



# Introduction to Sleep Medicine

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PROFESSOR OF MEDICINE

# Sleep Disorders

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Sleep disorders are amongst the most common medical complaints in our society.

- 35% of adults reports insomnia within the previous year with half perceiving the problem as serious
- 38% of adults report feeling excessively sleepy at least several days per month with 6% feeling sleepy daily.

# Sleep Disorders

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Sleep disorders can last just a few nights, causing only a minor inconvenience, or become a pervasive illness affecting all aspects of a person's life.

# Insomnias

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Chronic insomnia disorder

Short-term insomnia disorder

# Sleep Related Breathing Disorders

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## Central Sleep Apnea Syndromes

- Primary central sleep apnea
- Central sleep apnea due to Cheyne Stokes breathing pattern

## Obstructive Sleep Apnea Syndromes

- Obstructive sleep apnea, adult
- Obstructive sleep apnea, pediatric

# Central Disorders of Hypersomnolence

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Narcolepsy Type 1

Narcolepsy Type 2

Idiopathic hypersomnia

Kleine-Levin syndrome

Insufficient sleep time

# Circadian Rhythm Disorders

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Delayed sleep phase type

Advanced sleep phase type

Irregular sleep-wake type

Free-running type

Jet lag type

Shift work type

# Parasomnias

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## Disorders of Arousal (from NREM sleep)

- Confusional arousals
- Sleepwalking
- Sleep terrors
- Sleep related eating disorder

## Disorders Usually Associated with REM sleep

- REM sleep behavior disorder
- Recurrent isolated sleep paralysis
- Nightmare disorder



# Sleep Related Movement Disorders

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Restless leg syndrome

Periodic limb movement disorder

Sleep related leg cramps

Sleep related bruxism

Sleep related rhythmic movement disorder

# Screening for Sleep Disorders

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All patients should be asked the following:

- How many hours of sleep do you get at night?
- Do you have trouble falling asleep or staying asleep?
- Are you excessively sleepy during the daytime?
- Do you snore?

# The Sleep History

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## Snoring

- How loud?
- How bothersome?
- How frequent?

Witnessed apneas

Gaspings/choking

Sudden arousals

Restless sleep

Morning headaches

AM dry/sore throat

Changes in weight

Excessive daytime sleepiness

- Can do Epworth

**Consider using STOP-BANG**

1. <b>Snoring</b> Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?	Yes/No
2. <b>Tired</b> Do you often feel tired, fatigued, or sleepy during daytime?	Yes/No
3. <b>Observed apnea</b> Has anyone observed you stop breathing during your sleep?	Yes/No
4. <b>Blood pressure</b> Do you have or are you treated for high blood pressure?	Yes/No
5. <b>BMI more than 35 kg/m<sup>2</sup>?</b>	Yes/No
6. <b>Age</b> Age over 50 yr old?	Yes/No
7. <b>Neck circumference</b> Neck circumference greater than 40 cm?	Yes/No
8. <b>Gender</b> Gender male?	Yes/No
<b>High risk of OSA:</b> answering yes to three or more items <b>Low risk of OSA:</b> answering yes to fewer than three items	

# The Sleep History

## OSA

- Do you snore?
- Does your snoring or kicking prevent somebody from sleeping in the same bed with you?
- Do you wake up gasping or feeling you cannot breathe?
- Has your bed partner or other person ever told you that you stop breathing during sleep?
- Do you waken with a headache?
- Do you waken feeling refreshed?

## RLS

- Do you experience an urge to move your legs, usually accompanied by an uncomfortable feeling or unpleasant sensation?
- Do these symptoms begin or worsen when resting or inactive such as when sitting or lying down (in bed or recliner)?
- Is the restless feeling improved by moving your legs or walking?
- Is the restless feeling present primarily in the evening?
- Has your bed partner ever noticed leg movements while you were sleeping or complain that you kick him/her?
- Are your sheets messy in the morning?
- Do you toss and turn?

## EDS

- Do you have a problem with sleepiness while driving?
- Have you ever had an automobile accident related to sleepiness?
- Does sleepiness interfere with work or school?
- Have you ever had accidents at work related to sleepiness?

## Narcolepsy

- Do you ever find yourself somewhere and do not know how you got there?
- Do you have vivid dreams shortly after falling asleep at night?
- Do you ever feel that you cannot move just after having awakened?
- Do you ever feel sudden weakness in your limbs when laughing or emotional?

## Sleep Habits

Work Schedule:

Bedtime:

Sleep latency:

Sleep aids:

Awakenings:

Wake Time:

Naps:

Caffeine use:

# Insomnia

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Insomnia refers to a persistent difficulty in either initiating or maintaining sleep.

Insomnia can be both a

- Symptom of another primary condition interferes with sleep; or a
- Disease, in that there is no association with another disorder.

# Insomnia Prevalence

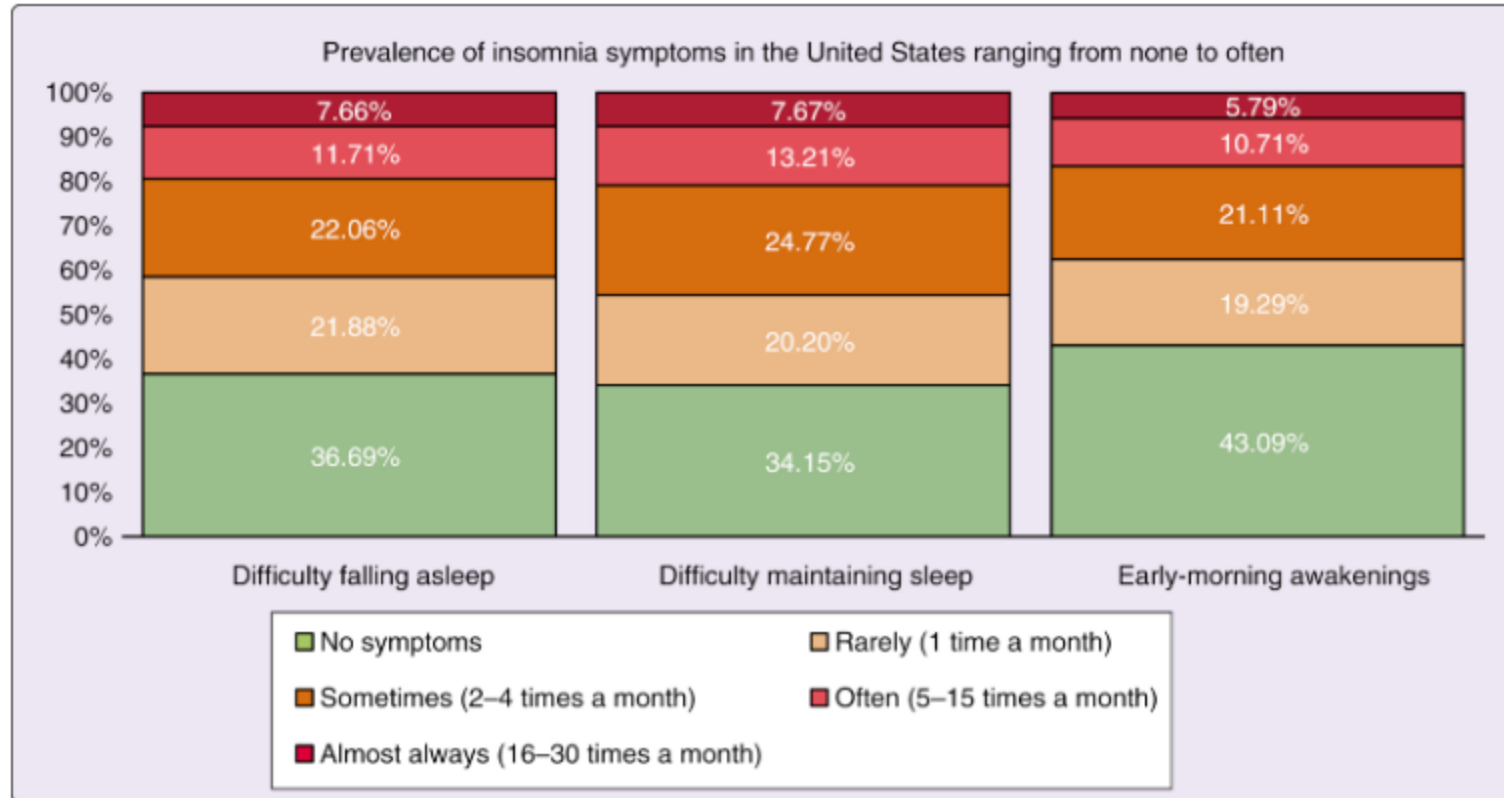


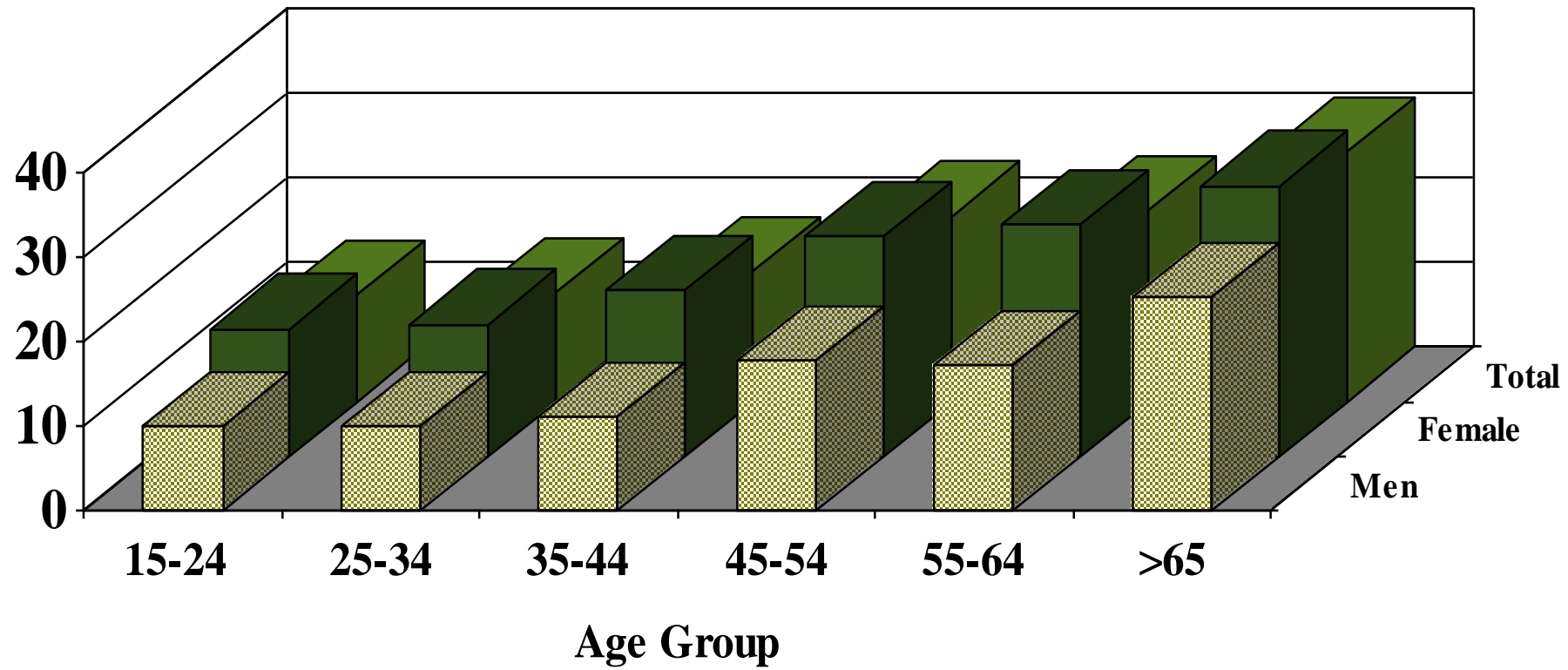
Figure 90.1

Prevalence of insomnia symptoms in the United States. Relative frequency of a number of symptoms of insomnia (difficulty initiating sleep, difficulty maintaining sleep, early-morning awakenings) in the US general population. Frequencies are based on nationally representative weighted estimates from the Centers for Disease Control and Prevention's 2007 to 2008 National Health and Nutrition Examination Survey (NHANES).



# Epidemiology

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# Insomnia and Other Disorders

Medical Problem	Prevalence of Medical Problem (%) <sup>a</sup>		Adjusted Odds Ratio <sup>b</sup> (95% CI)
	PWI	PNI	
Heart disease	21.9	9.5	2.27 (1.13–4.56) <sup>c</sup>
Cancer	8.8	4.2	2.58 (0.98–6.82)
Hypertension	43.1	18.7	3.18 (1.90–5.32) <sup>d</sup>
Neurologic disease	7.3	1.2	4.64 (1.37–15.67) <sup>c</sup>
Breathing problems	24.8	5.7	3.78 (1.73–8.27) <sup>e</sup>
Urinary problems	19.7	9.5	3.28 (1.67–6.43) <sup>e</sup>
Diabetes mellitus	13.1	5.0	View full size 3–4.16)
Chronic pain	50.4	18.2	3.19 (1.92–5.29) <sup>d</sup>
Gastrointestinal problems	33.6	9.2	3.33 (1.83–6.05) <sup>d</sup>
Any medical problem	86.1	48.4	5.17 (2.93–9.12) <sup>d</sup>

# Insomnia and Other Disorders

Medical Problem	Insomnia Prevalence (%) <sup>a</sup>		Adjusted Odds Ratio <sup>b</sup> (95% CI)
	PHM	PNM	
Heart disease	44.1	22.8	2.11 (1.07–4.15) <sup>c</sup>
Cancer	41.4	24.6	2.50 (1.01–6.21) <sup>c</sup>
Hypertension	44.0	19.3	3.19 (1.87–5.43) <sup>d</sup>
Neurologic disease	66.7	24.3	5.21 (1.22–22.21) <sup>c</sup>
Breathing problems	59.6	21.4	2.79 (1.27–6.14) <sup>c</sup>
Urinary problems	41.5	23.3	3.51 (1.82–6.79) <sup>d</sup>
Diabetes mellitus	47.4	23.8	2.03 (0.86–4.79)
Chronic pain	48.6	17.2	3.16 (1.90–5.27) <sup>d</sup>
Gastrointestinal problems	55.4	20.0	3.00 (1.66–5.43) <sup>d</sup>
Any medical problem	37.8	8.4	5.26 (2.82–9.80) <sup>c</sup>

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# Common Medical Causes

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Obstructive sleep apnea

Restless leg syndrome/periodic leg movement disorder

Circadian rhythm disorders

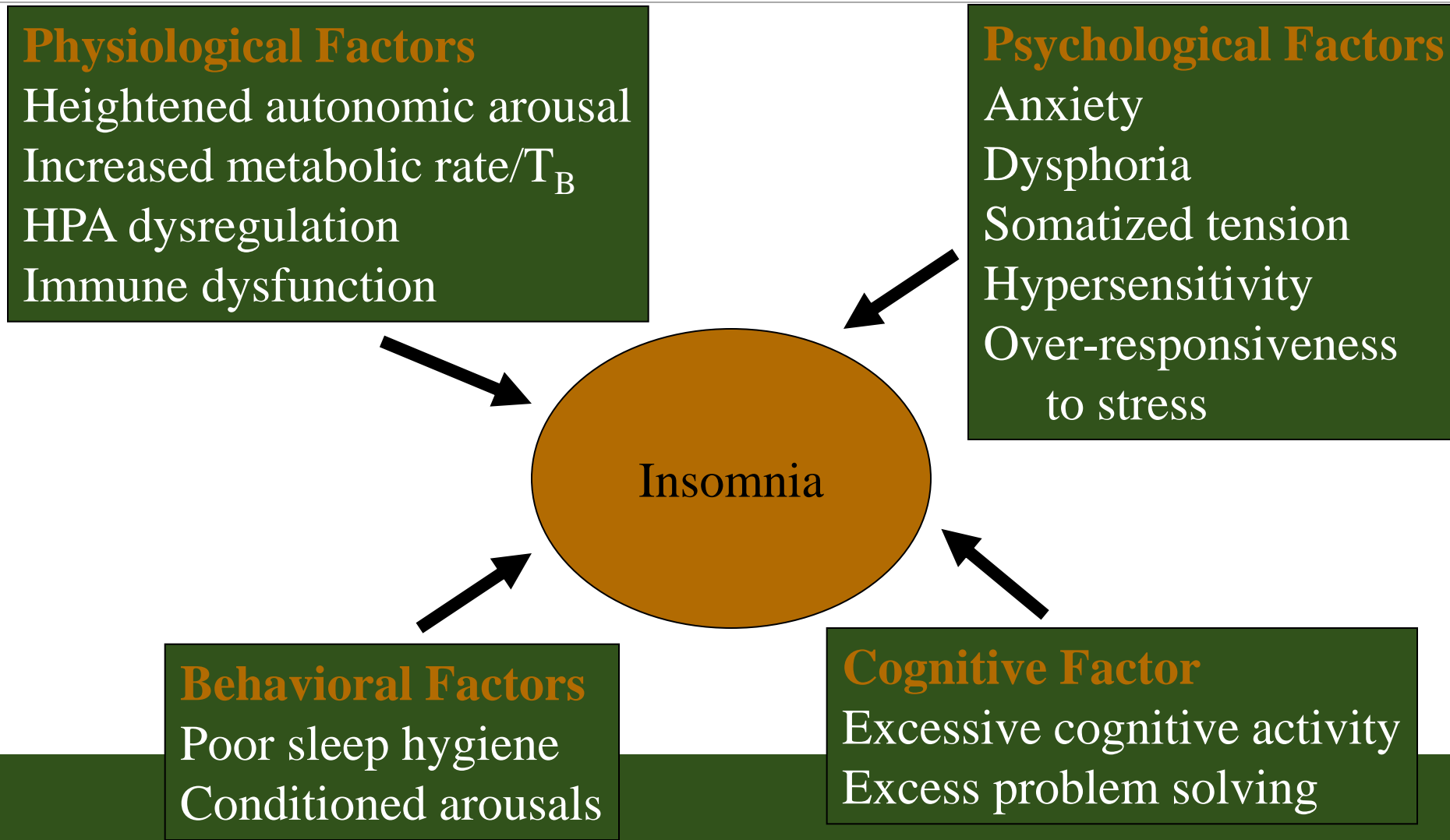
Chronic pain

Gastroesophageal reflux

Psychiatric illnesses, particularly mood and anxiety disorders

# Determinants of Insomnia

## Primary Insomnia



# Symptoms

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## NOCTURNAL COMPLAINTS

- Delayed sleep onset
- Early morning awakening
- Multiple, frequently prolonged, awakenings
- Insufficient sleep time

## DAYTIME COMPLAINTS

- Being unrefreshed in the morning or through the day
- Feeling fatigued or sleepy during the day
- Poor concentration or attention during the day
- Cannot nap

# Key Historical Details in Primary Insomnia

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- Sleepy until start bedtime routine
- Frequent racing thoughts once in bed
- Tries to force self asleep/feels tense in bed
- Worries about getting to sleep all day
- Sleeps better on couch or away from home

# Consequences

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Impairments in daytime function

Poor job/school performance

Impairments in interpersonal relationships

Impaired driving skills

Self-medication



# Treatment

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The best therapy for chronic insomnia is cognitive behavioral therapy

- Stimulus control
- Restriction therapy
- Relaxation therapy
- Cognitive therapy

Pharmacologic therapy can be helpful in short-term insomnia or in patients who failed CBT

# Excessive Daytime Sleepiness

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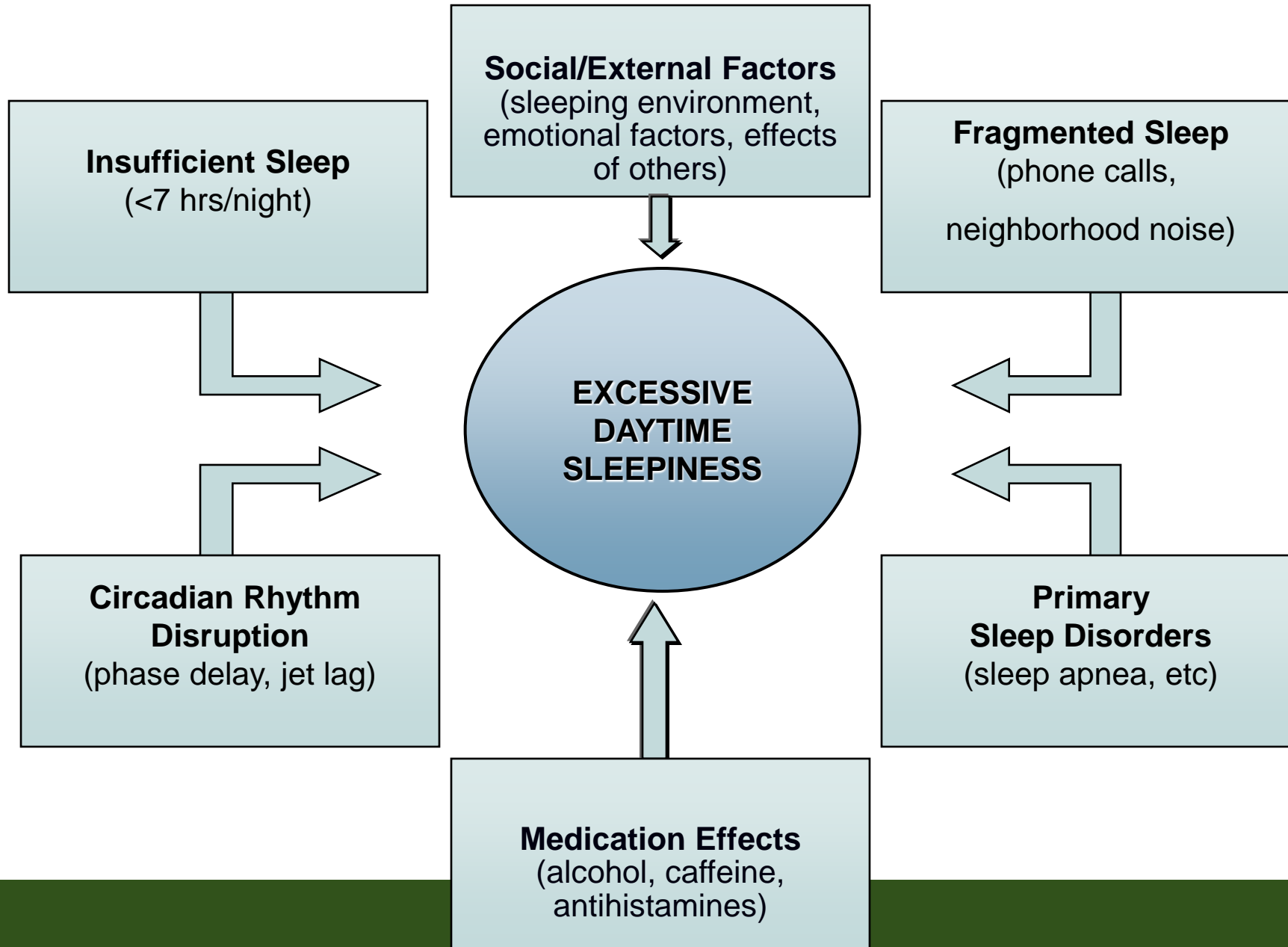
Sleepiness in mid-afternoon is normal. Therefore, sleepiness at other times of the day or during situations in which alertness is warranted (meetings, lectures, driving) is considered abnormal.

# Manifest v. Physiological Sleepiness

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- Physiological sleep tendency: tendency for sleep to occur in absence of alerting factors.
- Manifest sleep tendency: changes moment to moment depending upon host of factors including light, noise, motivation, hunger, recumbency.

# Excessive Daytime Sleepiness



# Medications and EDS

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Antihistamines

Sedative-hypnotics

Opioids

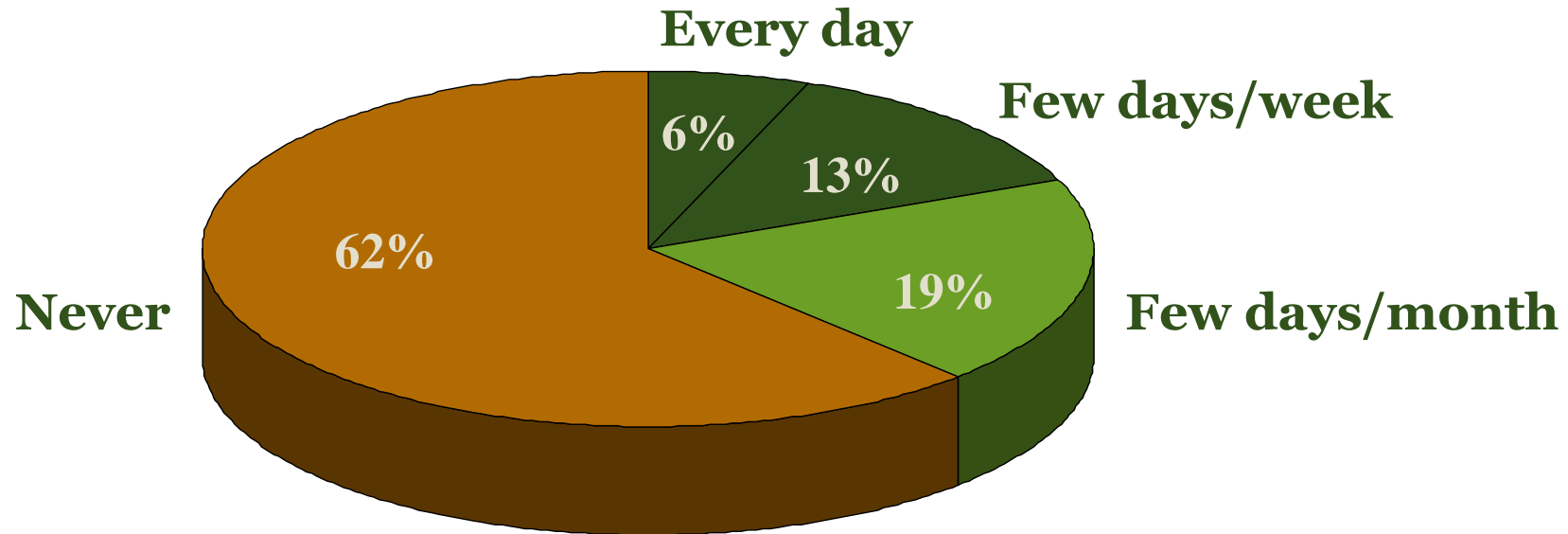
Anti-epileptics

Anti-depressants/anti-psychotics

# Prevalence

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How often do you have sleepiness that interferes with your daily activities?



# Consequences

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Problems with vigilance, cognitive function, memory/concentration, and mood are the major consequences of EDS.

These problems lead to deterioration in:

- School performance
- Job performance/productivity
- Social relationships/family life
- Driving skills

# Epworth Sleepiness Scale

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- The **Epworth Sleepiness Scale** (ESS) is a simple questionnaire designed to measure the general level of excessive daytime sleepiness or sleep propensity in adults.
- Intended to measure the EDS that persists from week to week or longer in a given subject, independent of changes in time of day and from day to day, similar to the MSLT.



# EPWORTH SLEEPINESS SCALE

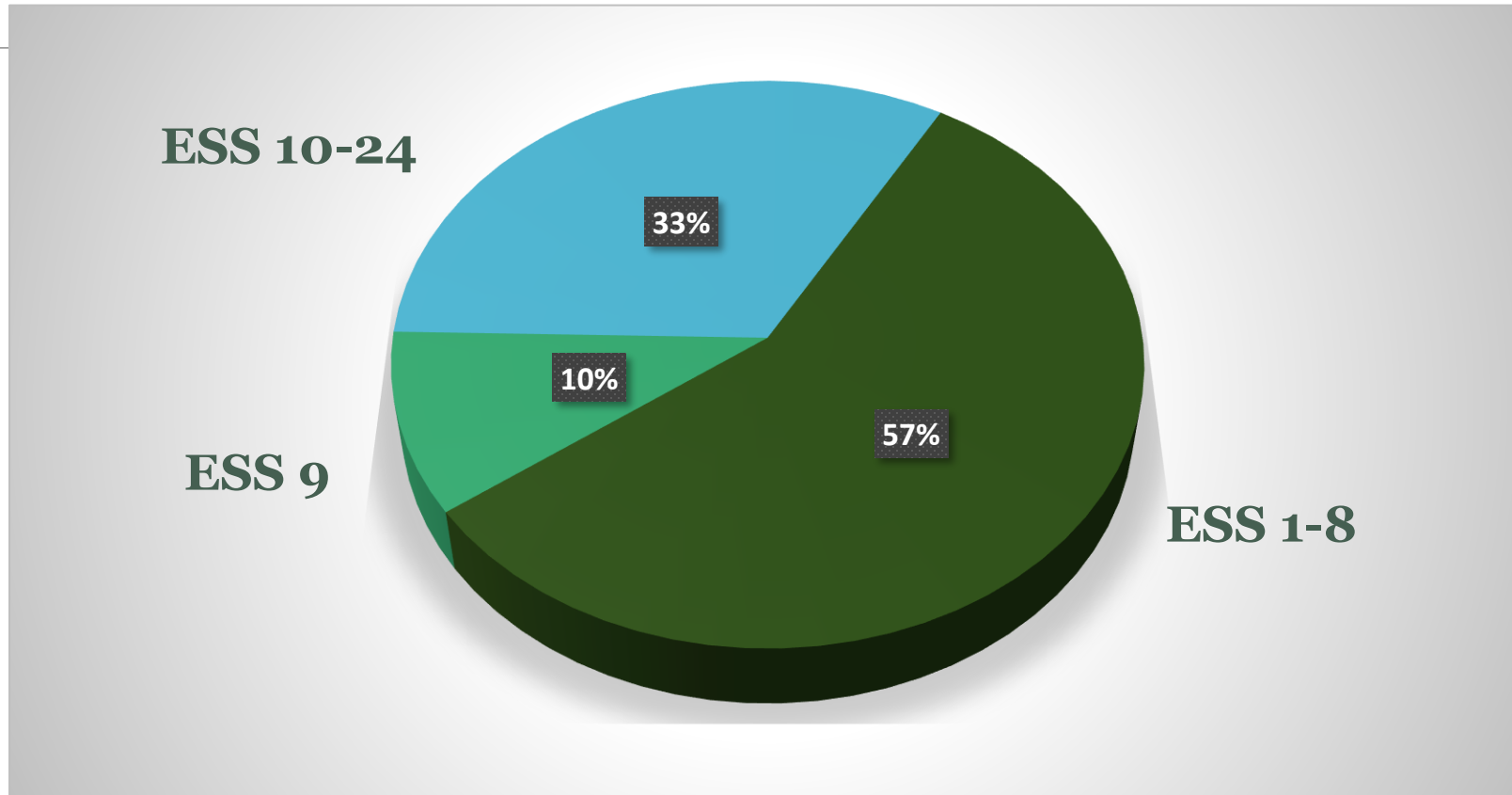
How likely are you to doze off or fall asleep during the following situations?

0 = would never doze      2 = moderate chance of dozing  
1 = slight chance of dozing      3 = high chance of dozing

	Score
1. Sitting and reading	0 1 2 3
2. Watching TV	0 1 2 3
3. Sitting, inactive in a public place	0 1 2 3
4. As a passenger in a car for an hour without a break	0 1 2 3
5. Lying down to rest in the afternoon when circumstances permit	0 1 2 3
6. Sitting and talking to someone	0 1 2 3
7. Sitting quietly after a lunch without alcohol	0 1 2 3
8. In a car, while stopped for a few minutes in the traffic	0 1 2 3

Total \_\_\_\_\_

# ESS Scores in the General Population



# Epworth Sleepiness Scale

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An increased ESS does indicate a greater propensity to fall asleep on the MSLT.

- However, the ESS does not correlate well with the MSLT (ie, a higher score does not mean falling asleep faster).

However, is a good instrument for:

- General screening: score >10 suggests EDS
- Follow-up: scores generally decrease with treatment.

# Differential Diagnosis

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Chronic insufficient sleep

Obstructive sleep apnea

Narcolepsy

Restless leg syndrome/periodic limb movement disorder

Disorders of the sleep-wake cycle

- Shift work
- Sleep phase delay syndrome

Drug effect