

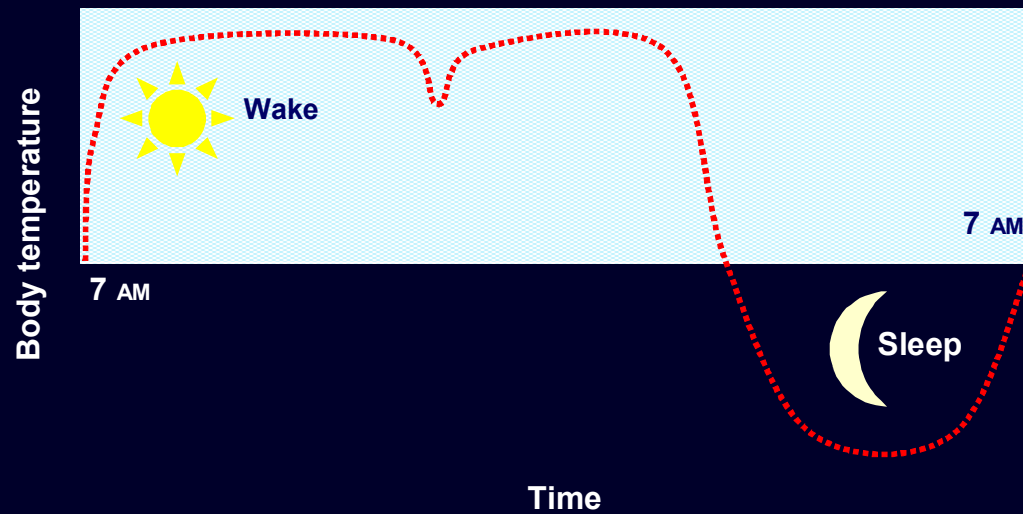
Sleep

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Circadian Rhythm of Sleep

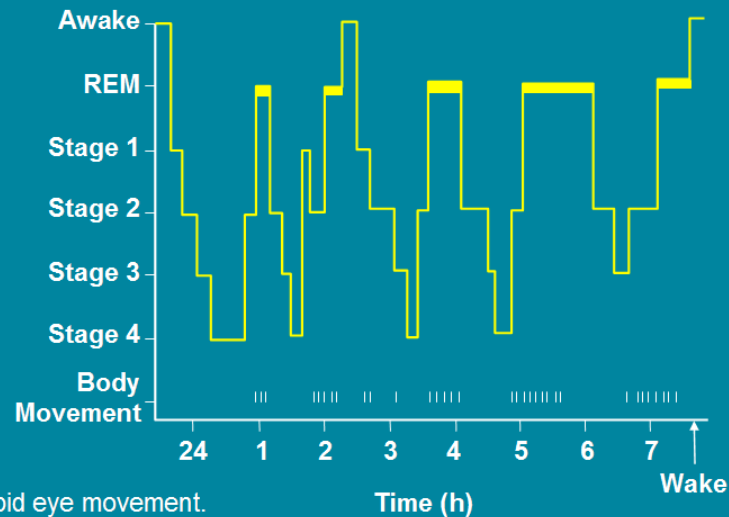


Courtesy of R. Bogan, MD.

Sleep Stages and Function

	States	Function
(NREM)	Stage 1 Stage 2 Stage 3 Stage 4	Body's rest and metabolic restoration
(REM)	Phasic eye movements Loss of muscle tone EEG neutral	Active state of brain functions in learning and memory

Typical Progression of Sleep Over the Course of the Night



REM = rapid eye movement.

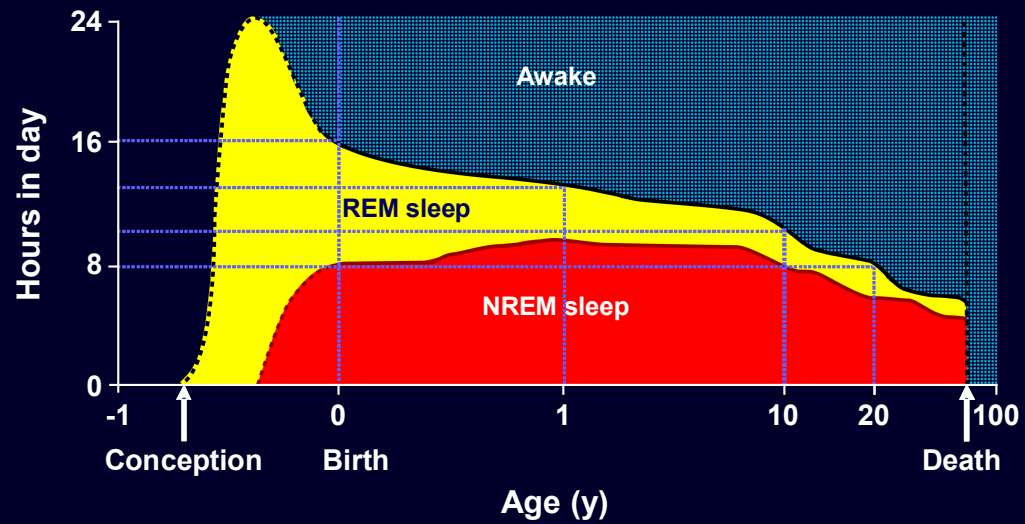
Erman MK. *J Clin Psychiatry*. 2001;62(suppl 10):9-17.

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Sleep and Age



Hobson, Sleep and Dreaming. In: *Fundamental Neuroscience*. 1999.
Roffwarg et al. *Science*. 1996;152:604.



Sleepy cabbie.wmv

Epworth Sleepiness Scale (ESS)

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your way of life in recent times. Even if you have not done some of these things recently, try to work out how they would have affected you. Use the following scale to choose the *most appropriate number* for each situation.

0 = would never doze

1 = slight chance of dozing

2 = moderate chance of dozing

3 = high chance of dozing

Situation	Chance of Dozing
Sitting and reading	_____
Watching TV	_____
Sitting, inactive in a public place (eg, a theater or a meeting)	_____
As a passenger in a car for an hour without a break	_____
Lying down to rest in the afternoon when circumstances permit	_____
Sitting and talking to someone	_____
Sitting quietly after a lunch without alcohol	_____
In a car, while stopped for a few minutes in traffic	_____

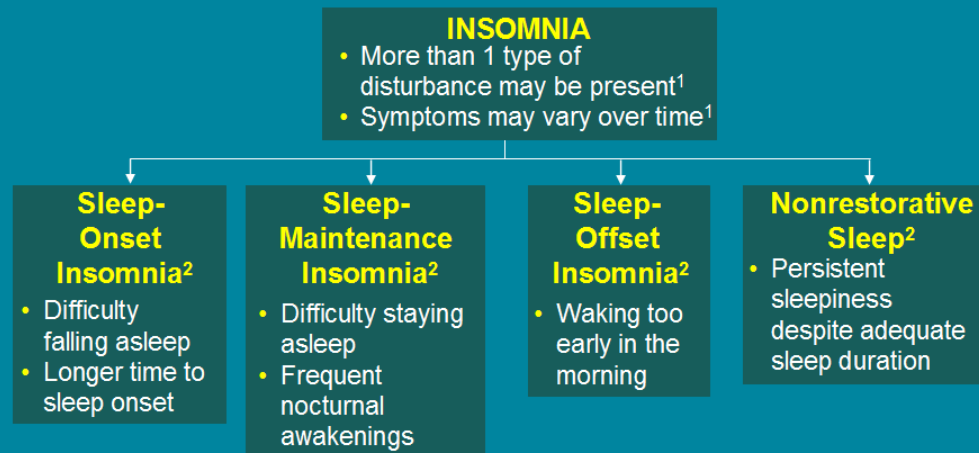
Johns. *Sleep*. 1991;14:540.

Sleepiness: Clinical Presentation

- Pervasive drowsiness
- Sleep attacks
- Fatigue
- Microsleep episodes
- Visual disturbances
- Apathy
- Mood changes
- Automatic activity
- Impaired alertness
- Lethargy
- Impaired memory and concentration
- Poor performance in work/school
- Accident prone

Overeem et al. *J Clin Neurophysiol.* 2001;18:78.
Bassetti and Aldrich. *Neurol Clin.* 1996;14:545.
J. Black, MD. Personal communications. October 2002.

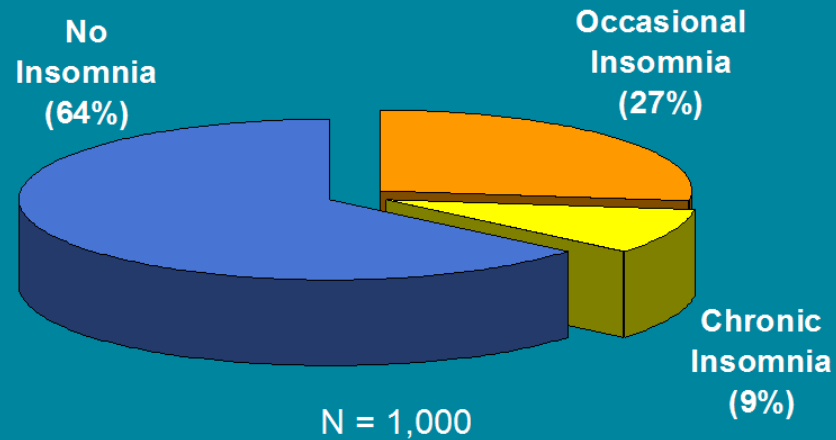
Sleep Patterns in Insomnia



1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed, text rev (DSM-IV-TR™). 2000:597-661.

2. Czeisler CA et al. In: Braunwald E et al, eds. *Harrison's Principles of Internal Medicine*. 15th ed. 2001:155-163.

Self-Reported Prevalence of Insomnia in US



Ancoli-Israel S, Roth T. *Sleep*. 1999;22(suppl 2):S347-S353.

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The Two-process Model of Sleep Regulation

- Process S (Homeostatic Process)
 - Increases during waking and decreases during sleep
- Process C (Circadian Process)
 - Clock-like process that is independent of sleep and waking

Insomnia: Differential Diagnosis

- Environmental
- Behavioral
- Psychiatric Disorders
- Neurological Disorders
- Sleep-Wake Pattern Timing Disorders
- Movement Disorders
- Respiratory Disorders
- Miscellaneous Medical Conditions
- Sleep State Misperception
- Idiopathic



Behavioral Insomnia

- Adjustment Sleep Disorder
- Psychophysiological Insomnia
- Inadequate Sleep Hygiene
- Limit-setting Sleep Disorder
- Sleep-onset Association Disorder



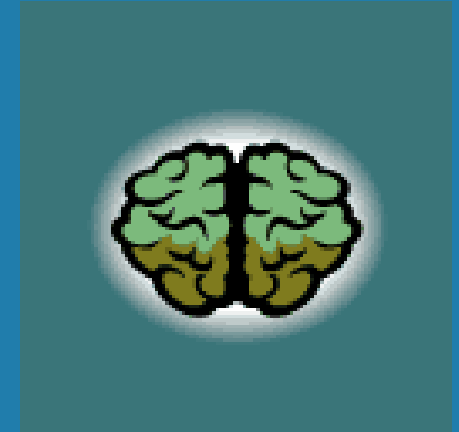
Psychiatric Disorders Causing Insomnia

- Mood Disorders
- Anxiety Disorders
- Panic Disorder
- Alcohol and Drug Dependency
- Psychoses



Neurological Disorders Causing Insomnia

- Parkinson Disease
- Nocturnal Epilepsy
- Degenerative Brain Disorders
- Fatal Familial Insomnia



Sleep-Wake Pattern Timing Disorders Causing Insomnia

- Time Zone Change
- Shift Work
- Delayed Sleep Phase Syndrome
- Advanced Sleep Phase Syndrome
- Non-24 Hour Sleep-Wake Syndrome
- Irregular Sleep-Wake Pattern
- Short Sleeper

Movement Disorders Causing Insomnia

- Restless Legs Syndrome
- Periodic Limb Movement Disorder
- Sleep Starts
- Nocturnal Seizures

Respiratory Disorders Causing Insomnia

- Obstructive Sleep Apnea
- Central Sleep Apnea
- Obesity-Hypoventilation Syndrome
- Nocturnal Asthma
- Chronic Lung Diseases
- High Altitude

Miscellaneous Medical Conditions Causing Insomnia

- Gastroesophageal Reflux
- Hyperthyroidism
- Fibromyalgia
- Pregnancy
- Menopause

Craniofacial Abnormality

OSA Identification





Maxillary/Mandibular Advancement

OSA Intervention - Surgical



Mandibular Repositioners

OSA Intervention - Mechanical



Courtesy of Sleep Disorders Dental Society