



# LEADER GUIDE

## SLEEP HABITS

TO OPTIMIZE PERFORMANCE,  
MENTAL HEALTH, & RESILIENCE

CHAMP



Uniformed  
Services  
University

HUMAN PERFORMANCE RESOURCES by CHAMP | [HPRC-online.org](https://www.hprc-online.org)

Human Performance Resources by CHAMP (HPRC) brings the best and most recent evidence-based information on human performance optimization (HPO) to the military community. This Leader Guide offers strategies for unit leaders, trainers, providers, and practitioners seeking to share performance-based information with the Service Members they work with. The guide includes an HPO tool, research that supports it, and strategies for implementing the tool in a 1:1 session, hip-pocket training, formal presentation, or casual conversation with those you lead. If you have questions about using this guide, reach out to our subject-matter experts through HPRC's [Ask the Expert](#) portal at [www.hprc-online.org/ask-the-expert](http://www.hprc-online.org/ask-the-expert).



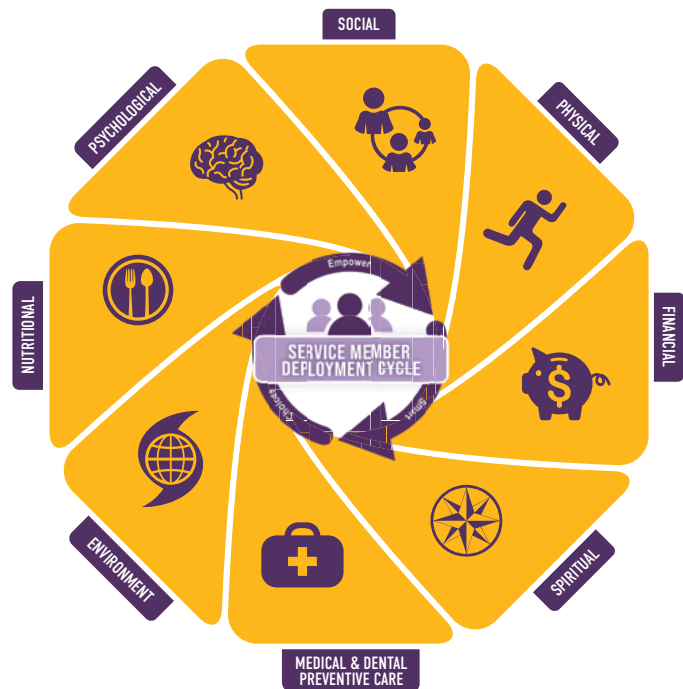
## ATTRIBUTION TO HPRC

If you repurpose any material from this Leader Guide into a presentation, handout, or other publication, we ask you properly attribute the content to HPRC at the Uniformed Services University (USU) and link to our website, [HPRC-online.org](http://HPRC-online.org). Our [attribution guidelines](#) are online at [www.hprc-online.org/about-us/guidelines-policies](http://www.hprc-online.org/about-us/guidelines-policies).

## WHAT IS HUMAN PERFORMANCE OPTIMIZATION (HPO) AND TOTAL FORCE FITNESS (TFF)?

HPO is the process of achieving and sustaining a state of readiness that helps Service Members bring their best selves to any goal or mission—both in and out of uniform. Total Force Fitness (TFF) represents all of the dimensions that contribute to health and performance. TFF serves as a “holistic” compass that helps guide Service Members’ efforts to focus on the domains that are key to maintaining health and sustaining HPO. HPO enables Service Members with different goals, jobs, and responsibilities to work toward reaching and maintaining an optimal level of performance and sustain health and readiness.

This Leader Guide summarizes available evidence of the importance of good sleep habits for military health and performance. It also provides tips and suggestions for leaders on how to use the self-check tool effectively.



**Sleep is essential to military health and performance. Yet 70% of Service Members report getting fewer than 6 hours of sleep each night.<sup>1,2</sup> Many factors contribute to that statistic—habits, personal and mission demands, and health conditions.<sup>3</sup> Refer to the appendix to further explore how these different factors impact sleep.**

HPRC created the Sleep Habits Self-Check to help Service Members learn how different habits impact their sleep and to identify effective strategies to improve their sleep quality and duration.<sup>4,5</sup> Service Members in a deployed setting might not be able to apply all the tips included in the Sleep Habits Self-Check. For example, some suggestions include adjusting environmental conditions to have a cool, dark, and silent bedroom, and this might not be possible when deployed. But most of the sleep-optimizing tips in the self-check apply to all Service Members, regardless of their assigned mission.

This guide is intended to empower you to work through the Sleep Habits Self-Check with other Service Members.

## **OBJECTIVES**

- Describe the different processes that regulate and promote sleep and wakefulness.
- Explain different strategies to effectively improve sleep.
- Use the Sleep Habits Self-Check to identify evidence-based tips that meet your unique needs.

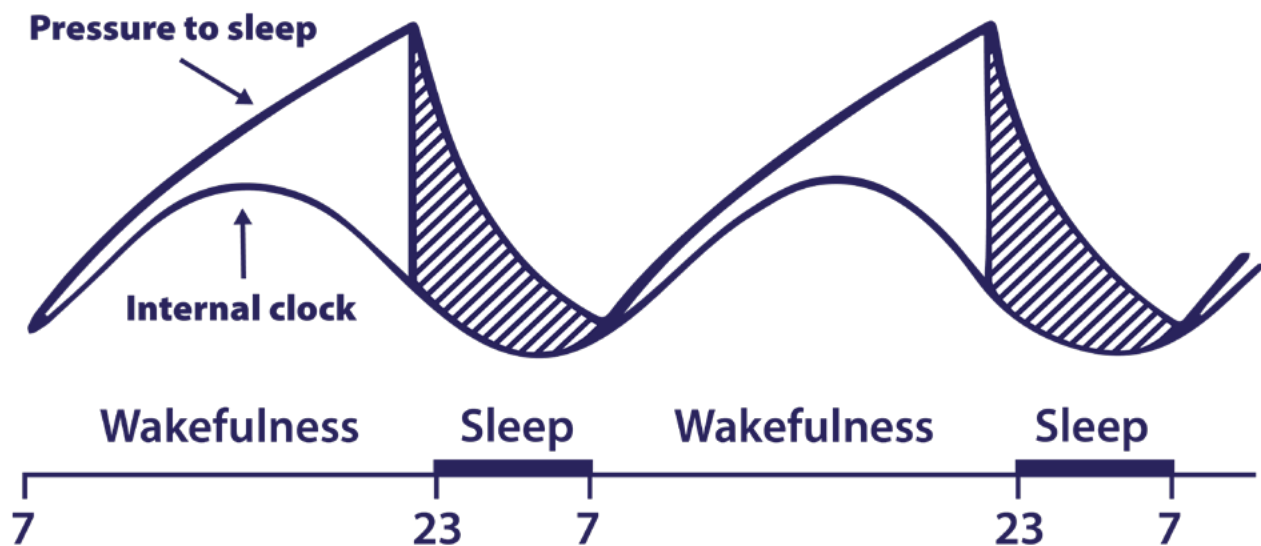
## THE BIOLOGY OF SLEEP AND WAKEFULNESS

A brief overview of the factors that regulate the sleep-wake cycle can help you appreciate the impact different sleep habits have on sleep duration and quality. The sleep-wake cycle is complex and tightly regulated by 2 different processes: Pressure to sleep and your internal clock.<sup>6</sup>

**Pressure to sleep (or Process S)** is the gradual increase in fatigue that happens throughout the day. From the moment you wake up, pressure to sleep builds as a result of chemicals building up in your brain.<sup>6</sup> The longer you stay awake, the stronger your need to sleep. During sleep, the level of the sleep-inducing chemicals goes down. If you get 7–9 hours of good-quality sleep, the sleep-inducing chemicals reach their lowest point and lead to your waking up. As soon as you wake, the process restarts.

Your **internal clock (or Process C)** uses the light-dark cycle of the day to further regulate the sleep-wake cycle.<sup>6</sup> When you see sunlight, the timekeeper in your brain adjusts to promote wakefulness and support performance. When it gets dark, the timekeeper responds to the absence of light and makes you sleepy. Your internal clock also controls other body functions such as body temperature, strength, heart rate, and hormone levels in response to the light-dark cycle.

Both processes, S and C, work together to enable good-quality sleep, and understanding them can help Service Members work with their biology to optimize their sleep.



## HPO TOOL: SLEEP HABITS SELF-CHECK

HPRC's Sleep Habits Self-Check lists evidence-based habits that can help Service Members fall asleep fast and improve their sleep duration and quality. Each item in this self-assessment tool encourages Service Members to reflect on their unique needs and demands and determine whether a particular habit can potentially improve their sleep.

### HOW IT WORKS

- The goal of the Sleep Habits Self-Check is to offer research-based habits that can improve sleep. Service Members can choose one or two habits to try out. It's not a prescriptive list, and they don't need to implement all the tips listed in the Sleep Habits Self-Check to notice changes in their sleep quality and duration.
- It's wise to focus on learning or stopping only 1 or 2 habits at a time to increase the chances of success. Trying to focus on too many changes at once might leave them feeling overwhelmed and can lead to frustration.
- Each item in the self-check tool gives the participant the option to mark "I already do this," "This will not work for me at this time," or "I want to try this strategy."
- After successfully implementing the first couple of tips, a participant can work through the self-check tool again and identify habits that can potentially further improve their sleep quality and duration.
- Knowing the science behind each sleep habit can help you and Service Members identify the habits that can most effectively improve sleep. For example, a Service Member who reads from a lit device in bed might commit to breaking this habit after they understand that lighted screens inhibit the release of the sleep-promoting hormone.

**Sleep Habits Self-Check**

Sleep is critical for your health, performance, and well-being. Sleep strategies aren't one-size-fits-all, though. So it's important to find what works best for you when it comes to getting the sleep you need to be energized and productive each day. Check out these sleep habits to see if they might work for you. To learn more about the science behind these tips, read HPRC's article on [sleep readiness](#).

- 1. I make sleep a priority by choosing it over work, social events, or watching "just one more" TV show when appropriate.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 2. I know how much sleep I personally need to optimize my health and performance by doing a sleep self-study, and how different lengths of sleep impact my energy and focus (most adults need 7-9 hours each night).**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 3. I have a consistent wake-up time for most days of the week.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 4. I get early morning and regular exposure to sunlight (or artificial bright light when sunlight isn't possible) that helps me set my body clock and be ready for sleep at night.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 5. I have a regular exercise routine that helps me be physically tired at the end of the day.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 6. I avoid naps close to bedtime.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 7. I avoid stimulating or energizing physical or mental activities at least one hour before bedtime. (It's normal to have an energy boost one hour before bedtime.)**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 8. I turn off devices at least one hour before bedtime and dim the lights.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.
- 9. I stop consuming caffeine at least 6 hours before I go to bed.**
  - I already do this.
  - This will not work for me at this time.
  - I want to try this strategy.

**TIP #1**

- If you need resources to hold conversations and training on the impact of sleep on health and performance, check out the [Sleep and Total Force Fitness Leader Guide](#).
- Many valid reasons, including military missions, can contribute to Service Members' inability to prioritize sleep during a given period. Acknowledging that these reasons are temporary, and committing to prioritizing sleep when possible, can result in long-term benefits in health and performance.

**TIP #2**

- Most adults, including Service Members, need 7–9 hours of sleep to sustain optimal health and performance.<sup>7</sup>
- Using a [sleep diary](#) during a [sleep vacation](#) can help Service Members identify their unique sleep needs.
- Individual sleep needs aren't the result of personal choice, but the reflection of each Service Member's biology.
- Each Service Member needs to identify their unique sleep needs and implement necessary changes to reach those goals.

**TIP #3**

- Process C has a reciprocal relationship with your daily schedule. It influences when you naturally wake up and fall asleep, but it also adapts to your behavioral patterns.<sup>6</sup> For example, if you take an extended vacation and shift your bed and sleep time by 2 or 3 hours, you'll need time to re-adapt to your old schedule once you return home.<sup>8</sup>
- Consistent wake-up times on weekdays, weekends, holidays, and vacations can enhance your ability to easily fall asleep around the same time every day.<sup>4, 5, 9, 10</sup>

**TIP #4**

- Light from the environment is the strongest cue your brain uses to differentiate daytime from nighttime.<sup>11-15</sup>
- Melatonin production in your brain increases in the absence of light, promoting sleep.<sup>15</sup>
- When you're exposed to sunlight melatonin production shuts down, promoting wakefulness.
- Exposure to natural light immediately after waking up is an effective way to regulate the circadian rhythm for improved sleep.<sup>11, 13-15</sup>

**TIP #5**

- Sleep and exercise have a two-way relationship. Regular exercise improves sleep and getting adequate sleep supports overall physical performance during the day.<sup>16-18</sup>
- Exercise can decrease the time it takes to fall asleep and increase sleep quality.<sup>19</sup>
- People who exercise regularly spend more time in the deep, restorative stage of sleep.<sup>19</sup>

**TIP #6**

- Napping impacts the buildup of the pressure to sleep (Process S).<sup>20</sup>
- Naps that are too long or scheduled too close to bedtime can make it harder to fall asleep.<sup>20</sup> Service Members can benefit from using **strategic naps** but should avoid them within 4 hours of bedtime.
- It's important to learn **how long you should nap** to meet your performance needs without impacting your night's sleep.

**TIP #7**

- It's hard to transition from intense physical and mental activity into sleep. If possible, modify your evening schedule to allow 30–60 minutes to transition to sleep.
- Use this time to implement some of the activities covered in tips 15–18.

**TIP #8**

- As highlighted under Tip #4, light entering your eyes informs your brain it's daytime and shuts down melatonin production.
- Melatonin is a natural hormone released in the absence of light to help promote sleep.
- Light from screen devices is strong enough to reduce melatonin release and impact sleep.<sup>21</sup>
- When you use screen devices right before bedtime, you might struggle to fall asleep despite being tired.<sup>21</sup>

**TIP #9**

- 5 hours after you consume caffeine, half of it is still in your body.<sup>22</sup>
- The general recommendation is to stop consuming caffeine at least 6 hours before bedtime. This ensures that your body will have time to clear more than half out of your system.<sup>22</sup>
- How caffeine is metabolized varies by individual. Some people might need to stop consuming caffeine earlier in the day than others.<sup>22</sup>

- The total amount of caffeine consumed also plays a role in its impact on sleep. The average caffeine content in an 8-oz cup of coffee is 95 mg. If you consume this amount of caffeine around 1400 or 1500, you'll likely enjoy restful sleep around 2200.



### TIP #10

- Alcohol acts as a brain-activity inhibitor. In other words, it sedates the brain.<sup>23, 24</sup>
- Many people drink alcohol around bedtime to fall asleep easier. In fact, once alcohol reaches the brain, it promotes mental and physical relaxation, making it easier to fall asleep. However, people who drink before bed often experience disruptions later in their sleep cycle and low-quality sleep overall.<sup>23, 24</sup>
- In summary, drinking alcohol might help you fall asleep faster, but you likely won't wake up feeling rested and energized.<sup>23, 24</sup>



### TIP #11

- Eating large meals close to bedtime impacts sleep quality, and going to sleep right after a large meal impairs digestion.<sup>25, 26</sup>
- After you eat a large meal, your body devotes energy to processing and digesting the food you ate. Fully digesting a heavy meal can take hours.
- Sleep slows down digestion, contributing to discomfort, indigestion, and acid reflux. As a result, sleep quality also decreases.<sup>27</sup>
- You should also avoid going to bed hungry, as you might have trouble falling asleep. If needed, eat a small, light snack before bed.
- It's also important to avoid drinking lots of liquids around bedtime. Many people have a difficult time getting back to sleep after waking up to empty their bladder in the middle of the night.



### TIP #12

- Light, noise, and temperature can impact the quality of your sleep. You should adjust those variables to your comfort level as you're able.<sup>28-34</sup>
- Ideally, bedrooms should be quiet, dark, and cool.
- At night, adjust the temperature to be cooler than you keep it during the day.



**TIP #13**

- Your brain can quickly learn to associate a specific behavior with a cue in the environment.<sup>35</sup>
- For example, if you consistently bring your laptop to bed to work, your brain will associate sitting in bed with being productive and doing work-related tasks.<sup>35</sup>
- With time, it might get harder to fall asleep in that particular environment.
- Breaking unintended associations can be hard—the best thing to do is to avoid forming them in the first place.<sup>35, 36</sup>

**TIP #14**

- Feeling anxious and worried about not being able to sleep only makes falling asleep harder.<sup>37</sup>
- Checking the clock and watching time pass as you try to sleep can raise your stress and anxiety levels.

**TIP #15**

- Create a repeatable 15–30-minute bedtime routine.<sup>35, 36</sup>
- The idea is to have a series of actions that culminate in sleep. With time, your brain will strengthen the association between a given routine and sleep.
- Incorporate one or several of Tips 16–18 into your bedtime routine.
- You can also add other habits such as taking a hot shower, enjoying a cup of tea, brushing your teeth, setting out clothes and shoes for the next day, or prayer, among others. The activity itself doesn't need to promote sleep, but it should be part of a series of actions that end with going to bed to sleep.

**TIP #16**

- A **gratitude practice** is a great habit to include in your bedtime routine.
- It helps you disconnect from possible bad experiences, improves sleep, and enhances feelings of well-being.<sup>38-40</sup>

**TIP #17**

- Relaxation techniques are an excellent way to calm your brain and body before sleep.<sup>41-43</sup>
- Most of these practices include taking slow, deep breaths with long exhales. This breathing pattern activates the rest-and-digest branch of the nervous system, resulting in a lowered heart rate and muscle relaxation.<sup>44</sup>
- These body responses help you feel calmer and make it easier to fall asleep.

**TIP #18**

- Sometimes the solution to a problem comes to mind just as you fall asleep. Trying to hold on to that information might keep you awake.
- Have a journal by your bed to write down important thoughts and ideas you don't want to forget. This way, you won't risk forgetting the information or staying awake trying to remember it.<sup>45, 46</sup>
- Racing thoughts can keep you awake, even when the information being mentally processed isn't important.<sup>45, 46</sup>
- In these cases, you can try calming mental games to distract your attention system away from the racing thoughts.
- You can't focus attention on 2 things at the same time. As you focus on a calming mental game, racing thoughts will go away.

**TIP #19**

- As highlighted under Tip #13, you want to avoid associating lying in bed with being awake.
- If you can't fall asleep within 20–30 minutes, get out of bed and do something relaxing under low light until you feel drowsy.
- As per Tip #14, use your sense of time to guide your decision to get out of bed.

**TIP #20**

- If you diligently work on the tips provided in the Sleep Habits Self-Check and still have trouble falling and staying asleep, you should seek medical help.
- When searching for sleep specialists who can effectively help you improve your sleep, prioritize professionals who can deliver cognitive behavioral therapy for insomnia (CBT-i).
- CBT-i retrains your brain to improve sleep quality and duration without the help of prescription medication.<sup>37</sup>
- CBT-i intervention is effective and produces long-term results.<sup>37</sup>

## STRATEGIES FOR SUCCESS

Review the tips below to help you present the Sleep Habits Self-Check in ways that help participants see its value, fully engage, and fully benefit from the activity.

**Why should they care? Start with a hook!** Service Members are ready to learn when they understand that the material will help them deal with real-life situations that can range from mission-essential tasks to events in their personal lives, interests, or hobbies.



### PLAN & PREPARE

- How can you grab participants' interest and make them curious to learn more about the importance of sleep and want to change their sleep habits?
- Many Service Members might have the belief that sleep is overrated or not mission critical, so helping them understand the importance of sleep before engaging in this activity can help them be open to trying some of the sleep habits.
- If you suspect your audience isn't open to changing their sleep habits at this time, review HPRC's [Leader Guide: The impact of sleep on Total Force Fitness](#). It provides research on the value of sleep that you can use to highlight the importance of improving sleep habits.
- Brainstorm and share any personal stories, relatable experiences, or popular anecdotes your participants should be familiar with. Use them to highlight the impact of sleep on something your participants value.



### EXECUTE

- Share your most attention-grabbing personal story, relatable experience, or popular anecdote that highlights the impact of sleep on something your participants value.
- Consider using HPRC's [Leader Guide: The Impact of Sleep on Total Force Fitness](#) first to present ways sleep might be impacting their performance.
- Encourage participants to share examples of sleep deprivation they've witnessed.

**How would this have helped in the past?** Service Members learn best when topics are provided with clear, real-world examples for application.



## PLAN & PREPARE

- Helping Service Members identify the impact that sleep has had on their performance in the past can help them understand the importance of good sleep habits.
- To help participants reflect deeper, brainstorm a few common examples of how poor sleep hurts performance, relationships, health, or well-being. Think of cues, examples, or metaphors that your audience might find relatable.



## EXECUTE

- Ask Service Members to reflect on past experiences of what happened when they had really poor sleep. Then, have them list some common negative impacts of poor sleep. For example, you could ask, “Have you experienced any of the following after not getting enough sleep?”
  - ➔ Lashed out at a loved one when you didn’t mean to.
  - ➔ Misinterpreted a situation.
  - ➔ Was quick to make a judgment without thinking it through.
  - ➔ Had trouble focusing on a task.
  - ➔ Consumed unhealthy comfort foods or drinks.
  - ➔ Felt extra lonely, sad, anxious, or angry out of proportion to what was really going on at the time.
  - ➔ Failed to live up to one of your core values.

Add in your own examples that would directly relate to your audience.

**How will this help them achieve future goals?** Service Members are ready to learn when they understand that the material will help them deal with real-life situations that can range from mission-essential tasks to events in their personal lives, interests, or hobbies.



## PLAN & PREPARE

- After you review how poor sleep might have negatively impacted them in the past, help them decide on future goals for changing their sleep habits.
- Think on why your audience should care about prioritizing sleep.
- How will it help them improve at the things they deeply value? Or, what’re potential costs of not prioritizing sleep?

- How can you help them see how prioritizing sleep can bring about these benefits?
- Consider any “wake-up call” or “aha” insights you realized about the importance of sleep. Also, address any barriers you faced and how you overcame them.



## EXECUTE

- Point out how a lack of sleep is often used as an excuse for poor behavior: “I lashed out at you because I’m just tired.” Although sometimes sleep is out of your control, you owe it to yourself, your mission, your loved ones, and your future health to make sure you’re doing all you can to apply good sleep habits.
- Help the participants reflect on what they value most—their career, their health, their relationships—how can getting good sleep can help them to live out those values?
- Share your values and how changing your sleep habits helps you live them out now and, hopefully, in the future. Note any “wake-up call” or “aha” insights you experienced.

**How can they create their own strategy with the tips in the Sleep Habits Self-Check?** Service Members learn best when topics are provided with clear, real-world examples for their application.



## PLAN & PREPARE

- The Sleep Habits Self-Check is designed to give participants the autonomy to determine what tips they want to try. They should recognize that life or mission demands might make some tips unrealistic for them.
- Review the scientific sources cited throughout this Leader Guide. Use information you find most relatable when presenting the Self-Check tool.
- The sleep-enhancing tips are grouped and ordered into sub-categories that you can present in groups that provide strategic breaks to pause for reflection, questions, or discussion.
  - Tips 1 and 2: Self-awareness
  - Tips 3–8: Daily habits
  - Tips 9–11: Sleep nutrition
  - Tips 10–14: Sleep environment
  - Tips 15–19: Bedtime habits
  - Tip 20: Medical help

**Note:** These category labels don't appear in the Sleep Habits Self-Check.



## EXECUTE

- Explain to participants that you'll review each of the tips in the Self-check tool. They're to mark "I already do this," "This will not work for me at this time," or "I want to try this strategy."
- Walk through each of the tips and present a couple of key points from the science of the tip.
- As you review each tip, share your own experiences and ways to help participants see how they might apply them.
- Give participants the opportunity to share how they might apply some tips and what benefits they might find.
- Pause periodically to give them time to reflect and ask questions. It is important that you do not rush through the list and give time to reflect.
- After reviewing all of the tips, encourage participants to choose one or two tips to try out first. If possible, give them the opportunity to discuss with their peers to troubleshoot and create accountability.
- Point out that, when trying to create a new habit, it's best to just focus on a couple at a time.

**What's working? What isn't? Don't forget to follow up!** Make sure to check in after participants have started trying to apply their new sleep habits to help them review the activity and troubleshoot.



## PLAN & PREPARE

- Help participants discuss how they're doing with their sleep habits.
- What benefits have they noticed?
- What barriers are they facing? How or what can they adjust to improve?
- Remind them this is a trial-and-error process. Maybe trying a different sleep habit will work better for them.



## EXECUTE

- After they've had some time to try the activity, ask them how it's been so far.
- Encourage them to share differences they've noticed in their mood, energy, and focus, and if they've been successful in applying their new sleep-hygiene habits.
- If they haven't been successful, help them discuss how they can adjust fire to improve their sleep.
- Encourage them to check out HPRC's [Strategic Habits Workbook](#) to find additional tips about how to create new habits.
- If they've formed new sleep habits, encourage them to pick one or two other new habits to also try.

## APPENDIX

Service Members often lack knowledge of the impact daily habits have on sleep duration and quality, and they develop poor sleep habits as a result. In addition, inadequate sleep might be related to mission deployment, shift work, or personal demands such as having a newborn. Poor sleep might also be associated with medical conditions such as insomnia, chronic pain, depression, anxiety, and post-traumatic stress disorder (PTSD), among others.

Health educators and leadership can provide evidence-based information to help Service Members improve their sleep habits and optimize their sleep readiness to meet mission and personal demands. When medical conditions such as insomnia contribute to sleep disturbances, Service Members should seek professional medical help and treatment. Use the QR code here to learn more about [insomnia](#) and the most effective intervention to treat this medical condition.



## FACTORS AFFECTING SLEEP QUALITY AND DURATION



### 1 SLEEP HABITS

Daily habits can either improve or worsen sleep quality and duration. For example, seeing sunlight upon waking up can improve sleep, but excessive exposure to light around bedtime can make it hard to fall asleep.

### 2 MISSION & PERSONAL DEMANDS

During many stages of a military career, Service Members can't control how long they sleep or their sleep environment.

### 3 MEDICAL CONDITIONS

Insomnia, sleep apnea, psychiatric conditions, and chronic pain can directly impact sleep quality and duration. Service Members with these and other conditions should seek medical care, as sleep habits won't address the underlying causes of poor sleep.

## REFERENCES

1. Luxton, D. D., Greenburg, D., Ryan, J., Niven, A., Wheeler, G., & Mysliwiec, V. (2011). Prevalence and impact of short sleep duration in redeployed OIF soldiers. *Sleep, 34*(9), 1189–1195. doi:10.5665/SLEEP.1236
2. Mysliwiec, V., McGraw, L., Pierce, R., Smith, P., Trapp, B., & Roth, B. J. (2013). Sleep disorders and associated medical comorbidities in active duty military personnel. *Sleep, 36*(2), 167–174. doi:10.5665/sleep.2364
3. Good, C. H., Brager, A. J., Capaldi, V. F., & Mysliwiec, V. (2020). Sleep in the United States Military. *Neuropsychopharmacology, 45*(1), 176–191. doi:10.1038/s41386-019-0431-7
4. Brown, F. C., Buboltz, W. C., Jr., & Soper, B. (2002). Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. *Behavioral Medicine, 28*(1), 33–38. doi:10.1080/08964280209596396
5. Irish, L. A., Kline, C. E., Gunn, H. E., Buysse, D. J., & Hall, M. H. (2015). The role of sleep hygiene in promoting public health: A review of empirical evidence. *Sleep Medicine Reviews, 22*, 23–36. doi:10.1016/j.smrv.2014.10.001
6. Borbely, A. A., Daan, S., Wirz-Justice, A., & Deboer, T. (2016). The two-process model of sleep regulation: A reappraisal. *Journal of Sleep Research, 25*(2), 131–143. doi:10.1111/jsr.12371
7. Hirshkowitz, M., Whiton, K., Albert, S. M., Alessi, C., Bruni, O., DonCarlos, L., . . . Adams Hillard, P. J. (2015). National Sleep Foundation's sleep time duration recommendations: Methodology and results summary. *Sleep Health, 1*(1), 40–43. doi:10.1016/j.sleh.2014.12.010
8. Caliandro, R., Streng, A. A., van Kerkhof, L. W. M., van der Horst, G. T. J., & Chaves, I. (2021). Social jetlag and related risks for human health: A timely review. *Nutrients, 13*(12). doi:10.3390/nu13124543
9. Okano, K., Kaczmarzyk, J. R., Dave, N., Gabrieli, J. D. E., & Grossman, J. C. (2019). Sleep quality, duration, and consistency are associated with better academic performance in college students. *NPJ Science of Learning, 4*. doi:10.1038/s41539-019-0055-z
10. Stepanski, E. J., & Wyatt, J. K. (2003). Use of sleep hygiene in the treatment of insomnia. *Sleep Medicine Reviews, 7*(3), 215–225. doi:10.1053/smrv.2001.0246
11. Bilu, C., Einat, H., Zimmet, P., Vishnevskia-Dai, V., & Kronfeld-Schor, N. (2020). Beneficial effects of daytime high-intensity light exposure on daily rhythms, metabolic state and affect. *Scientific Reports, 10*(1). doi:10.1038/s41598-020-76636-8
12. Blume, C., Garbazza, C., & Spitschan, M. (2019). Effects of light on human circadian rhythms, sleep and mood. *Somnologie (Berl), 23*(3), 147–156. doi:10.1007/s11818-019-00215-x
13. Fernandez, F. X. (2022). Current insights into optimal lighting for promoting sleep and circadian health: Brighter days and the importance of sunlight in the built environment. *Nature Science*



*Sleep*, 14, 25–39. doi:10.2147/NSS.S251712

14. Kaida, K., Takahashi, M., Haratani, T., Otsuka, Y., Fukasawa, K., & Nakata, A. (2006). Indoor exposure to natural bright light prevents afternoon sleepiness. *Sleep*, 29(4), 462–469. doi:10.1093/sleep/29.4.462
15. Nagare, R., Woo, M., MacNaughton, P., Plitnick, B., Tinianov, B., & Figueiro, M. (2021). Access to daylight at home improves circadian alignment, sleep, and mental health in healthy adults: A crossover study. *International Journal of Environmental Research and Public Health*, 18(19). doi:10.3390/ijerph18199980
16. Chennaoui, M., Arnal, P. J., Sauvet, F., & Leger, D. (2015). Sleep and exercise: A reciprocal issue? *Sleep Medicine Reviews*, 20, 59–72. doi:10.1016/j.smr.2014.06.008
17. Jurado-Fasoli, L., De-la, O. A., Molina-Hidalgo, C., Migueles, J. H., Castillo, M. J., & Amaro-Gahete, F. J. (2020). Exercise training improves sleep quality: A randomized controlled trial. *European Journal of Clinical Investigation*, 50(3). doi:10.1111/eci.13202
18. Satti, M. Z., Khan, T. M., Qurat-Ul-Ain, Q. U., Azhar, M. J., Javed, H., Yaseen, M., . . . Hamza, M. (2019). Association of physical activity and sleep quality with academic performance among fourth-year mbbs students of Rawalpindi Medical University. *Cureus*, 11(7). doi:10.7759/cureus.5086
19. Park, I., Diaz, J., Matsumoto, S., Iwayama, K., Nabekura, Y., Ogata, H., . . . Vogt, K. E. (2021). Exercise improves the quality of slow-wave sleep by increasing slow-wave stability. *Scientific Reports*, 11(1). doi:10.1038/s41598-021-83817-6
20. Mantua, J., & Spencer, R. M. C. (2017). Exploring the nap paradox: Are mid-day sleep bouts a friend or foe? *Sleep Medicine*, 37, 88–97. doi:10.1016/j.sleep.2017.01.019
21. Carter, B., Rees, P., Hale, L., Bhattacharjee, D., & Paradkar, M. S. (2016). Association between portable screen-based media device access or use and sleep outcomes: A systematic review and meta-analysis. *JAMA Pediatrics*, 170(12), 1202–1208. doi:10.1001/jamapediatrics.2016.2341
22. Temple, J. L., Bernard, C., Lipshultz, S. E., Czachor, J. D., Westphal, J. A., & Mestre, M. A. (2017). The safety of ingested caffeine: A comprehensive review. *Frontiers in Psychiatry*, 8. doi:10.3389/fpsy.2017.00080
23. Colrain, I. M., Nicholas, C. L., & Baker, F. C. (2014). Alcohol and the sleeping brain. *The Handbook of Clinical Neurology* 125, 415–431. doi:10.1016/B978-0-444-62619-6.00024-0
24. Koob, G. F., & Colrain, I. M. (2020). Alcohol use disorder and sleep disturbances: A feed-forward allostatic framework. *Neuropsychopharmacology*, 45(1), 141–165. doi:10.1038/s41386-019-0446-0
25. Crispim, C. A., Zimberg, I. Z., dos Reis, B. G., Diniz, R. M., Tufik, S., & de Mello, M. T. (2011). Relationship between food intake and sleep pattern in healthy individuals. *Journal of Clinical Sleep Medicine*, 7(6), 659–664. doi:10.5664/jcsm.1476

26. Kinsey, A. W., & Ormsbee, M. J. (2015). The health impact of nighttime eating: Old and new perspectives. *Nutrients*, *7*(4), 2648–2662. doi:10.3390/nu7042648
27. Jung, H. K., Choung, R. S., & Talley, N. J. (2010). Gastroesophageal reflux disease and sleep disorders: Evidence for a causal link and therapeutic implications. *Journal of Neurogastroenterology and Motility*, *16*(1), 22–29. doi:10.5056/jnm.2010.16.1.22
28. Harding, E. C., Franks, N. P., & Wisden, W. (2020). Sleep and thermoregulation. *Current Opinion in Physiology*, *15*, 7–13. doi:10.1016/j.cophys.2019.11.008
29. Krauchi, K. (2007). The thermophysiological cascade leading to sleep initiation in relation to phase of entrainment. *Sleep Medicine Reviews*, *11*(6), 439–451. doi:10.1016/j.smrv.2007.07.001
30. Basner, M., Muller, U., & Elmenhorst, E. M. (2011). Single and combined effects of air, road, and rail traffic noise on sleep and recuperation. *Sleep*, *34*(1), 11–23. doi:10.1093/sleep/34.1.11
31. Halperin, D. (2014). Environmental noise and sleep disturbances: A threat to health? *Sleep Science*, *7*(4), 209–212. doi:10.1016/j.slsci.2014.11.003
32. Cho, J. R., Joo, E. Y., Koo, D. L., & Hong, S. B. (2013). Let there be no light: The effect of bedside light on sleep quality and background electroencephalographic rhythms. *Sleep Medicine*, *14*(12), 1422–1425. doi:10.1016/j.sleep.2013.09.007
33. Figueiro, M. G., & Rea, M. S. (2012). Preliminary evidence that light through the eyelids can suppress melatonin and phase shift dim light melatonin onset. *BMC Research Notes*, *5*. doi:10.1186/1756-0500-5-221
34. Obayashi, K., Yamagami, Y., Kurumatani, N., & Saeki, K. (2019). Pre-awake light exposure and sleep disturbances: Findings from the HEIJO-KYO cohort. *Sleep Medicine*, *54*, 121–125. doi:10.1016/j.sleep.2018.10.027
35. Graybiel, A. M. (2008). Habits, rituals, and the evaluative brain. *Annual Review of Neuroscience*, *31*, 359–387. doi:10.1146/annurev.neuro.29.051605.112851
36. Wood, W., & Runger, D. (2016). Psychology of habit. *Annual Review of Psychology*, *67*, 289–314. doi:10.1146/annurev-psych-122414-033417
37. Trauer, J. M., Qian, M. Y., Doyle, J. S., Rajaratnam, S. M., & Cunnington, D. (2015). Cognitive behavioral therapy for chronic insomnia: A systematic review and meta-analysis. *Annals of Internal Medicine*, *163*(3), 191–204. doi:10.7326/M14-2841
38. Alkozei, A., Smith, R., Kotzin, M. D., Waugaman, D. L., & Killgore, W. D. S. (2019). The association between trait gratitude and self-reported sleep quality is mediated by depressive mood state. *Behavioral Sleep Medicine*, *17*(1), 41–48. doi:10.1080/15402002.2016.1276017
39. Boggiss, A. L., Consedine, N. S., Brenton-Peters, J. M., Hofman, P. L., & Serlachius, A. S. (2020). A systematic review of gratitude interventions: Effects on physical health and health behaviors. *The Journal of Psychosomatic Research*, *135*. doi:10.1016/j.jpsychores.2020.110165

40. Jackowska, M., Brown, J., Ronaldson, A., & Steptoe, A. (2016). The impact of a brief gratitude intervention on subjective well-being, biology and sleep. *Journal of Health Psychology, 21*(10), 2207–2217. doi:10.1177/1359105315572455
41. Bankar, M. A., Chaudhari, S. K., & Chaudhari, K. D. (2013). Impact of long term yoga practice on sleep quality and quality of life in the elderly. *Journal of Ayurveda and Integrative Medicine, 4*(1), 28–32. doi:10.4103/0975-9476.109548
42. Hallegraeff, J. M., van der Schans, C. P., de Ruiter, R., & de Greef, M. H. (2012). Stretching before sleep reduces the frequency and severity of nocturnal leg cramps in older adults: A randomised trial. *Journal of Physiotherapy, 58*(1), 17–22. doi:10.1016/S1836-9553(12)70068-1
43. Ong, J., & Sholtes, D. (2010). A mindfulness-based approach to the treatment of insomnia. *Journal of Clinical Psychology, 66*(11), 1175–1184. doi:10.1002/jclp.20736
44. Zaccaro, A., Piarulli, A., Laurino, M., Garbella, E., Menicucci, D., Neri, B., & Gemignani, A. (2018). How breath-control can change your life: A systematic review on psycho-physiological correlates of slow breathing. *Frontiers in Human Neuroscience, 12*, 92–107. doi:10.3389/fnhum.2018.00353
45. Scullin, M. K., Krueger, M. L., Ballard, H. K., Pruett, N., & Bliwise, D. L. (2018). The effects of bedtime writing on difficulty falling asleep: A polysomnographic study comparing to-do lists and completed activity lists. *Journal of Experimental Psychology, 147*(1), 139–146. doi:10.1037/xge0000374
46. Niles, A. N., Haltom, K. E., Mulvenna, C. M., Lieberman, M. D., & Stanton, A. L. (2014). Randomized controlled trial of expressive writing for psychological and physical health: The moderating role of emotional expressivity. *Anxiety Stress Coping, 27*(1), 1–17. doi:10.1080/10615806.2013.802308