AN INTRO TO

Sleep Studies

An introductory guide to
Sleep Studies and Home Sleep Tests

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Introduction

A sleep disorder is anything that interferes with a person getting a full night's sleep on a regular basis. There are many types of sleep disorders including breathing disorders (such as sleep apnea), movement disorders, insomnias, circadian rhythm disorders, parasomnias, and more.

The majority of these disorders can be diagnosed by a sleep physician. Most disorders will require a polysomnogram test, which is an overnight, in-lab study performed while the patient is sleeping. However, sleep apnea (especially moderate to severe forms) can be diagnosed with a Home Sleep Test (a device that is taken home and worn overnight).

Sleep tests are critical in diagnosing sleep disorders so that patients can then be prescribed the right therapy for their disorders.

Here we examine the various types of sleep tests, what they diagnose, and how much they cost.

CHAPTER

1

What are In-lab Sleep Studies?

In-lab Sleep Study

Four Types of Sleep Studies

1.Polysomnogram (PSG). A polysomnogram is an overnight sleep study that records brain activity, eye movements, heart rate, blood pressure, oxygen levels, body movement, and more. Polysomnograms are used to help diagnose some of the following:

- Sleep related breathing disorders such as obstructive sleep apnea (OSA).
- Sleep related seizure disorders.
- Sleep related movement disorders such as restless leg syndrome (RLS) and periodic limb movement disorder (PLMD)
- Sleep related disorders caused by excessive daytime sleepiness.

In-lab Sleep Study

Four Types of Sleep Studies

2. Multiple Sleep Latency Test (MSLT). A MSLT is a sleep study that is performed during the day to measure how sleepy you get or to discern whether breathing treatments for your disorder are working properly. MSLT's generally follow a Polysomnogram and record whether you fall asleep during the test, and if so, which stages of sleep you enter. In an MSLT you are generally given five 20-minute nap opportunities spaced 2 hours apart while a sleep technician monitors your brain activity and eye movements. An MSLT is often used to test for narcolepsy.

In-lab Sleep Study

Four Types of Sleep Studies

3. Maintenance of Wakefulness Test (MWT). A MWT is a daytime sleep study that measures how alert you are during the day and your ability to stay awake. They are usually performed after a PSG and can help determine if your sleepiness is a safety concern. Results of a MWT can be critical if a person's job involves public transportation. Often, employers will require an employee to have an MWT if they have a history of excessive daytime sleepiness or other related sleep disorders.

In-lab Sleep Study

Four Types of Sleep Studies

4. CPAP Titration Study. A CPAP titration study is occasionally necessary if your diagnosis for CPAP pressure settings were not clear during your polysomnogram test. The titration study is a follow-up test for calibrating the exact pressure needs that your CPAP will need to be set to for your continued therapy. It's very similar to a polysomnogram in that you are connected to the same equipment, but you will also be using a CPAP machine and mask all night. You will get to try on various mask styles to find the one that works best for you and your needs, and the technician will find your ideal pressure setting during the night.

Picture of a patient during a polysomnogram

In-lab Sleep Study

Preparing for a Sleep Study

Most sleep clinics want you to go about your nightly routine so as to get the best results. If you over-prepare or do things differently leading up to your sleep study, the results may not be as accurate as they would if you kept to your normal routine. It sounds crazy, but a sleep tech wants to see you at your worst, so that they can recommend a treatment that is the best. However there are some things you will want to do in preparation for your test:

- Arrive shortly before your usual bedtime, approximately between 8 p.m. to 9 p.m. for an overnight study.
- Make sure you have already had dinner and are ready for bed.
- Bring your medications.
- Bring comfortable clothes that you normally sleep in.
- Bring your morning bathroom supplies.

In-lab Sleep Study

What Happens During a Sleep Study

When you arrive for your sleep study, you will be met by a registered polysomnographic technologist (RPSGT) who will be administering your sleep study. They will generally go over your paperwork, have you fill out any necessary forms, and review with you what the sleep study will entail. After collecting your health history as well as some vitals like your blood pressure, the tech will apply monitors to measure activity in your body as you sleep. This will normally include:

–Wires with small cup electrodes attached to your scalp with a conductive paste to measure brain activity. This lets the tech know if you are sleeping, and what stage of sleep you are in.

–Wire electrodes are taped to your face near the eyes and chin to show muscle activity. These electrodes are used to measure eye movements, which also give clues to sleep stages, as well as chin movements which can observe possible nocturnal teeth grinding as well as other sleep disorders related to muscle activity.

–2 elastic belts around your chest and stomach to measure breathing effort.

–A nasal cannula (clear plastic tubing) and small heat monitor to measure all breathing activity.

–A wire electrode on each leg to measure body movement/muscle activity.

–A monitor taped to your finger to detect oxygen levels during the study.

–2-3 lead EKG monitors to show heart rate and rhythm.

–A small mic applied to your throat to detect snoring.

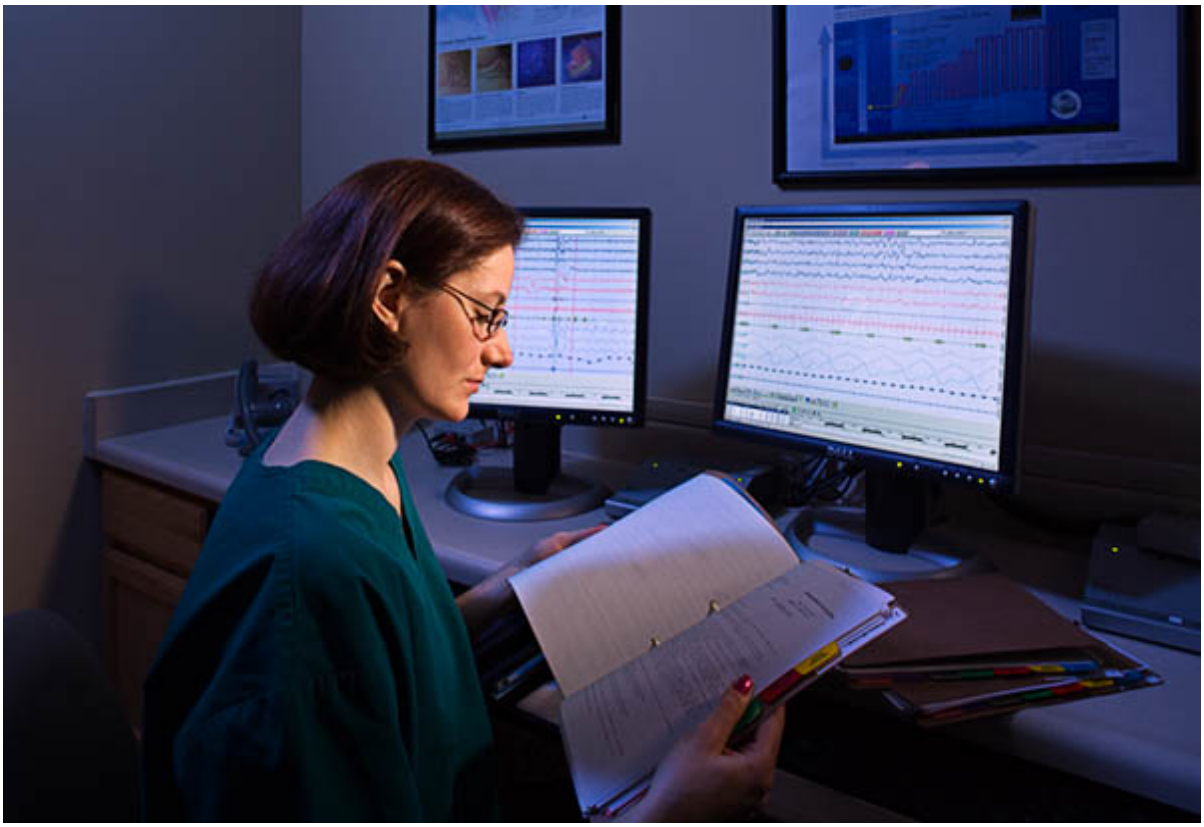
In-lab Sleep Study

What Happens After a Sleep Study

In the morning, around 6-7 a.m., the sleep technician will wake you, remove your monitors, have you fill out some more paperwork and allow you to go home or to work. Most sleep clinics have facilities available for showering and getting ready in the morning so that you don't have to run home first to prepare for your day.

The RSPGT will not be able to share your results with you. Instead, the information is sent to your doctor or a sleep specialist for evaluation. Your doctor or sleep specialist will review the results of your sleep test as well as your medical history and sleep history to make a diagnosis.

Results from the sleep study often take a week to 10 days to get reviewed and finalized before you will be contacted with the results. At this point, if a sleep disorder was detected in the study, your doctor or sleep specialist will go over possible treatments for your condition.



A Registered Polysomnographic Technologist (RPSGT) monitoring a sleep test from the technician room.

Once you have been hooked up to the various machines, the RSPGT will begin monitoring the data from another room. They will communicate with you via an intercom system, and run through a series of tests to calibrate the equipment. When the calibrations are finalized you are encouraged to sleep.

CHAPTER

2

What are Home Sleep Tests?

Home Sleep Tests

What are HSTs?

Home sleep tests are exactly what they sounds like: sleep tests that are administered from the comfort of one's own home. For a home sleep test, the user usually comes into the sleep clinic the day of the test to pick up a HST, and is given a demonstration on how to use the machine properly before taking the equipment home. Testing is performed by the user, and the data stored on the equipment is uploaded the following day at the sleep clinic.

A Home sleep test is an affordable alternative to traditional polysomnograms, but are really only good for diagnosing sleep breathing disorders such as obstructive sleep apnea. HSTs are further limited in that they are not efficient in diagnosing patients who also have a history of other medical conditions such as chronic obstructive pulmonary disease, congestive heart failure, or neuromuscular disease.

Home Sleep Tests

Equipment used during HSTs

Because HSTs are used strictly for diagnosing breathing disorders, it requires far less equipment. A HST comes in a small package that includes devices that are easy for patients to apply themselves including:

- a small nasal cannula to measure airflow
- a belt around the upper chest to measure respiratory effort
- a finger clip to measure the oxygen saturation in the blood

Home Sleep Tests

Pros and Cons of HSTs

Pros

–On average, a Home Sleep Test is about one-quarter the cost of an in-lab study.

–You get to be in your own home and sleep in your own bed.

–They are a good diagnostic tool for generally healthy people with uncomplicated Obstructive Sleep Apnea (OSA).

Cons

–If a sensor falls off, you may not know it, whereas the lab tech would be right in to reattach it. If a sensor is off for a good portion of the night, the study may need to be repeated.

–HSTs are limited to sleep disordered breathing and are not appropriate for patients with other conditions such as, Chronic Obstructive Pulmonary Disease (COPD), Congestive Heart Failure (CHF), Restless Leg Syndrome (RLS) and others that may necessitate more advanced monitoring.

–HSTs tend to *under* diagnose. Because they don't use EEG electrodes to positively determine when the patient is asleep, the entire study will be scored from Start to Stop, versus an in-lab study where sleep is accurately recorded and *only* the sleep portion is scored.

A patient sleeping during a home sleep test

Conclusion

What to Do Next

If you believe that you are ready to have a sleep test performed to get to the bottom of your sleeping troubles, schedule a consultation with a sleep clinic or discuss your symptoms with your primary care provider for guidance.

If you live in Alaska and would like a free 10-minute phone consultation with a sleep educator who could help determine, based on your symptoms, whether a sleep study is your best option, then visit :
www.alaskasleep.com/sleep-assessment

The Alaska Sleep Clinic has helped diagnose and treat tens of thousands of Alaskans suffering from sleep disorders, and would be more than happy to help you make your sleeping problems a thing of the past.