TEST

Polysomnography

Polysomnography is an overnight test that records breathing, brain activity, movement, and other body signals during sleep.

WHAT IT MEASURES
Breathing, brain activity, oxygen, heart rhythm, and movement during sleep

SAMPLE
None

FASTING NEEDED?
No, unless your sleep center gives specific instructions

HOW LONG IT TAKES
Eight to ten hours, including sensor setup

RESULTS IN
Several days to two weeks, varying by sleep laboratory

USED FOR
Diagnosis and monitoring of sleep disorders and treatment

MAIN LIMITATION
One laboratory night may not represent your usual sleep

Overview

Polysomnography is a detailed sleep study, usually performed overnight in a sleep laboratory. It records several body signals while you sleep.

Small sensors measure brain waves, eye movements, muscle activity, breathing, blood oxygen, heart rhythm, snoring, and body position. Video may also be recorded. Together, these measurements show when you are asleep, which sleep stages you enter, and whether breathing or movement repeatedly disturbs your sleep.

Polysomnography is more comprehensive than a home sleep apnea test. Most home tests focus on breathing and oxygen levels and do not directly measure whether you are asleep.

A sleep technologist monitors the recording from another room. The technologist does not usually interpret the final result. A clinician trained in sleep medicine reviews the recorded signals and report.

Why the test is ordered

Polysomnography is commonly used to investigate obstructive sleep apnea. In this condition, the throat repeatedly narrows or closes during sleep, reducing or stopping airflow.

The test may also help assess:

Polysomnography is not routinely needed for every person with insomnia, snoring, daytime tiredness, or restless legs. These concerns can have several causes, and some are diagnosed mainly from your symptoms and medical history.

- Central sleep apnea, in which breathing pauses because the brain does not consistently send breathing signals
- Unusual movements or behaviors during sleep
- Repeated leg movements that disrupt sleep
- Suspected narcolepsy, usually before a separate daytime nap test
- Sleep-related low oxygen or reduced breathing
- Persistent symptoms after an unclear or negative home sleep apnea test
- Whether positive airway pressure or another treatment is controlling breathing problems

Who should have the test

Your clinician may suggest polysomnography if your symptoms or medical history raise concern for a sleep disorder that requires direct measurement during sleep.

An in-laboratory study may be especially useful when a home test would provide too little information. Examples include suspected sleep apnea alongside significant heart or lung disease, muscle weakness affecting breathing, possible central sleep apnea, or unusual nighttime behaviors.

Children may have polysomnography when sleep-related breathing problems are suspected. Results are interpreted differently from adult results because children normally have fewer breathing events.

The test can also be used after treatment starts. For example, it may help select airway pressure settings or investigate continuing symptoms. Whether repeat testing is useful depends on the treatment, symptoms, and findings from the first study.

How to prepare

Follow the sleep center's instructions, because the plan may be adjusted for your usual sleep schedule and the question being investigated.

On the day of the study:

Do not stop prescribed medicines unless the clinician arranging the study tells you to. Some medicines affect sleep, but suddenly stopping them can also change the results or be unsafe.

Tell the sleep center if you have a latex or adhesive allergy, need help moving, or have difficulty sleeping without a caregiver. Ask whether you should bring your own mask if the study includes positive airway pressure treatment.

- Keep your usual routine unless told otherwise
- Avoid alcohol because it can alter breathing and sleep stages
- Ask when to stop caffeine, including coffee, tea, cola, and energy drinks
- Avoid hair products, heavy skin creams, and nail polish if requested
- Bring comfortable sleepwear and your usual nighttime medicines
- Tell the center if you use oxygen, positive airway pressure, or mobility equipment

What happens during the test

You usually arrive in the evening. The room is designed like a private bedroom, although equipment and a camera are normally present.

A technologist attaches sensors to your scalp, face, chest, abdomen, and legs. Elastic belts measure breathing effort. A small sensor on your finger measures oxygen levels. Airflow sensors sit near your nose and mouth.

The sensors are attached with paste, tape, or adhesive. No needles are normally involved. The wires are gathered so that you can turn over and change position.

Before sleep, the technologist asks you to perform simple actions, such as blinking, moving your legs, and breathing in and out. This checks that each sensor is recording properly.

You can speak to the technologist during the night. If you need to use the toilet, the equipment can be disconnected temporarily.

In a split-night study, the first part records your breathing without treatment. If the findings meet the sleep center's criteria, positive airway pressure may be started later that night. Not everyone qualifies for or needs this type of study.

Understanding your results

The report combines information from many recording channels. Important measurements may include:

The apnea-hypopnea index, or AHI, is the average number of complete or partial breathing interruptions per hour of sleep. Another measure, the respiratory disturbance index, may include additional breathing events that cause brief awakenings.

A higher number does not always explain how you feel during the day. Your clinician also considers oxygen changes, event length, sleep position, symptoms, other health conditions, and how much you actually slept.

Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context. Adult and child results should not be interpreted using the same thresholds.

- Total sleep time and time spent in each sleep stage
- How often you woke or briefly shifted into lighter sleep
- The number and type of breathing events
- Blood oxygen levels and time spent at lower levels
- Heart rate and rhythm during sleep
- Snoring, body position, and limb movements

What affects the results

A polysomnogram can be technically correct but still give an incomplete picture of your usual sleep.

Sleeping in an unfamiliar room may make you sleep less, wake more often, or spend less time in certain sleep stages. This is sometimes called the first-night effect. A short recording can miss problems that occur mainly during dream sleep or late in the night.

Other influences include:

Sleep and breathing also change with age and pregnancy. These factors may alter interpretation without meaning that the equipment was wrong.

Tell the sleep center what you took, drank, and did before the test. Do not try to create a "better" night by changing medicines or deliberately losing sleep unless instructed.

- Sleeping mostly on your back or avoiding your usual position
- Alcohol, caffeine, nicotine, or recreational drugs

- Sedatives, stimulants like methylphenidate or lisdexamfetamine , antidepressants like sertraline or fluoxetine , pain medicines, and other medicines
- Nasal congestion, pain, fever, or a recent illness
- An unusual bedtime, shift work, jet lag, or recent sleep loss
- Using or withholding oxygen or breathing equipment
- Loose sensors, airflow leaks, or signal interference

Accuracy and limitations

In-laboratory polysomnography is the most detailed standard test for many sleep-related breathing disorders. It can distinguish sleep from wakefulness and show whether events occur during particular sleep stages or positions.

However, it can miss a disorder when too little sleep is recorded or when the problem does not happen that night. Breathing events can vary from night to night, so no single percentage describes how often one study misses sleep apnea in every setting.

The test can also appear more abnormal than your usual sleep. This may happen if you spend more time on your back, take a medicine you do not usually take, or sleep differently because of the laboratory. Recording artifacts can resemble real events, although trained review reduces this risk.

A negative result does not always end the investigation when symptoms remain strongly suggestive. A repeat study may be considered after an adequate but negative test.

Different tests are better for some questions. A home sleep apnea test may be sufficient for selected adults with a strong suspicion of obstructive sleep apnea. A multiple sleep latency test measures daytime sleepiness and supports assessment for narcolepsy. Actigraphy, using a wrist-worn movement monitor, is often more useful for tracking sleep timing over several days.

Risks and complications

Polysomnography is noninvasive and generally has few physical risks. Adhesive or sensor paste may cause mild skin irritation, and the equipment may make sleep less comfortable than usual.

A fall is possible when getting out of bed while attached to wires. Use the call system if you need help during the night.

What happens next

A sleep specialist reviews the study and sends a report to the clinician who arranged it. Routine follow-up may involve discussing the findings, comparing them with your symptoms, and deciding whether treatment or another test is appropriate.

Possible next steps include a home test, repeat polysomnography, a daytime nap study, positive airway pressure treatment, or assessment for another cause of disrupted sleep. An unclear study does not by itself confirm or rule out a specific disorder.

Sleep study results rarely require emergency action. However, do not drive if you are struggling to stay awake or have had near-misses because of sleepiness. Seek emergency care for severe breathing difficulty, blue or grey lips, new chest pain, fainting, or another acute medical emergency rather than waiting for routine sleep follow-up.

Common questions

Can I drink coffee before a sleep study?

Many sleep centers ask you to avoid caffeine after the morning or early afternoon because it may delay sleep and reduce total sleep time. Follow the timing provided by your center.

Can I exercise beforehand?

Usual daytime exercise is generally acceptable. Avoid unusually intense or late exercise if it normally keeps you awake, unless the center gives different instructions.

Should I take my regular medicines?

Usually, but confirm this in advance. Medicines that cause sleepiness or alertness can affect the recording, and some should not be stopped suddenly.

What if I cannot sleep in the laboratory?

Many people sleep less than usual but still provide enough information. If too little sleep is recorded, the clinician may recommend another study or a different test.

Can I use the toilet during the study?

Yes. Call the technologist, who can disconnect or manage the wires while you get out of bed.

Does the time of day matter?

Yes. The study should usually match your main sleep period. If you work nights or sleep during the day, tell the center so it can consider appropriate scheduling.

Sources

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