COMITÉ OLÍMPICO DE PORTUGAL

“SONO – o principal recuperador”

por Jaime Milheiro MD , ABAARM

PORTUGAL

TOKYO 2020

SEMINÁRIO
RUMO A TÓQUIO 2020
1 DE ABRIL DE 2019
AUDITÓRIO COP

PROGRAMA

“ SONO – o principal recuperador”

por Jaime Milheiro MD, ABAARM

GERAÇÃO MILENAR

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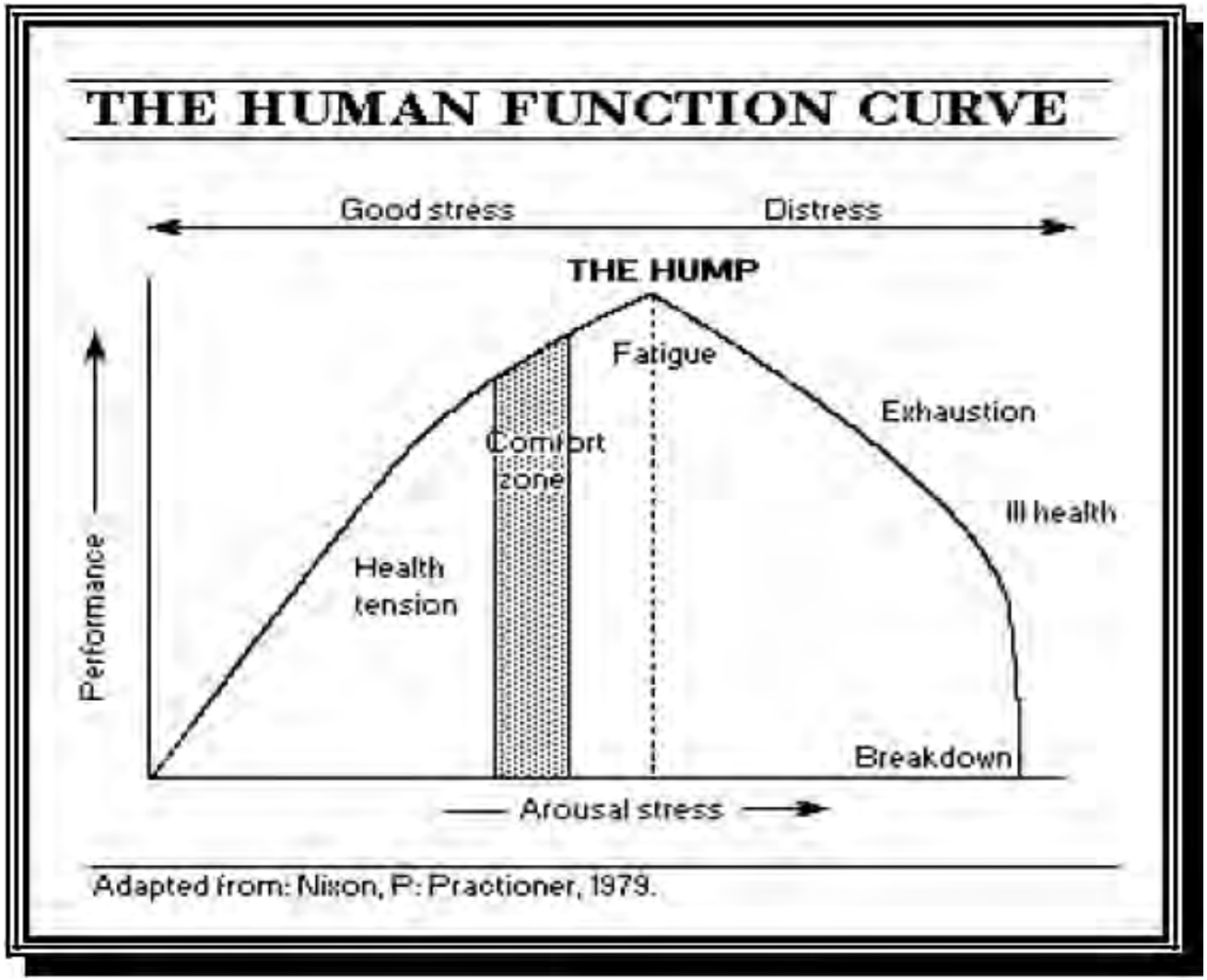

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Alostasis e estímulo alostático

Psychophysiological Dimension

Alostasis

O saldo da mudança. A adaptação fisiológica aos reais ou percebidos estímulos stressores a fim de melhorar a capacidade de sobrevivência do organismo

Estímulo alostático

O desgaste devido à adaptação crónica ao stress (alostasis), potencialmente causando estrago funcional no organismo

Conceito de allostasis and allostatic load (Eyer & Sterling, 1988, Schulkin 2003)

PRÁTICA DESPORTIVA INADEQUADA

- Resultante do incremento da prática desportiva em idades cada vez mais precoces, associadas ao possível estrelato que a competição pode proporcionar na geração milenar (considerada a mais narcisística da história), a prática desportiva inadequada **pode perder as suas características anabólicas e construtivas, levando entre várias coisas, ao dano físico e mental**.

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APOIO MÉDICO-FISIOLÓGICO

- Isso implica uma evidente necessidade crescente do apoio médico-fisiológico e psicológico ao atleta de alto rendimento. Considerando que a linha que separa a fadiga construtiva do overtraining é ténue, **a avaliação baseada na interpretação das sensações do atleta corre o risco de falhar redondamente**

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NFOR – NON-FUNCTIONAL OVER REACHING

- Nos dias de hoje é fundamental fazer um seguimento físico, mental e bioquímico, indicando o caminho a que o treino nos está a conduzir. É essencial a deteção precoce do denominado *NFOR – Non-Functional Over Reaching*, evitando o declínio físico e mental do atleta.

SONO

- Ritmo circadiano
- Anabolismo hormonal
- Ganho marginal
- Temperatura corporal
- Frequência cardíaca/ Variabilidade FC
- Quantidade/qualidade
- Ciclos de sono

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BURNOUT

Overuse Injuries and Burnout in Youth Sports: A Position Statement from the American Medical Society for Sports Medicine

John P. DiFiori, MD, Holly J. Benjamin, MD,† Joel Brenner, MD, MPH,‡ Andrew Gregory, MD,§ Neeru Jayanthi, MD,¶ Greg L. Landry, MD,‖ and Anthony Luke, MD, MPH***

(*Clin J Sport Med* 2014;24:3–20)

Executive Summary

BACKGROUND

- Youth sport participation offers many benefits including the development of self-esteem, peer socialization, and general fitness.
- However, an emphasis on competitive success, often driven by goals of elite-level travel team selection, collegiate scholarships, Olympic and National team membership, and even professional contracts, has seemingly become widespread.
- This has resulted in increased pressure to begin high-intensity training at young ages.
- Such an excessive focus on early intensive training and competition at young ages rather than skill development can lead to overuse injury and burnout.

PURPOSE

- To provide a systematic, evidenced-based review that will:
  - Assist clinicians in recognizing young athletes at risk for overuse injuries and burnout.
  - Delineate the risk factors and injuries that are unique to the skeletally immature young athlete.
  - Describe specific high-risk overuse injuries that present management challenges and/or can lead to long-term health consequences.
  - Summarize the risk factors and symptoms associated with burnout in young athletes.
  - Provide recommendations on overuse injury prevention.

METHODOLOGY

- Medical Subject Headings (MeSHs) and text words were searched on March 26, 2012, for MEDLINE, CINAHL, and PsychINFO.
- Nine hundred fifty-three unique articles were initially identified. Additional articles were found using cross-referencing. The process was repeated July 10, 2013, to review any new articles since the original search.
- Screening by the authors yielded a total of 208 relevant sources that were used for this paper.
- Recommendations were classified using the Strength of Recommendation Taxonomy (SORT) grading system.

DEFINITION OF OVERUSE INJURY

- Overuse injuries occur due to repetitive submaximal loading of the musculoskeletal system when rest is not adequate to allow for structural adaptation to take place.

Submitted for publication November 2, 2013; accepted November 6, 2013.
From the *Division of Sports Medicine and Non-Operative Orthopaedics, Departments of Family Medicine and Orthopaedics, University of California, Los Angeles, California; †Departments of Pediatrics and Orthopaedic Surgery, University of Chicago, Chicago, Illinois; ‡Children's Hospital of The King's Daughters, Eastern Virginia School of Medicine, Department of Pediatrics, Norfolk,

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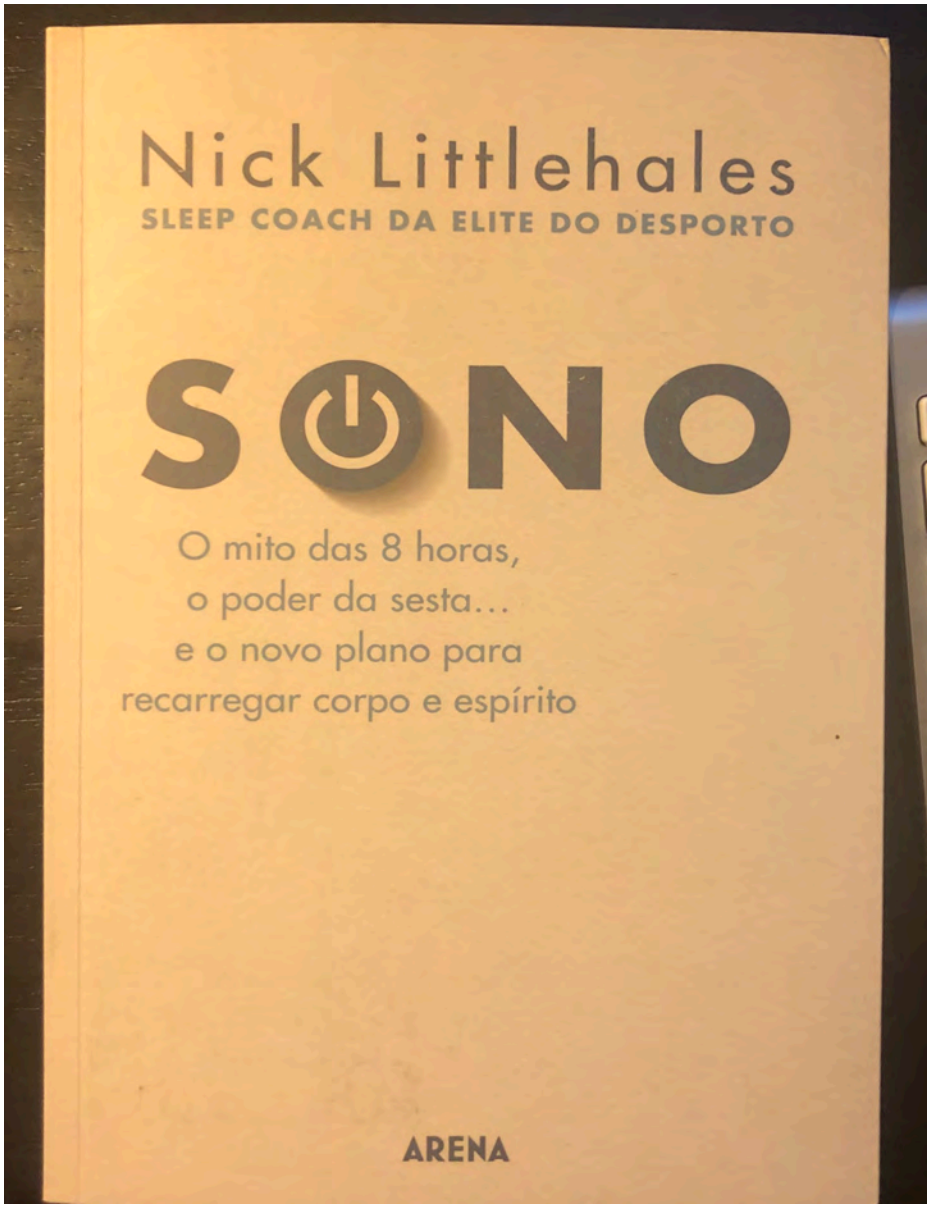

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TE

CO D

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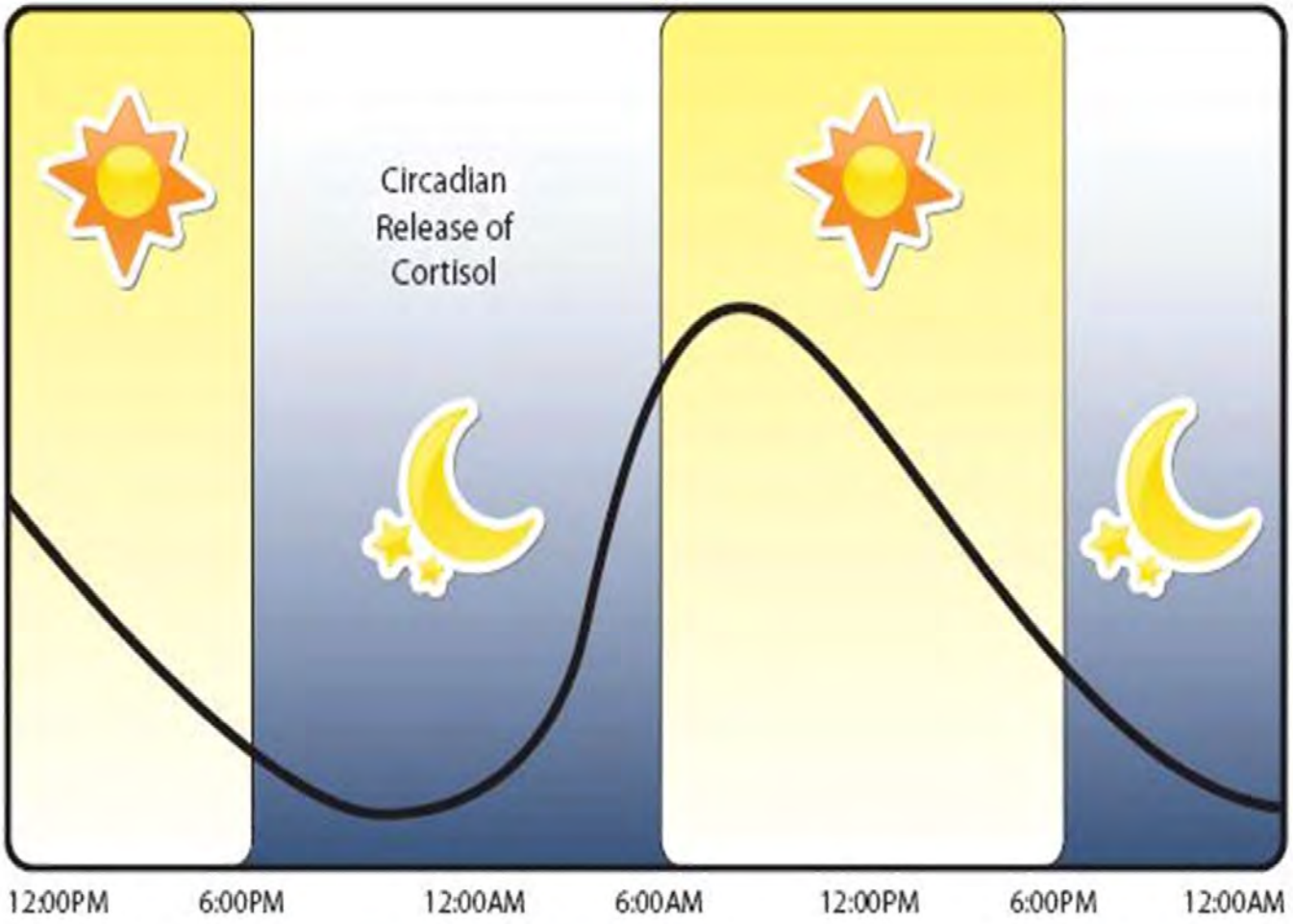
TEMPOS ACTUAIS – “NEVER OFFLINE”

- Os jovens na sociedade de hoje em dia são submetidas a **estilos de vida frenéticos, fatigantes e altamente desequilibradores.**
- Actualmente encontram-se muitos atletas que experimentam ao longo de uma época períodos de stress contínuo, proveniente de distúrbios emocionais (**necessidade de resultados desportivos e escolares**) e de agressões físicas como a **privação do sono, excesso de estimulantes ou cargas extremas sem a devida recuperação.**

A Healthy Cortisol Pattern



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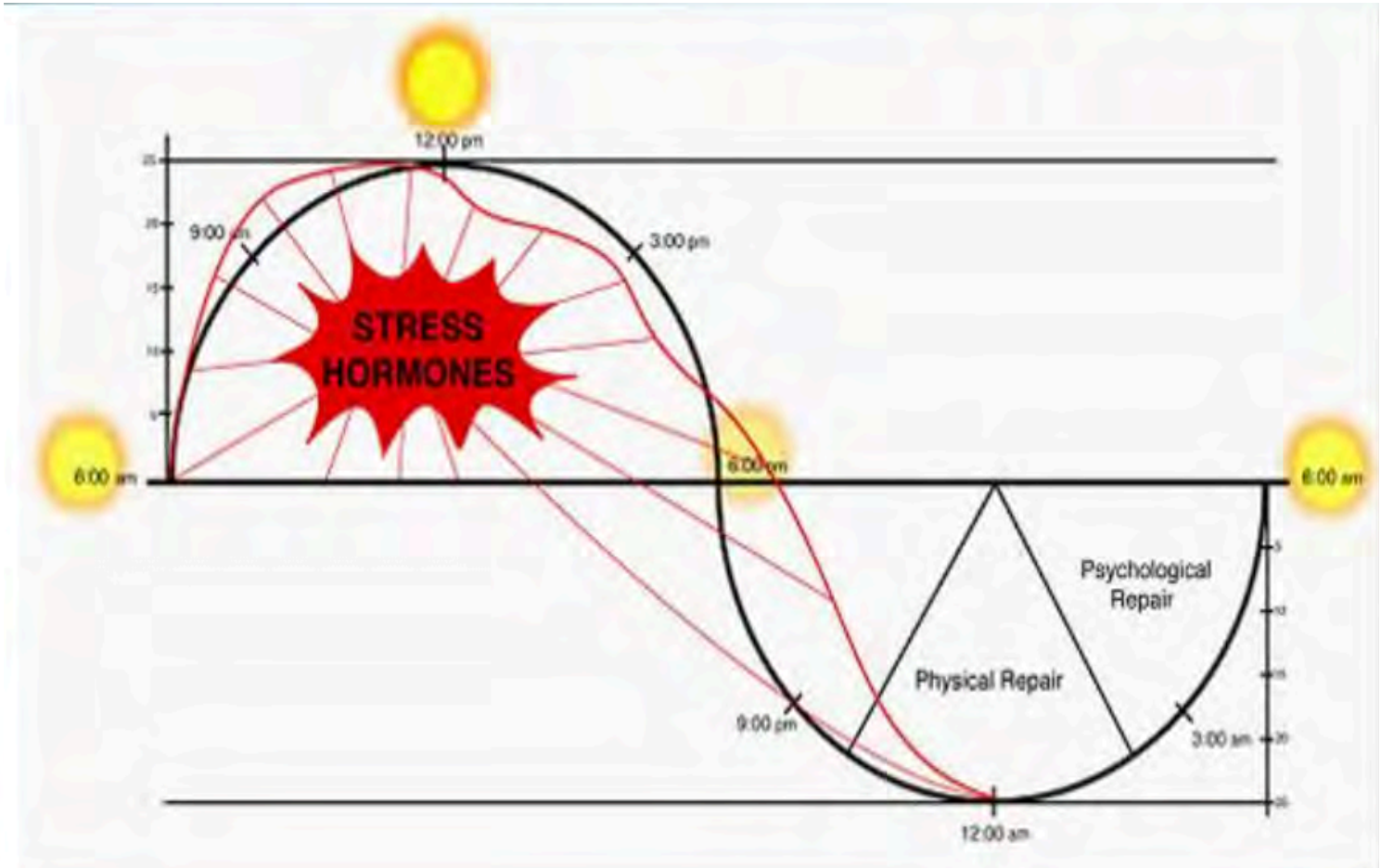
RITMO CIRCADIANO HORMONAL



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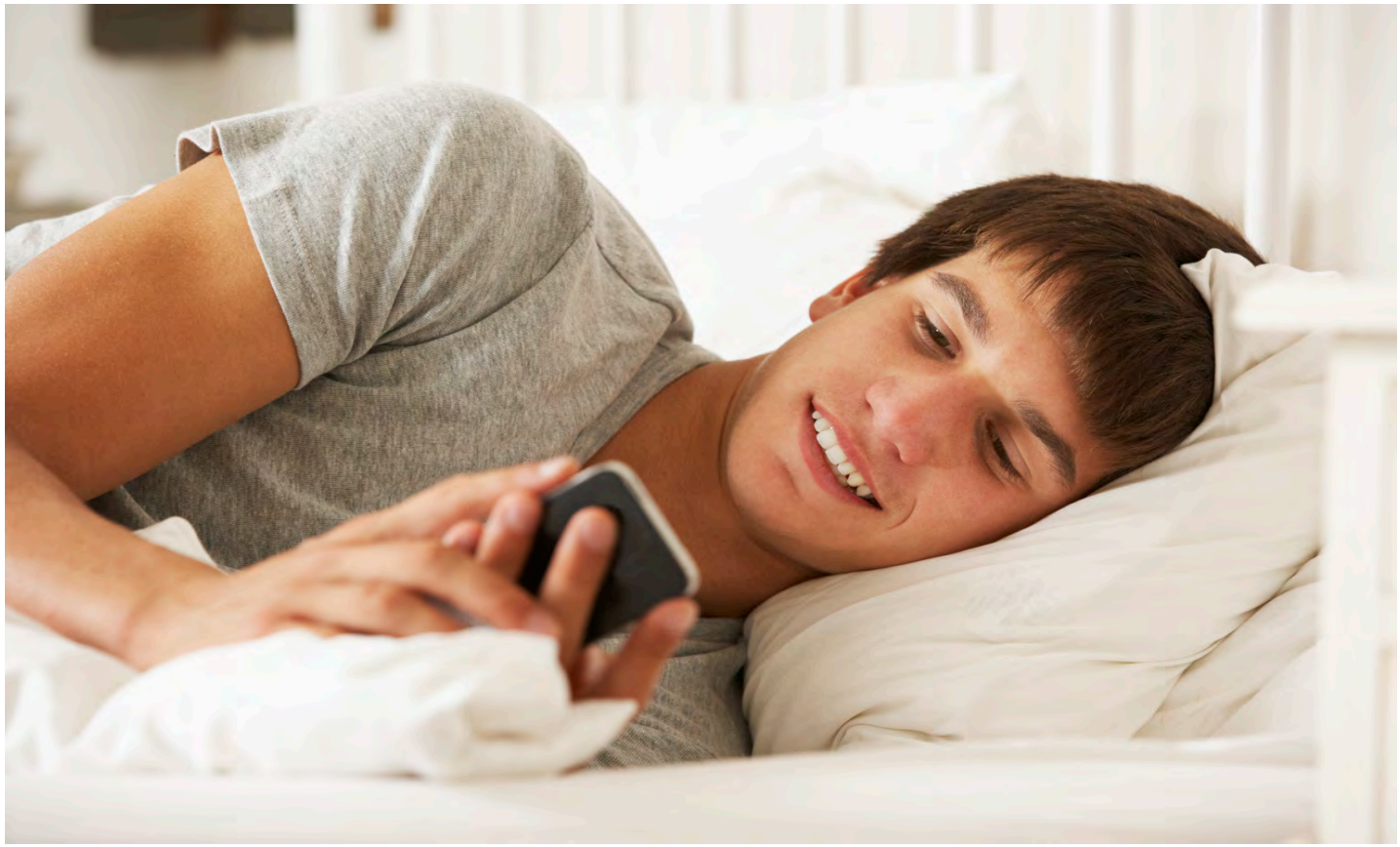
DISTÚRBIOS DE SONO



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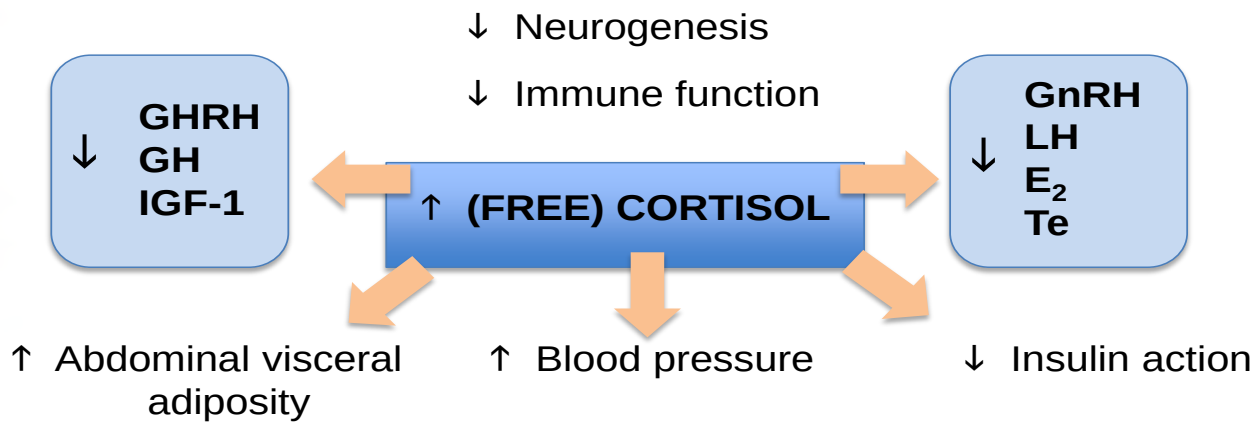
Clinical Effects of Excessive HPA axis Activation



OUTCOMES

(osteopenia, sarcopenia, syndrome X, cognitive decline, immunological compromise)

(fractures, frailty, cardiovascular disease, memory loss, infectious complications)

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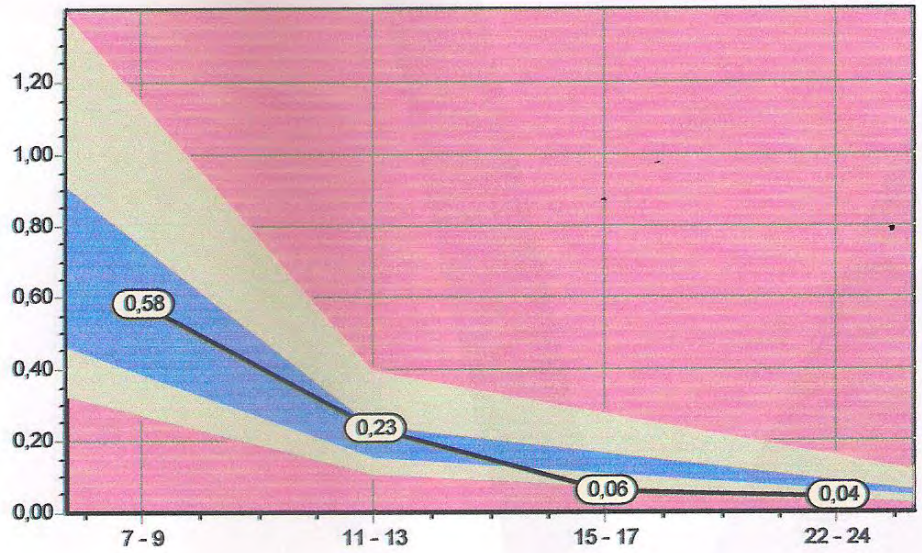
Posto: CMEP | Entidade: ADSE | Ben. Nº 001412930AP | Análise Nº FL00738
Médico: Dr. JAIME MILHEIRO | Nº Mec. 154227 | Data: 2014-09-11

ENDOCRINOLOGIA

29-05-2014

	Resultado / Unidades		Valores de Referência	(Resultados Anteriores)
Cortisol salivar (prova)				
7 a 9 horas	**0.58**	mcg/dL	0.27 - 1.18	0.37
11 a 13 horas	**0.23**	mcg/dL	0.10 - 0.41	0.23
15 a 17 horas	**0.06**	mcg/dL	0.05 - 0.27	0.15
22 a 24 horas	**0.04**	mcg/dL	0.03 - 0.14	0.09



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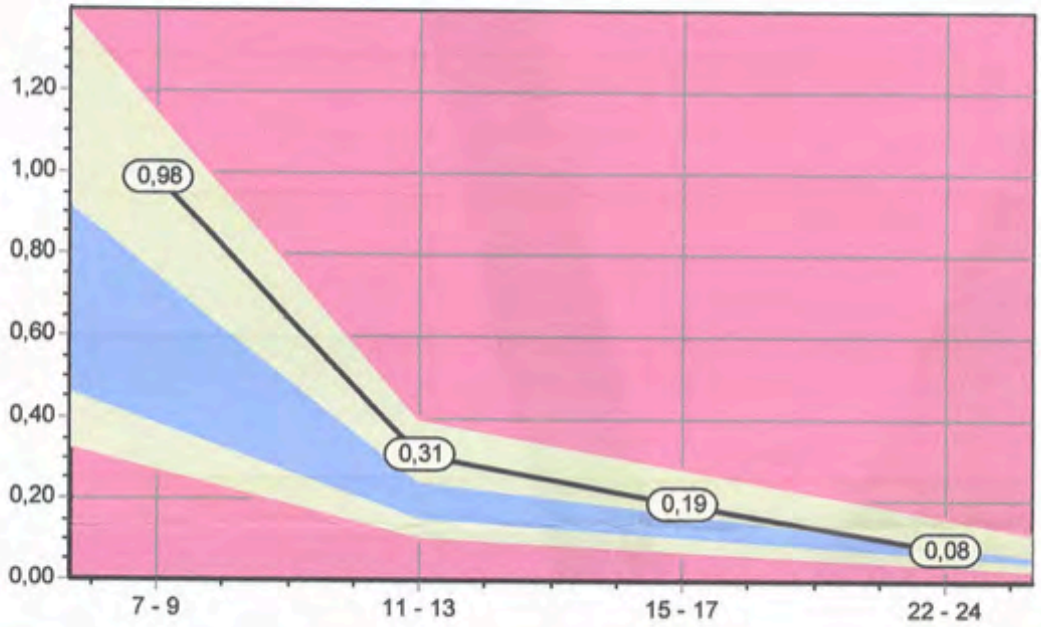
ENDOCRINOLOGIA

19-05-2017

Cortisol salivar (prova)

7 a 9 horas	**0.98**	mcg/dL	0.27 - 1.18	0.61
11 a 13 horas	**0.31**	mcg/dL	0.10 - 0.41	0.31
15 a 17 horas	**0.19**	mcg/dL	0.05 - 0.27	0.20
22 a 24 horas	**0.08**	mcg/dL	0.03 - 0.14	0.07



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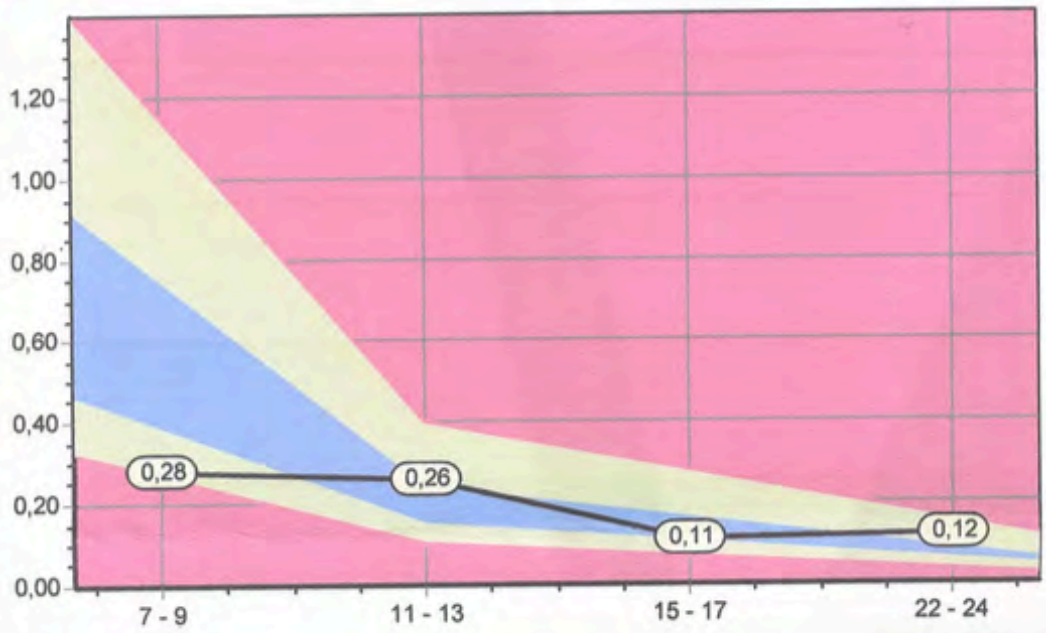
ENDOCRINOLOGIA

Cortisol salivar (prova)			
7 a 9 horas	**0.28**	mcg/dL	0.27 - 1.18
11 a 13 horas	**0.26**	mcg/dL	0.10 - 0.41
15 a 17 horas	**0.11**	mcg/dL	0.05 - 0.27
22 a 24 horas	**0.12**	mcg/dL	0.03 - 0.14



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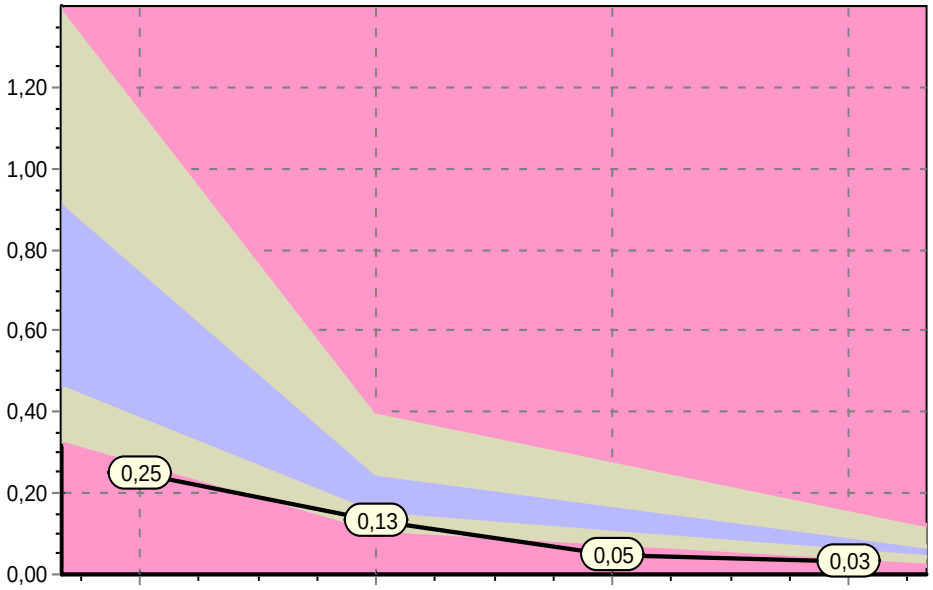
	Resultado / Unidades		Valores de Referência	(Resultados Anteriores)

ENDOCRINOLOGIA

Cortisol salivar (prova)

7 a 9 horas	**0.25**	mcg/dL	0.27 - 1.18
11 a 13 horas	**0.13**	mcg/dL	0.10 - 0.41
15 a 17 horas	**0.05**	mcg/dL	0.05 - 0.27
22 a 24 horas	**0.03**	mcg/dL	0.03 - 0.14



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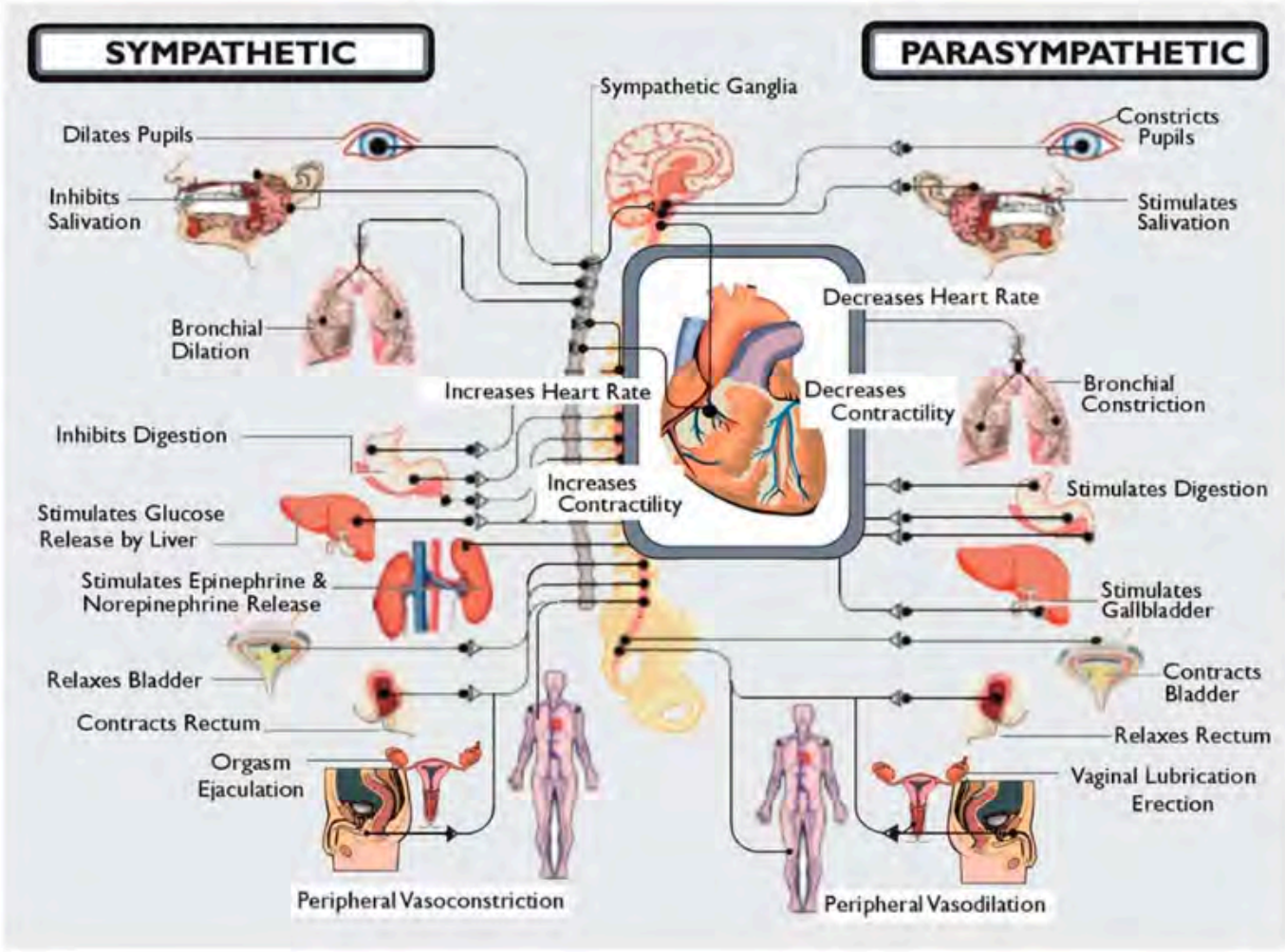

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HEART RATE VARIABILITY (HRV)

Heart Rate Variability

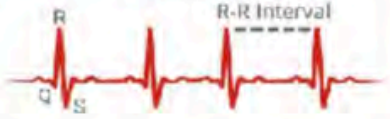
The inter-beat variability between successive heart contractions

Many regulatory mechanisms affect the heart

Short-term Mechanisms:
- Respiratory System
- Cardiovascular System
- Autonomic Nervous System

Long-term Mechanisms:
- Circadian rhythm
- Body Temperature
- Hormonal patterns
- Cumulative stressors

QRS complex is combination of 3 deflections on a typical ECG/EKG representing ventricular depolarization during a heart contraction



RR Intervals or **Inter-beat Intervals (IBI)** are time interval between the RR peaks used to calculate HRV

Not just Heart Rate!

Heart Rate (HR) measures the average beats per minute

HRV measures the change in time (or variability) between successive heart beats

Why is there variability?

Variability in heart rate is a result of the allostatic (adaptive) processes of the body’s response to stimuli or other regulatory processes within the body

Variability is good in biological systems

Heart Rate Variability is an accurate, non-invasive measure of the Autonomic Nervous System and therefore health

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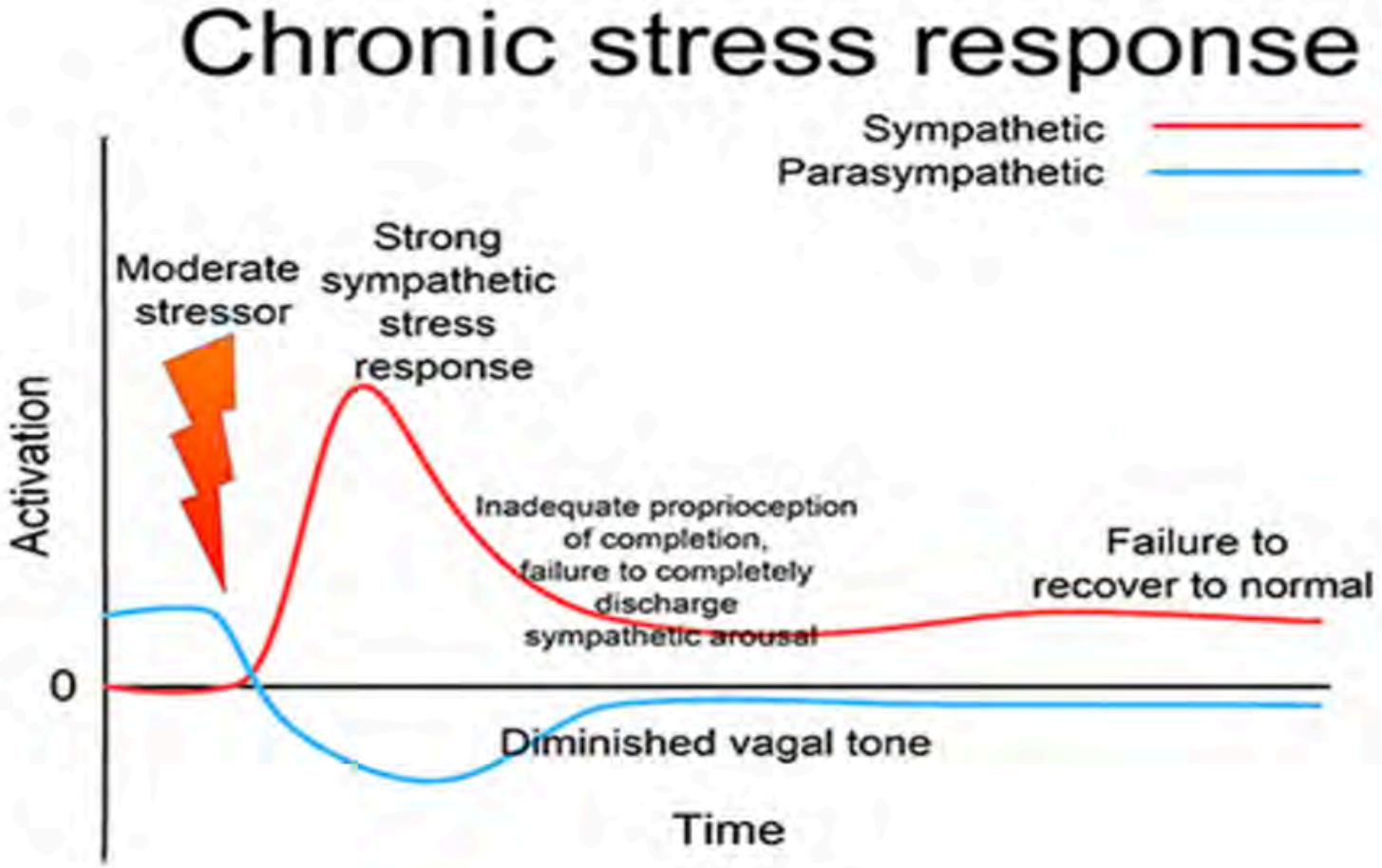
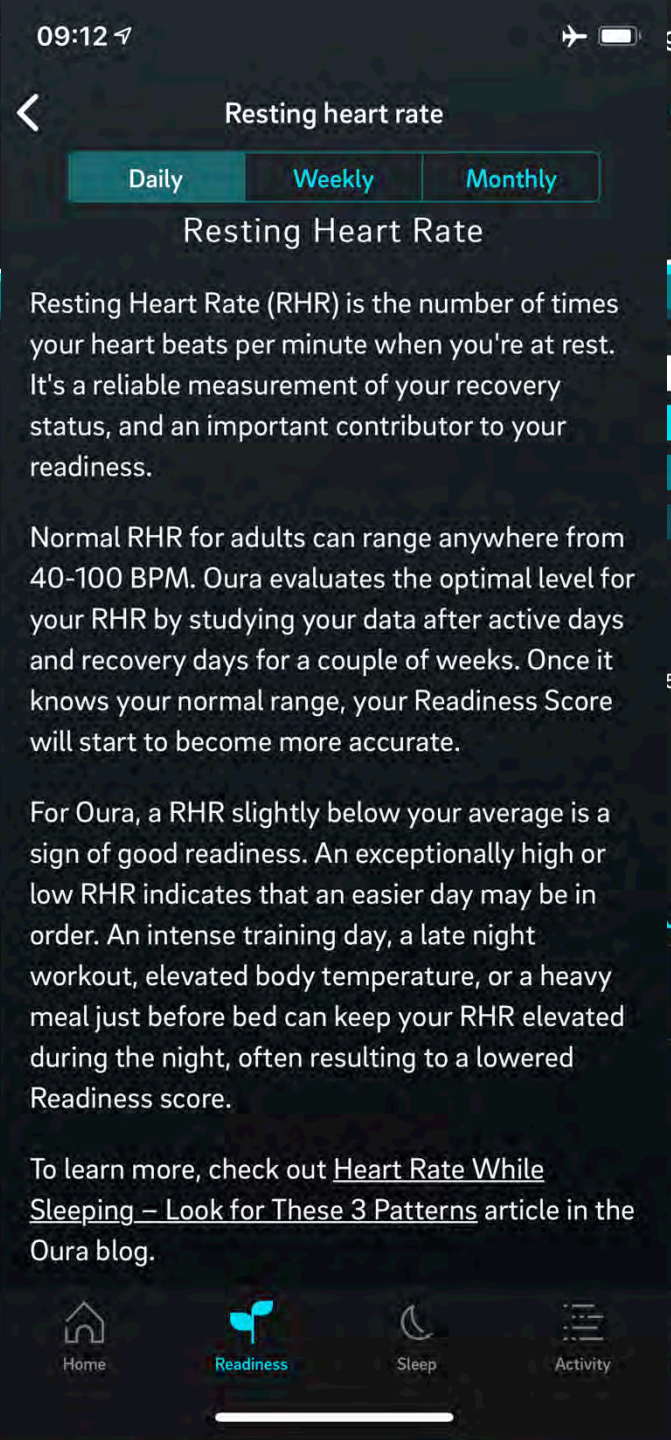
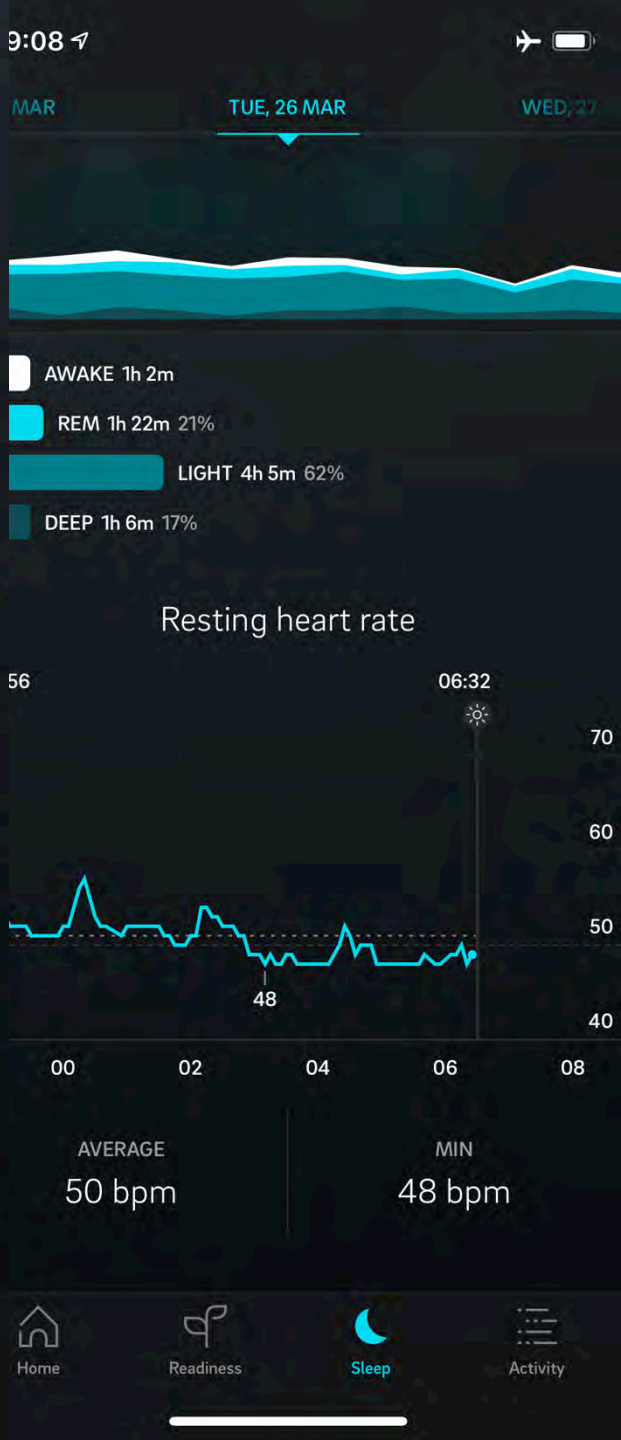
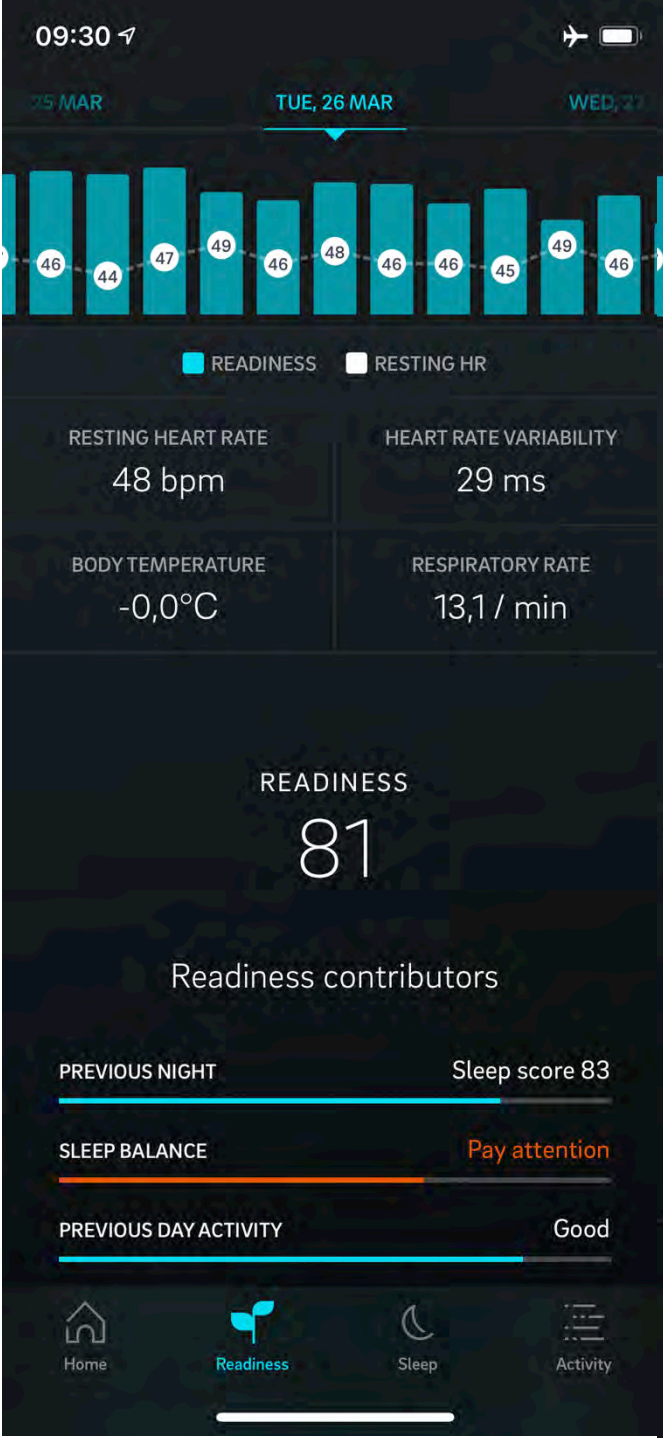


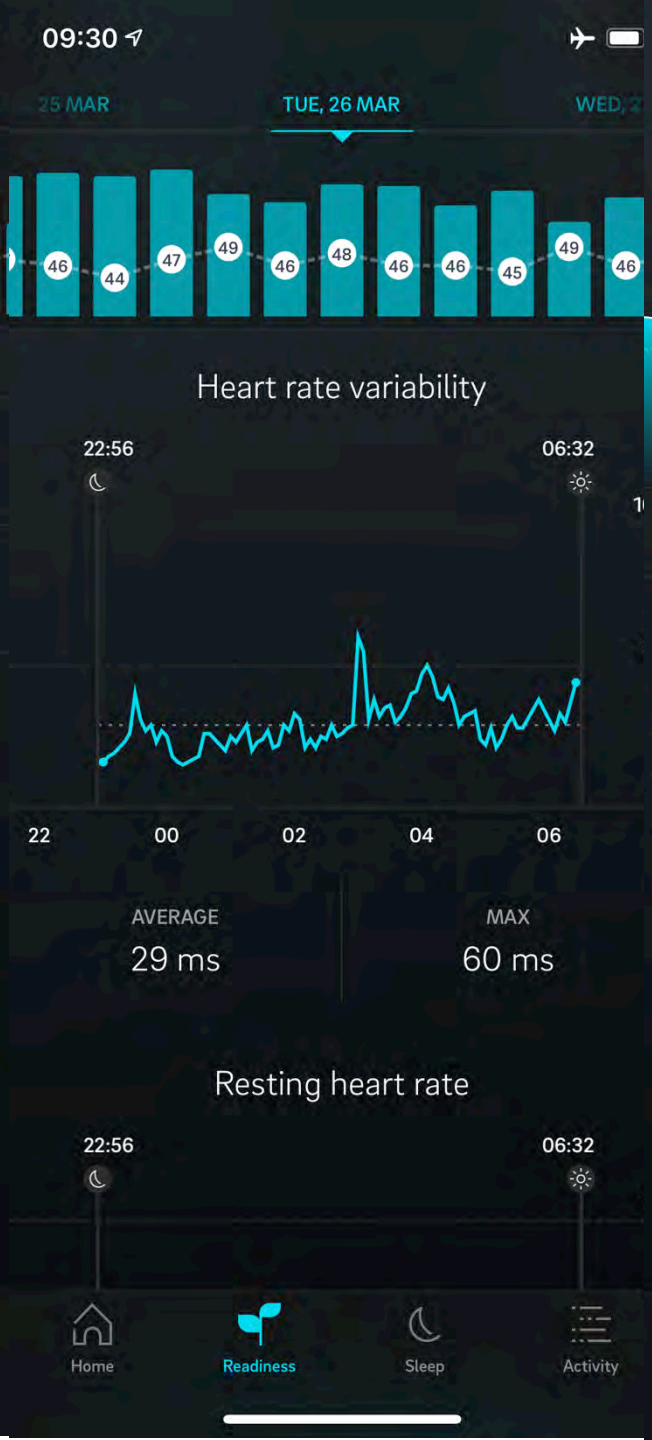
COMITÉ OLÍMPICO DE PORTUGAL

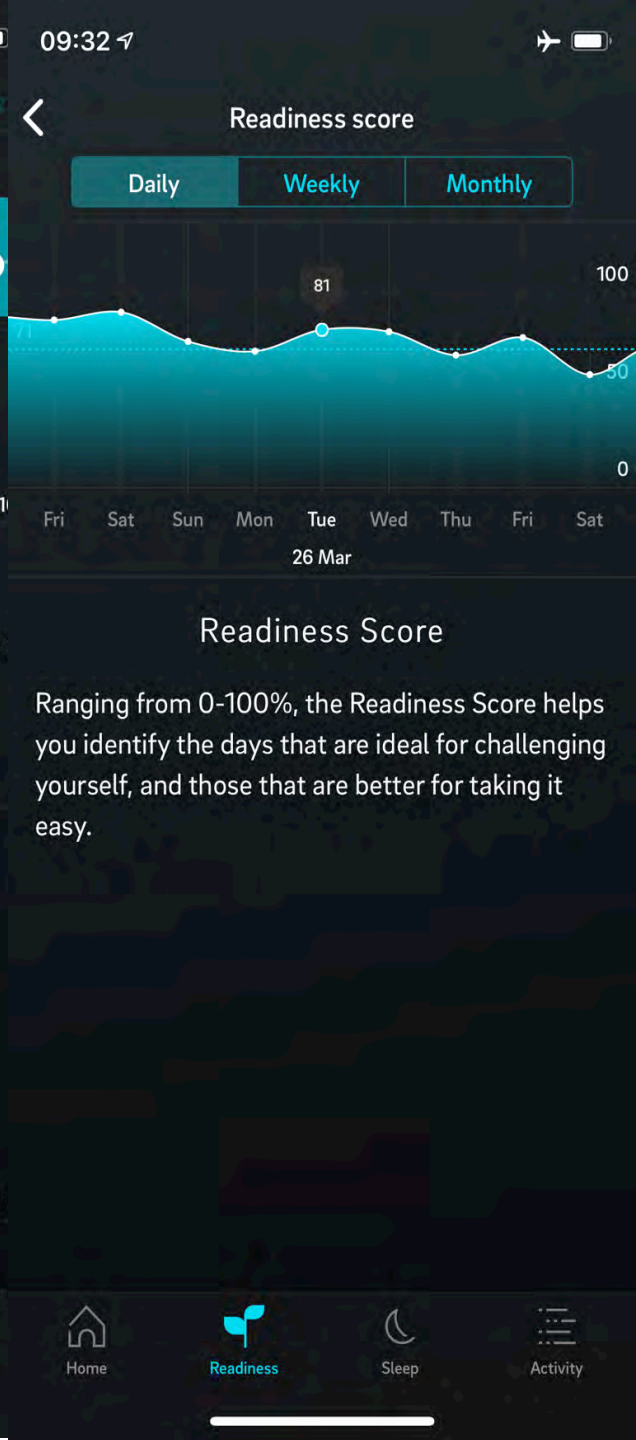

09:07
25 MAR
TUE, 26 MAR
WED, 27
SLEEP
83
Sleep contributors
TOTAL SLEEP 6h 34m
EFFICIENCY 86%
RESTFULNESS Good
REM SLEEP 1h 22m, 21%
DEEP SLEEP 1h 6m, 17%
LATENCY 16m
TIMING Optimal
Home
Readiness
Sleep
Activity


09:12
Resting heart rate
Daily
Weekly
Monthly
Resting Heart Rate
Resting Heart Rate (RHR) is the number of times your heart beats per minute when you're at rest. It's a reliable measurement of your recovery status, and an important contributor to your readiness.
Normal RHR for adults can range anywhere from 40-100 BPM. Oura evaluates the optimal level for your RHR by studying your data after active days and recovery days for a couple of weeks. Once it knows your normal range, your Readiness Score will start to become more accurate.
For Oura, a RHR slightly below your average is a sign of good readiness. An exceptionally high or low RHR indicates that an easier day may be in order. An intense training day, a late night workout, elevated body temperature, or a heavy meal just before bed can keep your RHR elevated during the night, often resulting to a lowered Readiness score.
To learn more, check out Heart Rate While Sleeping – Look for These 3 Patterns article in the Oura blog.
Home
Readiness
Sleep
Activity


9:08
MAR
TUE, 26 MAR
WED, 27
AWAKE 1h 2m
REM 1h 22m 21%
LIGHT 4h 5m 62%
DEEP 1h 6m 17%
Resting heart rate
56
06:32
70
60
50
40
48
00
02
04
06
08
AVERAGE
50 bpm
MIN
48 bpm
Home
Readiness
Sleep
Activity

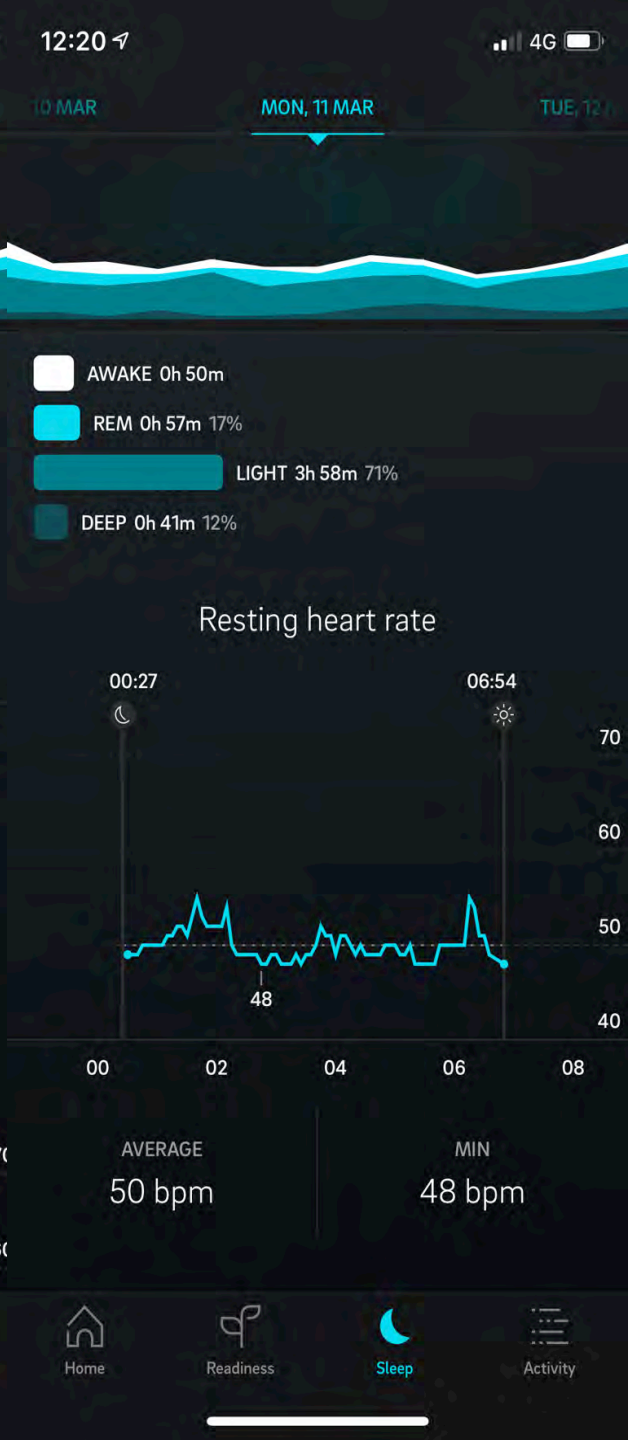

09:30
25 MAR
TUE, 26 MAR
WED, 27
46 44 47 49 46 48 46 46 45 49 46
READINESS
RESTING HR
RESTING HEART RATE
48 bpm
HEART RATE VARIABILITY
29 ms
BODY TEMPERATURE
-0,0°C
RESPIRATORY RATE
13,1 / min
READINESS
81
Readiness contributors
PREVIOUS NIGHT
Sleep score 83
SLEEP BALANCE
Pay attention
PREVIOUS DAY ACTIVITY
Good
Home
Readiness
Sleep
Activity


09:30
25 MAR
TUE, 26 MAR
WED, 27
46 44 47 49 46 48 46 46 45 49 46
Heart rate variability
22:56
06:32
22 00 02 04 06
AVERAGE
29 ms
MAX
60 ms
Resting heart rate
22:56
06:32
Home
Readiness
Sleep
Activity

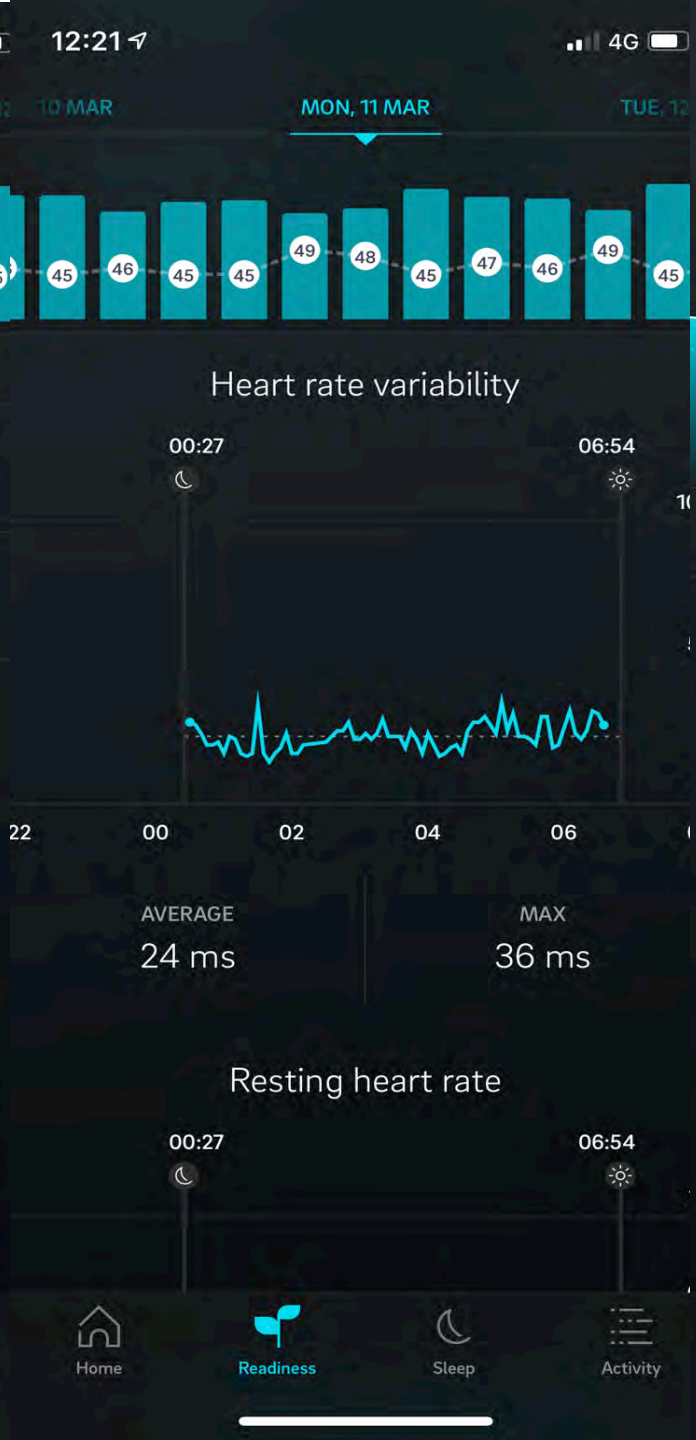

09:32
Readiness score
Daily
Weekly
Monthly
81
100
50
0
Fri Sat Sun Mon Tue Wed Thu Fri Sat
26 Mar
Readiness Score
Ranging from 0-100%, the Readiness Score helps you identify the days that are ideal for challenging yourself, and those that are better for taking it easy.
Home
Readiness
Sleep
Activity

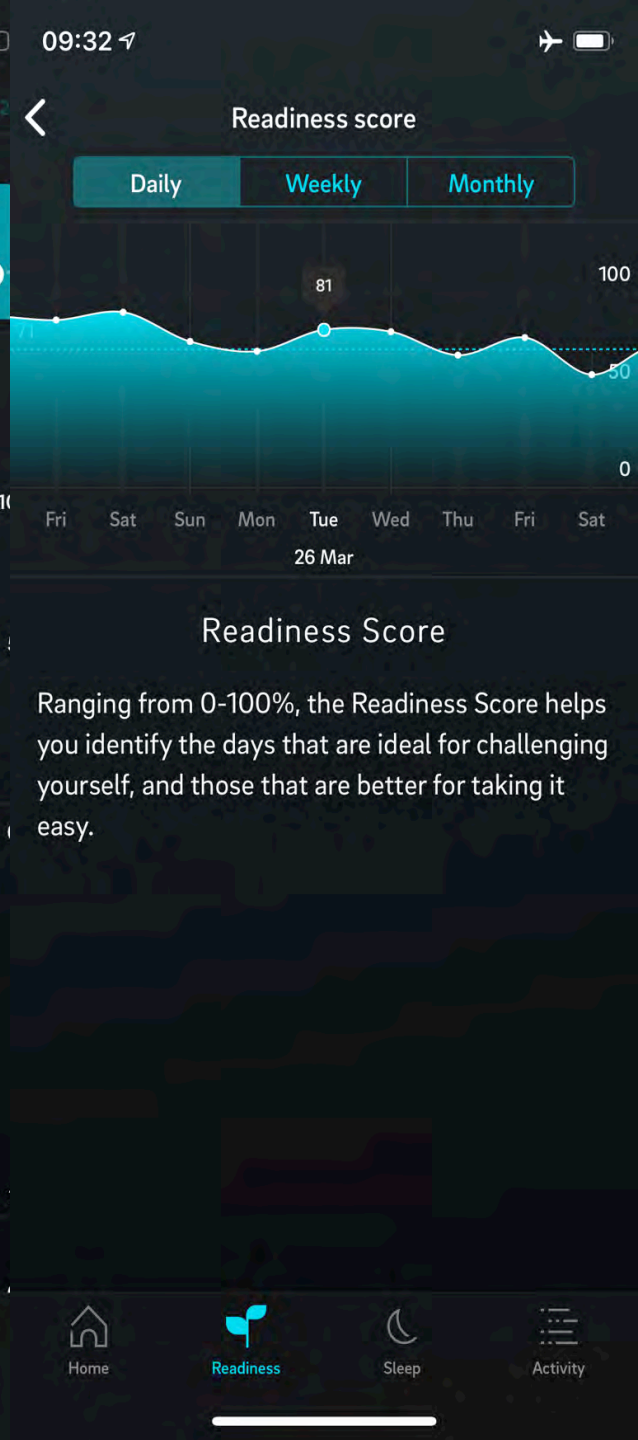

12:20
4G
10 MAR
MON, 11 MAR
TUE, 12
SLEEP
69
Sleep contributors
TOTAL SLEEP 5h 37m
EFFICIENCY 87%
RESTFULNESS Good
REM SLEEP 0h 57m, 17%
DEEP SLEEP 0h 41m, 12%
LATENCY 2m
TIMING Good
Home
Readiness
Sleep
Activity


12:20
4G
10 MAR
MON, 11 MAR
TUE, 12
Sleep stages
00:27
06:54
00
02
04
06
08
AWAKE 0h 50m
REM 0h 57m 17%
LIGHT 3h 58m 71%
DEEP 0h 41m 12%
Resting heart rate
00:27
06:54
Home
Readiness
Sleep
Activity


12:20
4G
10 MAR
MON, 11 MAR
TUE, 12
AWAKE 0h 50m
REM 0h 57m 17%
LIGHT 3h 58m 71%
DEEP 0h 41m 12%
Resting heart rate
00:27
06:54
70
60
50
40
48
00
02
04
06
08
AVERAGE
50 bpm
MIN
48 bpm
Home
Readiness
Sleep
Activity


12:21
4G
MON, 11 MAR
READINESS
RESTING HR
RESTING HEART RATE
48 bpm
HEART RATE VARIABILITY
24 ms
BODY TEMPERATURE
-0,1°C
RESPIRATORY RATE
13,2 / min
READINESS
68
Readiness contributors
PREVIOUS NIGHT
Sleep score 69
SLEEP BALANCE
Pay attention
PREVIOUS DAY ACTIVITY
Pay attention
Home
Readiness
Sleep
Activity


12:21
4G
MON, 11 MAR
Heart rate variability
00:27
06:54
22
00
02
04
06
AVERAGE
24 ms
MAX
36 ms
Resting heart rate
00:27
06:54
Home
Readiness
Sleep
Activity


09:32
Readiness score
Daily
Weekly
Monthly
81
100
50
0
Fri
Sat
Sun
Mon
Tue
Wed
Thu
Fri
Sat
26 Mar
Readiness Score
Ranging from 0-100%, the Readiness Score helps you identify the days that are ideal for challenging yourself, and those that are better for taking it easy.
Home
Readiness
Sleep
Activity

…e não reabastecer o corpo devidamente – leva ao esgotamento das reservas Coenzima Q10, crómio, magnésio…

DIAGNÓSTICO PRECOCE

- O diagnóstico precoce e objectivo desta condição **é determinante para a melhor resposta terapêutica**, necessitando de uma vigilância forte da equipa multidisciplinar de apoio ao atleta.

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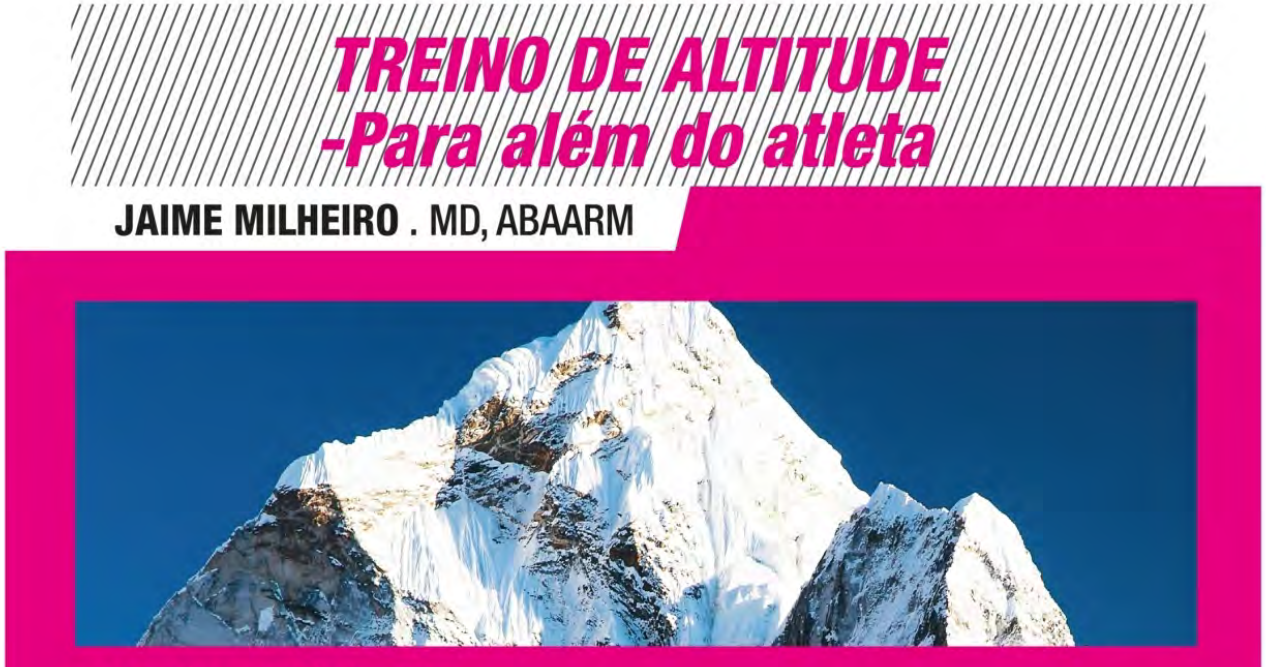
Scotty, we need more power!

I'm givin' her all she's got captain!

Obrigado!



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