



I need my sleep.

Information for sleep apnea patients

Respiratory arrest known as sleep apnea	4
How do I know if it's sleep apnea?	5
In their own words.....	5
What is sleep apnea?	6
What are the consequences of my sleep apnea?.....	7

Sleep apnea syndrome diagnosis	8
How will my sleep be examined?.....	9
What happens while I'm asleep?	10

Therapy for Sleep Apnea Syndrome	12
What treatment choices are there?	13

Questions and Answers, Tips and Tricks	16
Patients tell of their experiences.	17
What should I pay attention to?	17
How should I handle the technology?.....	18
Answers to my questions.	19



Dear Patient,

Sleep is as important as food and drink. Only a regular sleep-wake cycle keeps us physically and mentally fit over the long term. But nowadays our hectic lifestyle and its pressure on us to perform hardly allow us to relax. Almost one adult in three complains of sleep disorders and some of them are affected by sleep apnea.

Modern sleep research is deeply involved in the diagnosis and treatment of sleep disorders and sleep apnea. Thousands of patients have already been helped. Once their sound sleep is restored, they feel like new. We hope that you will soon be one of them!

Your Weinmann Team



Respiratory arrest known as sleep apnea

In this section, you'll learn what dangerous sleep disorders are hidden behind our apparently "normal" snoring at night. You'll read about how to recognize respiratory arrest, what causes this malfunction and what can happen if sleep apnea goes untreated.

Fall asleep. . . Snore. . . Respiratory arrest – How do I know if it's sleep apnea?

Perhaps you've been snoring for many years and your partner is seriously worried about you. At night you stop breathing and the bedroom becomes absolutely quiet. Sometimes it lasts a few seconds, sometimes longer than a minute.

Suddenly you wake with a start as your breathing begins again with an explosive snort. Your partner sits upright in bed, but you notice nothing of the nocturnal spectacle. That's the way it goes throughout the whole night. . . .

In the morning you feel tired and suffer from headaches or from tension in your shoulders and neck. During the day, you always feel tired and worn out and fall asleep at every opportunity. You can no longer keep up with the demands of the day. You have trouble concentrating and frequently lose your temper.

Perhaps you have even had sexual difficulties of late. Have you also fallen asleep at the wheel?

In their own words

Frank M. of Hameln:

"When my boss found me sleeping at my desk, I said to myself, 'That's the final straw. Go to the doctor.'"

Walter B. of Magdeburg:

"We have a big family, but I got no pleasure from our get-togethers anymore. My wife had to pinch me all the time just to keep me from falling asleep."

Waltraut L. of Ulm:

"I work as a field rep, so I'm used to driving long distances every day. Recently I have simply nodded off while driving. Horrible. The last time I heard the horn of an oncoming truck just in time to wrench the wheel in the other direction."

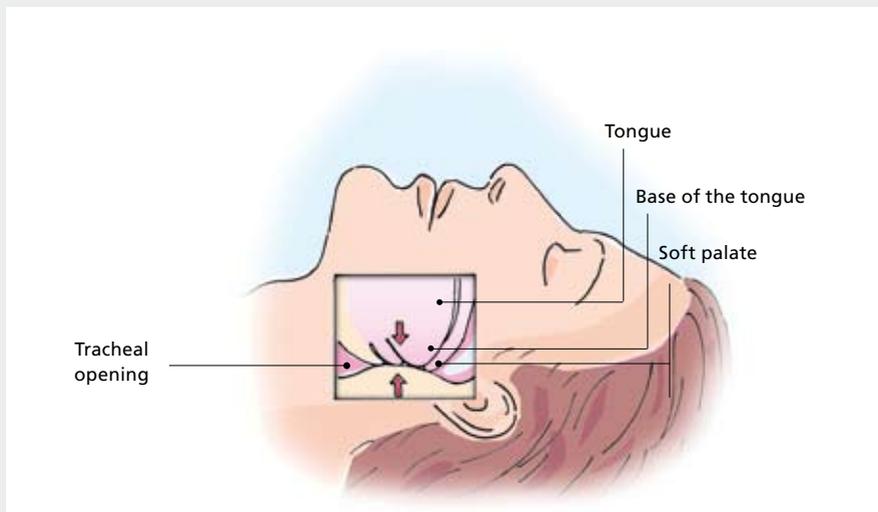
What is sleep apnea?

Respiratory arrest is called apnea. Sleep apnea means that respiratory arrest occurs while you sleep. Doctors distinguish between two forms of sleep apnea – central and obstructive – **although a mixed form can also occur.**

In “obstructive sleep apnea”, respiratory arrest is caused by so-called “obstructions” or the closing of the upper airways. While you sleep, the body’s musculature, including pharyngeal muscles and soft palate, relax and the base of the tongue falls backwards, closing off the upper airways.

The brain, however, continues to send signals to our most important inhalation muscle, the diaphragm, and tells it to continue working. This gives rise to negative pressure in the airways, which causes them to narrow and then close off completely.

Five to 10 respiratory arrests (apnea), each lasting more than 10 seconds, for every hour of sleep can put the body under dangerous strain. In this case, the body does not receive an adequate supply of oxygen. The organism frees itself from respiratory arrest by sending an alarm to the brain. Doctors refer to this emergency waking reaction as “arousal”.



What are the consequences of my sleep apnea?

The patient doesn't notice this waking reaction even though it usually occurs several times during the night. Nevertheless, the reaction disrupts the course of sleep and its natural structure.

Those affected wake in the morning feeling tired and worn out. Body and soul cannot sufficiently recover during sleep. As a result, the quality of life sometimes deteriorates considerably.

A further consequence is that the risk of accidents at home, at work or behind the wheel increases greatly. Over time, the nightly lack of oxygen can damage life-sustaining organs such as the heart and brain. Additionally, the risk of developing high blood pressure increases significantly.

Those suffering from such nocturnal disruptions definitely need the help of a medical specialist. Only an expert can determine the causes and the extent of the disease.

The following can occur as a result of sleep apnea::

- Sleep disruptions
- Loud snoring
- Extreme tiredness during the day
- Constant feeling of not having had enough sleep
- Decreased ability to perform
- Concentration difficulty and forgetfulness
- Headaches in the morning
- Effects on body functions (heart, blood pressure)
- Feelings of depression
- Anxiety
- Dizziness
- Decreased self esteem
- Nightly unrest with heavy sweating and nocturia (nocturnal urination)
- Nightmares
- Impotence
- Narcolepsy
- Immoderate consumption of coffee and/or overeating in order to compensate for fatigue
- Decreased participation in social life
- Decreased quality of life



Sleep apnea syndrome diagnosis

Whatever happens when you sleep can be examined only while you sleep. The next section tells you about how conventional examination methods are used. You'll learn that sleep laboratories are available and that you will have to spend at least one night there. You'll also read about the various stages of nightly sleep and how the lab can document and analyze the structure of your sleep.

How will my sleep be examined?

When sleep apnea is suspected, a preliminary diagnosis will be made on the basis of the symptoms “snoring” and “tiredness during the day” and respiratory arrest during sleep.

For this purpose, the patient will be given a wearable diagnostic device to take home. The device measures pulse, snoring noise and oxygen saturation while the patient sleeps. Data are also captured on the position of the body at different times and whether respiratory arrest occurs in certain positions.

If the findings indicate sleep apnea, the treating doctor will have the patient admitted to a sleep lab for a complete sleep examination (polysomnography). Normally, the patient reports to the sleep lab between 7 and 10:30 p.m.

In specially equipped rooms at the sleep lab, examination is made of the patient’s respiration (oxygen saturation, respiratory flow and movements, snoring), heart rhythm (electrocardiogram or ECG) and movement. An important portion of the examination consists of a graphic recording of the patient’s sleep. On the basis of the sleep structure, findings can be made regarding the quality of sleep.

This is carried out by measuring brain waves:

EEG = electroencephalogram

EOG = electro-oculogram and skeletal muscular activity

EMG = electromyogram



What happens while I'm asleep?

Healthy sleep is characterized by a certain physiological structure which is divided into definite sleep stages:

- Wake phase
- Sleep stage 1 or falling asleep phase
- Sleep stage 2 or light sleep phase
- Deep sleep phase 3
- Deep sleep phase 4
- REM or dream phase
(REM = Rapid Eye Movement)

During the night, each person normally goes through four to six sleep cycles which consist of a certain portion of individual phases in different sleep stages. Each "run through" lasts about 90 minutes.

While deep sleep phases are essential for the body's recuperation, the REM phases are necessary for the processing of

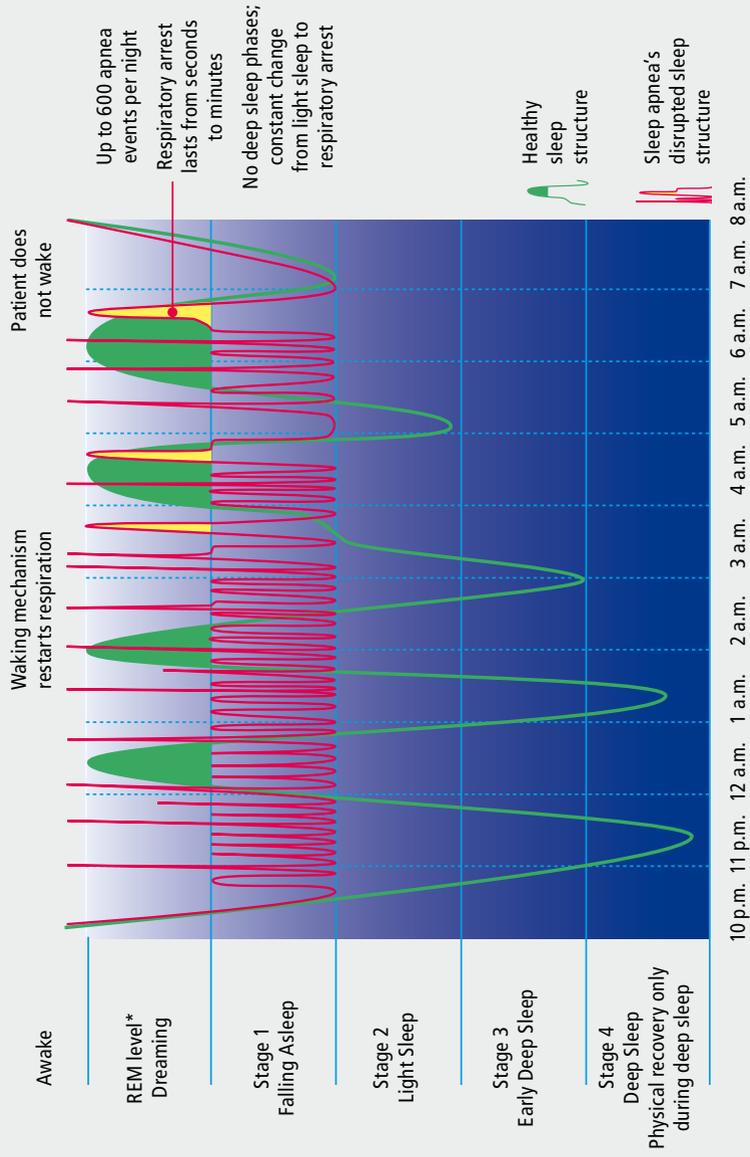
mental and emotional events of the day. Tension in the muscles (muscle tone) is lower in deep sleep stages than in sleep stages 1 and 2. REM sleep has the lowest muscle tone of all. At this point we have vivid dreams, evidenced by the rapid eye movements that give this stage its name.

Someone suffering from sleep apnea hardly ever reaches the deep sleep phase since he is often disturbed by the arousals working as the body's emergency reaction. Dream sleep is also often minimized and disrupted. This has, of course, a negative effect on the patient's condition during the day.

If obstructive sleep apnea is diagnosed after an examination night in the sleep lab, the patient will receive the type of therapy suitable for him – a CPAP device.



Sleep structures





Therapy for Sleep Apnea Syndrome

What treatment choices are there? What is the nasal mask for? Why is there a special setting for air flow? These are just some of the questions that you'll find answers to here. In this section we describe the technical assistance that will eliminate your nightly respiratory arrest.

What treatment choices are there?

The goal of sleep apnea therapy is to eliminate nightly respiratory arrest and to restore healthy sleep structure.

General Measures

These measures help you to eliminate the preventable risks associated with sleep-related respiratory disorders or at least to reduce them considerably.

They are:

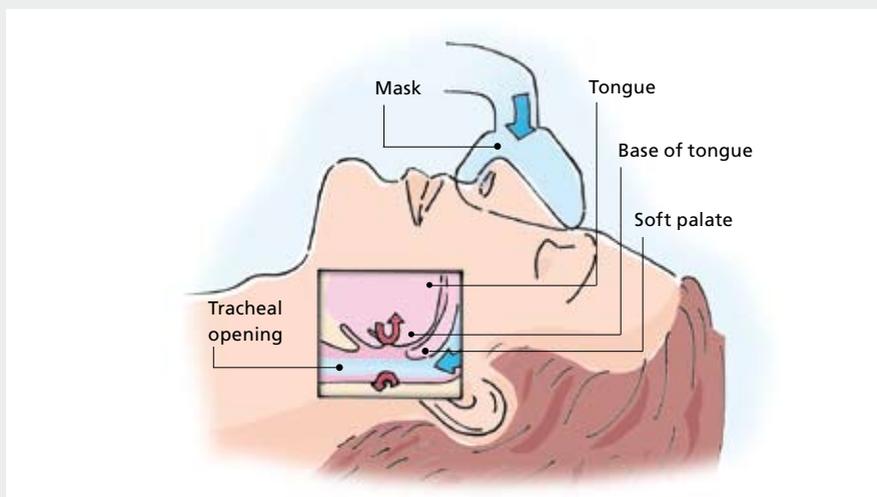
- weight reduction
- observance of good sleep habits
- reduced consumption of alcohol and nicotine
- discontinuation of medicine that diminishes respiratory functions during sleep (e.g., sedatives or sleeping pills)
- avoidance of coffee/tea/cola in the evening

Position Therapy

You should prevent yourself from turning over onto your back during the night since that position increases the risk of sleep-related respiratory disorder. You can wear a backpack filled with newspapers or sew a tennis ball into your pajamas.

Therapy Devices

In the treatment of obstructive sleep apnea, the use of nasal positive pressure devices (CPAP, auto-CPAP, Bi-Level) have proven to be the most successful by far. These devices prevent the airways from closing by providing a so-called “splint” of individually determined air pressure that keeps airways open.





In **nCPAP therapy** (nasal Continuous Positive Airway Pressure), the patient is supplied with air set at a pressure of 8 mbar, for example. This pressure is determined for each individual patient at the sleep lab and set on the device.



Some patients with obstructive sleep apnea require a greatly varied pressure. In this case, an **auto-CPAP device** or an **intelligent CPAP device** can be of help. They always see when an obstruction is building up and react in time to prevent the airways from closing.

Another patient group requires permanently high pressure to hold open the airways through the night. For some patients, the high pressure makes exhalation increasingly difficult. Fortunately, **Bi-Level devices** can help by greatly reducing the pressure during exhalation.

Depending on the type of device („S“ or „ST“), Bi-Level devices are also used for assisted or controlled ventilation, for example, in cases of Adipose-Hypoventilation Syndrome or central respiratory regulation disorders.

Masks

How does the air flow get into the airways? The air is brought from the device via a hose system to the patient's mask, which is held firmly in place by headgear. The mask is a central component of treatment. It sits directly on the patient's face and determines the degree of movement permitted during sleep. A mask with a ball-and-socket joint allows the patient to move any way he likes during the night.





into the air and prevents the airways from drying out. Heated humidifiers that warm the air with water are especially efficient because they provide a higher humidity level than devices without heating elements. The appropriate humidifier should be selected on a case-by-case basis.

Exhalation Systems

During therapy, the exhaled CO₂-laden air has to be discharged properly. This is handled by the exhalation system, which is an opening, slits or pores through which the air can be expelled. Obviously, the patient will find therapy more comfortable if the noise level of the outgoing air is low.



Dental splint / Orthosis

A small number of OSA patients benefit from dental splints or orthosis appliances. They are normally positioned to push the lower jaw forward.



Headgear

The mask is held in position by appropriate headgear. Caps and straps are now available in many forms and colors to suit all possible head shapes and tastes.

Humidifiers

Some patients have sensitive mucous membranes that dry out quickly. They also need a humidifier, which puts humidity

Medicinal Therapy

Only a few patients with a slight case of sleep apnea can be considered for theophylline treatment.

Surgical Therapy

Some patients with sleep apnea syndrome can be helped with oral or facial surgery, which stabilizes and enlarges the pharyngeal area. Since the success rate is very low, this method of treating OSAS is hardly ever used.



Questions and Answers, Tips and Tricks

It pays to read the answers to patients' frequently asked questions and to learn some valuable tips and tricks. This information can help you day-to-day and show you that you're not alone with your sleep apnea.

Patients tell of their experiences:

Maike K. of Erfurt:

"When I first saw the device combination that was supposed to be with me night after night, I was not exactly happy. But as soon as I'd spent one trial night with my CPAP device, I felt fresher and more rested the next morning than I had in years. Now I use it every night, even on vacation because otherwise I'd get nothing out of my vacation."

Richard R. of Oberammergau:

"In the beginning, I had problems with dried out mucous membranes. Then my doctor prescribed a heated humidifier for me. After that, everything was much better."

Reinhard P. aus Nuremberg:

"At first I was worried that my family wouldn't accept my therapy. It's not easy to overlook the equipment. But my wife and children are so happy that their lively husband and father is back again."

What should I pay attention to?

- Make sure you keep to a regular sleep-wake cycle. Your body adapts to a regularly scheduled bedtime, such as 10 p.m.
 - A television does not belong in the bedroom.
 - Avoid stimulating discussions or arguments at bedtime.
 - Too much alcohol in the evening has a negative effect on sleep quality. One glass of wine or one beer does no harm.
 - Take no sedatives or sleeping pills, which reduce the quality of sleep. Instead, try to establish a bedtime ritual.
- A hot "good-night" tea or even pleasant thoughts of your next vacation in the sunny south can help.
 - Choose a comfortable bedroom temperature that's best for you.
 - Avoid dry air, which can irritate your upper airways.
 - Avoid eating and drinking great quantities before going to bed. They burden your stomach, intestines and bladder and cause you to sleep fitfully.
 - Don't go to bed hungry. A small snack, such as a banana, can help.
 - Pay attention to your weight.

- Extra pounds can worsen sleep apnea and put a strain on the circulatory system. Try changing your diet. Eat a balanced diet with foods low in fat and reduce your intake of sweets and alcohol.
- Make an effort to participate regularly in sports. Physical activity makes it easier to lose weight, supports your physical and psychological performance and lets you fall asleep more easily. It doesn't have to be a marathon. A simple one-hour walk is good for your health.

How should I handle the technology?

- Never open the **device** housing.
- Never attempt to correct or to reset the **pressure** on your device by yourself. If you have the feeling that the pressure setting is incorrect, please talk to your authorized dealer or sleep lab.
- Never treat your **hoses** and **masks** with a strong cleaning agent.
- Do not place your **therapy device** on a rug or carpet, in dusty corners or in tight cabinets or cupboards. If you do, the filter will require more frequent changing.
- Be sure to follow the **instructions for cleaning**.
- Remember the next **technical inspection** for your device. Write it down where you cannot overlook it, for example, on your kitchen calendar.
- See your doctor or sleep lab for **follow-up exams** as recommended. Only then can you be certain that your therapy will be as effective as possible.

Answers to my questions

What is AHI?

AHI stands for Apnea Hypopnea Index and describes the number of respiratory arrests and periods of clearly decreased respiratory lows with a drop in oxygen levels per hour. Example: with 20 apnea events and 10 hypopnea events, the AHI is equal to 30.

What is an arousal?

An arousal is a so-called emergency or protective waking mechanism of the body. It is triggered by a lack of oxygen in the blood, which is caused by respiratory arrest.

Can sleep apnea be cured?

Unfortunately, most cases involve life-long therapy. Weight reduction often results in marked improvement.

Is respiratory arrest always dangerous?

Even healthy people occasionally experience respiratory disruption at night. The frequency and length of these disruptions determine the danger to one's health. Treatment should be sought when a person experiences five incidents per hour, each of which lasts more than 10 seconds.

Does snoring damage one's health in every case?

Snoring does no damage unless it results in respiratory arrest of a certain degree or causes changes in healthy sleep structure.

When is the risk of obstructive sleep apnea higher?

Overweight patients are particularly at risk. Furthermore, the probability increases with advanced age. Too much alcohol and strong sedatives (also sleeping pills) should be avoided.

Can I do my job despite obstructive sleep apnea?

As soon as you have grown accustomed to your therapy and your performance has been restored, you can return to your job.

I'm a little afraid of using my device. Will I get enough unused air to inhale?

On or slightly behind the mask, there is an "exhalation valve". This is usually a porous material, a circular slit or a simple hole from which the exhaled air can be expelled. Even with a full mask that covers your mouth and nose, you'll be able to exhale normally.

What side effects can occur with CPAP therapy?

The most frequently reported side effects are facial marks caused by the mask, runny nose, dry nose and/or dry mouth, irritation of the conjunctiva from drafts,

sinus pressure and air in the stomach. Most of the side effects mentioned can be eliminated by adjusting the mask and/or using a humidifier. Patients who have sensitive stomachs could consider auto-CPAP therapy, which uses a lower mean therapy pressure.

How often should I use my device?

Every night without exception. Otherwise, you won't get any restorative sleep.

How often do I have to clean my device?

The mask, exhalation valve and humidifier should be cleaned daily. The headgear should be cleaned with the same frequency as you change your nightclothes. Hose connections should be cleaned at least once a month. Tip: You can get an overview of the details from the manufacturer. Otherwise, you'll find the information in the User Manual.

I have to go to the hospital. What should I do with my therapy device?

You should take it along and inform hospital personnel of your obstructive sleep apnea. If you have surgery, you should be connected to your therapy device in the recovery room.

My therapy device is on my bedside table. When I use it, the table wobbles and makes noise.

Check the stability of the table. Can you improve it? In any case, you should put

something secure underneath the device. Use either a noise-suppressing material or a few newspapers.

When I have a cold, my nose is too stuffed up for me to use my device.

Try to clear your nasal passages with nose drops. In addition, you can try sleeping on your side or with the upper body elevated. If those things don't help and you experience swelling and mucous build-up, then you'll have to do without your device for a few nights.

I have an open wound on my nose. What can I do?

A first aid cream can help. However, be sure to have the fit of your mask checked.

The inhaled air is too cold.

Your own body warmth increases the air temperature by about 5°C. If you find that too cold, you can place the non-kink hose under the blanket or comforter on your bed.

We recently had our bedroom walls painted. After the first night, I felt nauseated.

You presumably used a paint containing solvents. Next time, choose paint without solvents. In this case, you should sleep in another room until the odors have disappeared.

CPAP therapy has made me a new person, but lately my dried out nose has really been bothering me.

You apparently need a humidifier. Talk to your doctor about this problem.

Oh no. First a CPAP device and now a humidifier. How can I fit all of that into my bag?

No problem. Your manufacturer will be happy to give you packing instructions.

Because I have allergies to PVC and silicone, I'm having problems with commercially available masks. What do you advise?

Cut out a piece of soft cloth in the same shape as the mask seal and place it under the part of the mask that rests on your face. Many patients find that this works for them.

I'm planning a long trip. Where can I find help abroad?

Ask your manufacturer for an address list of its service partners.

I've already experienced trouble with security at airports. What do you advise?

Take along a "manufacturer's confirmation" with you. This document explains that your device is a piece of medical treatment equipment.



In conclusion, Frank B. of Mettmann has some encouraging words:

Since the end of the 1980s, I had suffered – without knowing – from sleep apnea. After my family doctor told me about sleep apnea and sent me to a sleep lab, my life with a mask on my nose is so much better that I feel as if I could uproot trees.

Fortunately, my wife quickly got used to my device. She said that she can sleep better now because she's no longer afraid that I'll stop breathing and because no horribly loud snoring wakes her all the time.

I've been able to return to work as a truck driver since I can run my "breathing fix" on the truck's battery. We can also keep our spot at the campground because I can use my device in our camper too.

We suffered for many years from my illness. Today we're happy again and enjoy our lives despite sleep apnea.

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