The Epi-Pen permits easy, self-administration of a 0.3-mL subcutaneous dose of epinephrine into the lateral thigh. A new approach is the delivery of epinephrine via a metered-dose inhaler such as Primatene Mist. Ten to 20 puffs of inhaled epinephrine produces approximately the blood levels achieved by subcutaneous administration of 0.5 mL of 1:1,000 epinephrine, and more reliably produces blood levels in the therapeutic range. Inhalation is particularly helpful when throat angioedema is present.

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MANAGING SLEEP DISORDERS IN THE ELDERLY PATIENT

The image of Grandpa nodding off to sleep in his chair is a stereotype, but the condition is not normal. Some social and physiologic changes associated with aging may cause sleep disruption, but sleep apnea, nocturnal leg movements, esophageal reflux, and the use of hypnotics and other medications also can contribute to daytime sleepiness in the elderly and should be considered in a diagnostic evaluation.

Sleep is an active physiologic process. Specific electroencephalographic (EEG) criteria are used to distinguish rapid eye movement (REM) from non-REM sleep; the latter ranges from stage 1, or light sleep, to stage 3 and 4 (deeper, delta sleep). Normally, there is cyclic alternation between non-REM and REM sleep, with REM sleep accounting for 20% to 25% of total sleep time.

As we age, there is little change in total sleep time, but sleep is less efficient. We spend more time in bed, but it takes longer to fall asleep (sleep latency), there is less deep sleep, and awakenings are more frequent.

DIAGNOSTIC VALUE OF HISTORY

In most instances of sleep complaints, a careful history that includes the bed partner or caregiver can provide enough information to make a diagnosis and start treatment—for example, whether the patient takes too long to fall asleep, has frequent awakenings, awakens too early in the morning or has excessive daytime sleepiness; whether he or she retires and gets up at regular times; whether there are disruptions during the night such as noise, needing to use the bathroom, or awakening because of pain; whether the patient uses medication or alcohol; whether the patient eats, exercises, or watches TV before going to bed; and whether there are life stresses, such as marital discord or a death in the family. The bed partner also may provide information about snoring, which suggests possible sleep apnea, and nocturnal leg movements, which the patient may be unaware of.

A careful drug history is important, and should include queries about alcohol, caffeine, and over-the-counter preparations. Among the medications that can interfere with sleep are steroids, adrenergic agonists, diuretics, and theophylline.

Certain age-related physiological changes can interfere with normal sleep, such as decreased bladder capacity, menopausal vasomotor activity, and discomfort or anxiety from heart disease or arthritis. Gastric reflux also is a common cause of sleep disturbance in elderly patients.

Restless leg syndrome (the "creeping" sensation that makes it impossible not to keep moving) and periodic leg movements during sleep (nocturnal myoclonus) occur more frequently among the elderly. They prolong sleep latency, cause increased sleep fragmentation, and decrease deep sleep. Some patients complain of insomnia, others of excessive daytime sleepiness.

SLEEP HYGIENE, DRUG THERAPY

Behavioral approaches to sleep disturbance are helpful, and should be attempted before resorting to therapy with hypnotic drugs. The patient should be educated to retire and, more importantly, to get up at the same time every day, including weekends. Individuals who have sleep problems should avoid caffeine after breakfast and avoid all alcohol. Regular physical exercise is helpful, but not at bedtime. The bedroom should be used only for sleeping, not for paperwork or watching television.

Weight loss, avoidance of sleep medications and nighttime alcohol, and changes in sleeping position to

avoid sleeping on one's back may help to relieve mild sleep apnea. A nasal mask with continuous positive airway pressure (CPAP) can relieve moderate to severe sleep apnea. Invasive procedures may be needed for severe sleep apnea.

Opioids are effective but addicting for patients with restless leg syndrome and nocturnal myoclonus. A double-blind trial showed that L-dopa combined with a dopa decarboxylase inhibitor decreased daytime sleepiness, nocturnal leg movements, and sleep latency, and produced subjective improvement in sleep. Clonazepam does not decrease the frequency of leg movements, but when they do occur, they are less likely to cause awakening.

Hypnotics are prescribed more frequently for the elderly than for the general population. The incidence of side effects with hypnotic therapy is higher among the elderly; for that reason, sleep hygiene should be stressed before turning to hypnotic therapy for relief.

Contraindications to hypnotic use include sleep apnea or heavy snoring, alcohol abuse, and a need for nighttime alertness, such as trips to the bathroom. Advanced age and increasing frailty is a relative contraindication.

Among the benzodiazepines frequently used, temazepam has an intermediate half-life of 8 to 12 hours; triazolam is the shortest acting, with a 3- to 4-hour half-life. Flurazepam with its active metabolites have half-lives up to 300 hours and are best avoided in elderly patients.

L-tryptophan, which is available over-the-counter, has been shown in several studies to be effective at dosages varying from 1 to 15 g at bedtime. Chronic insomnia may not respond immediately but, at a relatively low dose, sleep is likely to improve after a week or so. Even with high doses, there are few side effects. Impairment of mental function has not been reported, nor has tolerance, interference with normal sleep stages, or hangover.

Antidepressants can be helpful for patients who have fibrositis or depression, but the anticholinergic effect of tricyclics can cause problems with mental function in elderly patients.

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