENJOY!**

Looking at the whole picture: Lifestyle Assessment

Work

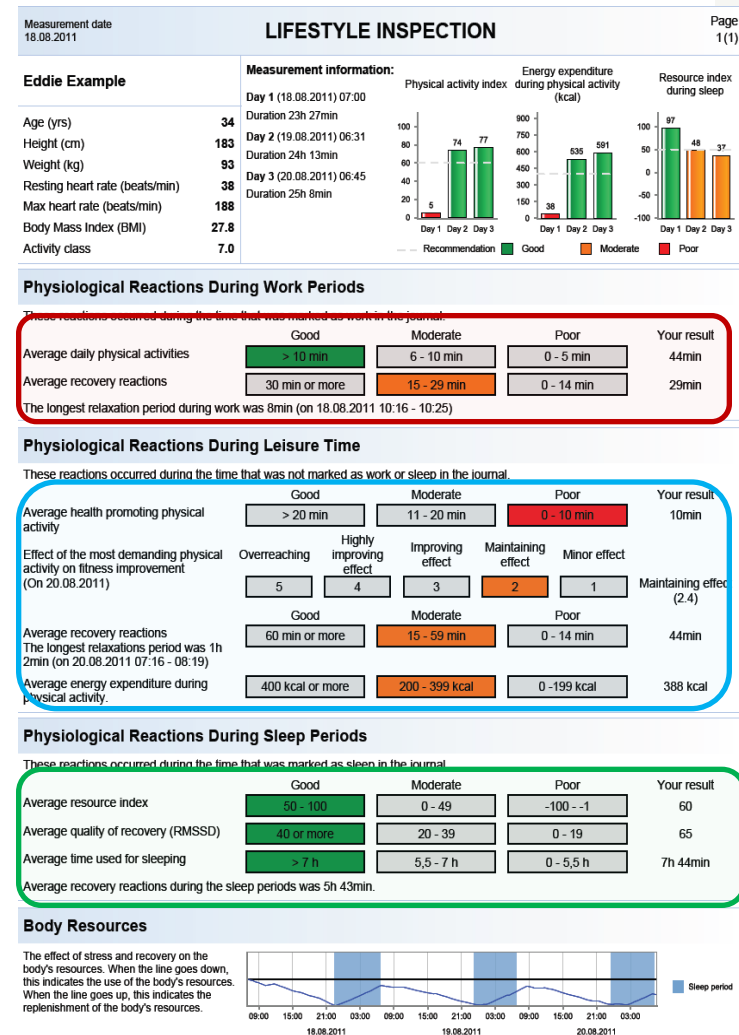
- Is there some light activity during the work day?
- What is the physical workload?
- Is there any recovery during the workday?

Leisure time

- Is there enough exercise to get health benefits?
- Is the exercise intensive enough to improve fitness?
- Is there any recovery during leisure time?

Sleep

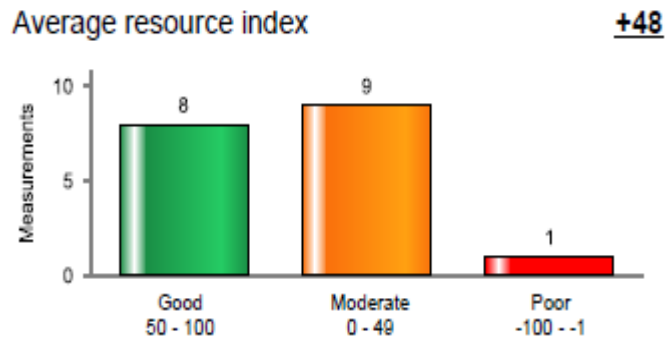
- Is there enough recovery during sleep?
- Is the quality of sleep good?
- Was the sleep period long enough?



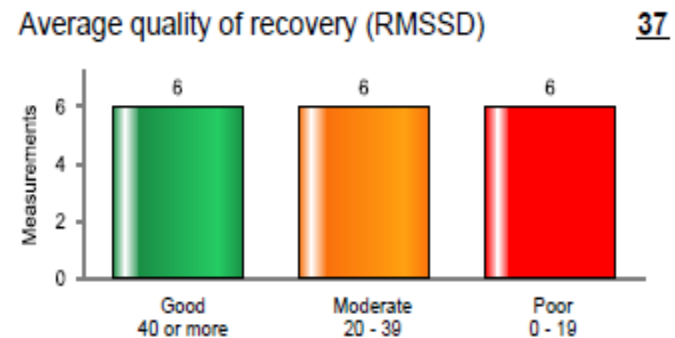
Group Summary (total x measurements)

- **Stress: 54% → Recommendation < 55%**
- **Recovery: 24% → Recommendation > 30%**
- **Resource balance: +47 → Recommendation > 50 (> 75% of sleep time is recovery)**

RESOURCE INDEX

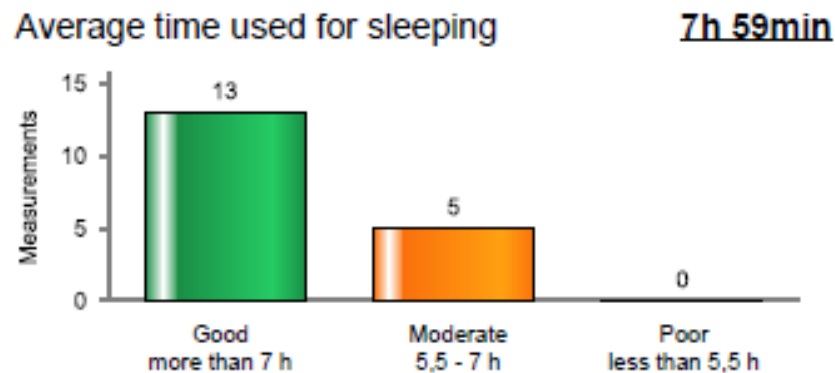


QUALITY OF RECOVERY



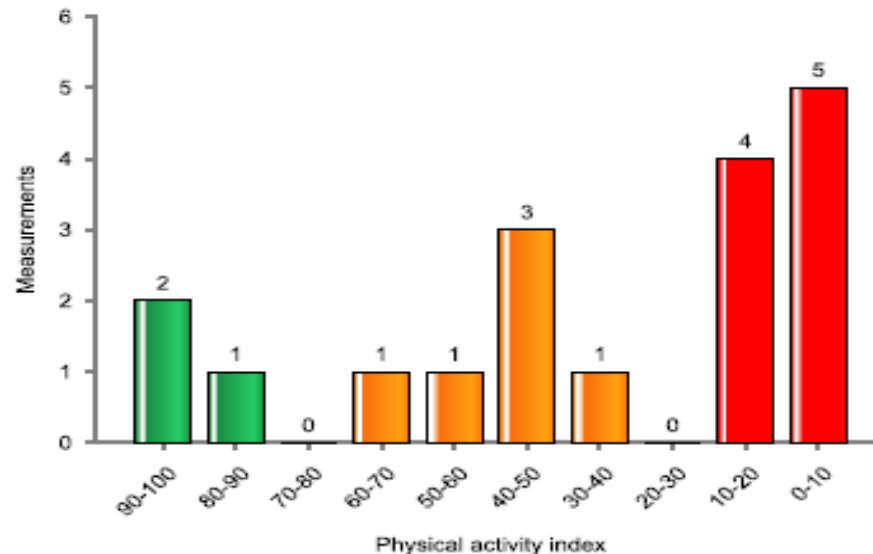
Stress Management...

- Amount of recovery is a bit low (24%) → Most nights show pretty good recovery, but there are quite a few days where the share of recovery is low, also during sleep! A lot of individual variation.
- Share of stress is normal – but there's a lot of individual variation here as well!
- Duration of sleep is good (and an important part of the whole)! 😊



Physical Activity / Exercise

Average health promoting physical activity 15min/day
Average physical activity index 36

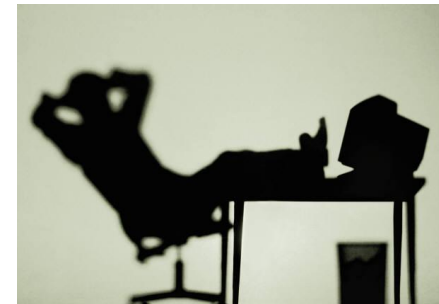


Good points (= the green bars / >60p.) are achieved with 30 mins of health-promoting physical activity!

Group Conclusions

Example

- **Physical activity → Some room for improvement...**
 - **Increase the number of daily physical activity minutes**
 - **Good fitness enhances your ability to recover and protects from stress!!**
 - **Variety, appropriate amount, enjoyable activities**
- **Recovery → Good sleep and sufficient recovery is important for all of us...**
 - **Recovery during sleep is the most important focus!**
 - **Days-off and leisure time: make sure it's not all "stress"**
- **Managing the "load"**
 - **Recognize excessive stress and overload**
 - **Balance between load and recovery**
 - **Learn to "let go" every once in a while!**



Target Your Focus & Action Points

- Pay special attention to stress management if:
 - You feel stressed, tired or lethargic frequently.
 - The amount of recovery was <30% on most days.
 - Resource index was <50 on most nights.
 - Your sleep quality index was <20.
- Increase the amount or intensity of exercise if:
 - Your activity class is <5.
 - Daily physical activity minutes are <20min on most days of the week.
 - Physical activity index was below 61p on the measurement days.
 - You feel yourself that the amount of physical activity is not sufficient to maintain health or improve your fitness level.
- Try to lose some weight if:
 - Your BMI is >26.
 - If your weight has been gradually increasing.

Setting a Goal

Work

- ☐ I will take regular breaks and won't deal with work tasks during the breaks.
- ☐ I will remember to drink and eat regularly and healthily, even when I'm busy.
- ☐ I will set a realistic work schedule / won't promise to do things that I don't have time to do.
- ☐ I will draw attention to ergonomics: e.g. correct posture and the possibility to use assistive devices.
- ☐ I will value my leisure time / set a "no-later-than" time for leaving work.

Leisure time

- ☐ I will engage in recovery activities that I feel work best for me (e.g. relaxation techniques, watching TV, reading).
- ☐ I will remember to spend time with people who are close to me, even when I'm busy.
- ☐ I will reduce my alcohol consumption.
- ☐ I won't pile up too much activity for leisure time, but will also leave room for recovery.
- ☐ I will lose weight by ____ kg/month OR ____ kg by ____ 20 ____.
- ☐ I will attempt to engage in physical activity/exercise at least ____ times per week.
- ☐ I will continue to engage in my hobbies because positive experiences enhance my well-being.
- ☐ I will draw special attention to recovery activities on weekends and holidays.
- ☐ I will learn to say "No".
- ☐ I will increase my amount of daily activity, e.g. by taking the stairs instead of the lift, and walking/biking whenever possible.
- ☐ I will maintain a regular meal rhythm (2-3 meals + 1-3 snacks per day).
- ☐ I will pay attention to the quality of what I eat; e.g. avoid products that contain excessive fats, sugar or salt.
- ☐ I will stop smoking / chewing tobacco.

Night and sleeping

- ☐ I will avoid high-intensity exercise late at night.
- ☐ I will avoid heavy meals just before bedtime.
- ☐ I won't think about or do stressful tasks just before bedtime (e.g. work / e-mail).
- ☐ I will attempt to go to bed early enough to get enough sleep (app. 7-8 hrs).
- ☐ I will engage in activities that I find relaxing and help me to fall asleep (reading, listening to music, making love, gentle stretching, etc.)

How To Succeed

- **Make a decision!**
- **Set a goal.**
 - **Realistic**
 - **Concrete**
 - **A schedule for reaching your goal**
- **Monitor your progress.**
- **Don't give up if you sometimes take a few steps "backwards"...**
- **START NOW!**

Personal feedback

- **Via phone or in a personal discussion – opportunity to discuss your own questions and goals in more detail!**
- **Reserve a time from the list or e-mail the specialist to agree on a time!**
- **Setting a goal: Examples in the back of your report booklet: what can I improve or change?**