Sleep, training and recovery

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Short sleep hurts strength, endurance and skill, slows muscle repair and makes fat loss harder.

Why it matters: Sleep is the recovery tool most people neglect, and no supplement or recovery gadget makes up for it.

The big picture: Adults need at least 7 hours a night. In one trial, dieters lost less than half as much fat with 5½ hours in bed as with 8½ hours.

What to do with this

- **Aim for 7 to 9 hours a night,** most nights [1].
- **Keep a regular wake-up time,** even on weekends.
- **Before a big workout or event,** protect the night before. Sleep loss hurt afternoon and evening performance more than morning performance [2].
- **If you're dieting, prioritize sleep.** It helps you keep muscle and lose fat [3].
- **Having trouble sleeping?** See "Sleep problems and how to fix them" and the guide "Better sleep tonight."

Go deeper

The terms:

- **Sleep restriction:** getting less sleep than usual, such as 5 or 6 hours.
- **Sleep deprivation:** a night with little or no sleep.
- **Muscle protein synthesis:** the process of building new muscle protein after training and meals.
- **Cortisol:** a stress hormone that rises with sleep loss.
- **Sleep extension:** deliberately spending more time asleep.

What people believe: You can train through a few short nights without consequence, or that sleep is a luxury compared with training and diet.

How much sleep?

- A 2015 consensus of sleep experts concluded adults should sleep 7 or more hours a night, and that 6 or fewer hours is not enough to sustain health and safety [1].
- Young adults, people recovering from sleep debt and people who are ill may need more than 9 hours [1].

Performance:

- A 2022 meta-analysis of 69 studies found acute sleep loss reduced exercise performance by about 7.6% on average, across strength, power, endurance, intervals and skill [2].
- The clearest harm came from a full night without sleep or from waking early after a late night; performance fell about 0.4% for each extra hour awake. Evening sessions were affected more than morning ones [2].

Muscle:

- In a trial of 13 young adults, one night without sleep cut muscle protein synthesis by about 18% the next day, raised cortisol by 21% and lowered testosterone by 24% [4].

Weight loss:

- In a crossover trial, 10 overweight adults dieted for two weeks with either 8½ or 5½ hours in bed. With short sleep, the share of weight lost as fat fell by 55%, and they lost more lean mass [3].
- In a 2022 trial of 80 overweight adults who usually slept under 6½ hours, a single counseling session helped them sleep about 1.2 hours more. They ate about 270 fewer calories a day than the control group, without being told to diet [5].

Injury:

- In a survey of 112 middle and high school athletes, those sleeping less than 8 hours were 1.7 times more likely to have been injured [6].

Between the lines: Sleep supports almost everything on this site: training, recovery, appetite and mood. Treat it as part of your program, not what's left over.

Reality check: Many sleep studies are small and short, and the injury study was a survey that can't show cause and effect. The effects of long-term mild short sleep are harder to study than a single bad night.

How sure are we: Strong that adults need at least 7 hours. Strong that acute sleep loss hurts exercise performance. Moderate that short sleep undermines fat loss and muscle repair. Early on sleep and injury risk.

Protect your sleep

1. **Set a fixed wake time,** and count back 7½ to 8½ hours for your target bedtime.
2. **Stop caffeine at least 6 hours before bed** (see "Sleep problems and how to fix them").
3. **Limit alcohol,** especially close to bedtime.
4. **Keep the bedroom dark, quiet and cool.**
5. **Schedule hard training earlier in the day** after a short night, if you can.

Sources

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