Kalat’s Book
Chapter 9
Alphabetical
activation-synthesis hypothesis
activation-synthesis hypothesis

Theory that dreams are caused by the brain creating a story to explain why multiple sparsely-distributed brain regions have become activated at the same time.
alpha wave
Relaxed but conscious brain produces smooth brain waves at a rate of about 10 per second.
basal forebrain
basal forebrain

Small structures, basement (basal) of brain. The nuclei surrounding stiatum produce acetylcholine; involved in learning, memory, confabulation & amnesia. It’s nitric oxide production may impact sleep. The nuclei that surround hypothalamus release GABA; needed for sleep.
brain death
brain death

Nonresponsive to stimulation, no brain activity (including brainstem); 24 hours before death pronounced.
clinico-anatomical hypothesis
clinico-anatomical hypothesis

Theory that dreams are hallucinations caused by lack of prefrontal regulation and visual info. There is no override to spontaneous activity in occipital, parietal and temporal lobes.
coma
coma

Comatose. Extended unconsciousness, little brain activity or response to stimuli. Unable to move; appear to be asleep. Result of drug poisoning or lack of oxygen.
endogenous circadian rhythm
endogenous circadian rhythm

Internal clock for daily activities; includes eating, body temperature, mood, sleepiness and sensitivity to drugs.
endogenous circannual rhythm
endogenous circannual rhythm
A built-in seasonal calendar for yearly activities; includes mating seasons, readiness to fly south, etc.
insomnia
insomnia

Difficulty getting or staying asleep. Causes include discomfort (noise, temperature, pain), compulsive thinking (worry, stress, anxiety), neurological disorders (brain tumors, Parkinson’s, epilepsy) and changes in schedule, circadian rhythms and jet lag.
jet lag
jet lag

Desynchronosis. Result of rapid travel across time zones. Circadian rhythms are out of sync. Takes 1 day per time zone to recover.
K-complex
K-complex

Characteristic of the 2nd stage of NREM sleep. Sharp spikes; quick negative one, following by slower positive one. Occurs less thru night.
locus coeruleus
locus coeruleus

Nucleus in pons. Primary synthesizer of norepinephrine. Usually inactive while sleeping; important for memory, mediates sympathetic system during stress.
melatonin
melatonin

Synthesized in pineal gland and released into blood. Has less impact on sleepiness than on circadian rhythms & leptin regulation.
minimally conscious state
minimally conscious state

More likely to recover than vegetative state. Intermittent periods of purposeful acts (gestures, following simple commands, appropriate smiling).
narcolepsy
narcolepsy

Sudden daytime sleepiness (dangerous if driving). Cataplexy (strong emotions make muscles weak), reduced orexin, and rapid falling into REM sleep. Treated with stimulants.
night terrors
night terrors

Disruption during stage 3 of NREM sleep. Suddenly aroused from delta wave sleep (slow waves) or from daytime naps; fear and anxiety. Uncommon (1-6%) in children, less in teens, less in adults.
NREM sleep
NREM sleep

Non-rapid eye movement sleep. Three stages of sleep before REM stage. No dreaming, little eye movement, skeletal muscles aren’t paralyzed. Sleepwalking is the result of getting stuck in NREM.
orexin
orexin

Hypocretin; neurotransmitter produced in hypothalamus. Stimulates activity, arousal and appetite (particularly at onset of meals). Absent in those with narcolepsy.
paradoxical sleep
paradoxical sleep

Rapid eye movement sleep (REM).
periodic limb movement disorder
periodic limb movement disorder

Involuntary limb movements during sleep (mostly NREM). Disturbs sleep, causes insomnia. Can be treated with tranquilizers.
PGO waves
PGO waves

Ponto-geniculo-occipital waves. Prior to REM sleep, electrical pulses begin in pons, move to LGN and then to occipital cortex.
pineal gland
pineal gland

Pineal body or third eye. Endocrine gland, shaped like a pine cone, synthesizes the hormone melatonin from serotonin. Melatonin doesn’t make you sleepy but regulates sleep cycles.
polysomnograph
polysomnograph

Sleep study. Multichannel recording to diagnose sleep disorders. Electrodes are attached to scalp, electrical potential between sensors are measured with EEG (electroencephalograph). Video & motion detectors record body & eye movements.
pontomesencephalon
pontomesencephalon

Part of reticular formation. Involved in arousal and alertness.
REM sleep
REM sleep

Rapid eye movement sleep; paradoxical sleep. Have lack of movement (like stage 3) but extensive forebrain and midbrain activity (like being awake. For adults ~20% of a night’s sleep; ~80% for newborns.
REM behavior disorder
REM behavior disorder

Don’t have the muscle paralysis typical of REM sleep (pons doesn’t inhibit spinal motor neurons). Instead of lying perfect still, show leg twitches, vigorous movement or acting out dreams.
reticular formation
reticular formation

Dozens of small neural networks; behind the pons, in front of the cerebellum and above the medulla. Filters incoming signals, differentiates foreground-background, maintains arousal, and regulates wake-sleep cycles.
sleep apnea
sleep apnea

Breathing stops while sleeping. Lack of oxygen can lead to difficulties in attention, learning, heart problems, & impulse control.
sleep spindle
sleep spindle

Characteristic of the 2nd stage of NREM sleep. Sudden half-second burst of waves; occur most at beginning and end of sleep cycle. May help hippocampus reset.
slow-wave sleep (SWS)
slow-wave sleep (SWS)

Occur in stage 3 of NREM sleep. Deep sleep. High-amplitude delta waves. Difficult to arouse during this period.
suprachiasmatic nucleus
suprachiasmatic nucleus

SCN. Located in hypothalamus; controls sleep and temperature rhythms. Reset by light intensity sensors in retina (retinohypothalamic path).
vegetative state
vegetative state

Alternates between sleep & moderate arousal. Show no awareness of surroundings, no purposeful actions.
zeitgeber
zeitgeber

German for time giver; stimuli used to reset internal clock. Although noise, temperature can have an impact, light works best (such as retina to SCN path).