



# *X-Plain™*

## *Sleep Disorders*

### **Reference Summary**

Sleep disorders are very common conditions that can be overcome. It is important to understand what affects sleep and the importance of sleep. This reference summary will help you to understand sleep, sleep disorders, and their treatment.

### **Sleep**

While we sleep, our bodies are inactive but our brains stay very active. Sleep affects daily functioning and physical and mental health in many ways that researchers are just beginning to understand.



People usually cycle through 5 phases of sleep:

- stage 1 -- Drowsiness
- stage 2 – Light Sleep
- stage 3 – Deep Sleep
- stage 4 – Slow-Wave Deep Sleep
- Rapid eye movement, or *REM*

We spend almost 50% of our total sleep time in stage 2 sleep, about 20% in REM sleep, and the remaining 30% in the other stages. Infants, however, spend nearly 1/2 of their sleep time in REM sleep. During stage 1, or light sleep, we drift in and out of sleep and can be awakened easily. Our eyes move very slowly and muscle activity slows. Muscle contractions called *hypnic myoclonia* are often preceded by a sensation of starting to fall. In stage 2 sleep, eye movement stops and brain waves slow. In stage 3 and 4, extremely slow brain waves appear. It is very difficult to wake someone during stages 3 and 4, which together are called deep sleep. There is no eye movement or muscle activity.



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People awakened during deep sleep do not adjust immediately and often feel groggy and disoriented for several minutes after they wake up. Some children experience bedwetting, night terrors, or sleepwalking during deep sleep. During REM sleep, our breathing becomes more rapid, irregular, and shallow. Our eyes jerk rapidly in various directions, and our limb muscles become temporarily paralyzed. Our heart rate increases, our blood pressure rises, and males develop penile erections. When people wake up during REM sleep, they often describe bizarre and illogical dreams. A complete sleep cycle takes about 90-110 minutes. The first sleep cycles of the night contain short REM periods and long periods of deep sleep. As the night progresses, REM sleep increases in length while deep sleep decreases. By morning, nearly all sleep time is in stages 1, 2, and REM.

If REM sleep is disturbed, our bodies do not follow the normal sleep cycle the next time we doze off. Instead, we often slip directly into REM sleep and go through long periods of REM until we "catch up" on this stage of sleep.

## **Sleep Needs**

The amount of sleep each person needs depends on many factors, including age. Babies generally need about 16 hours a day, while teenagers need about 9 hours a day. For most adults, 7-8 hours a night appears to be the best amount of sleep, although some people may only need 5 hours or as many as 10 hours each day.

A person needs more sleep if he or she has not gotten enough sleep in previous days. Lack of sleep creates a "sleep debt" which is much like being overdrawn at a bank. Eventually, your body will demand that the debt be repaid! People do not successfully adapt to sleeping less than necessary. Although people can get used to a sleep-deprived schedule, their judgment, reaction time, and other functions will be impaired.

Many studies show that sleep deprivation is dangerous. Sleep-deprived people who are tested with a driving simulator or hand-eye coordination tasks perform as poorly or worse than people who are intoxicated. Sleep deprivation also makes the effects of alcohol worse. A tired person who drinks will become much more impaired than someone who is well rested. Driver drowsiness is responsible for around 100,000 motor vehicle accidents and 1,500 deaths each year, according to the National Highway Traffic Safety Administration.

## **Benefits**

Even though scientists are still learning exactly why people need sleep, studies show that sleep is necessary to survive. For example, rats normally live for 2-3 years but in

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studies, those deprived of REM sleep survive only about 5 weeks. Rats deprived of all sleep stages live only about 3 weeks!

Sleep deprivation has bad effects on the immune system. Sleep is also necessary in order for the nervous system to work properly. Too little sleep leaves us drowsy and unable to concentrate. It also leads to memory problems, clumsiness, and decreased ability to carry out math calculations. If sleep deprivation continues, hallucinations and mood swings may develop.

Deep sleep in children and young adults is related to an important growth hormone. Many body cells regenerate during deep sleep. They grow and repair damage caused by stress and ultraviolet rays. This is why deep sleep may truly be "beauty sleep."

## **Sleep Disorders**

At least 40 million Americans experience chronic, long-term sleep disorders each year, and 20 million more experience occasional sleep problems. Sleep disorders and the resulting sleep deprivation interfere with work, driving, and social activities.

Sleep disorders are responsible for \$16 billion in medical costs each year, while more costs are due to lost work and other factors.

There are more than 70 different sleep disorders. Most of them can be managed successfully once they are diagnosed.

The most common sleep disorders are:

- insomnia
- sleep apnea
- restless legs syndrome, or RLS
- narcolepsy

## **Insomnia**

A lot of people experience short-term insomnia occasionally. For short-term insomnia, doctors sometimes prescribe sleeping pills. Most sleeping pills stop working after several weeks of nightly use and long-term use can interfere with good sleep.

Many people who suffer from insomnia try to solve the problem with alcohol. While alcohol does help people fall into light sleep, it also keeps them from having REM and deep stages of sleep.

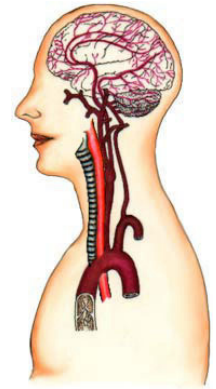
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Heavy smokers often sleep very lightly and have less REM sleep. They also tend to wake up after 3 or 4 hours of sleep due to nicotine withdrawal. Mild insomnia can often be prevented or cured by practicing good sleep habits. Researchers are experimenting with light therapy and other treatment options for more serious cases of insomnia.

## Sleep Apnea

Approximately 18 million Americans have sleep apnea. However, few of them have had the problem diagnosed. Sleep apnea is an interruption in breathing during sleep. It is linked to obesity and decreased muscle tone due to aging. These conditions allow the windpipe to collapse when muscles relax during sleep. This problem, called obstructive sleep apnea, usually causes loud snoring.



During an episode of obstructive apnea, the effort to inhale air creates a suction that collapses the windpipe. Airflow may be blocked for 10-60 seconds while the sleeping person struggles to breathe.

When the person's blood oxygen level falls, the brain responds by waking the person up enough to tighten the airway muscles and open the windpipe. The person may snort or gasp, then go back to snoring. This cycle may be repeated 100's of times a night. From waking up so many times, sleep apnea patients are always sleepy and may even experience personality changes, such as irritability or depression.

Sleep apnea deprives people of oxygen, which can lead to:

- morning headaches
- loss of interest in sex
- decline in mental functioning
- high blood pressure
- irregular heartbeats
- increased risk of heart attacks or stroke

Patients with severe, untreated sleep apnea are 2–3 times more likely to have automobile accidents than people without sleep apnea. Sometimes, sleep apnea can even lead to sudden death from respiratory arrest during sleep. Patients who have typical symptoms of sleep apnea, such as loud snoring, obesity, and excessive

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daytime sleepiness, should see a sleep center specialist who can perform a test called a polysomnography.

A polysomnography records brain waves, heartbeat, and breathing during an entire night of sleep. If sleep apnea is diagnosed, several treatments are available. Mild sleep apnea can often be overcome by losing weight. The patient may also avoid sleeping on his or her back. Special devices or surgery can also correct obstructions causing sleep apnea. Patients with sleep apnea can wear a special mask any time a patient sleeps.

This device is known as CPAP or Continuous Positive Airway Pressure device. It uses air pressure to keep the patient's airways open during sleep. It is very successful in managing sleep apnea.

People with sleep apnea should never take sedatives or sleeping pills because they may not wake up enough to breathe.

### **Restless Legs Syndrome**

Restless legs syndrome, or RLS, is a hereditary disorder that causes unpleasant crawling, prickling, or tingling sensations in the legs and feet. The patient has an urge to move them for relief. RLS is becoming one of the most common sleep disorders among older people. RLS, which affects about 12 million Americans, leads to constant leg movement during the day and insomnia at night. Severe RLS is most common in elderly people, though symptoms can develop at any age. In some cases, RLS may be linked to other conditions such as anemia, pregnancy, or diabetes. Some drug therapies are available to relieve RLS. Learning why RLS occurs may lead to better therapies in the future.

### **Narcolepsy**

Narcolepsy affects approximately 250,000 Americans. People with narcolepsy have *sleep attacks* at various times of the day, even if they get a normal amount of sleep at night. A sleep attack is a sudden period of sleep in the middle of being awake.

The disorder is thought to be due to the brain's inability to regulate sleep-wake cycles normally.

Sleep attacks last anywhere from several seconds to over 30 minutes. People with narcolepsy also may experience:

- cataplexy - loss of muscle control during emotional situations

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- hallucinations
- disrupted nighttime sleep
- temporary paralysis when they wake up

Narcolepsy is usually hereditary, but it is sometimes associated with brain damage from a head injury or a neurological disease. Drugs such as stimulants and antidepressants can control narcolepsy symptoms. Naps during the day can also reduce excessive daytime sleepiness.

## **Sleep Well**

It is best to have scheduled times to go to bed and wake up. It is preferable to go to bed and wake up at the same time even during weekends and holidays. Sleep until the sun comes up if possible; otherwise use very bright lights in the morning. Daily exercise can help sleep patterns, especially if it is done 5-6 hours before your scheduled bedtime.

Relax before going to bed. Reading, watching TV, praying, and meditating are good ways to do this. Avoid caffeine, nicotine, and alcohol.

Do not lie in bed awake if you cannot sleep. Do something instead, for instance, read or watch TV. Frustration from not being able to get to sleep can make insomnia worse. Keeping bedrooms at a comfortable temperature can also reduce sleep disruptions.

Seek medical help if you keep having sleep problems. There are numerous techniques and medications available to help you sleep better!

## **Summary**

Sleep problems are common and can have very serious consequences. However, they can be treated. Improving your sleeping habits and talking with your doctor about persistent sleep problems can help you to achieve a good night's sleep!

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