

THE IMPORTANCE OF SLEEP FOR PERFORMANCE AND RECOVERY

Sleep is one of the most important parts of human performance, yet people often give it up for other priorities. The quality and quantity of sleep affects everything from physical and mental performance to general health and well-being. When it comes to physical performance, sleep is a major contributor to recovery and muscle regeneration.

Sleep and healing

If you think of your body as a chimney, over time and with normal use, the bricks get old and start to crumble. To fix the chimney, you need to take out the broken bricks and replace them with new ones. That's a simplified way of explaining how your body repairs damaged muscle cells.

When you're asleep, specifically in the "deep sleep" phase, your body releases growth hormone, which starts repairing damage. This damage could be from injury. But normal exercise also causes your muscles to break down slightly, which is thought to be a contributing cause of **delayed onset muscle soreness**. The deep sleep phase creates the best environment for your body to break down and rebuild damaged muscle cells. This repair process is what actually leads to muscle growth and the way physical fitness improves over time.

Effects of sleep deprivation

True sleep deprivation has a narrow definition—having no sleep for at least 30 hours—which is more common in deployed settings than in garrison. Sleep deprivation has been shown to reduce sprinting performance and cardiorespiratory endurance (needed for the running component of your PFT). Your ability to generate power can also decrease when you get closer to 36 hours without sleep.

Shorter periods of sleep loss and building sleep debt can also worsen your:

- athletic performance, such as strength-based activities at less than 100% effort (also called sub-maximal strength)
- hand-eye coordination
- reaction time
- mood
- immune system, which fights disease and repairs the body
- endocrine system, which controls your body's "chemical messaging system" that starts and stops body functions

Over time, all these effects of sleep loss can hurt your body's ability to recover from normal, short-term muscle damage, and can build up and lead to burnout and the physical signs of **overtraining**.



When all else fails - take a nap [Find Out More](#)

Sleep to improve performance

There are a few ways to *use sleep to improve your performance*. The first is called sleep extension, where you aim to sleep more overnight and take **naps** during the day. It works to improve athletic performance and can also help you feel less sleepy during the day. This tactic can be difficult to use regularly because of schedule and family demands, but with some strict scheduling and setting boundaries for your family (don't wake up mom or dad when they're napping) it can help improve your recovery after work or exercise.

Recovery sleep is where you sleep longer in a 24-hour period than you normally would, like on weekends or after an intense training session. It's similar to sleep extension, but isn't a regularly scheduled sleep time. Recovery sleep is not as effective at restoring physical performance after activity as getting enough sleep every night, but it can help reset your circadian rhythm and hormone levels over a 24-hour period.

When you go to sleep, it's important to practice good [sleep hygiene](#). Creating a dark environment, avoiding electronic device use before bed, and wearing ear plugs to make it quiet all can help improve sleep quality. Practicing good sleep hygiene will help you spend more time in the deep sleep phase and can help boost your recovery.

Bottom line

Good, quality sleep is one of the most effective ways to recover and recharge after training and exercise. Sleeping enough—and soundly— will not only improve your physical performance, but it will help improve your mental and emotional performance as well. Read HPRC's article about the importance of [prioritizing sleep for better military performance](#). Also, check out HPRC's [Sleep & Stress](#) section.

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References

Blumert, P. A., Crum, A. J., Ernsting, M., Volek, J. S., Hollander, D. B., Haff, E. E., Haff, G. G. (2007). The acute effects of twenty-four hours of sleep loss on the performance of national-caliber male collegiate weightlifters. *Journal of Strength Conditioning Research*, 21(4): 1146–1154. doi:10.1519/R-21606.1

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(3), 683–703. doi:10.1007/s40279-017-0832-x

Caldwell, J. A., Knapik, J. J., & Lieberman, H. R. (2017). Trends and factors associated with insomnia and sleep apnea in all United States military service members from 2005 to 2014. *Journal of Sleep Research*, 26(5), 665–670. doi:10.1111/jsr.12543

Halson, S. L. (2008). Nutrition, sleep and recovery. *European Journal of Sport Science*, 8(2), 119–126. doi:10.1080/17461390801954794

Oliver, S. J., Costa, R. J. S., Laing, S. J., Bilzon, J. L. J., & Walsh, N. P. (2009). One night of sleep deprivation decreases treadmill endurance performance. *European Journal of Applied Physiology*, 107(2), 155–161. doi:10.1007/s00421-009-1103-9

Pejovic, S., Basta, M., Vgontzas, A. N., Kritikou, I., Shaffer, M. L., Tsaoussoglou, M., . . . Chrousos, G. P. (2013). Effects of recovery sleep after one work week of mild sleep restriction on interleukin-6 and cortisol secretion and daytime sleepiness and performance. *American Journal of Physiology-Endocrinology and Metabolism*, 305(7), E890–E896. doi:10.1152/ajpendo.00301.2013

Postolache, T. T., Hung, T.-M., Rosenthal, R. N., Soriano, J. J., Montes, F., & Stiller, J. W. (2005). Sports chronobiology consultation: From the lab to the arena. *Clinics in Sports Medicine*, 24(2), 415–456. doi:10.1016/j.csm.2005.01.001

Reilly, T., & Edwards, B. (2007). Altered sleep-wake cycles and physical performance in athletes. *Physiology & Behavior*, 90(2-3), 274–284. doi:10.1016/j.physbeh.2006.09.017

Reilly, T., & Piercy, M. (1994). The effect of partial sleep deprivation on weight-lifting performance. *Ergonomics*, 37(1), 107–115. doi:10.1080/00140139408963628

Sinnerton, S., & Reilly, T. (1992). Effects of sleep loss and time of day in swimmers. *Biomechanics and medicine in swimming: Swimming science VI*, 399–405.

Skein, M., Duffield, R. O. B., Edge, J., Short, M. J., & MÜNdel, T. (2011). Intermittent-sprint performance and muscle glycogen after 30 h of sleep deprivation. *Medicine & Science in Sports & Exercise*, 43(7), 1301–1311. doi:10.1249/MSS.0b013e31820abc5a

Souissi, N., Sesboue, B., Gauthier, A., Larue, J., & Davenne, D. (2003). Effects of one night's sleep deprivation on anaerobic performance the following day. *European Journal of Applied Physiology*, 89(3-4), 359–366. doi:10.1007/s00421-003-0793-7

Waterhouse, J., Atkinson, G., Edwards, B., & Reilly, T. (2007). The role of a short post-lunch nap in improving cognitive, motor, and sprint performance in participants with partial sleep deprivation. *Journal of Sports Sciences*, 25(14), 1557–1566. doi:10.1080/02640410701244983