



LEADER GUIDE

STRATEGIES TO MANAGE OPERATIONAL FATIGUE

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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 it 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.



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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, wellness, and performance.¹⁻³ Most people, including Service Members, need 7–9 hours of sleep every night.⁴ But military missions and operations often involve night shifts, prolonged periods of wakefulness, and irregular sleep schedules.⁵ Working under these conditions can degrade performance, increase the risk of human errors, and might reduce mission safety.⁵ Service Members can benefit from creating a personalized fatigue management plan to help offset the consequences of sleep deprivation and sustain performance during night and sustained operations.

HPRC created the [Fatigue management strategies for shift work and sustained operations](#) to help Service Members identify strategies they can use before, during, and after night and sustained operations. Sleep deprivation—being awake for over 18 hours or regularly getting less than the recommended 7–9 hours of sleep—negatively impacts both mental and physical performance.⁶ The strategies included in the worksheet can help offset the consequences of sleep deprivation, but they won't completely restore mental and physical performance back to well-rested levels. Only meeting your sleep needs can do that.

This guide is intended to help you work through the fatigue management strategies for shift work and sustained operations worksheet with other Service Members to help them create their own fatigue management plans.

OBJECTIVES

- Summarize the acute signs of sleep deprivation.
- Describe how to use HPRC's Fatigue Management Worksheet.
- Identify strategies to help other Service Members use HPRC's Fatigue Management Worksheet.

IMPACT OF SLEEP DEPRIVATION ON PERFORMANCE

Acute effects of sleep deprivation start to appear after about 18 hours of wakefulness. At this point, your performance degrades and can be similar to being drunk. For example, someone who's been awake for 18 hours has cognitive impairment similar to a person with a blood alcohol concentration (BAC) of 0.06%.⁷ In the U.S., a BAC of 0.08% is considered legally intoxicated. Just 6 more hours of sleep deprivation (for a total of 24 hours) is similar to having a BAC of 0.1%.⁷

Learning the signs of acute sleep deprivation can help you identify the ideal time to implement one or more of the fatigue management strategies included in the worksheet. The following signs of sleep deprivation appear after about 18 hours of being awake and intensify with time:^{8,9}

- Extreme fatigue
- Slower thinking and reaction time
- Reduced vigilance, attention span, and concentration
- Drowsiness
- Microsleeps
- Uncontrollable eye movement
- Mood changes—irritability, increased anxiety, heightened fear
- Worsened memory and forgetfulness
- Impaired judgment and decision making
- Poor coordination and balance

Working while sleep deprived can decrease personal and mission safety. Slowed reaction time can contribute to life-threatening accidents, and impaired decision making can lead to errors when assessing environmental dangers and determining courses of action. In addition, compromised balance, coordination, and reaction time can increase the risk of musculoskeletal injuries, further reducing operational readiness.

HPO TOOL: FATIGUE MANAGEMENT PLAN


An effective fatigue management plan is key to supporting performance and enhancing safety during night and sustained operations. Exploring available options and identifying appropriate courses of action before these operations can contribute to a successful, overall strategy. For example, if you know from previous experience on night shifts that around 0100 is when you feel sleepy, plan to either get some extra sleep before then or have 200 mg of caffeine around this time. Especially if this time is during a mission-critical period.¹⁰⁻¹²

Sleeping for 7–9 hours as regularly as possible is the foundational component of an effective fatigue management plan. Getting fewer than the recommended sleep hours leads to sleep debt. Avoiding sleep debt is crucial for the success of a fatigue management plan.^{13,14} Those not scheduled for night operations and exercises should maintain a consistent wake-up time for most days of the week, including weekends.

HOW IT WORKS

This fatigue management plan consists of 3 phases: preparation, execution, and recovery.

The **preparation phase** focuses on getting adequate sleep and banking sleep hours. Sleeping more than the recommended hours of sleep per day results in sleep banking. You can bank sleep for up to 2 weeks before night and sustained operations to help offset the consequences of sleep deprivation.¹⁵ Plan to bank sleep hours in one of these 2 ways:


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Fatigue management worksheet

PREPARATION PHASE

Adequate sleep during regular daytime operations is the foundation of an effective fatigue management plan. Check out what you need to support your sleep readiness:

- Learn [how much sleep](#) you need to sustain your optimal health and performance.
- Maintain a consistent sleep schedule to help you get 7–9 hours of sleep.
- Develop [good sleep habits](#).
- Learn the different ways you can use [strategic napping](#) to optimize your performance.

Up to 2 weeks prior to shift work or sustained operations, [bank sleep hours](#) to help offset the impact of sleep deprivation. The more hours you bank, the better. Check off which strategy works for you:

- Sleep longer during the night
- Nap

Write down specific days and times you plan to bank sleep:

Get as much sleep as you can one day before shift work or sustained operations. Check the strategies that work for you:

- Delay PT until the afternoon.
- Nap as close to the start of your shift or mission as possible.
- Sleep as long as you can in the morning.

List what steps you need to take. For example, speak with your partner about your schedule):

EXECUTION PHASE

After being awake for 18 hours, your performance will degrade. Here are some strategies you can use to manage fatigue during shift work and sustained operations:

- Nap! Try [safety-first naps](#) or “[nappuccinos](#)” (coffee naps) to reset your alertness.
- Perform a short bout of high-intensity exercise.
- Get exposure to natural sunlight.
- Consume up to 200 mg of caffeine every 4 hours as needed, but don't exceed 600 mg of caffeine in 24 hours.

Plan out your shift work schedule and apply these tips as you can. Be as specific as possible. When might you nap? What type of caffeine might you consume? When and where will you exercise and expose yourself to natural sunlight?

If you're on a shift-work schedule for a few days or weeks, a consistent sleep schedule can improve your overall performance:

- Consider your social and family commitments. Find the best time to get uninterrupted sleep.
- Strive for 7–9 hours of sleep in a single stretch. If this isn't possible, meet your daily sleep requirements with two shorter periods of sleep.
- Adjust the temperature and reduce light and noise to create an optimal sleep environment.
- Keep a consistent daily schedule. Try to sleep and eat at the same time every day.

- Nap, for any length of time, away from bedtime. Taking advantage of afternoon dips in alertness that typically occur between 1300 and 1500 can make falling asleep easier. However, long naps during the day can make it hard to fall asleep at night, so if sleeping during the day interferes with falling asleep at your usual bedtime, cut back on daytime napping. It's important to prioritize the length and quality of nighttime sleep.
- If you're unable to nap, try increasing how long you sleep at night. Either go to bed earlier or wake up later. Try to incrementally add a few minutes of sleep each night. If your work schedule does not allow for this flexibility, focus on getting extra sleep on your days off.

On the day before night operations start, sleep as long as possible in the morning and delay physical training until the afternoon. If your schedule allows, nap as close as possible to the start of the operation, too. In short, avoid creating a sleep debt and bank as many hours as possible during the **preparation phase**. This helps offset the negative effects of sleep deprivation during night and sustained operations.

The **execution phase** focuses on assessing fatigue levels and implementing one or more strategies to manage sleep deprivation. Signs of sleep deprivation start to appear after about 18 hours and peak after 24 hours of wakefulness. While it's impossible to completely offset the effects of sleep deprivation, these tips can help manage fatigue during night and sustained operations:

- Get sunlight during the daytime to increase alertness. Simply turn your face towards the sun, but don't look directly at the sun.^{16,17}
- Perform a short bout of high-intensity exercise. This can boost alertness and cognitive function.¹⁸⁻²⁰
- Nap for 10 to 30 minutes.²¹ If you're groggy when you wake from a short nap, consume caffeine right **before napping**.²² Caffeine takes about 20 minutes to start acting on the brain and can help reduce grogginess upon waking.
- Consume up to 200 mg of caffeine every 3–4 hours.^{10,11}

Energy drinks and caffeine products aren't substitutes for sleep. Nor are they equivalent to getting adequate sleep. Sleep is irreplaceable and essential to optimal health and performance. Caffeine can help *mitigate* the impact of sleep deprivation on cognitive performance, but it can't fully restore performance levels to those achieved from proper rest. Being awake for 24 hours equals a BAC of 0.1%, which is greater than the BAC for legal intoxication.⁷ Consuming 200 mg of caffeine during this period helps your cognitive performance enough to reduce the BAC equivalent to 0.06%, or under the legal intoxication limit. Caffeine slightly offsets the impact of sleep deprivation, but your cognitive performance remains impaired as compared to when you're fully rested.²³⁻²⁵

When using caffeine as part of your fatigue management plan, it's important to do it safely. Generally, consuming up to 400 mg every 24 hours is considered safe for daily consumption.^{10,11} But don't exceed 600 mg of caffeine in 24 hours when using it for fatigue management.^{10,11} If an

operation requires being awake for over 36 hours, consuming up to 800 mg of caffeine in 24 hours is acceptable, but it's essential to prioritize getting some sleep at this point.^{10,11} To ensure your safety, never consume more than 800 mg of caffeine in a 24-hour period.^{10,11}

For Service Members assigned to extended shift work, keeping a consistent sleep schedule throughout can help them adjust their internal clock to support night work. Here's how they can optimize their sleep routine for the best results:

- **Tailor your sleep window.** Consider social and family commitments, and find the best time to get uninterrupted sleep. It might be easier to fall asleep between 1300 and 1500, but identify the time that works best for you.
- **Create an optimal sleep environment.** Adjust the temperature and reduce light and noise for good sleep.
- **Prioritize sleep duration.** Strive for 7–9 hours of sleep in a single stretch. If this isn't possible, meet your daily sleep requirements with two shorter periods of sleep.
- **Establish a consistent routine.** Keep to a daily schedule. Try to sleep and eat at the same time every day. This practice can help you optimize your performance by aligning your internal clock with your activities.

In the **recovery phase**, prioritize paying off sleep debt and returning to your regular daily routine. Once the operation or exercise is over, aim to sleep as soon (and for as long) as possible. Optimize your sleep environment by adjusting temperature, light, and noise levels to ensure ideal sleep conditions. It's common for it to be hard to fall asleep after prolonged wakefulness due to the activation of stress and fight-or-flight responses. To promote relaxation and a calm mind for better sleep, try relaxation response activities like mindfulness, progressive muscle relaxation, and deep breathing. These techniques activate the body's response that triggers relaxation.

Also, plan to get extra sleep during the first few days after an operation or exercise to pay off sleep debt. As with sleep banking, you can achieve this through napping or extending your sleep overnight. Regardless of the approach, getting extra sleep during this period is essential to pay off your sleep debt and support optimal performance.

Once you're back on daytime operations, go back to your usual bed and wake-up times as soon as possible. Get sunlight in the morning to help reset your internal clock. This makes it easier to fall asleep at night. Within two hours of bedtime, limit exposure to bright light. Bright light and screen light can disrupt your sleep-wake cycle. Use relaxation techniques to make it easier to fall asleep.

Remember, for optimal health and performance, strive to get 7–9 hours of sleep each night. Prioritizing adequate sleep during the recovery phase will aid in your overall well-being and ensure you're ready for future challenges.

STRATEGIES FOR SUCCESS

Review the suggestions below to help you present this Fatigue Management Plan 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 can help them deal with real-life situations that can range from mission-essential tasks to their personal lives, interests, or hobbies.



PLAN AND PREPARE

- How can you grab participants' interest and make them understand the importance of setting and following a fatigue management plan?
- Many Service Members believe that sleep is “overrated” or not mission critical. Helping them understand the importance of sleep before engaging in this activity can help them be open to creating their own fatigue management plan.
- Brainstorm ways a lack of sleep might impact the mission, whether related to shift work or sustained operations. Consider safety and mission-essential tasks. Include the research presented in this leader guide:
 - ➔ Being awake for 24 hours is similar to having a BAC of 0.1%.
 - ➔ Signs of sleep deprivation emerge after about 18 hours of being awake and intensify with time:
 - » Extreme fatigue
 - » Slower thinking and reaction time
 - » Reduced vigilance, attention span, and concentration
 - » Drowsiness
 - » Mood changes—irritability, increased anxiety, heightened fear
 - » Worsened memory and forgetfulness
 - » Impaired judgment and decision making
 - » Poor coordination and balance
- Brainstorm personal stories, relatable experiences, or popular anecdotes your participants might be familiar with. Use them to highlight the impact of sleep on something they value.



EXECUTE

- Explain how setting a fatigue management plan is mission essential.
- Review the research on how being awake for 24 hours is similar to having a BAC of 0.1% and the impacts of sleep deprivation.
- Review the signs of sleep deprivation that show up after about 18 hours of being awake, how they intensify with time, and how they might impact the mission:
 - Extreme fatigue
 - Slower thinking and reaction time
 - Reduced vigilance, attention span, and concentration
 - Drowsiness
 - Mood changes—irritability, increased anxiety, heightened fear
 - Worsened memory and forgetfulness
 - Impaired judgment and decision making
 - Poor coordination and balance
- Share your most attention-grabbing personal story, relatable experience, or anecdote that highlights the impact of sleep on the mission or something else your participants might value.

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



PLAN AND PREPARE

- Helping Service Members identify the impact fatigue had on their past performance can help them understand the value of a fatigue management plan.
- Brainstorm potential past experiences your audience might have had that are similar to the focus of this fatigue management plan.
- Develop a few questions to help them reflect on how a lack of sleep impacted their performance, as well as their safety and relationships at home.
- What planning or strategies did they use to deal with their lack of sleep? Were they productive or counterproductive?



EXECUTE

- Ask participants to think of a specific past experience that restricted their sleep.
- Help participants to reflect on:
 - How did they plan to address the impact of sleep? (Did they plan at all?)
 - What was helpful?
 - What was unhelpful?
 - How can it be different in the future?
 - What can they learn from the past that will help them prepare for future missions?
- If possible, have participants discuss their past experiences as a group or with a partner.

How can they create their own fatigue management plan to achieve future mission 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 their personal lives, interests, or hobbies.



PLAN AND PREPARE

- Review the [“Fatigue management strategies for shift work and sustained operations”](#) worksheet and note any specific barriers or strategies your audience should take into account when developing their plan.
- The more specific your audience gets when making the plan, the more likely they’ll follow through. Try and brainstorm any upcoming events, demands, or opportunities that might impact their planning.
- Review the “How it works” section in this leader guide to highlight the importance of the tips listed on the worksheet.

NOTE: The **preparation** phase in the worksheet covers how to prepare prior to night or sustained operations:

- Adequate sleep during regular daytime operations is the foundation of an effective fatigue management plan.
- Up to 2 weeks prior to shift work or sustained operations, bank sleep hours to help offset the impact of sleep deprivation. The more hours you bank, the better.
- Get as much sleep as you can one day before shift work or sustained operations.

The **execution** phase in the worksheet covers what to do during night or sustained operations:

- After being awake for 18 hours, your performance will degrade. Here are some strategies you can use to manage fatigue during shift work and sustained operations.
- If you're on a shift-work schedule for a few days or weeks, a consistent sleep schedule can improve your overall performance.

The **recovery** phase in the worksheet covers what to do after a return to normal duty:

- After your shift or sustained operations, catch up on lost sleep as soon as possible.
- Back on daytime operations.



EXECUTE

- Go through each section of the worksheet and present each phase, any barriers they should consider, and then give them time to ask questions and develop their own plan for each phase.
- Encourage participants to be as specific as possible. Prompt them to note days, times, and strategies.
- Encourage them to consider barriers they might have to overcome and how to plan for them.
- Help them think through who can help them. What conversations might they need to have to secure that help?
- If possible, have participants work in pairs or in a group to help them consider multiple perspectives. This encourages peer accountability to follow through with their plans.

What's working? What isn't? Don't forget to follow up! Check in with participants after they've created their fatigue management plan to help them to follow through, troubleshoot any issues, and note lessons learned for the future.

Consider scheduling multiple fatigue management check-ins throughout the mission.



PLAN AND PREPARE

- Review the mission schedule and consider key times it would be helpful to schedule check-ins. Some times to consider are:
 - ➔ 2 weeks prior to night or sustained operations: Remind participants of the plan and consider any changes they might need to make.

- 1 week prior to night or sustained operations: Assess how participants have been able to follow through with their plan and to reassess the “day before shift work or sustained operations” part of their plan.
 - If on a shift-work schedule for a few days or weeks, consider scheduling checkpoints throughout to help participants assess how their sleep is adjusting to the shift work. What, if any, changes should they make?
 - Prior to shifting to the recovery phase, check in to review how to catch up on sleep as soon as possible and return to daytime operations.
 - After they are back on daytime operations for a week or more, AAR the overall process to determine what went well, where they might improve, and what they’ve learned to improve their plan in the future.
- Based on your time frame, brainstorm what obstacles have come up since they initially made the plan.
 - Consider using HPRC’s “[Sleep Habits Self-Check](#)” to help them identify other research-based habits that can help optimize their sleep.



EXECUTE

- If your meeting is prior to participants implementing their plan, consider asking the following questions:
 - Give participants the opportunity to re-share their plan for that specific time-frame.
 - What, if anything, has changed since they made their plan?
 - How might they need to adjust to their plan based on changes or new barriers?
 - How can they make sure they follow through? Who can help them? How can they set up their environment for success?
- If your meeting is during or after participants implement a section of their plan, consider asking the following questions.
 - What was supposed to happen in your plan?
 - What actually happened?
 - How effective are you in managing your fatigue? Energy levels? Focus?
 - What’s going well?
 - Where can you improve?
 - What did you learn?

- ➔ What do you need to do moving forward?
- ➔ How can they make sure they follow through? Who can help them? How can they set up their environment for success?

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