



Breathing & Sleeping *(at the same time)*

BY MILTON TESKE, M.D.

Sleep is essential to life — for humans about 8 hours per day (bats sleep over 20 hours per day). Normal central nervous system function requires that the brain shut down all of its usual conscious thoughts and actions so that organizing, sorting, filing and saving of data from the previous day can take place as well as deleting non-essential data. A deep power washing cycle also washes out all the metabolic debris and waste that accumulated during the day. During sleep a special switching station in the thalamus shuts off all sensory input to the brain and motor output can also be shut off (during dream sleep we become completely paralyzed).

Every cell in our entire body must carry on certain basic func-

tions to stay alive and they must do so 24/7, awake or asleep, every day of your life. These metabolic functions require energy (glucose) that is delivered though the blood with every beat of your heart. And to burn this fuel requires oxygen that is also transported in the blood. As the glucose is burned using the oxygen, it produces carbon dioxide, a waste product, that is transported back to the lungs by the blood where it is then exhaled. The heart must continue to beat, and the lungs must continue to breathe — always. Life depends on these two processes never stopping.

And so God built in certain automatic control centers in your brain stem that keep your heart beating and your lungs breathing even when you are sleeping. They have uninter-

rupted access to a network of sensors that monitor heart rate, blood pressure, oxygen levels and carbon dioxide levels so we always maintain the right cardiac output and respiratory rate to supply the needs of every cell.

Whales Don't Dream

During REM sleep we dream and our motor output is paralyzed so that we don't act out our dreams. If a whale started dreaming it would become paralyzed and drown. So whales don't dream. They do not have a REM stage of sleep. Sea lions who spend months at sea do not have REM sleep at sea, but upon returning to land they resume normal REM sleep.



But no creature can go without sleep, and so whales do sleep. They go through all the usual stages of Non-REM sleep like we do every night. But like us, they also must continue breathing while they sleep. Apparently, swimming is just too complex of a process to accomplish that it cannot be done while one is sleeping. You cannot swim and sleep at the same time and neither can a whale. So God designed them to have *uni-hemispheric* sleep. They sleep with one hemisphere of the brain while they stay awake and swim with the other hemisphere. After a few hours they switch over so the other half can sleep.

Did you know that birds can also have unihemispheric sleep? But for a different reason. They can sleep

with one eye open and half the brain awake and watching for predators while the other half of the brain sleeps, and then later they switch over like the whales do. Have you seen a small flock of birds sleeping together on a wire or twig? The two birds on the two outside ends sleep with the outside eye open watching for danger. During the night, when they switch hemispheres for sleep they will turn around 180 degrees on the perch so that the open and awake eye is still facing out. While all night the birds that are in between them

will have normal *bihemispheric* sleep like we do with both eyes closed and both sides of the brain sleeping at the same time. The amazing complexities that go into creating a world with so many varied creatures in it.

We Aren't Whales

So we can just go to sleep with normal bihemispheric sleep and breath automatically all night long with no problem, or at least that was the plan in a perfect world. But today, thousands suffer from breathing problems while sleeping — we call it **sleep apnea**. Or more specifically: **Obstructive Sleep Apnea (OSA)** where the airway becomes obstructed during sleep blocking normal breathing.

There is also something called *central sleep apnea* where instead of an airway obstruction blocking the breathing, the automatic breathing centers in the brain just stop sending the messages to breathe. An opi-

SLEEP APNEA



ate overdose would be an example of this type of apnea. Too much heroin or methadone or oxycodone will put the automatic breathing centers to sleep. They stop sending the message to breathe, and when the breathing stops death will soon follow. So unless someone quickly intervenes and starts breathing for them or gives them an emergency shot of Narcan to reverse the opiate, respiratory arrest will be the cause of death.

Obstructive Sleep Apnea

OSA is more common as we get older and gain more weight, and snoring becomes a problem. Here is what happens: As we fall asleep, all of our muscles relax and the tongue can fall back and the soft palate and uvula sag back into the throat. If we have gained some increased fat in the tissues of our neck and throat then this airway through which we must breathe can partially or completely block.

Snoring is the loud noise created when our breathing tries to force air through this narrowed, blocked space. As it worsens, it can be completely blocked off preventing air move-

ment. Then the oxygen level starts to drop and the carbon dioxide level rises and the sensors start sending emergency alarm signals to the brain “Wake up! We need oxygen! We need to breathe!” So our brain arouses us from our deepening sleep, we tighten up the airway muscles and gasp some air through this space and then drift back to sleep only repeating this cycle over and over throughout the night. We might not fully wake up and remember these awakenings the next morning, but we never are able to get past the early, shallow phases of sleep down into the really deep sleep we so desperately need because we are constantly being awakened. OSA leaves one in a perpetual state of sleep deprivation.

OSA Symptoms

- Loud snoring, especially snoring that is loud enough to disturb you or others trying to sleep near you.
- OSA snoring is usually loudest when lying on your back and improves when turning on your side.
- Abrupt awakenings accompanied by gasping or choking.
- Intermittent pauses in your breathing while sleeping are often very noticeable to another listening to you sleep.
- Do you have a big neck or are you overweight or obese?
- Excessive daytime sleepiness.
- Drowsiness which may cause you to fall asleep while working, reading, watching TV or even while driving.

- Difficulty concentrating during the day.
- High blood pressure.
- Nighttime sweating.
- Awakening with a dry mouth, sore throat, headache or gasping feeling.

OSA is associated with high blood pressure, heart attacks, heart failure, strokes, diabetes, obesity and high cholesterol — all of the usual metabolic syndrome diseases that are so common here. While the same lifestyle factors that lead to these diseases lead to OSA, it is also true that OSA and its associated ongoing sleep deprivation contribute to and worsen all these other diseases. OSA can be effectively treated, and if you do have it I would highly recommend that you get it treated.

Diagnosis

If you or your spouse think you might have OSA, see your doctor, an ENT specialist, or a sleep specialist. They can order a sleep study to see if you have OSA or not. You will go to a sleep lab at bedtime and they will hook you up to multiple monitoring devices that will measure your brain electrical sleep waves, heart rate, respiratory rate, oxygen level, larynx movement, camera, etc. With all these concurrent measurements, it will be easy to see if you are apneic, if your oxygen is dropping, and if you are disrupting your normal sleep.

If you are having frequent episodes of OSA, the second step is to try a CPAP machine either on a subsequent night or even that same night in a split study. CPAP stands

for Continuous Positive Airway Pressure. It is a machine with a mask that fits over your nose or entire face and blows air in continuously while you sleep. It maintains a positive pressure inside your airway while you sleep. This air pressure holds the airway open even when your tongue and other tissues relax. This way you can continue to breathe in and out without being blocked. This normal breathing will allow your sleep to progress through its normal deep sleep cycles as it should. This part of the study will tell them what pressure setting you need to hold your airway open, so they can set the machine to the right setting for you.

OSA Treatment

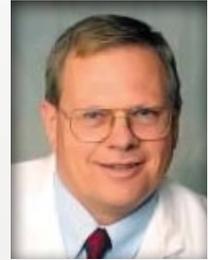
Lifestyle measures, particularly significant weight loss, can help to restore a normal airway. For some, even a 10% weight loss may be enough to push things back far enough to restore normal sleep. Sleeping on your side can help some. Avoid alcohol and sleeping pills or tranquilizers as these will always worsen sleep apnea. A few have been benefited by oral devices that hold the jaw forward while sleeping. But most people will benefit from a CPAP machine every night. Your insurance should cover this after a positive sleep study has been done. Some may require some surgical procedure to correct some anatomic problems causing the obstructed airway. Enlarged tonsils or a deviated septum or enlarged turbinates can contribute to airway obstruction. Extra soft palate tissue can be removed and the back of the tongue can be reduced.

Normal, Uninterrupted Deep Sleep

The quality of your life depends on the quality of your sleep. To awaken in the morning with a clear mind, rested and ready to commune with God, your brain must go through the deep sleep cycles that organize and save the important things, delete the stuff you don't need, as well as go through the deep power washing cycles that wash out the waste products that have built up the day before.

This is when you restore your essential neurotransmitters. You need these deep stage 4 sleep cycles, so do whatever it takes to get them. If you have OSA, change your diet, exercise, lose the weight, get rid of the sleeping pills (ask your doctor about tapering off if they are prescription drugs), get a sleep study, get and use the CPAP machine. It will be worth it in the quality of life you will recover.

*“The greatest bridge from despair to hope
is a good night’s sleep.”*



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