Pink Noise Might Be Stealing Your Best Sleep

5 MIN READ

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Read this before using pink noise or other sounds to fall asleep.

Pink noise, that soft, steady hum that sounds like rainfall or a distant waterfall, is the lower-pitched cousin of white noise. Where white noise hits every frequency at equal intensity, a static-like hiss, pink noise emphasizes the lower end of the spectrum, making it feel warmer, more natural, easier to sink into. It sits in the same family as white noise, both are types of broadband sound, and that category has become enormous:white noise and ambient sound podcasts alone account for **three million daily listening hours on Spotify**, and the top white noise videos on YouTube have topped 700 million views.

The logic is seductive: mask the noise outside with something smoother inside. Drift off faster. Sleep deeper. Except a new study from the University of Pennsylvania Perelman School of Medicine, **published in the peer-reviewed journal *SLEEP***, suggests that the sound you're playing to protect your sleep may be quietly undermining its most important stage.

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Pink Noise Disrupts Your Most Restorative Sleep Stage

Researchers monitored 25 healthy adults across seven nights in a controlled sleep laboratory, using **polysomnography**, the gold standard of sleep measurement,

tracking brain waves, eye movement, and muscle tone, to see exactly what was happening at each sleep stage under different noise conditions.

Two findings stood out.

1. **First, environmental noise (traffic, jets, etc) cost people nearly 23 minutes of deep sleep per night.** Deep sleep is when your body handles **physical restoration, memory consolidation, and what neuroscientists call glymphatic clearance**, the brain's overnight process of flushing out metabolic waste products that accumulate during the day.
2. **Second, pink noise at 50 decibels, roughly the sound of moderate rainfall, erases nearly 19 minutes of REM sleep** per night compared to sleeping in silence. REM is when emotional regulation, memory formation, and brain plasticity happen. It's the stage that helps you wake up rested and emotionally calibrated.

As lead author **Mathias Basner, M.D., Ph.D**., professor of Sleep and Chronobiology in Psychiatry at Penn, put it: "Deep sleep and REM sleep complement each other, and collectively guarantee that we wake up restored in the morning, ready for the next day." Disrupt both, and you're not just sleeping lighter, you're shortchanging your brain's overnight work.

Worth noting: when pink noise was layered on top of environmental noise, people lost both deep sleep and REM sleep, and spent 15 more minutes awake than on nights with traffic noise alone. Neither sound, on its own, produced that outcome.

A critical caveat**:** this was a small study, 25 adults, ages 21–41, in a lab setting, over one week. The findings are preliminary, and the researchers themselves call for more long-term research, particularly in older adults and real-world settings. Take it as reason to pay attention, not panic.

The Surprising Sleep Fix: $3 Earplugs

Here's the part the researchers didn't expect to be the headline: earplugs outperformed

pink noise in every meaningful measure. Worth noting that this study was funded by the FAA, not an earplug company (I checked!), which makes the finding harder to dismiss. Wearing standard foam earplugs recovered more than 70% of the deep sleep lost to traffic noise, without touching REM sleep at all. Most people found them comfortable, and 85% reported sleeping better or much better with them in.

If you're not ready to give up the sound machine entirely, Basner offers a middle path: use pink noise at the lowest volume that still works for you, and set a timer so it shuts off after you fall asleep. But if street noise is your actual problem, a $3 pair of foam earplugs may be doing more work than any app.

Try This: The 3-Night Sleep Sound Experiment

Run your own test this week. Each morning, rate your energy, mood, and mental clarity on a simple 1–10 scale.

- **Night 1:** Your usual routine, soundscape as normal
- **Night 2:** Low level pink noise with a timer to cut out 20 minutes after lights out
- **Night 3:** Standard foam earplugs instead (any pharmacy, under $5)

The goal is finding out how to protect your sleep so you can wake up refreshed and sharp

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