



NSCA
COACHES
CONFERENCE 2022

JANUARY 6 – 8, 2022

San Antonio, TX & Online | 2.0 CEUs

Matt Crawley, MS, CSCS*D, RSCC

*Strategies to Target the Undervalued Ergogenic
Aid of Sleep in Elite Athletes*

#NSCACoaches22

Quick Background

Currently serve as a Performance Coach | Combat Sports Manager | Research Lead for Sports Academy at the Star in Frisco

- Former S&C Coach for the UFC
- Interdisciplinary approach
- PhD program & knowledge sharing promotion



CONFLICT OF INTEREST STATEMENT

I have had in the past 2 years an affiliation with UFC and Oura around this presentation, including:

- Corporate sponsorship
- Data collection

Gratification

Much appreciation for the support from everyone

- Attendees & Speakers!
- NSCA, Eric McMahon, Matt Sandstead, & Staff
- Dr. Schilling
- Coach Leyva-Camberos & Coach Baladi
- UFC PI staff and MMA athletes
- Sports Academy

Objectives

1. Background of sleep health and issues in athletes
2. Sleep health resources for practitioners
3. Case studies of MMA fighters with Oura ring
4. Practitioners sleep toolbox
5. Take home messages

Poll Question 1

Why is sleep important for sport performance?

“Scientists have discovered a revolutionary new treatment that makes you live longer. It enhances your memory, makes you more attractive. It keeps you slim and lowers food cravings. It protects you from cancer and dementia. It wards off colds and flu. It lowers your risk of heart attacks and stroke, not to mention diabetes. You’ll even feel happier, less depressed, and less anxious. Are you interested?”

-Dr. Matthew Walker (Why We Sleep)

Sleep- An Ergogenic Aid

Ergogenic aid- “mechanical, nutritional, pharmacological, physiological and psychological tools that athletes use to increase energy, performance and recovery, (Marcus, 2013)”

- **How can this be related to sleep?**
- **Consider its influences combined with nutrition and physical qualities (80/20 principle)**

Sleep Key Points



- **Sleep is essential for the human body**
 - Energy & focus, sport performance, health & well-being
- **Abundance of research in sleep provides emerging awareness for athletes and performance staff**
- **Use evidence- and anecdotal-based strategies to implement sleep-enhancing practices**

Sleep Health Considerations for Elite Athletes

- Athlete sleep health overview
 - Why is it so important?! **Sleep = Recovery**
- Sleep issues in athletes
 - Contextual challenges in sport
 - Sleep deprivation, hygiene & total sleep



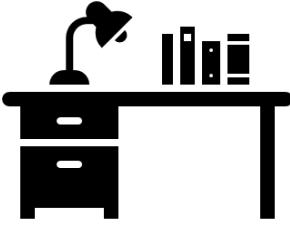
Quick Facts

Short- and long-term sleep deprivation

1. Neurobehavioral deficits (AASM, 2021)
2. Lapses of attention (AASM, 2021)
3. Depressed mood (AASM, 2021)
4. Metabolic dysfunction
5. Performance decrements

Sleep Research in Athletes

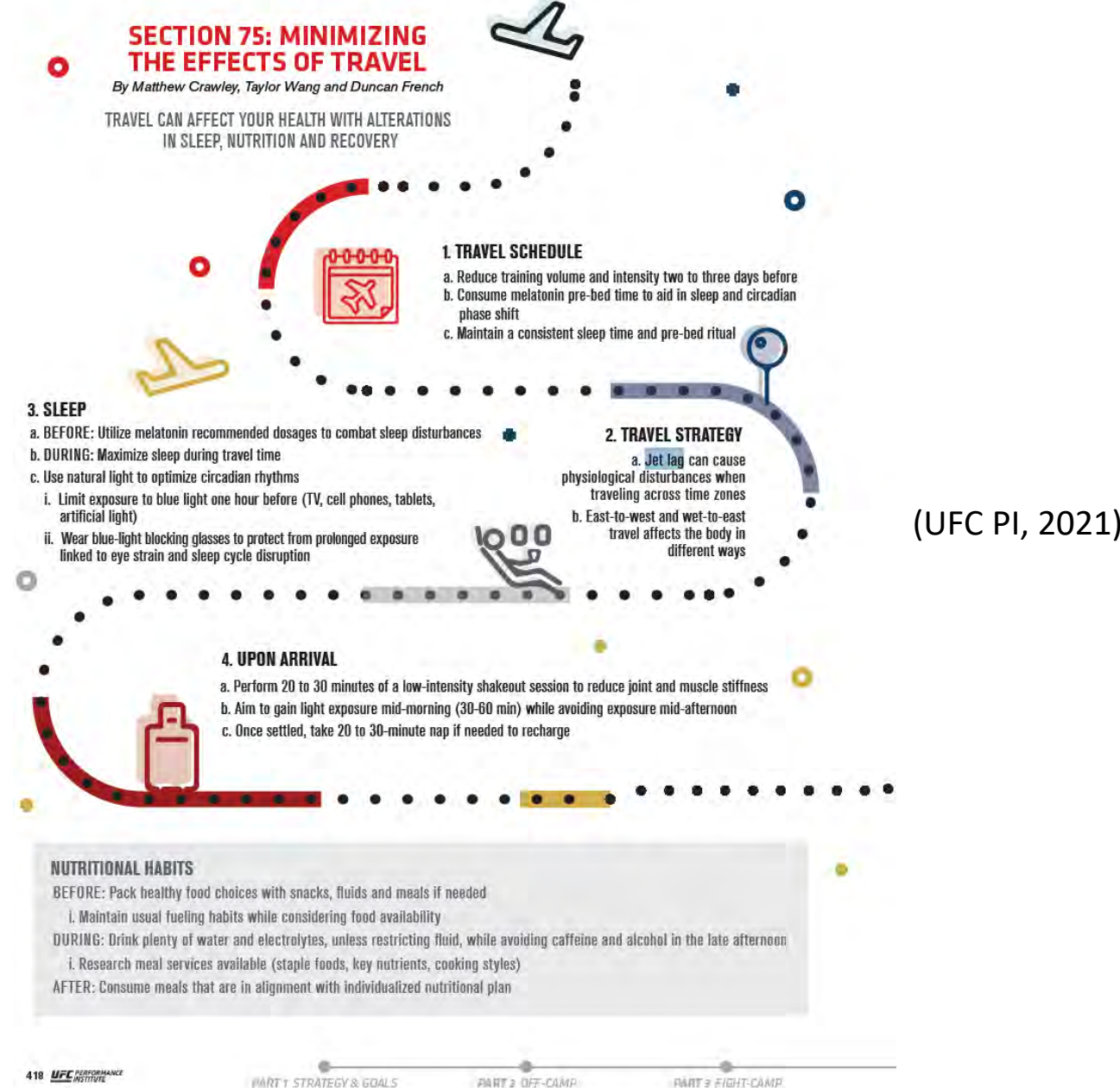
What the research has been saying



- According to Walsh et al. (2021) elite athletes are susceptible to habitual sleep of **<7 hrs/night.**
- Sargent et al. (2021) found individual & team sports to **avg 6.7 ± 0.8 hrs of total sleep.**
- Ritland et al. (2018) identified tactical athletes **avg ~6 hrs 11 min of total sleep.**
- Lastella et al. (2015) found elite athletes **avg ~6 hrs 30 min hrs of total sleep.**
- Sargent et al. (2014) found elite athletes **avg ~6 hrs 30 min of total sleep.**
- While general population adults are recommended to attain 7-9 hrs, athletes require more- ~9-10 hrs (Bonnar et al., 2019; CDC, 2014; Hale et al., 2020).

Causes of Sleep Deprivation

- Despite the evidence to obtain sufficient sleep, sleep disturbances are common
 - Training schedule –training load
 - Jet lag
 - Travel
 - Nutritional habits
 - Electronics use



(UFC PI, 2021)

Need for Sleep Health Education

Purpose: Twofold

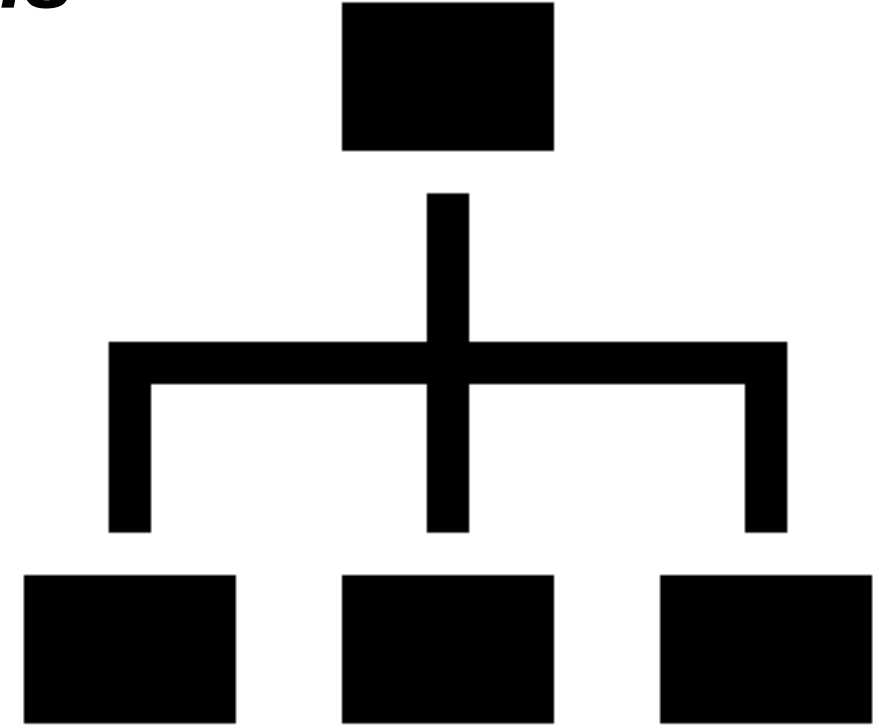
1. Provide a sleep health education framework to increase sleep health knowledge
2. Evaluate effectiveness of sleep health education with appropriate planning and implementation of program(s)

Poll Question 2

- How are you providing athlete sleep health education?
- What can we do better?!

Sleep Health Program Considerations

- **Sleep measurement tools**
 - Questionnaires (subjective) vs. wearables (objective)
- **Plan, implementation, & evaluation**
- **Planning committee**



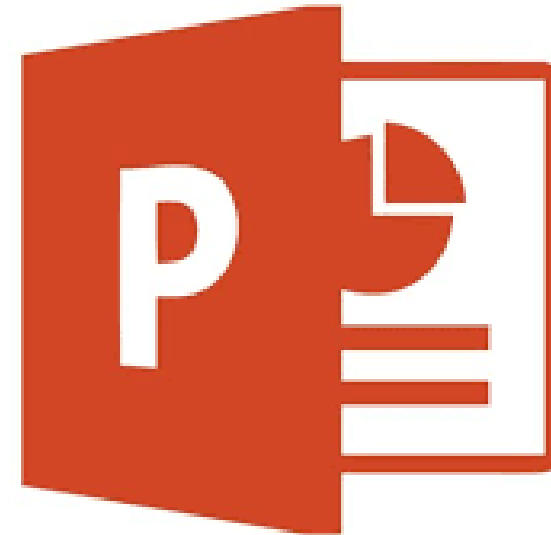
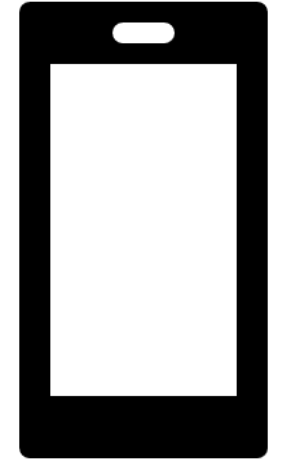
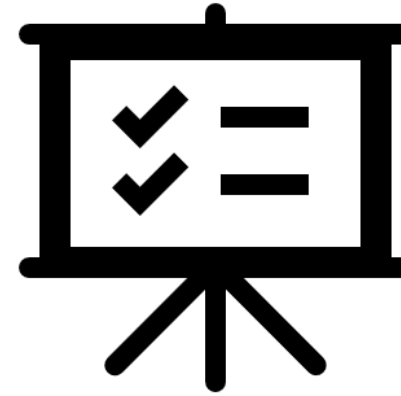
Components for Sleep Health Education

- **Educational materials**
 - Knowledge-sharing and awareness strategies
- **Intervention methods**
 - Health education & behavior modification models
- **Needs assessment / screening**
 - Quantitative vs. qualitative measurements

Educational Materials

- **Sleep health programs** (UFC PI SHP Proposal)

- *Objective timelines*
- *Presentation/PowerPoint*
- *Handouts*
- *Check-ins*



Sleep Health Resources

Organizations

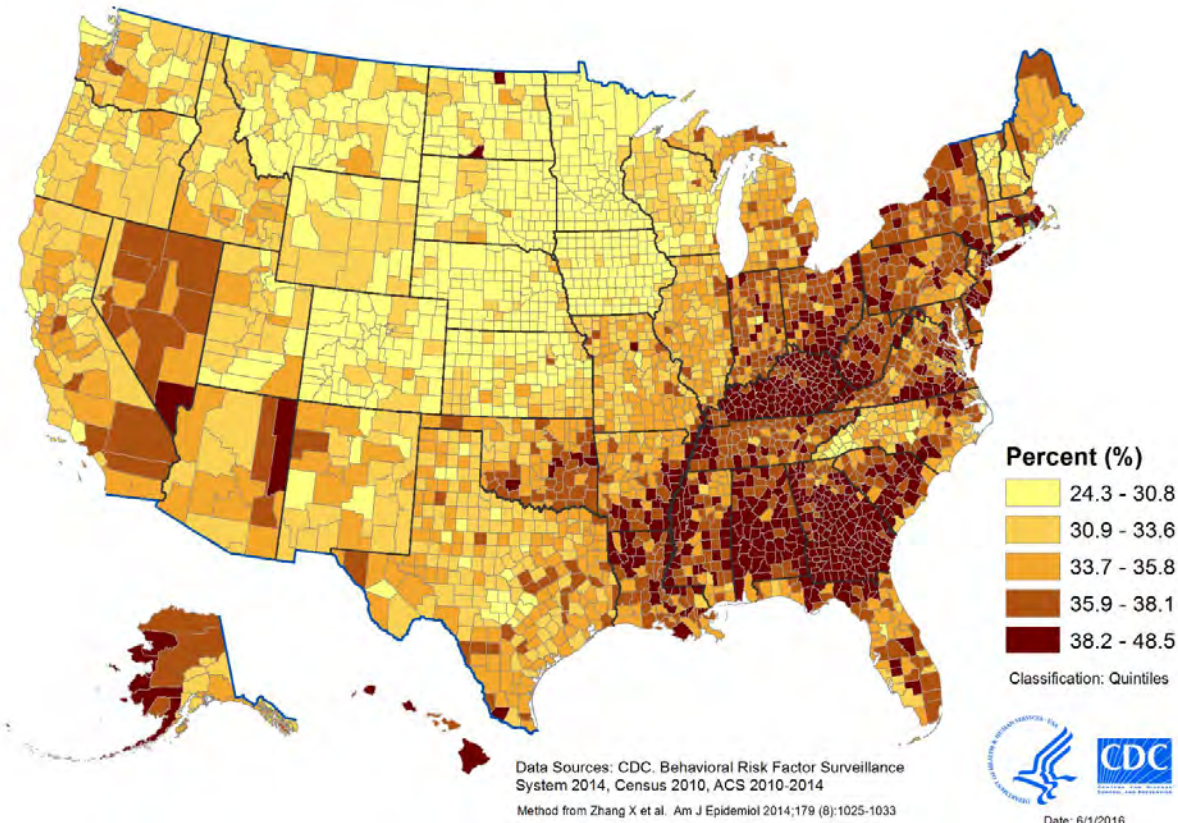
- American Academy of Sleep Medicine (AASM)
 - <https://aasm.org/professional-development/choose-sleep/sleep-medicine-elective-toolkit/>
- National Sleep Foundation
 - <http://www.sleepeducation.org/>
- Centers for Disease Control and Prevention (CDC)
 - <https://www.cdc.gov/sleep/index.html>
- Centre for Sleep (ASSQ)
 - <https://centreforsleep.com/education-and-awareness/athlete-sleep-screening-questionnaire/>
- Sleep Foundation
 - <https://www.sleepfoundation.org/how-sleep-works/sleep-facts-statistics>

Other

- WVU Rockefeller Neuroscience Institute
- Dr. Matt Walker
 - Sleep science MasterClass
- Dr. Huberman of Huberman Lab Podcast
 - <https://hubermanlab.com/>

Data and Statistics

Figure 2. Prevalence of Short Sleep Duration (<7 hours) for Adults Aged ≥ 18 Years, by County, United States, 2014



Fact Sheets

SLEEP

Sleep and Health Among Adults in NEVADA

Sufficient sleep is essential for a healthy lifestyle

How much sleep do adults need?
Adults should sleep 7 or more hours each night for optimal health.¹ Insufficient sleep (or short sleep) is defined as less than 7 hours of sleep daily. More than a third of U.S. adults report insufficient sleep.²

What are the consequences of not getting enough sleep?
Not getting enough sleep is associated with an increased risk for a number of chronic diseases and conditions:¹

- Diabetes
- Cardiovascular disease
- Stroke
- Obesity
- Depression

Not getting enough sleep also contributes to motor vehicle crashes and machinery-related injuries, causing substantial injury and disability each year.³

What are 5 health behaviors for preventing chronic disease?
Five health behaviors have been identified as being key for preventing chronic disease⁴:

- Not smoking
- Regular physical activity
- Moderate⁵ or no alcohol consumption
- Maintaining a healthy weight
- **Daily sufficient sleep (7 or more hours)**

Why don't adults get the sleep they need?
Causes of insufficient sleep include lifestyle (like inconsistent bedtimes and using technology late at night) and occupational factors (like shift work or long work hours).² In addition, some medical conditions, medications, and sleep disorders like sleep apnea affect how long and how well you sleep.³

1. Watson NF, Badr MS, Belenky G, et al. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. Sleep 2015;38:843-4.
2. Liu Y, Wheaton AG, Chapman DP, et al. Prevalence of healthy sleep duration among adults - United States, 2014. MMWR Morb Mortal Wkly Rep 2016;65:137-141.
3. Institute of Medicine. Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem. Washington, DC: The National Academies Press; 2006.
4. Liu Y, Croft JB, Wheaton AG, et al. Clustering of five health-related behaviors for chronic disease prevention among adults, United States, 2013. Prev Chronic Dis 2016;13:160064.
5. Up to one drink per day for women and two drinks per day for men - only by adults of legal drinking age. Individuals who do not drink alcohol should not start drinking for any reason. 2015-2020 Dietary Guidelines for Americans.

National Center for Chronic Disease Prevention and Health Promotion
Division of Population Health

CS260267 November 2016

Sleep Measurement Tools

- **Wearables**
- **Questionnaires, diaries & surveys**
 - Athlete Sleep Screening Questionnaire (ASSQ)
 - Athlete Sleep Behavior Questionnaire (ASBQ)
 - (Stone et al., 2020)
- **Clinical settings** (when in doubt, refer out)

Appendix A.

Athlete Sleep Screening Questionnaire (ASSQ)

INSTRUCTIONS

The following questions relate to your sleep habits. Please circle the best answer which you think represents your typical sleep habits over the recent past. For all questions, circle a letter from 'a' to 'e' unless otherwise specified.

1. During the recent past, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
 - a. 5 to 6 hours
 - b. 6 to 7 hours
 - c. 7 to 8 hours
 - d. 8 to 9 hours
 - e. more than 9 hours
2. How many naps per week do you take?
 - a. none
 - b. once or twice
 - c. three or four times
 - d. five to seven times
3. How satisfied/dissatisfied are you with the quality of your sleep?
 - a. very satisfied
 - b. somewhat satisfied
 - c. neither satisfied nor dissatisfied
 - d. somewhat dissatisfied
 - e. very dissatisfied
4. During the recent past, how long has it usually taken you to fall asleep each night?
 - a. 15 minutes or less
 - b. 16 – 30 minutes
 - c. 31 – 60 minutes
 - d. longer than 60 minutes
5. How often do you have trouble staying asleep?
 - a. none
 - b. once or twice per week
 - c. three or four times per week
 - d. five to seven days per week



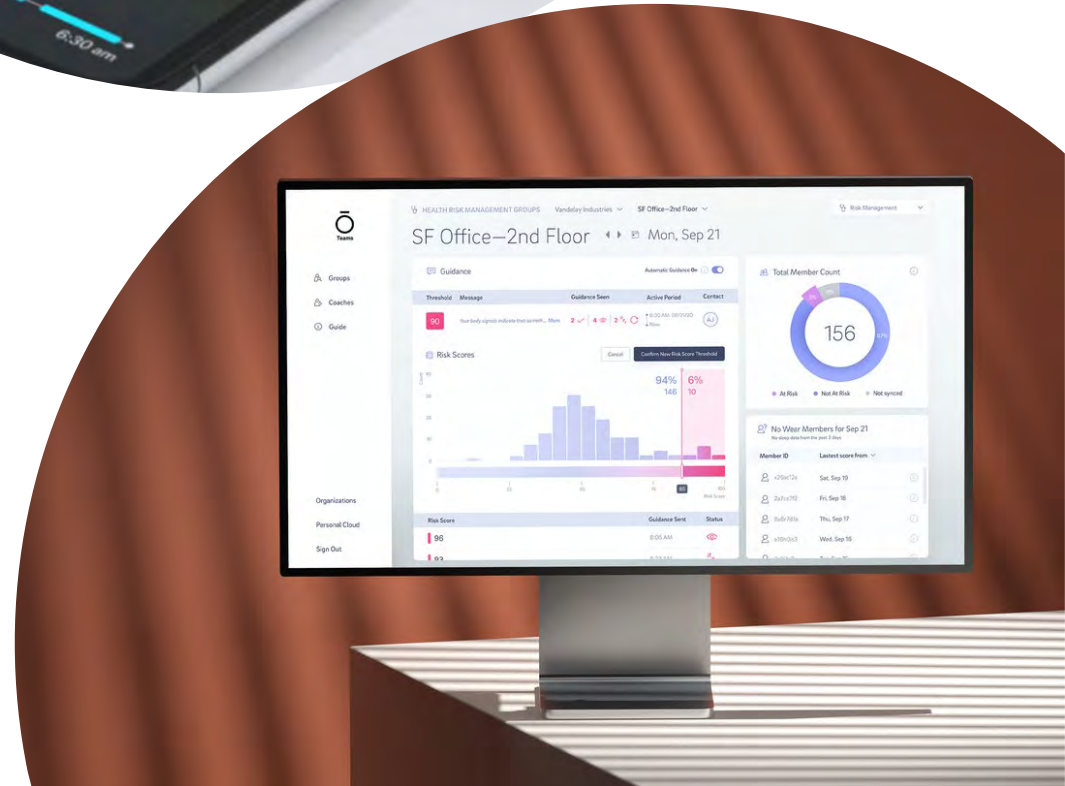
Oura Smart Ring

- **Benefits**

- Sleep monitoring
- Readiness
- Illness detection

- **Limitations**

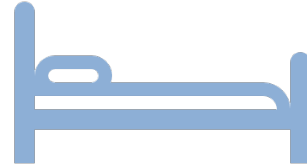
- Price
- Wearable location (for training)
- Charging/daily uploads/misplacing



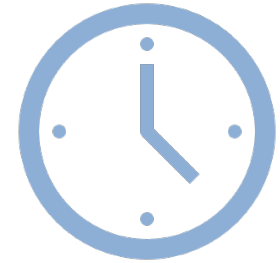
Sleep Health Metrics



Total sleep: amount of time spent in light, REM and deep sleep



Sleep efficiency: % of time asleep compared to time awake

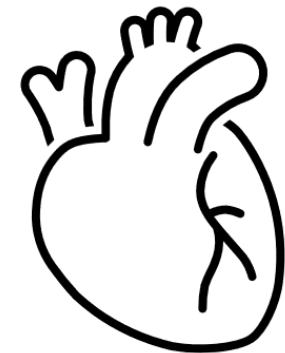


Sleep latency: amount of time it takes to fall asleep

Readiness Metrics



- Heart rate variability (HRV)
- Resting heart rate (RHR)

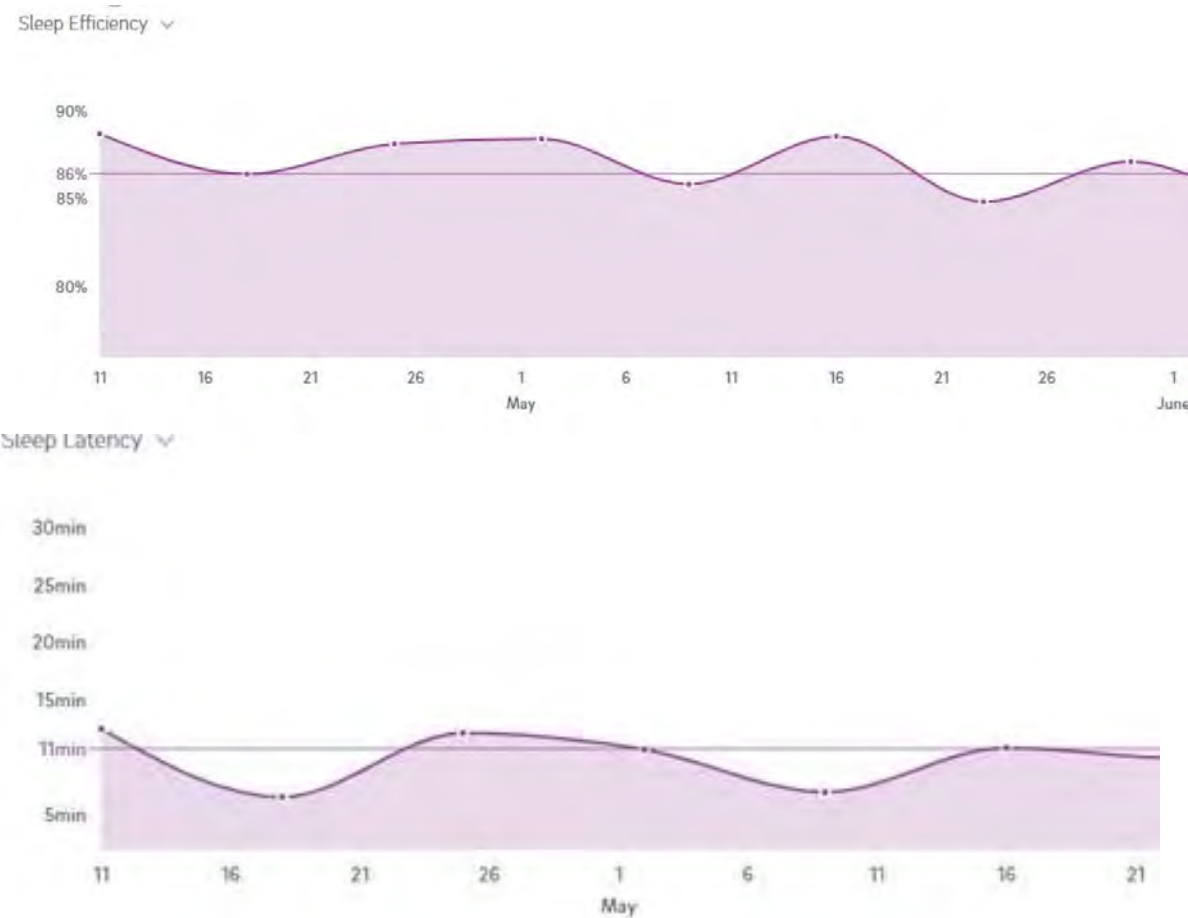


- Professional UFC fighters
- Discuss sleep variables
 - Total sleep, sleep efficiency & sleep latency
- Discuss readiness variables
 - RHR, HRV
- Considerations for performance and recovery

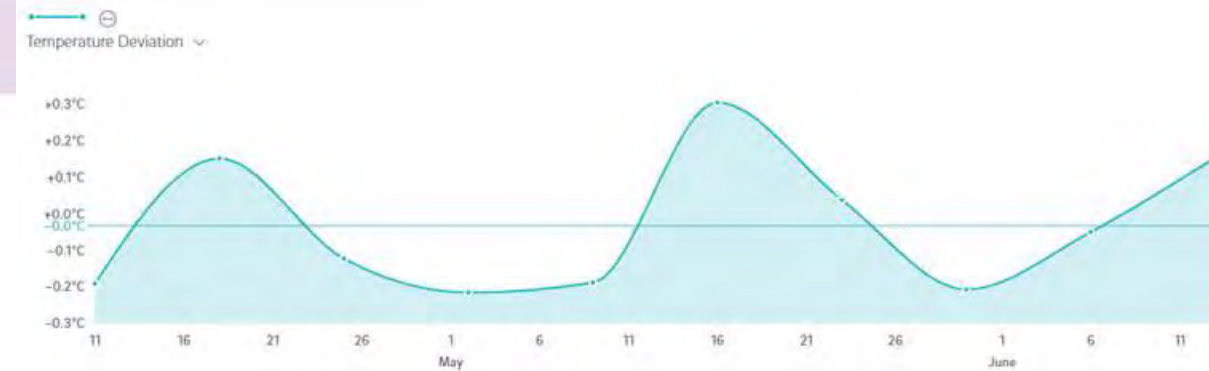
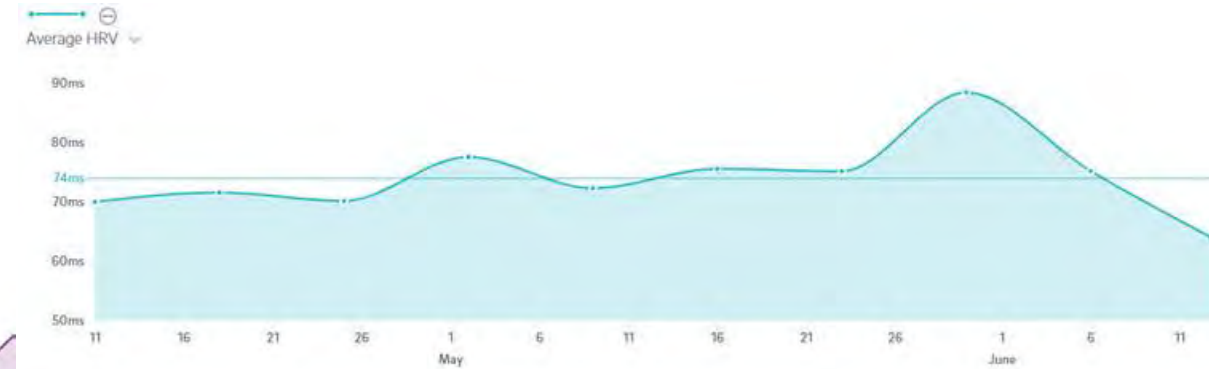
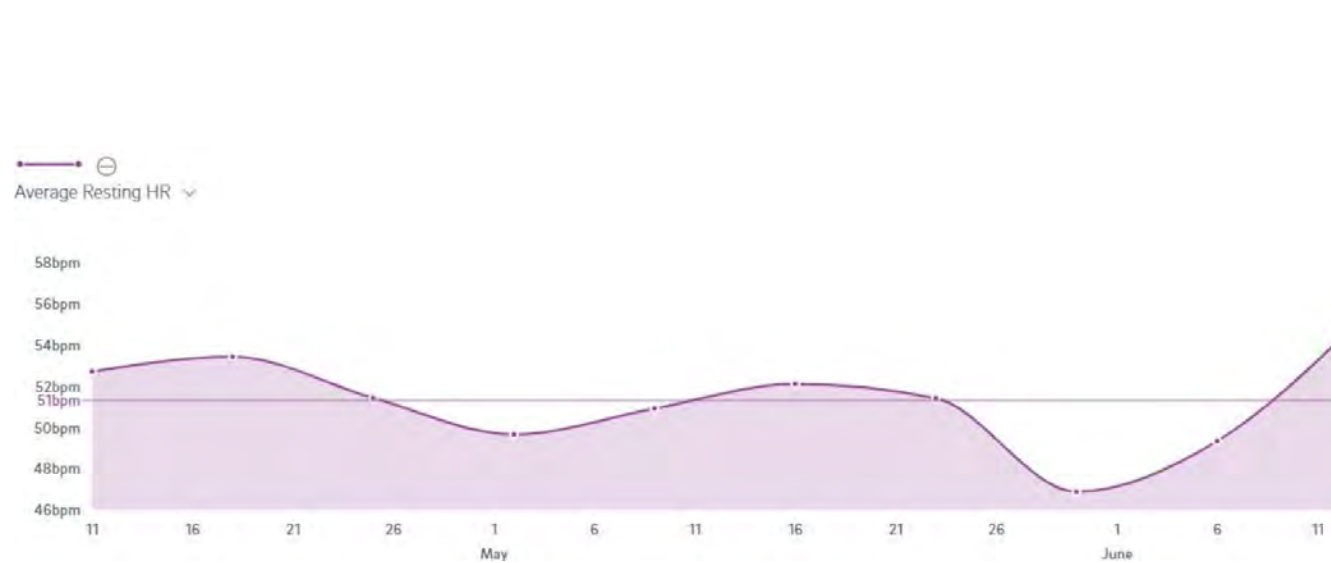
Case Study 1

- Professional UFC female fighter
- Sleep metrics during fight camp
 - Time in bed 9 h 20 min,
 - Total sleep: 8 h 5 min,
 - Sleep latency: 11 min, 4 min (night before [weight cut])
 - Efficiency: 86%, 67% (night before [weight cut])
- Readiness metrics
 - RHR: avg; 51 bpm
 - HRV: avg; 75 ms





Case Study 1 – Readiness metrics

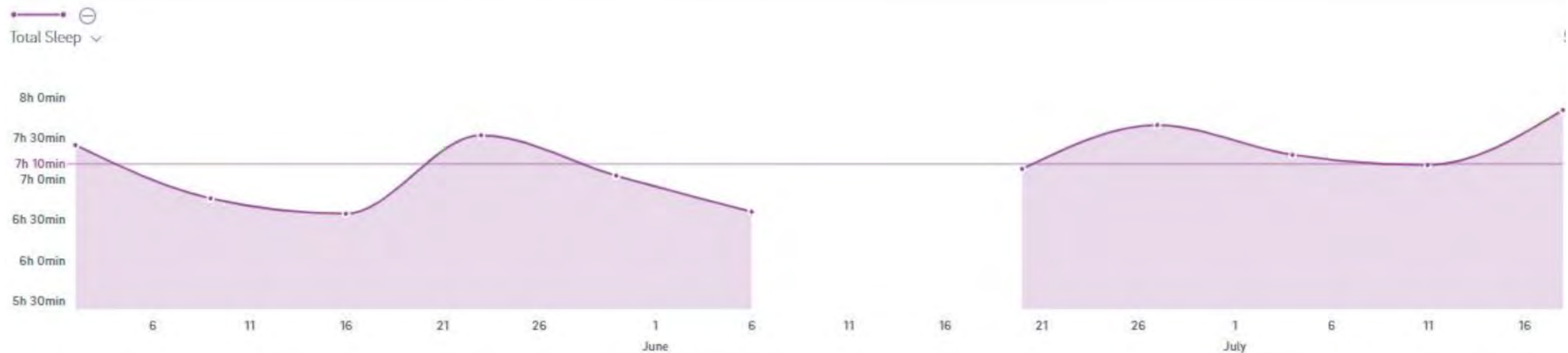
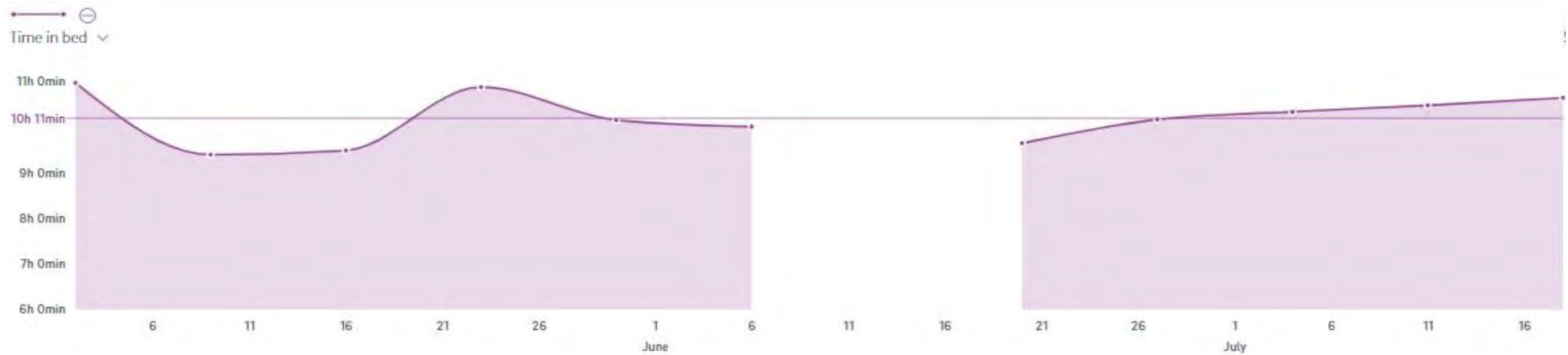


Case Study 2

- Professional UFC male fighter
- Sleep metrics during fight camp
 - Time in bed 10 h 11 min
 - Total sleep: 7 h 10 min
 - Sleep latency: 18 min, 7 min (2 night before [weight cut])
 - Efficiency: 71%, 78% (2 night before [weight cut])
- Readiness metrics
 - RHR: avg; 44 bpm
 - HRV: avg; 137 ms



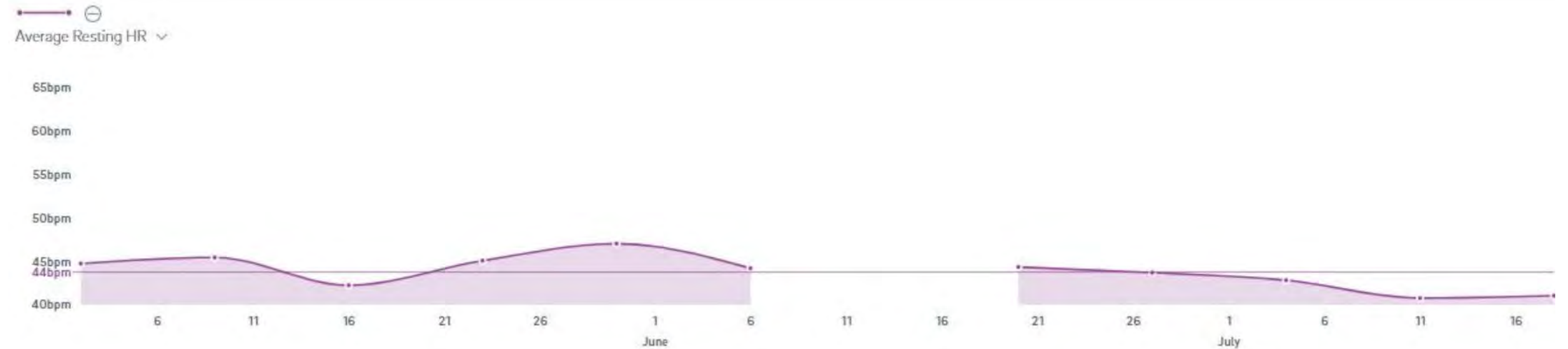
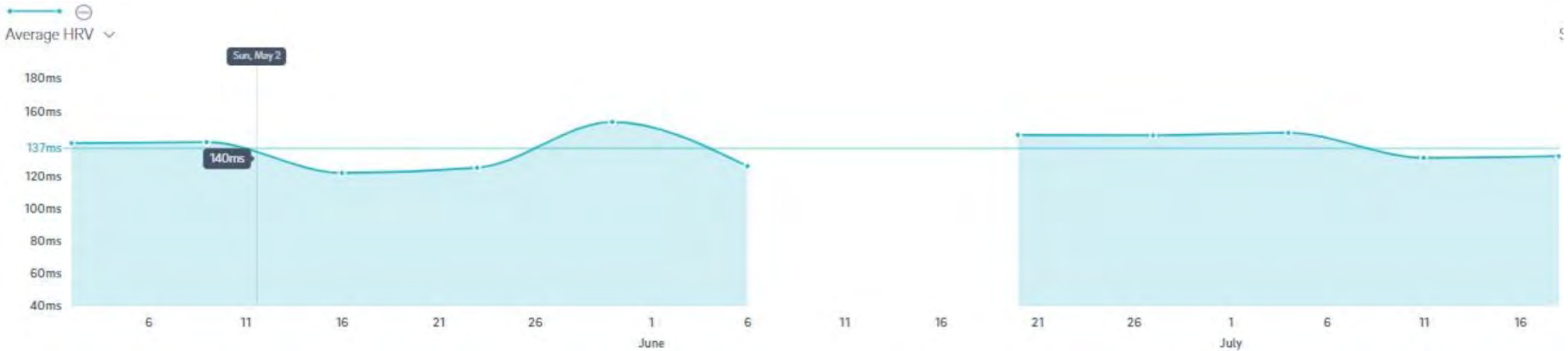
Case Study 2 – Sleep metrics



Case Study 2 – Sleep metrics



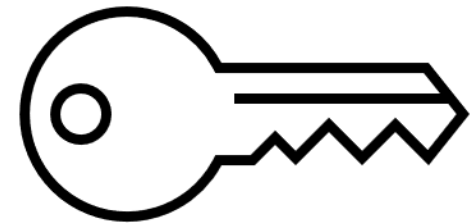
Case Study 2 – Readiness metrics



- Daily, weekly and monthly monitoring
- Check-ins
- Sleep hygiene recommendations
 - Routines for bed and wake times
 - Sleep extension nutrition tactics

Need for a Sleep Toolbox

- **Athletes require greater amounts to recover from training and competitions**
- **Sleep deprivation is a real issue**
 - Sleep hygiene and sleep extension are **KEY** areas to address
- **No one size fits all**
 - 8-10 hours recommended for elite athletes

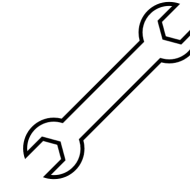


Sleep Toolbox

Education materials, sleep measurement & monitoring, intervention, and evaluation



Top 3 Tips



1. **Get more sleep** (*duration of ~8-10 hrs per night*)
2. **Develop a CONSISTENT routine** (*bed & wake times*)
3. **Take your bed environment seriously** (consider: clothing, room temperature, lighting, bedding, electronics)

Take Home Messages

1. Grab that low hanging fruit

It's there and is FREE!

2. Focus on sleep hygiene

Use your resources!

3. Remain open-minded

You never know who can be of help!

Sleep Health on a Budget

- Cool tools, what if my budget is limited?
- Sleep health on a budget
 - Sleep: diaries, questionnaires, wearables (Fitbit, Garmin, Apple) & SleepScore
 - Readiness metrics (HRV4 training app)



HRV4Training



Heart Rate Variability (HRV) insights to help you quantify stress,
better balance training and lifestyle,
and improve performance

Available on the
App Store

GET IT ON
Google play

Areas of Future Consideration

- **Napping** (evidence- & anecdotal-based)
- **Sleep hygiene tools**
 - Sleep environment (bedding)
 - SleepHub
- **Apps** (Calm, Endel, Ten Percent Happier Meditation, Rain Rain, Idagio)



Thank you!

Questions?

- **Contact information**

- Email: mcrawley87@gmail.com
- Twitter: mcrawley87
- IG: mcrawley87
- LinkedIn: <https://www.linkedin.com/in/matt-crawley-ms-cscs-rscc-28130a3b/>



References

- AASM. (2021). *American Academy of Sleep Medicine. Fast Facts*. Retrieved from Professional Development: Choose Sleep: <https://aasm.org/professional-development/choose-sleep/>
- Bonnar, D., Bartel, K., Kakoschke, N., & Lang, C. (2018). Sleep interventions designed to improve athletic performance and recovery: a systematic review of current approaches. *Sports Medicine*, 48, 683-703. <https://doi.org/10.007/s40279-017-0832>
- CDC. (2014). *Centers for Disease Control and Prevention. Short Sleep Duration Among US Adults*. Retrieved from Sleep and Sleep Disorders: https://www.cdc.gov/sleep/data_statistics.html
- Hale, L., Troxel, W., & Buysse, D. (2020). Sleep health: an opportunity for public health to address health equity . *Annual Reviews*, 41, 81-99. <https://doi.org/10.1146/annurev-publhealth-040119-094412>
- Lastella, M., Roach, G., Halson, S., & Sargent, C. (2015). Sleep/wake behaviours of elite athletes from individual and team sports. *European Journal of Sport Science*, 15(2), 1-8. <https://doi.org/10.1080/17461391.2014.932016>
- Marcus, J. (2013). *Weight management: finding the healthy balance: practical applications for nutrition, food science and culinary professionals*. Academic Press.
- Ritland, B., Simonelli, G., Gentili, R., Smith, J., He, X., Oh, H., Balkin, T., & Hatfield, B. (2019). Sleep health and its association with performance and motivation in tactical athletes enrolled in the reserve officers' training corps. *Sleep Health*, 5(9), 309-314.
- Sargent, C., Lastella, M., Halson, S., & Roach, G. (2014). The impact of training schedules on the sleep and fatigue of elite athletes. *Chronobiology International*, 31(10), 1160-1168. <https://doi.org/10.3109/07420528.2014.957306>
- Stone, J., Rentz, L., Forsey, J., Ramadan, J., Markwald, R., Finomore, V., Galster, S., Rezai, A., Hagen, J. (2020). Evaluations of commercial sleep technologies for objective monitoring during routine sleeping conditions. *Nature and Science of Sleep*, 12, 821-842. <http://doi.org/10.2147/NSS.S270705>
- UFCPI. (2021). Cross-sectional performance analysis and projection of the UFC athlete. Volume: 2. Zuffa
- Walsh, N., Halson, S., Sargent, C., Roach, G., Nedelec, M., Gupta, L., Leeder, J., Fullagar, H.H., Coutts, A.J., Edwards, B.J., Pullinger, S.A., Robertson, C.M., Burniston, J.G., Lastella, M., Le Meur, Y., Hausswirth, C., Bender, A.M, Grandner, M.A., & Samuels, C.H. (2020). Sleep and the athlete: Narrative review and 2021 expert consensus recommendations. *British Journal of Sports Medicine*, 0, 1-13. <https://doi.org/10.1136/bjsports-2020-102025>