

AN INTRO TO

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# SNORING AND SLEEP APNEA

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An introductory guide to the health risks of  
snoring and sleep apnea

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CHAPTER

1

Is Snoring Harmful to Your Health?

# Snoring

## What you need to know

Simply put, snoring is the sound caused by vibrations in the upper airways of the respiratory system due to partial obstructed air movement while sleeping.

All too often snoring gets written off as a mere nuisance by your partner who has to listen to you "saw logs" all night long. **With approximately 20% of the adult population, and 60% of men over the age of 40 snoring regularly, it's easy to believe that snoring is relatively harmless.** And yes, in many cases snoring can be nothing more than an annoyance for your partner. However, there could also be some serious potential health risks connected with frequent snoring.



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Many people may not even realize they snore, and only learn about it from an irritated or concerned bedpartner.

# Snoring

## Causes of snoring

- **Age.** As you're probably aware, when you begin to age your body naturally begins to relax and lose muscle tone, requiring more effort to keep your body defined. These processes also occur in the throat and tongue muscles causing the muscles there to relax and fall back into your airways causing obstructions that lead to snoring.
- **Weight.** Your weight can play a large role in whether or not you snore. If you are overweight you more than likely have an excess of built-up fatty tissues in your throat as well as poor muscle tone leading to a restriction of your throat muscles, thus causing snoring.
- **Alcohol consumption, smoking, and medications.** Alcohol, smoking, and some medications increase muscle relaxation allowing the flesh of the throat to relax and disrupt airflow. Smoking also irritates the nasal passages and throat muscles causing inflammation of these areas and further restriction of airflow.
- **Nasal and sinus problems.** Seasonal allergies and sinus infections can cause swelling of the nasal passages making breathing difficult and snoring likely. A deviated septum can also cause snoring due to the imbalance in the sizes of breathing passages. A severe deviated septum may even lead to sleep apnea.
- **Sleep posture.** Sleeping on your back puts you at a higher likelihood of snoring. The tissues at the back of the throat can more readily fall back and cause partial or complete blockage of the airways leading to snoring. To avoid snoring, try changing your sleeping posture by sleeping on your side.

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CHAPTER

2

Treatments for Snoring

# Snoring

## DIY Treatments

- **Maintain a healthy weight with diet and exercise.** If you are overweight you are naturally more predisposed to snoring. Excess fatty tissues build up in your throat, narrowing your air passage. By routinely dieting and exercising you can cut back on these fatty throat tissues and have a freer air passage.
- **Cut back on alcohol.** Alcohol can cause muscles in the body to relax, and it includes the muscles in the throat and jaw. If you think your snoring may be related to alcohol consumption, try not drinking at least 3 hours before bed.
- **Cut back on smoking.** Smoking irritates the tender lining of the throat causing it to become inflamed which narrows the air passages. And this isn't only true for smokers themselves, but for non-smokers as well who may be exposed to secondhand smoke.
- **Keep your bedroom humid.** Purchasing a humidifier for your bedroom can be very helpful if you're snoring. The added moisture in the air helps lubricate your throat making breathing through the night easier.
- **Treat allergies.** You may notice that you snore more often during allergy season. When your nasal passages close up, your respiratory system is forced to breathe more through the mouth. Treating your allergies with antihistamines before bedtime can help free your nasal passages back up.



# Snoring

## DIY Treatments

- **Try changing sleeping positions.** Lying on your back at night causes your tongue and soft palate to collapse back into your airways causing you to snore. If you're having difficulty maintaining sleeping on your side you may want to try the "The Tennis Ball Trick." With this trick you can tape, sew, or use an ace bandage to secure a tennis ball so that it rests against your back. As you roll onto your back while unconscious, the pressure will cause discomfort making you roll back onto your side during the night. Within a few nights, your body may be trained to stay sleeping on your side.
- **Consider purchasing an anti-snore pillow.** There are dozens of different anti-snoring pillows on the market, and they come in all different shapes and sizes. The main purpose behind the majority of these pillows is to help elevate your head at night. Elevating the head helps to align the spine and keeps the airways from becoming blocked.
- **Ask your doctor if your medications may be causing you to snore.** Similar to alcohol, some medications may relax your muscles including your throat muscles causing you to snore. If you believe your snoring may be caused or intensified by medications, you may consider asking your doctor for possible medicinal alternatives.

# Snoring

## DIY Treatments

- **Try throat and tongue exercises.** Some of these may seem a little silly, but they have been proven to work in many cases. As you've already read, the muscles of the throat begin to relax and lose muscle tone over time. Strengthening your throat and tongue muscles can help reduce the probability of frequent snoring. Trying singing more often or playing the didgeridoo (yes, that bizarre Australian aboriginal wind instrument). Singing or playing the didgeridoo a few times a day has been proven to strengthen and tone the throat muscles and soft palate, reducing the chances of snoring.



# Snoring

## Medical Treatments

- **CPAP machines.** If your snoring is out of control it may be a good indicator that you have sleep apnea and you may want to talk with your physician about a sleep study consultation. A CPAP (continuous positive airway) machine is a device that uses mild air pressure to keep your airways open. There are a variety of devices that come in all shapes and sizes to accommodate your comfort level including nasal pillows, nasal masks, and full face masks.
- **Mouth Guards.** You may want to speak with your dentist about getting fitted for a mouth guard. Mouth guards push your lower jaw muscles and tongue forward, keeping them from becoming too relaxed, and in doing so, prevent your throat muscles from collapsing back into your airways.
- **Chin straps.** For those you who may be snoring as a result of breathing through your mouth, a chin strap might be a helpful solution. Chin straps hold your jaws shut making you breathe through your nasal passages thus reducing the chances of obstructed breathing.
- **Surgery.** If you have a deviated nasal septum, large tonsils and adenoids, or other upper airway narrowing, an Ear Nose and Throat specialist may be helpful in providing a surgical alternative.

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CHAPTER

3

What is Sleep Apnea?

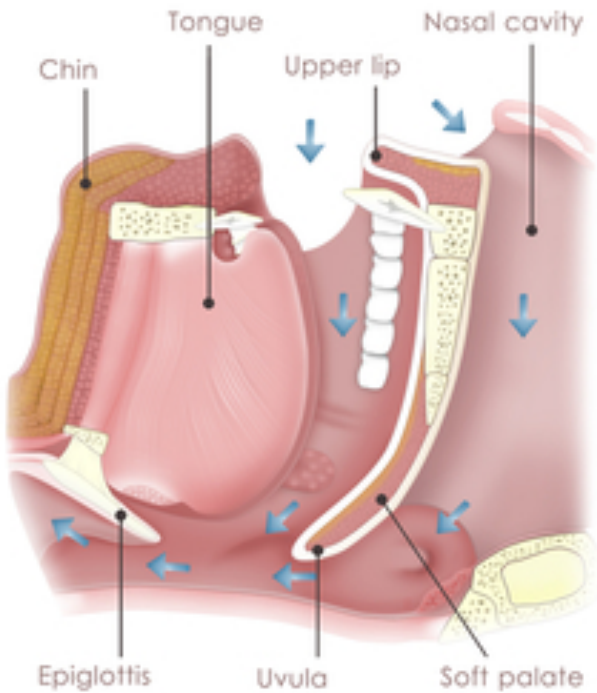
# Sleep Apnea

## What is it?

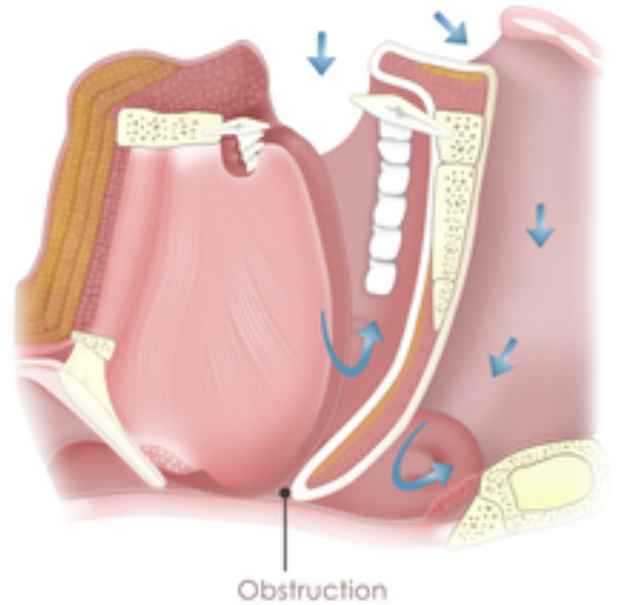
Apnea literally translates as "cessation of breathing" which means that during sleep **your breathing stops periodically during the night for a few seconds**. These lapses in breathing can occur for up to ten seconds or more and can happen up to hundreds of times a night in severe cases.

### **OSA is caused by blockage of the upper respiratory airways**

in which either the throat muscles collapse, the tongue falls back into the airway, or enlarged tonsils and/or adenoids impede air flow. When your airway becomes cutoff, the brain has to wake itself to signal the respiratory system to kick back into gear. This often leads to breathing resuming with loud gasps, snorts, or body jerks that may wake you from your slumber and disrupt your sleep. When you're waked multiple times through the night, your body and mind don't get the rest they need to function, leaving you tired and drained during the daytime.



Open airway during sleep



Sleep apnea present with obstruction

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This diagram shows the airways of a normal person during sleep compared with the airways of a person having an apnea event. During such an event, the airways become obstructed by the tongue and fatty tissues in the throat.

# Sleep Apnea

## Levels of Severity

- Obstructive sleep apnea can be considered one of three levels depending on the amount of nightly sleep interruptions in breathing:
- **Mild OSA**- The sufferer experiences 5-14 episodes of interruptions in breathing in an hour.
- **Moderate OSA**- The sufferer experiences 15-30 episodes of interruptions in breathing in an hour.
- **Severe OSA**- The sufferer experiences 30 or more interruptions in breathing in an hour.



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It is estimated that over 20 million adults in the U.S. alone suffer from Obstructive Sleep Apnea, and roughly 80% of those afflicted go untreated. Adult men over the age of 40 and people who are overweight or suffer from obesity are at greater risk for acquiring obstructive sleep apnea.



# Sleep Apnea

## Causes of Sleep Apnea

- **Weight-** In many cases a person's body weight is directly linked to having obstructive sleep apnea. People who are overweight or obese are more likely to have sleep apnea than those that maintain a healthy weight. Sleep apnea can often be caused by excess fatty tissues that become built up in the neck and throat. This can lead to restrictions in airflow as the upper respiratory system's pathway is narrowed or pinched off during sleep.
- **Age-** As people age their muscles begin to lose muscle tone. This is also true of the muscles in the throat. As throat muscles lose definition, they become weaker and more likely to collapse into the airways during sleep.
- **Enlarged tonsils or adenoids** are the leading cause of obstructive sleep apnea in children but can also affect adults who never had a tonsillectomy when they were younger.
- **Natural causes-** Some people can be genetically predisposed to having a narrower throat or may have an enlarged tongue that falls back into their airway. If your family has a history of OSA you are more likely to have it yourself.
- **Frequent alcohol use-** Alcohol relaxes the muscles in the body, and this includes the throat muscles as well which may relax to the point of blocking the airway during sleep.
- **Smoking-** Smoke is an irritant to the lungs, throat, and esophagus. It can cause inflammation and fluid retention in the upper airways that can impede airflow.

# Sleep Apnea

## Symptoms of Sleep Apnea

- **Snoring** that is loud, disruptive, and regular is one of the most obvious signs of potential OSA.
- **Frequent breaks in breathing** caused by an obstruction. These cessations are often followed by choking or gasping noises as the body's respiratory system fights through the blockage.
- **Excessive daytime sleepiness** caused by frequent interruptions of sleep.
- **Morning Headaches** stem from the loss of oxygen in your bloodstream that flows to your brain as a result of the irregular breathing at night.
- **Restless sleep.** Sufferers of obstructive sleep apnea often have fitful sleep as their mind and body are constantly awakened throughout the night, pulling them out of the much needed stages of non-REM and REM sleep.
- **Depression or irritability.** Lack of regular quality sleep can wreak havoc on a person's mental well-being. Sufferers of obstructive sleep apnea often find themselves feeling short-tempered, and in time it can lead to more severe symptoms of depression.

# Sleep Apnea

## What happens if sleep apnea is left untreated?

- **Cardiovascular problems.** Untreated obstructive sleep apnea can cause a strain on your heart as sudden drops in blood oxygen levels that occur during OSA increases your blood pressure. High blood pressure (hypertension) increases the likelihood of a number of heart diseases and complications:
  - Abnormal heart rhythms (arrhythmia)
  - Greater risk of coronary artery disease.
  - Greater risk of heart attack or heart failure.
  - Greater risk of having a stroke.
- **Daytime Fatigue.** Untreated OSA keeps your body and mind from getting a full night's sleep as you continuously wake because of breathing obstructions disturbing your sleep. This leaves sufferers feeling tired and groggy throughout the day. People with untreated OSA have a higher likelihood of work related accidents and driving related accidents resulting from lack of restful sleep at night.
- **Complications with medications and surgery.** Medications such as sedatives, narcotic analgesics, and general anesthesia all aid in relaxing your upper airways that can further complicate your OSA.
- **Other Problems include:** memory problems, morning migraines, mood swings, and depression.

# Sleep Apnea

## How is Sleep Apnea Related to Heart Disease?

During an apnea event (pause in breathing) the oxygen levels in your blood drop significantly. When this happens your brain partially wakes from sleep to send signals to the nervous system to constrict the blood vessels (tighten up) in order to increase the flow of oxygen to your heart and brain.

When your blood pressure increases at night to keep oxygen flowing to your heart and brain, it causes high blood pressure during sleep. Most people's blood pressure drops ten to twenty percent during sleep, but many patients with sleep apnea show an increase in blood pressure of ten to twenty percent.

Unfortunately, the increased blood pressure experienced during sleep often begins to overlap into periods of wakefulness. Even though your blood pressure only needs to be increased at night when you require extra respiratory effort to get oxygen, many people with sleep apnea end up with increased blood pressure at all times.

High blood pressure is a major risk factor for heart disease, stroke, heart attack, and many other medical problems, and sleep apnea is a major risk for high blood pressure.

A study by the National Sleep Foundation found that men with severe OSA were 58% more likely to develop new congestive heart failure than men without sleep apnea. They also found that men aged 40-70 with an apnea-hypopnea index (AHI) of 30 or higher were 68% more likely to develop coronary heart disease than those with lower AHIs.

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CHAPTER

4

How is Sleep Apnea Treated?

# Sleep Apnea

## How is Sleep Apnea Diagnosed?

- **Physical Examination.** In some cases a doctor may administer a simple check of your mouth, throat, and neck to determine if you have OSA. In these physical examinations the doctor is looking for abnormalities or excessive fatty tissues of the uvula, tongue, soft palate, or checking for enlarged tonsils and adenoids. With children, doctors often only need a physical examination to determine that tonsils and adenoids are the cause of obstructive sleep apnea.
- **Polysomnogram (PSG).** If your doctor believes you may have moderate to severe OSA, he will probably refer you to a sleep specialist for a sleep study. During the sleep study, you will spend the night at a sleep clinic where you will be hooked up to diagnostic machines that measure and record your heart, lung and brain activity, breathing patterns, arm and leg movements, body positions, and blood oxygen levels while you sleep. These tests are painless and non-invasive and generally take six hours to complete.
- **Home Sleep Test (HST).** If you live far from a sleep clinic, uncomfortable sleeping away from home, or can't afford the full in-lab PSG sleep test, an HST might be best for you. While not as in-depth of a study as a PSG, an HST is a test that you can take home overnight for a similar assessment. An HST monitors airflow, respiratory effort, breathing patterns, blood oxygen levels, and even body positions. The information is either transmitted wirelessly to the sleep clinic, or stored on a memory card for later drop-off.



A patient using a Home Sleep Test (HST) to determine the level of severity of his sleep apnea.

# Sleep Apnea Treatments

## Lifestyle Treatments

- **Diet and exercise.** Being overweight or obese increases the likelihood of acquiring OSA. Larger people have more fatty tissue built up in the throat and thicker necks that aid in choking off the airways during sleep. Reducing the fatty tissues through routine diet and exercise can have a dramatic positive impact on the quality of one's sleep.
- **Cut back on alcohol consumption.** This is important especially before bedtime. Alcohol relaxes the throat muscles allowing them to collapse into the airways and cause an obstruction. Not drinking alcohol 3 hours before bedtime can help alleviate the likelihood of blockage.
- **Quit smoking.** Smoke is an irritant that causes inflammation of the sensitive tissues in the throat and lungs producing swelling of the tissues that aid in obstruction.
- **Sleep on your side.** Sleeping on your back at night permits your tongue and throat muscles to relax easier and fall backwards into your airway. For those with mild OSA, simply changing sleeping positions can relieve obstructions.



# Sleep Apnea Treatments

## Medical Treatments

- **Positive Airway Pressure (PAP).** The majority of OSA sufferer's symptoms are often relieved through the use of a PAP machine. PAP machines are devices that use masks that fit over the wearer's nose, nose and mouth, or full face and deliver a gentle force of air that pushes past the blockage to allow for easier breathing at night. There are 3 kinds of PAP machines for differing needs but the CPAP is the most common.
  - **Continuous Positive Airway Pressure (CPAP).** A CPAP device includes a breathing mask that sleep apnea sufferers wear when sleeping. Just enough consistent air pressure is delivered via the mask to the patient's airways to keep the tissue that otherwise would collapse (and cause breathing pauses and snoring) from closing during sleep. CPAP devices are effective in treating sleep apnea but do not cure the disorder. If you discontinue using your CPAP device, your sleep apnea may return.
  - **Automatic Positive Airway Pressure (APAP).** Automatic, or autotitrating, positive airway pressure adjusts to the air levels sleep apnea patient needs throughout the night. An APAP can detect if the patient's apnea is spiking and increase the air pressure, then decrease the flow if the sufferer is at a peaceful, non-snoring state. APAP therapy is useful for people who can't get comfortable with a CPAP's air pressure, or for people with seasonal allergies whose breathing might be affected at different times during the night.

# Sleep Apnea Treatments

## Medical Treatments Continued

- **Bilevel positive airway pressure (BPAP).** Bilevel positive airway pressure is similar to CPAP except that BPAP adjusts the level of air being delivered depending on whether the patient is inhaling or exhaling. During inhalation, an electronic sensor tells the BPAP to send more air through the mask to clear the apnea-causing obstruction. When the user exhales, the air pressure is reduced. This decrease is helpful for sleep apnea sufferers who have a rough time breathing out against the constant pressure of a CPAP machine.
- **Adaptive-servo ventilation (ASV).** The Adaptive-servo ventilation device monitors breathing and adjusts air flow appropriately through the mask to match how the patient would be normally breathing if awake. This adjustment can be made quickly as soon ASV detects that the patient is not breathing correctly (as is the case with central sleep apnea, when the brain doesn't signal the body to take a breath). When the patient exhales or after the patient resumes a normal breathing pattern, ASV adjusts the pressure again.
- **Oral Appliances**
  - **Mandibular advancement devices.** Often used for snorers, mandibular advancement devices (MADs) also can be helpful in curbing sleep apnea. MADs look like sports mouthguards and push the lower jaw down slightly, just enough to pull the tongue forward and help open the air passage.
  - **Tongue-retaining mouthpieces.** Also common as a snoring treatment, tongue-retaining mouthpieces are worn in the mouth and change the position of the tongue during sleep. The flow of air through the user's mouth becomes less obstructed and may help lessening obstructive sleep apnea.

# Sleep Apnea Treatments

## Medical Treatments Continued

- **Surgery for obstructive sleep apnea**
  - **Uvulopalatopharyngoplasty (UPPP).** A procedure in which soft tissues in the back of the throat are removed. The tissues removed are from the uvula (the little soft flap of tissue that dangles in the back of the throat) and parts of the soft palate. If tonsils and adenoids are still intact, they are often removed as well.
  - **Adenotonsillectomy.** Surgical removal of enlarged adenoids and tonsils is usually the first-line of treatment in children with obstructive sleep apnea.
  - **Nasal Surgery.** For OSA sufferers whose symptoms are often caused by a deviated septum, the straightening of the nasal passages or removal of the deviated cartilage can help free up the blockage causing snoring and OSA.
  - **Maxillomandibular Advancement (MMA).** In this surgery, upper and lower parts of the jawbone are moved forward. It creates an enlarged space behind the tongue and soft palate, making obstructions less likely.
  - **Tracheostomy.** In the most severe and potentially life-threatening cases of obstructive sleep apnea, it may be recommended that the patient undergo a tracheostomy. In this surgical procedure, a permanent opening is made in the throat to the windpipe where a breathing tube is inserted. The breathing tube has a valve that is closed during the day for regular breathing and speaking, and opened at night. When opened during sleep, air enters the lungs through the tube rather than through the upper airways allowing airflow to bypass the obstruction by entering beneath it.

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## Conclusion

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# What to do Next

If you believe that your snoring and other symptoms may be a sign that you have obstructive sleep apnea, the next step is to get help.

Help can be found by a visit to your general practitioner, or you can schedule to have a sleep study performed at a sleep clinic.

If you live in Alaska and would like to have a sleep study performed, visit us at:

<http://www.alaskasleep.com/sleep-assessment>