

Sleep and Mental Health

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Objectives

- Identify common sleep disorders in primary care
- Understand basic management for sleep disorders
- Describe the bidirectional relationship between sleep disorders and mental health

Why Do We Sleep?

- All lifeforms sleep
- we eventually die without sleep
- restore bodily functions, repair damaged tissue, conserve energy
- removal of brain waste
- temperature regulation



Sleep Disturbances

-negatively impacts physical health, mental health, and quality of life

-immune function

-neural plasticity

-affective regulation

-neuroendocrine regulation

HOW SLEEP AFFECTS YOUR HEALTH

SLEEP DEPRIVATION

The infographic features a light blue silhouette of a human figure against a dark blue background. Inside the silhouette, there are icons for a brain with gears, a heart with a pulse line, a white awareness ribbon, three stars, and a slice of pizza. Lines connect these icons to text boxes describing health impacts.

- IMPAIRED COGNITION**
Lack of sleep impairs memory and your ability to process information.
- HIGHER LEVELS OF ANXIETY**
Lack of sleep raises the brain's anticipatory reactions, increasing overall anxiety levels.
- STROKE RISK**
When you sleep 6 hours or less a night, your chance of a stroke increases 4x.
- INCREASED RISK FOR DIABETES**
Lack of sleep increases cortisol and norepinephrine, both are associated with insulin resistance.
- INCREASES SYMPTOMS OF DEPRESSION**
A lack of sleep disrupts neurotransmitters to the brain which regulates mood.
- INCREASED RISK OF BREAST CANCER**
Melatonin decreases when you are exposed to light late at night. A decrease in melatonin disrupts estrogen production which can lead to breast cancer.
- INCREASED RISK FOR HEART DISEASE**
Blood pressure decreases when you sleep.
- WEIGHT GAIN**
Sleep helps balance hormones that make you feel hungry and full.

Adventist Health
livingwellpdx.org

<https://www.adventisthealth.org>

Project ECHO University of Vermont

Sleep Disturbances and Mental Health

-risk factor for the development, persistence, and relapse of psychiatric disorders

-3-4 fold increase in psychiatric disorders in those with sleep disruptions (Hossain et al., 2002)

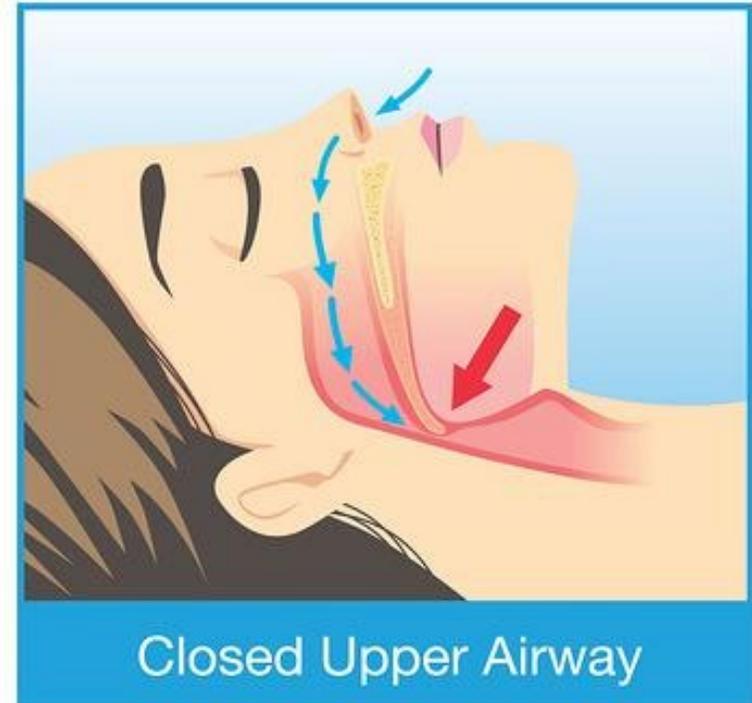
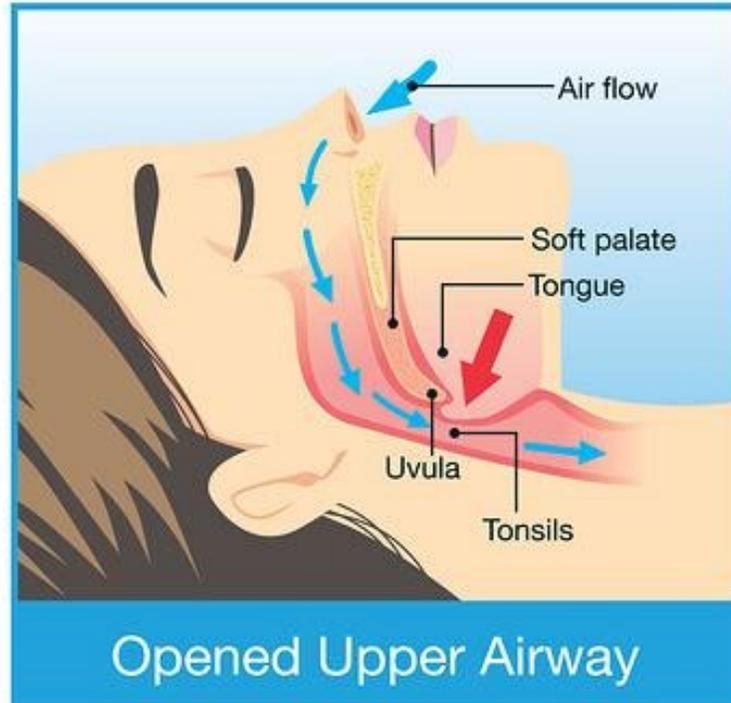
-circadian and sleep disruptions are found in up to 90% of those with depression (Cunningham et al, 2018)

-increase risk for suicidal ideation, suicide attempt, and suicide (Pigeon et al., 2012)

Obstructive Sleep Apnea (OSA)

Symptoms: (patient and bed partner)

- Snoring
- Witnessed apneas
- Gasping for breath
- Morning headache
- Dry mouth, sore throat
- Restless sleep
- Changes in mood
- Impaired concentration/memory
- Unrefreshing sleep
- Excessive daytime sleepiness
- Middle of the night awakenings:
 - insomnia
 - nocturia



Untreated OSA

-increased risk for sleepy driving , CAD, hypertension, arrhythmias, sudden death, stroke, endocrine dysfunction, increased all cause mortality (Westerman, 2017)

-increase risk for depression, exacerbate mood symptoms, and contribute to refractory treatment for depression (Murphy et al, 2015)

- may exacerbate and perpetuate PTSD symptoms (Jaoude et al, 2015)

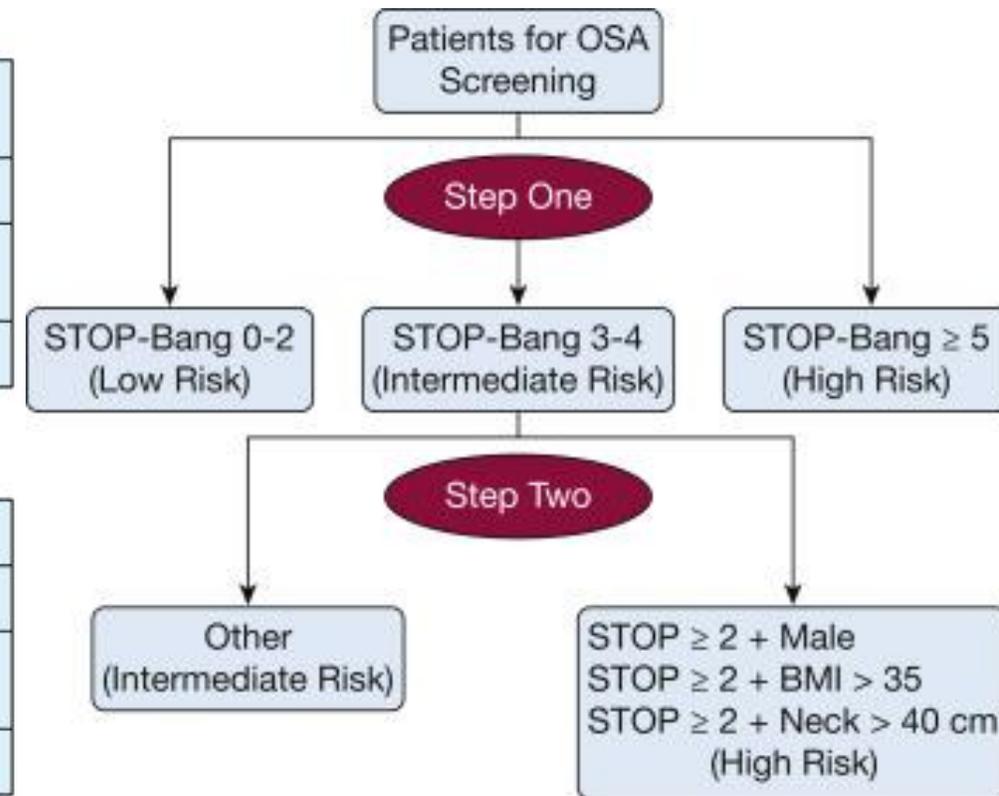
STOP-BANG: >3 sleep referral

STOP

S	So you snore loudly (louder enough to be heard through closed doors or louder than talking)?	Yes	No
T	Do you often feel tired , fatigued or sleepy during the daytime?	Yes	No
O	Has anyone observed you stop breathing or choking or gasping during your sleep?	Yes	No
P	Do you have or are you being treated for high blood pressure ?	Yes	No

Bang

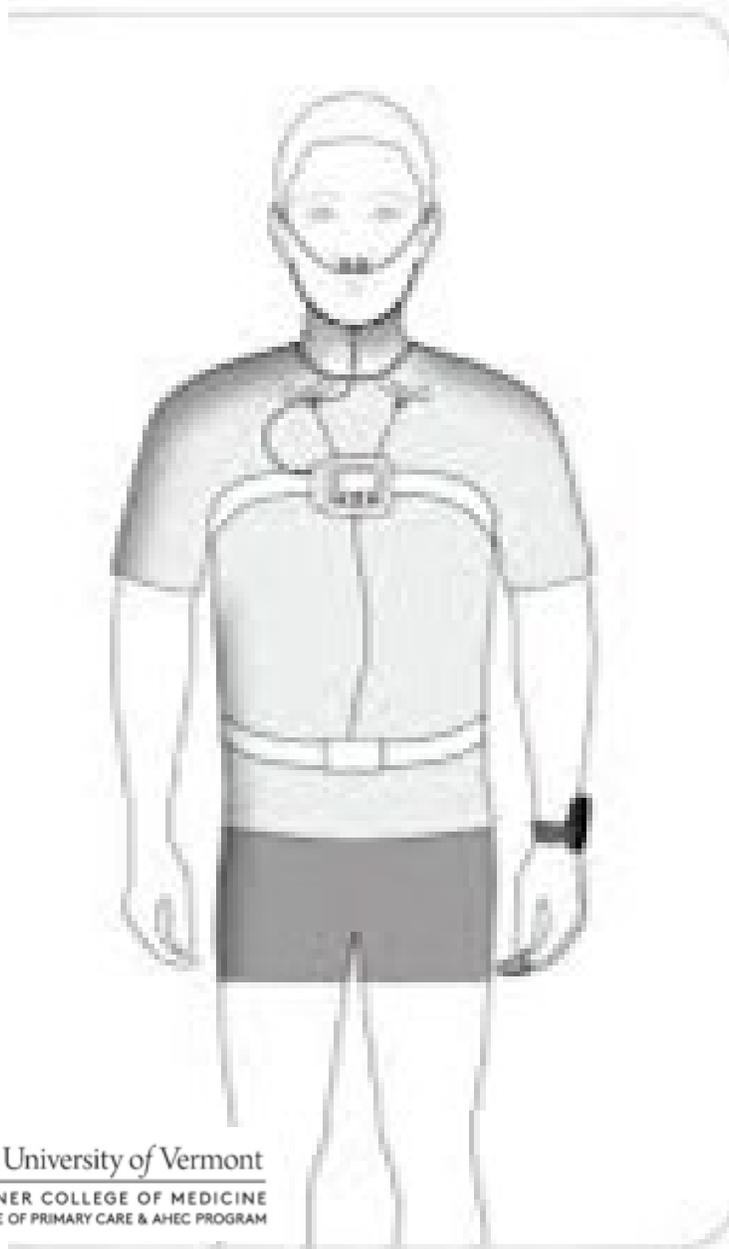
B	BMI more than 35?	Yes	No
a	Age – over 50 years old?	Yes	No
n	Neck circumference – is it greater than 17" if you are a male or 16" if you are a female?	Yes	No
g	Gender – are you a male?	Yes	No



Epworth Sleepiness Scale

Chung et al, 2016

Home Sleep Apnea Testing (HSAT)



In-lab Sleep Testing:



Treatment for OSA:

Positive Airway Pressure (PAP)

- Continuous positive airway pressure (CPAP) and AutoCPAP
- Bilevel Positive Airway Pressure (BPAP)



Masks: We've come a long way...





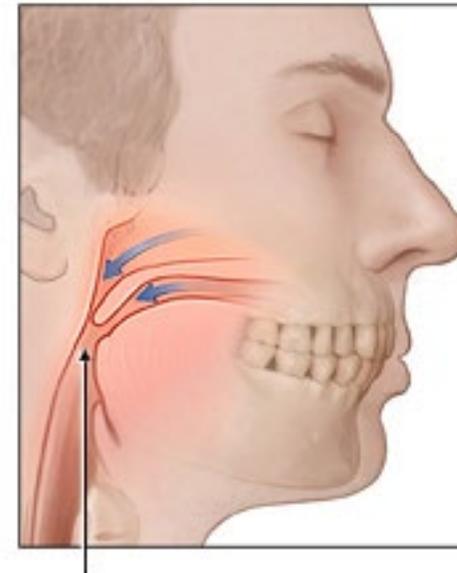
CPAP Treatment Outcomes

- improves sleepiness, quality of life, neurocognitive deficits from OSA, concentration (Avidan, 2018)
- improvement in psychiatric comorbidities
 - *anxiety, depression (Avidan, 2018)
 - *PTSD symptoms (El-Solh et al; 2017)

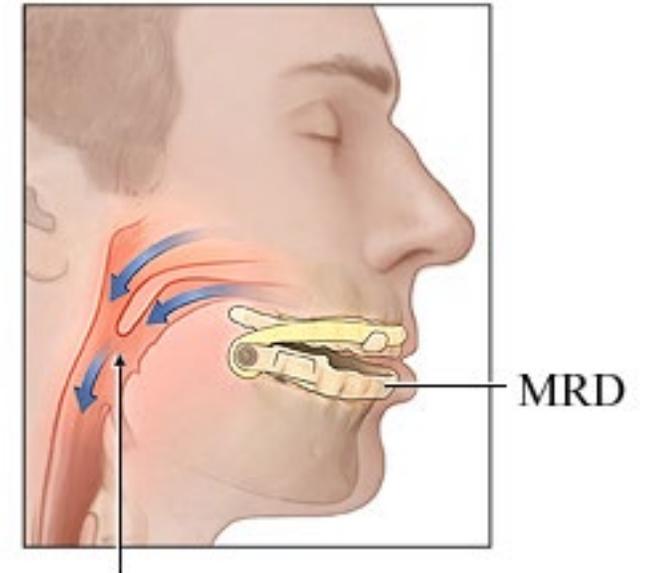
Oral Appliance therapy

Mandibular Advancement Device (MAD):

-alternative to PAP therapy
or those intolerant to PAP therapy



During sleep there is restricted airway space



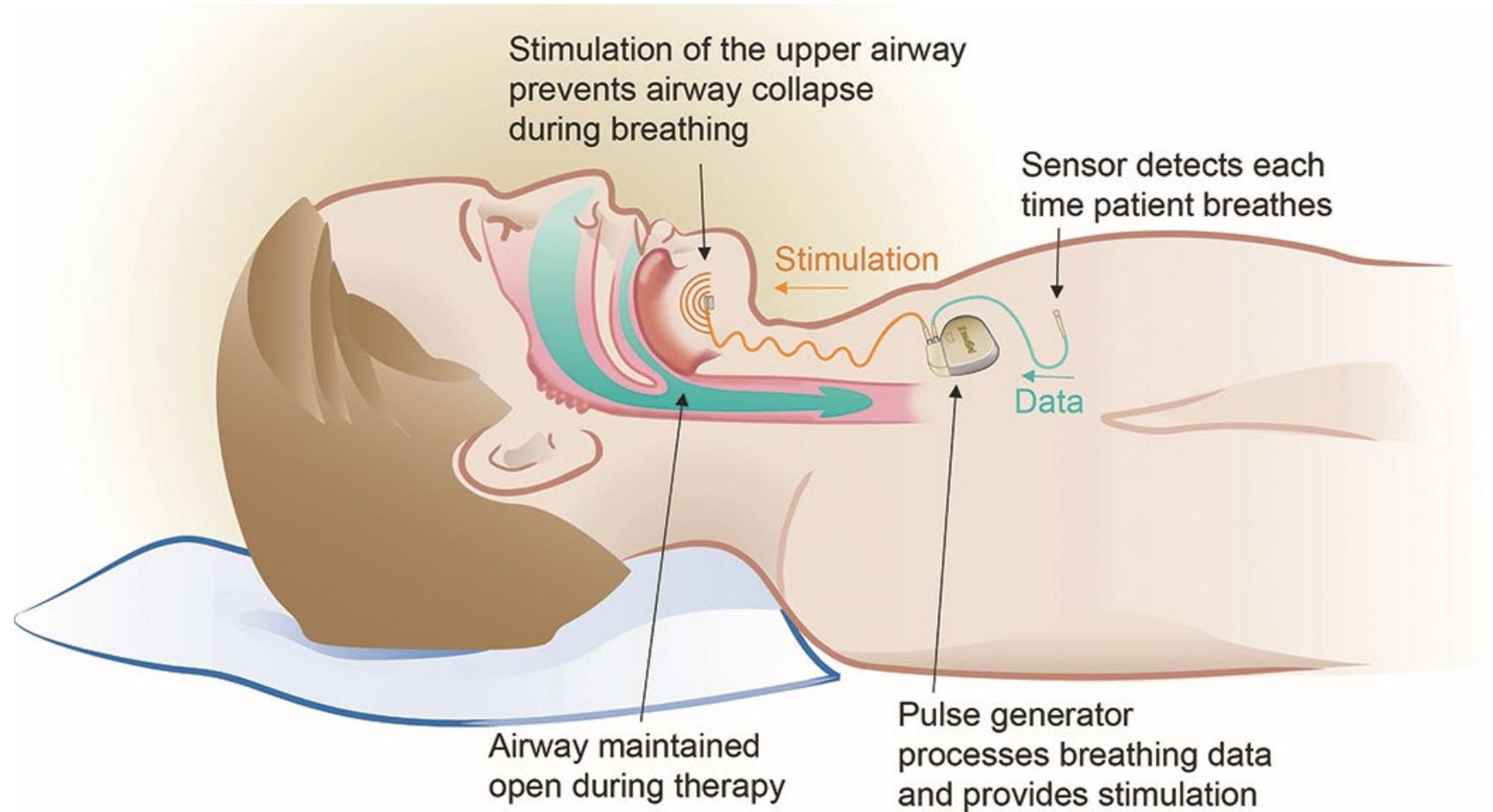
Mandibular repositioning device (MRD) increases airway space

© Healthwise,



Hypoglossal Nerve Stimulator (Inspire)

- moderate to severe OSA
- recent in-lab sleep study
- failed/intolerant to CPAP
- BMI <32 or 35**



Behavioral Modifications

Positional Therapy

-avoiding supine sleep

-zoma pillow

-healthy weight loss
and exercise

-avoiding sedating substances and medications



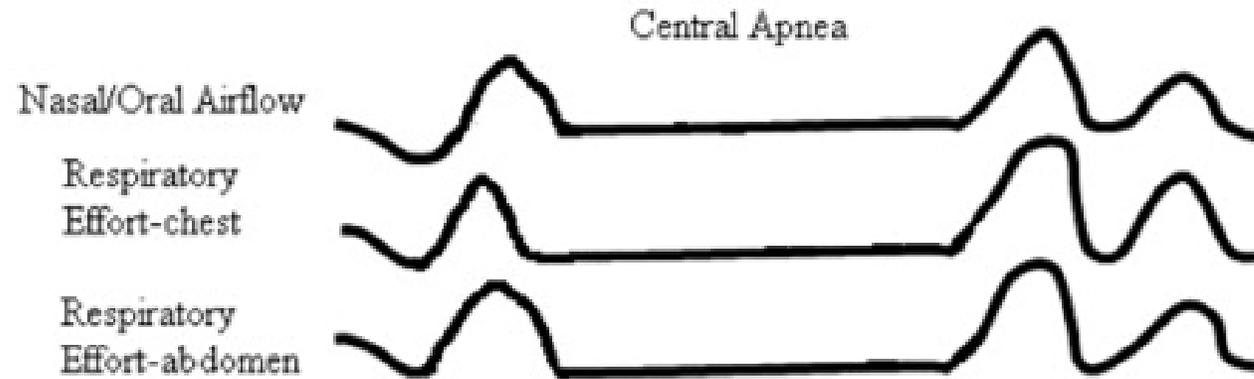
Neck



Chest



Central sleep apnea (CSA)



- sleep disturbances/daytime impairment
- methadone, suboxone, morphine, oxycodone, hydrocodone, fentanyl patches
- withdrawal of the opiate may resolve the CSA

ICSD 3, Westerman, 2017

Restless Legs Syndrome (RLS)



“When you try to relax in the evening or sleep at night, do you ever have unpleasant, restless feelings in your legs that can be relieved by walking or movement?”

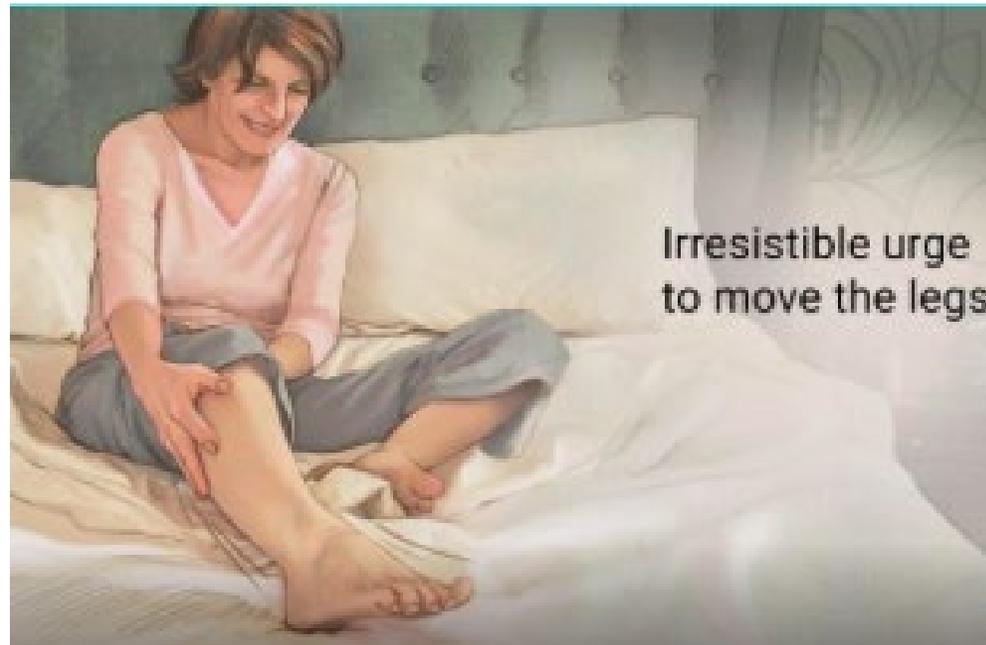
-difficulties with falling and staying asleep, daytime sleepiness

RLS and Mental Health

-increased odds ratio for depression, anxiety, panic, PTSD

-treatment of RLS may help with depression symptoms

- $\frac{1}{4}$ of patients with RLS have ADHD symptoms and 12-35% of patients with ADHD meet RLS criteria



ICSD 3

RLS Treatment

-Abnormalities in brain dopamine and iron

-Ferritin levels ≤ 75 ug/l

-Antidepressants/antipsychotics

-Antihistamines

-Substances

-OSA

-Alpha 2 delta ligands

-Dopamine agonists

Phenylalanine



(Phenylalanine hydroxylase enzyme)
Cofactors - Iron, niacin, and tetrahydrobiopterin (BH4)

L Tyrosine (may also be ingested directly from food)



(Tyrosine hydroxylase enzyme)
Cofactors - Iron, niacin, folic acid, tetrahydrobiopterin (BH4)

L Dopa



(Aromatic L-amino acid decarboxylase - AKA Dopa decarboxylase enzyme)
Cofactor - P5P, which is the active form of B6

Dopamine

Periodic Limb Movement Disorder (PLMD)

-80%-90% of RLS patients also have PLMs

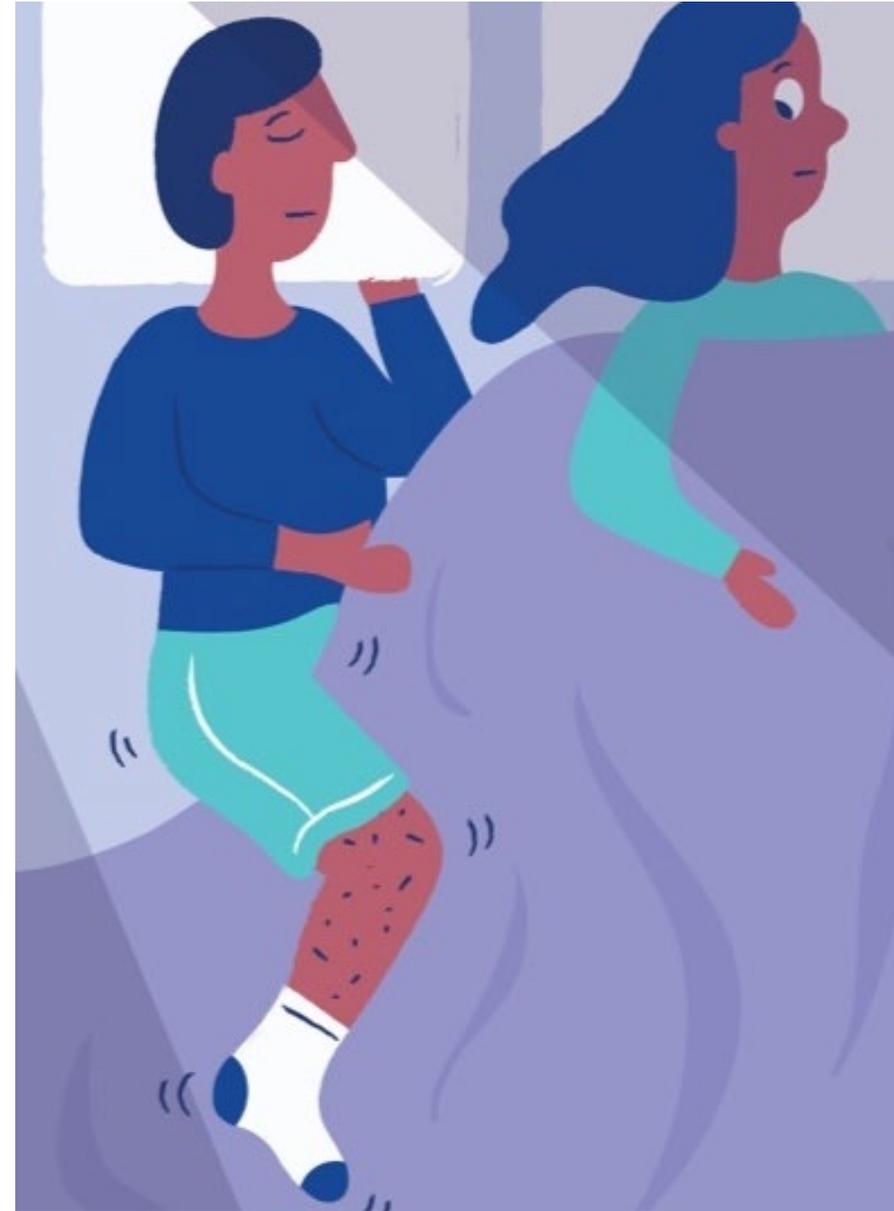
-antidepressants are associated with PLMD

Treat:

-medication culprits

-check ferritin

-comorbid sleep disorders such as OSA



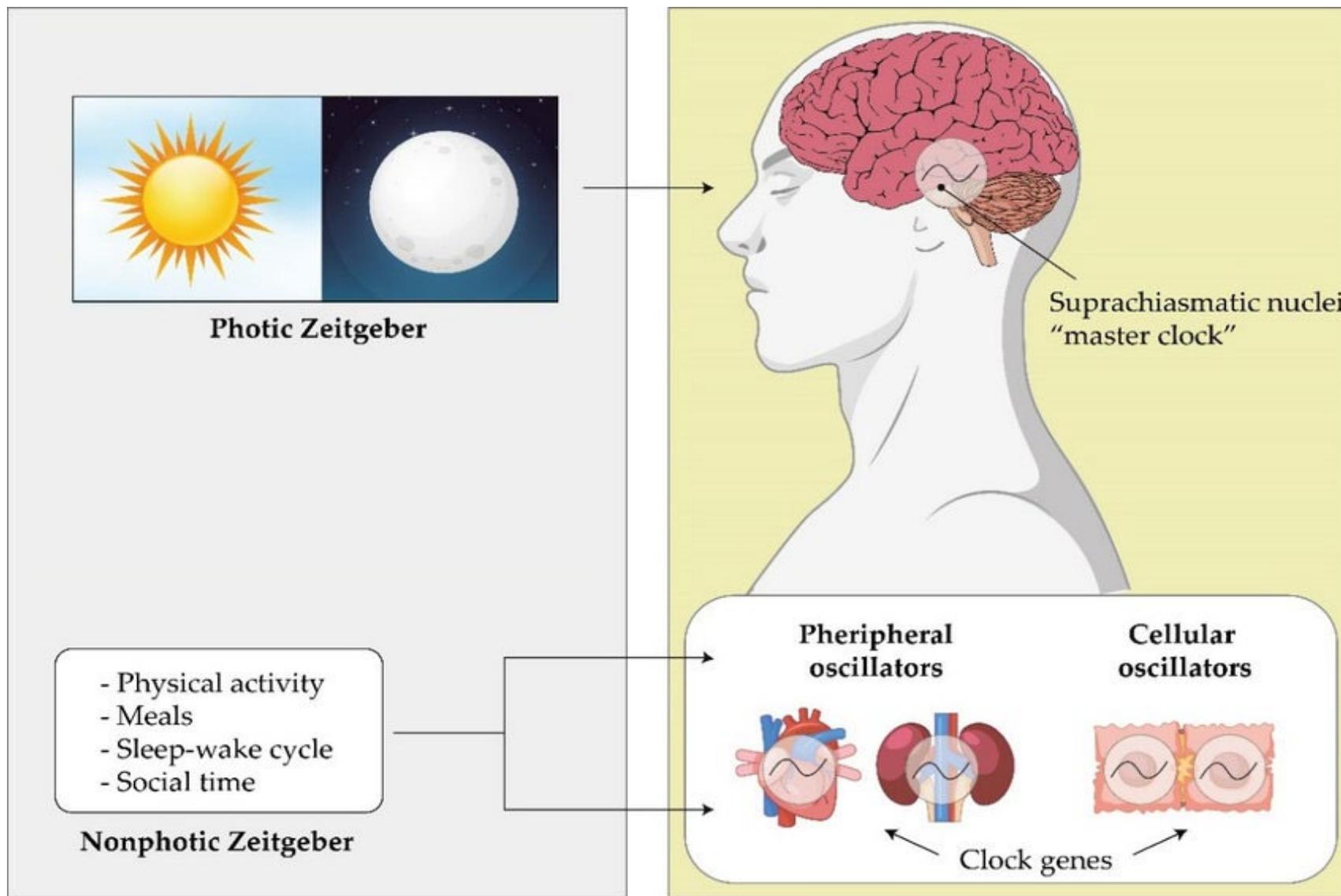
(Westerman, 2017; ICSD 3

Circadian Rhythm Disorders

-circadian rhythm disorders are often associated with increased incidence of psychiatric disorders (Abbott et al., 2015)

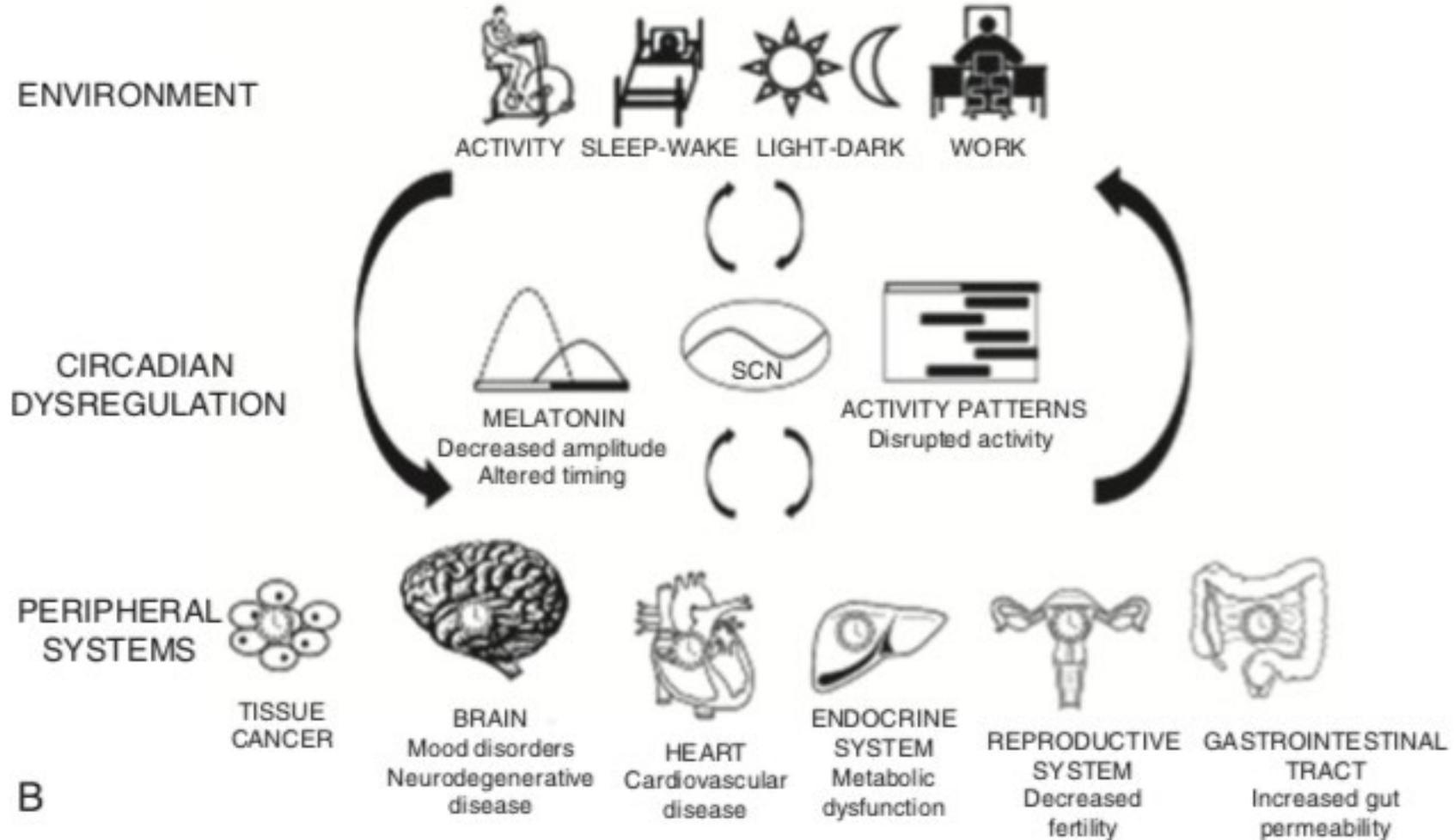
-Delayed Sleep-Wake Phase Disorder (DSWPD)

-Advanced Sleep-Wake Phase Disorder (ASWPD)



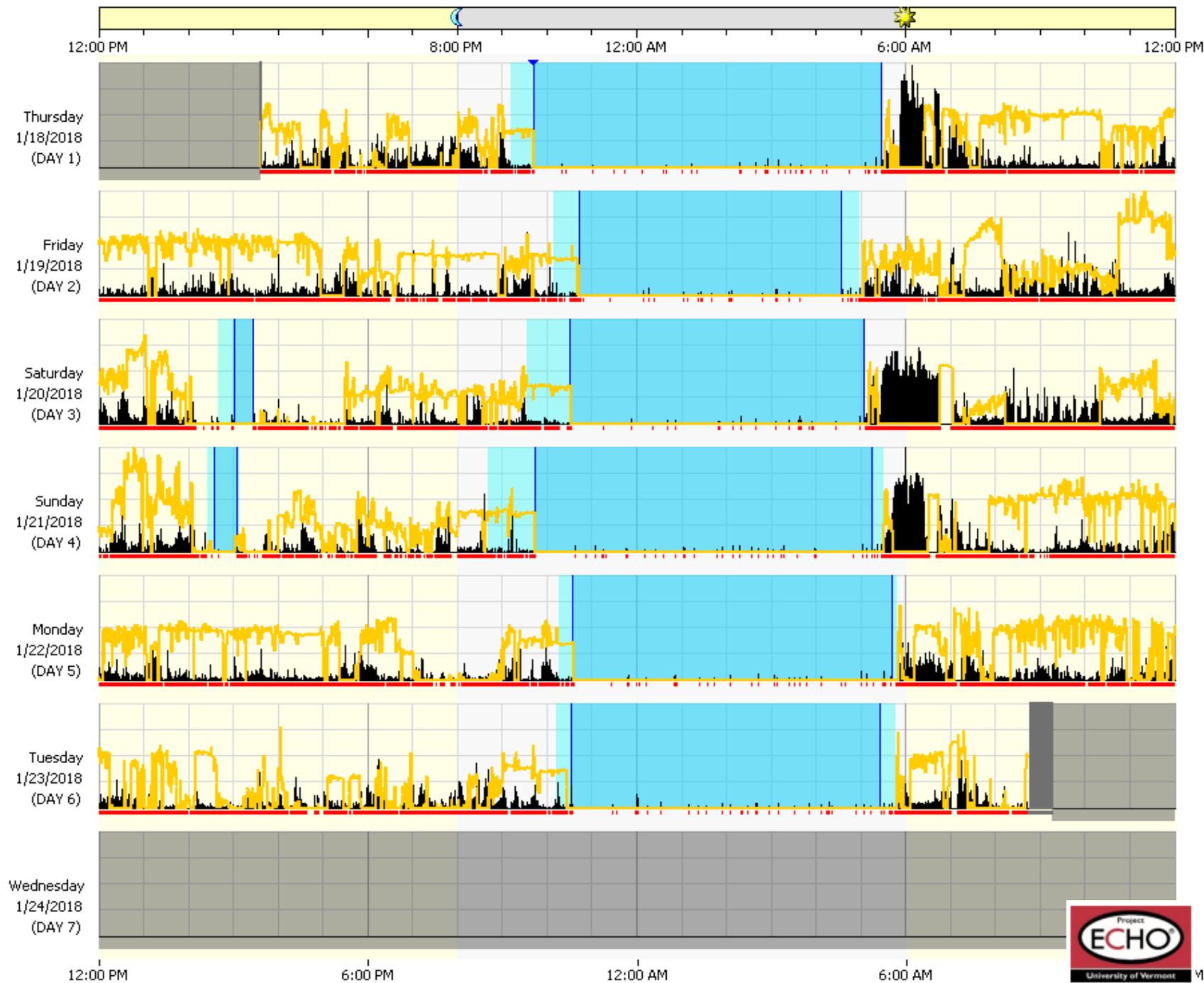
https://www.researchgate.net/figure/Photic-and-nonphotic-zeitgebers-in-humans-and-their-role-on-the-circadian-clock-which_fig1_350179017

Peripheral Clocks



B

Actigraphy

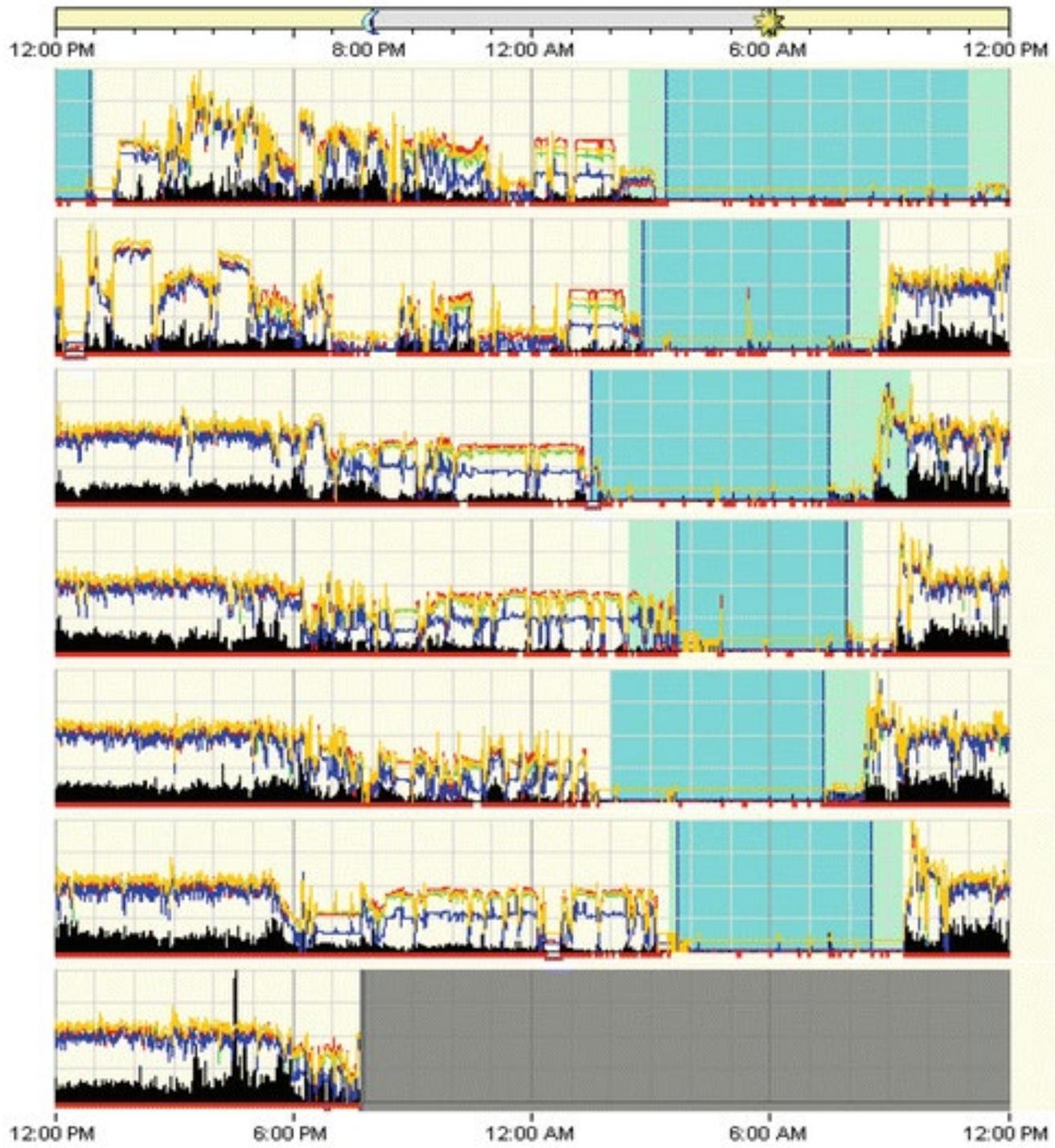


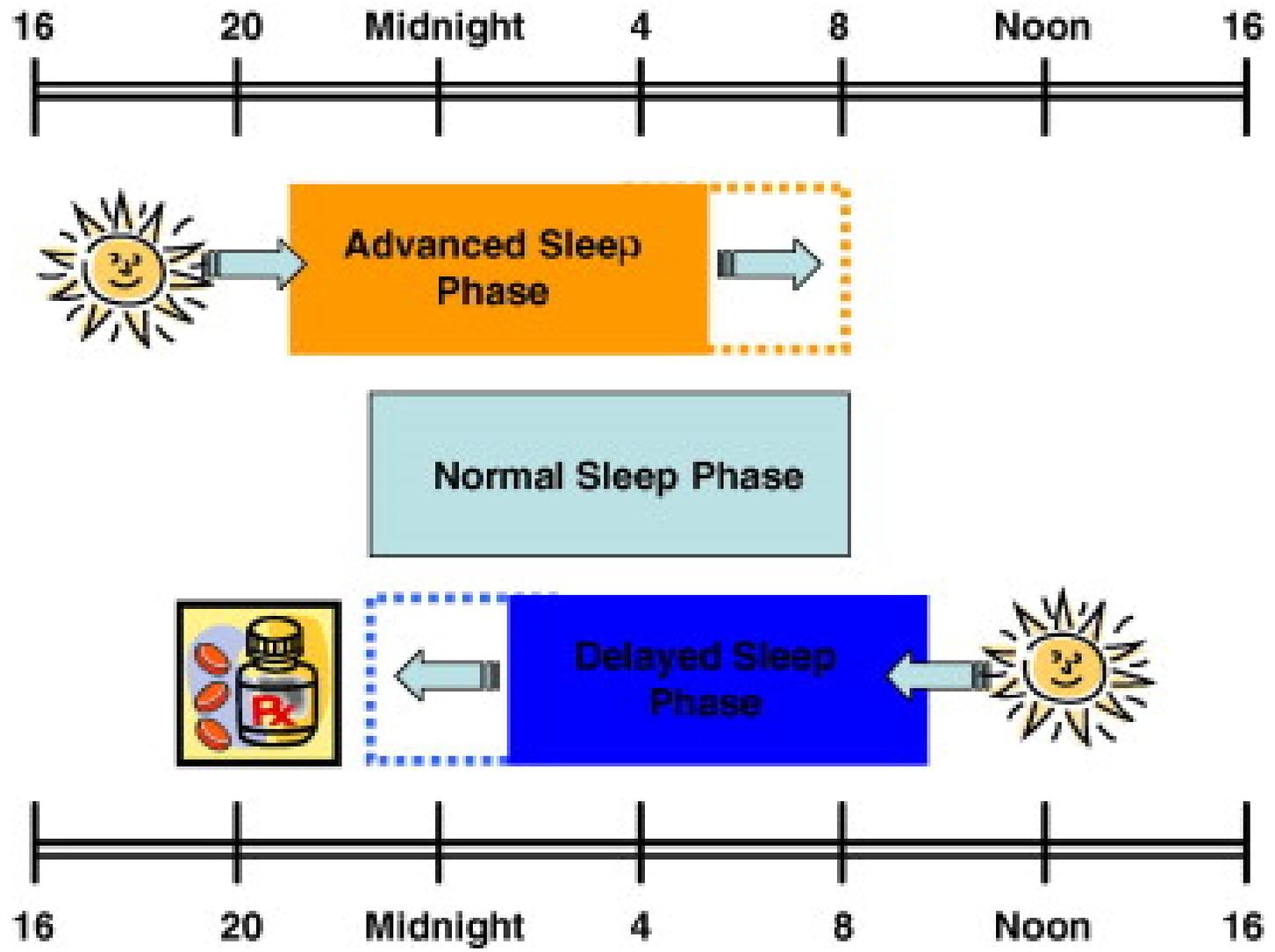
Delayed Sleep- Wake Phase Disorder

-delay in sleep and
wake times

-? sleep onset
insomnia

-days off/weekend

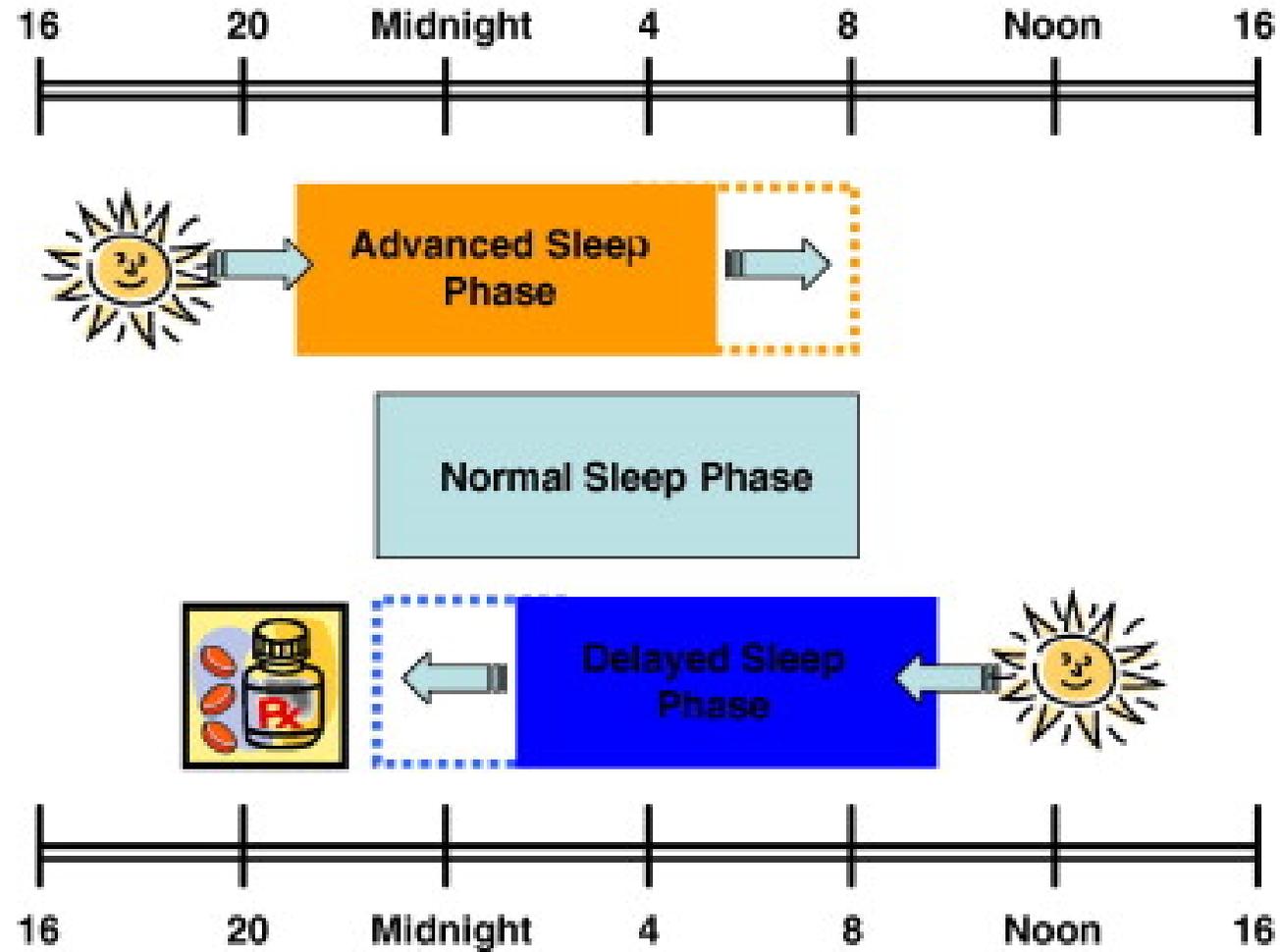




Delayed sleep-wake phase disorder: Low dose melatonin (0.5-3mg) 5 hrs prior to habitual sleep time; combined with bright light therapy after awakening (Abbott et al, 2015)

Advanced sleep-wake disorder

- early bedtime and awake time
- seen more in older populations
- important to distinguish this from early morning awakenings due to depression
- evening bright light



(Abbott et al,
2015)

Circadian Rhythm Sleep-Wake Disorder	Diagnosis	Treatment
Delayed sleep phase type	Recommended: Sleep logs and/or actigraphy for at least 7 d Optional: Biomarkers such as salivary DLMO. Morningness/eveningness questionnaires	Advance circadian phase: Low dose (0.5–3 mg) of melatonin, 5 h before habitual bedtime; bright light (at least 5000 lux) for 30 min to 2 h on awakening
Advanced sleep phase type	Recommended: Sleep logs and/or actigraphy for at least 7 d Optional: Biomarkers such as salivary DLMO. Morningness/eveningness questionnaires	Delay circadian phase: Bright light (at least 5000 lux) for 2 h in the evening (eg, 7–9 PM)
Irregular sleep-wake type	History and sleep diary (can be completed by caregiver) and/or actigraphy	Consolidate nocturnal sleep: Mixed modality therapy: daytime bright light, melatonin at bedtime (in children); structured activities
Non-24-h sleep-wake type	Recommended: Sleep logs and/or actigraphy for at least 14 d Optional: Sequential measurement of phase markers (eg, salivary DLMO or urine melatonin)	Entrainment: Blind: Melatonin (0.5 mg) or tasimelteon 1 h before habitual bedtime Sighted: Bright light on awakening, regular sleep wake schedule. ± melatonin
Shift work type (night)	Clinical history: Sleep logs and/or actigraphy may also be helpful	Align circadian rhythm to work schedule: Sleep hygiene; bright light intermittent exposure at work; avoid bright light in the early morning; low-dose melatonin sleep time. Excessive sleepiness: Modafinil/armodafinil, scheduled naps, caffeine, bright light Insomnia symptoms: Melatonin, hypnotics

Abbott et al., 2015

Phototherapy: light boxes

Sleep

Mood

Energy



Menopause and Sleep

- increased prevalence for sleep disorders
- Vasomotor symptoms (VMS) and insomnia:
 - *69% reported VMS associated with awakenings
 - *Hormone therapy/antidepressants
- Mood disorders: depression
- OSA: prevalence triples; independent of Body Mass Index
- Circadian changes
- RLS/PLMs: women are 37% more likely than men to report symptoms

Insomnia

- Difficulty initiating, maintaining sleep, or awakening too early,
- Significant distress or impairment
- Insomnia Severity Index (ISI)

Today's Date	Day of the week	Type of Day Work, School, Off, Vacation	Noon	1PM	2	3	4	5	6PM	7	8	9	10	11PM	Midnight	1AM	2	3	4	5	6AM	7	8	9	10	11AM	
sample	Mon.	Work		E					A				I									M	C				
2/2	MON	WORK											I														C
3/2	TUES	WORK											I														C
4/2	WED	WORK										A	I														C
5/2	THURS	WORK										E	I														C
6/2	FRI	WORK										A	A		I												C
7/2	SAT	OFF		A						A	A	A			I												C
8/2	SUN	OFF											I														C

Insomnia and mental health

- bidirectional relationship between insomnia and mental health disorders
- 40% of individuals with insomnia have a coexisting mental health disorder (Ohayon et al. 1998).
- insomnia is reported in 80% of patients with major depression, which increases to 90% with a concurrent anxiety disorder (Ohayon 2002).
- insomnia increases the risk of developing depression by two-fold (Baglioni et al. 2011).

Cognitive Behavioral Therapy for Insomnia (CBT-I)

- first-line treatment for chronic insomnia (Schutte-Rodin et al, 2008)
- effective treatment with long-term benefits

Stimulus control
Sleep restriction
Sleep hygiene
Relaxation therapy
Cognitive therapy



Insomnia: FDA approved medications

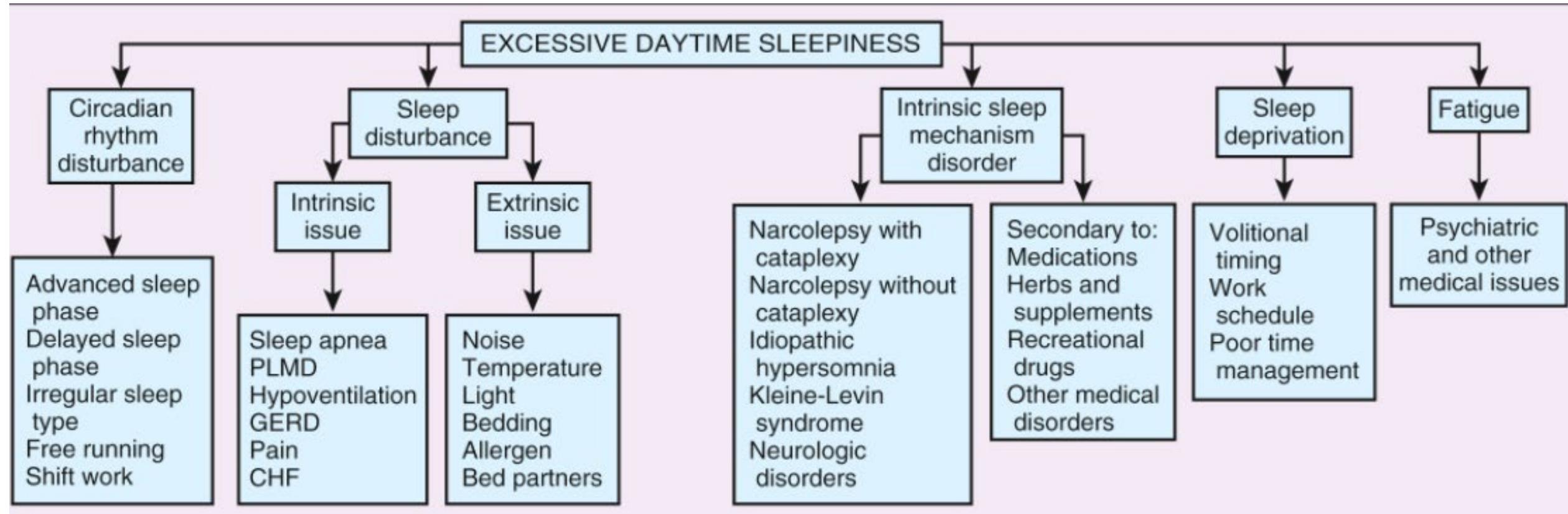
Medication	Starting dose	Usual dose	Considerations
Non-Benzodiazepine Receptor Agonists			
Zolpidem	5mg females 5-10mg males	5-10mg	sleep-onset insomnia
Zolpidem extended-release	6.25mg	6.25-12.5mg	sleep-onset and maintenance insomnia
Zolpidem Tartrate Sublingual (Intermezzo)	1.75mg females 3.5mg males	same as starting	Middle-of-the-night waking
Eszopiclone	1mg	1-3mg	sleep-onset and maintenance insomnia
Zaleplon	5mg	10-20mg	sleep-onset insomnia
Melatonin Receptor Agonists			
Ramelteon	8mg	8mg	sleep-onset insomnia
Selective Histamine Receptor Antagonist			
Doxepin	3mg	3-6mg	sleep maintenance insomnia
Dual Orexin Receptor Antagonist			
Suvorexant	5mg	10-20mg	sleep-onset and maintenance insomnia
Benzodiazepine Receptor Agonists			
Temazepam	7.5mg	7.5-30mg	sleep-onset and maintenance insomnia

Cucchiara, B. L.,
& Price, 2021

Insomnia: Not FDA approved medications

Medication	Starting dose	Usual dose	Considerations
Other medications*			
Amitriptyline	10mg	10-100mg	comorbid depression or chronic pain
Trazodone	25mg	25-150mg	comorbid depression or substance use
Mirtazapine	7.5mg	7.5-30mg	comorbid depression
Quetiapine	25mg	25-200mg	comorbid psychosis or mania
Gabapentin	100mg	100-900mg	comorbid pain or alcohol use
Melatonin	0.3mg	0.3-10mg	circadian rhythm disorders or dementia

Hypersomnolence



Thank you!

