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August 2005 "Sleep Disorders" 707-000-05-008-H01

THIS MONTH
"Sleep Disorders"

RENEWAL STATEMENTS FOR NEXT YEAR WILL BE MAILED SOON. KEEP YOUR EYES ON YOUR MAIL. SPECIAL DISCOUNT IF RETURNED EARLY.

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HAVE YOU RECENTLY MOVED? PLEASE NOTIFY US.

Sleep disorders are common complaints. It has been estimated that one third of the population in the U.S. suffers from occasional or chronic sleep disturbances. Our goal is to provide information that may be shared with patients, especially regarding therapeutic options. This lesson provides 1.25 hours (0.125 CEUs) of credit, and is intended for pharmacists in all practice settings.

The program ID # for this lesson is 707-000-05-008-H01.
Pharmacists completing this lesson by August 31, 2008 may receive full credit.

To obtain continuing education credit for this lesson, you must answer the questions on the quiz (70% correct required), and return the quiz. Should you score less than 70%, you will be asked to repeat the quiz. Computerized records are maintained for each participant.

If you have any comments, suggestions or questions, contact us at the above address, or call toll free 1-800-323-4305. (In Alaska and Hawaii phone 1-847-945-8050). **Please write your ID Number (the number that is on the top of the mailing label) in the indicated space on the quiz page** (for continuous participants only).

The objectives of this lesson are such that upon completion the participant will be able to:

1. Describe the physiology of sleep.
2. List the stages of sleep.
3. Differentiate between REM & NREM sleep.
4. Discuss the function & importance of sleep.
5. Name the types & contributing factors associated with sleep disorders.
6. State the treatments of sleep disorders.

INTRODUCTION

Sleep disorders are common complaints. Both prescription and nonprescription drugs are utilized to treat them. It has been estimated that 33% of the population in the US suffers from occasional or chronic sleep disturbances. These can have significant adverse effects on daytime functioning. Sleep disorders can be primary or may be associated with medical or psychiatric conditions. About thirty years ago sleep disorders, in particular insomnia, were treated without meaningful diagnosis or patient evaluation. Currently, sleep disorder medicine is considered a discipline that seeks understanding of diagnosis, pathophysiology and treatment. We spend a considerable amount of time asleep. There are alternating cycles of sleep and wakefulness that are governed by our brain, and lead to a natural circadian, or 24 hour rhythm. Even though adults may sleep 7 to 8 hours a night, there is no ideal duration of sleep because it varies among healthy individuals. Infants and the elderly experience interrupted sleep; whereas, younger adults tend to experience one uninterrupted sleep period every 24 hours. A newborn may sleep 20 hours every day; whereas a child 8-14 hours depending on age; adults with a mean of 7-8 hours; and the elderly 6-5 hours. Women over 35 years of age tend to sleep more than men of the same age. About half the world's population has an afternoon nap (siesta) and a shortened night sleep. It has been reported that persons who sleep 7 to 8 hours every 24 hours live longer than those who sleep less than 4 hours or more than 9 hours.

PHYSIOLOGY OF SLEEP

Sleep is a recurrent normal state of rest accompanied by changed consciousness or varying degree of consciousness during which the individual's responses to stimuli such as noise, touch, and smell are reduced significantly, but the person can be aroused by stimulation. In coma, any type of stimulation cannot arouse the state of unconsciousness. During sleep, cortical activity is reduced, while brain stem functions such as breathing, heartbeat, and blood pressure remain active. In the awake state, the activity of the cerebral cortex (the conscious brain) is controlled by the reticular activating system, whose centers tend to maintain the wake state as well as mediating some stages of sleep, in particular, dreaming sleep. The hypothalamus is believed to control the timing of the sleep cycle.

STAGES OF SLEEP

Sleep consists of 2 stages that are defined in accordance with patterns generated by the electroencephalogram (EEG), the electroculogram (EOG), and the surface electromyogram (EMG). The profile of these electrophysiological patterns defines 2 stages of sleep that occur cyclically:

1 - Non-rapid Eye Movement (NREM), and

2 - Rapid Eye Movement (REM)

Both stages alternate during the night.

Non-rapid Eye Movement (NREM)

This stage consists of 4 phases that occur during the first 45 to 60 minutes of the sleep cycle.

Phase 1: It begins after closing the eyes. Then the person feels relaxed (decreased muscle tone). Thoughts become unclear and the person experiences a drifting feeling. Body temperature, breathing, pulse and blood pressure are normal; the EEG pattern is characterized by low-voltage and low frequency, and the eye movement is slow and rolling. If interrupted by stimuli such as noise, the person is readily aroused and may deny being asleep.

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August, 2005

Phase 2: This is characterized by slower and more irregular EEG pattern. The person now is sound asleep and arousal becomes more difficult.

Phase 3: The person is in deep sleep and delta waves appear. Blood pressure, respiration, body temperature, and pulse begin to decline, and the skeletal-muscular system is relaxed. The person may experience dreaming. This begins about 20 minutes after Phase 1.

Phase 4: The EEG pattern is characterized by dominant delta waves, and the person is in a deep restful sleep. The vital signs are at their lowest normal activity. There is an increase in the gastrointestinal motility, and the muscular activity is in total relaxation. Arousal difficulty is at its peak. If arousal took place, the person appears perplexed. During this state some people experience bed-wetting and sleepwalking. Nightmares and sleep terror occur in Phases 3 and 4.

Rapid Eye Movement (REM)

Within 90 minutes of the start of the sleep cycle, abrupt low-voltage EEG waves occur with rapid eye movement and are accompanied by increased body temperature, heart rate, respiration, blood pressure and oxygen consumption, and decreased gastrointestinal motility. Most regular dreams occur in REM sleep. The vast majority of people recall dreams when awakened. In a normal night a person alternates between REM and NREM sleep, with each cycle lasting about 90 minutes. Once the REM episode is completed, the person will enter into Phase 4 NREM again. REM episodes occur 5-7 times per night, and consume about 1-2 hours of the total sleep time.

FUNCTION AND IMPORTANCE OF SLEEP

The need for sleep is evident. However, it is not known how sleep provides a daily rejuvenation and revitalization of body functions and renewal of well being. The function of sleep is believed to occur during the slow-wave and REM sleep. Slow-wave sleep appears to be the restorative stage. It assists in regulation of body repair. During sleep, reduction in body temperature, metabolic rate, glucose consumption, and release of catabolic hormones take place. Sleep is believed to play a role in allowing the brain to analyze short-term memory stores and review the day's events by eliminating nonessential information or emotional problems and retaining necessary data in long-term memory. Persons who are deprived of sleep become irritable, fatigued, disoriented and unable to concentrate. Personality disorders such a paranoid thoughts, auditory and visual illusions or hallucinations may be encountered. Deprivation of REM sleep may lead to anxiety disorders. These manifestations are transient, and the person reverts to normal once the regular sleep-wake cycle is restored. As stated earlier, sleep requirements vary, but it begins to decline from 16-18 hours for infants to about 7 hours for normal adults. Further decline may occur in old age. In adulthood, 25% of a sleep cycle consists of REM sleep. Phase 4 sleep declines gradually, and may disappear in the elderly causing their sleep to be light and interrupted. This may force such individuals to take afternoon naps to compensate for lost sleep.

SLEEP DISORDERS

A sleep disorder refers to any condition that interferes with the normal sleep cycle. The major classes of sleep disorders are **dyssomnia**, **parasomnia** and **medical/psychiatric sleep disorders**.

Dyssomnia

Dyssomnia refers to a group of sleep disturbances or excessive sleepiness that includes various types of insomnia, narcolepsy, sleep apnea, hypersomnia, and circadian rhythm sleep disorders.

Insomnia is the inability of a person to obtain the quantity or quality of sleep that is necessary to perform normal daily functions. This may occur due to difficulty in initiating sleep, maintaining sleep, or waking up early in the morning. It has been estimated that 10%-14% of the population suffers from chronic insomnia, and 20%-40% experiences occasional insomnia. A recent poll revealed that 49% of adults in the US are dissatisfied with their sleep and experience insomnia at least 5 nights per month. Results of the surveys indicated that insomnia is more common among women and the elderly. Likewise, it is encountered in individuals who suffer from physical illness, pain, or psychological conditions such as anxiety or depressive disorders. Additionally, medications may interfere with sleep. Several European studies found that primary insomnia is experienced by approximately 16% of the patients; insomnia associated with psychological disorders, 44%; insomnia caused by medical causes, 7%; other sleep disorders, 5%; insomnia due to substance abuse, 2%; and no cause was found for the remainder of the cases. Insomnia has been associated with decreased work productivity and increased motor vehicle accidents. The estimated cost exceeds $100 billion per year. Furthermore, insomnia has been associated with morbidity. In general,

insomniacs have poorer general health, higher absenteeism rates, and continued use of medical services. Studies have shown that insomniacs are at great risk for the development of mental depression.

Etilogy: Insomnia may be classified based on the duration of the symptoms. It may be transient, short term, or chronic. **Transient insomnia** usually lasts for less than a week, and occurs as a result of situational stress, a change in sleep schedule or sleep environment (i.e., noisy environment, anxiety over a meeting or exam, sleeping in a hotel bed, jet lag). **Short-term insomnia** lasts from one to three weeks and occurs usually during short illness, recovery from surgery, or loss of a loved one. **Chronic or long term insomnia** lasts from weeks to years, and it reflects factors associated with primary sleep dysfunction such as medical disorders (angina pectoris, diabetes, migraine, depression, gastroesophageal reflux, peptic ulcer, asthma, hypertension, chronic bronchitis, and emphysema), psychiatric disorders (i.e., anxiety, bipolar disorders, dementia, depression, and substance abuse), and sleep disorders (i.e., insomnia caused by drugs such as alcohol, certain antidepressants, antihypertensives, and sympathomimetic amines). Night shift workers, especially those who rotate their schedule, usually experience sleep difficulties. Certain individuals are adversely affected by caffeine, alcohol, and nicotine. Even though consumption of alcohol can assist the person in falling asleep, it may result in frequent awakening. Inadequate sleep hygiene relates to habitual routines prior to sleep and/or inadequate bedroom environment that interfere with sleep. Eating prior to bedtime and performing vigorous exercise may delay falling asleep. Noise, lights, as well as a bed partner who snores loudly, and inconsistent retiring and rising times are not conducive to sleep. Finally, sleeping problems may be encountered in high altitude places.

Treatment of Insomnia

Treatment should be based on the type of insomnia, nature (difficulty falling asleep, maintaining sleep, or waking up early), and severity of symptoms. Prior to therapy, it is essential that the contributing factors, if known, be eliminated or treated. Treatment may be non-pharmacological and/or pharmacological.

1. – Non-pharmacological treatment: It is essential that non-pharmacological treatment be initiated either alone or in conjunction with pharmacological treatment. Non-pharmacological treatment can reestablish normal sleep cycle. It is inexpensive and practically free of adverse effects. Evaluation of the patient is an important step in approaching insomnia treatment. A thorough sleep and family history is useful in identifying the underlying problems. About 30% of insomniacs have a family history of insomnia. Sleep-awake pattern should be established. A review of current intake of medications, both nonprescription and prescription, is helpful in determining the role these play in triggering insomnia. There is evidence to indicate that nonpharmacologic treatment either alone or with pharmacological therapy resulted in significant improvement and in more durable outcome. Even though hypnotics are effective in treating transient insomnia, such an approach has not been as successful for dealing with chronic insomnia. Cognitive-behavioral treatments may be effective and durable in long-term therapy. Non-pharmacological treatment is considered successful, if it decreases the time to fall asleep or increases the total sleep time by 30 minutes. When studying the outcome of treatment, one may rely on patient-reported sleep diaries. The recorded information should include sleep onset latency, total sleep time, and number of awakenings occurring at night.

Non-pharmacological treatments include education and sleep hygiene, stimulus control, sleep restrictions, relaxation training, biofeedback and cognitive therapy. These methods of cognitive-behavioral therapy may be used individually or in combination.

Good **sleep hygiene** may improve transient and short-term insomnia. This includes following a regular sleep-wake schedule, engaging in relaxing exercises until tired, going to bed only when tired, refraining from napping especially close to bedtime, avoiding the intake of caffeine, nicotine or alcohol 4 to 6 hours before retiring, avoiding poor sleeping environment (i.e., noise, snoring bed partner), avoiding the intake of excessive liquids or heavy meals, avoiding strenuous exercise before bedtime and engaging in moderate exercise about 3 to 4 hours before bedtime. It has been reported that moderate exercise enhanced sleep quality, onset latency and duration of sleep in the elderly.

Stimulus control therapy is useful for sleep-onset insomnia. The patient should be told to go to bed when he/she is sleepy. If the patient fails to fall asleep within 20 minutes, he/she should leave the bedroom and return only when sleepy. This cycle should be repeated as necessary through the night.

Sleep restriction therapy deals with reassociation of the bed with sleep. It has been reported that this type of therapy improves sleep quality and efficiency. Some insomniacs tend to spend more time in bed with the hope that this will lead to more sleep. To the contrary, this may lead to disappointment and aggravation of the problem. The patient should spend

the same amount of time in bed as they actually sleep. The patient should keep a sleep log to determine sleep efficiency (time asleep/time in bed x 100). Each week, once the efficiency exceeds 90%, the patient should increase the time in bed by 15 minutes. If the efficiency is less than 80%, then the patient should decrease time in bed by 15 minutes. However, the time spent in bed should not be less than 5 hours. It has been suggested that insomniacs should wake up at the same time, regardless of the amount of time they sleep. They should refrain from taking naps. This may result in a limited amount of sleep deprivation, which ultimately assists the patient to sleep.

Relaxation therapy includes muscle relaxation that may lead to relief of anxiety associated with the aroused state that precludes sleep.

Biofeedback based on muscle relaxation may be used. Other methods of biofeedback involve the utilization of EEG that provides information regarding delta or sleep spindle. However, the application of this method may have a limited success.

Cognitive behavioral therapy is based on identification of dysfunctional cognition about the causative factors and consequences of insomnia. Such misconceptions that may be encountered in insomniacs should be replaced with more realistic states of mind. A high percentage of insomniacs experience anxiety about their sleeplessness, and become overly concerned when going to bed. Such behavior tends to exacerbate the problem. Others may nap in order to compensate for the deprived sleep, and this may perpetuate the problem. In one study, it was shown that cognitive behavioral therapy caused a decrease of sleep latency by 54% compared with 16% with the relaxation therapy and 12% with placebo treatment.

2 – <u>Pharmacological Treatment</u>: Although it does not exist, the ideal sleep aid agent should possess a quick onset of action, have a long duration to assist in maintaining sleep with normal waking hours in the morning, minimal side effects such as daytime sedation, motor coordination, and cognitive impairment. It should not cause tolerance or dependence when used for several consecutive nights, and abrupt discontinuation should not result in drug-withdrawal or rebound insomnia. It should be safe and produce no drug-drug interactions. Using hypnotics may relieve symptoms of acute insomnia. However, the usefulness of these agents in the management of chronic insomnia is questionable. Taking them for longer then 4-6 weeks may lead to physical or behavioral dependence, withdrawal and rebound insomnia. Thus the use of hypnotics has its limitations. When using them in the elderly, the initial dose should be the one at the low end of the dosage range.

The most commonly used hypnotics are the barbiturates (pentobarbital, secobarbital, amobarbital), nonbarbiturate non-benzodiazepines (methaqualone, ethchlorvynol, glutethimide, chloral hydrate, diphenhydramine hydrochloride, melatonin and tryptophan), benzodiazepines (flurazepam, temazepam, triazolam, quazepam and estazolam), and BZD_1 receptor specific non-benzodiazepines.

Barbiturates

The barbiturates are seldom used for treating insomnia due to their narrow margin of safety and the potential for causing dependence. Because the barbiturates are potent liver enzyme inducers, they interact with many medications. In addition, they suppress delta and REM sleep and lose their hypnotic properties within 14 consecutive dosings at the same regime.

Non-Benzodiazepines

Like the barbiturates, the nonbarbiturate non-benzodiazepines have lost a great deal of their popularity, mainly because they possess disadvantages similar to those of the barbiturates. **Methaqualone**, a sedative-hypnotic drug that was introduced in 1965, was withdrawn from the market in 1984 due to its abuse. Such abuse resulted in severe psychic and physical dependence. Withdrawal symptoms are similar to those of barbiturates.

Ethchlorvynol is a CNS depressant that is used as a sedative-hypnotic. It has a rapid onset of action and short duration. It is approved for short-term management of insomnia. It possesses side effects such as dizziness, hypotension and facial numbness.

Glutethimide is a widely abused sedative-hypnotic that produces dependence. Withdrawal symptoms resemble those of barbiturates. It acts as a CNS depressant and an anticholinergic drug. It has been withdrawn from the markets of several European countries, but is still available in the US.

Chloral hydrate is a CNS depressant whose effect is believed to be due to its active metabolite tricholoroethanol. It is indicated for induction of sleep. It is rapidly absorbed from the GI tract and undergoes metabolism in the liver. Its hypnotic dose of 500-1,000 mg produces sleep in 30 minutes. It is available in capsules, syrup and suppositories. The main side effects of chloral hydrate include nausea, abdominal distress, and vomiting. It has the ability to displace other protein-bound

drugs such as warfarin. Chloral hydrate may be abused and produce symptoms similar to those encountered with alcoholism. With repeated use, it may lose its effectiveness in maintaining sleep.

The antihistamines, **diphenhydramine hydrochloride** and **doxylamine,** are widely used in nonprescription sleep aid drugs. Their use is due to the drowsiness that these cause. It is believed that they exert their action as sleep-aids through the blockage of both the histamine and muscarine receptors. Both are used to manage transient and short-term insomnia. Their effectiveness in the management of chronic insomnia is questionable, as tolerance may develop following repeated use. The adverse effects of the antihistamines as sleep aids include next morning hangover, production of anticholinergic effects such as dry mouth and throat, blurred vision, constipation, urinary retention, and in elderly patient, cognitive impairment. They are contraindicated in patients with prostate hypertrophy and difficult urination.

Melatonin is a peptide hormone that is secreted by the pineal glands, which are believed to have an effect on the sleep-wake cycles. This hormone is secreted at night, but its precise mechanism of action is not understood. It can influence the shifting of the circadian rhythms, produce sedation, and, as such, is used for sleep disturbances and jet lag. When taken in the morning, it delays the circadian cycle. If administered in the evening, it tends to advance it. It may be needed to assist patients to fall asleep in shorter time, but has no influence on nocturnal awakening, or total sleep time. It does not cause morning hangover. Patients should exercise caution when using melatonin, as its adverse effects are not fully understood. The optimal dose has not been determined, but it is recommended that a dose of 0.1-1 mg may be taken one to two hours before bedtime.

Tryptophan is an essential amino acid precursor of serotonin, a neurotransmitter, and is found in high concentrations in animal and fish proteins. Its efficacy in treating insomnia has not been determined. Results of studies conducted for evaluation of its sedative-hypnotic activity are inconclusive. In large doses, it may cause nausea and vomiting. The drug should not be used with serotonin reuptake inhibitors.

Benzodiazepines

The benzodiazepines were introduced in the early 1960's and are considered one of the most prescribed groups in the US. They are used to induce anesthesia and manage convulsions, anxiety, insomnia, and withdrawal from alcohol. They are CNS depressants and act by suppressing neuronal function at various regions in the CNS. They tend to induce sleep by depressing the cortical areas and the sleep-wakefulness clock. They potentate the activity of the hypnotic gamma-aminobutyric acid (GABA), an inhibitory neurotransmitter located in the CNS. The following benzodiazepines are among the most commonly used hypnotics:

Flurazepam was the first to be introduced. When compared to barbiturates and non-benzodiazepine hypnotics, it is safer and has less potential for dependence and abuse. At normal doses, it does not have detrimental effect on REM or delta sleep. It has long-acting metabolites with the potential for accumulation, causing impaired daytime functioning especially in the elderly. The sedative-hypnotic dose is 15 to 30 mg.

Temazepam gained popularity because of its short to intermediate elimination half-life of 9 to 15 hours, which could reach 20 to 30 hours in the elderly. Thus, repeated use could cause accumulation and resultant daytime hangover. A 15 to 30 mg dose can cause an increase in total sleep time and reduction in the nocturnal awakening time.

Triazolam is an ultra short-acting benzodiazepine that is rapidly eliminated following absorption. It has an elimination half-life of 2 to 3 hours. It suppresses REM sleep early in the sleeping hours, but has little effects on delta sleep. Like temazepam, it improves the total sleep time and unnecessary awakening during the night.

Quazepam is a hypnotic with high affinity for the BZD_1 receptors. It has a half-life of elimination of 8 to 28 hours, and active metabolites. It decreases sleep latency, nocturnal awakening and total sleep time. However, it has more residual effect during the daytime than most of the other benzodiazepines.

Estazolam is indicated for short-term treatment of insomnia. It is absorbed well from the G.I. tract and is capable of crossing the brain-barrier.

BZD_1 Receptor Specific Nonbenzodiazepines

Zolpidem belongs to this category. The drug is effective in relieving acute symptoms of insomnia. It reduces the time for the person to fall asleep, decreases nocturnal awakening, and enhances total sleep time. In a double blind, placebo-controlled study, it was reported that after 6 months of nightly hypnotic use, insomniacs did not develop tolerance to the drug. The most commonly encountered adverse effects include amnesia, ataxia, fatigue, and hangover.

Zolpidem has been recently approved for use as a hypnotic in the USA. It is not a benzodiazepine, but is capable of binding to the BZD_1 receptors. It has no nonspecific benzodiazepine-receptor binding metabolites. Its hypnotic activity is due to zolpidem BZD_1 receptor specificity. However, unlike most benzodiazepines, it possesses no anxiolytic, muscle relaxant, or anticonvulsant activity. It is rapidly absorbed from the GI tract, resulting in a quick onset of action. Sleep occurs within 20 to 30 minutes. Like most benzodiazepines, it increases total sleep time and reduces nocturnal awakening. In high doses, zolpidem may suppress REM sleep. In doses of 5 to 10 mg at bedtime, it causes the user to have a full night sleep with no hangover or memory impairment. The risk for causing dependence is less than that caused by the benzodiazepines. When taken in large doses by a potential abuser, nausea, vomiting, and dizziness may occur. Drug-withdrawal insomnia occurs minimally or not at all. The drug appears to cause tolerance after nightly use for 5 weeks. Side effects include headache, drowsiness, dizziness, nausea, and sinusitis. When elderly patients use a 10 mg dose or larger, there is potential for falling and confusion.

Eszopiclone has been recently approved by the FDA for the treatment of both transient and chronic insomnia. Its precise mechanism of action is unclear, but it is believed that it interacts with GABA receptors. Eszopiclone is well absorbed from the GI tract, and peak concentrations are reached within 1 to 1.5 hours. About 52-59% of the dose is bound to plasma protein. The drug undergoes metabolism in the liver resulting in metabolites that are less active than the drug. The vast majority of the dose is excreted in the urine. Sleep maintenance, sleep latency, and sleep time are improved. Patients should be evaluated as to the underlying cause of the insomnia. Patients should take this short acting hypnotic immediately before they go to bed, and should be aware of the fact that the drug may cause impaired motor and cognitive function. Adverse reactions include headache, unpleasant taste, dry mouth, depression, anxiety, dizziness, and hallucination.

Narcolepsy

This is a condition characterized by recurrent uncontrollable sudden daytime drowsiness and sleep attacks, often associated with cataplexy (muscular sleep paralysis that lasts for seconds to minutes) that usually occurs immediately after falling asleep or on awakening. The person may also experience visual and auditory hallucination. Individuals who suffer from narcolepsy may have several sleep attacks per day. The etiology of this disorder is unknown. It is believed that genetic factors play an important role in its causation. Treatment can be non-pharmacologic and/or pharmacologic. Patients should be advised to schedule naps during the day. Also, treating underlying causes such as neurological and psychiatric disorders is important. Pharmacologically, this disorder may be treated with amphetamine derivatives, methylphenidate, and pemoline.

Sleep apnea

This condition is a temporary cessation of breathing during sleep. It affects about 25% of middle-aged men and 10% of middle-aged women. It is potentially fatal. Breathing stops for 10 seconds or more, and its frequency may reach 300 times per night. Sleep apnea may be classified as obstructive, central or mixed. **Obstructive sleep apnea** occurs as a result of blockage in the upper airways. It is usually encountered in middle-aged obese men who experience snoring or snorting during sleep. **Central sleep apnea** occurs as a result of absence of respiratory muscle activity due to decreased respiratory center output. **Mixed sleep apnea** begins as central, followed by airway obstruction.

Weight reduction is essential to reduce the magnitude of sleep apnea and to improve blood gas contents. Relief of obstruction usually gives positive results.

Hypersomnia

This is a sleep disorder characterized by excessively long or deep sleep. The person is awakened only by aggressive stimulation. However, the person is normal during the waking intervals.

Circadian Rhythm Reversals

These occur when the biological clock or the wake-sleep cycle is disrupted. It is a result of jet lag, disease or injury to the hypothalamus, sedative misuse, or irregular night shift working hours. This disorder may be managed by dealing with underlying cause.

Summary

Sleep disorders are common occurrences that can be managed by judicious use of sedatives/hypnotics, non-pharmacologic therapy or a combination of both therapies.

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REMAINING TOPICS FOR 2005

September—Drug Considerations During Pregnancy & Lactation	**October**—MS & ALS
November/December Double Lesson—Food – Drug Interactions	

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LESSON EVALUATION

Please fill-out this section as a means of evaluating this lesson. The information will aid us in improving future efforts. Either circle the appropriate evaluation answer, or rate the item from 1 to 7 (1 is the lowest rating; 7 is the highest).

1. Does the program meet the learning objectives?

Describe physiology of sleep	Yes	No
List stages of sleep	Yes	No
Differentiate between REM & NREM sleep	Yes	No
Discuss the function & importance of sleep	Yes	No
Name the types & contributing factors associated with sleep disorders	Yes	No
State treatments of sleep disorders	Yes	No
2. Was the program independent & non-commercial?	Yes	No

	Poor			Average			Excellent
3. Relevance of topic to your practice	1	2	3	4	5	6	7
4. Author's ability to communicate	1	2	3	4	5	6	7

5. What did you like most about this lesson?_____

6. What did you like least about this lesson?_____

7. How would you improve this lesson?_____

8. Further comments or suggestions for future programs_____

(WATCH OUR WEBSITE FOR RESULTS OF PARTICIPANT EVALUATIONS)

Quiz—Please Select the Most Correct Answer

1. A transient insomnia usually lasts for:
   A. One or more months
   B. Less than one week
   C. Only one day
   D. Only 12 – 24 hours

2. The hypothalamus is believed to control:
   A. Timing of sleep cycle
   B. Rapid eye movements
   C. Breathing
   D. Cortical Cortex Activity

3. In Phase 2 of NREM:
   A. The person experiences a slow & rolling eye movement
   B. The person is in very deep sleep
   C. There is an increase in GI motility
   D. The EEG pattern is low & irregular

4. Persons who are deprived of sleep become irritable & unable to concentrate.
   A. True
   B. False

5. Another term for a condition characterized by uncontrollable disposition to sleep is:
   A. Insomnia
   B. Sleep apnea
   C. Narcolepsy
   D. Brief jerks

6. The ideal duration of sleep is 6 hours.
   A. True B. False

7. Which of these is not considered good sleep hygiene?
   A. Taking a nap in the afternoon
   B. Avoid intake of liquids
   C. Going to bed only when tired
   D. Avoid strenuous exercise

8. Which of these is not a non-pharmacological therapy for managing asthma?
   A. Biofeedback
   B. Cognitive behavioral therapy
   C. Relaxation therapy
   D. Low fat diet

9. Which of these is a BZD_1 receptor specific nonbenzodiazepine?
   A. Flurazepam
   B. Glutethimide
   C. Zolipidem
   D. Temazepam

10. Which of these is not used for narcolepsy?
    A. Amphetamine
    B. Eszopiclone
    C. Pemoline
    D. Methylphenidate

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