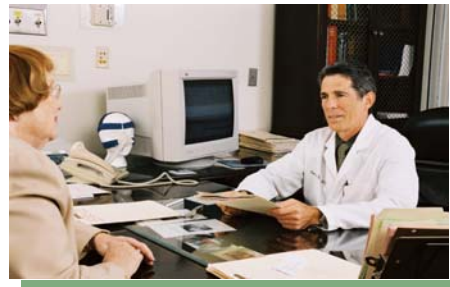


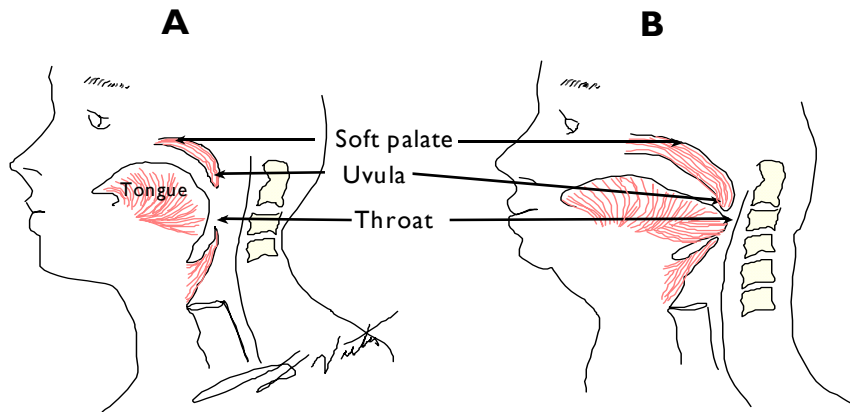
# **OBSTRUCTIVE SLEEP APNEA**

**Sleepy People That Snore**



## WHAT IS SLEEP APNEA? Sleepy People that Snore

Obstructive Sleep Apnea is caused from a partial or complete obstruction of the throat while sleeping. Snoring, daytime sleepiness and fatigue are the most common symptoms of this disorder that may affect up to 10% of adults. Obstructed breathing causes many partial awakenings (arousals), up to 60 or 70 or more per hour. Even though you are not fully awake, this constant disruption to the flow of sleep can cause fatigue sleepiness the next day. Sleep apnea only occurs during sleep because the tongue and soft tissues of the throat are more relaxed at that time. Also, most people sleep while lying down which allows gravity to push the tongue more posteriorly against the throat increasing the tendency to snore and obstruct.



*What happens in sleep apnea?* Panel A shows a normal sized tongue, soft palate, uvula and throat. Panel B shows how these structures are enlarged in apnea patients

## SYMPTOMS OF SLEEP APNEA

The majority of patients with sleep apnea snore heavily. The sleep of family members will be disturbed by the persistence and volume of the snoring and may even drive the bed partner from the room. Apnea patients often complain of difficulty falling asleep or having disrupted sleep all night long and may have early morning awakenings and difficulty falling back to sleep. Sometimes there will be a complaint of having to get up often to urinate, attributing this to a bladder problem rather than a sleep disorder. causing arousal.

### Symptoms of sleep apnea

- Loud snoring
- Disrupted sleep
- Gasping and choking at night
- Night time sweating
- Night time arm and leg movement
- Teeth grinding
- Daytime fatigue/sleepiness

The sleep in apnea patients is not refreshing and patients are often just as tired in the morning as when they went to sleep; as well as having a dry mouth sore throat or even a headache. Most apnea patients have daytime fatigue and sleepiness. The tendency to doze can be severe and often occurs during sedentary activities such as watching TV, reading or sitting at meetings. Dozing off at the wheel of an automobile may happen as well. As patients start to fall asleep while driving they may go off the road or hit the median stripes. Car crashes are more common in sleep apnea with the highest risk times being about 3 PM in the afternoon and 4 AM in the morning. It is important for patients to realize that the history of a car crash can be the most significant predictor of a future sleep related auto mishap.

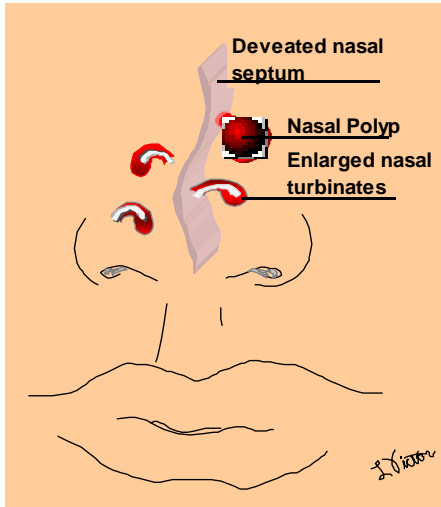
## PHYSICAL FINDINGS IN SLEEP APNEA

About two thirds of apnea patients are overweight or obese, while one third are of normal weight but have small or receding jaws. As people gain weight, fat is deposited in the tongue and tissues surrounding the throat. A receding jaw may act to push the tongue backward against the throat. Jaws that are too small for the tongue size have the same effect. Many patients will have a small mouth,

<i>Physical Findings in sleep apnea</i>
Overweight/Obese
Small mouth, jaw and throat
Large tongue
Receding jaw
Short, thick neck
Swollen legs

large tongue and small throat and sometimes complain that they cough and choke when eating. One of the most common physical findings is a short, thick neck that may measure up to 18 to 20 inches in some individuals. Some patients will have a soft palate that is lying low over the back of the tongue or have an enlarged uvula (the soft tissue dangling from the bottom of the soft palate) If heart failure is present there may be swollen ankles as well.

Nasal disease is common in apnea sufferers. Many complain of sinus drainage or blockage. Snoring may be increased in individuals with a deviated nasal septum, nasal polyps, or enlarged nasal tissues (turbinates)



Nasal Disease. When your doctor examines your nose she may find a deviated septum, polyps or swollen turbinates.

## **COMPLICATIONS AND PROBLEMS CAUSED BY SLEEP APNEA**

**Frequent reductions in the oxygen level in the blood may result in heart and lung problems including heart attacks, heart failure, unusual heartbeats and swollen ankles. Hypertension and depression are among the most common complications of untreated sleep apnea. Strokes are more common in apnea sufferers, as is impotency in males.**

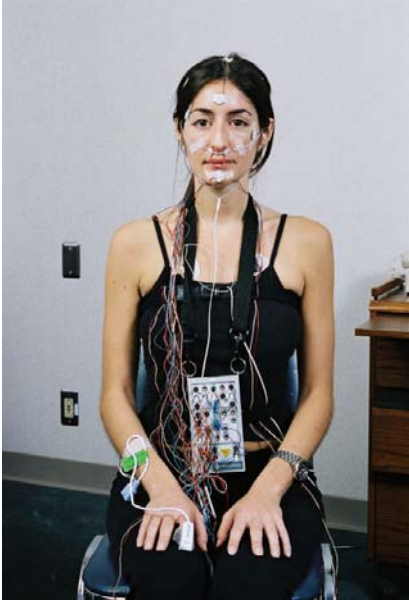
<i>Medical Complications of Sleep Apnea</i>
Hypertension
Strokes
Heart attacks
Heart failure
Male impotence

Emotional complications of OSA may be severe including mood swings, irritability loss of memory and poor concentration, depression and panic attacks.

<i>Emotional Complications of Sleep Apnea</i>
Mood swings
Irritability
Poor memory/concentration
Depression
Panic attacks

## MAKING A DIAGNOSIS

If you have symptoms of sleep apnea your doctor may ask you to get an overnight sleep study (called Polysomnography) to confirm the diagnosis. Typically this involves spending the night in a sleep center at which time sleep technicians will attach pads (electrodes) to your head to measure brain waves and wires to your chest to check your ability to breath. Additionally, there will be a small pad placed around your finger to measure the oxygen status of your blood along and pads placed on your chest to assess your heartbeat. While it looks as if all these attachments to your body may interfere with your rest, it is rare that anyone has difficulty sleeping.



Some patients with mild apnea may be asked to stay for a series of naps done throughout the day at two-hour intervals called the Multiple Sleep Latency Test (MSLT). The first nap occurs about two hours from your usual wake up time and the last nap occurs at approximately 3 PM. During the naps the technician will ask you to try to go to sleep, but it is important not to sleep between naps.

The day after your sleep study the technicians and doctors will evaluate the results of your breathing during sleep. They will evaluate the number of times per hour that you have difficulty breathing and partially or fully wake up and calculate an “apnea hypopnea index” (AHI). Typically some sort of treatment will be recommended if there are more than 10 respiratory disturbances per hour.

# TREATMENT OF SLEEP APNEA

## Conservative Measures

Sometimes loud snoring and mild apnea (less than 10 respiratory events per hour) may be managed by the following conservative measures

*Get enough sleep.* Sleep deprived individuals snore more while having more daytime sleepiness and fatigue. It may take a week or two of earlier bedtimes because most people are unable attempt sleep earlier by more than a half hour a day.

*Avoid alcohol and sedating drugs.* Alcohol use can cause a non-snorer to snore and snorers to stop breathing by causing relaxation of the tongue and throat tissues. Some sleeping pills and tranquilizers have the potential to increase snoring and apnea. Ask your doctor before taking these medications.

*Avoid tobacco.* Smoking has the potential to irritate the posterior airway and enhance the swelling of the air passages and increase the likelihood of apnea.



*Lose weight.* The majority of patients that have sleep apnea are overweight. Sometimes even losing a modest amount of weight such as 20 or 30 pounds can improve sleep apnea significantly. Unfortunately, only 2-5 % of individuals ever permanently lose weight. Recent information shows that up to 6% normal individuals gain weight and develop significant sleep apnea over the course as short as 4 years. While I recommend that all overweight patients go on a diet, I assume that they are not likely to be permanently successful and I offer other treatment options, usually a Continuous Positive Airway Pressure Mask (CPAP)

*Raise the head of the bed and sleep on your side.* Any position that will reduce the tendency for the tongue to impinge on the posterior airway has the potential to alleviate sleep apnea. Raising the head of the bed will tend to bring the tongue forward, while sleeping on ones side will gravitationally move the tongue to the side. Some sleep specialists recommend that patients sew a tennis ball into the back of a night shirt which will cause discomfort when they sleep on their back and increase the tendency to sleep on their side. Those with mild apnea tend to respond the best to changes in body position.



*A tennis ball sewed in the back of a T shirt will encourage a snoring patient to sleep on their side.*

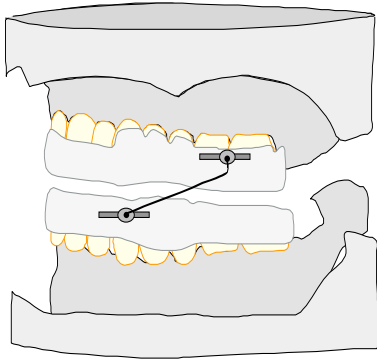
### CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

The majority of patients will be treated with continuous positive airway pressure (CPAP) consisting of a mask that fits over the nose powered by a fan, which creates a gentle stream of air that will keep your throat open during sleep. When used properly, CPAP virtually eliminates sleep apnea and restores normal sleep patterns. A more detailed discussion of CPAP treatment for sleep apnea be found in the brochure entitled “CPAP Treatment of Obstructive Sleep Apnea”



*CPAP mask with headgear*

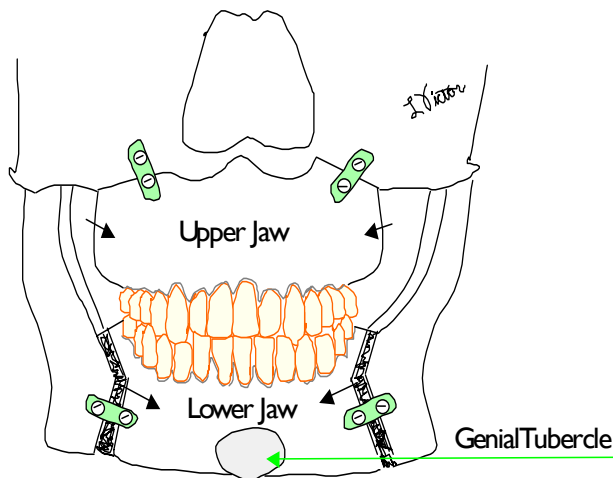
Some patients who have loud snoring without out significant sleep apnea may benefit from a *dental appliance* which acts to bring the jaw forward thereby alleviating snoring. There are many devices on the market and you will have to find a dentist that has interest and experience in this area. While insurance companies often pay for CPAP, dental appliances are not usually covered and may cost in excess of \$600.00. Dental appliances may be of most use in younger individuals who snore heavily or only have mild apnea. CPAP or surgery is often needed in these patients, as they get older.



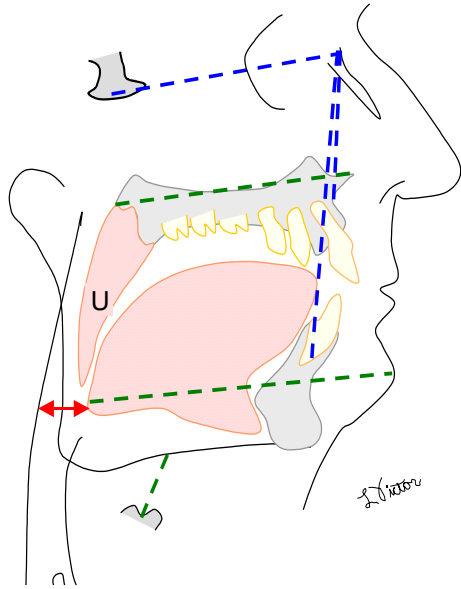
A dental appliance is used to pull the jaw forward while sleeping

There are surgical treatments of sleep apnea; the most commonly performed is called an uvulopalatoplasty, (UPPP) which consists of removing part of the soft palate and uvula (the piece of tissue that dangles from the back of your throat) While this surgery is effective in alleviating snoring, there is only a fifty percent cure rate. Many patients will develop symptoms of OSA several years after the surgery and will require CPAP or jaw surgery. Fewer UPPP surgeries are being done these days.

A procedure to advance the chin and tongue, called a genial tubercle advancement (may be done in association with the uvulopalatoplasty) may have cure rates of almost 70%. Maxillofacial (Jaw) surgery may be performed on patients with abnormal jaws and can be effective in up to 95% of cases. This is a major surgery with occasional complications such as loss of sensation in the tongue or lip and requires that the jaws be wired together for a few weeks after surgery while the jaws heal; it is not recommended for older patients. Your physician may order *cephalometrics*, which is an x-ray of the lower skull and jaws in order to assess if you would benefit from jaw or chin advancement procedures.

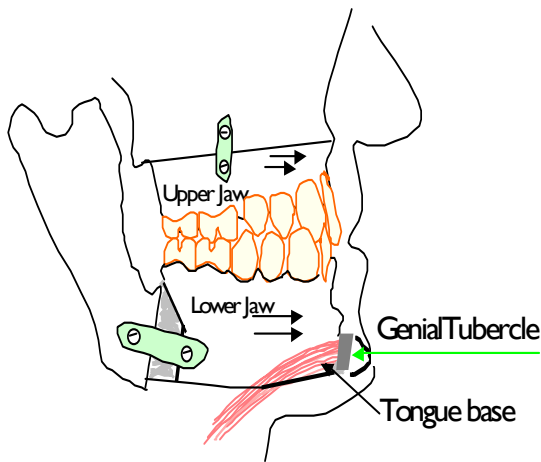


Frontal view of the skull showing how the airway may be enlarged by moving the upper and lower jaws (black arrows) or the genial tubercle (green arrow) forward.



*Lateral Cephalometric Analysis*

*Dashed lines show angles and distances measured by the radiologist. Red arrows show the posterior airway space. U is the uvula.*



Side view of the skull showing how the airway may be enlarged by forward movement of the upper and lower jaws (black arrows) or the genial tubercle (green arrow) attached to the tongue base.

**CONCLUSIONS**

Obstructive sleep apnea is common, annoying and potentially life-threatening disorder. Snoring and daytime fatigue are the most common symptoms while increased body weight and jaw abnormalities are the often-found physical findings. CPAP is the most widely used treatment and has significant potential to treat the disorder if used properly. Jaw surgery may be highly effective but has a long convalescence and may not be appropriate for older patients.



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