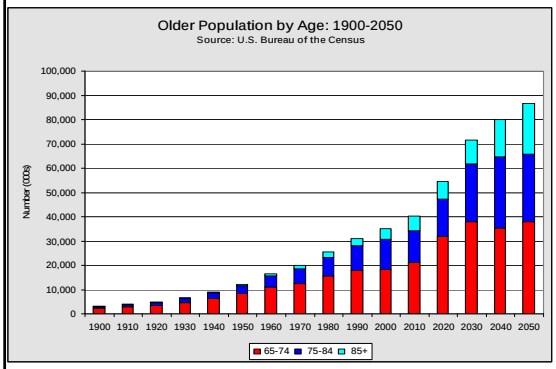
Geriatric Sleep in Long Term Care- Can We Get Better ZZZs?

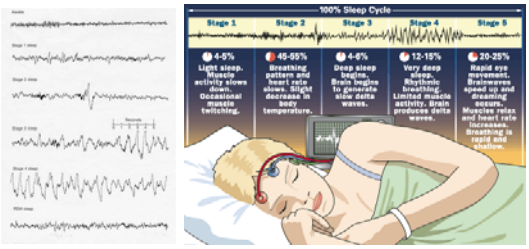
Timothy Juergens MD
Department of Veterans Affairs/University of Wisconsin School of Medicine and Public Health
VA Sleep Program Director, UW Geriatric Psychiatry Fellowship Director

Objectives

- 1. What are sleep changes that occur with aging?
- 2. What are many things that can 'go wrong' and impact sleep, including common sleep disorders and secondary sleep disorders?
- 3. What is different in people with dementia?
- 4. What are disruptive factors that prevent sound sleep?
- 5. What interventions may improve sleep?



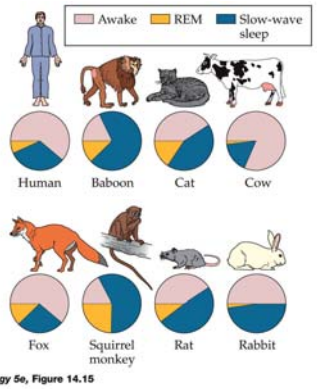
Aging and Sleep- Stages in Adult



Aging and Sleep- Sleep Stages Young Versus Elderly

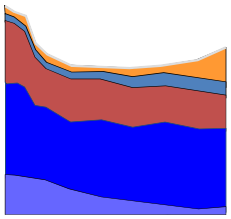
- In normal young adult
  - Total Sleep Time ~8 hours
    - NREM stage: 75%
      - » N1: Stage 1: 5%
      - » N2: Stage 2: 45%
      - » N3: Stage 3: 12%
      - » N3: Stage 4: 13%
    - REM stage: 25%
- In normal elderly adult
  - Reduction in total sleep time, slow-wave sleep (N3) and REM sleep
  - Decrease ability to maintain sleep

Figure 14.15 Amounts of Different Sleep States in Various Mammals



Biological Psychology 5e, Figure 14.15

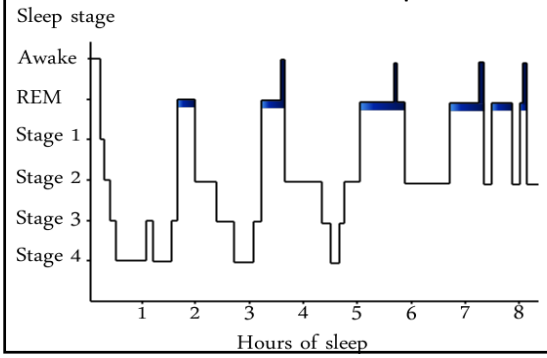
Sleep Across the Life Span

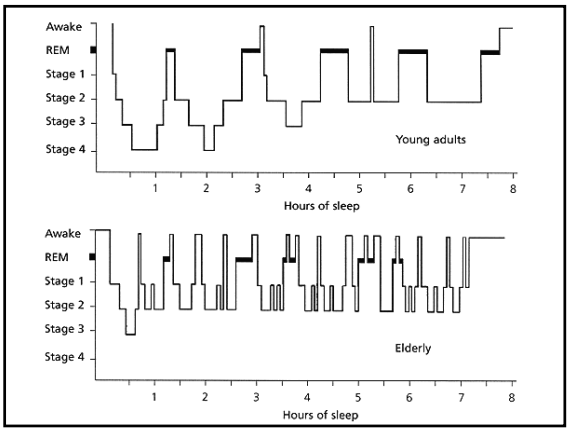


Changes in Sleep with Aging

• Total sleep time	Decrease
• Sleep efficiency	Decrease
• Awakenings/arousals	Increase *
• Sleep latency	Increase
• Slow wave sleep	Decrease*
• REM latency	Decrease
• Day napping	Increase
• Day sleepiness	Increase

Normal Adult Sleep

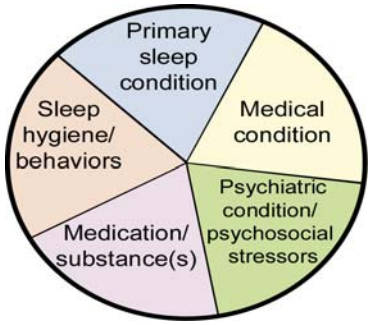




Aging and Sleep

- As we age, many common sleep disorders become more common (circadian rhythm disorders, sleep disordered breathing, limb movement disorders).
- As we age, secondary sleep disorders become more common, by the nature of greater odds of having more of those potentially contributing conditions (pain, urinary symptoms, heart/lung disease…).

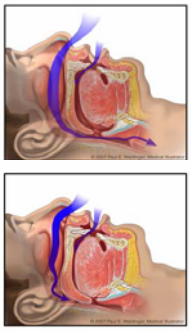
Causes of Sleep Problems in Elderly

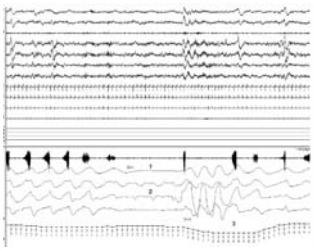


Sleep and Aging-
Primary Sleep Conditions

- Insomnia
- Sleep Breathing Disorders
- Movement disorders (PLMS-periodic limb movements of sleep, RLS-restless leg syndrome), and RBD-REM sleep behavior disorder
- Circadian Rhythm Disorders
- Narcolepsy-much less common

Sleep Disordered Breathing





Aging and Sleep
Common Medical Conditions

- Pain (arthritis, osteoporosis, cancer)
- Urinary symptoms
- GERD- heart burn/reflux
- Lung disease (COPD, asthma)
- Heart disease (heart failure, vascular disease, hypertension)
- Medications/treatments (radiation/chemo)

Sleep and Dementia

- All of the common things that disrupt sleep in normal aging are there. Often more meds too, more psychiatric conditions.
- Additionally, circadian rhythm disruption is even more common.
  - This often presents with further fragmentation of the sleep wake cycle (so awake some at night, and sleeping some in day), as well as sundowning.
  - Mechanism: Likely related to neurodegeneration in the SCN (suprachiasmatic nucleus– central clock/pacemaker).

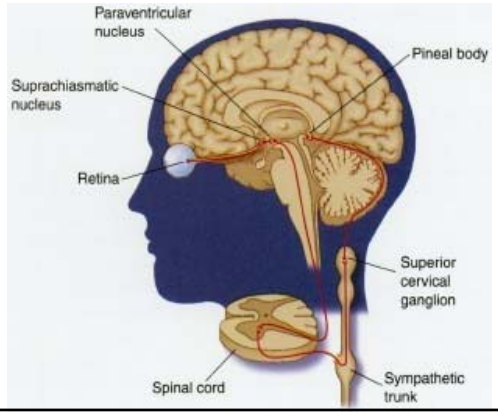
Disruptive Factors that Prevent Sound Sleep

- Aging (and worse in neurodegenerative conditions) impacts to decrease the ability to sustain continuous deep sleep.
- Circadian Rhythm disruptions, usually in the form of less amplitude (less strong) and different pattern (less consistent rise of melatonin in evening, drop in night).
- Environmental factors which influence both

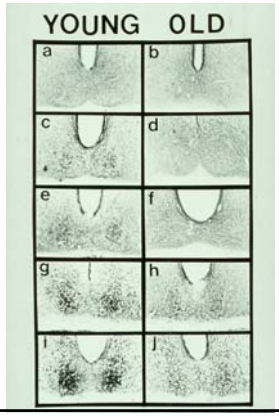
Sleep – Neural plasticity

Feinberg, 1983

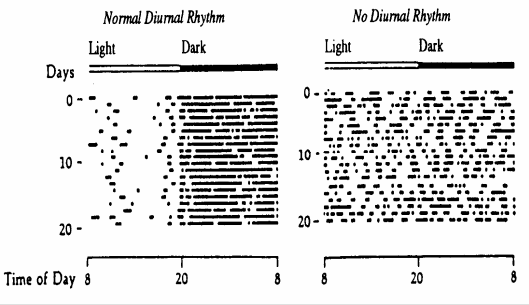
- Change of delta wave amplitude during SWS by age (upper panel)
- Estimated number of synaptic density and age (lower panel)
- Estimated number of synaptic density increases during time of growth and will be reduced during ageing, paralleling SWS activity.



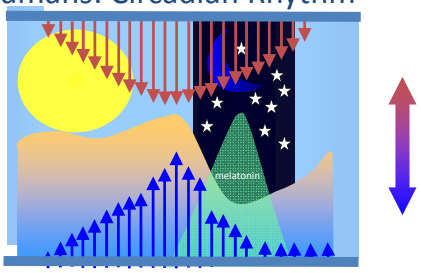
Suprachiasmatic Nucleus Neurons



Circadian Rhythms Following SCN Lesion



Normal Sleep/Waking Regulation in Humans: Circadian Rhythm



Sound Sleep Potential Disruptions-Environmental

- Noise during sleep time, at awake time
- Light during sleep time, at awake time
- Timing of bathing, meals, staffing situation
- Location of sleep versus wake activities
- Body position in sleep versus wake activities

Interventions

- 1. Work to really strengthen to degree possible the circadian component of sleep at sleep time. This MAY involve changing expectation if physiologically the body is not able to produce the 'desired' sleep all night, up all day pattern.
  - Light exposure timing
  - Scheduled timing of social activities/interactions
  - Scheduled timing of meals in relation to sleep time
  - ?temperature manipulation/?melatonin

Interventions

- 2. To degree possible, increase homeostatic drive to sleep at night (sleep deprivation component we each have each day).
  - Timing and duration of daytime naps
  - Physical activity
  - Mental activity/stimulation/learning

Interventions

- 3. Environment
  - Light/noise/timing of activities/other people's noise
  - As creatures of habit/patterns, making sleep environment different from wake environment, which increases cues that time to sleep.
    - Out of bed
    - Upright
    - Lighting/activity level

Intervention Conclusions

1. Address the common things that occur for people related to aging.
2. Pay particular attention to circadian rhythm disturbances.
3. Consistent behaviors/activities and environments help as far as cues to the brain and body.
4. Think of sleep as 24 hour a day issue, not only about what happens when the sun goes down.