NSÜ
NEMZETI
SPORTÜGYNÖKSÉG ZRT.

A TERHELÉS ÉS PIHENÉS MODERN MEGKÖZELÍTÉSE

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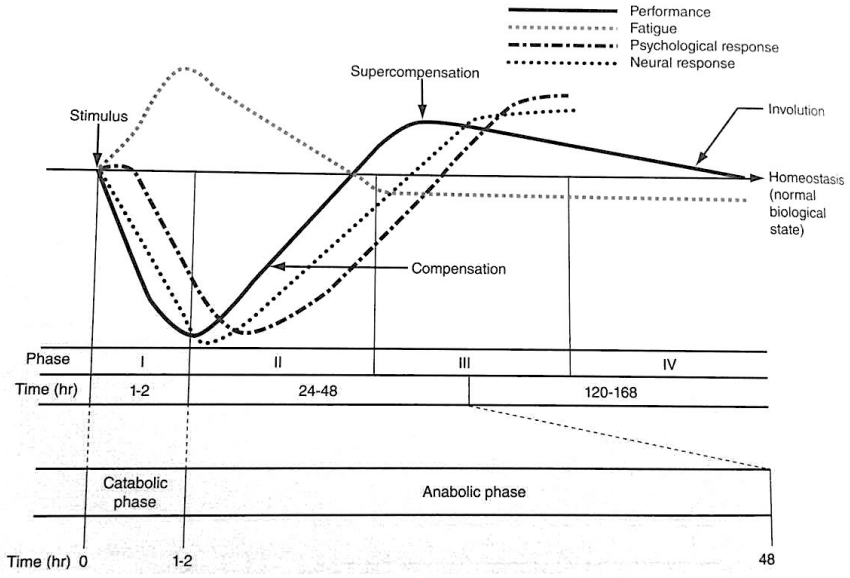
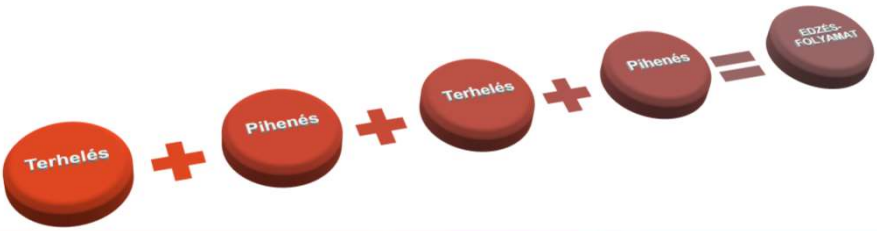
Egy edzés terhelésének szerkezeti elemei, a szuperkompenzáció bázisa



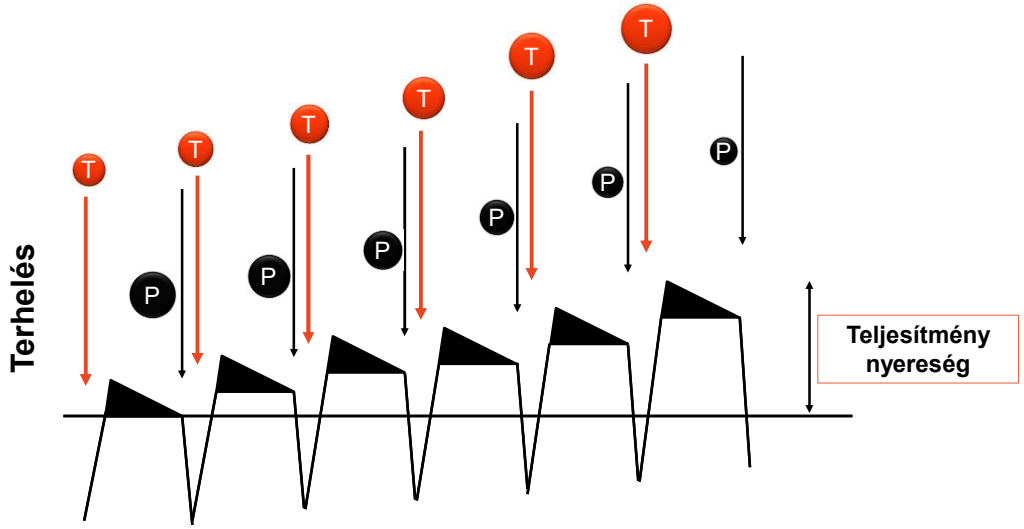
TERHELÉS+PIHENÉS

Ha a **pihenőidő túl hosszú**, vagyis az alkalmazkodás következő fázisában nem érik újabb ingerek a szervezetet hosszabb ideig, akkor **a szuperkompenzáció pozitív hatása leépül**.
Ezért az edzésfolyamatban a **terhelést fokozatosan növelni kell**, hogy újabb szuperkompenzációk jöjjenek létre.

EDZÉSFOLYAMAT a szuperkompenzációs változás egymás utáni sorozatának tervezése.

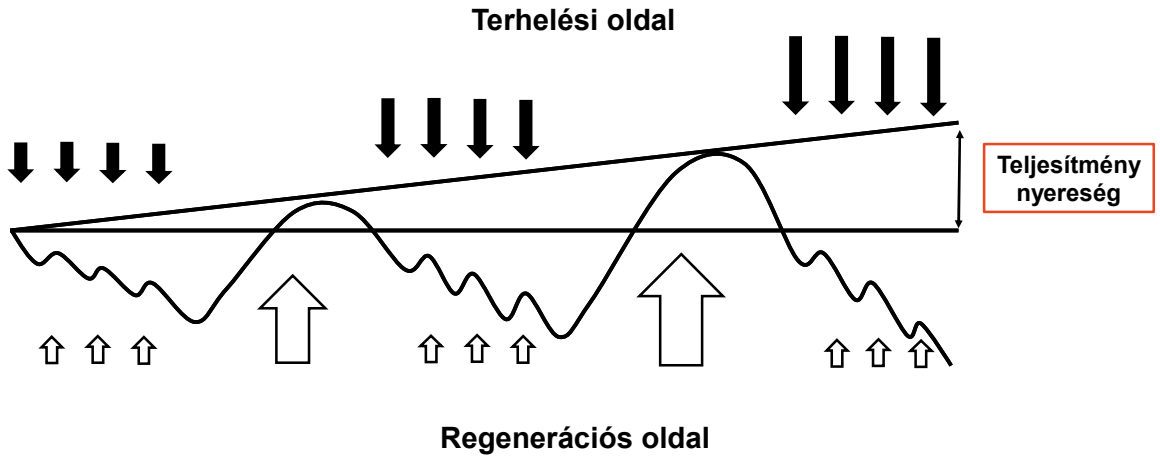


Az alkalmazkodás, az edzettség és a teljesítmény kialakulásának folyamata

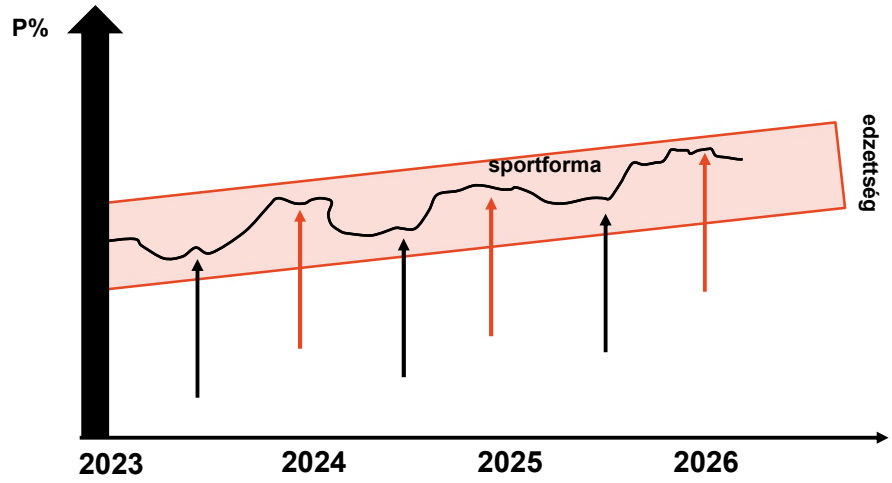


Optimális terhelések sorozata teljesítmény növelését eredményez

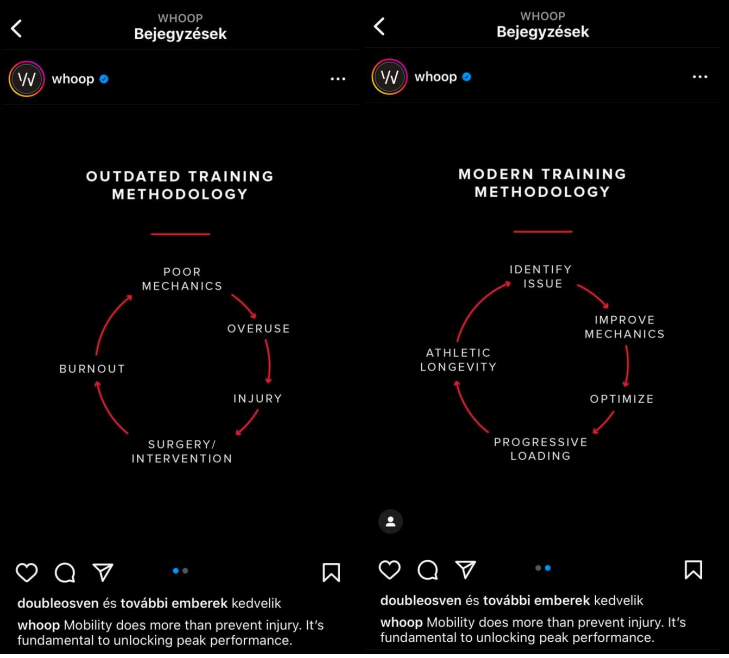
Élsport jellegű, nyújtott idejű adaptáció



Az edzettség és a sportforma viszonya



Rendezetlen és modern metodika (WHOOP)

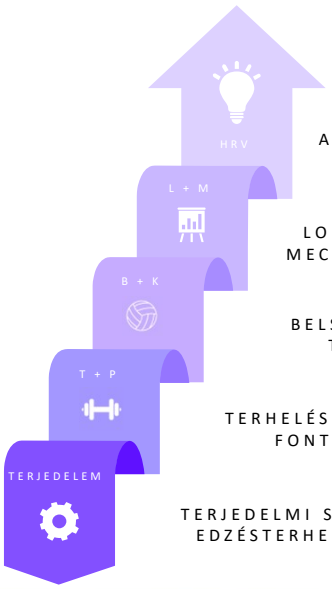


Az edzéstervelés fókuszának evolúciója

A sport-, és orvostudomány fejlődésével a sportoló terhelés-szabályozásának egyfajta evolúciója látható.

A **terjedelmi edzések** súlyozása egyre inkább átalakult, az intenzitás fontossága mellett a terhelés és pihenési arány kalkulációja lett a siker kulcsa.

A terhelési arányok, terhelési összetevők definiálása mellett a modern sporttudományi megközelítés egyre inkább az autonóm, vegetatív állapotra fókuszál.



HRV, VEGETATÍV, AUTONÓM IDEGRENDSZER KÖVETÉSE

LOKOMOTORIKUS ÉS MECHANIKAI TERHELÉS

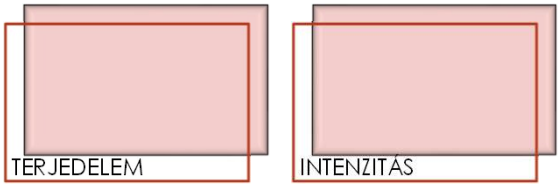
BELSŐ ÉS KÜLSŐ TERHELÉS

TERHELÉS ÉS PIHENÉS FONTOSSÁGA

TERJEDELMI SÚLYOZÁS AZ EDZÉSTERHELÉS SORÁN

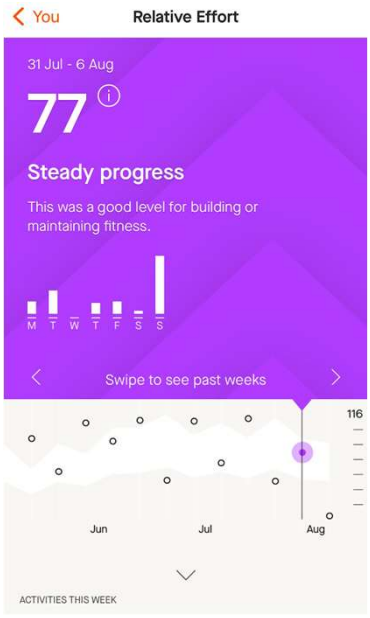
Terhelési összetevők

Két nagy terhelési összetevő egységet különböztetünk meg.
Az **intenzitás, valamint a terjedelem**, gyakorlatilag négy összetevőre bontható.
A fogalmak szakszerű kezelése azonban elvi értelmezésű és flexibilisen kell kezelni őket.



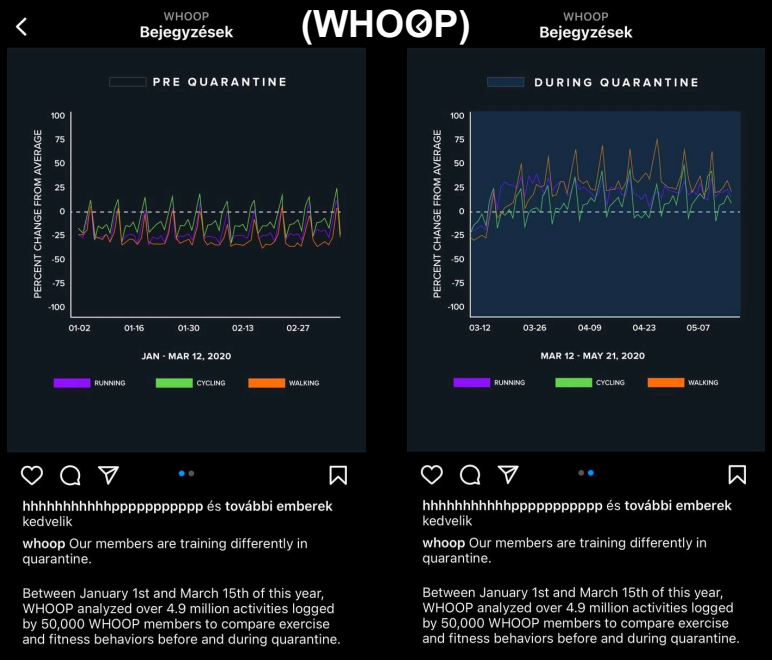
INTENZITÁS	TERJEDELEM
Intenzitás	Ingersűrűség
Ingersűrűség	Időtartam
Időtartam	Terjedelem

Terjedelem intenzitás nélkül mit sem ér... (Strava)



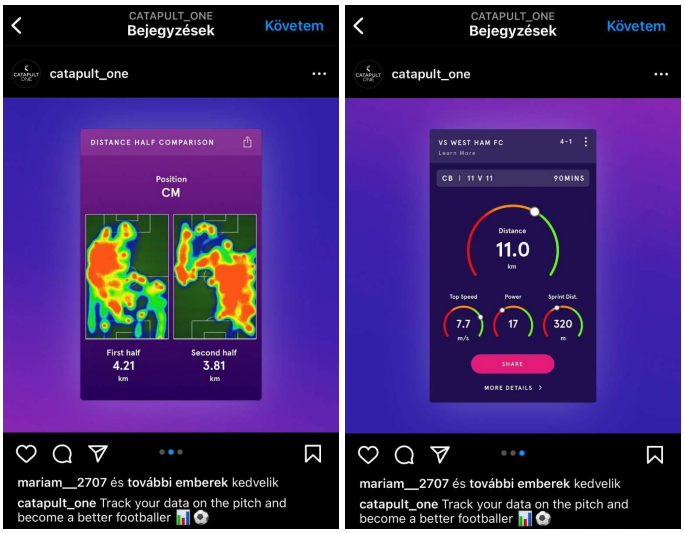
A COVID-19 hatása a fizikai aktivitás szokásokra (terjedelem) (WHOOP)

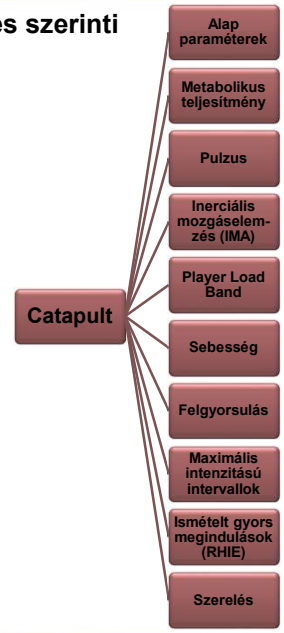
2020. Jan – Márc.



2020. Márc. - Máj

A CATAPULT OPENFIELD felhőben található paraméterek terhelés szerinti bontásban





Az edzés-hatás és a vegetatív idegrendszer válasza (ANS, autonomic nervous system)

Every training session can be considered as stress to the body, which in turn causes disturbance of homeostasis and ANS modulation. These changes in ANS activity are manifested by increased sympathetic and/or decreased parasympathetic activity of the ANS and are reflected by HRV parameters

TABLE 2

Sympathetic tone	Parasympathetic tone
Insomnia	Fatigue
Irritability	Depression
Agitation	Bradycardia
Tachycardia	Loss of motivation
Hypertension	
Restlessness	

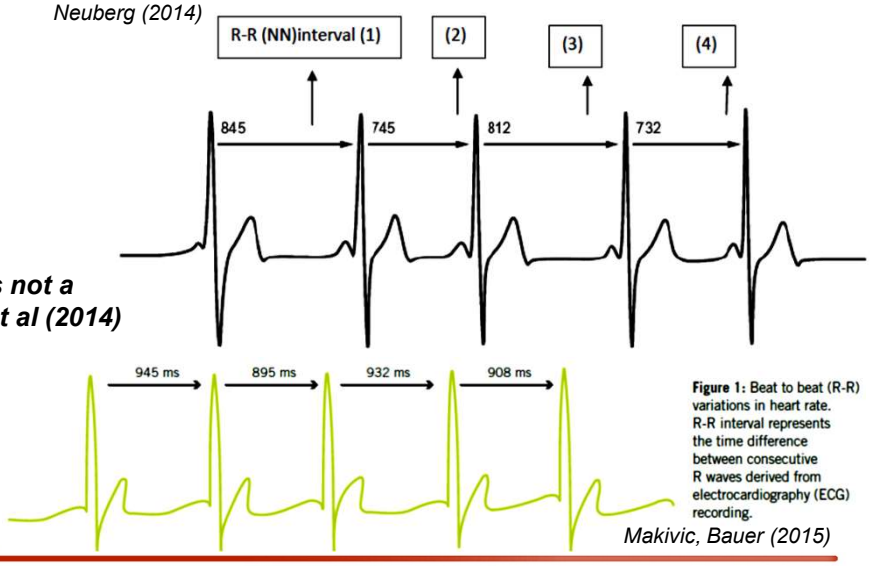
Table 2: Sympathetic and parasympathetic characteristics of overtraining.

Makivic, Bauer (2015)

ECG (EKG) görbéből számítható R-R intervall értékek (HRV)

Figure 2 ECG show how heart rate varies with every heartbeat= Heart Rate Variability.

Neuberg (2014)



„A healthy heart is not a metronome" Shaffer et al (2014)

Figure 1: Beat to beat (R-R) variations in heart rate. R-R interval represents the time difference between consecutive R waves derived from electrocardiography (ECG) recording.

Makivic, Bauer (2015)

R-R intervall görbe 10 perces mérése

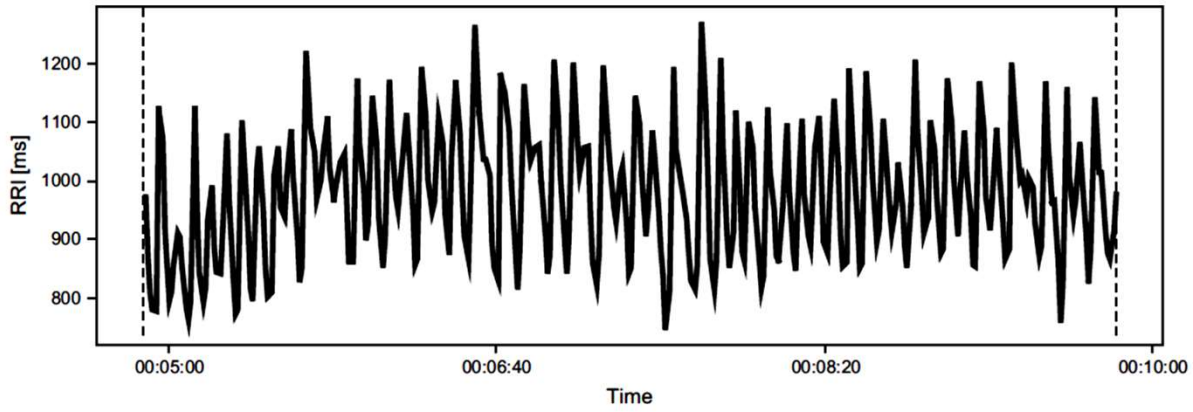


Figure 1 R–R interval tachogram obtained from a healthy subject in the supine position at rest for 10 min.

Kingsley, Figueroa (2014)

HRV vizsgált változói

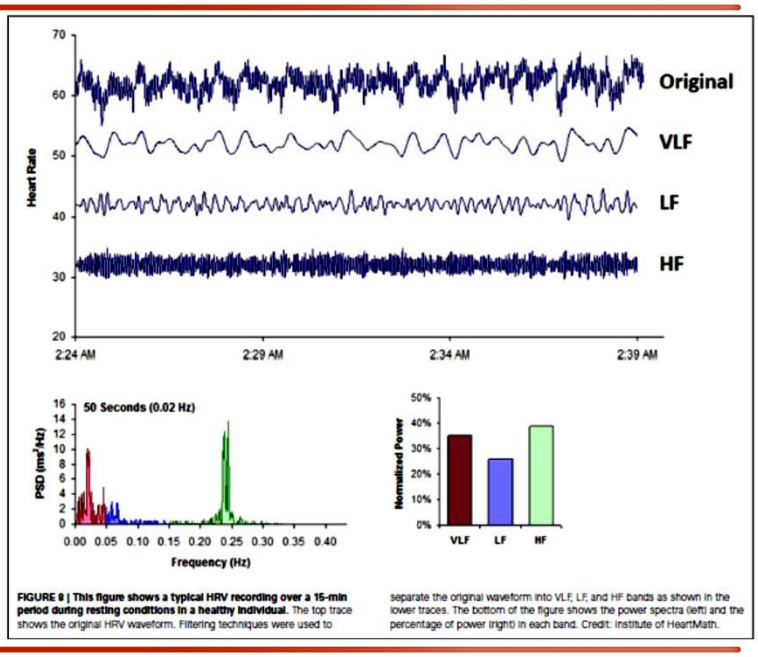
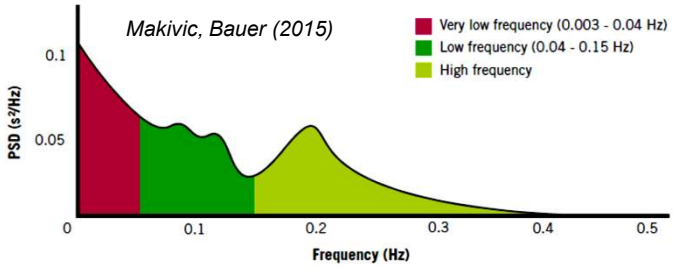
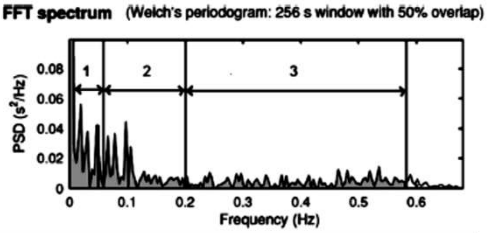


FIGURE 8 | This figure shows a typical HRV recording over a 15-min period during resting conditions in a healthy individual. The top trace shows the original HRV waveform. Filtering techniques were used to separate the original waveform into VLF, LF, and HF bands as shown in the lower traces. The bottom of the figure shows the power spectra (left) and the percentage of power (right) in each band. Credit: Institute of HeartMath.

Shaffer et al (2014)

HRV spektrum elemzése



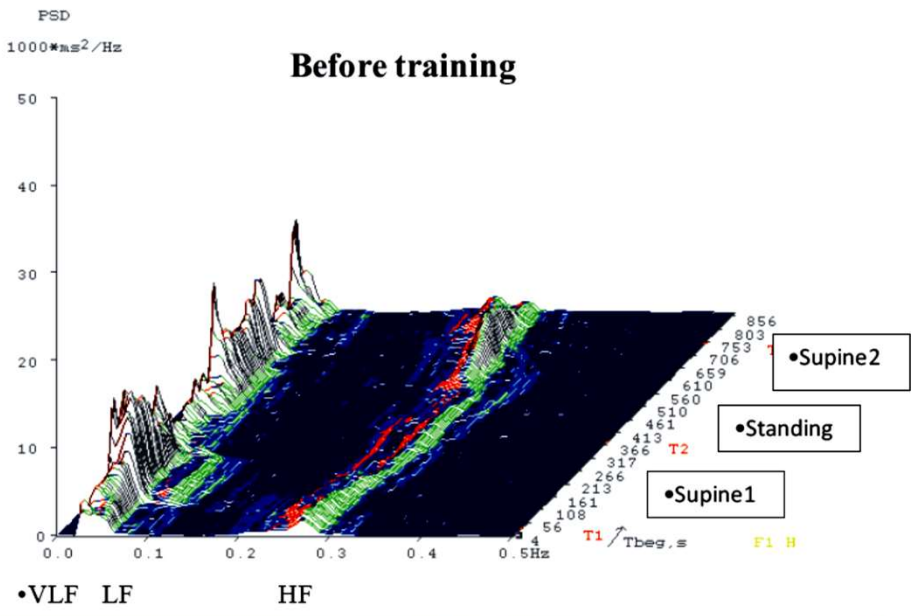


	Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
1	VLF (0–0.05 Hz)	0.0039	2902	49.0	
2	LF (0.05–0.2 Hz)	0.0977	1414	23.9	46.7
3	HF (0.2–0.58 Hz)	0.5352	1612	27.2	53.3
	Total		5928		
	LF/HF		0.877		

Figure 2 Power spectral density (PSD) of heart rate variability (HRV) performed by Fast Fourier Transformation (FFT) using the Welch Periodogram method corresponding to the 256 values of analysis selected previously. Spectral frequency bands are obtained at very low (VLF: 0 to 0.05 Hz), low (LF: 0.05 to 0.20 Hz) and high (HF: 0.20 to 0.58 Hz) frequencies, in absolute (ms^2) and normalised units (NU). LF/HF is expressed as the ratio between the absolute areas of low and high frequency bands. Data were calculated with Kubios HRV analysis software.

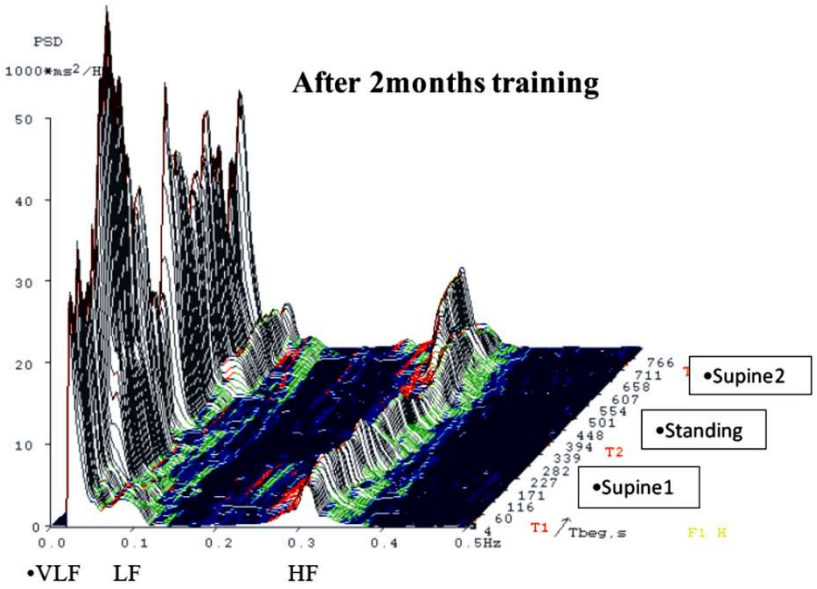
Kovács et al (2014)

3D spektrum analizálás



Metelka (2014)

3D spektrum analizálás



Metelka (2014)

LF és HF spektrum analízis eltolódás nyugalomban, illetve edzést követően

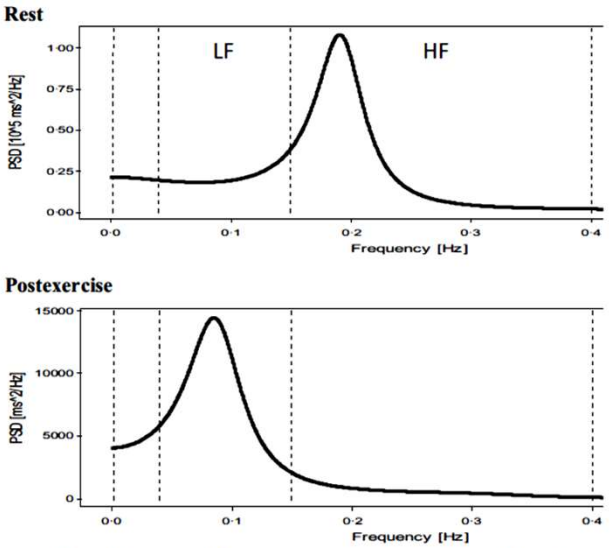
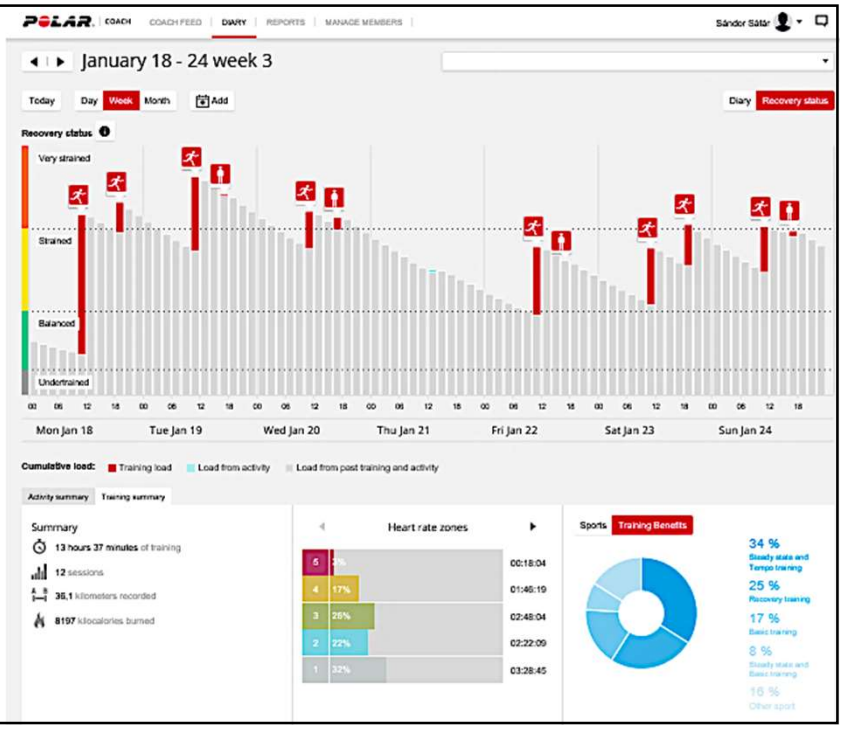


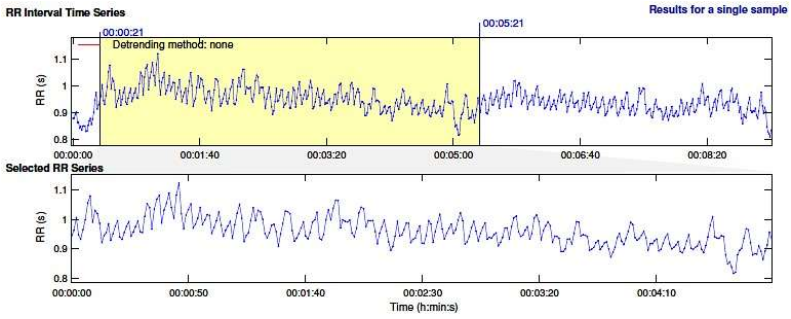
Figure 2 Power spectra analysis R-R variability calculated by parametric autoregressive modeling in a healthy subject at rest and postexercise in the supine position. The HF (0.15-0.40 Hz) component (parasympathetic) is predominant at rest. After acute exercise, the LF (0.04-0.15 Hz) component of heart rate variability is increased while the HF component is decreased (vagal withdrawal). PSD=Power Spectral Density.

Kingsley, Figueroa (2014)

NBI-es labdarúgó játékvezető két hetes edzőtáborának második hete (recovery status)



HRV vizsgálat alatt mért változók I. (idő alapú, Kubios HRV)



Time–Domain Results

Variable	Units	Value
Mean RR*	(ms)	959.0
STD RR (SDNN)	(ms)	47.6
Mean HR*	(1/min)	62.72
STD HR	(1/min)	3.10
RMSSD	(ms)	33.4
NN50	(count)	39
pNN50	(%)	12.5

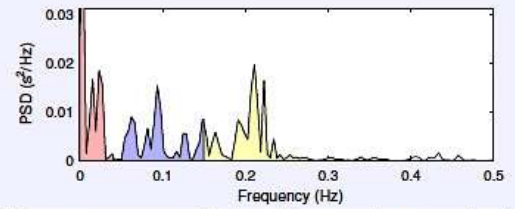
MeanRR (ms) | STD RR (SDNN) (ms) | Mean HR (1/min) | STD HR (1/min)

RMSSD (ms) | NN50 | pNN50 (%)

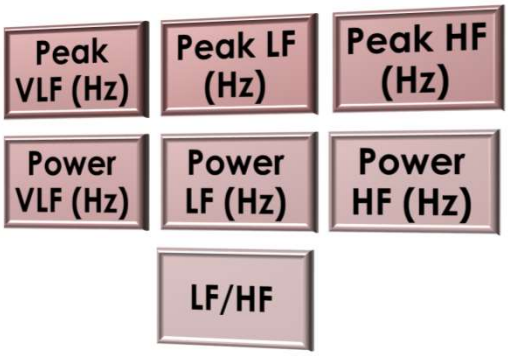
HRV vizsgálat alatt mért változók II. (frekvencia spektrumra vonatkozó, Fast Fourier transformation, FFT)

Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



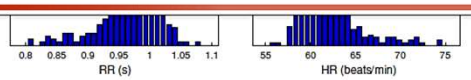
Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	492	34.2	
LF (0.04–0.15 Hz)	0.0938	415	28.9	43.8
HF (0.15–0.4 Hz)	0.2109	531	36.9	56.1
Total		1438		
LF/HF		0.782		



Welch peridogram, 256 s ablak, 50% overlap

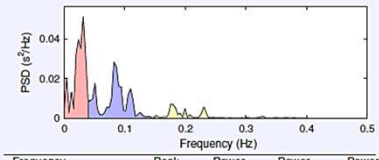
HRV (01. 18.)

NN50	(count)	14
pNN50	(%)	4.4
RR triangular index		9.606
TINN	(ms)	155.0



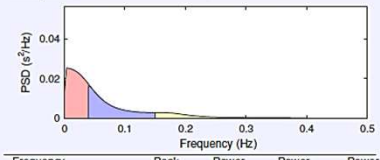
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0313	936	47.4	
LF (0.04–0.15 Hz)	0.0820	822	41.7	79.3
HF (0.15–0.4 Hz)	0.1758	214	10.9	20.7
Total		1972		
LF/HF		3.840		

AR Spectrum (AR model order = 16, not factorized)

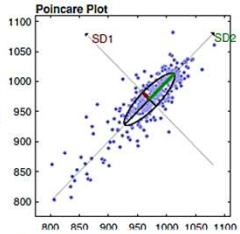


Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	884	49.9	
LF (0.04–0.15 Hz)	0.0430	679	38.3	76.5
HF (0.15–0.4 Hz)	0.1523	209	11.8	23.5
Total		1772		
LF/HF		3.249		

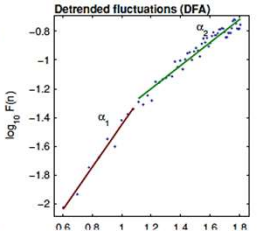
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	16.3
SD2	(ms)	59.9
Recurrence plot		
Mean line length (Lmean)	(beats)	14.03
Max line length (Lmax)	(beats)	238
Recurrence rate (REC)	(%)	45.09
Determinism (DET)	(%)	99.41
Shannon Entropy (ShanEn)		3.458
Other		
Approximate entropy (ApEn)		1.067
Sample entropy (SampEn)		1.302
Detrended fluctuations (DFA):α1		1.472
Detrended fluctuations (DFA):α2		0.800
Correlation dimension (D2)		1.641

Poincare Plot

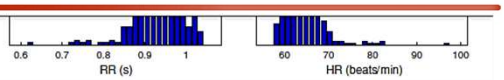


Detrended fluctuations (DFA)



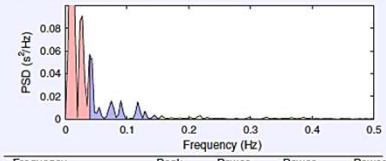
HRV (01. 19.)

NN50	(count)	10
pNN50	(%)	3.1
RR triangular index		10.933
TINN	(ms)	285.0



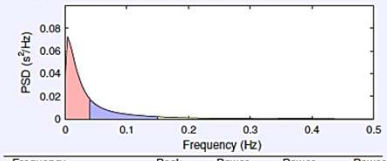
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0078	3055	76.2	
LF (0.04–0.15 Hz)	0.0430	781	19.5	81.7
HF (0.15–0.4 Hz)	0.2188	173	4.3	18.1
Total		4011		
LF/HF		4.514		

AR Spectrum (AR model order = 16, not factorized)

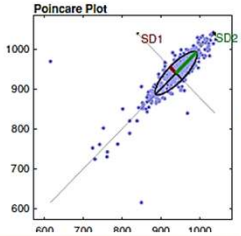


Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	1675	66.2	
LF (0.04–0.15 Hz)	0.0430	666	26.3	78.0
HF (0.15–0.4 Hz)	0.1523	187	7.4	21.9
Total		2529		
LF/HF		3.563		

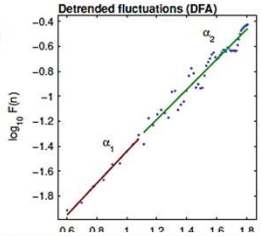
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	22.5
SD2	(ms)	74.3
Recurrence plot		
Mean line length (Lmean)	(beats)	18.24
Max line length (Lmax)	(beats)	239
Recurrence rate (REC)	(%)	51.93
Determinism (DET)	(%)	99.62
Shannon Entropy (ShanEn)		3.719
Other		
Approximate entropy (ApEn)		0.990
Sample entropy (SampEn)		1.153
Detrended fluctuations (DFA):α1		1.276
Detrended fluctuations (DFA):α2		1.203
Correlation dimension (D2)		3.459

Poincare Plot

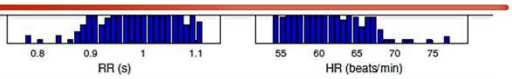


Detrended fluctuations (DFA)



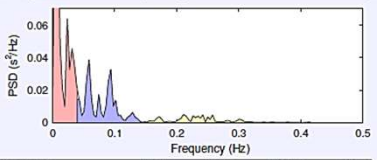
HRV (01. 20.)

NN50	(count)	31
pNN50	(%)	10.9
RR triangular index		15.053
TINN	(ms)	165.0



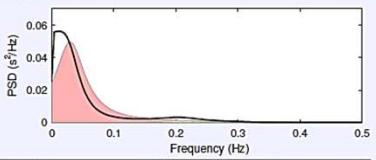
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0078	2322	63.4	
LF (0.04–0.15 Hz)	0.0586	1054	28.8	78.5
HF (0.15–0.4 Hz)	0.2109	288	7.9	21.5
Total		3664		
LF/HF		3.660		

AR Spectrum (AR model order = 16, factorized into components)

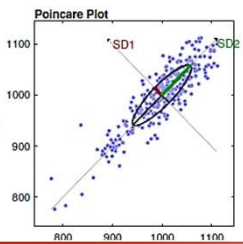


Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0313	3472	96.9	
LF (0.04–0.15 Hz)	0.0000	0	0.0	0.0
HF (0.15–0.4 Hz)	0.2070	112	3.1	100.0
Total		3584		
LF/HF		0.000		

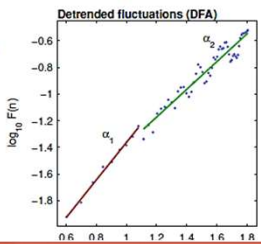
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	20.8
SD2	(ms)	82.3
Recurrence plot		
Mean line length (Lmean)	(beats)	15.38
Max line length (Lmax)	(beats)	276
Recurrence rate (REC)	(%)	43.31
Determinism (DET)	(%)	98.94
Shannon Entropy (ShanEn)		3.466
Other		
Approximate entropy (ApEn)		1.086
Sample entropy (SampEn)		1.390
Detrended fluctuations (DFA):α1		1.409
Detrended fluctuations (DFA):α2		1.040
Correlation dimension (D2)		3.316

Poincare Plot

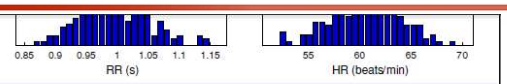


Detrended fluctuations (DFA)



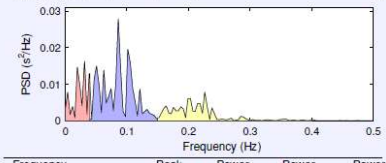
HRV (01. 21.)

NN50	(count)	17
pNN50	(%)	6.3
RR triangular index		10.423
TINN	(ms)	110.0



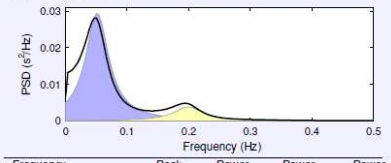
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0313	278	19.4	
LF (0.04–0.15 Hz)	0.0859	812	56.6	70.3
HF (0.15–0.4 Hz)	0.2266	343	23.9	29.7
Total		1434		
LF/HF		2.365		

AR Spectrum (AR model order = 16, factorized into components)

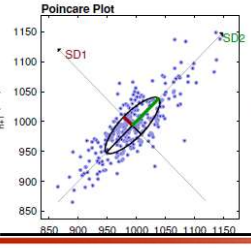


Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0000	0	0.0	
LF (0.04–0.15 Hz)	0.0508	1860	84.8	84.8
HF (0.15–0.4 Hz)	0.1992	333	15.2	15.2
Total		2193		
LF/HF		5.578		

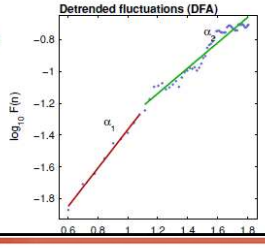
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	21.0
SD2	(ms)	63.8
Recurrence plot		
Mean line length (Lmean)	(beats)	12.43
Max line length (Lmax)	(beats)	258
Recurrence rate (REC)	(%)	38.69
Determinism (DET)	(%)	98.86
Shannon Entropy (ShanEn)		3.303
Other		
Approximate entropy (ApEn)		1.056
Sample entropy (SampEn)		1.519
Detrended fluctuations (DFA):α1		1.212
Detrended fluctuations (DFA):α2		0.797
Correlation dimension (D2)		2.883

Poincare Plot

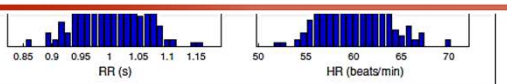


Detrended fluctuations (DFA)



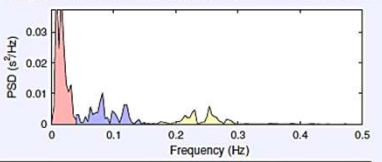
HRV (01. 22.)

NN50	(count)	12
pNN50	(%)	4.4
RR triangular index		12.409
TINN	(ms)	120.0



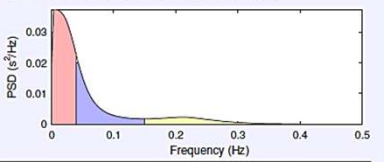
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0078	721	59.3	
LF (0.04–0.15 Hz)	0.0820	303	24.9	61.3
HF (0.15–0.4 Hz)	0.2539	191	15.7	38.7
Total		1215		
LF/HF		1.585		

AR Spectrum (AR model order = 16, not factorized)

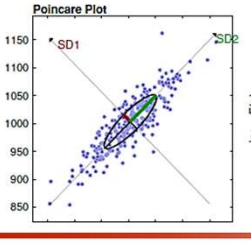


Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	1293	59.0	
LF (0.04–0.15 Hz)	0.0430	629	28.7	70.0
HF (0.15–0.4 Hz)	0.2109	269	12.3	30.0
Total		2192		
LF/HF		2.338		

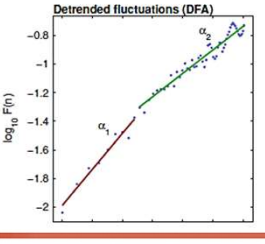
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	17.7
SD2	(ms)	66.6
Recurrence plot		
Mean line length (Lmean)	(beats)	12.12
Max line length (Lmax)	(beats)	263
Recurrence rate (REC)	(%)	40.72
Determinism (DET)	(%)	99.06
Shannon Entropy (ShanEn)		3.268
Other		
Approximate entropy (ApEn)		1.057
Sample entropy (SampEn)		1.466
Detrended fluctuations (DFA):α1		1.260
Detrended fluctuations (DFA):α2		0.818

Poincare Plot

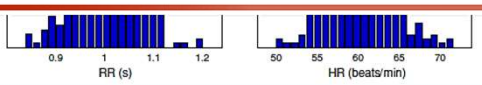


Detrended fluctuations (DFA)



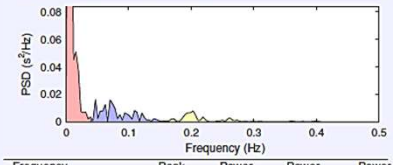
HRV (01. 23.)

pNN50	(%)	7.5
RR triangular index		16.286
TINN	(ms)	145.0



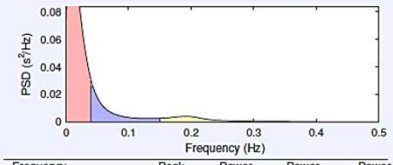
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	3355	80.1	
LF (0.04–0.15 Hz)	0.0469	571	13.6	68.3
HF (0.15–0.4 Hz)	0.2031	264	6.3	31.6
Total		4190		
LF/HF		2.165		

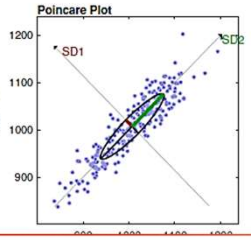
AR Spectrum (AR model order = 16, not factorized)

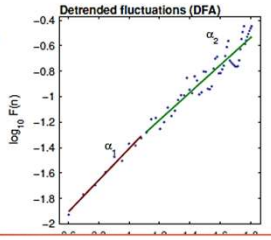


Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	3416	76.5	
LF (0.04–0.15 Hz)	0.0430	732	16.4	69.6
HF (0.15–0.4 Hz)	0.1914	319	7.1	30.4
Total		4467		
LF/HF		2.292		

Nonlinear Results

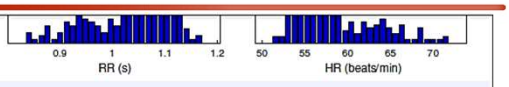
Variable	Units	Value
Poincare plot		
SD1	(ms)	19.8
SD2	(ms)	96.6
Recurrence plot		
Mean line length (Lmean)	(beats)	15.23
Max line length (Lmax)	(beats)	218
Recurrence rate (REC)	(%)	40.01
Determinism (DET)	(%)	99.39
Shannon Entropy (ShanEn)		3.446
Other		
Approximate entropy (ApEn)		0.964
Sample entropy (SampEn)		1.265
Detrended fluctuations (DFA):α1		1.247
Detrended fluctuations (DFA):α2		1.081





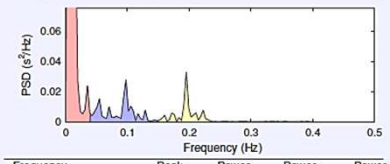
HRV (01. 24.)

NN50	(count)	30
pNN50	(%)	10.8
RR triangular index		13.238
TINN	(ms)	115.0



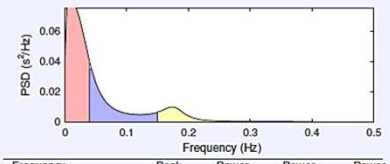
Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)



Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0078	4076	79.3	
LF (0.04–0.15 Hz)	0.0977	629	12.2	59.0
HF (0.15–0.4 Hz)	0.1953	437	8.5	41.0
Total		5142		
LF/HF		1.439		

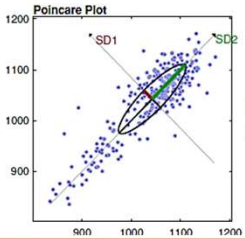
AR Spectrum (AR model order = 16, not factorized)

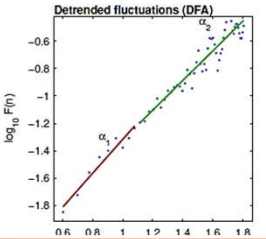


Frequency Band	Peak (Hz)	Power (ms²)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	2657	61.6	
LF (0.04–0.15 Hz)	0.0430	1162	26.9	70.0
HF (0.15–0.4 Hz)	0.1758	497	11.5	30.0
Total		4317		
LF/HF		2.336		

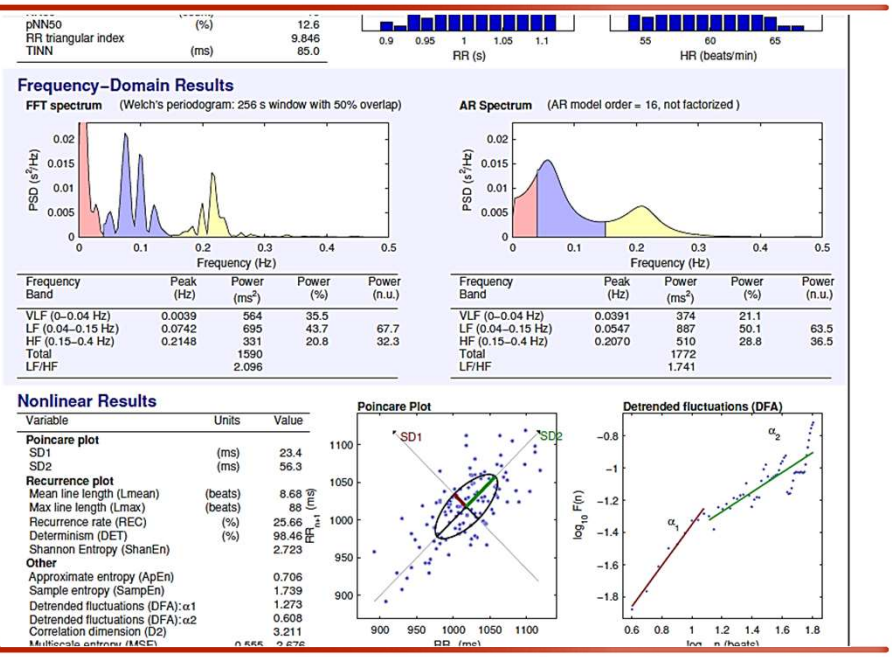
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	23.8
SD2	(ms)	94.5
Recurrence plot		
Mean line length (Lmean)	(beats)	19.28
Max line length (Lmax)	(beats)	268
Recurrence rate (REC)	(%)	47.71
Determinism (DET)	(%)	99.61
Shannon Entropy (ShanEn)		3.702
Other		
Approximate entropy (ApEn)		1.006
Sample entropy (SampEn)		1.276
Detrended fluctuations (DFA):α1		1.237
Detrended fluctuations (DFA):α2		1.082





HRV (01. 25.)



pNN50	(%)	12.6
RR triangular index		9.846
TINN	(ms)	85.0

RR (s) HR (beats/min)

Frequency–Domain Results

FFT spectrum (Welch's periodogram: 256 s window with 50% overlap)

AR Spectrum (AR model order = 16, not factorized)

PSD (s^2/Hz) Frequency (Hz)

Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0039	564	35.5	
LF (0.04–0.15 Hz)	0.0742	695	43.7	67.7
HF (0.15–0.4 Hz)	0.2148	331	20.8	32.3
Total		1590		
LF/HF		2.096		

Frequency Band	Peak (Hz)	Power (ms^2)	Power (%)	Power (n.u.)
VLF (0–0.04 Hz)	0.0391	374	21.1	
LF (0.04–0.15 Hz)	0.0547	887	50.1	63.5
HF (0.15–0.4 Hz)	0.2070	510	28.8	36.5
Total		1772		
LF/HF		1.741		

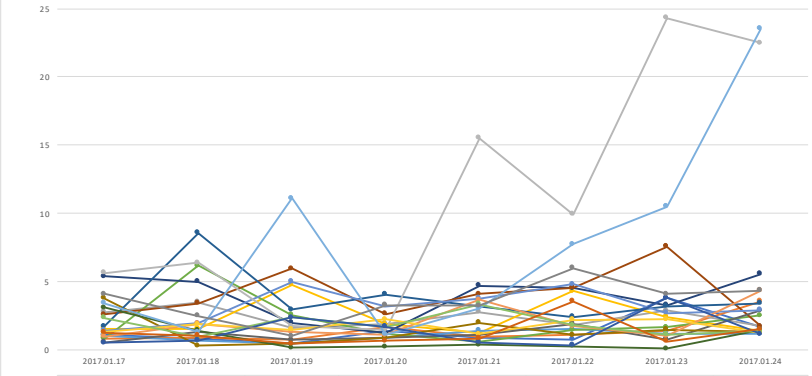
Nonlinear Results

Variable	Units	Value
Poincare plot		
SD1	(ms)	23.4
SD2	(ms)	56.3
Recurrence plot		
Mean line length (Lmean)	(beats)	8.68
Max line length (Lmax)	(beats)	88
Recurrence rate (REC)	(%)	25.66
Determinism (DET)	(%)	98.46
Shannon Entropy (ShanEn)		2.723
Other		
Approximate entropy (ApEn)		0.706
Sample entropy (SampEn)		1.739
Detrended fluctuations (DFA):α1		1.273
Detrended fluctuations (DFA):α2		0.608
Correlation dimension (D2)		3.211
Multiscale entropy (MSE)		0.555 2.676

Poincare Plot — SD1, SD2 — RR_{n+1} (ms) — RR (ms)

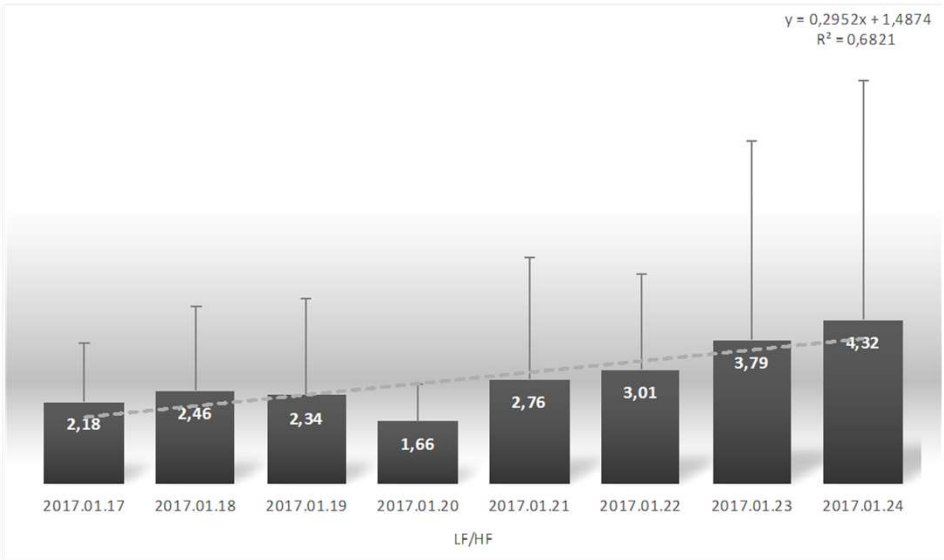
Detrended fluctuations (DFA) — $\log_{10}$ F(n) — α_1, α_2

LF/HF arány alakulása a tábor alatt

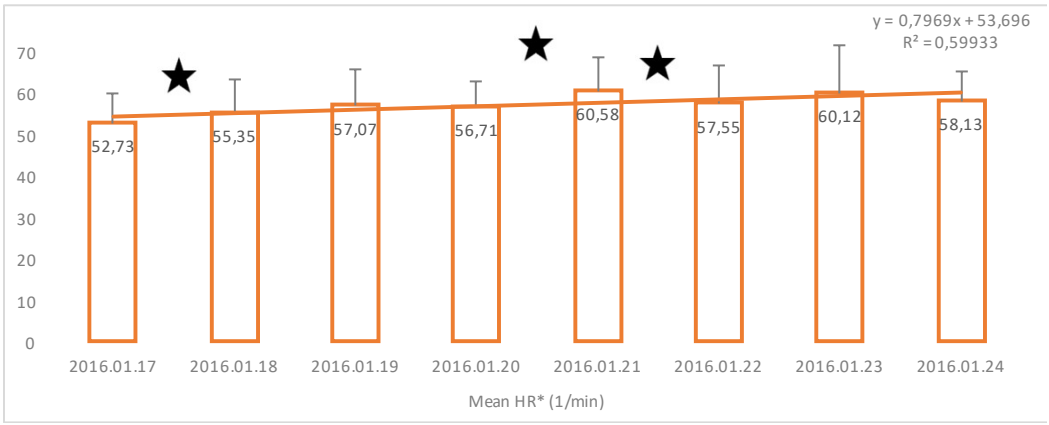


	2017.01.17	2017.01.18	2017.01.19	2017.01.20	2017.01.21	2017.01.22	2017.01.23	2017.01.24
ASZS	1,071	0,803	0,430	1,352	0,88	0,75	3,79	1,622
BB	0,825	0,853	0,697	1,677	0,933	1,067	1,351	3,539
BT	2,765	3,456	1,560	1,888	2,76	1,793	2,859	1,705
EJ	1,530	1,514	4,765	1,863	1,199	4,291	2,393	1,342
FÁ	1,015	0,640	0,414	0,865	1,378	1,503	1,179	1,147
GYT	0,822	6,135	2,527	1,151	0,596	1,425	1,629	2,484
IZ	5,378	4,981	1,978	1,253	4,669	4,508	3,24	5,558
KF	2,581	3,399	5,919	2,616	4,086	4,521	7,543	1,696
MA	0,527	1,271	0,720	0,843	1,119	1,902	0,74	2,840
NR	3,735	0,266	0,405	0,891	1,966	1,051	1,461	1,294
NT	1,712	8,560	2,945	4,052	3,146	2,382	3,169	3,380
NÁ	3,076	1,378	0,136	0,216	0,348	0,24	0,07	1,448
PCS	1,391	1,919	4,951	3,18	3,752	4,775	2,67	2,883
SP	0,971	1,900	1,286	1,055	3,632	1,707	0,984	4,320
SZZS	5,599	6,372	1,710	1,445	15,498	9,901	24,305	22,493
SZG	1,297	1,862	1,458	2,197	1,133	2,169	2,211	1,197
TJ	3,381	1,271	11,074	1,101	3,039	7,732	10,469	23,506
UE	2,301	0,922	2,344	1,66	3,311	1,767	1,106	1,357
GGY	0,477	0,679	2,340	1,666	0,519	0,303	3,79	1,137
KK	1,257	1,039	0,405	0,626	0,827	3,547	0,592	1,513
VI	4,059	2,460	0,991	3,244	3,204	5,964	4,085	4,320

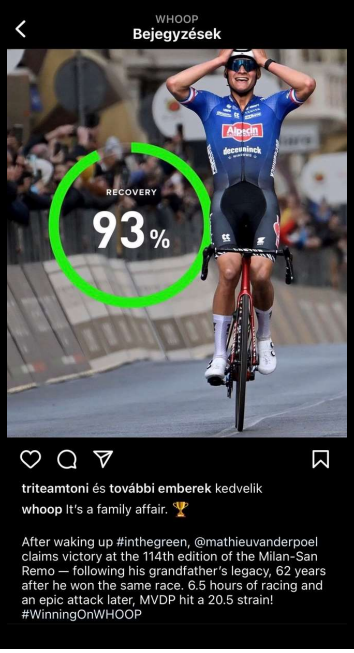
LF/HF átlagos értékek alakulása a tábor alatt

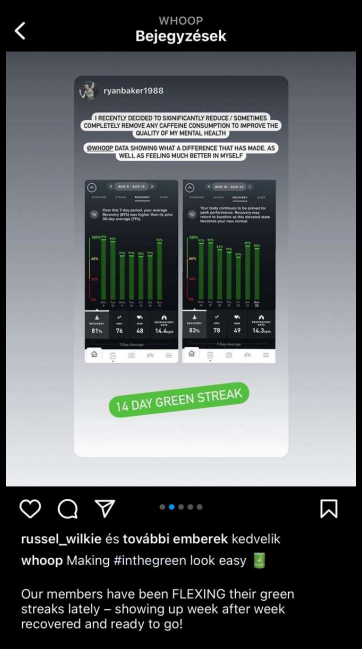


Átlag ébredési, nyugalmi pulzus (1/min) átlagai az edzőtábor alatt

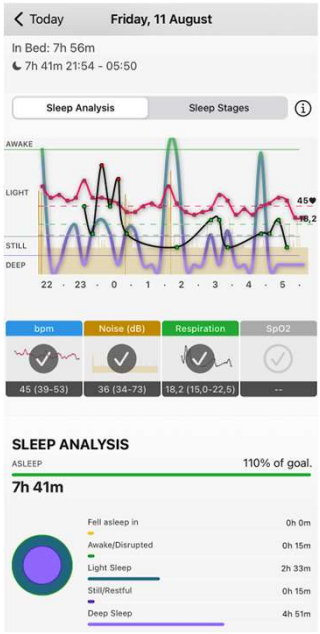


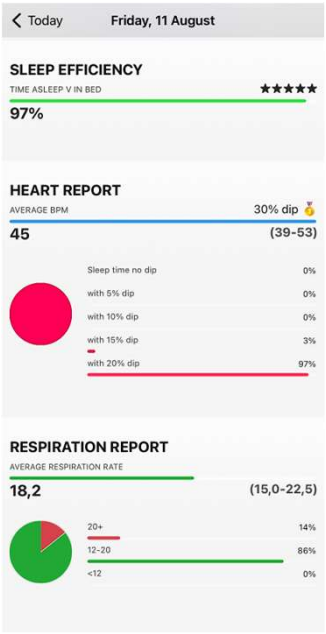
Regeneráció kiemelt fontosságú a magas szintű sportteljesítmény elérésben (WHOOP)



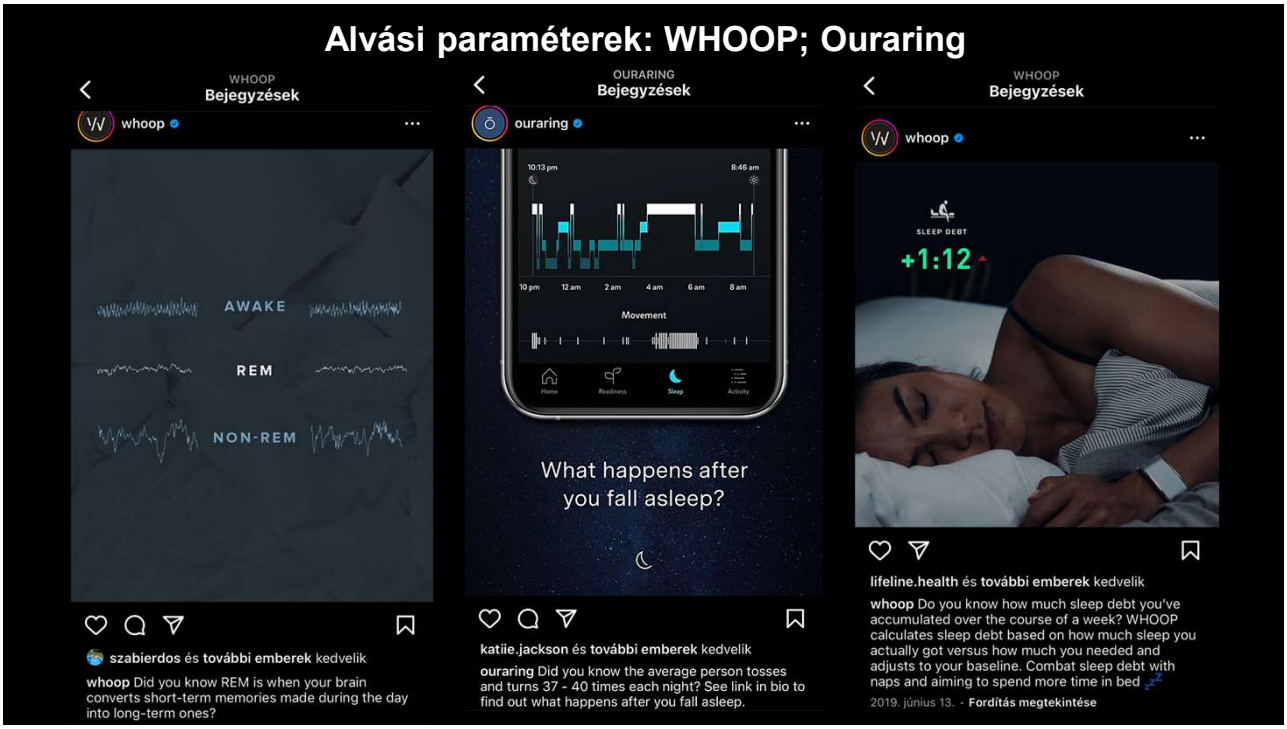


Alvási paraméterek: Apple Watch Ultra Autosleep App

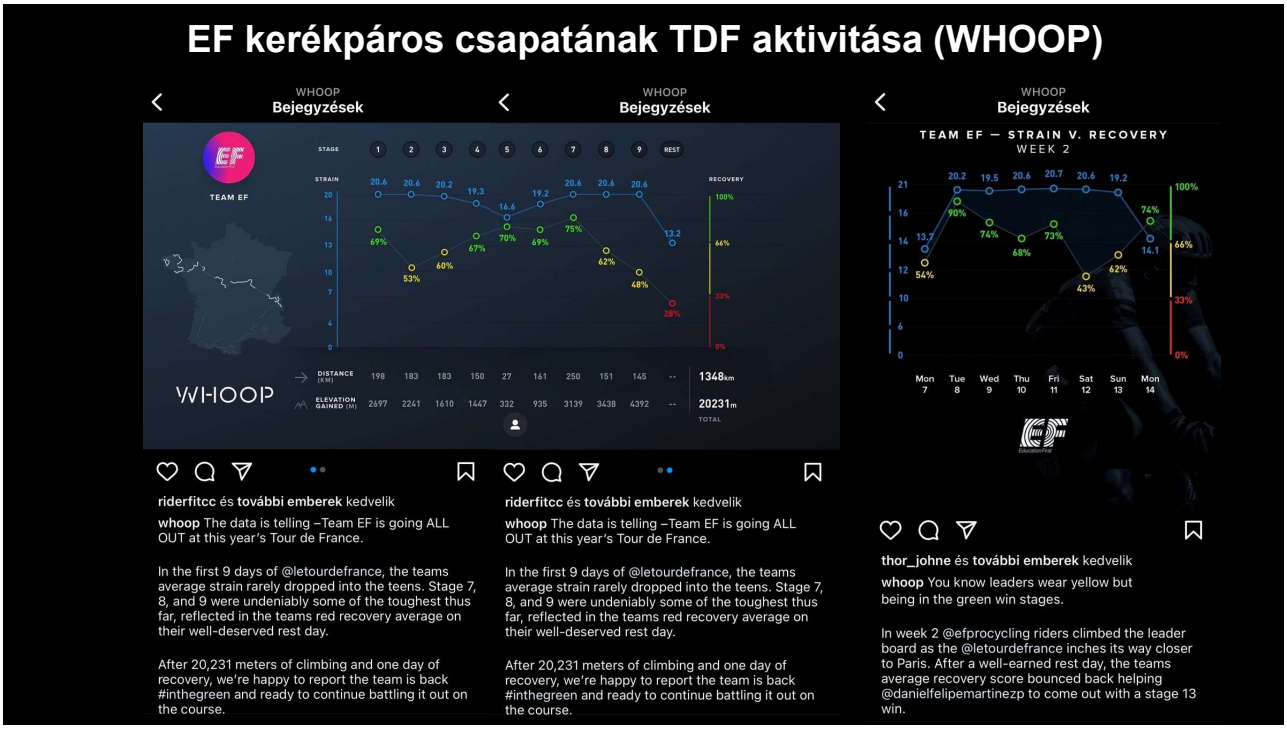




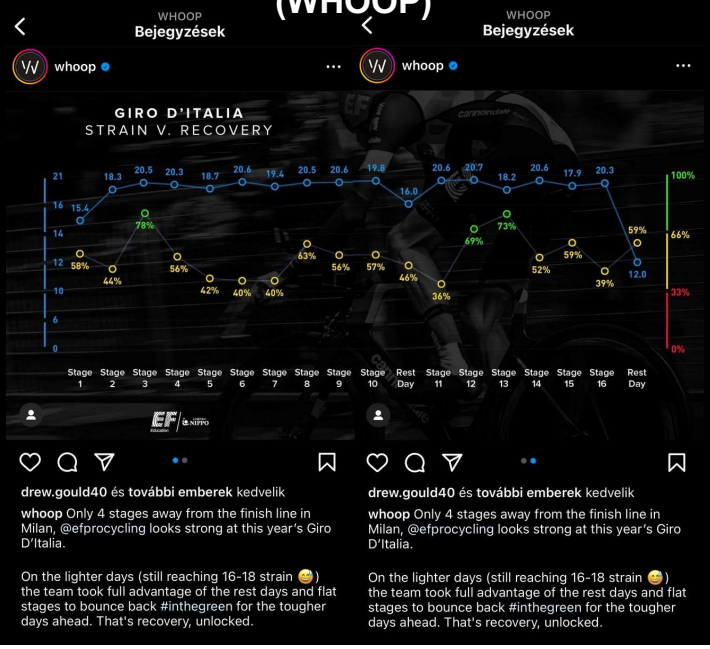
Alvási paraméterek: WHOOP; Ouraring



EF kerékpáros csapatának TDF aktivitása (WHOOP)



EF kerékpáros csapatának Giro'd Italia aktivitása (T + P) (WHOOP)



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