

Insomnia in the Context of Stress & Trauma

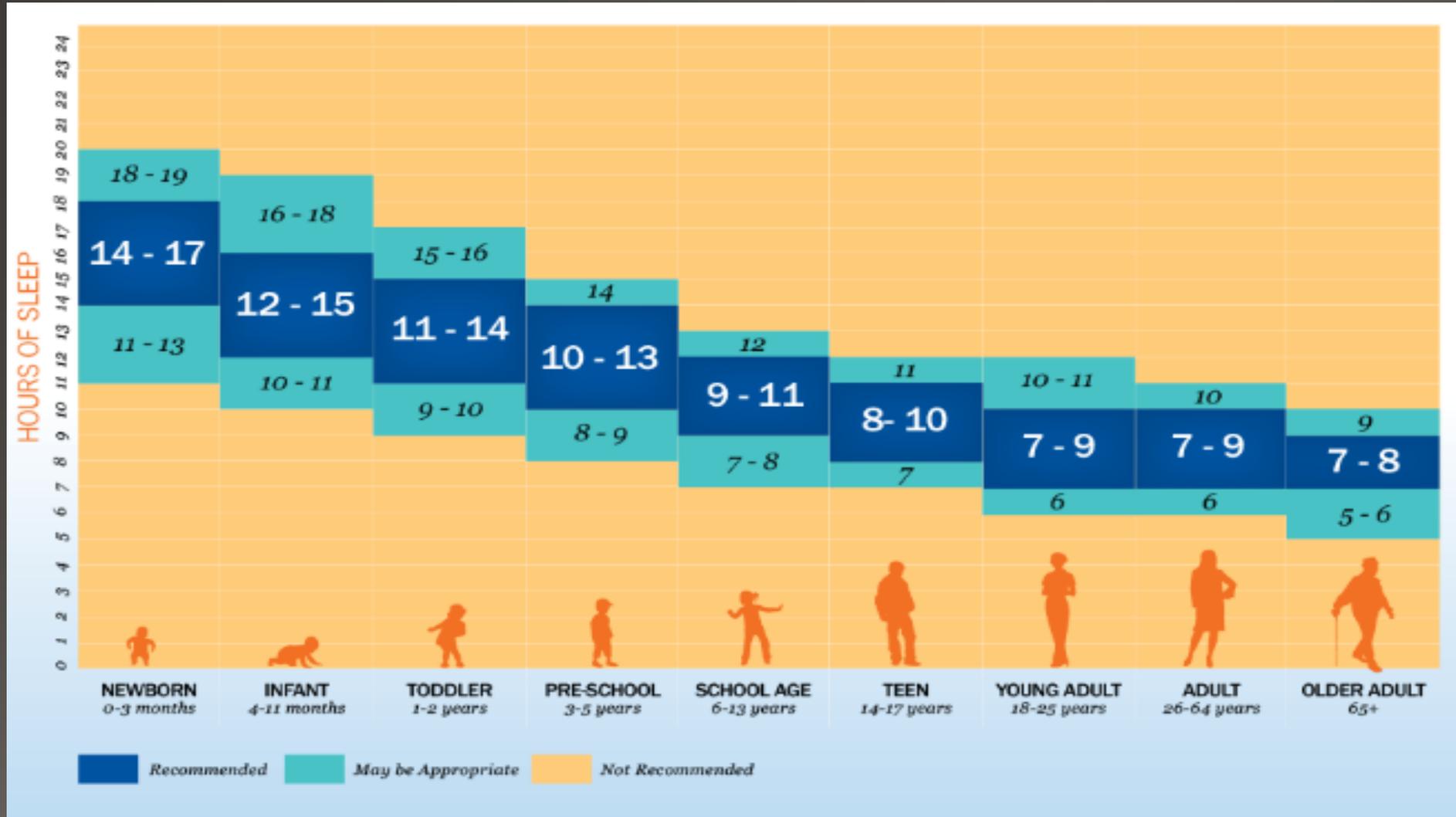
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Agenda

- Understanding Sleep
 - How does sleep work in our bodies?
- Stress and Sleep
 - Stress and Relaxation Responses
- Relaxation
 - Progressive Muscle Relaxation Activity
- Tools to Improve Sleep
 - Stimulus Control



Sleep Duration Recommendations



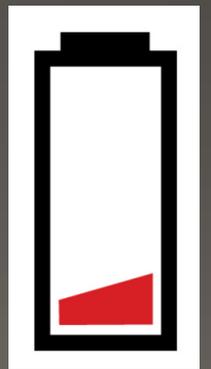
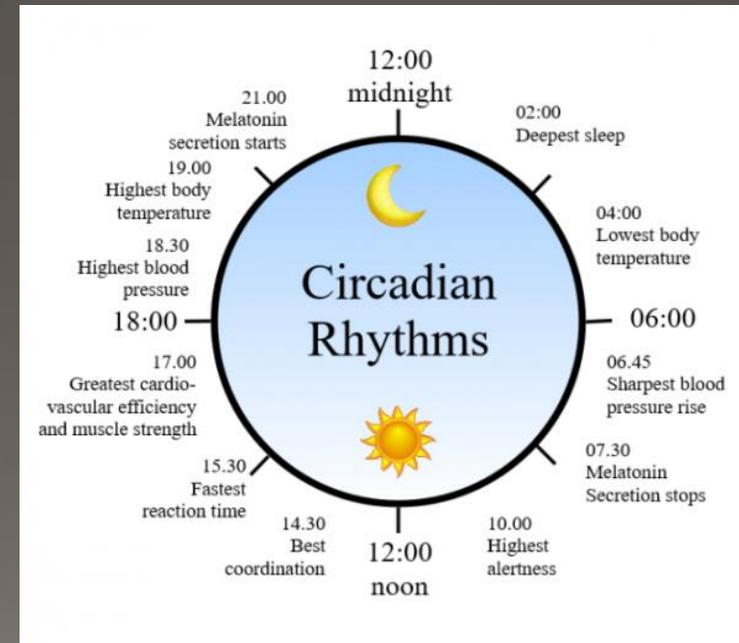
Understanding Sleep

Components of Sleep

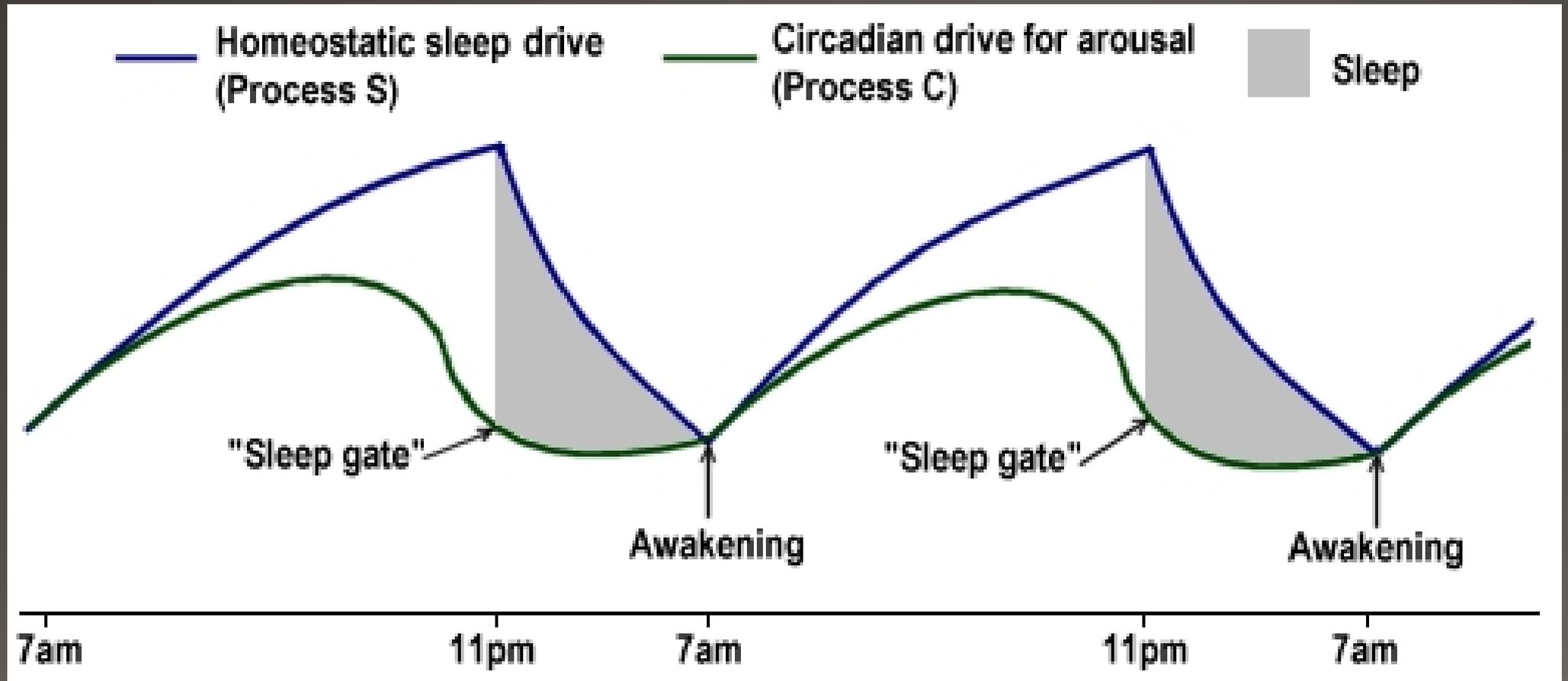
- Behavioral
 - Decreased responsiveness and interaction with external stimuli



- Biological
 - Endogenous circadian rhythm (biological clock)
 - Homeostatic process (sleep drive – battery)



Two Process Theory of Sleep



What can disrupt these processes?

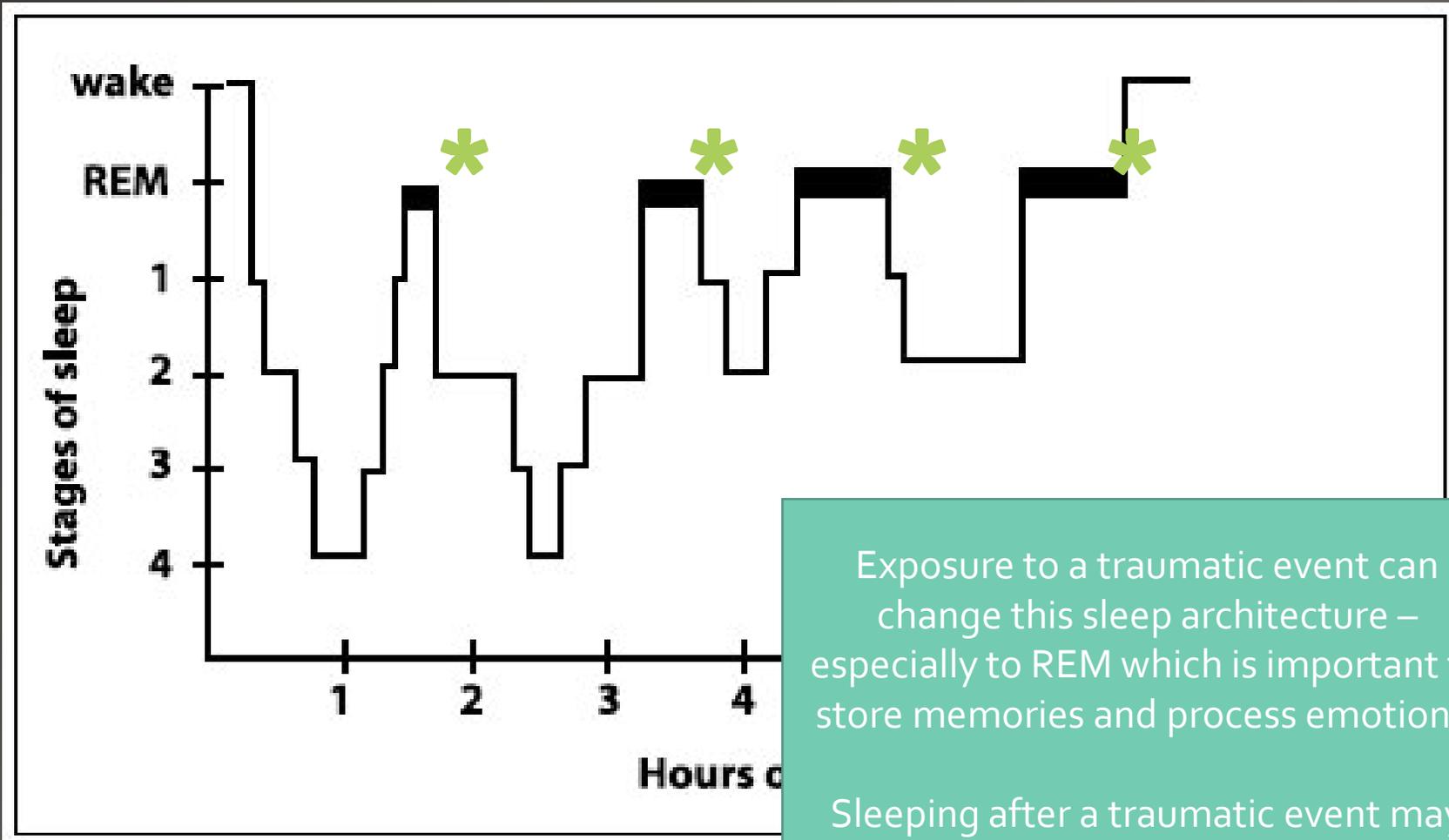
Homeostatic Sleep Drive (Battery)

- Oversleeping
- Napping
 - Teens have a slower build of “sleep pressure”
- Caffeine

Circadian Drive for Arousal (Bio Clock)

- Puberty
 - Later melatonin secretion
- Zeitgebers
 - Light, temperature, exercise, eating/drinking, social interaction
- Staying up late, sleeping in

Sleep Cycles ("Architecture")



REM Sleep

- ~25% of night
- Dream Sleep
- Sleep Paralysis

NREM Sleep

- N1-N4
- Deepest, most restorative sleep

Exposure to a traumatic event can change this sleep architecture – especially to REM which is important to store memories and process emotions.

Sleeping after a traumatic event may reduce future intrusive memories and make them less distressing.

* Brief spontaneous arousal

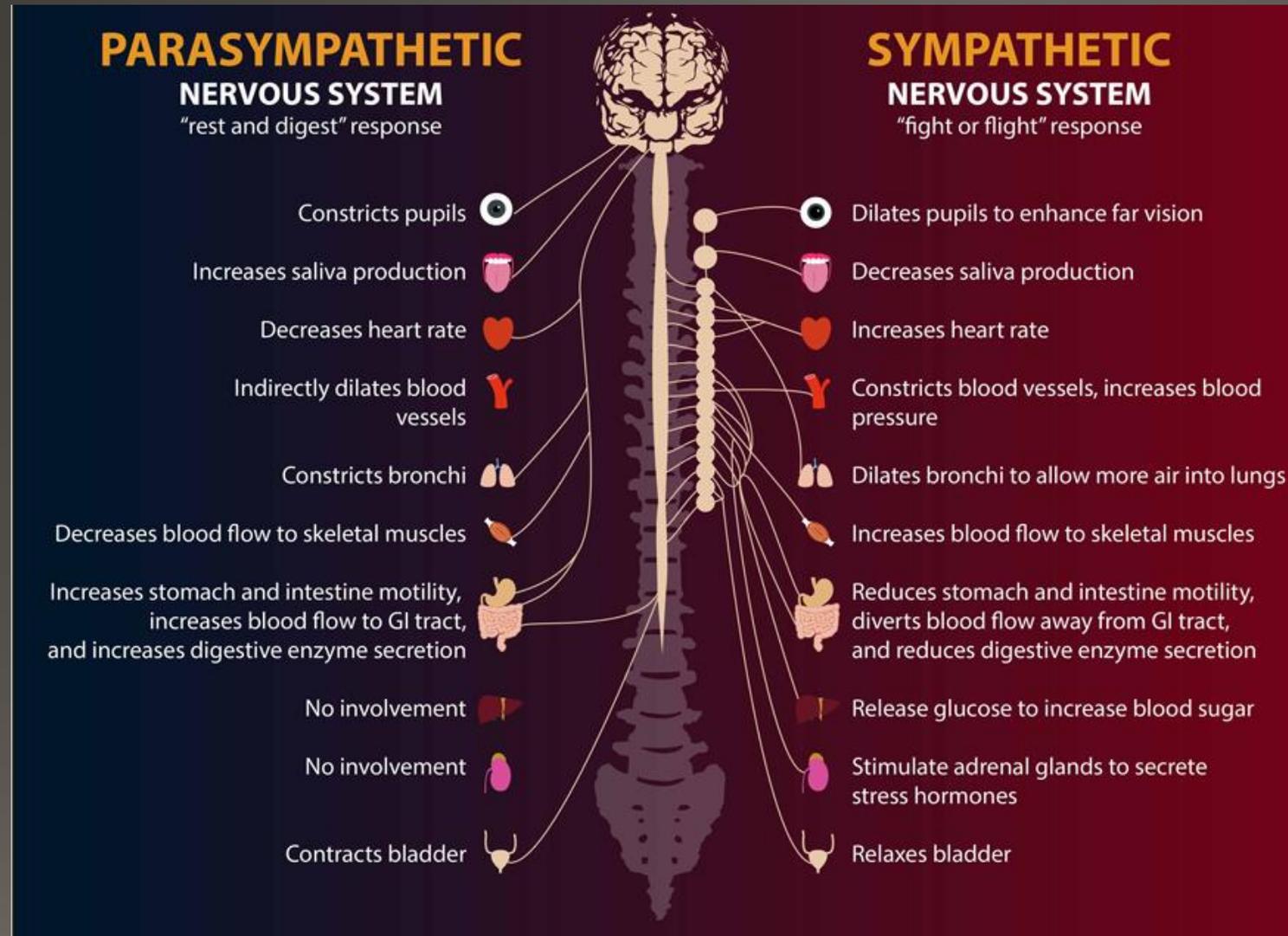
Environmental & Social Influences

- Can “override” biological influences
 - Can “fight sleep” but can’t “force” it
 - Biological processes must be aligned
 - Sleep associations (e.g., TV, partner, parent)
 - Stress
 - Worry
 - Circadian “Zeitgebers” (external cue that sets the biological clock)
 - *Light*
 - Temperature
 - Exercise
 - Eating

The Role of Stress

- Reaction to novel, unpredictable, and uncontrollable events
- Impacts individuals through
 - Direct physiological effects (next slides)
 - Indirect effects via poor coping and health behaviors (e.g., smoking, poor eating habits)

Autonomic Nervous System Response



General Adaptation Syndrome (Hans Selye)

Alarm – Resistance – Exhaustion

Alarm

- Fight, Flight, or Freeze
- Activation of the sympathetic nervous system (HPA axis) – adrenaline and stress hormones released
- Mobilizes body's resources to react to danger (prepare for physical activity)
 - Increased heart rate and constricted blood vessels to move blood away from organs (e.g., digestion) to extremities
 - Rate of breathing increases to get oxygen to the heart, brain, and muscles
 - Sweat production increases to eliminate toxins and lower body temperature
 - Blood sugar rises as liver converts stored glycogen into glucose to support activity
- Relatively short-lived

General Adaptation Syndrome (Hans Selye)

Alarm – Resistance – Exhaustion

Resistance

- Allows body to continue fighting stressor long after fight/flight/freeze
- Release of additional hormones like cortisol
 - Stimulate conversion of protein to energy so body has a large supply of energy after glucose is depleted
 - Promotes retention of sodium to keep blood pressure elevated
- Provides changes to meet emotional crises, perform strenuous tasks, and fight infection BUT when prolonged increases risk of disease and leads to exhaustion

General Adaptation Syndrome (Hans Selye)

Alarm – Resistance – Exhaustion

Exhaustion

- Result of prolonged resistance in response to stress
- Partial or total collapse of body function or systems
 - Stress puts increased load on heart, blood vessels, adrenals, and immune system
- Two major causes of exhaustion:
 - Loss of potassium ions = cellular dysfunction or death
 - Depletion of adrenal glucocorticoid hormones (e.g., cortisone) = reduced glucose control → hypoglycemia

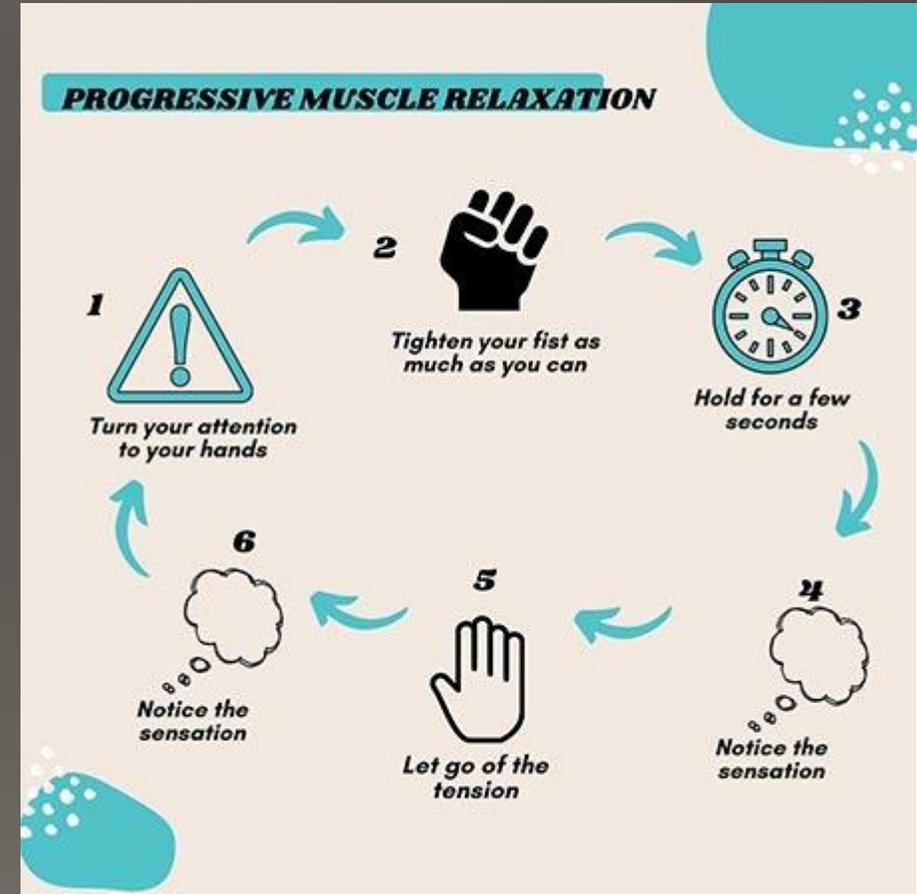
Can learn to engage a relaxation response:

- Have control over the activation of the parasympathetic nervous system (rest/digest)
- Decreases negative impacts of alarm, resistance, and exhaustion
 - Promotes sleep
- Relaxation Techniques (scripts and videos available online)
 - Guided Imagery
 - Deep Breathing
 - Meditation
 - Autogenic Training
 - Progressive Muscle Relaxation*

Progressive Muscle Relaxation (PMR)

What is PMR and Why?

- Practice of tensing and relaxing one muscle group at a time
- Brings awareness of the body signals of increased stress/arousal
 - Direct comparison of tense/tight vs. calm/relaxed
 - Reduces sympathetic nervous system arousal
 - Should never be uncomfortable
- Practice is important



Basics of PMR

Squeeze,
tighten, hold
muscles



Bring
awareness to
the tension



Relax, soften,
let go of
muscles



Bring
awareness to
the relaxation

10-15 seconds

10-15 seconds

Deep Breaths



Progressive Muscle Relaxation



- 1 Forehead**
Scrunch up your forehead like you are thinking hard! Squeeze it tighter, tighter! Now you can relax. (hold for around 10 seconds)
- 2 Eyes**
Squeeze your eyes tight like you are about to blow out the candles on your cake and make a wish! No peeking! (10 seconds)
- 3 Cheeks**
Puff your cheeks out as far as you can! Make them bigger, like you have a mouth full of food! Now, relax (10 seconds)
- 4 Mouth**
I want you to pretend you are chewing a really big piece of gum! It's really hard to chew, but keep chewing! (10 seconds)
- 5 Shoulders**
I want you to try and touch your shoulder blades together! Squeeze tighter, you're almost there! Now you can relax (10 seconds)
- 6 Arms**
I want you to make your arms as straight and stiff as possible! Pretend you are frozen! Now you can relax (10 seconds)
- 7 Lower Back**
Sit up super straight and try to be as tall as you can! Taller! Taller! And now relax (10 seconds)
- 8 Legs**
I want you to make your legs as straight as you can! Pretend you are frozen again! Now you can relax (10 seconds)
- 9 Feet**
I want you to press your feet into the ground as hard as you can! Push, Push! And now relax (10 seconds)
- 10 Toes**
Pretend you are at the beach, and squish your toes in the sand! So squishy! And now relax (10 seconds)



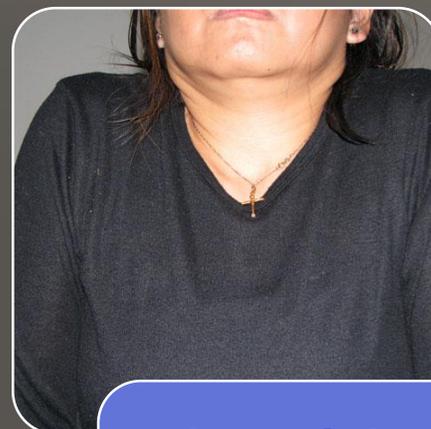
Hands

- Squeeze
- Relax



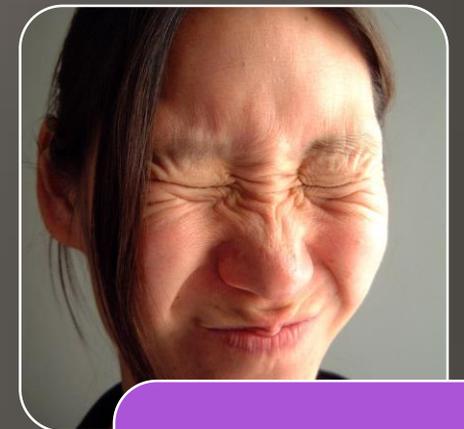
Arms

- Squeeze
- Relax



Shoulders

- Squeeze
- Relax



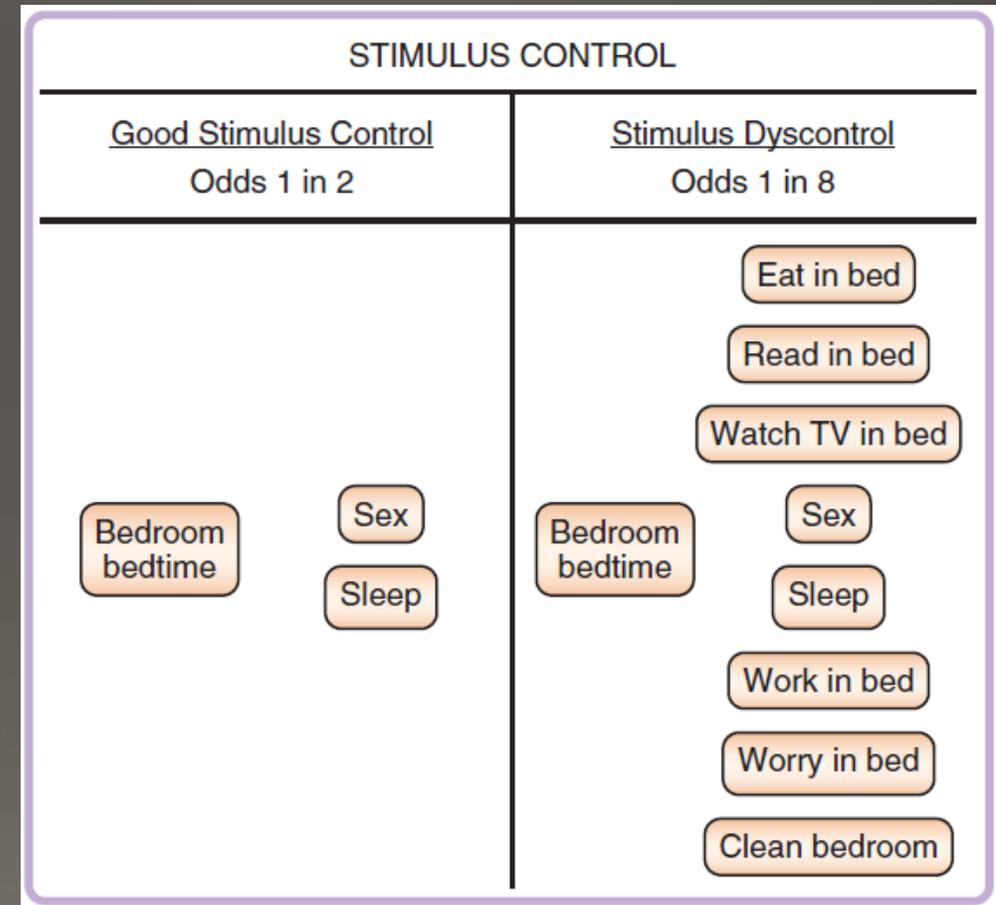
Face

- Squeeze
- Relax

Models of Insomnia

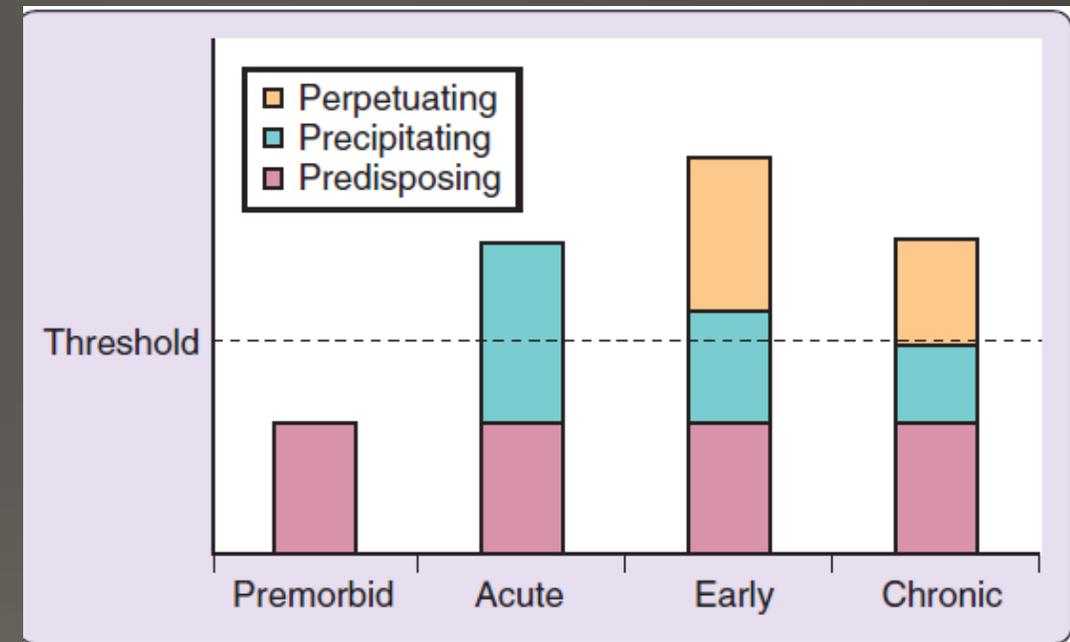
Models of Insomnia – Stimulus Control

- Bed/bedroom is a stimulus that should elicit the response of sleep
 - If a stimulus always paired with 1 behavior, the stimulus will yield 1 response
- Insomnia
 - Stimulus (i.e., bedroom/bed) paired with many responses
- Must recondition stimulus to mean sleep



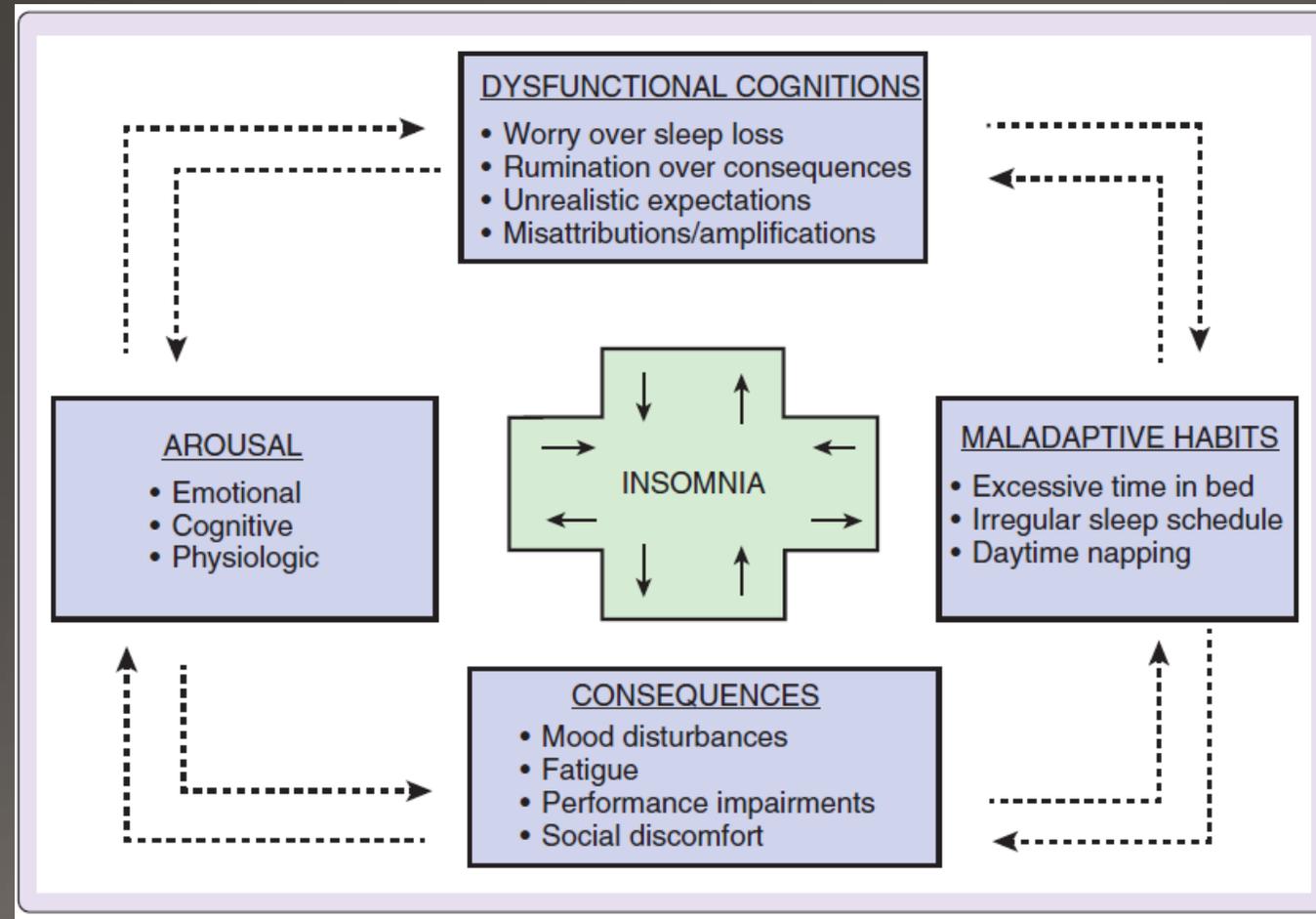
Models of Insomnia – Three Factor (3P)

- How insomnia moves from acute to chronic
- Predisposing
 - Biopsychosocial
- Precipitating
 - Acute trigger
- Perpetuating
 - Behaviors that reinforce problem



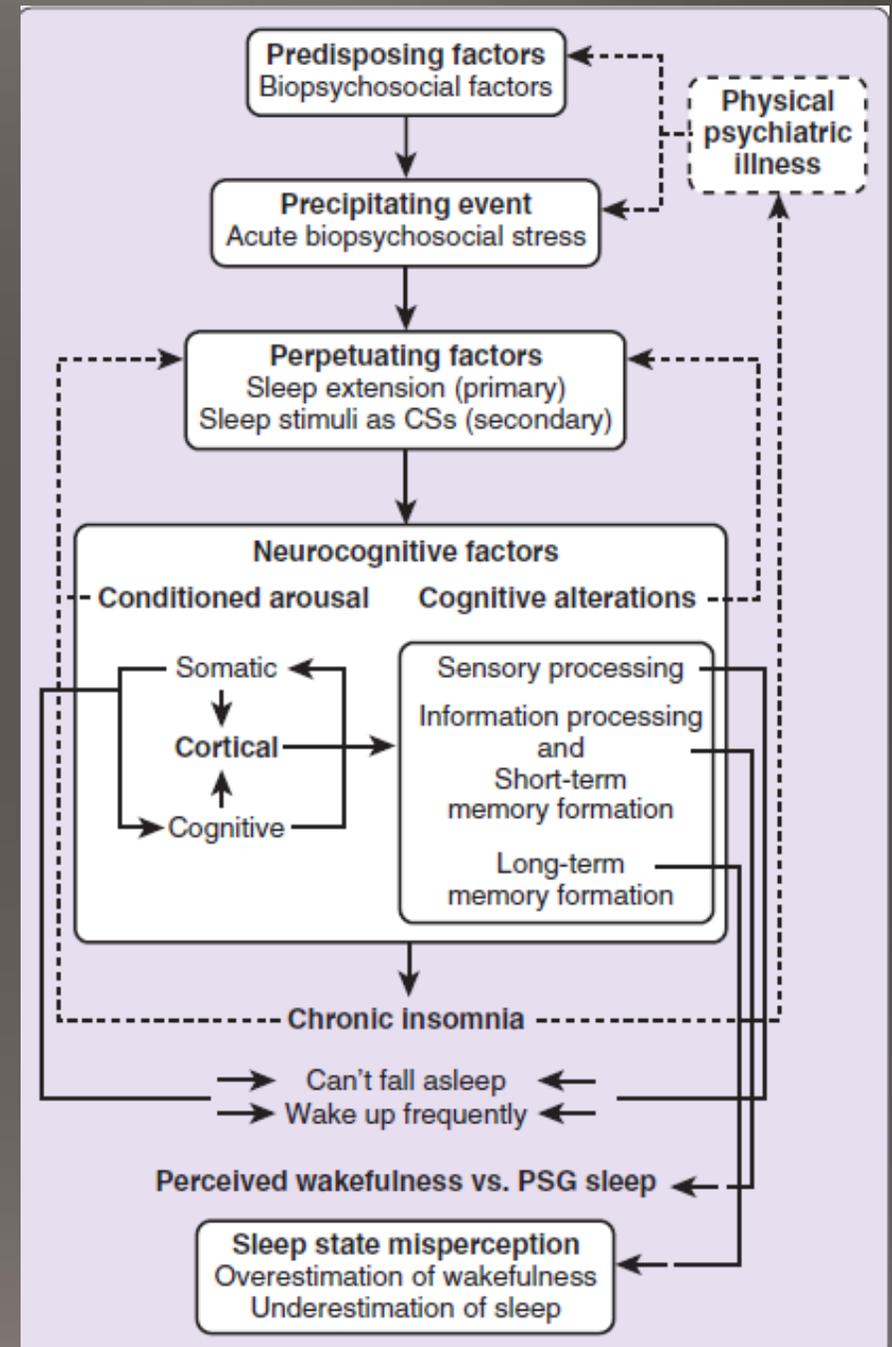
Models of Insomnia – Microanalytic

Each occurrence of insomnia has consequences, including increased arousal, and results in the engagement of cognitions and behaviors that increase risk of additional occurrences.



Models of Insomnia - Neurocognitive

- Extension of 3P
- Proposes cortical arousal is central to insomnia
 - Occurs as a result of classical conditioning and is characterized by cognitive changes
- Not hyperarousal but increased sensory and information processing at sleep onset and during NREM that leads to difficulty falling and staying asleep
 - Also responsible for sleep state misperception



Models of Insomnia - Summary

- **Stimulus Control**

- Ideal: Bed/Bedroom (stimulus) → Sleep (response)
- Insomnia: Bed/Bedroom → Sleep Incompatible Behaviors (e.g., work, watching TV, stress, worry)

- **Three Factor (3P)**

- Predisposing (biopsychosocial), Precipitating (acute trigger), and Perpetuating (maintaining behaviors)

- **Microanalytic**

- Each occurrence of insomnia has consequences, including increased arousal, and results in thoughts and behaviors that increase risk of future occurrences

- **Neurocognitive**

- 3P + Addition of hyperarousal as key component of perpetuating factors

Common to all models

- Conditioned arousal due to attempted sleep extension
 - Classical conditioning (stimulus → response)
 - Repeated pairing of sleep-related stimuli (bed) with insomnia-related wakefulness (arousal)
 - Physiologic (stress system) and cognitive arousal
 - Primary perpetuating factor in chronic insomnia

Trigger + Safety Behaviors



Sleep Treatment

Maintaining Factors

- Cognitive Behavioral Therapy for Insomnia (CBT-I) targets factors that maintain insomnia over time:
 - Excessive amounts of time spent in bed
 - Regular napping
 - Irregular sleep-wake schedule
 - Excessive worry over sleep loss
 - Rumination about daytime consequences of sleep loss
 - Performance anxiety subsequent to sleep loss

Components of CBT-I

- Sleep Psychoeducation (what was discussed at beginning)
- Sleep Hygiene
- **Stimulus Control (single most effective component)**
- Sleep Restriction/Sleep Compression
- Relaxation (discussed previously)
- Cognitive Therapy

Stimulus Control

When to use:

- Patient spends a significant amount of time in bed awake

Justification:

- Conditioned arousal
 - Time spent in bed heightens arousal, anxiety, frustration
 - Tired (fatigued) vs. Sleepy – important distinction!
 - “The earlier I go to bed, the earlier I will fall asleep.”

Stimulus Control - Steps

1. Go to bed only when sleepy (not tired)
2. Use the bed/bedroom only for sleeping
 - No reading, work, TV, etc.
 - Reconditioning the stimulus response to bed = sleep
3. Get out of bed when unable to sleep
 - After 15-20 minutes, go to another room and engage in quiet activity
 - Prolonged waking at night – same thing
4. Arise at the same time every morning, regardless of sleep
5. No naps!

Summary of Recommendations

- Practice relaxation to engage the relaxation response
- Maintain routines (day and evening) as best as possible
- Sleep wherever and however you feel safe
- Practice stimulus control, if needed (don't try and force sleep)
- Normalize your experience

Questions? Comments?

Thank you!!!

Please reach out at tvandyk@llu.edu