



## Warning:

### Sleep May Be Hazardous To Your Health



In an age when it seems like everything from the food we eat to the air we breathe is hazardous to our health, now physicians are examining the changes that occur when we sleep and the impact it can have on our lives. For people with breathing difficulties, sleep may have a profound impact on their breathing and their health.

In all people, several things occur which affects our breathing during sleep. First, the centers in our brain that control breathing become less sensitive. This is especially true during the deepest stage of sleep

called "rapid-eye movement" or REM sleep. Airflow through the airways may be reduced due to the back of the throat and other airways getting smaller during sleep. Also, muscles other than the diaphragm involved in breathing don't function as effectively during sleep and the volume of the lungs actually decreases during sleep. All of these changes result in less air movement in and out of the lungs, especially during REM sleep when ventilation drops to about 60-70% as much as awake ventilation. In healthy individuals, these changes don't have any significant effect on health, but in people that already have breathing difficulties, these changes can be very significant.

In patients with chronic lung diseases (e.g., COPD, emphysema, chronic bronchitis, asthma, etc.), these changes often result in dramatic drops in ventilation during sleep. This is also true for patients with other conditions that affect breathing (e.g., neuromuscular disease, severe obesity, curvature of the spine, etc.). For example, in asthmatics, studies have shown that airflow may drop to 50% of daytime levels. Many patients with chronic lung disease use their accessory muscles (muscles other than the diaphragm such as chest, shoulder, and abdominal muscles) to breath. As stated above, the accessory muscles nearly stop contributing to ventilation during the deepest stages of sleep. These factors, as well as others, often result in profound drops in ventilation and blood oxygen levels during sleep.

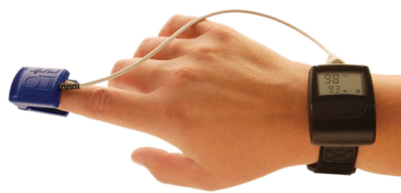
When blood oxygen levels drop during sleep, this causes the blood vessels that run through the lungs to constrict (get smaller in diameter). This makes the blood pressure

inside the lungs higher (called pulmonary hypertension) and puts an added strain on the right side of the heart. With time, if this goes uncorrected, the right side of the heart may enlarge and become less effective at pumping blood, a condition referred to as *cor pulmonale*. People with low oxygen levels during sleep may exhibit irregular heart beats and other signs that the heart is not getting enough oxygen.

Some signs and symptoms that may occur as a result of impaired breathing during sleep include restless sleep, having to sleep with the head elevated, waking up short of breath, waking up with headaches, and daytime sleepiness.

### **How do I know if my oxygen level drops during sleep?**

Fortunately, it is very simple to tell if your oxygen level is dropping during sleep. A device called an oximeter is able to monitor and record your oxygen level all night long.



Your physician will review your testing and determine if you are having significant drops in oxygen levels while sleeping. If you do, your physician may order oxygen for you to wear only while you sleep. Using oxygen has been shown to help prevent these drops and the increase in blood pressure which puts a strain on the right side of the

heart. In some patients, whose blood oxygen level is not adequately corrected by oxygen, a therapy called NPPV, which is designed to improve ventilation (the movement of air in and out of the lungs) during sleep, may be indicated.

If your physician suspects that you have a more complicated breathing problem associated with sleep, she may order a more complete sleep study. A polysomnogram is typically done if a condition called obstructive sleep apnea is suspected.

If you suspect that your breathing may be diminished during sleep, talk with your doctor or call one of our home care respiratory therapists for more information. We will be glad to talk with your physician to discuss your concerns and relay your questions.