

## Sleep Disorders in the Elderly

---

### Introduction

We spend almost a third of our lives asleep, yet more than 35 million Americans do not sleep well. The prevalence of sleep dissatisfaction increases steadily with age. It has been estimated that sleep disturbances affect more than 50% of community dwelling individuals over 65 years of age as well as an estimated two-thirds of institutionalized elderly persons. In addition to affecting the quality of life in the aged, problems with sleep have been associated with increased risk of nursing home placement and an increased mortality. There are many potential causes of disturbed or unrestful sleep in the elderly, including emotional stress, physiologic changes of aging, adverse effects of medications, and potentially serious underlying medical conditions. Although sleep complaints are frequently encountered in medical practice, physicians often find difficulty in diagnosing and managing sleep disorders in this population.

### How Sleep Changes with Aging

As an individual ages, several changes in the normal sleep pattern occur. More time is necessary to fall asleep (increased sleep latency) upon retiring to bed. Maintaining sleep continuity is often difficult, as sleep becomes increasingly fragmented. The amount of time spent in deeper levels of sleep is decreased. As a consequence, more time is spent awake and in lighter stages of sleep. The elderly appear to be more easily awakened from environmental stimuli and sleep often does not seem as restful. Circadian rhythms also appear to change. The "internal clock" shifts, so that elderly persons often retire to bed earlier in the evening and awaken earlier in the morning. But when the schedules and time demands of the external world intrude, sleep suffers. Some of this may be due in part to intrinsic changes in circadian rhythms associated with aging. However, other factors may contribute including lack of exercise, lack of socially, physically, or mentally stimulating external environment, too much time spent in bed, and significant sensory impairments.

In addition, a number of co-morbid conditions which lead to nocturnal awakening (e.g. nocturia, trochanteric bursitis, orthopnea, and gastroesophageal reflux) occur more frequently in the elderly, often resulting in an increase in daytime sleepiness and an increase in napping. This may cause the sleep pattern in the elderly to become polycyclic in nature, such that several sleep-wake cycles occur within a 24-hour period. This polycyclic pattern is similar to the normal sleep pattern of infants, and is especially prevalent in the nursing home setting. As a result, many elderly experience a significant decrease in sleep efficiency and sleep satisfaction. These factors likely contribute to the increasing frequency of sleep complaints reported with advancing age.

Patients with dementia often have significant sleep/wake cycle disturbances. The degree of disturbance parallels the severity of the dementia. The altered circadian rhythm may not trouble patients themselves, however, this can be a serious problem for caregivers or nursing home staff, as patients' sleep rhythm may not match the daily routine of the caregivers or the institution. This mismatch may culminate in the

prescription of hypnotic medications, virtually all of which can further impair cognition.

### **Sleep Disorders: A Classification**

There are nearly 100 known sleep disorders, which have been classified into four general categories including dyssomnias, parasomnias, sleep disorders associated with medical/psychiatric problems, and proposed sleep disorders. However, because of the large degree of syndrome overlapping among the categories, it may be more practical and convenient to classify sleep disorders according to the patient's chief complaint. These would include:

- insomnia (difficulty initiating sleep, problems with maintaining sleep, or early awakening)
- hypersomnia (excessive sleepiness, usually daytime or inappropriate times)
- parasomnias (unusual behaviors during sleep)
- nocturnal movement disorders (restless legs and nocturnal myoclonus)

Obviously, these categories also overlap and may change as more is known about the individual patient's difficulty. For example, any cause of disturbance in sleep may ultimately lead to excessive daytime sleepiness (for example, painful joints or difficulty breathing).

#### **1. Insomnia**

Insomnia can be simply defined as difficulty falling asleep, remaining asleep, or the belief that one is not getting enough sleep. Insomnia is the most frequently reported sleep complaint. Insomnia is a symptom, not a disease. It can be classified according to the part of the sleep cycle most affected; that is: sleep initiation, sleep maintenance (frequent awakenings), or early awakening (terminal insomnia). Classifying insomnia in this way may give clues to the underlying cause. The success of various treatments also depends upon the part of the sleep cycle is most affected. Numerous underlying pharmacological, medical, and psychological factors may result in insomnia. Most causes of insomnia can be diagnosed and managed by primary care physicians.

#### **Pharmacologic causes of insomnia**

A variety of drugs can make falling asleep difficult, while many others, such as diuretics, may lead to nocturnal awakening. Drug pharmacokinetics are influenced by physiologic changes of aging. Drug absorption, metabolism, and elimination can be altered in the elderly. Prescription and non-prescription drug use is highest in the elderly, therefore, careful review of all medications including over-the-counter (OTC) and caffeine-containing items is recommended.

Methylxanthines (caffeine and theophylline), sympathomimetics (pseudephedrine), alcohol, corticosteroids, thyroxine, neuroleptics, and certain antidepressant medications (particularly selective serotonin reuptake inhibitors such as fluoxetine, sertraline and venlafaxine) may all cause insomnia in the elderly. Patients may be unaware that caffeine is in food items such as chocolate or in OTC preparations like cold, allergy and headache remedies. In addition, other medications such as antihistamines and benzodiazepines, often used to induce sleep, may paradoxically

cause agitation and insomnia in some elderly patients. These sleeping-aids, because of significant hang-over effect, can lead to an increase in daytime sleepiness and disrupt the normal sleeping pattern. Alcohol is commonly used to initiate sleep. This is often counterproductive, however, in that subsequent sleep is usually fragmented and nonrestorative. Drug withdrawal should also be considered as a possible cause of insomnia, particularly withdrawal from alcohol, benzodiazepines, neuroleptics or beta-blockers.

### **Medical causes of insomnia**

Any chronic medical problem which causes pain or discomfort, difficulty breathing, frequent urination or defecation, or causes anxiety or an increased level of arousal may make falling asleep difficult or result in frequent episodes of nocturnal awakening. In the elderly population, prostatism, degenerative joint disease, bursitis, and gastroesophageal reflux are common causes of frequent awakening episodes, along with congestive heart failure, coronary artery disease, and chronic obstructive pulmonary disease. Some conditions, such as obstructive sleep apnea, may cause frequent awakening episodes, yet the duration of wakefulness is often so brief that patients with these conditions may be completely unaware of having been awakened during the night. Medications that are frequently used to treat chronic medical conditions can lead to insomnia. The timing of medication administration may also be important (e.g. diuretic use in the evening).

### **Psychological/Psychiatric factors**

Psychological stress occurs at every age, however several stresses are either unique to or more prevalent in the elderly. Retirement and the loss of personal identity, disruption of daily routines, death of a spouse, family members, and friends, changes in social circumstances, financial concerns, a perception of poor health, and the psychological effects of chronic or terminal illness involving the patient or loved ones can all affect sleep.

The most important psychiatric problems associated with insomnia in the elderly are anxiety, depression, and dementia. Anxiety and associated disorders often result in difficulty falling asleep and frequent nocturnal awakenings. Depression is usually associated with terminal insomnia or early morning awakening, but may also cause hypersomnia. Some depressed patients experience agitation as well, which can make falling asleep difficult. Because of the strong association between depression and sleep difficulties, physicians should consider underlying depression in every case where insomnia is of recent onset.

Patients with dementia often experience a disrupted and sometimes polycyclic sleep-wake cycle. Nocturnal awakening episodes may be quite common and are associated with wandering. These dementia-related sleep disturbances are in most instances more problematic for the caregivers than the patients themselves and often resulting in nursing home placement (Pollack). In the nursing home setting, problems occur when the patient's sleep-wake cycle does not correspond to the regimented schedule of the facility. The result may be frequent phone calls to physicians, requests for neuroleptic or sedative drugs, or attempts to remove the resident from the facility.

## **Behavior/Environmental factors**

Poor sleep hygiene (a form of learned insomnia) can be factors in the conversion of acute insomnia problems into chronic insomnia. Patients with this problem frequently spend too much time in bed awake and become sleepers with late or highly variable wake up times. These individuals frequently make a significant effort trying to fall asleep. This pattern becomes habitual and eventually may lead to the use of alcohol or medication as sleeping aids.

## **2. Hypersomnia**

Hypersomnia (or disorders of excessive somnolence) can be defined simply as excessive sleepiness during a time when one should be awake. This problem is most often a result of poor sleep at night, even though some patients may believe that they are sleeping well. Anything that causes nocturnal awakening and sleep fragmentation (such as sleep apnea) or affects the quality of sleep at night can result in excessive daytime sleepiness. In addition, other conditions such as myxedema (severe hypothyroidism), hypoxia or hypercapnia may lead to excessive sleepiness.

Hypnotic medications such as antihistamines and benzodiazepines may alter the quality of sleep, or may have a hangover effect during the day, leading to excessive sleepiness. Numerous other medications such as narcotic analgesics, antispasmodics, central alpha-agonists, tricyclic antidepressants, and antihistamines taken during the day may have sleepiness as a side-effect. Barbiturates can disrupt the sleep architecture and make sleep less restful. One should ask specifically about over the counter agents and home remedies which may contain drugs affecting sleep. Patients may not automatically volunteer such information, or may not recognize their role in sleep complaints.

## **Sleep apnea**

Sleep apnea is more common in the elderly than any other age group, and is an important cause of hypersomnia. Sleep apnea is characterized by loud snoring with transient, brief, intermittent breathing cessation lasting greater than ten seconds. These apneic episodes often occur more frequently when lying supine, as soft tissues in the posterior pharynx may occlude the upper airway. Excessive daytime sleepiness, depression, headaches, memory loss and cognitive impairment can result. Sleep apnea is important to diagnose since it can usually be treated effectively, yet if left untreated, can result in serious morbidity from pulmonary hypertension and right-sided heart failure. Sleep apnea is also associated with an increased risk of death.

## **3. Parasomnias**

Parasomnias are strange or unusual behaviors which occur during sleep. In addition to restless leg syndrome and nocturnal myoclonus, parasomnia syndromes experienced by the elderly include nightmares, sleep talking, sleepwalking, REM sleep behavior disorder, and nocturnal confusion. Some of these conditions can be extremely frightening or disturbing, while others may not even be noticed by the patient, yet cause considerable distress and disturbed sleep for the bedpartner. Parasomnias are often caused or aggravated by medications. For example, beta-blockers are well known to cause nightmares in some patients while caffeine and alcohol may exacerbate nocturnal myoclonus.

## **4. Nocturnal Movement Disorders**

### **Restless Legs Syndrome**

Restless leg syndrome (RLS) is a relatively common problem in the elderly. Prevalence rates range from 5-15 percent. RLS is characterized by an irresistible urge to move the lower extremities. Patients often describe a great discomfort or creeping sensation occurring deep within the legs. This discomfort can be so severe that patients must get up and walk around for relief. Moving the legs however, gives only transient relief. As a result, patients may have difficulty falling asleep or suffer from frequent awakenings. Unfortunately, sleepiness and bedrest can exacerbate the symptoms of RLS.

The pathogenesis of RLS is unknown. A correlation between iron deficiency and RLS was first 35 years ago. More recent studies have revealed interest in this association. It has been suggested that RLS results from a central nervous system neurotransmitter deficit, as evidenced by the fact that the symptoms may respond to a number of centrally acting agents such as benzodiazepines, L-dopa and opioids. An abnormality of the peripheral nervous system has also been proposed. RLS is associated with peripheral axonal neuropathy. It has been further suggested that the two main components of RLS symptoms, sensory dysesthesias and muscular movement may be separate and independent components of a proposed common neuronal pathway dysfunction.

### **Nocturnal myoclonus**

Nocturnal myoclonus is one of several periodic limb movement disorders which, like the potentially related restless leg syndrome, is most prevalent in the elderly. Prevalence rates range up to 45 percent. Even though the prevalence increases with age, the disease may be stable (i.e. nonprogressive) in any given individual patient. This condition is characterized by sudden repetitive kicking or jerking movements of the lower extremities, occurring every 20 to 40 seconds throughout the night although the intensity of the movements can vary significantly from night to night. These sudden kicks may be quite powerful and can potentially awaken or even injure the bed partner. Like RLS, the cause of nocturnal myoclonus is as yet unknown. Dopamine depletion in the CNS may play a role in the pathogenesis.

## **Diagnostic Approach**

### **Taking a sleep history**

While it may seem obvious, when patients complain of difficulty sleeping, the clinician's first task is to decide if the patient does indeed have a sleep-related problem. If so, it is important to determine how long the symptoms have been present, as this may give a clue to the pathogenesis or relation to recent medication use. The sleep problem should then be classified into one of the four categories listed earlier, in order to assist in determining the underlying causes, and to determine the most appropriate treatment.

The following screening questions can usually determine whether or not a sleep disorder is present.

Is the patient satisfied with their sleep? (Is it restorative?)

Does sleep or fatigue intrude into their daily activities?

Does the bed partner or caregiver report any unusual behavior during sleep? (i.e. snoring, breathing pauses, abnormal movements)

If the response to any of the above questions suggest a sleep problem, the next step is to learn more about how the patient sleeps, and how they think they should sleep. It is helpful to determine the amount of time the patient sleeps within a 24 hour period including the amount of time spent napping during the day. It is useful to obtain the sleep history from as many sources as possible, as some symptoms may be more accurately reported by the bed partner or caregiver. A sleep log or diary may be very helpful in some instances, particularly if the history is not clear or if there are inconsistencies.

One should inquire about all prescription and OTC medications the patient is taking and how long they have been taking them. It is also important to ask what if any drugs the patient takes to help them sleep, and the amount and timing of caffeine and alcohol ingestion. The amounts of caffeine contained in various beverages and products can be helpful information.

Additional questions should be directed at eliciting symptoms of anxiety or depression, whether psychological stress is present, and whether any major life events or losses have occurred recently. A log or estimate of how the patient spends their day and the amount of physical activity they undertake can be useful. Elements of the past medical history which may be important include a history of painful musculoskeletal conditions, urologic problems, cardiopulmonary disease, thyroid dysfunction, psychiatric diagnoses, neurological disorders, cognitive impairment, substance abuse, upper airway pathology, and prior sleep difficulty.

### **Physical examination**

Findings on physical examination may substantiate the diagnosis of a sleep problem that is suspected on the basis of the history, but will seldom lead to the diagnosis of a sleep disorder that was otherwise unsuspected. The physical examination should therefore be limited in scope and guided by the medical history. If dementia is suspected, a mini-mental state examination should be performed. If sleep apnea is suspected, a careful cardiopulmonary and upper airway exam should be performed. Symptoms of restless legs or nocturnal myoclonus warrant at least a screening neurologic exam, and careful musculoskeletal examination may be worthwhile if the patient has symptoms of pain.

### **Laboratory Testing**

Laboratory evaluation, like the physical examination, should be guided by symptoms and presumptive diagnoses. The laboratory should be used only to confirm diagnoses that are clinically suspected, or to assess the necessity or appropriateness of treatment. Patients suspected of having sleep apnea should have overnight oximetry performed. This can be done at home. More detailed overnight sleep analyses can be performed at the discretion of the sleep specialist.

### **When to refer to specialist**

Referral to a physician specializing in sleep disorders is warranted:

If the diagnosis is not clear and a formal sleep study is desired  
If symptoms are refractory to empiric treatment  
If sleep apnea is present or strongly suspected  
If a nocturnal seizure disorder is suspected, or  
Periodic limb movement disorders or other parasomnias are suspected.

A formal sleep study typically involves overnight polysomnography. This consists of direct observation of the patient while asleep, continuous EEG monitoring, recording of eye movements, muscle or body movement, monitoring respiratory function, nasal and oral air flow, and blood oxygen saturation, and allows for documentation of the true sleep disorder present.

## **Treatment (Pharmacologic and Nonpharmacologic interventions)**

### **Treatment of sleep disorders has two goals**

To improve the quality of life for the patient and the family, and  
To decrease morbidity and mortality.

Other than sleep apnea, most other sleep disorders have not been shown to be associated with increased mortality, and therefore treatment is primarily aimed at improving the quality of life.

### **Treatment of insomnia**

The first step in treatment of insomnia, after a detailed patient interview and physical exam, is to identify and treat any underlying medical, psychological, or psychiatric problems. In many instances, this is all that is necessary to restore normal sleep. It is also helpful to review proper sleep hygiene with the patient.

## **Non-pharmacological treatments**

### **Sleep Hygiene**

Proper sleep hygiene consists of creating a quiet, peaceful, and relaxed environment for sleep. Since sleep is at least partly regulated by natural circadian rhythms, being consistent in one's habits and establishing a regular sleep pattern is of paramount importance. The bedroom should be a quiet, comfortable place. Patients should be instructed to avoid staying in bed for long periods of time. A regular bedtime should be established, however one should only retire to bed when feeling sleepy. Often, reading or watching television before bedtime may lead to drowsiness and allow one to fall asleep naturally. A bedroom clock is sometimes best avoided. If a morning alarm is needed, it can be placed underneath the bed. Exercising 3 to 6 hours before bedtime, taking a hot bath or eating a light snack before bedtime may also be useful. Caffeine, alcohol, and tobacco should be avoided, especially after noon.

### **Other Nonpharmacologic therapies**

Individuals who are prone to worry in bed should try to deal with their worries before retiring for the night. Behavioral interventions such as relaxation training, stress management, and sleep restriction techniques may be useful for these patients, as well as for others who have difficulty initiating sleep. Because of the tremendous potential for adverse drug reactions in the elderly, most of whom are already taking multiple medications, pharmacologic treatment of insomnia should only be

considered as a last resort after every effort at non-pharmacologic therapy has been made. Even when medications are used, non-pharmacologic therapies can help keep the dose and duration of drug therapy to a minimum.

Cognitively impaired patients may not be able to comprehend or cooperate with some behavioral therapies, however they may benefit from structured activities and exercise during the day. However, one should avoid making demented patients too tired from exercise since this may not improve sleep to the degree expected.

### **Pharmacologic treatments**

Medications are frequently prescribed to treat insomnia, often without a clear understanding of the underlying cause. Pharmacologic treatment of insomnia should generally be thought of as a temporary solution, at best. The chronic use of sedative and hypnotic drugs may actually worsen insomnia, and is fraught with hazards in the elderly. In general, when prescribing drugs for elderly patients, drugs with short half-lives are preferred, used in the lowest dose possible. Several classes of drugs used to treat insomnia.

### **Benzodiazepines**

Benzodiazepines can be classified according to their duration of action as being either long, intermediate, or short acting. Long acting agents such as flurazepam and diazepam can have a half-life of over 100 hours in elderly patients, greatly increasing their potential for adverse effects, particularly when taken daily. Daytime sedation and cognitive impairment, in addition to paradoxical agitation in elderly patients are of particular concern. Short acting agents such as triazolam and lorazepam are preferred, however hangover effects are still quite possible, as well as impaired cognition, daytime anxiety, rebound insomnia, and early morning insomnia. The potential for for adverse drug effects, abuse, dependency, withdrawal symptoms, and the development of tolerance to benzodiazepines cannot be overstated.

Benzodiazepines have been associated with an increased risk of falls and hip fractures in elderly patients Short-acting benzodiazepines may be useful for the temporary treatment of insomnia in elderly patients with anxiety. In addition they are sometimes used for the treatment of restless leg syndrome and nocturnal myoclonus. Recently implemented federal legislation restricts the use of benzodiazepines in nursing home patients. The use of benzodiazepines should be avoided in patients with sleep apnea.

### **Antihistamines**

Antihistamines, such as diphenhydramine are frequently used as hypnotics, and are available without a prescription. Several over-the-counter preparations are marketed specifically for this purpose. Nevertheless, antihistamines may have a number of untold effects in the elderly such as confusion, agitation, orthostatic hypotension, arrhythmias, and urinary retention. They can also affect the quality of sleep, making it less restful. In addition, hangover effects may result in daytime sleepiness. Antihistamines are not preferred agents in the elderly.

### **Antidepressants**

Most tricyclic antidepressants are sedating, and therefore potentially useful as hypnotics. They also may treat underlying depression, if present. Several agents,

such as amitriptyline have potent anti-cholinergic side effects such as constipation, orthostatic hypotension, urinary retention, and confusion. In addition, these drugs can adversely affect cardiac conduction system, and must therefore be used with caution in patients with known conduction system disease. There is some evidence of an increase in the risk of falls and hip fracture in nursing home patients receiving tricyclic antidepressants. Desipramine and nortriptyline have relatively few anticholinergic side effects and are therefore the preferred agents in this class for treating insomnia associated with other symptoms of depression in the elderly. Trazadone has minimal anticholinergic side effects but orthostasis can still be a problem. Sedation occurs at doses much lower than those needed to control depression. Consequently, it is frequently used at doses of 25 to 50 milligrams at bedtime as a hypnotic agent. Because of its relatively few side effects and the relatively low potential for abuse, it may be the preferred hypnotic agent for elderly patients who are not depressed.

### **Other sedatives**

Barbiturates are not recommended for use in the elderly because of their potential for abuse, tolerance, and toxicity. These agents also interact in potentially hazardous ways with many other drugs. Chloral hydrate is a trichloroacetaldehyde which is metabolized to trichloroethanol, a potent hypnotic. Chloral hydrate has several important side-effects including significant GI irritation, can interact with protein bound drugs such as warfarin and phenytoin, and has a significant sedating interaction with alcohol (the Mickey Finn or knockout drops). Chloral hydrate can also cause significant hang-over effects. The usual starting dose is 500 mg at bedtime.

### **Sleep apnea**

When sleep apnea is associated with obesity or recent weight gain, weight loss may be beneficial. Alcoholic beverages and other sedatives should be avoided in all patients with sleep apnea. In mild cases, when apneic episodes occur primarily in the supine position patients can be instructed to sleep on their side. A tennis ball or similar object can be sewn into the back of their pajamas making it uncomfortable for them to sleep on their back. Nasally applied, continuous positive airway pressure (nasal C-PAP) is a well tolerated, portable treatment that has quickly become the treatment of choice for patients with moderate to severe sleep apnea. Patients with prominent soft tissues in the oropharynx, symptoms of nasal obstruction, or history of nasal pathology may benefit from ENT consultation for possible surgical intervention.

### **Nocturnal movement disorders**

Treatment of RLS and nocturnal myoclonus are similar in nature, and often frustrating. In mild cases, the initial approach is non-pharmacologic. A program of regular physical activity and stretching exercises, coupled with avoidance of caffeine is a first step. When these efforts fail, medications with effects on the nervous system are used. Quinine sulfates have been used empirically for many years, however a recent randomized, double-blind placebo controlled trial found quinine to be mostly ineffective. Benzodiazepines, particularly clonazepam, have also been used. clonazepam has a prolonged half-life in the elderly. Consequently, daily dosing may result in drug accumulation and increased toxicity. Intermediate half-life benzodiazepines such as lorazepam are therefore preferred. Sinemet is also frequently used, and is the preferred agent for initial drug treatment in the elderly,

because of its safety and relatively few side effects. A single dose containing 25mg carbidopa and 100mg levodopa, taken up to one hour before bedtime, may be beneficial in mild cases. Opioids such as oxycodone and propoxyphene are effective but because of their side-effects and potential for tolerance and addiction, should be reserved for severe cases refractory to other treatments or for short-term use.

## **Classification of Sleep Disorders**

### **Insomnia**

difficulty initiating sleep  
difficulty with sleep maintenance  
early awakening

### **Hypersomnia**

Obstructive sleep apnea  
Central sleep apnea  
Narcolepsy  
Medication effects  
recent viral infection

### **Sleep/wake cycle disturbances**

irregular sleep-wake pattern  
delayed sleep phase syndrome  
advanced sleep phase syndrome

### **Parasomnias**

nocturnal leg movements  
disorders of arousal  
sleep-wake transition disorders  
REM sleep behavior disorders

## **Common Causes of Insomnia**

### **Medications**

Non-prescription medications/drugs (alcohol, caffeine, decongestants, nicotine, antihistamines, stimulants)  
prescription medications-primary and secondary effects (stimulants, rebound from sedatives, sympathomimetics, diuretics, corticosteroids, thyroxine, theophylline, several anti-depressants, others)

### **Medical**

pain (arthritis, bursitis, parasthesia, myalgias, fibrositis)  
gastric (GERD, peptic ulcers)  
respiratory (asthma, COPD, sleep apnea, intrinsic pulmonary disease, hypoxia)  
urologic (prostatism, urologic dysfunction)  
nocturnal myoclonus (restless legs syndrome, periodic limb movement disorder)

### **Psychological/Psychiatric**

situational stresses  
anxiety disorders

depression  
dementia/cognitive disorders

### **Behavior/environment**

poor sleep hygiene/environment  
disrupted routines/rituals  
psychosocial changes

### **Sleep/wake cycle disorders**

jet lag  
delayed sleep phase syndrome  
advanced sleep phase syndrome  
fragmented sleep patterns  
dementia  
sensory impairments such as decreased vision

### **Useful questions to ask as part of a sleep history**

#### **History of sleep patterns**

What is the past history of sleep problems and patterns?  
When did the current sleep problem start?  
How much do you sleep in a 24 hour period?  
How much sleep do you consider normal?  
When do you usually sleep? sleep best?  
When do you sleep now?  
What time do you retire and why?  
What time do you awaken?  
Do you awaken frequently during the night , if so what wakes you up?  
How do you feel when you wake up?  
Do you experience fatigue or sleepiness occurs during the day?  
How many naps do you take? How long do you nap?  
What is different about the sleep pattern now compared to past?  
When was the last time that you had a good night's sleep?  
What do you think the cause of your insomnia is?  
Has anyone said that you snore, have episodes in which you stop breathing?  
Has anyone said you display abnormal movements such as kicking or jerking?  
Has anyone said you talk or walk in your sleep?  
Do you ever fall asleep during the daytime, while driving, during meetings, during conversations, or watching TV?  
Do you feel depressed or anxious?

#### **Medication use**

What medication (prescription and non-prescription) do you use and for what reason?  
Do you use any alternative medicine treatments/medicines and why?  
When do you take your medications?  
Do you use medications/sleeping aids to fall asleep and if for how long?

#### **Behavior patterns/Sleep environment**

How much total time do you stay in bed?

What time do you get out of bed and why?  
How long does it take to fall sleep?  
What do you do when you can't sleep?  
How much time do you spend napping during the day?  
What are your patterns of exercise, eating (and what types of food, beverages), alcohol use, nicotine use?  
Do you have problems with anxiety, worrying, unable to relax or calm down at night?  
Do you have a bedtime routine?  
What is your bedroom environment like? Noise? Light? Bedding?

### **Amount of Caffeine in various products**

#### **Food items Caffeine (mg)**

Coffee (6-ounce cup) 60-100

Tea (6 ounce cup) 30-35

#### **Soft drinks**

Colas, Dr.Pepper (12 ounces) 35-50

Mellow Yellow (12 ounces) 54

Mountain Dew (12 ounces) 54

Cocoa (6 ounce cup) 4

Chocolate milk (8 ounces) 8

Chocolate (1 ounce) 8 to 25

#### **Medications**

Anacin 32

Excedrin 65

### **General Treatment Approach for Insomnia**

Detailed patient history, physical exam, reviews of past medical history, medications, and systems

### **Treat underlying medical/psychiatric disorders**

#### **Non-pharmacologic therapies**

sleep hygiene evaluation

sleep environment evaluation

stress management strategies

increase daytime stimulation/lighting

decrease nocturnal stimulation

relaxation techniques

sleep restriction

avoidance of drug-induced stimulation (caffeine, alcohol, etc)

#### **Preferred pharmacologic therapies**

Benzodiazepines: use of short/intermediate half-life agents for short periods of time (several weeks at most)

tricyclic antidepressants: for patients with symptoms of depression

trazodone: useful in the elderly in low doses

### **Referral to sleep disorders specialists**

## **Sleep Hygiene Suggestions**

Go to bed only when tired or sleepy.

Establish a consistent bedtime routine.

Avoid foods, beverages, medications which may contain stimulants.

Exercise midday or early afternoon.

Avoid naps in late afternoon, evening times.

Eat lightly before retiring, limit fluid intake.

Avoid alcohol, nicotine before retiring.

Use the bed only for sleep and intimacy.

Avoid emotional or mental stimulation before bed which may lead to anxiety, worry, and being unable to relax the mind.

Use behavioral/relaxation techniques which will assist with physical and mental relaxation.

Establish a good sleep environment which will limit distractions.

If sensory impaired, provide adequate light and stimulation during the daytime hours to establish proper sleep/night cycles.

## **Comparisons of commonly used drugs**

Agent Dosage Potential problems

### **Benzodiazepines/hypnotics**

#### **1. Short Half-life**

Triazolam (Halcion) 0.125-0.25 mg rebound insomnia, daytime anxiety, memory difficulties, early awakenings, tolerance/dependency

#### **2. Intermediate half-life**

Estazolam (ProSom) 1-2 mg tolerance, CNS stimulation, CNS potentiation with other sedatives, hang-over effects, confusion/anxiety, memory loss, dependence/abuse, depression, falls/incoordination

Temazepam (Restoril) 7.5-15 mg

Oxazepam (Serax) 10-15 mg

Lorazepam (Ativan) 0.5-1.0 mg

Alprazolam (Xanax) 0.25-0.5 mg

Imidazopyridines

Zolpidem tartrate (Ambien) 5 - 10 mg hang-over effects, memory difficulties, dizziness, diarrhea

Antihistamines

Diphenhydramine (Benadryl) 25 - 50 mg anticholinergic effects, gastritis, daytime somnolence, tremors/convulsions, CNS potentiation with other sedatives

Hydroxyzine (Atarax, Vistaril) 25 - 50 mg

Doxylamine (Unisom) 25 mg

Antidepressants

Tricyclics

Amitriptyline (Elavil, Endep) 10-25 mg anticholinergic effects, CNS stimulation, cardiac arrhythmias, extrapyramidal effects, hypo/hypertension, fatigue, nausea, blood dyscrasias, headache, blood glucose changes, photosensitivity

Doxepin (Adapin, Sinequan) 10-25 mg

Imipramine (Tofranil) 10-25 mg

Nortriptyline (Pamelor) 10-25 mg

Desipramine (Norpramin) 10-25 mg

Triazolopyridine

Trazodone (Desyrel) 25-50 mg Cardiac arrhythmias, CNS stimulation, priapism, impotence, hypotension, nausea, fatigue, extrapyramidal symptoms, headache

**Other Agents**

Chloral hydrate 500 mg GI toxicity, severe interaction with other CNS sedatives, especially alcohol, significant hang-over effect, drug-drug interactions with protein-bound agents