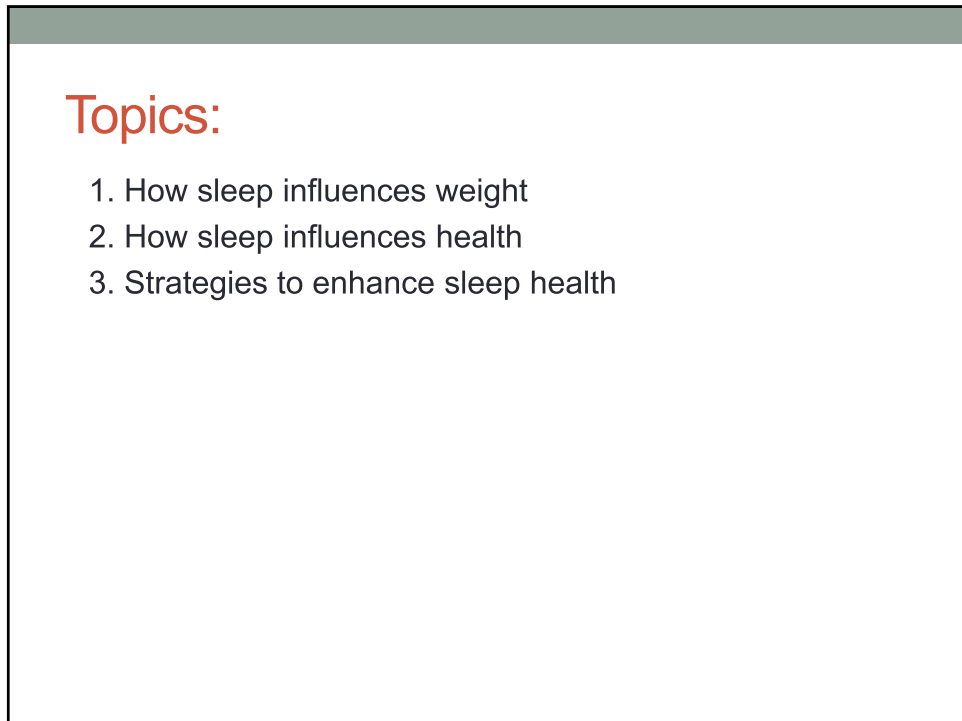


1



2

## Human Sleep....A lot!

- Humans (ideally) spend about a third of our lives sleeping
- Sleep is a critical period of recovery and activity that supports cardiovascular, neurologic, metabolic, and other life functions



3

## How does sleep impact weight?

- Insufficient sleep:
  - Increase in energy intake
    - Increase in snacks, meal size, night-time eating
  - Poorer food choices
    - Higher intake of fast foods, sugar, and fats
    - Lower intake of fruits and vegetables
  - Impacts hunger hormones
    - Increase in ghrelin (stimulates hunger)
    - Decrease in leptin (reduces appetite)



4

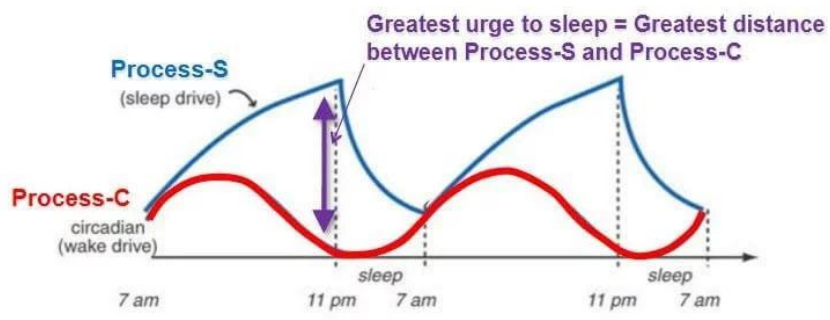
## How does sleep impact health?

### Poor sleep impacts:

- Immune function
- Tissue healing
- Pain modulation
- Cardiovascular health
- Cognitive function
  - Thinking ability, learning, and memory
- Metabolic and endocrine functions
  - Obesity and diabetes
- Mood
  - Depression and anxiety



5

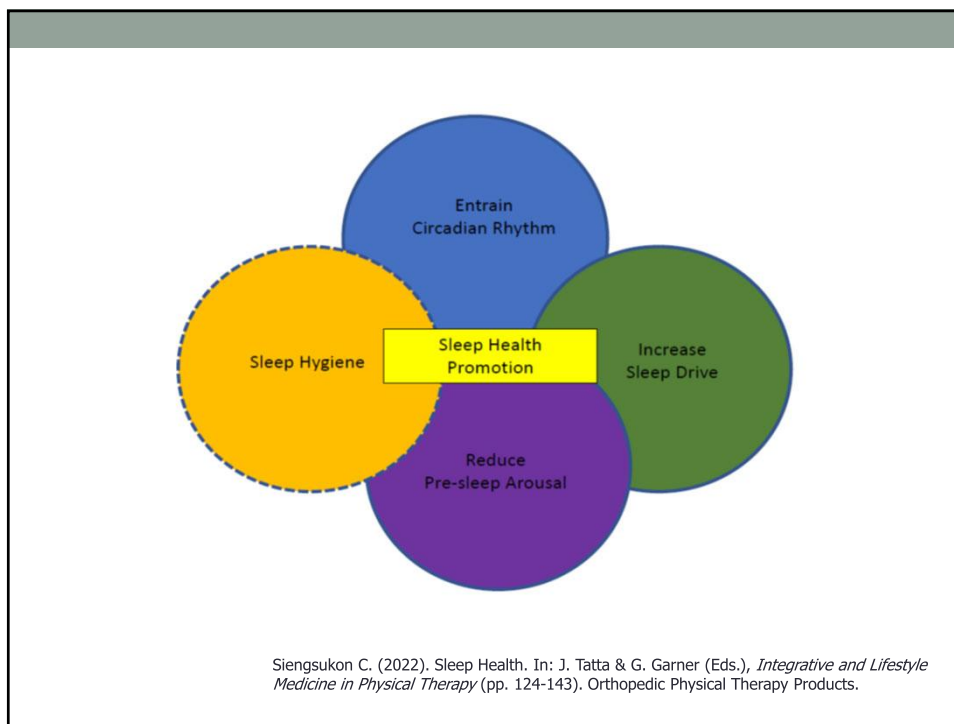


Process C: circadian rhythm (suprachiasmatic nucleus)

Process S: sleep homeostasis (accumulation of sleep-promoting substances such as adenosine)

<https://sleepjunkies.com/two-process-model/>

6



7

- Wake up same time ( $\pm 1$  hr) every day
  - If have regular wake time, regular bedtime will emerge
    - Go to bed when sleepy enough to fall asleep easily (within  $\sim 15$  min) (stimulus control)
  - Strategies: Alarm(s), schedule morning activity, "reward", support of partner
- Exposure to light (light = wake; dark = sleep)
  - Mornings: Expose self to light upon awakening (sunlight ideal, but turning on lights if sunlight not possible)
  - During day: expose self to sunlight
  - Near bedtime: dim lights, avoid electronics held close to face
  - Bedroom: make as dark as possible (while maintaining safety)
    - UNLESS have shifted circadian rhythm
- Regularity of other activities (meals, exercise)

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8

Entrain Circadian Rhythm

Increase Sleep Drive

Reduce Pre-sleep Arousal

Sleep Hygiene

Sleep Health Promotion

- Stimulus control (bed = sleep)
  - Use bed for sleep and sex only
  - Leave bed if unable to fall asleep within **what feels like** 15-20 min OR if begin to feel upset/anxious not asleep (avoid watching clock)
    - Leave bed/bedroom
    - Go to "cozy nest"
    - Do mildly pleasant/distracting/min effort activity (ie. listen to book or music, relaxation techniques)
    - Return to bed when sleepy
    - Repeat as needed
- Have a plan!
- Why??
  - Increase sleep drive
  - Associate bed with sleep
  - Eliminate sleep effort
- If concern re fall risks or mobility limitations, perform distraction IN BED for safety

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9

Entrain Circadian Rhythm

Increase Sleep Drive

Reduce Pre-sleep Arousal

Sleep Hygiene

Sleep Health Promotion

- Physical Activity
  - ↑ deep sleep, total sleep time, sleep quality
  - ↓ time it takes to fall asleep, medication use
  - "Exercise is good, regardless of time of day." (National Sleep Foundation, 2013)
    - Avoid vigorous exercise within 1 hour of bedtime
  - Meditative movement (tai chi, qi gong, yoga) appears to improve sleep quality in a variety of populations

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10

- Avoid/limit naps
  - If need to nap, limit to <30 min & avoid napping in evening
- If nap, may need to delay bedtime
- Rest break ≠ Nap; set timer/alarm

**Sleep Drive**

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- Develop relaxing bedtime routine (train brain what comes next is bed = sleep)
  - Be consistent; short & sweet
  - Ex: Warm bath/shower, reading, meditation, mindfulness, yoga, relaxation technique, journaling
- Daytime relaxation techniques (day is 24 hrs!)
  - Practice, practice, practice; be consistent
  - Examples:
    - Deep breathing (5-7-8 breathing)
    - Progressive muscle relaxation
    - Mental imagery
- Mindfulness
- Journaling (to-do list, gratitude, process events from day, plan, etc)
- Get off screens 1-2 hours before bedtime
  - Blue light emitted from electronics disrupts melatonin production
  - Content can be stimulating
  - Time suck
- Referral as needed (psychologist, counselor)

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12

Entrain Circadian Rhythm

Increase Sleep Drive

Reduce Pre-sleep Arousal

Sleep Hygiene

Sleep Health Promotion

- Avoid caffeinated foods/drinks at least 4 hours before bedtime
  - Caffeine is stimulant
  - Check drink/food labels (tea, chocolate, drinks)
  - Some medications (weight-loss, pain relievers)
  - Half-life of 5-7 hours
  - De-caffeinated ≠ non-caffeinated
  - As age, takes longer for liver to remove caffeine
- Refrain from smoking (stimulant) at least 3-4 hours before bedtime
- Avoid/limit alcohol consumption
  - Alcohol may help with relaxation before bedtime, but can increase the number of nighttime awakenings

Siengsukon C. Sleep Health. In: Tatta J, Garner G, eds. *Lifestyle Medicine in Physical Therapy*. Orthopedic Physical Therapy Products; anticipated 2022.

13

Entrain Circadian Rhythm

Increase Sleep Drive

Reduce Pre-sleep Arousal

Sleep Hygiene

Sleep Health Promotion

- Avoid eating a large meal or spicy food 2-3 hours before going to bed
  - Digestive system slows down while sleeping which can stimulate acid secretions that cause heart burn
  - A light snack may be helpful if hungry
- Avoid excessive liquid 2-3 hours before bedtime
  - BUT avoid being dehydrated!
  - Make using bathroom as safe and easy as possible (also for stimulus control):
    - Bed mobility; gait training
    - Fall prevention:
      - Lamp within reach to switch on easily
      - Dim or motion-activated night-lights in hallway and bathroom
      - Assistive device
      - Remove obstacles or rugs

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- Make sleeping environment as comfortable and relaxing as possible
- Avoid light
  - Use light-blocking curtains, eye mask, cloth if needed
- Avoid disturbing noises
  - Use ear plugs, white noise machine
- Keep the temperature comfortable (~65°F general recommendation)
  - Being too warm or cold may disturb sleep
- Comfortable and supportive pillow and mattress

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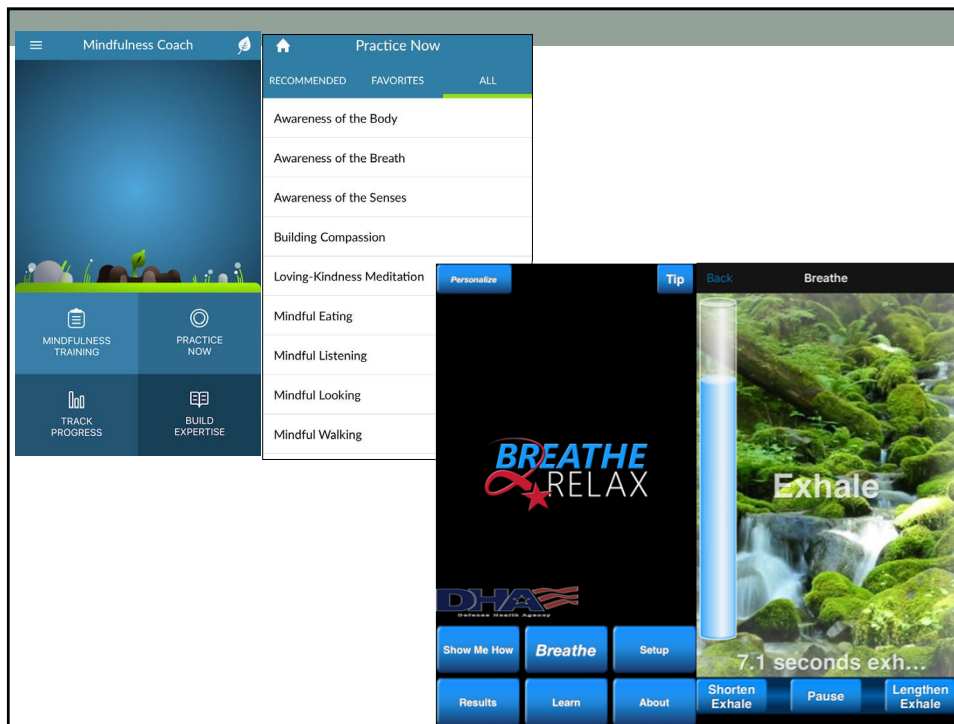
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**Insight Timer**

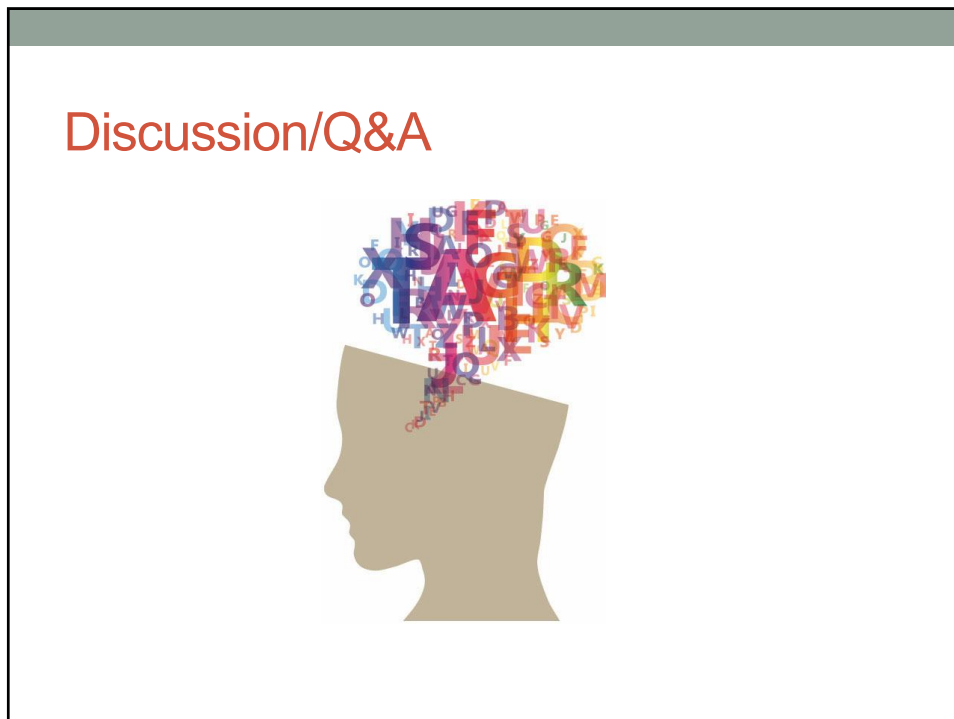
**Insomnia Coach**

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