Age-related Changes in pattern of Daily Sleep
Sleep-wake disorders

Dyssomnias

1. Circadian Rhythm Sleep Disorders
2. Intrinsic Sleep Disorders
   1. (Disorders that either originate or develop from within the body)
3. Extrinsic Sleep Disorders
   1. (Disorders that either originate or develop from causes outside the body)
4. Parasomnias
   1. (Disorder of arousal, partial arousal or sleep stage transition)

The synaptic homeostasis hypothesis of sleep

The SHH posits that synapse accumulation during the day drives a need for synaptic downscaling, which preferentially occurs during sleep.
Dramatic changes in sleep duration
(Western cultures, USA)

As sleep time fell in USA, average weights rose
Kripke 2002; Keith 2006; Lauderdale 2006

Hypnic jerks = Sleep starts

• One or two abrupt myoclonic flexion jerks, often accompanied by a feeling of falling

• Cause:
  – Insufficient sleep
Hypnic hallucinations

- Occur at sleep onset
- Vivid perceptual experiences
- Sensation of hearing voices
- Feeling someone else is nearby
- Precipitated by
  - Sleep deprivation
  - Excessive caffeine
  - Emotional stress
  - Narcolepsy

Sleep talking

- 50-80% of children
- 5% of Adults
- 50% sleep talk only a few times per/year
- 10% sleep talk nightly
- Risk increases with:
  - Sleep deprivation
  - Stress
  - Sickness (fever)
  - Medications
  - Family History
Sleep Paralysis

- Transient inability to move, despite being fully awake
- Brief persistence of atonia of REM lingering into wakefulness
  - 40% of teens and college students
  - 10% of adults
- Triggered by sleep deprivation

Sleep Terrors

- 40% children
- 2% adults
- Individuals are:
  - 95% family history
  - 3-5 times more likely to have OSA
  - Have nightmares > once/month
  - Prone injury-causing behaviors during sleep
**Violent Behavior During Sleep (VBS) 1.**

- VBS occurs in 1.6% of adults
- VBS: Range from simple dream enactment to complex behaviors
- VBS:
  - Risk factors:
    - Family member with VBS
    - Age < 35
    - Sleep deprivation
    - Stress
    - Alcohol

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**Violent Behavior During Sleep (VBS) 2.**

- Occur in the first 2 hours of sleep
- 79% of people have vivid dreams
- 31% hurt themselves or someone else
- Few people consult a physician

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Scucs et al, Medical Hypotheses 2014
Ohayon et al, Sleep Medicine 2010

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Sleepwalking 1.

UK - 4924 adults
- 4% sleep walked at least twice a year
- 40% lifetime prevalence
- Highest incidence is ages 4-8
- Sleepwalking generally stops by age 13

US - 19,136 adults
- 3% reported nocturnal wandering at least once in the previous year
- 30% lifetime prevalence
- 30% had a relative who had nocturnal wandering
- 1% reported at least two nocturnal wanderings in the previous month

Ohayon, Neurology 2012
Pressman, Neurology 2013

Sleepwalking 2.

- Occurs in NREM III
- Patients arise from bed, walk toward a sound or light
- Sleepwalkers may run through the house
- Behavior is often followed by a calm return to bed, or lying down somewhere else in the house

- Patients appear confused
- Eyes are open, but objects are misidentified
- Patients are slow to respond
- Patients are difficult to arouse
- Patients often suffer retrograde amnesia

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Sleepwalking 3.

- New onset or late recurrence in teenage years warrants consideration of other primary sleep disorders
  - Sleep deprivation
  - Extreme fatigue
  - Obstructive sleep apnea
  - RLS
  - RBD
  - Infections

- Stressful life events often precipitate sleepwalking
  - Changes in sleep environment
  - Family conflicts
  - Personal conflicts
  - Medications

Sleep bruxism

- Teeth grinding during sleep
- 30-40% of children
- 8% of young adults
- Symptoms of tooth-grinding noises, jaw muscle discomfort, abnormal wear of teeth on dental exam
- Risk factors
  - Emotional stress
  - Caffeine
  - Type A personalities

Masuko et al, BMC Research Notes 2014
Sleep Paralysis

- Has been reported to occur in families
- Treatment
  - SSRIs can be effective when frequent and bothersome
  - Key: sleep one more hour!
  - Move wake up time beyond REM sleep

Nightmare disorder

- Long, involved frightening in REM sleep
- Preceded by increased heart rate, increased respiration, increased REM
  - 10-15% of children ages 3-6
  - 20-40% children overall
  - 5-12% adults
- May be caused by a daytime traumatic experience, medications, or disruption in routine
Nightmare Disorder

- Reduced movement during sleep
- Freezing:
  - Heightened anxiety consistent with the suppression of movement exhibited by animals under conditions of perceived threat
- Treated
  - Reassurance
  - Medications that decrease REM sleep

Insomnia vs. Sleep Deprivation

- **Sleep Deprivation**
  - Adequate ability to sleep
  - Inadequate opportunity
  - Generally sleepy, at risk for accidents
- **Insomnia**
  - Inadequate ability
  - Adequate opportunity
  - Generally not sleepy
  - May report fatigue
What is Insomnia?

• Classified as the inability to get enough sleep despite adequate time.
• Symptoms Include:
  – Delayed Sleep Onset
  – Early Morning Wake-Ups
  – Unrefreshing Sleep
  – Trouble Maintaining Sleep
• Causes many problems in daytime functioning

Classifications of Insomnia

• Primary vs. Secondary
• Chronic vs. Acute
Acute Insomnia

- Insomnia fewer than 3 times a week for less than a month
- Stems from changes in the environment and a short illness

Chronic Insomnia

- More than 3 times a week for a period longer than a month
- comorbid insomnia
### Treatment of Sleep Disorders

- Good Sleep Hygiene
- Medications
- Psychotherapy, stress management
- Relaxation techniques
- OSA treatment
  - Mouth appliance
  - Surgery-tonsils and/or adenoids
  - Weight reduction if obese
  - CPAP-Continuous positive airway pressure
Pharmacological treatment

• 4 Classes of Prescription Agents
  – Benzodiazepines
  – Benzodiazepine Receptor Agonists
  – Melatonin Receptor Agonists
  – Antidepressants/Antipsychotics

• Some supplements are thought to help as well

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