

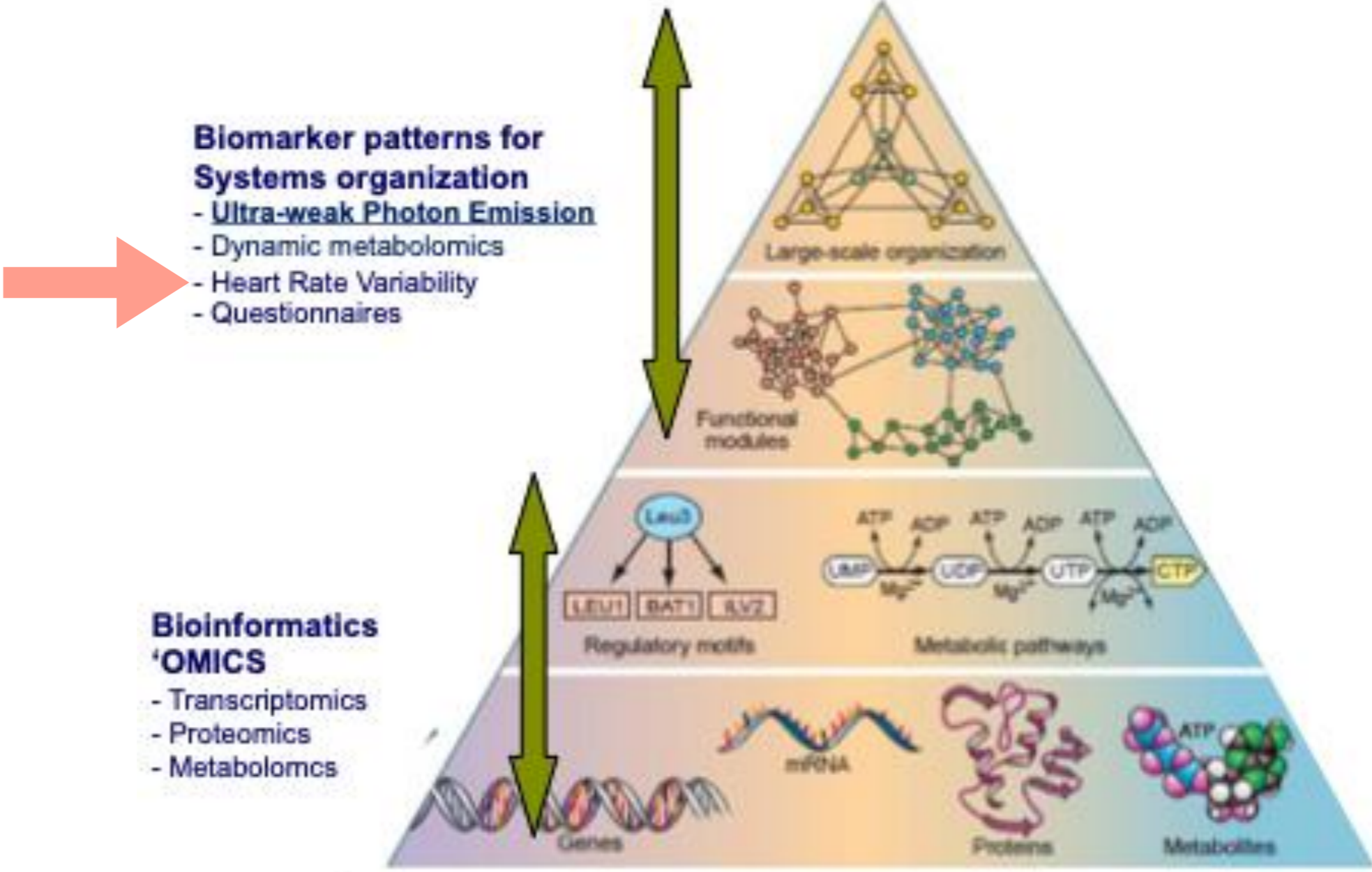
Low HRV during sleep can be a sign of weak vagal function. What can you do to improve it?

A deeper look at HRV and vagal function and strategies to improve it



HRV is part of understanding Systems Organization

System diagnosis is key for understanding health



Adapted from: Oltvai et al Science 298 (2002) 763

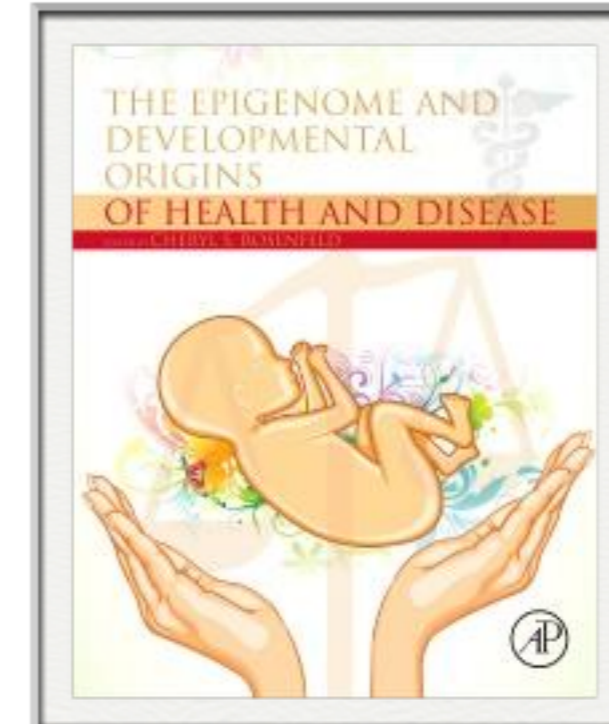
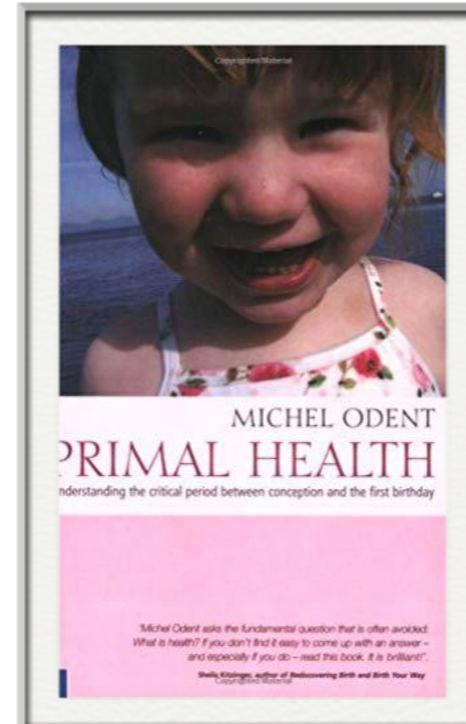
RMSSD-night is an important marker of
Vagal Tone

"HR fluctuations in respiration, high frequency (e.g. HF, RMSSD) is linked to parasympathetic activity and there is a strong scientific consensus about that."

–Tero Myllymäki, Physiology Research Manager at Firstbeat Technologies Ltd–

Scientific evidence: growing number of factors creating a lifelong biochemical disruption in humans

“Our health is to a great extent shaped during the ‘primal period’, which includes fetal life, the period surrounding birth and the year following birth” - Dr. Michel Odent



GUT-BRAIN health and Vagal Tone

[Front.Neurosci.](#) 2018; 12: 49.
Published online 2018 Feb 7. doi: [10.3389/fnins.2018.00049](#)

PMCID: PMC5808284
PMID: [29467611](#)

The Vagus Nerve at the Interface of the Microbiota-Gut-Brain Axis

[Bruno Bonaz](#),^{1,2,*} [Thomas Bazin](#),^{3,4} and [Sonia Pellissier](#)⁵

[Front.Psychiatry.](#) 2018; 9: 44.
Published online 2018 Mar 13. doi: [10.3389/fpsy.2018.00044](#)

PMCID: PMC5859128
PMID: [29593576](#)

Vagus Nerve as Modulator of the Brain–Gut Axis in Psychiatric and Inflammatory Disorders

[Sigrid Breit](#),^{1,†} [Aleksandra Kupferberg](#),^{1,†} [Gerhard Rogler](#),² and [Gregor Hasler](#)^{1,*}

Your Gut Has a
Mind of Its Own

The Second Brain

A Groundbreaking New Understanding
of Nervous Disorders of the
Stomach and Intestine

"Persuasive, impassioned . . . hopeful news [for those]
suffering from functional bowel disease."

— *New York Times Book Review*

Michael D. Gershon, M.D.

Stress inhibits the Vagal Tone

Alcohol consumption is a well documented stress factor which inhibits the Average RMSSD during night

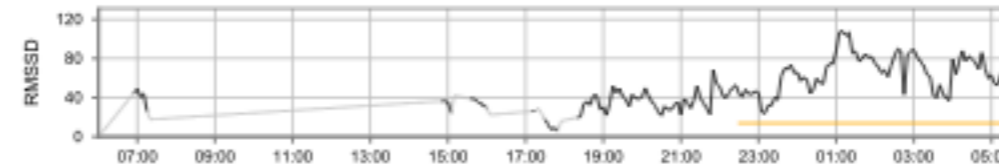
	Alcohol	Medication
Day 1: Fri 16.02.2018	-	-
Day 2: Sat 17.02.2018	-	-
Day 3: Sun 18.02.2018	6 units	-

HEART RATE VARIABILITY

Heart rate variability (RMSSD) during the measurement period.

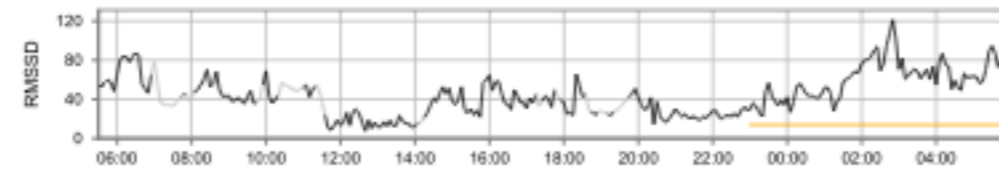
Day 1: Fri 16.02.2018

Average RMSSD
 During awake time 35
 During sleep time 66
 Relative difference 1.9 (Good)



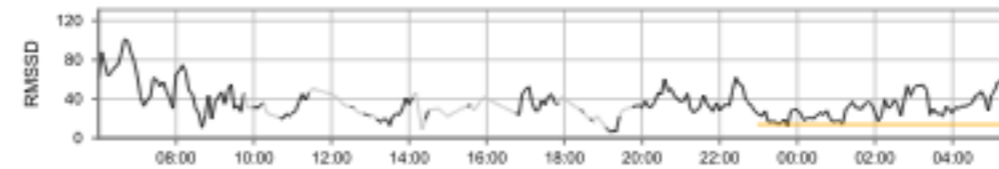
Day 2: Sat 17.02.2018

Average RMSSD
 During awake time 37
 During sleep time 61
 Relative difference 1.6 (Good)



Day 3: Sun 18.02.2018

Average RMSSD
 During awake time 39
 During sleep time 31
 Relative difference 0.8 (Poor)



— Data used in analysis — Work period — Sleep period — Preferred minimum during sleep

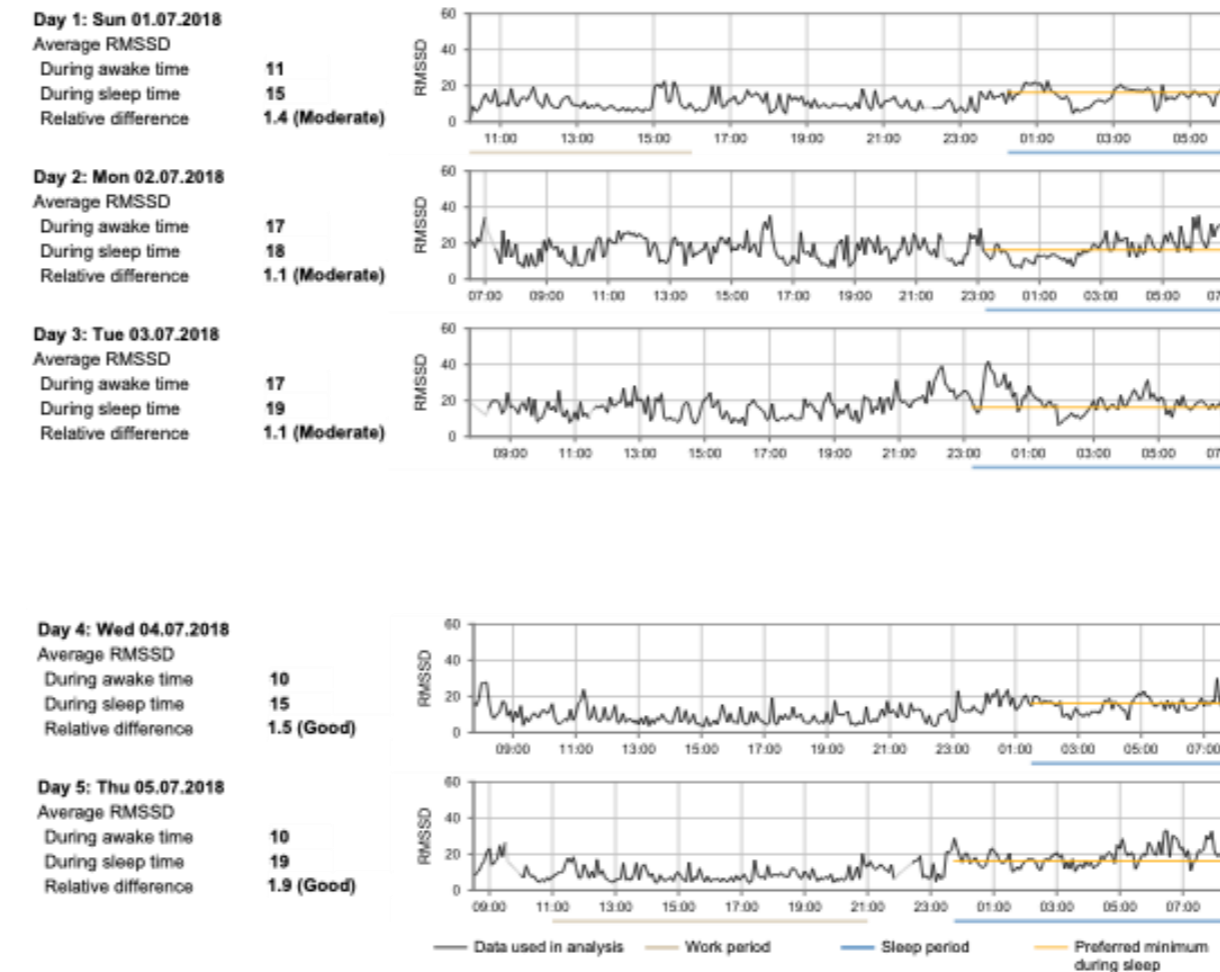
i RMSSD is a measure of heart rate variability indicating the quality of recovery. Low values of RMSSD during sleep can indicate poor recovery. Higher values can indicate enhanced recovery. The average RMSSD value should be 14 or greater during sleep (the value is determined based age).

The Vagal Tone is correlated with capacity to regulate stress responses

A structural low Average RMSSD during night can be a sign of a serious problem in the capacity of stress regulation and adaptability, it might need a biochemical reset as well as lifestyle adjustments to restore health and vitality.

HEART RATE VARIABILITY

Heart rate variability (RMSSD) during the measurement period.



i RMSSD is a measure of heart rate variability indicating the quality of recovery. Low values of RMSSD during sleep can indicate poor recovery. Higher values can indicate enhanced recovery. The average RMSSD value should be 16 or greater during sleep (the value is determined based age).

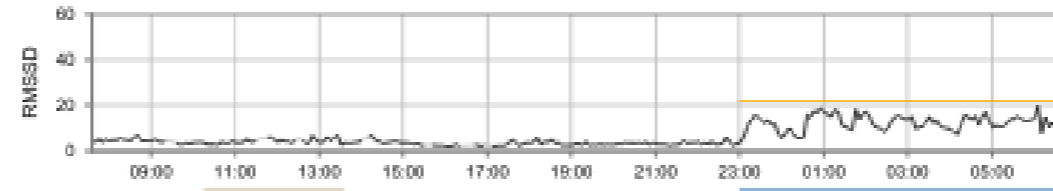
Casus: Male (born 1982) serious Burnout

HEART RATE VARIABILITY

Heart rate variability (RMSSD) during the measurement period.

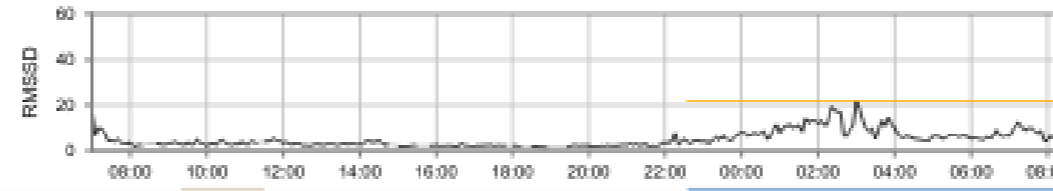
Day 1: Wed 24.05.2017

Average RMSSD
 During awake time **4**
 During sleep time **12**
 Relative difference **3.0 (Good)**



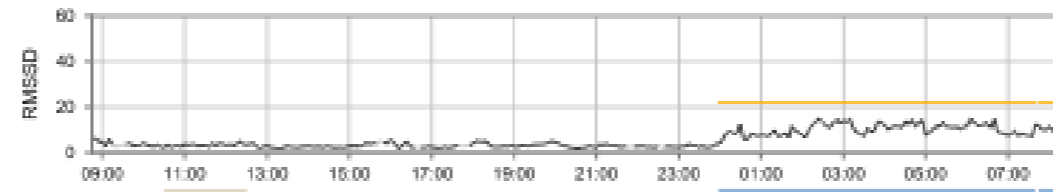
Day 2: Thu 25.05.2017

Average RMSSD
 During awake time **3**
 During sleep time **8**
 Relative difference **2.7 (Good)**



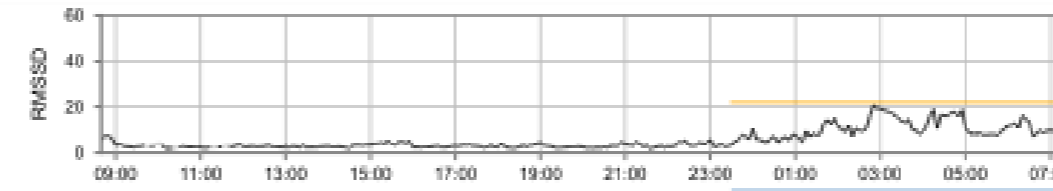
Day 3: Fri 26.05.2017

Average RMSSD
 During awake time **3**
 During sleep time **10**
 Relative difference **3.3 (Good)**



Day 4: Sat 27.05.2017

Average RMSSD
 During awake time **3**
 During sleep time **11**
 Relative difference **3.7 (Good)**

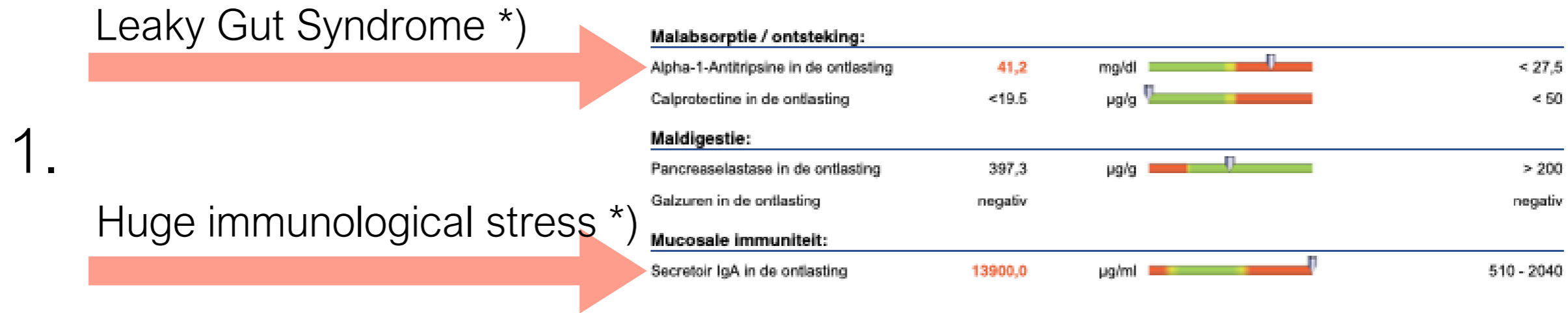


— Data used in analysis — Work period — Sleep period — Preferred minimum during sleep

i *RMSSD is a measure of heart rate variability indicating the quality of recovery. Low values of RMSSD during sleep can indicate poor recovery. Higher values can indicate enhanced recovery. The average RMSSD value should be 22 or greater during sleep (the value is determined based age).*

Before physiological intervention

Components of Systems Diagnosis



*) Related to gluten sensitivity

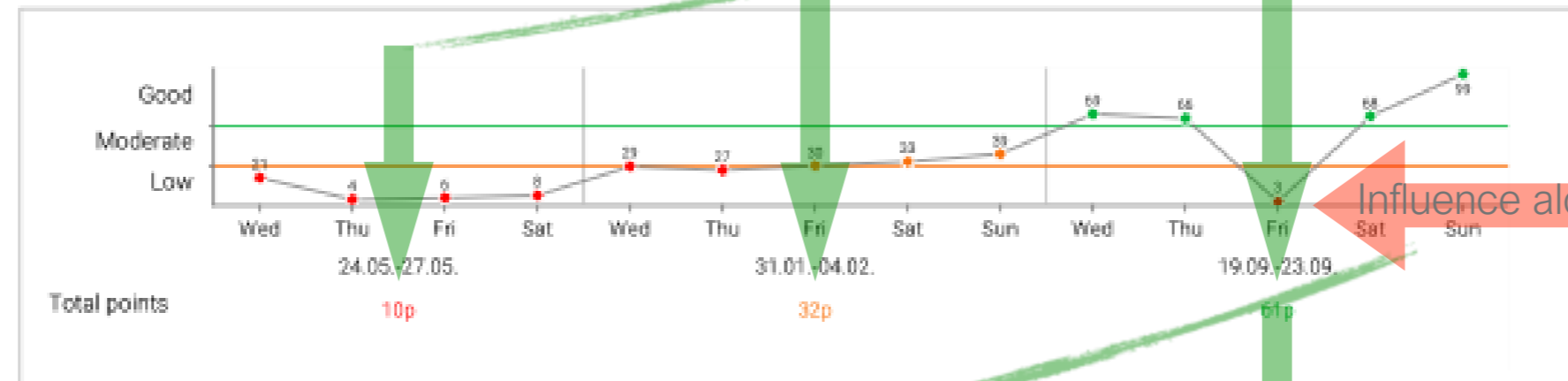
2. Oxytocin Induced Labor: Oxytocin Receptor Resistance



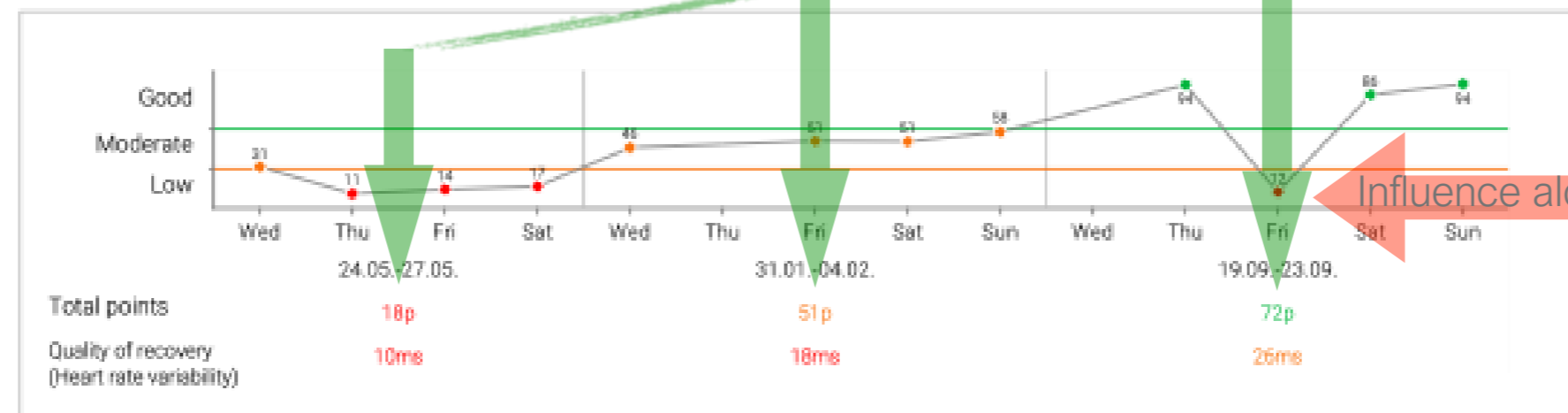
LIFESTYLE ASSESSMENT - FOLLOW-UP

👤 421180			
Date	Wed 24. - Sat 27.05.2017	Wed 31. - Sun 04.02.2018	Wed 19. - Sun 23.09.2018
Lowest heart rate	55	50	46
Activity Class	6 (Good)	6 (Good)	6 (Good)
Weight (kg)	75	75	75
'I feel well at the moment.'	☹️ Partially disagree	☺️ Partially agree	

📊 STRESS AND RECOVERY BALANCE



📊 RESTORATIVE EFFECT OF SLEEP



Discussion items:

1.

The importance of a low Quality of Recovery (Av. RMSSD night) should count more heavily in the calculation of the Recovery Index during the night.

2.

More consideration should be given to serious biochemical blockages in the intervention processes aimed to improve the stress-recovery balance and the amount/quality of recovery during sleep. There is a growing population of people where lifestyle changes alone will not have (enough) effects.

