

Treating Obstructive Sleep Apnea and Its Lesser Twin, Snoring

Patients as well as health care professionals should be alert to the interaction of several factors when considering treatment strategies for snoring and obstructive sleep apnea. Careful diagnosis and effective treatment of obstructive sleep apnea (OSA, Sleep Apnea Syndrome) and snoring require attention to lifestyle, medical factors, and anatomical problems, as well as to the age and sex of the person with snoring and/or apnea. Phantom Sleep Newsletter™ from Sleepwell®

by Gila Lindsley, Ph.D., A.C.P.

What is wrong with this picture?

Thanksgiving dinner, or perhaps it is Christmas dinner, or Passover. Uncle Charlie (or perhaps it is Aunt Charlene) has fallen asleep, as usual, on the overstuffed chair in the living room. and everyone chuckles fondly to see him (or her) snug in front of the fire, his(her) arms resting gently on his (her) belly. Snoring up a storm.

Familiar picture? Probably. Endearing, sweet Norman Rockwell scene? No. The association of this picture to a potentially life threatening disorder called Obstructive Sleep Apnea has been known for about a decade. It is only over the past several years, however, that there has been enough media coverage for the disorder called sleep apnea to have reached public awareness. By this time, the message that loud snoring can be serious -- not humorous -- has been sent into the living room by network television shows such as 20/20, 60 Minutes, the Phil Donahue Show, and even the half-time show of the Super Bowl where the players wore band-aid like devices (designed to help control snoring) on their nose to help their breathing. The full picture of what to do when sleep apnea (or an incipient sleep apnea condition such as loud snoring) is diagnosed has been less well publicized.

The signs and symptoms of apnea are described in other materials. It is more likely in men and perimenopausal or postmenopausal women than in premenopausal women. It certainly can occur in children. If you snore you should become aware of the kinds of personal discomfort, jeopardy when driving, and decreased function as well as possible medical jeopardy in which this places you.

The treatment of obstructive sleep apnea or snoring

The most important point to make about the treatment of Obstructive Sleep Apnea or Snoring Syndrome is that effective treatment requires several related problems to be treated simultaneously. At least the following need to be addressed:

- **Lifestyle factors**

The impression is growing that to a large extent many cases of obstructive sleep apnea and snoring may be a concomitant of Western culture. The risk of significant obstructive sleep apnea increases with the numerous factors described below, many of which are problems endemic to our society. Correction of obstructive sleep apnea (OSA) generally requires that these factors be eliminated. At times, elimination of these factors completely resolves the problem.

- **Weight**

Excessive weight brought about by a sedentary life style, too many rich foods, or by medically related situations such as retention of weight after delivering a child or thyroid problems are probably the leading factors contributing to OSA. Bedpartners almost invariably make the observation that the larger their snoring spouse became, the louder the snoring bellowed, and the more often they hear snoring pauses followed by snorts and a resumption of breathing (i.e., apneas--episodes of obstructed breathing). Conversely, in a large percentage of patients weight loss, aided by exercise if medical conditions don't counterindicate doing exercise, down to an ideal weight has reversed the process.

- **Smoking**

Smoking has numerous undesirable effects on the body as Surgeon General Koop's report has by now made well known. Most pertinent to OSA are the obstructions to the airway which cigarette smoking causes: swelling of the mucous membrane in the nose, swelling of the tissue in the throat, blockage of the small vessels in the lung.

- **Alcohol**

It is the partial collapse of the airway (breathing tube between nose/mouth and lungs) which is the immediate cause of snoring, and its complete collapse which is the immediate cause of apnea. Alcohol relaxes the imbiber, but also causes too great a relaxation of the airway during sleep. This, and other effects of alcohol on the body, mean that alcohol (in patients otherwise at risk) can either cause or greatly contribute to the development of loud snoring and apnea.

- **Organization of sleep and wakefulness across the week**

There are two periods of sleep which, given the right circumstances, are especially vulnerable to the development of unstable breathing. These are Stage 1 sleep, which should only occur when a person is first falling asleep but which can occur many times during the night if sleep is poor); and REM sleep which is the time when dreaming most frequently occurs.

If a person, for instance, goes to bed at 10 PM and awakens at 5 AM each workday, but then waits until several hours later to go to sleep and wake up on on-work days, both Stage 1 sleep and REM behave oddly. This problem with REM and Stage 1 is also true if

on some days of the week a person just does not get enough sleep, and then on other days of the week s/he makes up for it by sleeping much longer.

The result in both cases can be the development of very significant respiratory instability during sleep. It is not unusual in the sleep laboratory when recording the sleep of people with irregular sleeping hours to discover that all of their apnea is confined to Stage 1 and/or REM sleep. In our experience for these people correction of this problem minimally requires stabilizing bedtime hours across the week. Sometimes, this is all that is required.

- **Other factors affecting quality of nighttime sleep can lead to apnea**

A disruptive bedpartner, a baby or child waking you up, aggravation from the day, sleeping during conventional hours (e.g. 11 PM - 6:30 AM) when the body's preference is to sleep a night-owl's schedule, excessive use of caffeinated products -- all of these things can also lead to the instability of Stage 1 and REM sleep. In turn, such instability can lead to an OSA tendency.

- **Medical problems**

Anything which can lead to a blockage of the nose, the throat, or the lung potentially play a role in the development of OSA.

Pertinent nasal problems include allergies to air-borne particles such as animal dander, dryness of the nose because of a wood burning stove, or a septum (structure separating the left and right sides of the nose) so deviated it completely blocks the flow of air through one side. Often in that case, other structures in the nose called turbinates grow larger on the unaffected side. The result can be almost complete blockage of nasal breathing. That, in turn, increases the effort the sleeper must make to breathe because of increased resistance to airflow -- and it is that increased resistance which can then create OSA.

Factors which can block the throat include large tonsils, large adenoids, excessive amounts of fatty tissue, at times enlargement of some of the complex tissue at the back of the throat.

Pertinent lung problem range from childhood asthma through emphysema. Apnea can also be a symptom of diabetes or hypothyroidism.

Specific forms of treatment

Addressing lifestyle issues

Addressing lifestyle issues is essential no matter what other factors might be involved. Here is an admittedly extreme example from our own case log which exemplifies the problems. In lesser form, the problems described are common among many OSA sufferers.

Mr. K is a 52 year old man who runs his own small business. The stress of overseeing his 25-some odd staff members, meeting deadlines, carrying out negotiations and so forth has led over the years to his having extremely poor sleep hygiene. Sleeping hours are very erratic. When he is worried, when he has to meet a deadline, or when he feels he simply cannot stop a task until it is absolutely finished, his nightly quota of sleep often is less than 3 or 4 hours. He catches up by sleeping for upward of 12 hours on his recovery days. He keeps himself going with up to 2-quarts of coffee and 3 packs of cigarettes per day. He rarely gives himself time for meals, but rather grabs food (generally junk food) on the run while sitting at his desk. At 5'7" his weight vacillates between 250 and 300 lbs. He does not use alcohol (but did in the past). When studied in the sleep laboratory, which in his case was necessary, an average of 45 apneas per hour of sleep was observed -- when he was able to sleep at all. That is, about once every 1 1/4 minutes he stopped breathing.

Treatment for Mr. K involved a short term interim measure which will be described below (nasal CPAP), but of necessity also had to involve addressing these numerous lifestyle issues. In his case, because his lifestyle was so ingrained, we referred him to a behavioral psychologist to help out.

The overnight sleep study

The overnight sleep study provides some clues regarding treatment. The study can reveal disturbances of Stage 1 and REM sleep. Identification of these leads to further questions about lifestyle.

We may discover that the OSA is present only when the patient is sleeping supine (on the back). Gently turning the patient onto his or her side or stomach reduces the OSA. If we are not concerned that the patient is in immediate medical jeopardy, we may try to actually train the patient to stay off of his or her back during sleep. Please note that currently there is a debate about the safety of trusting the results of this kind of intervention.

The overnight study might demonstrate that OSA develops only when the person reverts to breathing through the mouth (vs breathing through the nose), so-called *obligate mouth breathing*. *Otolaryngological evaluation* (by an ear-nose-throat specialist) might demonstrate this to be caused by allergies (which should be evaluated by an allergist) or other causes that may restrict air flow through the nose. One current approach to correcting this problem is the use of rings which are placed inside the nostrils at night. Another device looks like butterfly band-aids that keep the nasal airway open if the problem is not too severe. There is yet insufficient evaluation of the rings and the Breathe-Right® "bandaids" to know how effective these treatment approaches are for OSA.

Nasal CPAP

CPAP (Continuous Positive Airway Pressure) is in most spheres considered to be the treatment of choice. The CPAP unit consists of an air compressor and mask which delivers pressurized air through the nose when a person is sleeping, and which then can open up the airway from the inside almost as if the air were an internal splint. The correct pressure for the individual is

determined in what is called a *titration* trial in the sleep laboratory. If the nasal airway will admit the flow of air, CPAP has in many cases offered immediate relief. Some people opt to use CPAP indefinitely. Others use it to support their breathing during sleep until some of the measures which take more time to accomplish (e.g. weight loss, smoking cessation, correction of sleep-wake rhythms) have produced the desired effect. Not everyone opts to follow through with CPAP either short term or long term once they've experienced it. Some find the way they look when wearing the nasal CPAP mask to be offensive. Others feel claustrophobic with it, and yet others find that the compressed air causes dryness of their nose or -- in some cases -- sinus infections. In the majority of cases these problems can be rectified, but neither is this universally true.

For more extensive coverage, the reader is referred to *Phantom of the Night* by T.S. Johnson, M.D. and Jerry Halberstadt (New Technology Publishing, 1995) [*Phantom of the Night*](#). It is delightfully written. It offers two vantage points on CPAP--one, from a respected pulmonologist, the other from a man who suffered from apnea for years before it was diagnosed. The information provided is useful, easy to understand, and covers the ground from the symptoms and biology of sleep apnea, through the effective use of nasal CPAP. It is an honestly written book, and well worth the reading.

Surgery

Youngsters with demonstrated apnea during sleep usually have shown signs at home of poor concentration, of either withdrawal or aggressiveness, and of generally feeling poorly. For many of these young people, large tonsils which actually meet at the midline are the demonstrated cause. For the majority of these, a tonsillectomy may correct the problem.

In some people the lower jaw is set too far back. This also displaces the tongue backward which in turn blocks what is called the posterior air space (behind the tongue down into the throat). During the night, the combination of normal airway relaxation with the already limited airway diameter leads to the development of OSA. New surgery has become available for repositioning the jaw. Long term results are not yet in.

Repair of a previously fractured nose which has led to severe obstruction of the nasal airway is a cause which can be surgically corrected.

There are some forms of surgery in use now which are more controversial since they are promoted to stop snoring, but not necessarily the underlying apnea disorder; and since they are not necessarily for the purpose of correcting an obvious anatomic abnormality. Among these forms of surgery are:

- **straightening the septum** in patients whose septal deviation is congenital and does *not* produce significant blockage of the nasal airway or induce obligate mouth breathing;
- **turbinectomy** to correct enlarged turbinates;
- **uvulopalatopharyngoplasty (UPPP)**

Called by some an internal face lift, a recent study reported a 79% success rate for UPPP treatment for an unselected group of patients with diagnosed OSA. Successful response was not defined as elimination of the apnea, but rather a decrease in apnea rate by half or more from the presurgical rate. To provide a more concrete sense of what was meant by success, the mean apnea rate after UPPP was still an average of 30 apneas per hour of sleep (compared to a normal range of 0-5). Thus the patient would still require treatment for apnea. A post-surgery sleep study should be done after this surgery.

There are therefore continued efforts to develop diagnostic strategies to fine tune decisions about which patients with diagnosed apnea are most likely to derive significant benefit from the UPPP. We add that attention must also be paid to the numerous other factors which also must be addressed when treating patients with obstructive sleep apnea.

- **LAUP surgery**, which involves removal or shortening of the uvula (the structure which hangs down from the roof of the mouth, toward the back), removal of tonsils if present, and in some cases a shortening of the soft palate. It has been heavily promoted as a treatment for snoring. Success in treating snoring may, however, cause the patient to overlook obstructive sleep apnea, and this operation has not been demonstrated to be effective in treating apnea. Therefore, the possibility of apnea should be eliminated before this surgery.
- **Tracheostomy** In very severe cases, when a person's breathing during the night is so impaired that his or her heart is highly dysfunctional and blood oxygen levels become perilously low, guaranteed immediate correction of the sleep-related breathing problem is critical. However, if s/he cannot tolerate nasal CPAP, a life-saving *tracheostomy* can be performed. This is the creation of an opening in the lower part of the throat, below the level where the airway collapses. Plugged during the day so that normal speech is possible, the tracheostomy is open for breathing during the night.

Oxygen

Oxygen is rarely used alone because of the way the brain uses information about how much oxygen is in the blood. That is, oxygen administration during sleep in some cases can paradoxically lead to significant worsening of the apnea. This becomes especially problematic when a person with apnea also has a chronic lung disease that requires oxygen. Oxygen at the correct flow rate when used in conjunction with nasal CPAP, however, in many cases corrects this problem. It is essential for the appropriate oxygen flow rate and appropriate nasal CPAP pressure to be determined while the patient is being monitored during nighttime sleep in a qualified sleep disorders center or apnea laboratory.

Medical interventions

In the case of an underactive thyroid gland, the obesity which untreated **hypothyroidism** can create eventually can also cause OSA. However, current data suggest that an underactive thyroid gland can lead to apnea even before the individual begins gaining weight. The mechanism is unknown. Thyroid hormone supplementation might lead to significant correction of the apnea if this is the sole problem. Because of this finding it has become common for routine thyroid

function testing to be recommended if there is any suspicion whatever (including family history) of hypothyroidism.

For unclear reasons, uncontrolled **diabetes** can also lead to apnea. Control of blood sugar levels has, however, in our experience had at best a moderate effect in controlling the diagnosed obstructive sleep apnea.

Certain medications which increase respiratory drive are helpful in some patients. **Progesterone** (often marketed as Provera in the synthetic form), a female hormone secreted at a high rate during the third trimester of pregnancy when the growing uterus has pushed hard against the diaphragm and decreased the space lungs have to operate in, has been used with some degree of success in men and women alike. For perimenopausal and postmenopausal women, addition of exogenous progesterone might be the first treatment effort.

Dental appliances

Dental appliances worn during sleep, many of which gently move the lower mandible forward, are increasingly being evaluated with respect to their efficacy in treating obstructive sleep apnea, with positive results in at least a subset of the patients studied. More studies clearly need to be conducted, but the current findings are promising, according to a recent consensus report by the American Sleep Disorders Association.

Conclusion

The actual cause of OSA is not known. There are many people who can violate the majority of the described lifestyle factors or who have blatant obstruction of the upper airway, but who still do not develop obstructive apnea, or even loud snoring. However, for people with clearly diagnosed apnea, all of the foregoing can be pertinent in developing a treatment plan. We would like to underscore that neither nasal CPAP nor surgery can be expected to have the intended effect if too many of the other factors described above are not corrected as well. On the other hand, for some patients, correction of these lifestyle factors may eliminate the problem without further treatment.

SleepWell® is a private practice Sleep Disorders Service of Gila Lindsley, Ph.D., A.C.P. and is located in Lexington, MA 02173 USA Dr. Lindsley is a Diplomate of the American Board of Sleep Medicine and a Licensed Psychologist.

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