States of Consciousness 2-4%

States of Consciousness

- **Sleep and Dream content survey**

States of Consciousness What's new(ish)?

- Stage 3 and 4 of sleep have been combined
- It is now NREM 3

States of Consciousness

- **Radiolab: Sleep**
- **Resource: Mouse Party**

Unit Presentation:
States of Consciousness

Sleep

If you live to be 90…

Sleep Deprivation

Table 4.2

The National Sleep Foundation Survey: Asleep at the Wheel?

Key findings from the Sleep in America Poll, a national survey of randomly selected American adults:

- 37% reported being so sleepy during the day that it interfered with their daily activities.
- 40% compensated for sleep lost during the week by sleeping an extra hour or more on the weekends.
- 43% use caffeine to help them stay awake during the day.
- 51% have driven when drowsy during the past year.
- 17% have actually fallen asleep at the wheel in the past year.
- 1% have had a traffic accident due to being drowsy or falling asleep at the wheel.

SOURCE: National Sleep Foundation (2002, 2004a).

A story: Peter Tripp (radio DJ)

1959: 201 hours or 8.5 days

A story: H.S. senior Randy Gardner

1965: 264 hours or 11 days

How much sleep do we really need to function?

Animal studies of deprivation (cats and dogs)

Microsleeps

Why do we sleep?

How has evolution molded our sleep patterns?

*other animals and uni-hemispheric sleep

* monophasic vs. polyphasic sleep
•Note: “predation risk”

*** sleeping in new places?**

Why do we sleep?

Adaptive or Evolutionary Theory:

Humans sleep at night because it's historically been best for their survival to do so

Restorative Theory:

Humans sleep to replenish physical energy

Memory Consolidation Theory: *(aka: Information Processing Theory)*

Human sleep helps in sorting and filing info, and in strengthening some neural connections, while pruning others away

The Sleep Cycle

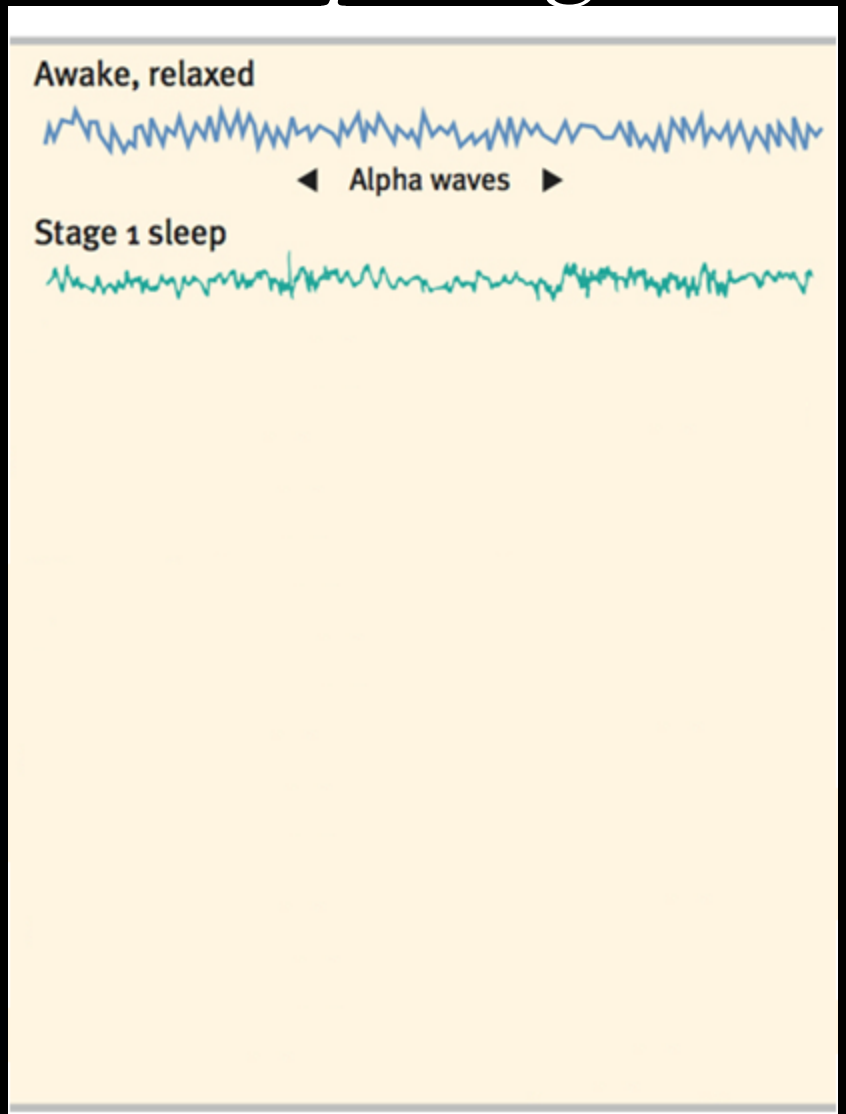
Biological Rhythms and Sleep

Sleep Stages

An EEG

Biological Rhythms and Sleep

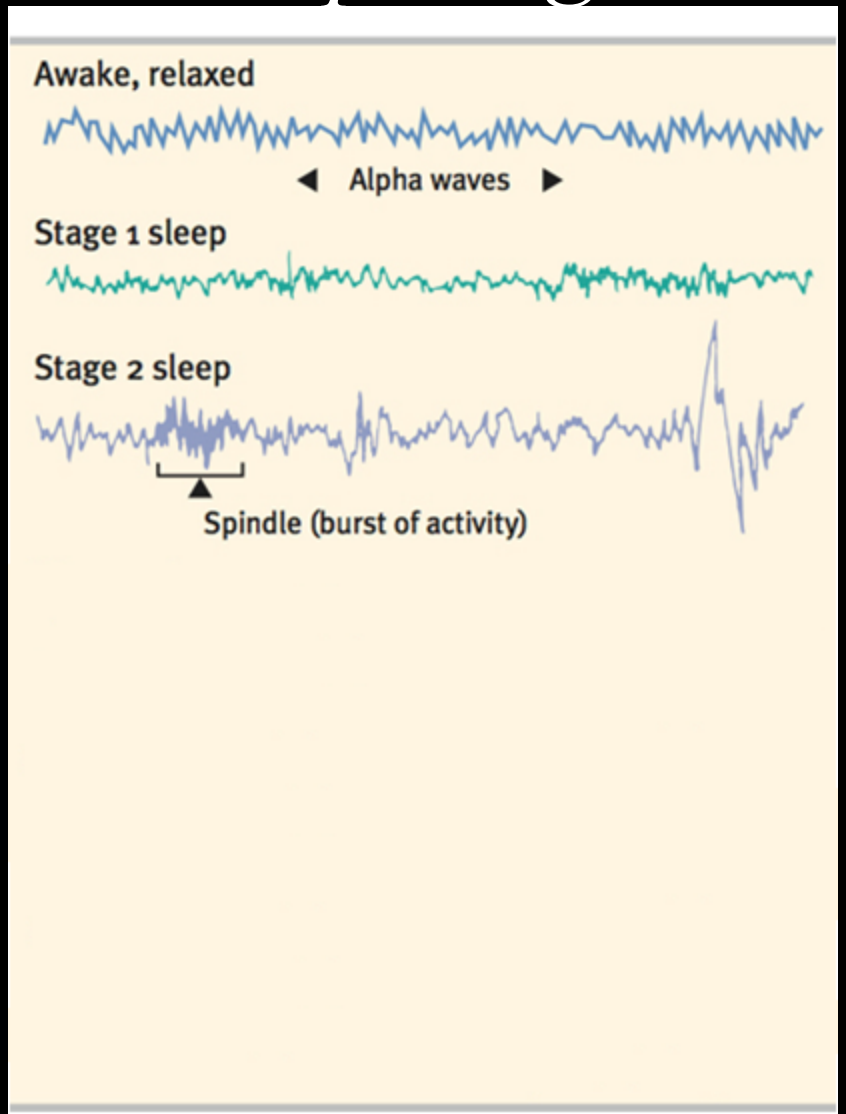
Sleep Stages



An EEG

Biological Rhythms and Sleep

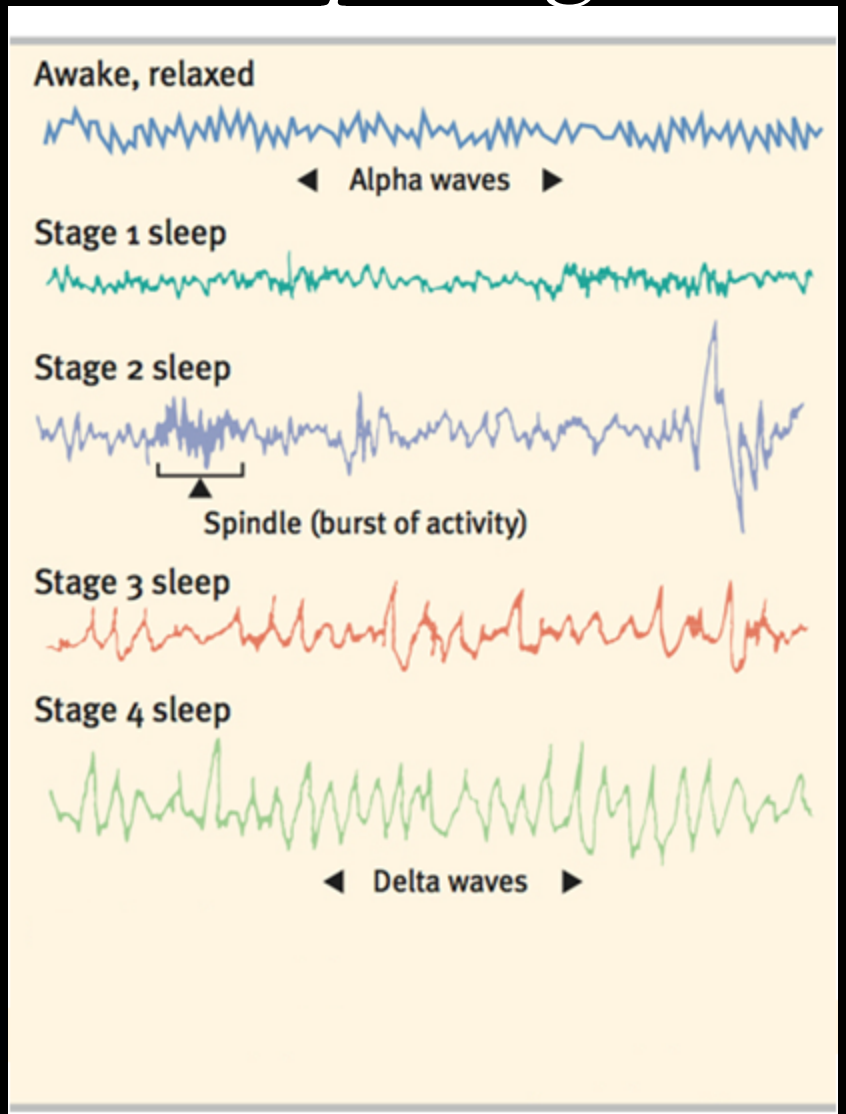
Sleep Stages



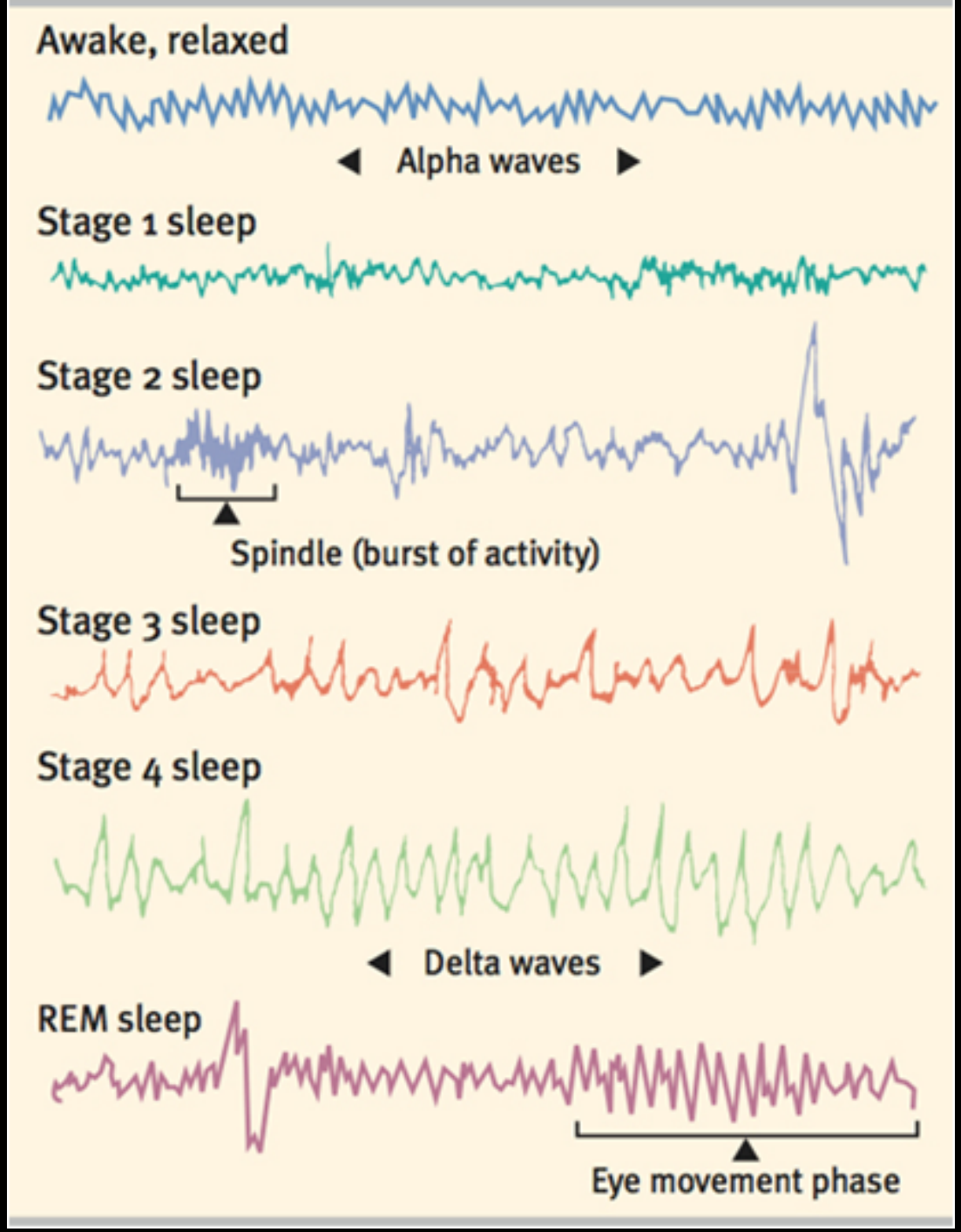
An EEG

Biological Rhythms and Sleep

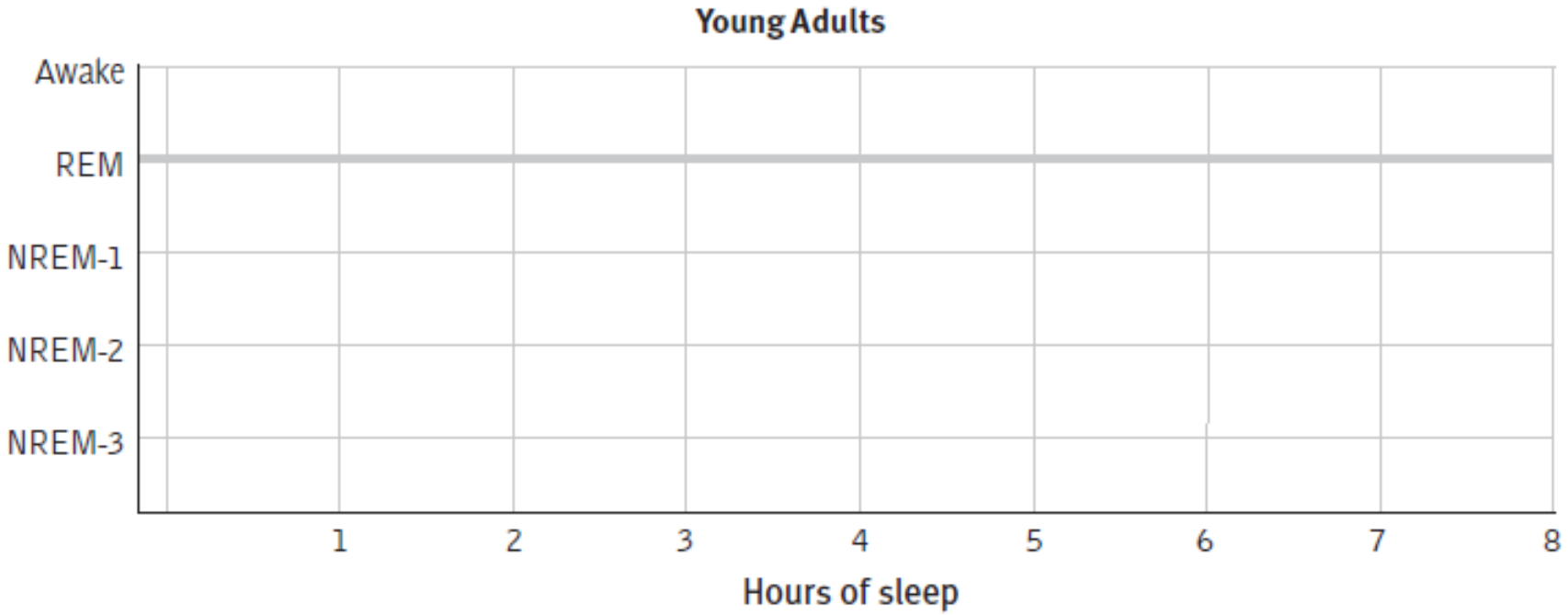
Sleep Stages

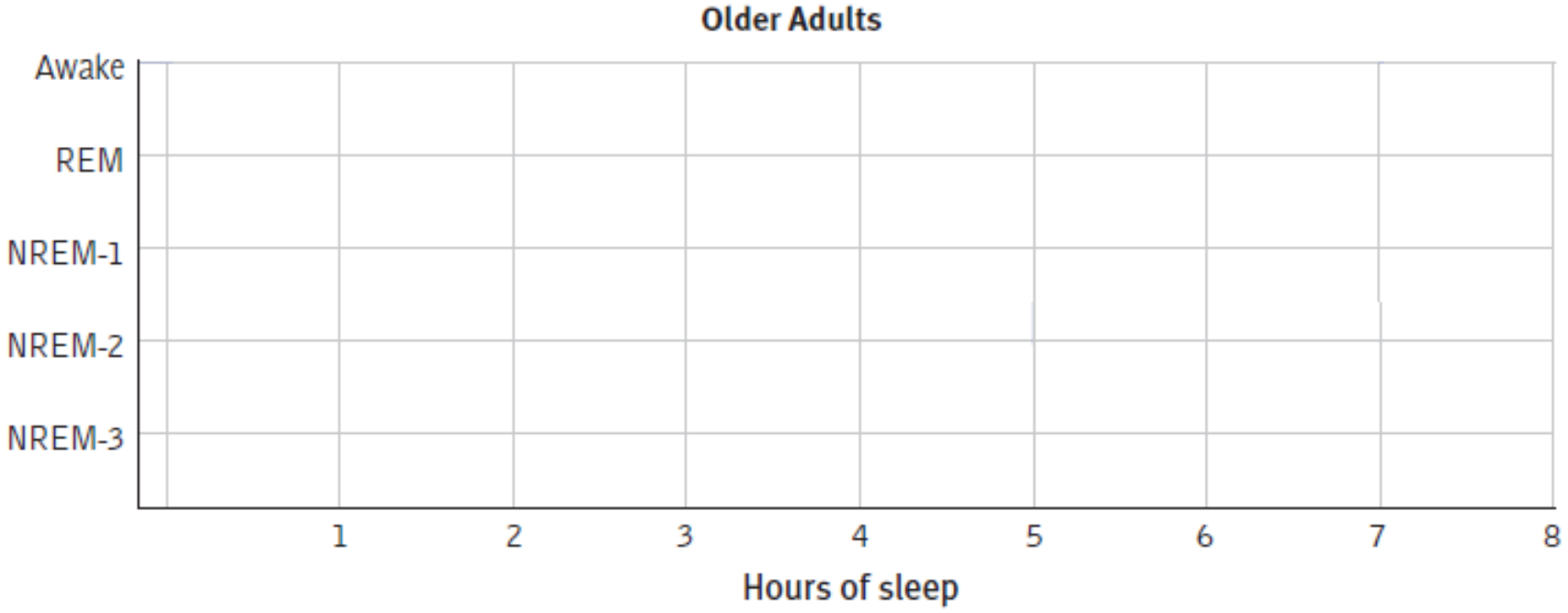


An EEG

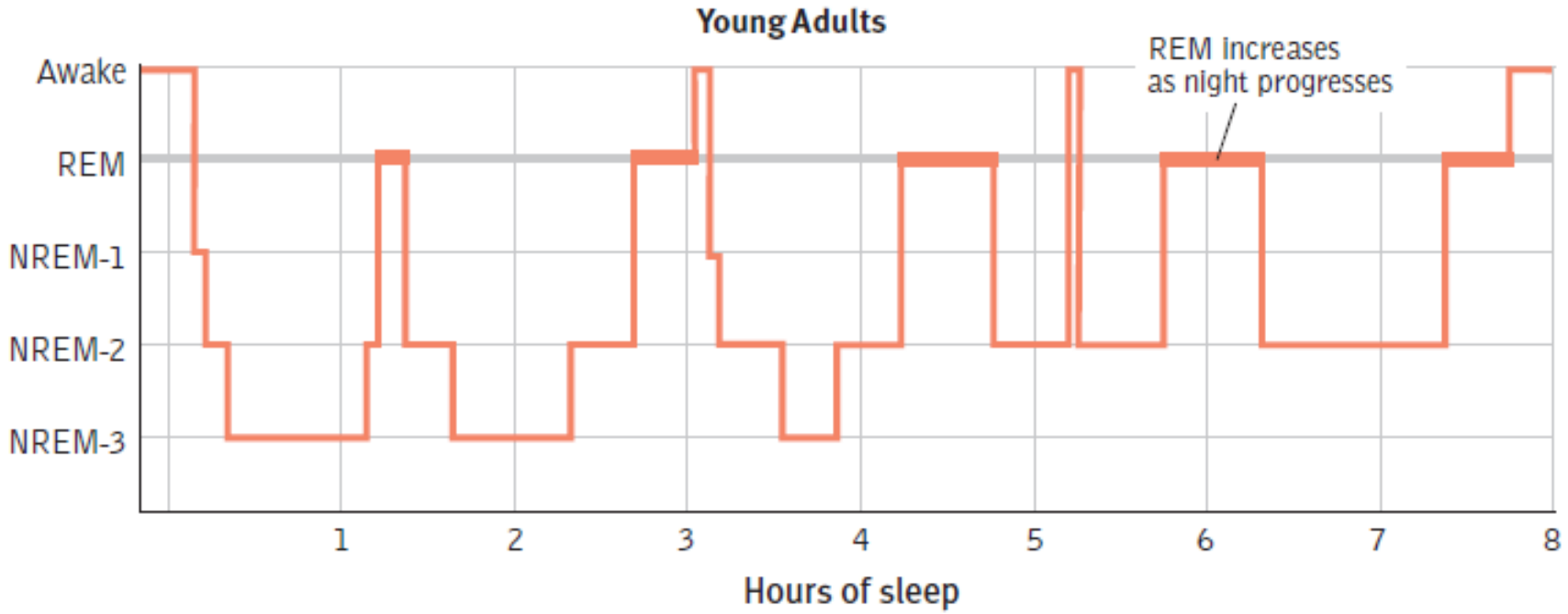

Awake, relaxed
Alpha waves
Stage 1 sleep
Stage 2 sleep
Spindle (burst of activity)
Stage 3 sleep
Stage 4 sleep
Delta waves
REM sleep
Eye movement phase

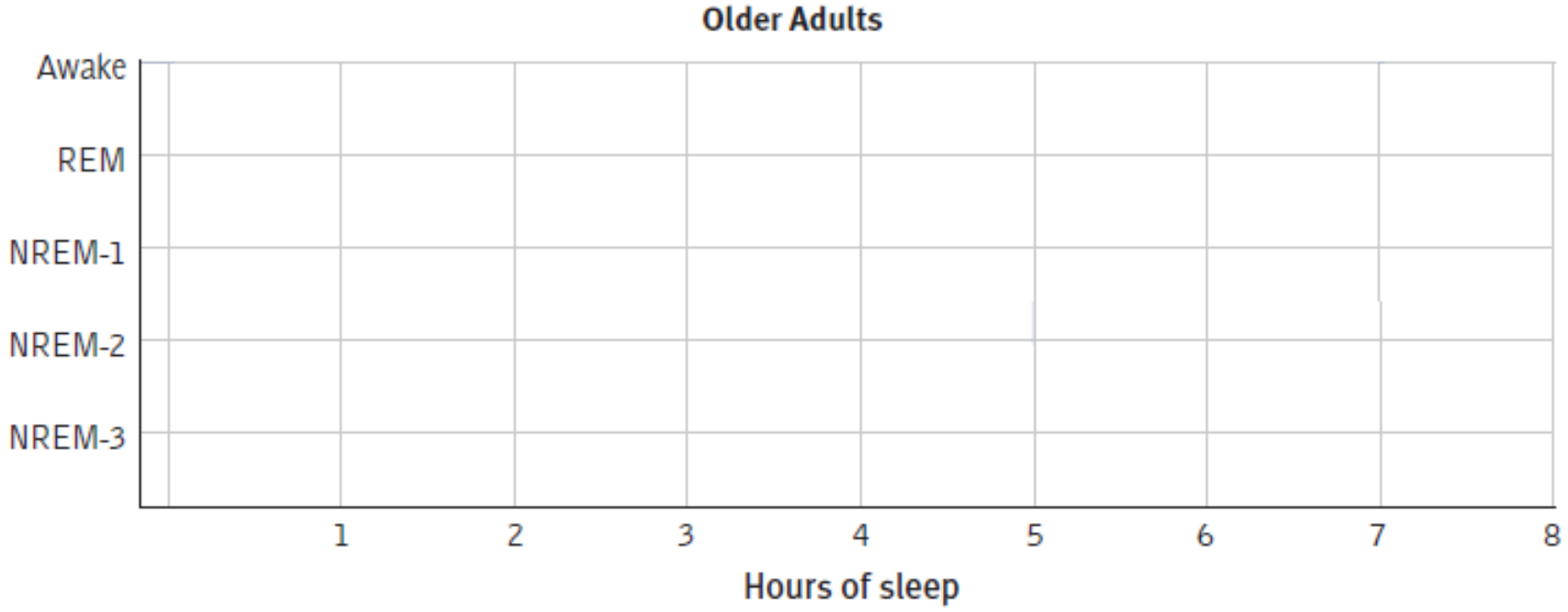
The stages in a typical night's sleep



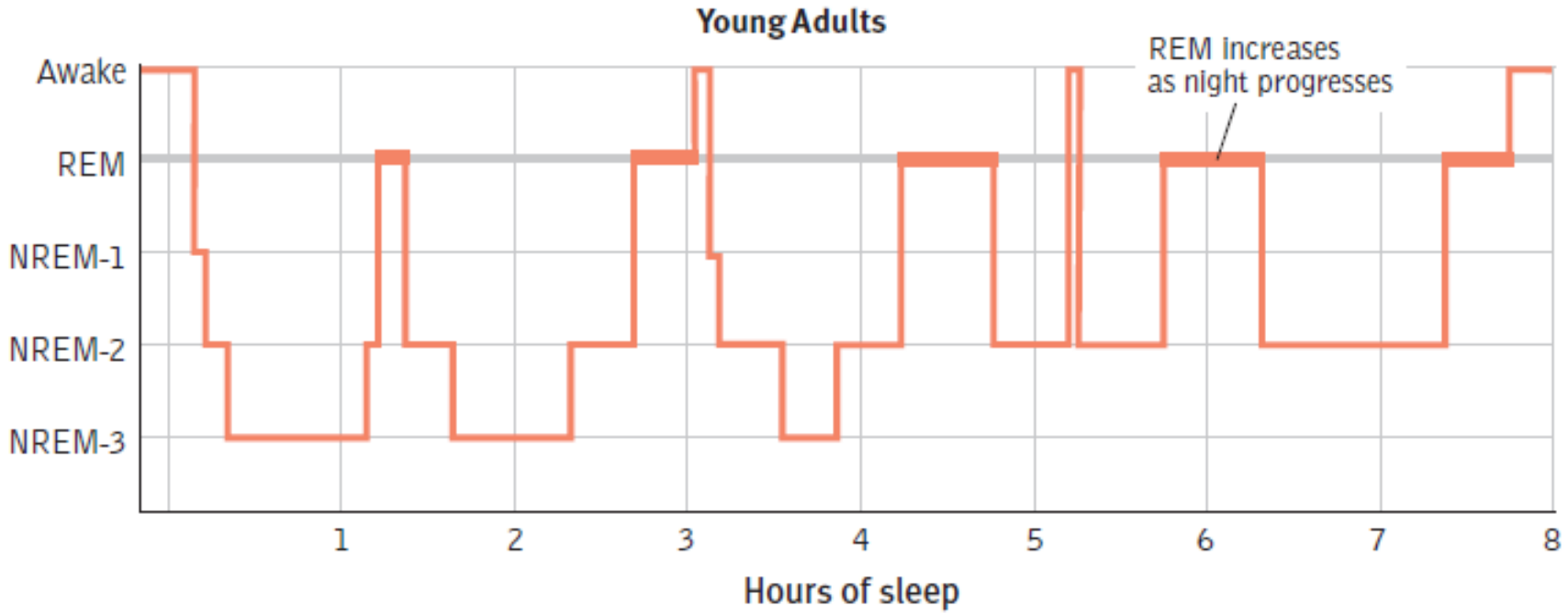


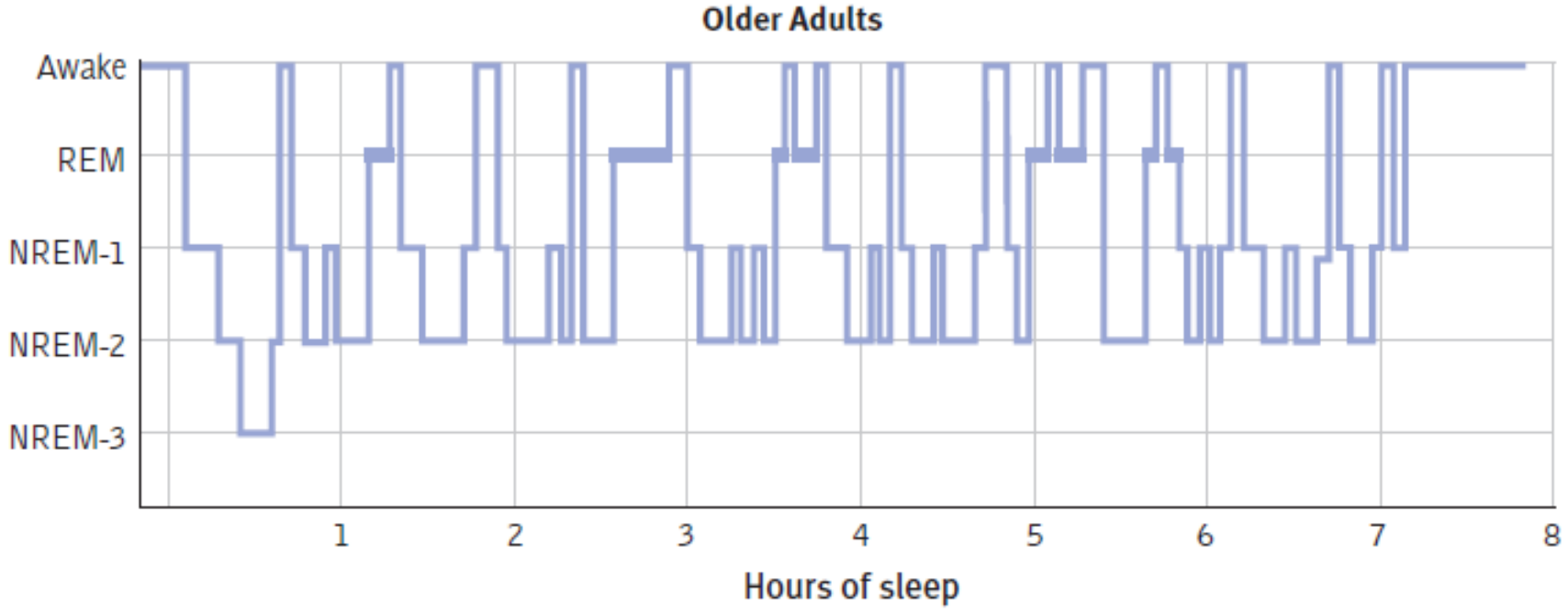
The stages in a typical night's sleep





The stages in a typical night's sleep





Insomnia?

Hypersomnia?

Sleep Disorders:

*Sleep Apnea

(Frequent stoppages of breathing during sleep)

*Narcolepsy

(A sudden, involuntary drop into REM sleep)

*Night Terrors

(Screaming, sweating etc., can't link to dream, no recall in AM)

*Somnambulism and Somniloquy

(Sleep Walking ------ Sleep Talking)

*REM Sleep Behavior Disorder

(The muscles don't shut down as they should – potentially dangerous!)

‘Sleep Related Eating Disorder’

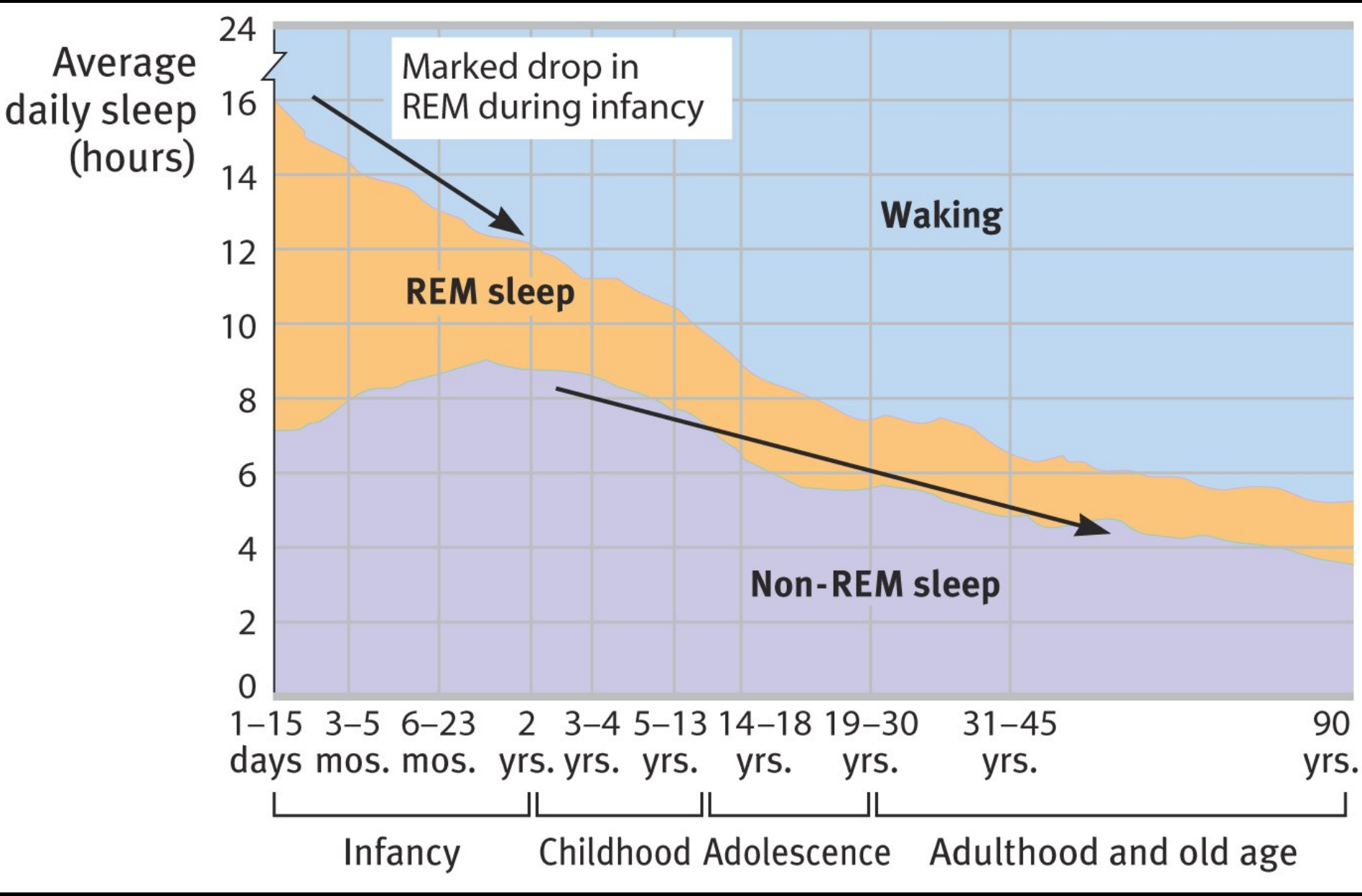
More common in females; *somnambulism* combined with compulsive eating, with no recall of the binge; some have been known to eat raw bacon, cat food, tubs of butter, “soap slice sandwiches”, etc.

A bit more on REM

"Boy are my eyes tired! I had REM sleep all night long."

REM ("**paradoxical sleep**")

- **The dream stage?**
- **Paralysis**
- Tetris (link to info processing)
- **REM deprivation (lab studies)**
- REM rebound (lab studies)
- **Babies and REM**


Average daily sleep (hours)
24
16
14
12
10
8
6
4
2
0
Marked drop in REM during infancy
Waking
REM sleep
Non-REM sleep
1–15 days
3–5 mos.
6–23 mos.
2 yrs.
3–4 yrs.
5–13 yrs.
14–18 yrs.
19–30 yrs.
31–45 yrs.
90 yrs.
Infancy
Childhood
Adolescence
Adulthood and old age

Circadian Rhythms:

“about a day”

Primary example = 24 hr. sleep/wake cycle

Table 4.1

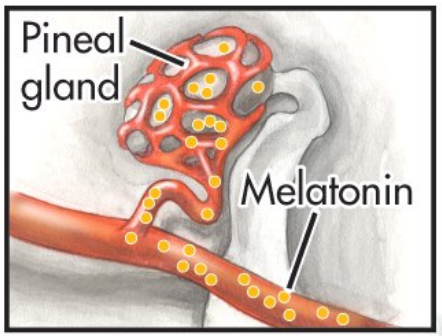
Examples of Human Circadian Rhythms

Function	Typical Circadian Rhythm
Peak mental alertness and memory functions	Two daily peaks: around 9:00 A.M. and 9:00 P.M.
Lowest body temperature	About 97°F around 4:00 A.M.
Highest body temperature	About 99°F around 4:00 P.M.
Peak physical strength	Two daily peaks: around 11:00 A.M. and 7:00 P.M.
Peak hearing, visual, taste, and smell sensitivity	Two daily peaks: around 3:00 A.M. and 6:00 P.M.
Lowest sensitivity to pain	Around 4:00 P.M.
Peak sensitivity to pain	Around 4:00 A.M.
Peak degree of sleepiness	Two daily peaks: around 3:00 A.M. and 3:00 P.M.
Peak melatonin hormone in blood	Between 1:00 A.M. and 3:00 A.M.
Peak allergic sensitivity to pollen and dust	Between 11:00 P.M. and 1:00 A.M.

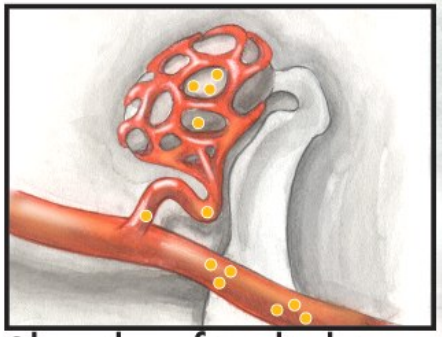
SOURCES: Campbell (1997); Czeisler & Dijk (2001); Refinetti (2000); M. Young (2000).

Remember **the hypothalamus?**

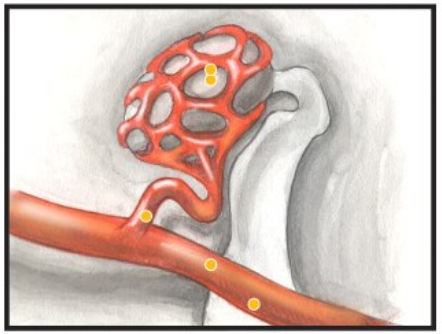
It's also a sleep control center, monitoring day/night changes, especially in a part of it called "**the suprachiasmatic nucleus**" (SCN)



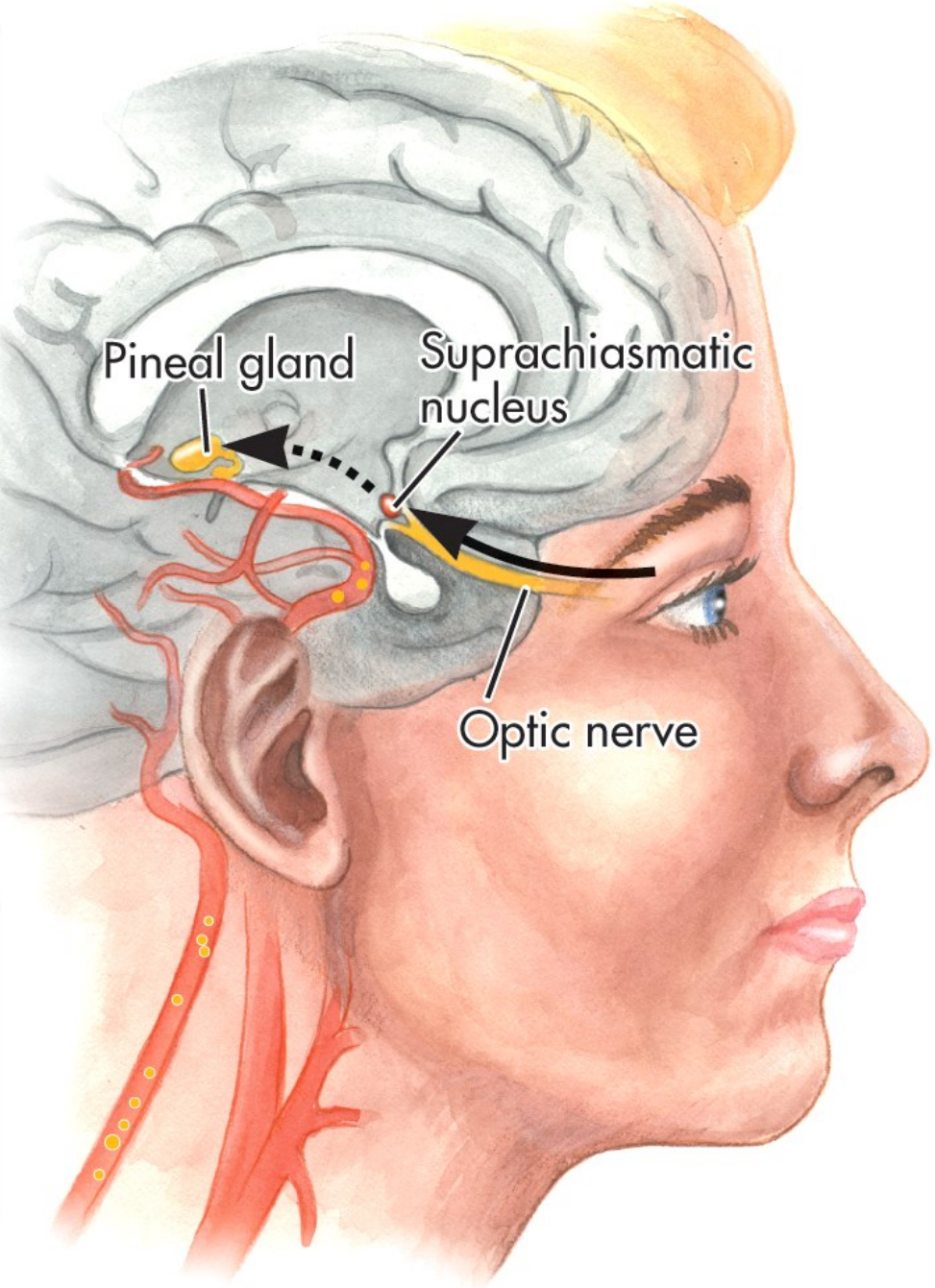
First thing in the morning



Shortly after light exposure



Later in the day



Dreaming

Why do we dream?

Is dream interpretation worthwhile?

Memory Consolidation/Information Processing Theory

Dreams help in sorting and filing info, and in strengthening some neural connections, while pruning others away

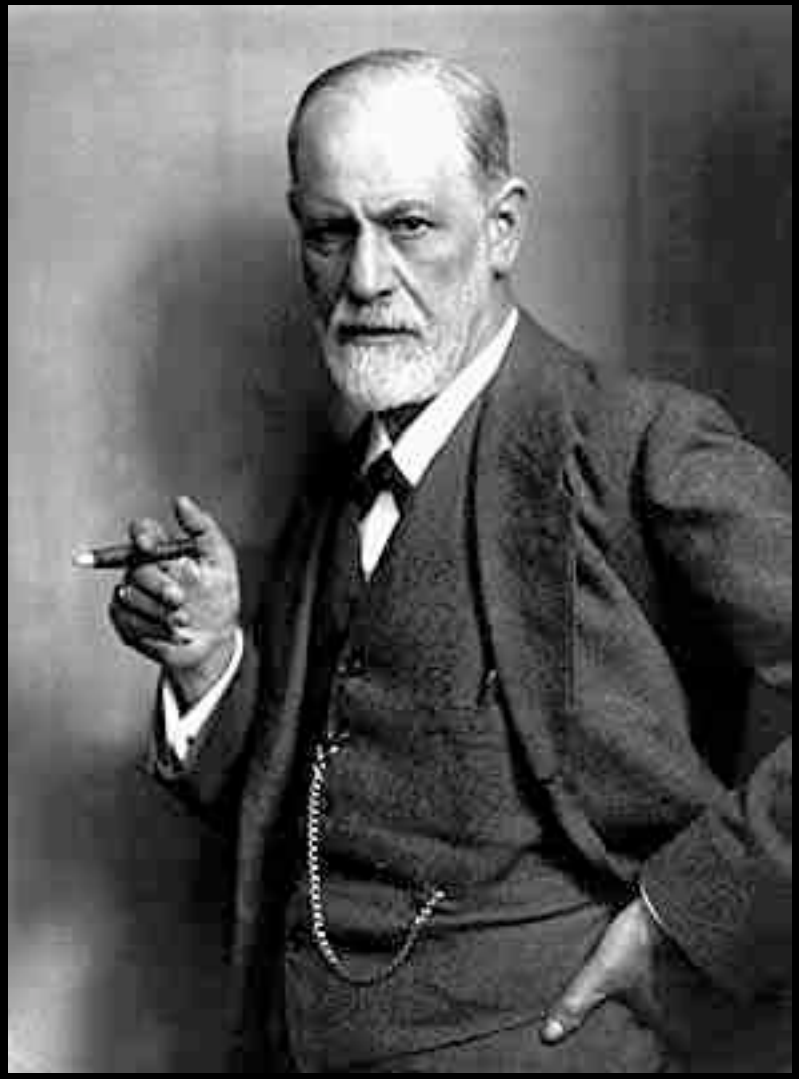
Activation-Synthesis Theory

Our brains are very active in firing electrical messages during REM, and we try to "make" those random signals into a coherent storyline

Freudian "Psychoanalytic" Theory

Our dreams are often a symbolic expression of unconscious wishes and fears and aggressive impulses

Freud & Psychoanalytic thought



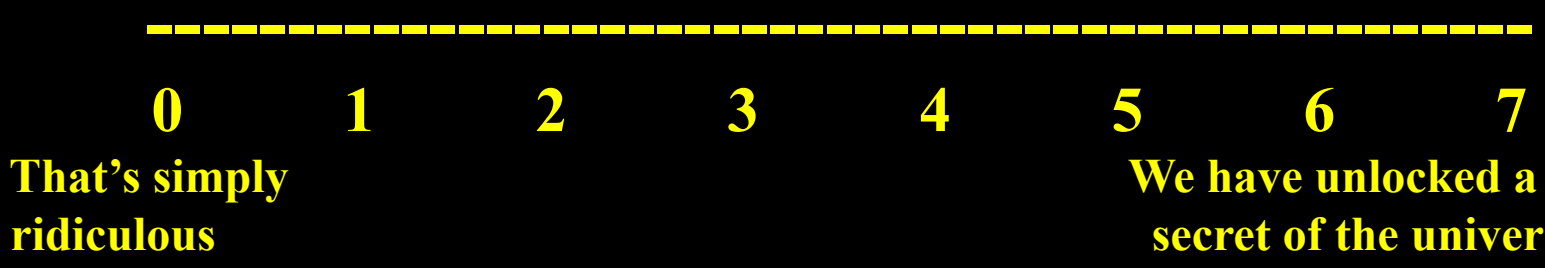
- **Wish fulfillment?**
- **"royal road to the unconscious"**
- **"Guardian of sleep"**

- **Manifest content**

- **Latent content**

Criticisms of Freud?

Hypnosis



Under hypnosis, a subject is in an "altered state of consciousness" and is thus not in control of how he or she behaves

Hypnosis: from Greek for ‘sleep’ (even though it’s not sleep!)

What is it?

* An “altered state” of consciousness?

* Simply a relaxed state of heightened suggestibility?

Hilgard’s hidden observer

Hypnosis terms

- Induction
- Hypnotizability
- Post-hypnotic suggestion
- Post-hypnotic amnesia

What is it used for?

Hypnosis and pain management?

Hypnosis and addiction control?

Hypnosis and age or memory regression?

Hypnosis as placebo effect?

Table 4.4

Help Through Hypnosis

Research has demonstrated that hypnosis can effectively:

- Reduce pain and discomfort associated with cancer, rheumatoid arthritis, burn wounds, and other chronic conditions
- Reduce pain and discomfort associated with childbirth
- Reduce the use of narcotics to relieve postoperative pain
- Improve the concentration, motivation, and performance of athletes
- Lessen the severity and frequency of asthma attacks
- Eliminate recurring nightmares
- Enhance the effectiveness of psychotherapy in the treatment of obesity, hypertension, and anxiety
- Remove warts
- Eliminate or reduce stuttering
- Suppress the gag reflex during dental procedures

Psychoactive Drugs

What factors most contribute to drug use/abuse?

Perceptual set and expectation?

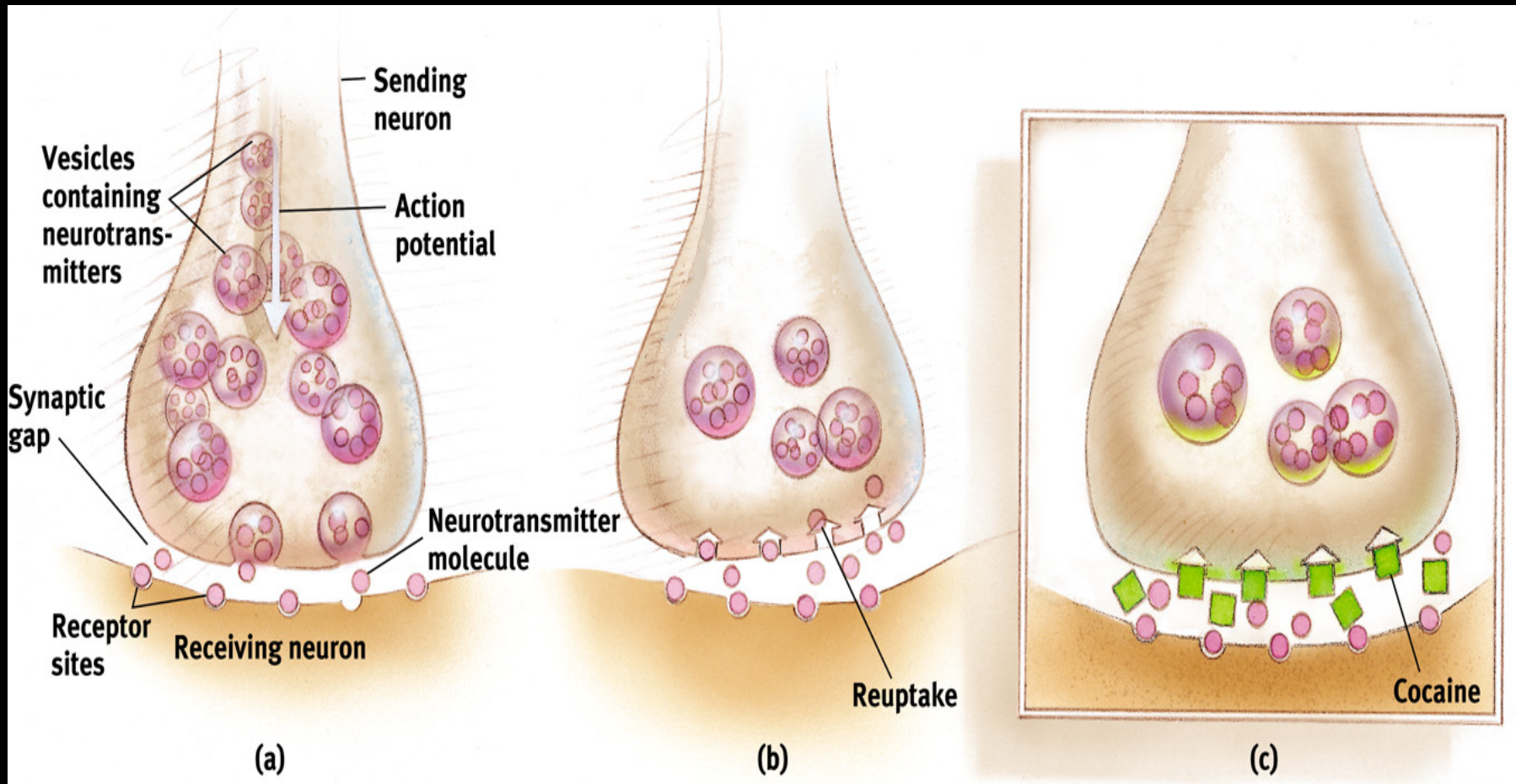
Tolerance?

Physical and psychological dependence?

Withdrawal?

The Blood-Brain Barrier?

Recall: agonists and antagonists?



Neurotransmitters carry a message from a sending neuron across a synapse to receptor sites on a receiving neuron.

The sending neuron normally reabsorbs excess neurotransmitter molecules, a process called reuptake.

By binding to the sites that normally reabsorb neurotransmitter molecules, cocaine blocks reuptake of dopamine, norepinephrine, and serotonin (Ray & Ksir, 1990). The extra neurotransmitter molecules therefore remain in the synapse, intensifying their normal mood-altering effects and producing a euphoric rush.

Stimulants

Caffeine, Nicotine, Cocaine

Ex. **Amp**hetamines

(Think “I’m amped up”?)

Suggestion:
Don’t use meth

DON’T LET DRUG DEALERS CHANGE

Depressants

Ex. Alcohol, Anti-anxiety drugs, Barbiturates

Opiates (also depressants)

Ex. Heroin, Morphine, Oxycodone

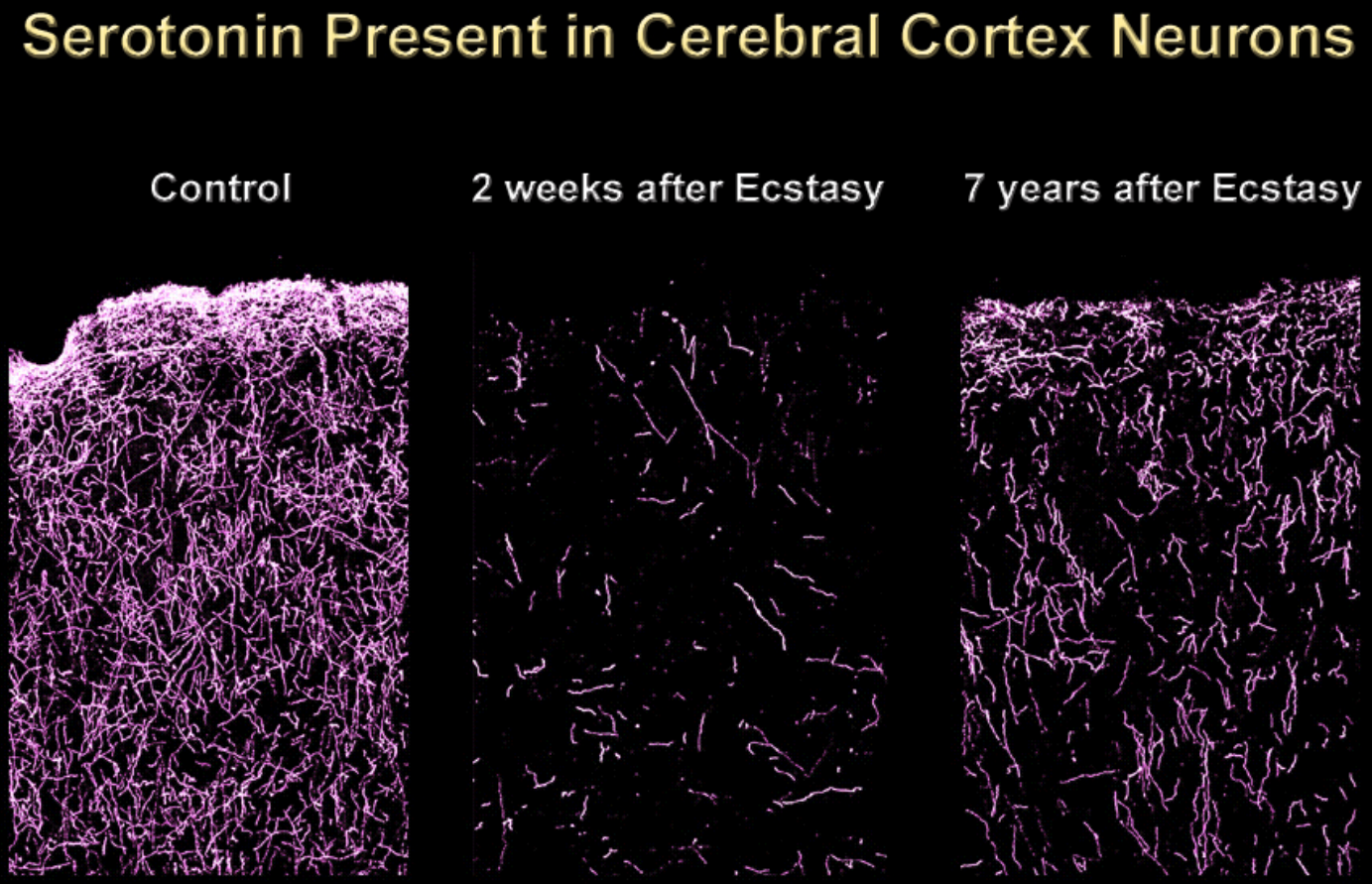
*mimick endorphins

Note: Methadone

Hallucinogens

Ex. LSD, THC

Another suggestion: don't use ecstasy



Structuralism

- Wundt and others…
- Study the structures (elements) of thought using ***introspection***

Functionalism

- William James
- Study the adaptive functions of thought

End of

“States of Consciousness”

powerpoint