



# Consciousness and the Two- Track Mind

## Chapter 3

# Forms of Consciousness

Consciousness, modern psychologists believe, is an awareness of ourselves and our environment.

Bill Ling/ Digital Vision/ Getty Images



Christine Brune



Stuart Franklin/ Magnum Photos



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Some occur spontaneously

Daydreaming

Drowsiness

Dreaming

Some are physiologically induced

Hallucinations

Orgasm

Food or oxygen starvation

Some are psychologically induced

Sensory deprivation

Hypnosis

Meditation

# Cognitive Neuroscience

The interdisciplinary study of how brain activity links with our mental processes or cognition—perception, thinking, memory, and language. It has started to take steps to explain how specific brain states relate to conscious experiences.

Cognitive neuroscientists are exploring and mapping the conscious functions of the cortex. But how the brain produces the mind remains a mystery.

# Cognitive Neuroscience

Brain scans from a noncommunicative 23-year-old woman—car accident victim with no outward signs of conscious awareness

When researchers asked her to imagine playing tennis or moving around her home, fMRI scans revealed brain activity like that of healthy volunteers.

Consider how this info is pertinent to the movie we watched—Awakenings.

# Dual Processing

Information in the brain is often simultaneously processed on separate conscious and unconscious tracks —a conscious (explicit), deliberate “high road” and an unconscious (implicit) automatic “low road.”

Example from Crash Course—the squirrel.

Explicit: “It’s a squirrel!”

Implicit: Color, form, movement, distance, identity, associations...

# Selective Attention

(Also called the **Cocktail Party Effect**)

Focusing on a limited aspect of all you experience.

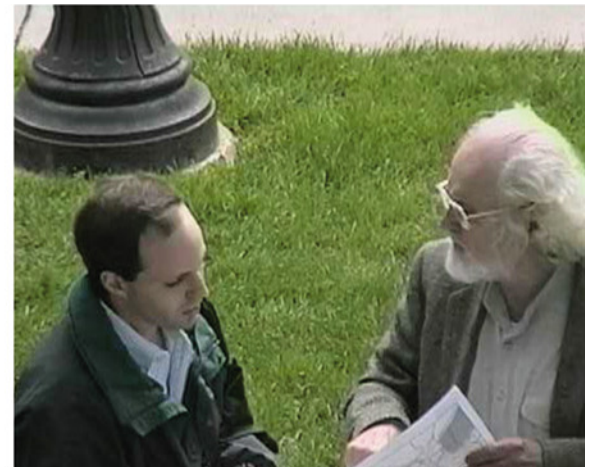
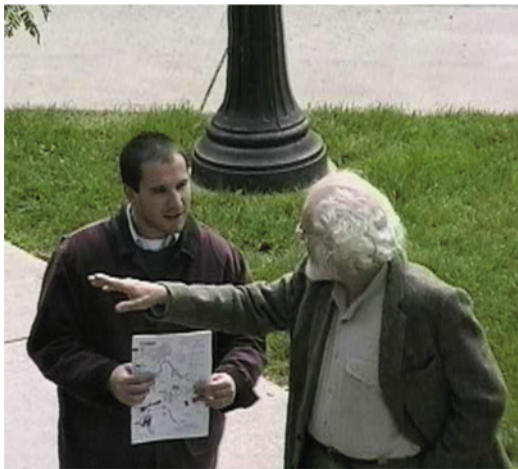
# Selective Inattention

**Inattentional blindness** - failure to see visible objects when our attention is directed elsewhere. For example, moonwalking bear.

# Selective Inattention

**Change blindness** - one fails to notice changes in the environment.

Two-thirds of individuals giving directions failed to notice a change in the individual asking for directions.





# Sleep & Dreams

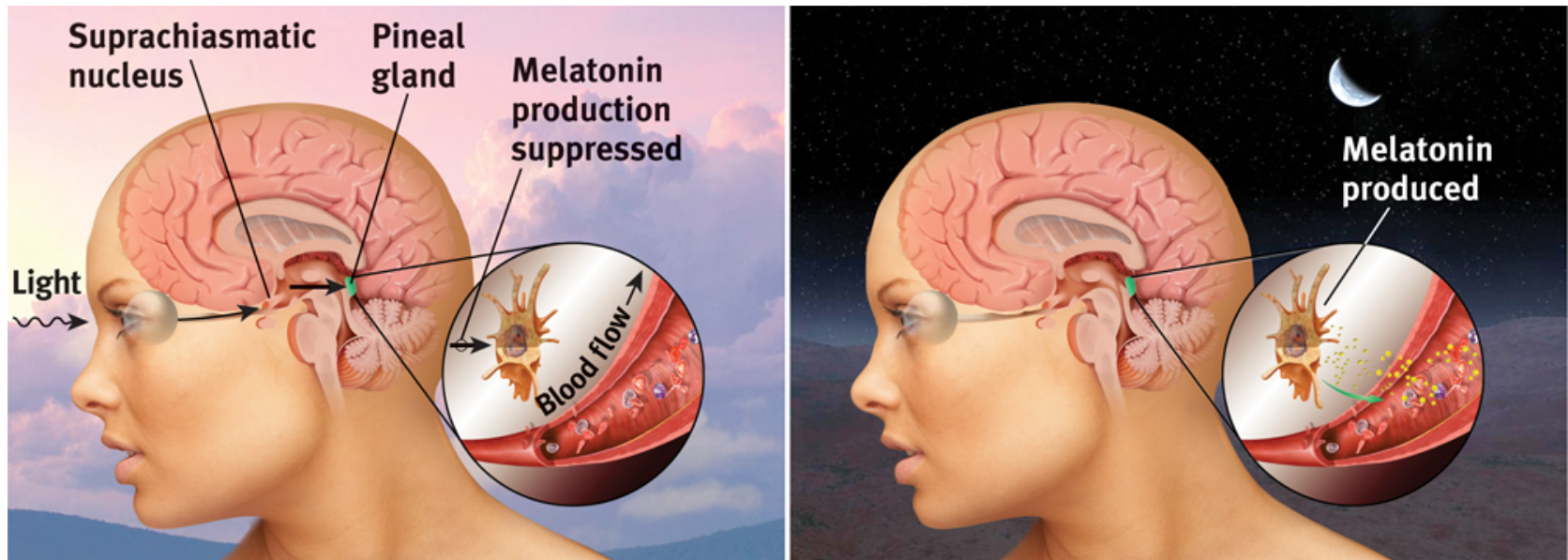
Sleep – the irresistible tempter to whom we inevitably succumb.



Mysteries about sleep and dreams have just started unraveling in sleep laboratories around the world.

# Biological Rhythms and Sleep

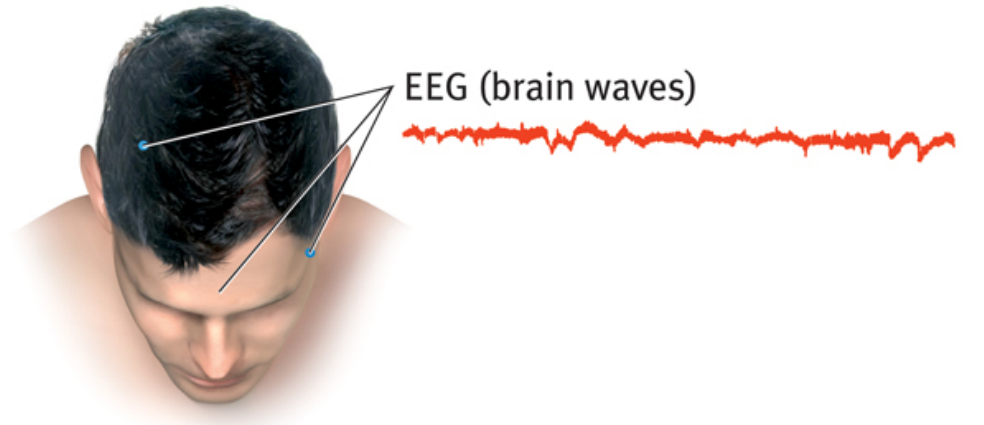
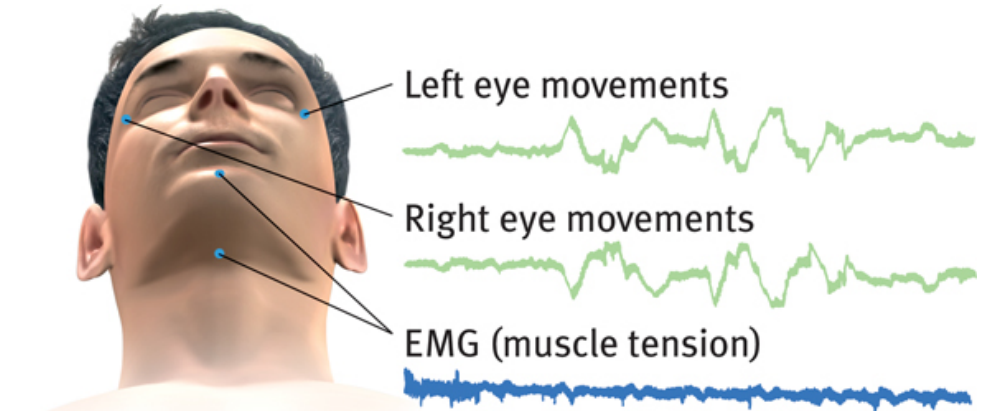
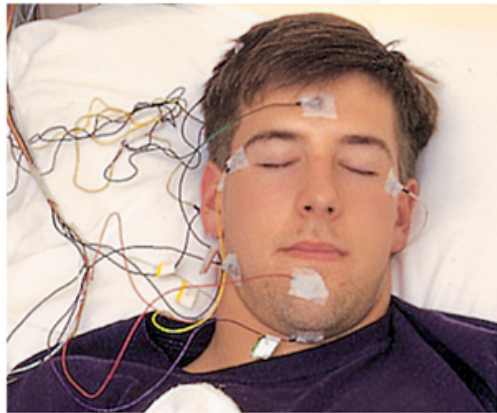
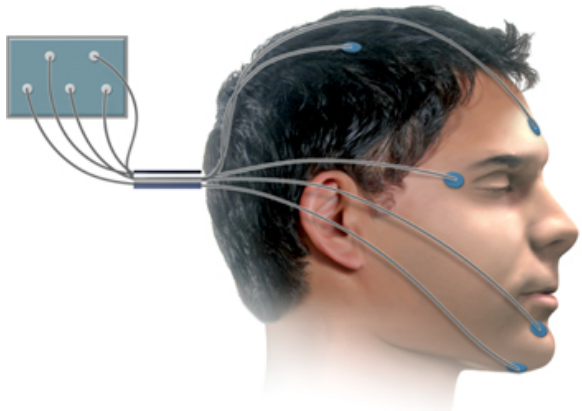
**Circadian Rhythms** occur on a 24-hour cycle and include sleep and wakefulness. Termed our “biological clock,” it can be altered by artificial light.



Light triggers the suprachiasmatic nucleus to decrease (morning) melatonin from the pineal gland and increase (evening) it at nightfall.

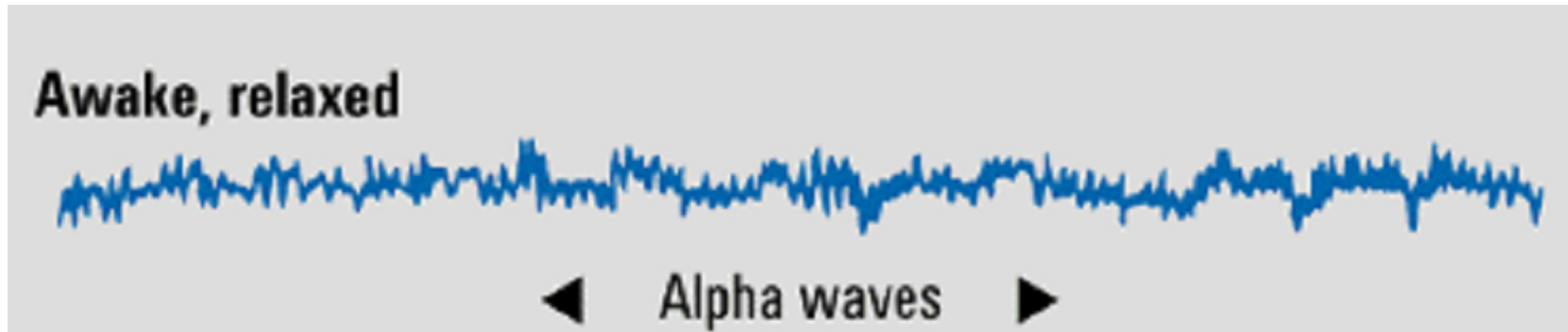
# Sleep Stages

Measuring sleep: About every 90 minutes, we pass through a cycle of five distinct sleep stages.



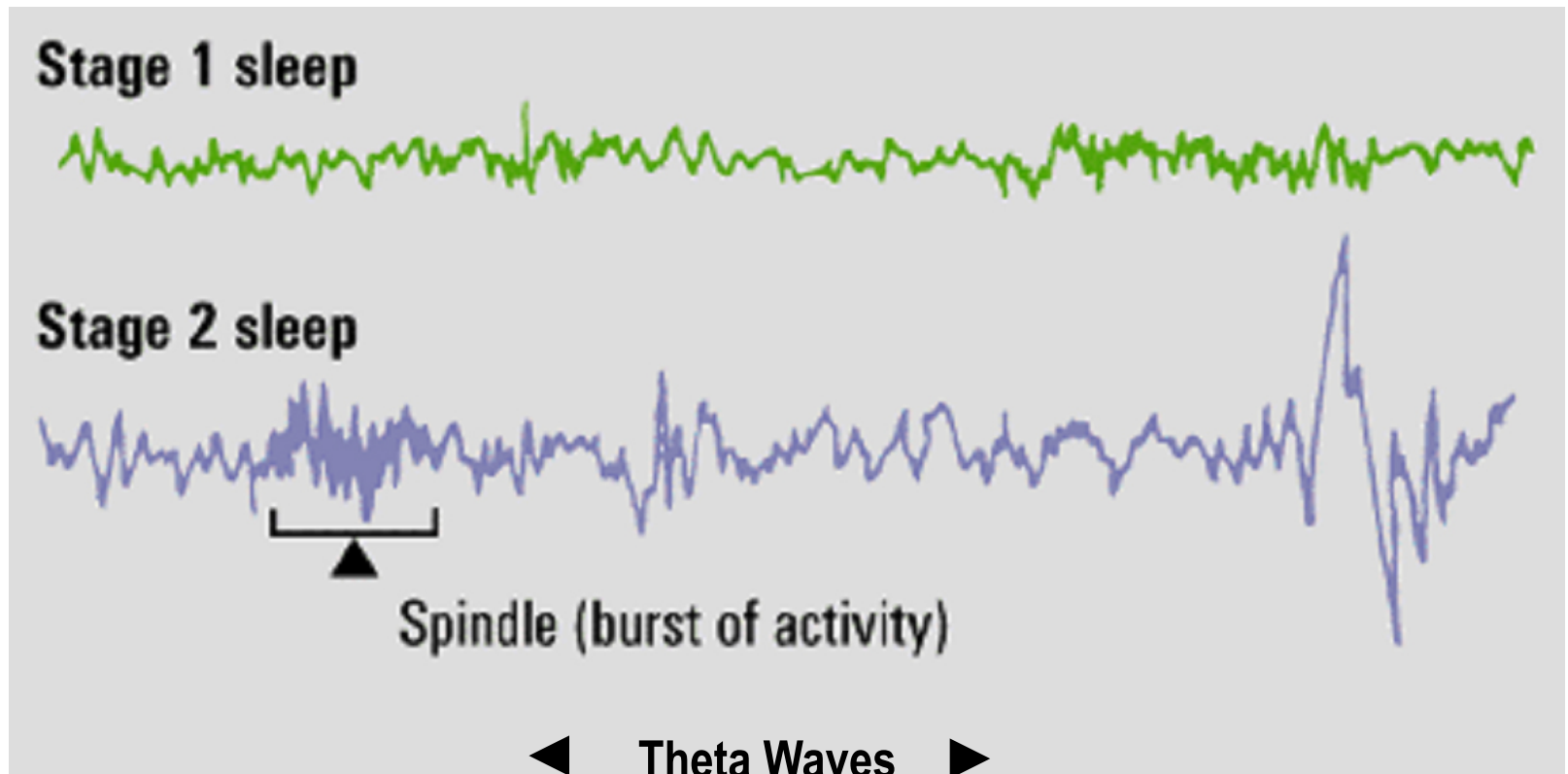
# Awake but Relaxed

When an individual closes his eyes but remains awake, his brain activity slows down to a large amplitude and slow, regular **alpha waves (9-14 cps)**. A meditating person exhibits an alpha brain activity.



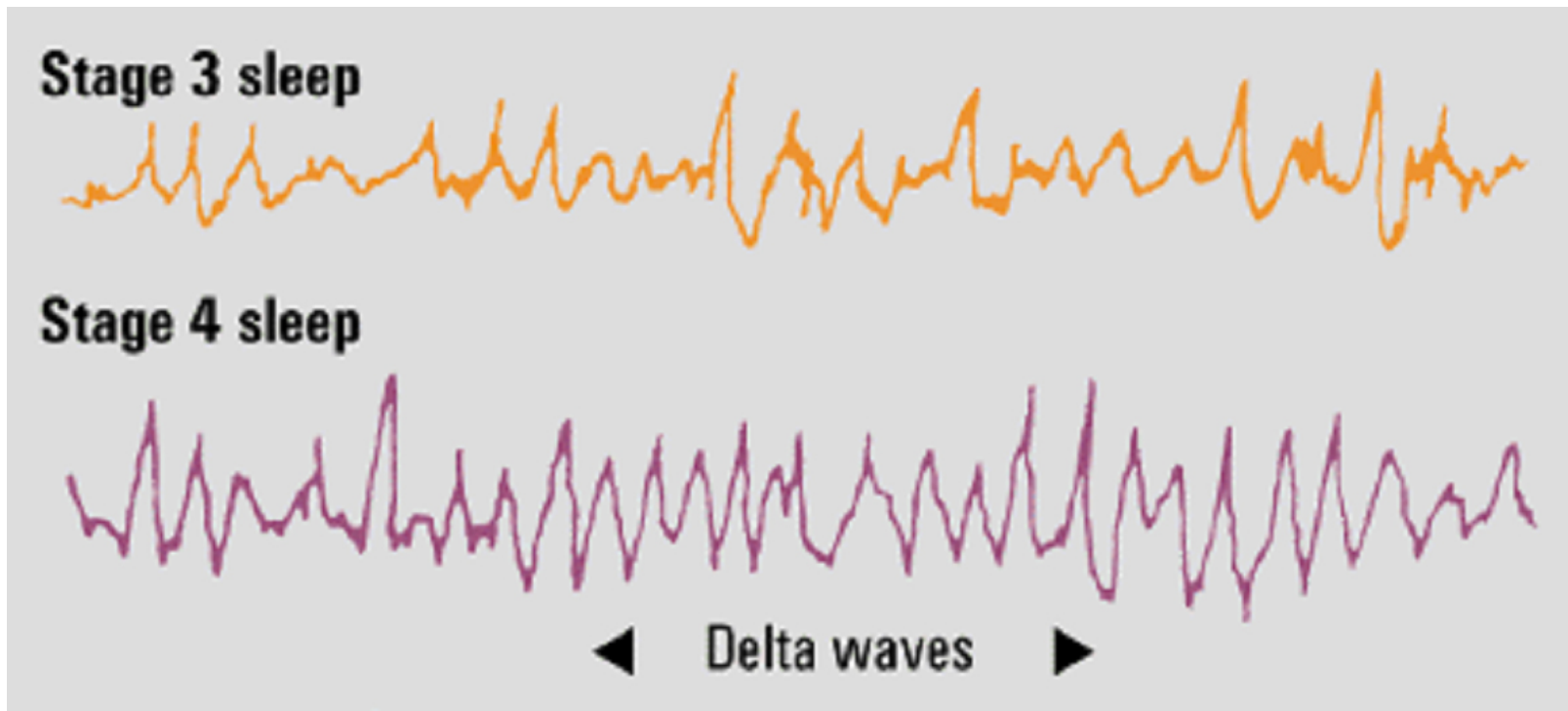
# Sleep Stages 1-2

During early, light sleep (stages 1-2) the brain enters a high-amplitude, slow, regular wave form called **theta waves (5-8 cps)**. A person who is daydreaming shows theta activity. Stage 2—sleeptalking can start to occur. Easier to awaken.



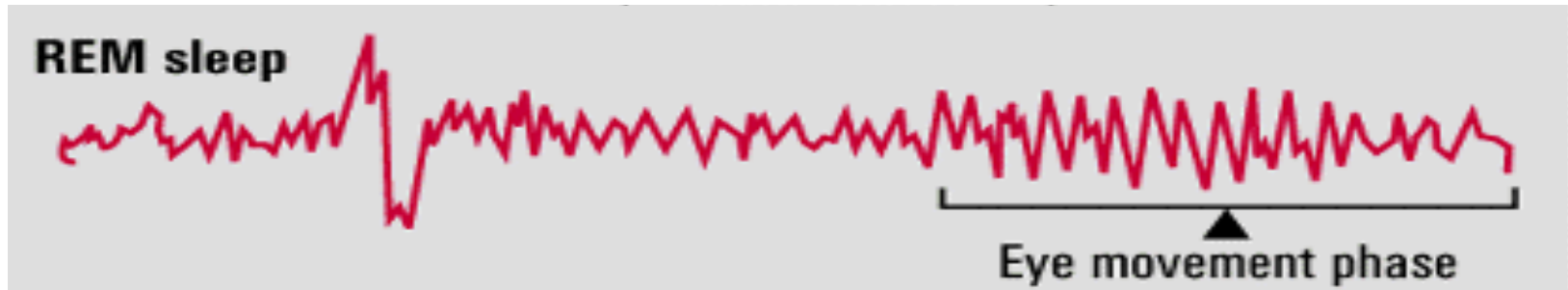
# Sleep Stages 3-4

During deepest sleep (stages 3-4), brain activity slows down. There are large-amplitude, slow **delta waves** (1.5-4 cps). Hard to awaken.



# REM Sleep

After reaching the deepest sleep stage (4), the sleep cycle starts moving backward towards stage 1. Although still asleep, the brain engages in low-amplitude, fast and regular **beta waves (15-40 cps)** much like awake-aroused state.



A person during this sleep exhibits Rapid Eye Movements (REM) and reports vivid dreams.

# REM Sleep

Except during very scary dreams, your genitals become aroused during REM sleep, and you have an erection or increased vaginal lubrication and clitoral engorgement, regardless of whether the dream's content is sexual.

Although your brain's motor cortex is active, your brainstem blocks its messages, leaving muscles relaxed, except for the occasional twitch. Moreover, you cannot easily be awakened.

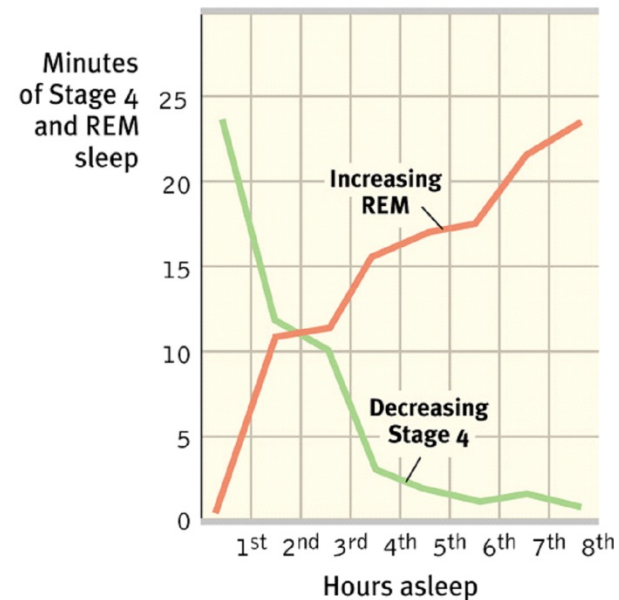
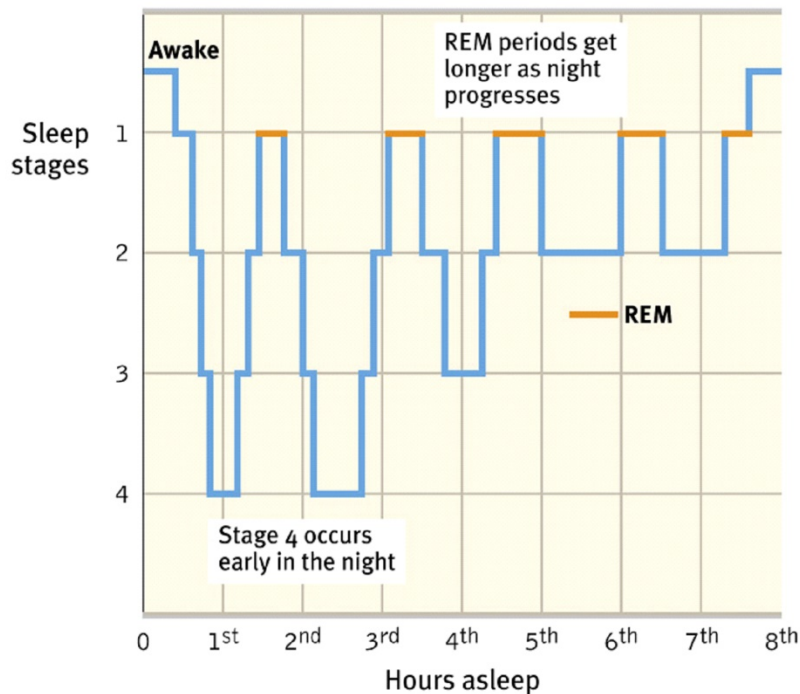
Sometimes called paradoxical sleep—body internally aroused but externally calm.

As night wears on, deep Stage 4 gets progressively briefer and then disappears. The REM and Stage 2 get longer. By morning, 20 to 25% of average night's sleep (around 100 minutes) has been REM sleep.



# 90-Minute Cycles During Sleep

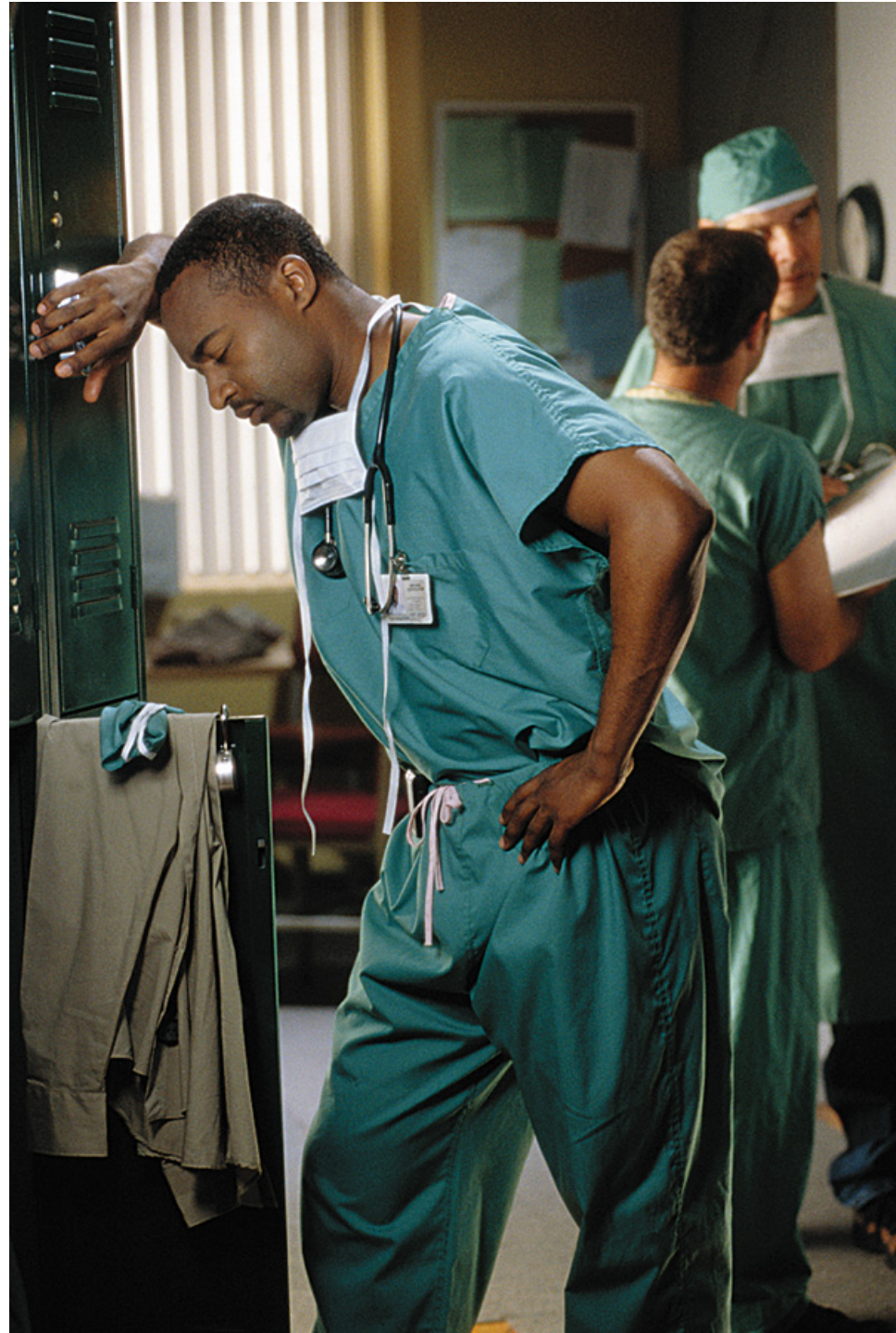
With each 90-minute cycle, stage 4 sleep decreases and the duration of REM sleep increases.



# Why do we sleep?

We spend one-third of our lives sleeping.

If an individual remains awake for several days, immune function and concentration deteriorates and the risk of accidents increases.



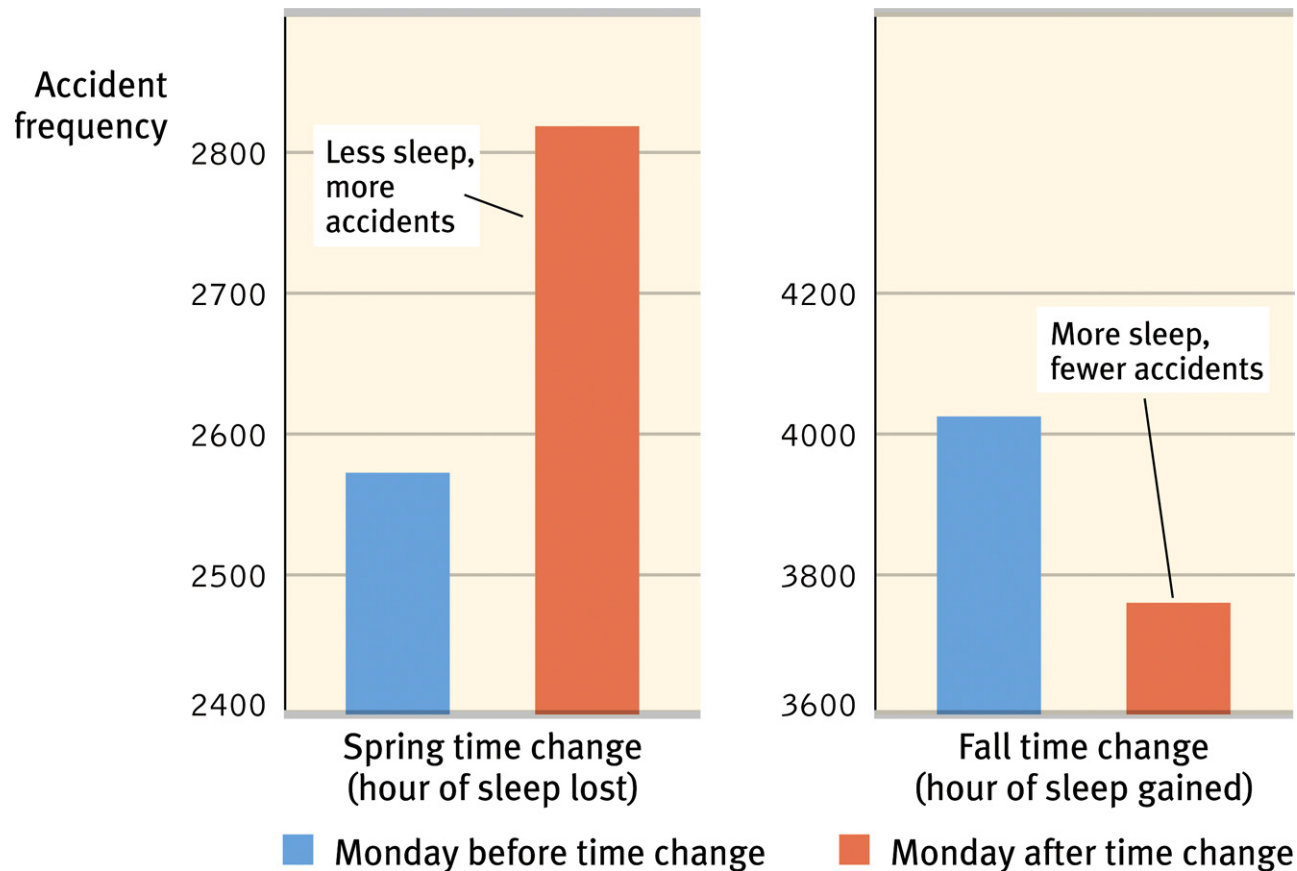
# Sleep Deprivation

1. Fatigue and subsequent death.
2. Impaired concentration.
3. Emotional irritability.
4. Depressed immune system.
5. Greater vulnerability.



# Accidents

Frequency of accidents increase with loss of sleep



# Sleep Theories

1. **Sleep Protects:** Sleeping in the darkness when predators loomed about kept our ancestors out of harm's way.
2. **Sleep Helps us Recover:** Sleep helps restore and repair brain tissue.
3. **Sleep Helps us Remember:** Sleep restores and rebuilds our fading memories.
4. **Sleep may play a role in the growth process:** During sleep, the pituitary gland releases growth hormone. Older people release less of this hormone and sleep less.

# Sleep Disorders

1. **Insomnia:** A persistent inability to fall asleep.
2. **Narcolepsy:** Overpowering urge to fall asleep that may occur while talking or standing up.
3. **Sleep apnea:** Failure to breathe when asleep.

# Sleep Disorders

Children are most prone to:

- **Night terrors:** The sudden arousal from sleep with intense fear accompanied by physiological reactions (e.g., rapid heart rate, perspiration) which occur during Stage 4 sleep.
- **Sleepwalking:** A Stage 4 disorder which is usually harmless and unrecalled the next day.
- **Sleeptalking:** A condition that runs in families, like sleepwalking.