Sharing or Use of this Presentation

We encourage you to share this presentation.

If you use this presentation in its entirety, parts of it, or any of the information in it, please credit the Ohio Cardiovascular and Diabetes Health Collaborative (Cardi-OH) AND include a link to Cardi-OH.org.

Please also send Cardi-OH (info@Cardi-OH.org) information about where the content will be used.

CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative

SCHOOL OF MEDICINE
CASE WESTERN RESERVE UNIVERSITY

In partnership with:

THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE

COLLEGE OF MEDICINE AND LIFE SCIENCES THE UNIVERSITY OF TOLEDO

OHIO UNIVERSITY Heritage College of Osteopathic Medicine

Northeast Ohio MEDICAL UNIVERSITY

University of CINCINNATI COLLEGE OF MEDICINE

Boonshoft School of Medicine WRIGHT STATE UNIVERSITY

medtapp

OHIO COLLEGES OF MEDICINE GOVERNMENT RESOURCE CENTER

Ohio Department of Medicaid

Heart Health and the Science of Sleep

May 24, 2023

CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative

Welcome

Michael W. Konstan, MD
Principal Investigator, Cardi-OH

Shari Bolen, MD, MPH
Co-Principal Investigator, Cardi-OH

Case Western Reserve University School of Medicine

About Cardi-OH

CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative

Founded in 2017, the mission of Cardi-OH is to improve cardiovascular and diabetes health outcomes and eliminate disparities in Ohio's Medicaid population.

WHO WE ARE: An initiative of health care professionals across Ohio's seven medical schools.

WHAT WE DO: Identify, produce, and disseminate evidence-based cardiovascular and diabetes best practices to primary care teams.

HOW WE DO IT: Best practices resources are available via an online library at Cardi-OH.org, including monthly newsletters, podcasts, webinars, and virtual clinics using the Project ECHO® virtual training model.

Learn more at Cardi-OH.org

School of Medicine Case Western Reserve University

In partnership with:

The Ohio State University College of Medicine

College of Medicine and Life Sciences The University of Toledo

Ohio University Heritage College of Osteopathic Medicine

Northeast Ohio Medical University

University of Cincinnati College of Medicine

Boonshoft School of Medicine Wright State University

Ohio Colleges of Medicine Government Resource Center

Ohio Department of Medicaid

medtapp

Special Thanks

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

OHIO COLLEGES OF MEDICINE
GOVERNMENT RESOURCE CENTER

medtapp
Medicaid Technical Assistance & Policy Program

Ohio
Department of Medicaid

SCHOOL OF MEDICINE
CASE WESTERN RESERVE
UNIVERSITY

University of
CINCINNATI
COLLEGE OF MEDICINE

Northeast Ohio
MEDICAL UNIVERSITY

OHIO
UNIVERSITY
Heritage
College of
Osteopathic
Medicine

THE OHIO STATE
UNIVERSITY
COLLEGE OF MEDICINE

COLLEGE OF MEDICINE
AND LIFE SCIENCES
THE UNIVERSITY OF TOLEDO

Boonshoft
School of Medicine
WRIGHT STATE UNIVERSITY

Zoom Webinar Logistics

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- **Your Zoom display name should contain your first and last name** for attendance purposes
- **Joining as a group?** Please use the Chat feature to record names and emails of all attendees
- **Submit questions for discussion**
  - Use the Q&A feature to submit questions at any point
  - Questions will be answered during the Q&A portion of the webinar
- **Post webinar evaluation survey**
  - The survey link will be shared at the end of today's webinar and also sent by email
  - Please complete by COB **Wednesday, May 31**

Disclosure Statements

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- The following speakers have no relevant financial interest or affiliation with any organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of their presentation:
  - Shari Bolen, MD, MPH; Michael W. Konstan, MD; Jennifer Molano, MD; Amy Zack, MD
- The following members of the planning committee do not have any disclosures or financial relationships from any ineligible companies:
  - Richard Cornachione; Carolyn Henceroth; Gillian Irwin; Elizabeth Littman; Devin O'Neill; Steven Ostrolencki; Ann Nevar; Claire Rollins; Catherine Sullivan

Continuing Medical Education (CME)

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- 1.0 *AMA PRA Category 1 Credit*™ is available for this webinar.
- Attendees who indicated on the registration form that they were interested in claiming CME credit for this webinar will receive an email from myevaluations.com next week with more information.
- Complete CME Evaluation and claim credits by **Friday, June 9.**
- Contact Cathy Sullivan (csullivan1@metrohealth.org) if you do not receive an email to complete your CME evaluation or need other assistance.

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Ohio State Medical Association (OSMA) and The MetroHealth System. The Ohio State Medical Association (OSMA) is accredited by the ACCME to provide continuing medical education for physicians. The MetroHealth System designates this educational activity for a maximum of 1.0 *AMA PRA Category 1 Credit(s)*™. Physicians should only claim credit commensurate with the extent of their participation in the activity. Other Healthcare Professionals: check with your professional association as these credits might be applicable for hours towards licensure renewal.

Agenda

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Topics	Presenter(s)	Timing
Welcome and Overview	Michael W. Konstan, MD Shari Bolen, MD, MPH	5 mins.
Heart Health and the Science of Sleep	Jennifer Molano, MD	40 mins.
Audience Question and Answer	Amy Zack, MD (Moderator) Jennifer Molano, MD	10 mins.
Next Steps and Wrap Up	Shari Bolen, MD, MPH	5 mins.

Jennifer Molano, MD
University of Cincinnati
College of Medicine

Amy Zack, MD (Moderator)
Case Western Reserve University
School of Medicine

CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative

Heart Health and the Science of Sleep

Jennifer Molano, MD

Associate Professor

Neurology and Rehabilitation Medicine

University of Cincinnati College of Medicine

Learning Objectives

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

1. Identify the cardiovascular implications of sleep conditions
2. Screen patients at risk for sleep conditions
3. Counsel patients on how to optimize sleep health

What is Sleep?

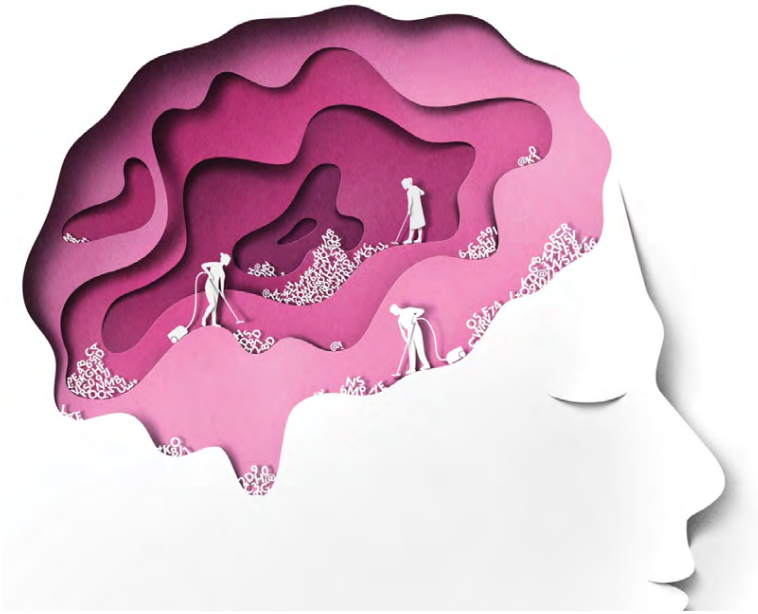
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

"A reversible behavioral state of perceptual disengagement from and unresponsiveness to the environment."

Kryger MG, Avidan AAY. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.

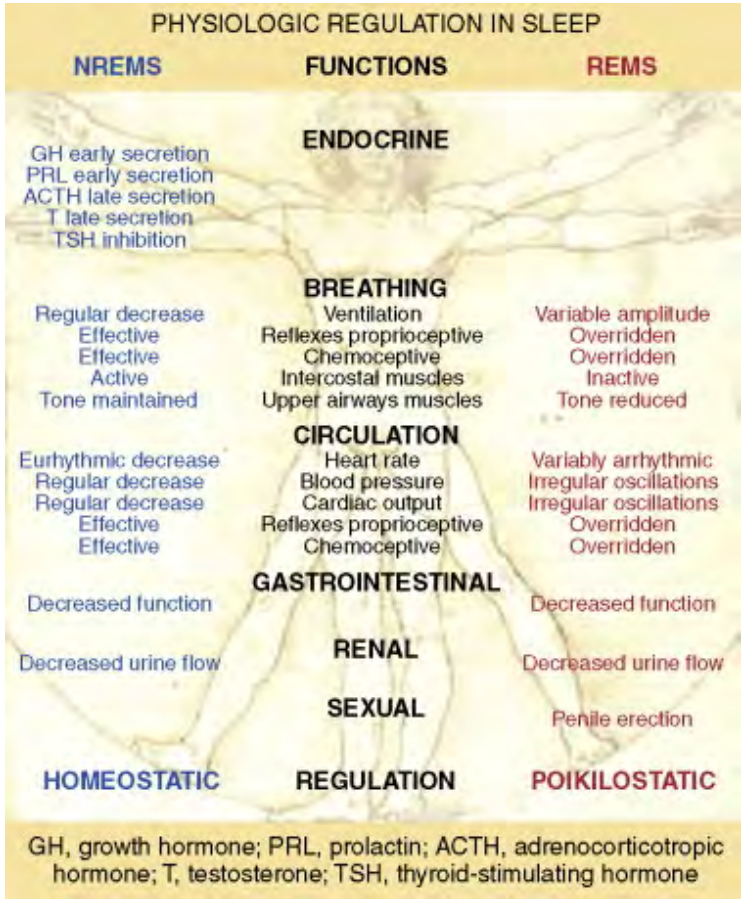
Why Sleep?

- Sleep helps us perform well and feel better
- Theories include:
  - Conservation of metabolic energy
  - 15% less energy expenditure in sleep than quiet wakefulness
  - Cognition
    - Decreased intellectual performance after sleep deprivation
    - Memory consolidation
  - Regulation of temperature and other body functions



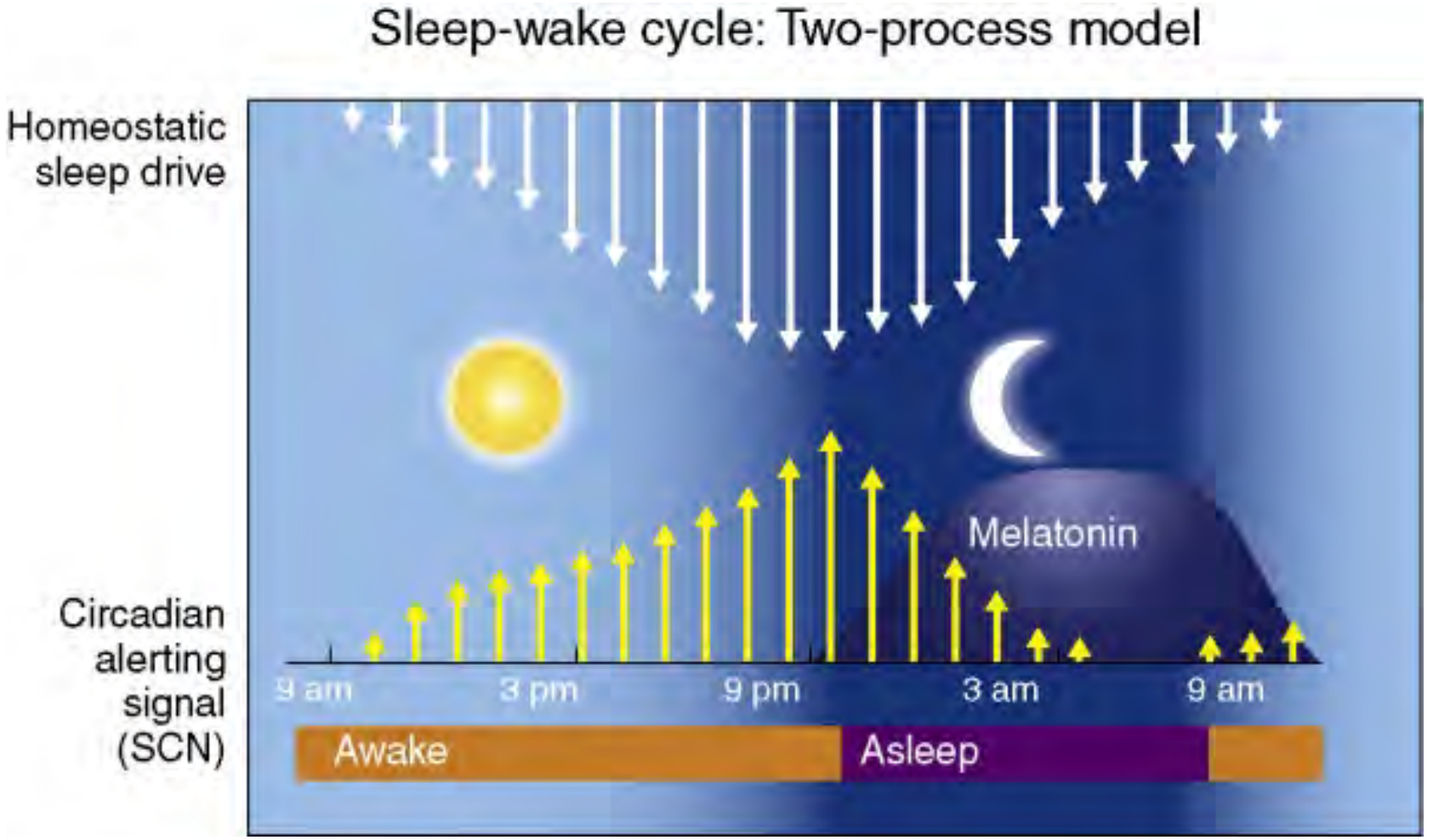
Kryger MG, Avidan AAY. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.
Konnikova M. NY Times Sunday Opinion. 2014

Why Do We Sleep?



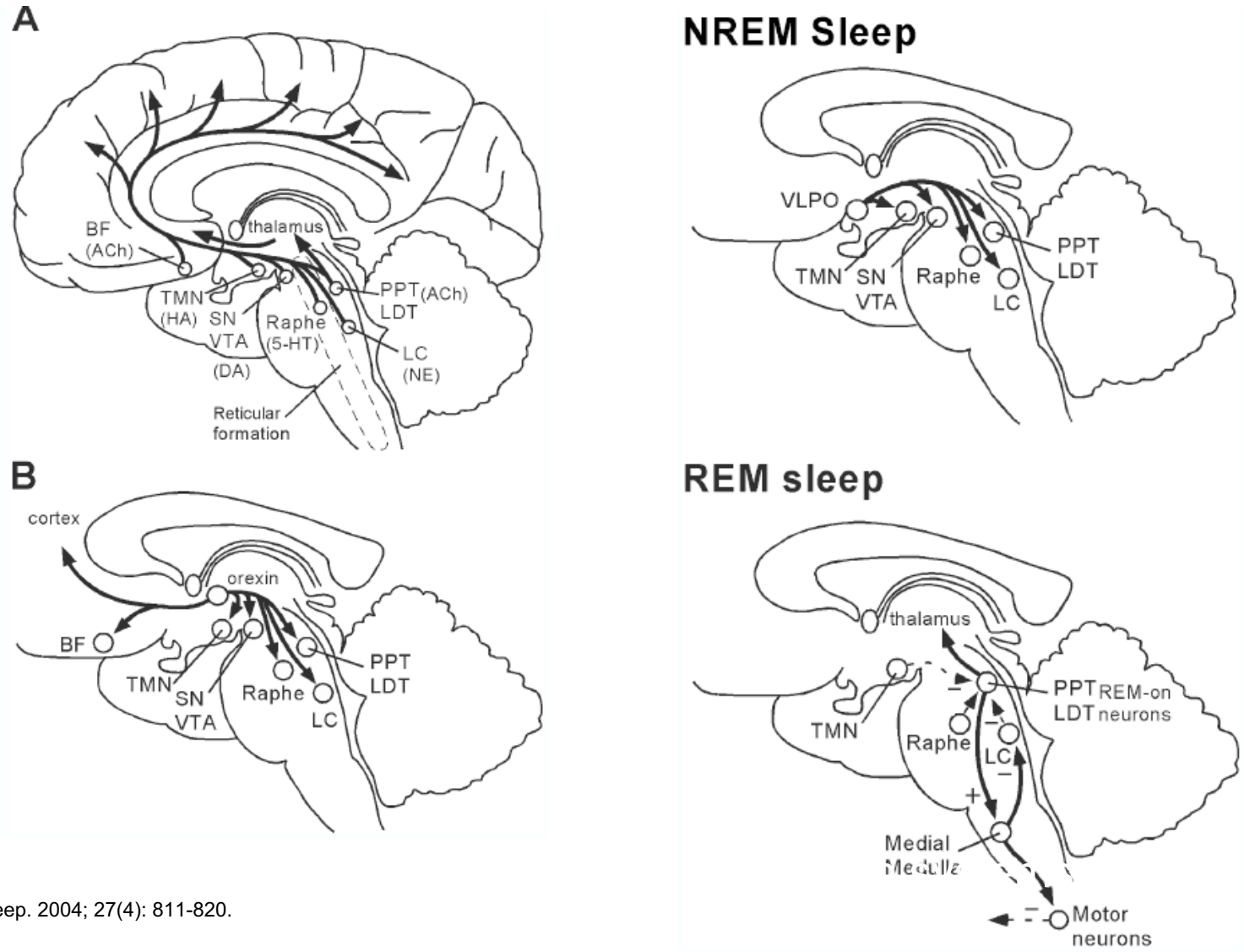
Kryger MG, Avidan AAY. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.
Lloyd-Jones DM, Allen NB, Anderson CAM, et at. Circulation. 2022;146: e18-e43.

What Drives Our Sleep Wake Cycle?



Kryger MG, Reid KJ. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.

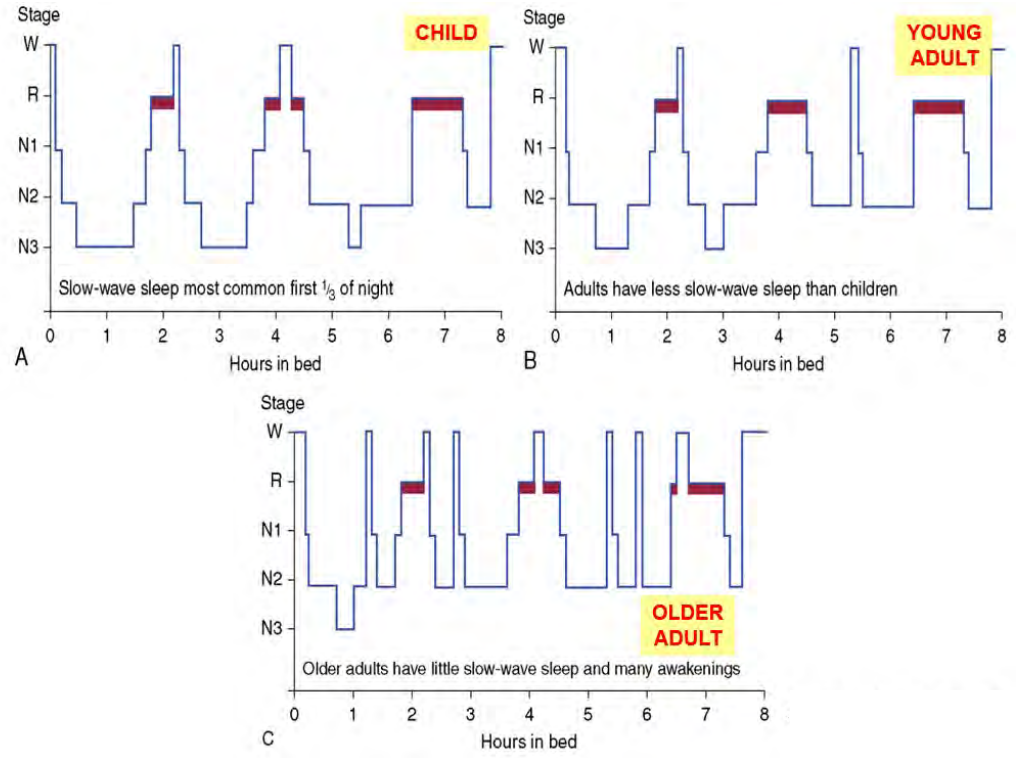
What Drives Our Sleep Wake Cycle?



España RA, Scammell TE. Sleep. 2004; 27(4): 811-820.

How is Sleep Organized?

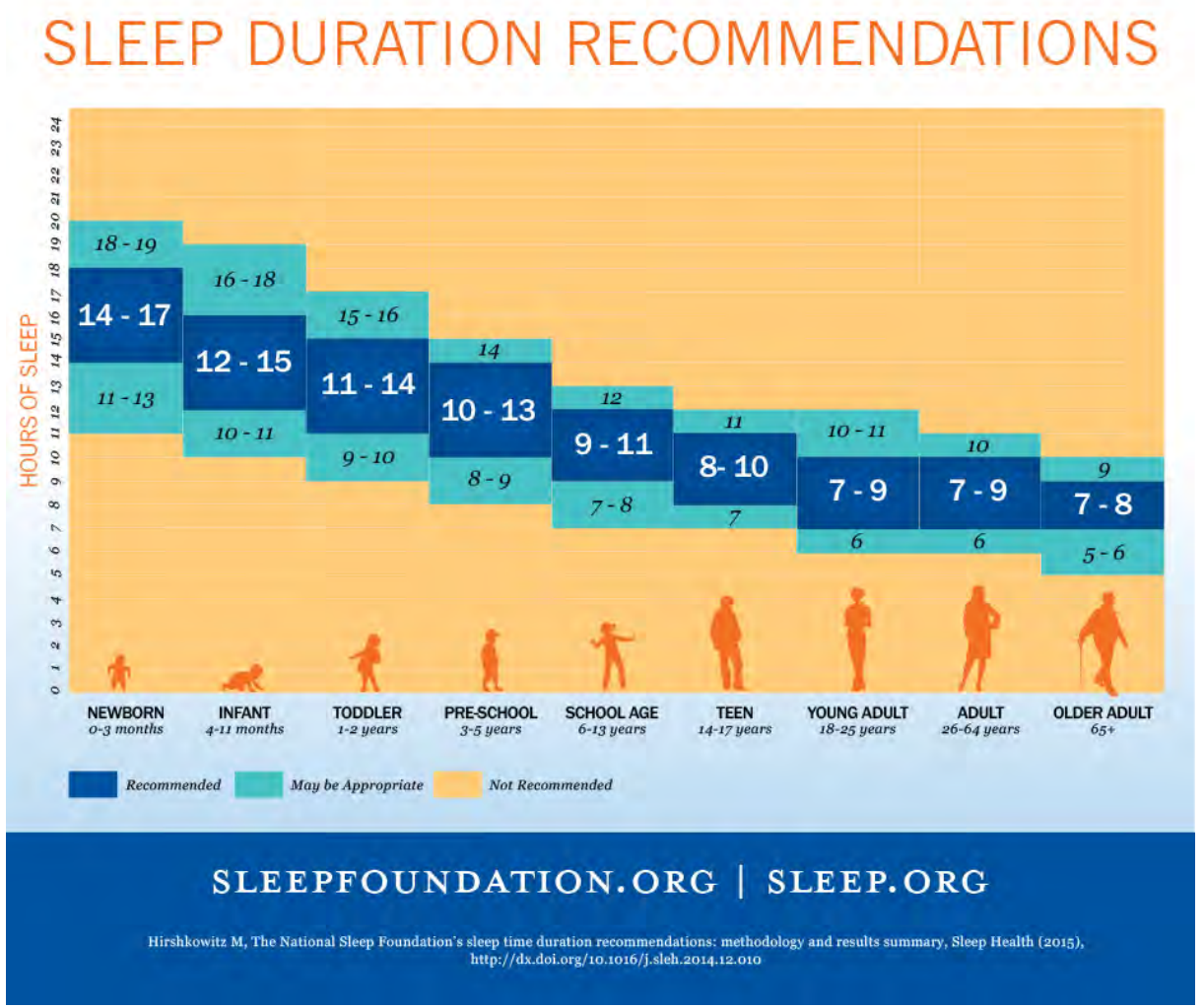
- Non-REM (N1,N2,N3) and REM Sleep
- Sleep cycle is about 90-110 minutes
- Repeated 4-6 times per night
- Stage N3 decreases, REM increases as night progresses
- Young adults spend:
  - 50-60% of the night in stage N2
  - REM is ~20-25% of the night
  - Stage N3 is 15-20% of the night



Kryger MG, Avidan AAY. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.

How Much Sleep Do We Need?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative



What Happens When Someone Does Not Sleep Well?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Hypersomnia

Insomnia

A General Approach to Sleep Issues

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Sleep quantity
  - Number of hours in bed
- Sleep quality
  - Perception of sleeping the entire time while in bed

- What time do you go to bed?
- What time do you wake up?
- Do you have trouble falling asleep or staying asleep?
  - Number of minutes or hours awake
    - Sleep onset
    - Sleep maintenance
  - Number of awakenings
- Do you nap in the day?

A General Approach to Sleep Issues

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Other history to obtain:

- Caffeine, alcohol, drug use
- Past medical and surgical history
- Medications
- Changes in weight
- Social or life stressors
  - Especially if history of insomnia
- Review of systems
  - Snoring
  - Dry mouth, morning headache, nasal congestion
  - Nocturia
  - Pain
  - Restless legs

McCarty DE. J Clin Sleep Med. 2010;6(3): 292-296.

Screening Tools for Sleep Issues

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

		Rarely/ Never (0)	Sometimes (1)	Usually/ Always (2)
Satisfaction	Are you satisfied with your sleep?			
Alertness	Do you stay awake all day without dozing?			
Timing	Are you asleep (or trying to sleep) between 2:00 a.m. and 4:00 a.m.?			
Efficiency	Do you spend less than 30 minutes awake at night? (This includes the time it takes to fall asleep and awakenings from sleep.)			
Duration	Do you sleep between 6 and 8 hours per day?			

Total for all for items ranges from 0-10

0=Poor Sleep Health ⟷ Good Sleep Health=10

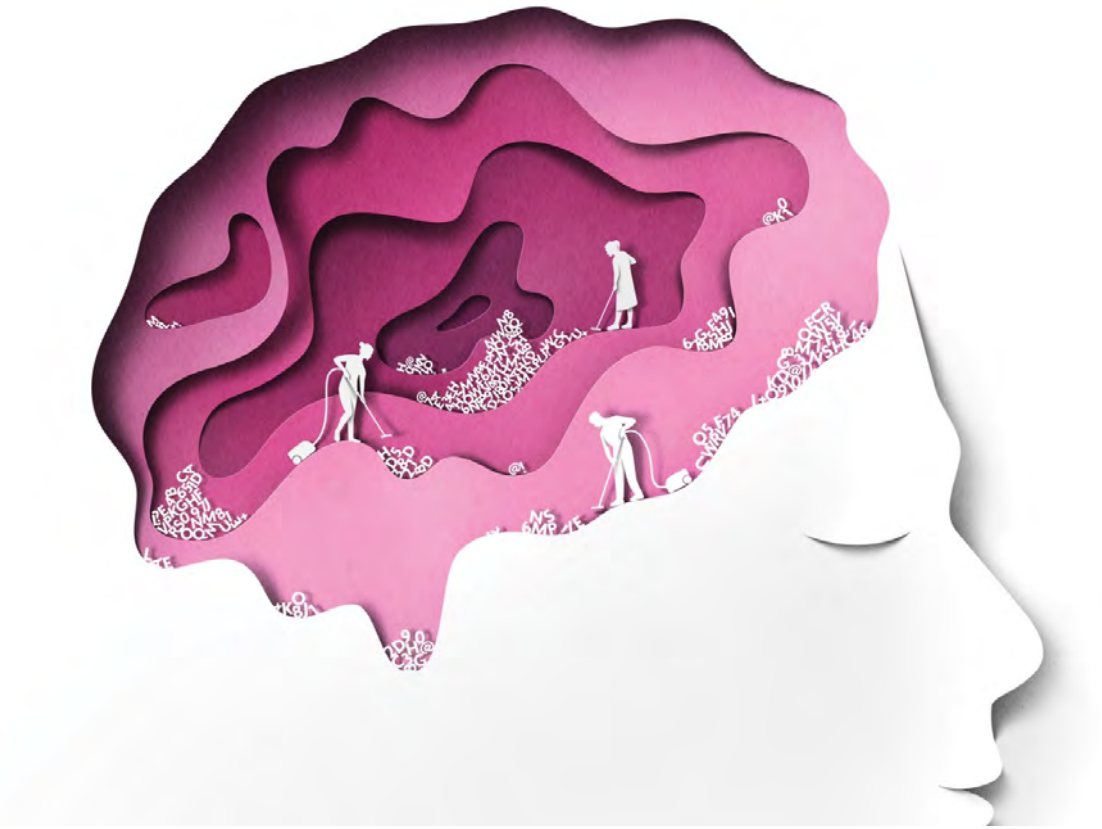
- RU-SATED
  - Focuses on sleep health
- Epworth Sleepiness Scale
  - Obstructive Sleep Apnea (OSA)
- OSA-Specific Screening Tools
  - Berlin Questionnaire
  - STOP-BANG Questionnaire

Buysse DJ. Sleep. 2014;37(1): 9-17.

Why is it Important to Address Sleep Issues?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Fatigue
- Slower response time
- Increased errors
- Reduced learning
- Reduced flexible thinking
- Increased risk taking
- Higher emotional dysregulation
- Decreased resilience



Gohar A, Adams A, Gertner E, et al. J Clin Sleep Med. 2009; 5(3):191-197.
Palagini L, Moretto U, Novi M, et al. J Clin Sleep Med. 2018; 14(5): 759-766.
Konnikova M. NY Times Sunday Opinion. 2014.

Why is it Important to Address Sleep Issues?
Sleep and Cardiovascular Effects

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Sleep duration
- Insomnia
- Sleep and blood pressure
- Obstructive sleep apnea (OSA)
- Restless legs syndrome (RLS)
- Shift work disorder

Sleep Duration
Health Risks

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Sleep duration affects survival
- U-shaped effect, based on meta-analyses of 137 prospective cohort studies comprised of ~5 million participants

Short duration

- 12% increased risk for all-cause mortality
- 37-38% increased risk for incident diabetes mellitus and obesity
- 26% increased risk for coronary heart diseases
- 16-17% increased risk for cardiovascular disease and hypertension

Long duration

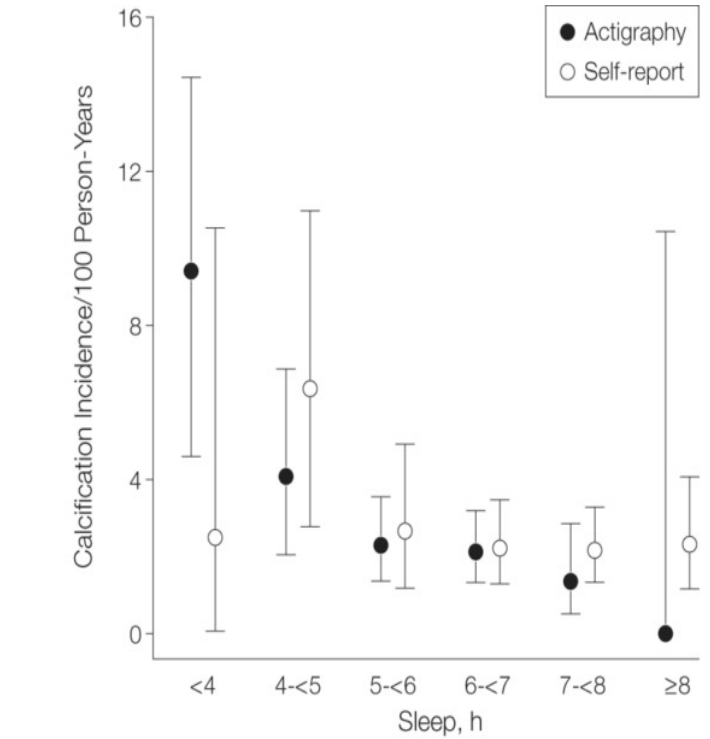
- 39% increased risk for all-cause mortality
- ~25% increased risk for incident diabetes mellitus, cardiovascular disease, and coronary artery disease
- 46% increased risk for stroke

Jike M, Itani O, Watanabe N, et al. Sleep Med Rev. 2018; 38: 25-36.
Itani O, Kaneita Y, Tokiya M, et al. Sleep Med. 2017; 39: 87-94.

Sleep Duration
Coronary Artery Calcification Risk

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- CARDIA cohort ages 18 to 30 in 1985-86
- Years 15 and 20, a subset of 495 subjects studied by sleep questionnaire and actigraphy in addition to the standard chest CT
- Odds of incident coronary calcification inversely related to hours of sleep
- An extra hour of sleep decreased estimated odds of calcifications by 33%
- Modeled effect of 1 extra hour of sleep nightly was equal to the modeled effect of a 16.5 mmHg drop in systolic blood pressure



King CR, Knutson KL, Rathouz PJ, et al. JAMA. 2008;300(24) :2859-2866.

Insomnia

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- **Definition:** Difficulty falling asleep, staying asleep, or early morning awakenings
- Health Professionals Follow-Up Study
  - Prospective cohort of 23,447 male health professionals
- Insomnia complaints associated with less physical activity, higher BMI, increased prevalence of depression, hypertension, cholesterol, triglycerides, diabetes, myocardial infarction, and stroke.
- Frequent sleep onset insomnia had a 55% (HR 1.55;95% CI, 1.19-2.04; *p*-trended=0.01) increased risk of cardiovascular disease mortality, particularly myocardial infarction
- No increased risk for difficulty maintaining sleep or early morning awakenings

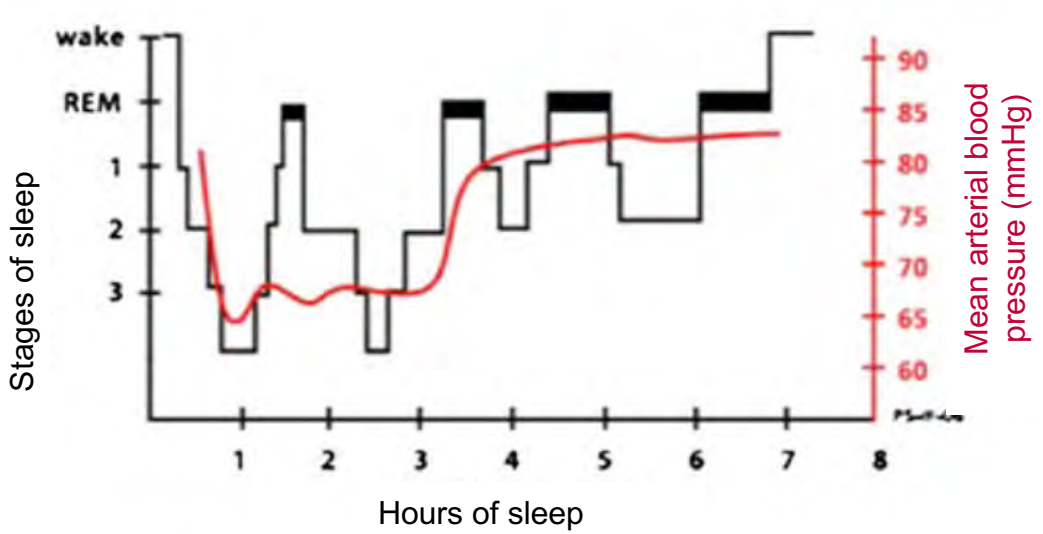
American Academy of Sleep Medicine. International Classification of Sleep Disorders- 3rd edition. 2014.
Li Y, Zhang X, Winkelman JW, et al. Circulation. 2014;129(7): 737-746.

Sleep and Blood Pressure
Normal Dipping

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Slow wave sleep (SWS)
  - Characterized by increased vagal tone and decreased sympathetic activity with subsequent lower heart rate and blood pressure
  - Decreased sympathetic vasoconstriction in the muscular vascular bed concomitantly
- REM sleep
  - Increased and variable sympathetic activity
- Overall blood pressure decreases by ≥ 10 mmHg during sleep, known as “dipping”

Normal Dipping Pattern in a Healthy Individual During a Typical Night of Sleep



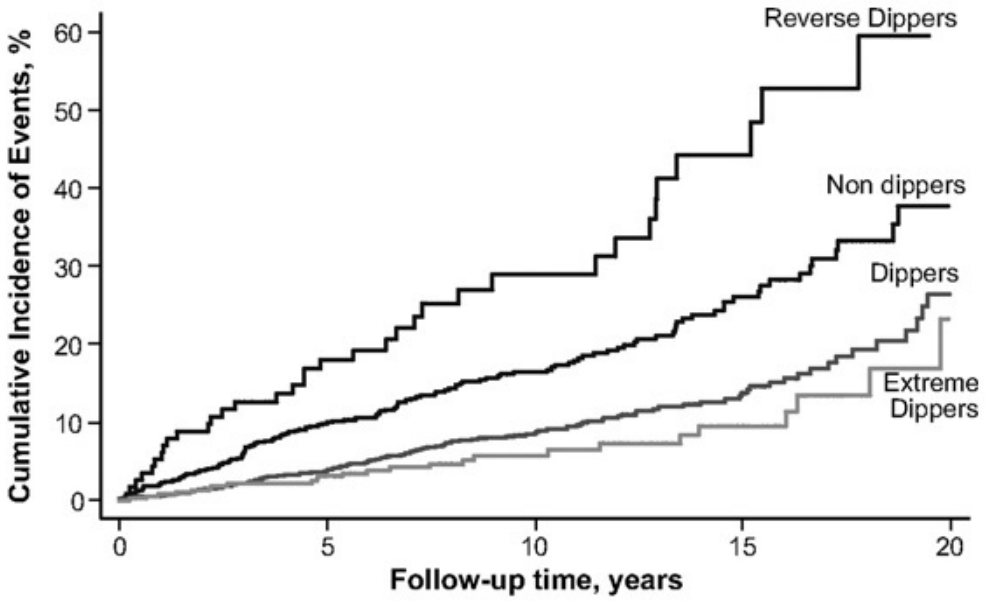
Javaheri S, Redline S. Curr Hypertens Rep. 2012; 14(5): 442-448.

Hypertension and Sleep

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Absence of dipping predicts poorer health outcomes and increased mortality
- Nocturnal hypertension or “reverse dipping” is more predictive of cardiovascular morbidity than daytime readings

Kaplan-Meier curves reporting the cumulative incidence of cardiovascular disease in the 4 categories of dipping pattern.

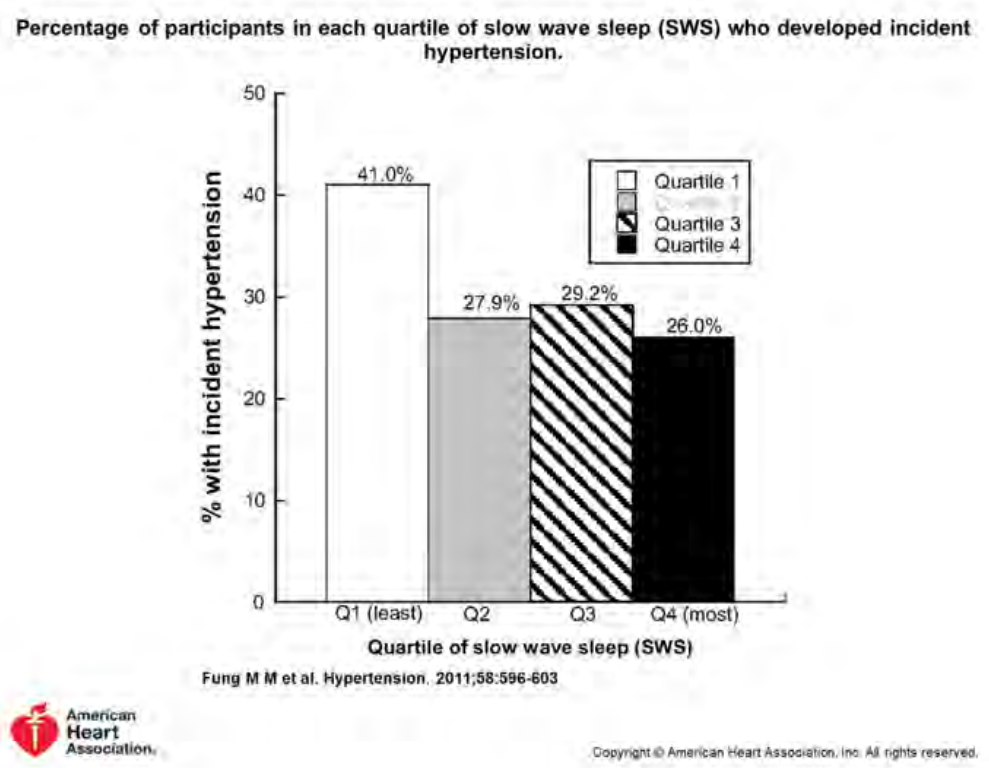


Ivanovic BA, Tadic MV, Celic VP. J Hum Hypertens. 2011; 27:62-70.
Verdecchia P, Angeli F, Mazzotta G, et al. Hypertension. 2012; 60(1):34-42.

Hypertension and Sleep

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- MrOs Sleep Cohort, a longitudinal study of males >67 years old
- 784 normotensive males at baseline developed incident hypertension over the 3.5 years of the study
- 243 of them had significantly less slow wave sleep (SWS) at baseline
- Those with the lowest amount of SWS had 70% increased odds of developing hypertension vs those with higher amounts



Fung MM, Peters K, Redline S, et al. Hypertension. 2011; 2011;58(4):596-603.

Hypertension and Obstructive Sleep Apnea (OSA)

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- OSA is common in those with hypertension
  - 30% in hypertensive adults and 80% in those with drug-resistant hypertension
- Untreated OSA is associated with increased hypertension
  - 18% increased risk in mild OSA
  - 56% increased risk in severe OSA
- OSA is associated with elevated nocturnal hypertension
- Severe OSA is associated with 8-fold risk of poorly controlled blood pressure in Black patients
- Increased severity of OSA is associated with a non-dipping pattern of blood pressure
- Non-dippers have an increased risk for stroke, cardiovascular disease-related and all-cause mortality
- Treatment for OSA may decrease blood pressure

Redline S, Azarbarzin A, Peker Y. Nat Rev Cardiol. 2023.

What is Obstructive Sleep Apnea (OSA)?

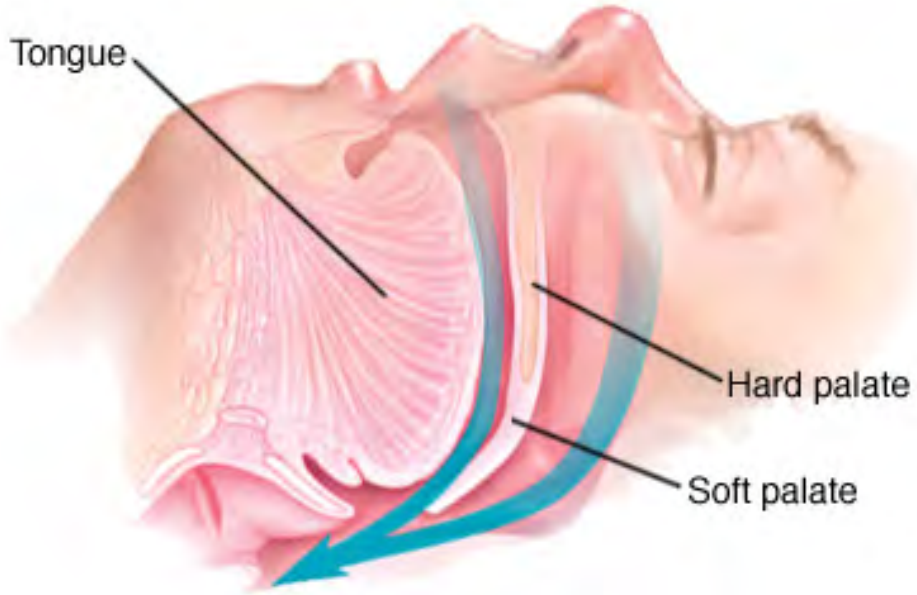
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Seen in 5% of the population
  - But can be seen in up to 60% in those over 65 years old
- Higher incidence
  - Obesity, cardiac disease, pulmonary disease
- More common in males
- Snoring is most common associated symptom (90%)
  - Other symptoms
    - Daytime sleepiness
    - Morning headaches
    - Dry mouth

What Happens in Obstructive Sleep Apnea (OSA)?

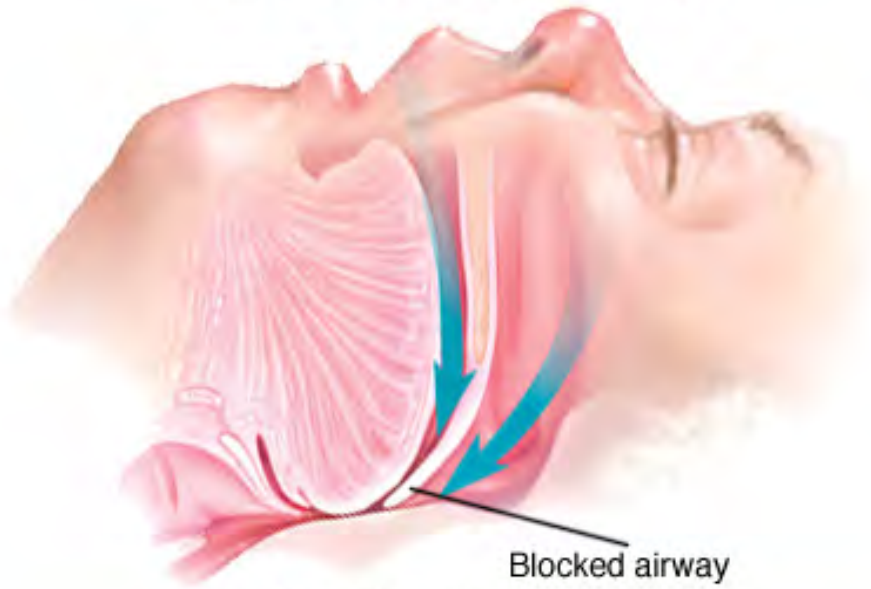
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Open Airway



Normal breathing during sleep

Blocked Airway (OSA)

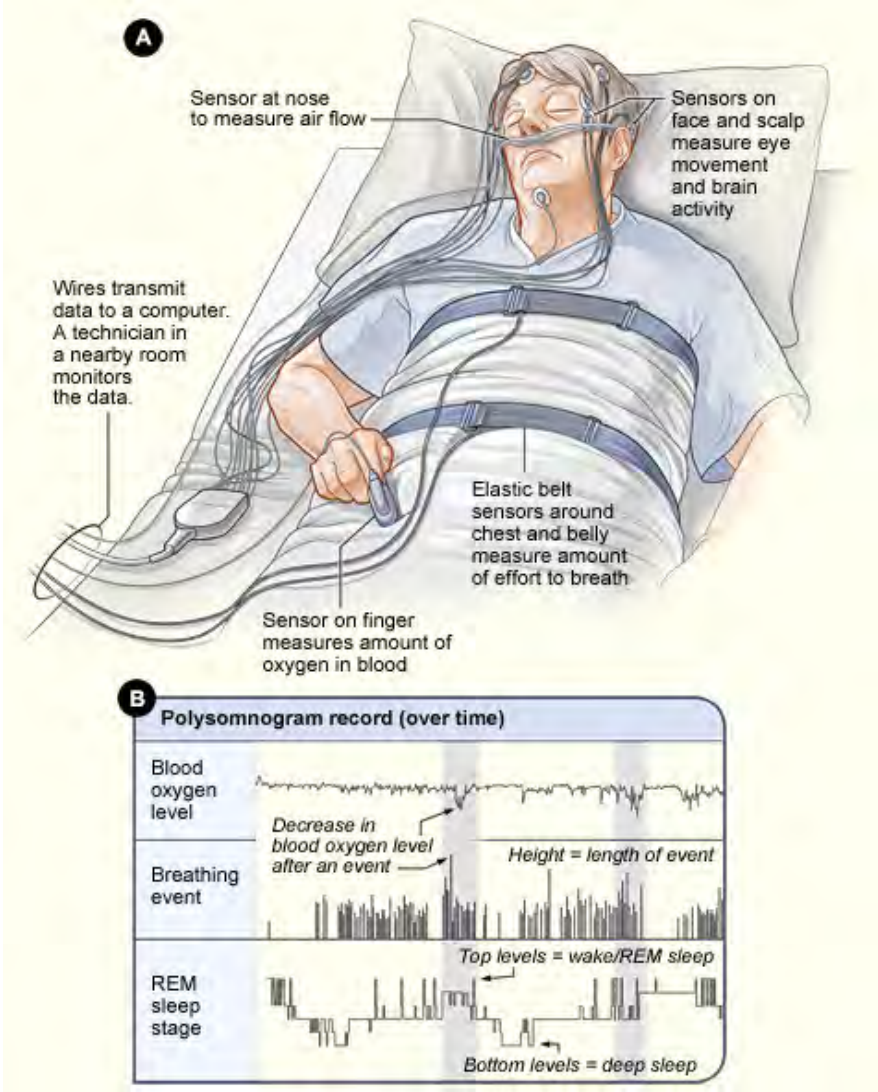


Obstructive sleep apnea

How Do We Evaluate for Obstructive Sleep Apnea (OSA)?

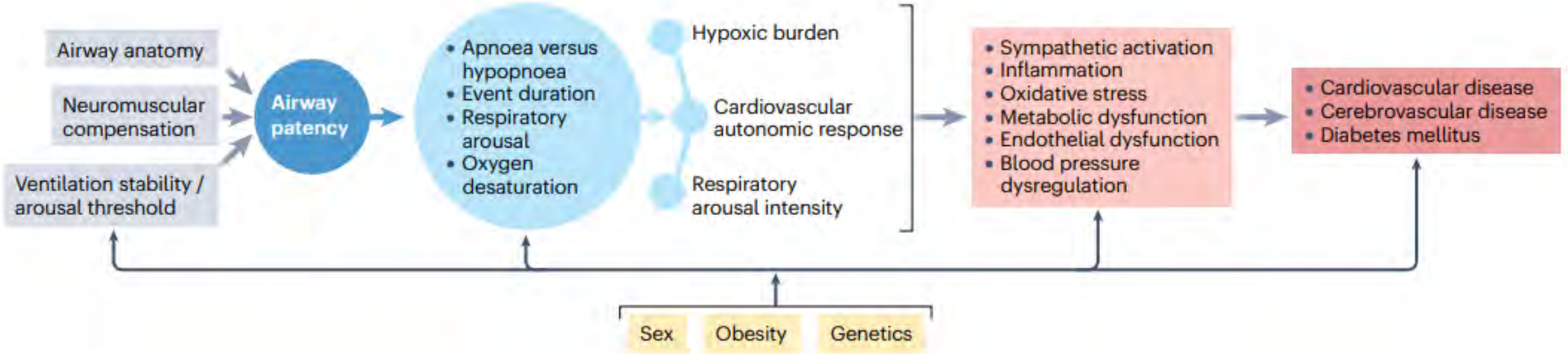
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Polysomnography
(Sleep Study)



Obstructive Sleep Apnea (OSA) and Cardiovascular Risk

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative



Redline S, Azarbarzin A, Peker Y. Nat Rev Cardiol. 2023.

Obstructive Sleep Apnea (OSA) and Diabetes Mellitus

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- OSA is common in those with diabetes mellitus
  - Seen in 15-30% of patients with diabetes
- OSA is associated with an increased risk for diabetes mellitus
  - 35% increased risk in a meta-analysis of nine prospective cohort studies
- Untreated OSA is associated with increased diabetic complications
  - Peripheral neuropathy
  - Retinopathy
  - Nephropathy
- CPAP (continuous positive airway pressure) may improve glycemic control
  - Especially if used >6 hours per night

Redline S, Azarbarzin A, Peker Y. Nat Rev Cardiol. 2023.

Obstructive Sleep Apnea (OSA) and Coronary Artery Disease

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- OSA associated with increased coronary artery calcium scores (>400)
  - Seen in 15-30% of patients with diabetes
- OSA increases the risk for coronary artery disease
  - 3-fold risk in moderate-severe OSA in females and severe OSA in males
- Mixed results on the effects of CPAP on decreasing OSA risk
  - CPAP (continuous positive airway pressure) compliance is a factor

Redline S, Azarbarzin A, Peker Y. Nat Rev Cardiol. 2023.

Obstructive Sleep Apnea (OSA) and Stroke

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- OSA is associated with an increased risk for stroke
  - Risk may increase due to the degree of OSA
  - Males with severe OSA had a 3-fold increased risk for stroke
- Treatment for OSA may decrease stroke risk
- Treatment for OSA may improve neurological outcomes in those with stroke

Redline S, Azarbarzin A, Peker Y. Nat Rev Cardiol. 2023.

Other Sleep Conditions and Cardiovascular Risk
Restless Legs Syndrome (RLS)

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Diagnostic Criteria

- **U**rge to move limbs, usually accompanied or caused by uncomfortable and unpleasant feelings in the limbs
- **R**est worsens or inactivity precipitates symptoms
- **G**etting up or moving improves the urge to move
- **E**vening worsening or nighttime appearance of symptoms

Note: Symptoms should be associated with functional difficulties.

American Academy of Sleep Medicine. International Classification of Sleep Disorders- 3rd edition. 2014.

Restless Legs Syndrome (RLS) and Cardiovascular Disease

- Epidemiological data is mixed
- Increased sympathetic nervous system activation may contribute
  - Similar to Obstructive Sleep Apnea (OSA)

Cohort	N (RLS%)	Mean age, duration of follow-up	RLS information (duration, frequency, 1°/2°)	CVD outcomes
Study of Health in Pomerania [9]	4 308 (10.1%)	50.3 5 years	None; no change w/out DM cases	- MI -CVA
Women's Health Study [7]	29 756 (11.7%)	63.4 6 years	None; no change w/out ESRD/PVD	- first CVD event -MI -CVA
Physician's Health Study [6]	19 182 (7.2%)	66.6 7.3 years	None; no w/out ESRD/PVD	- first CVD event -MI -CVA
Nurse's Health Study [10]	70 977 (2.1%)	67 5.6 years	Duration > 3 years; no change w/out DM/ESRD	+(fatal) CHD +first MI event
Kaiser Permanente [11]	~12 000 with RLS	1°=58; 2°=65 3.9 years	Physician diagnosis; 2°=many comorbidities	1°:-CVD/MI/CVA 2°:+CVD/MI/CVD
Veterans Administration [12]	7 392 (0.1%)	59.8 8.1 years	"Incident RLS"	+CHD/CVA

Abbreviations: "-", no relationship; "+", positive relationship with RLS; DM, diabetes mellitus; ESRD, end-stage renal disease; CHD, chronic heard disease; MI, myocardial infarction; PVD, peripheral vascular disease; CVA, cerebrovascular accident; 1^{o}, primary RLS; 2^{o}, secondary RLS.

Gottlieb DJ, Somers VK, Punjabi NM, Winkelman JW. Sleep Med. 2017;31: 10-17.

Restless Legs Syndrome (RLS) and Cardiovascular Disease

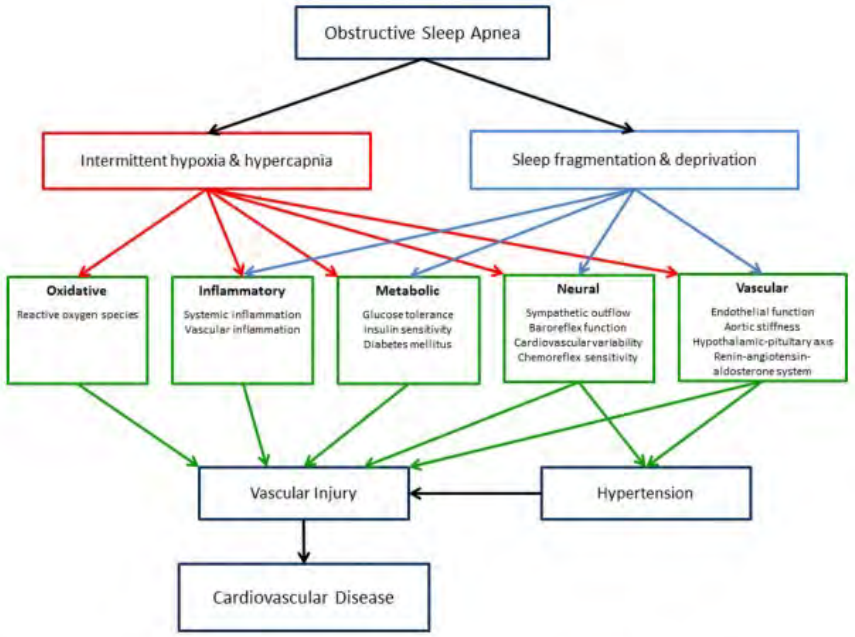


Figure 1. Proposed mechanisms linking obstructive sleep apnea to cardiovascular disease
While intermittent hypoxemia is unlikely to be relevant to RLS, there is evidence that sleep fragmentation and sleep deprivation may contribute to neural, metabolic, vascular, and inflammatory mechanisms. These pathways may therefore inform research in to the possible cardiovascular consequences of RLS.

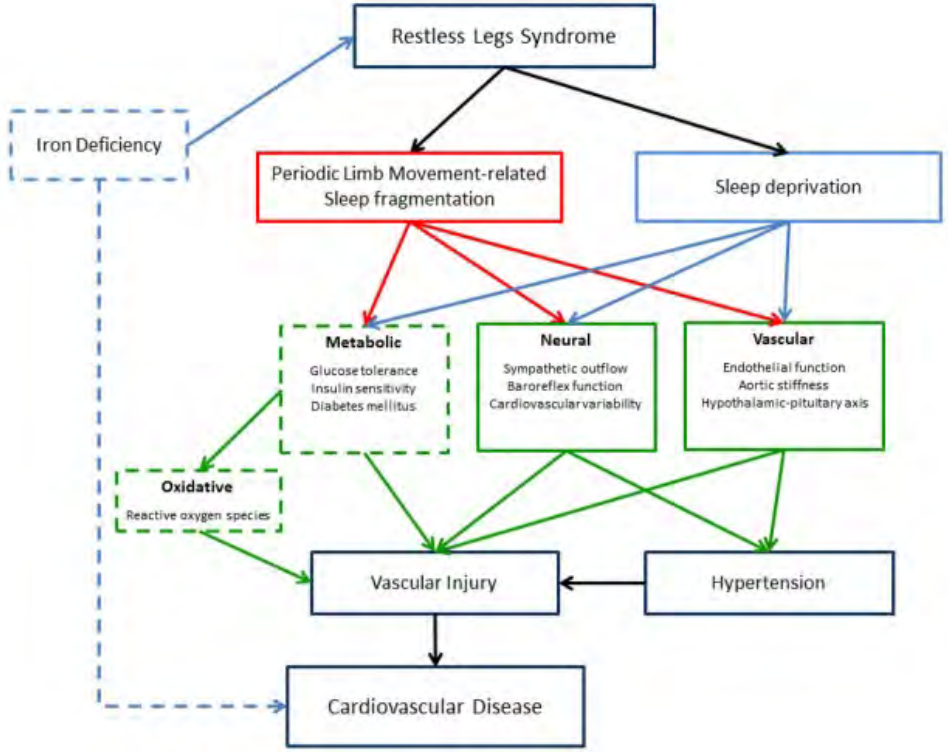


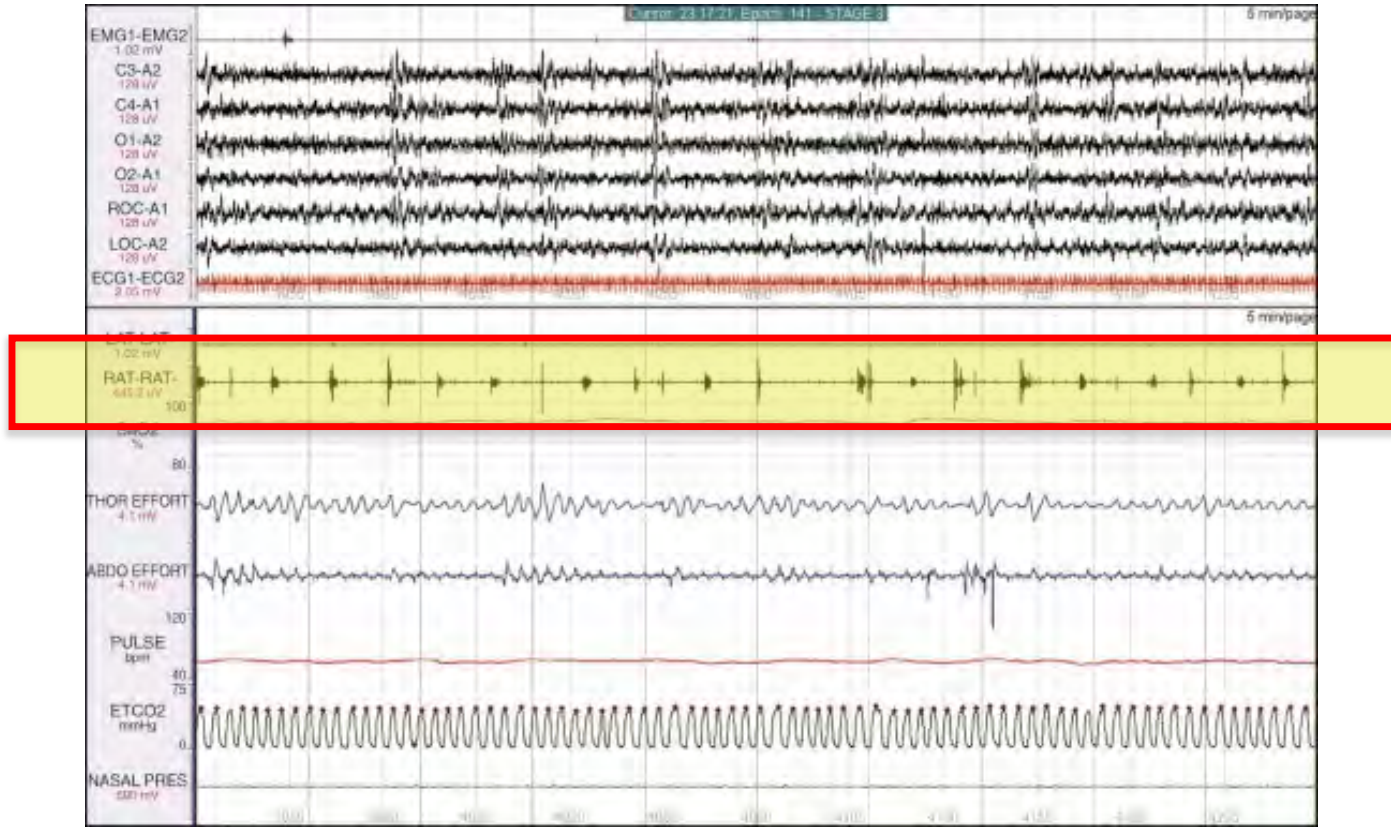
Figure 2. Plausible mechanisms linking restless legs syndrome to cardiovascular disease
Those mechanisms for which there is some experimental evidence of an association with RLS or periodic limb movements are shown in solid boxes.

Gottlieb DJ, Somers VK, Punjabi NM, Winkelman JW. Sleep Med. 2017;31:10-17.

Periodic Limb Movements of Sleep

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

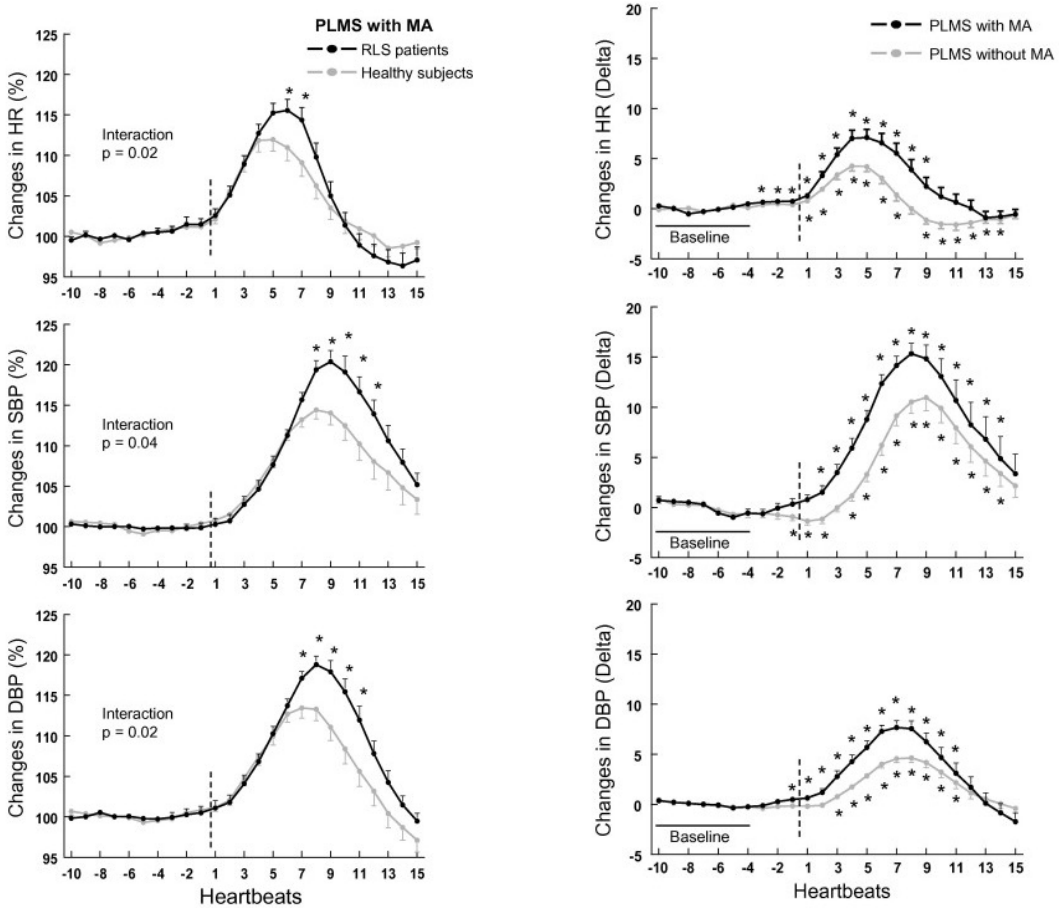
- Commonly seen in those with restless legs syndrome (RLS)
- Also, can be observed independently of RLS



Periodic Limb Movements (PLMs) of Sleep
Cardiovascular Effects

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

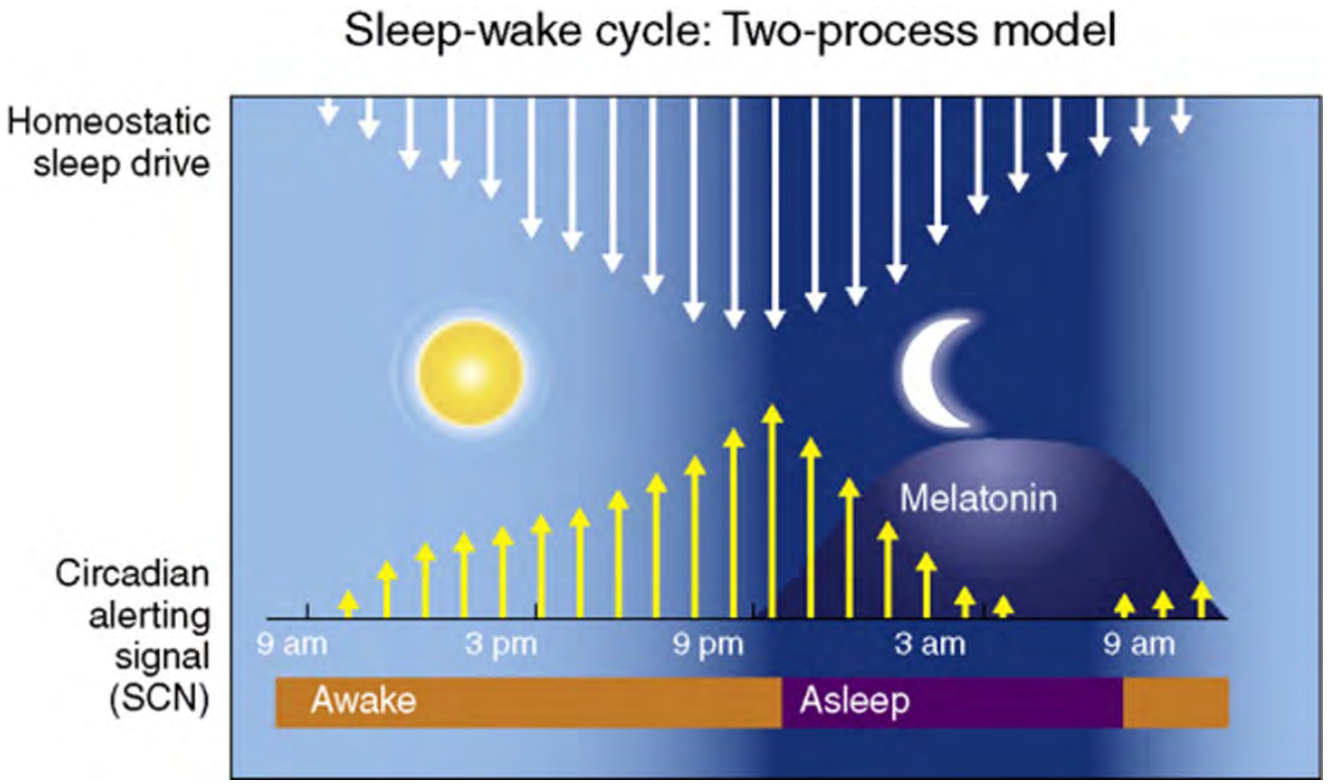
- Study with 14 restless legs syndrome (RLS) participants and 14 healthy controls
- PLMs associated with increased heart rate and blood pressure
  - More prominent in those with microarousals (MA)
- Cardiovascular effects more increased in those with RLS

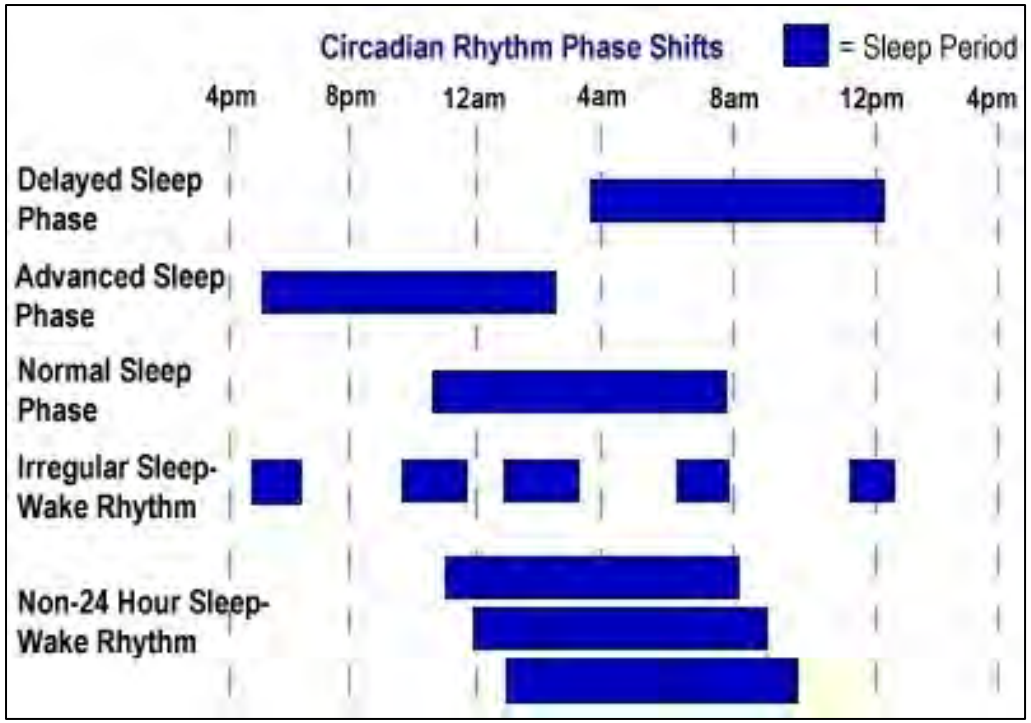


Pennestri MH, Montplaisir J, Fradette L, et al. Sleep Med. 2013; 14(6):555-561.

Other Sleep Conditions and Cardiovascular Risk
Circadian Rhythm Disorders

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

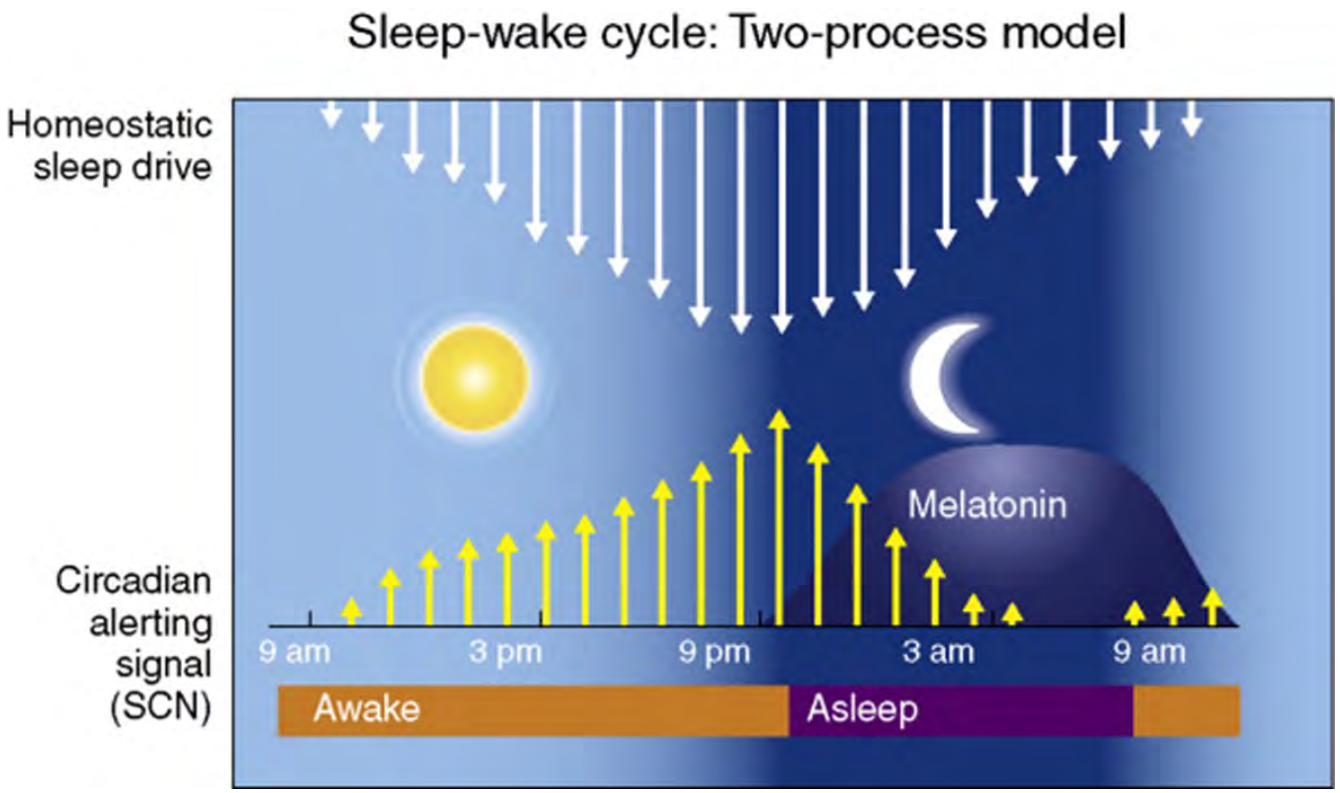


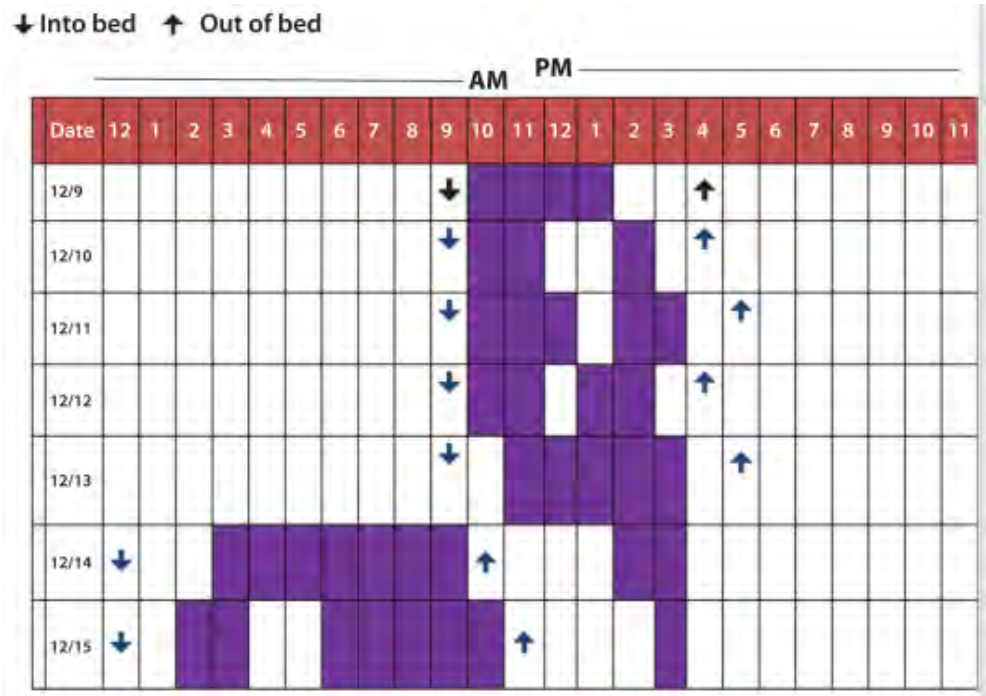


Kryger MG, Reid KJ. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.
Chokroverty S. Semin Neurol. 2009;29(4):446-467.

Shift Work and Cardiovascular Risk

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative





Kryger MG, Reid KJ. Atlas of Clinical Sleep Medicine. 3rd Edition. 2010.
Zee PC, Attarian H, Videnovic A. Continuum (Minneap Minn). 2013; 19(1 Sleep Disorders):132-147.

Shift Work and Cardiovascular Risk

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Shift work has been associated with an increased risk of myocardial infarction, stroke, and coronary events
- May have dose-response relationship to increased years of shift work
- May be more likely to have a non-dipping blood pressure pattern
- Increased risk for higher systolic and diastolic blood pressures

Belloir J, Makarem N, Shechter A. Curr Cardiol Reports. 2022; 24: 2097-2107.

How Do We Optimize Sleep?

Optimizing Sleep Duration

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Educate patients about the importance of adequate sleep time and good sleep habits
- Cognitive behavioral treatment for insomnia (CBT-i) has good, long-term results in both primary insomnias and insomnia associated with disease states, e.g., cancer, depression, rheumatologic conditions, among others.

Optimizing Sleep Duration
Pharmacotherapy for Insomnia

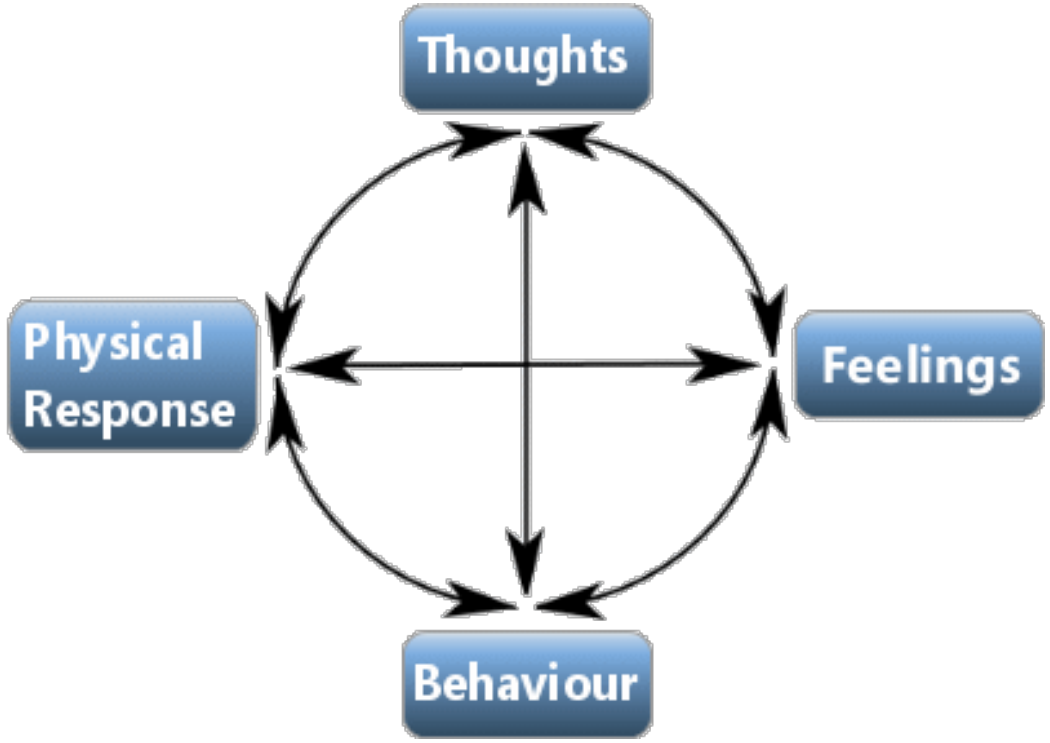
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Ideally used for acute insomnia
- Chronic, intermittent use may be beneficial
  - Anti-depressants or anti-epileptics with sedating side effects
- Studies show that behavioral treatments result in more sustained benefits over time

Optimizing Sleep Duration
Cognitive-Behavioral Therapy

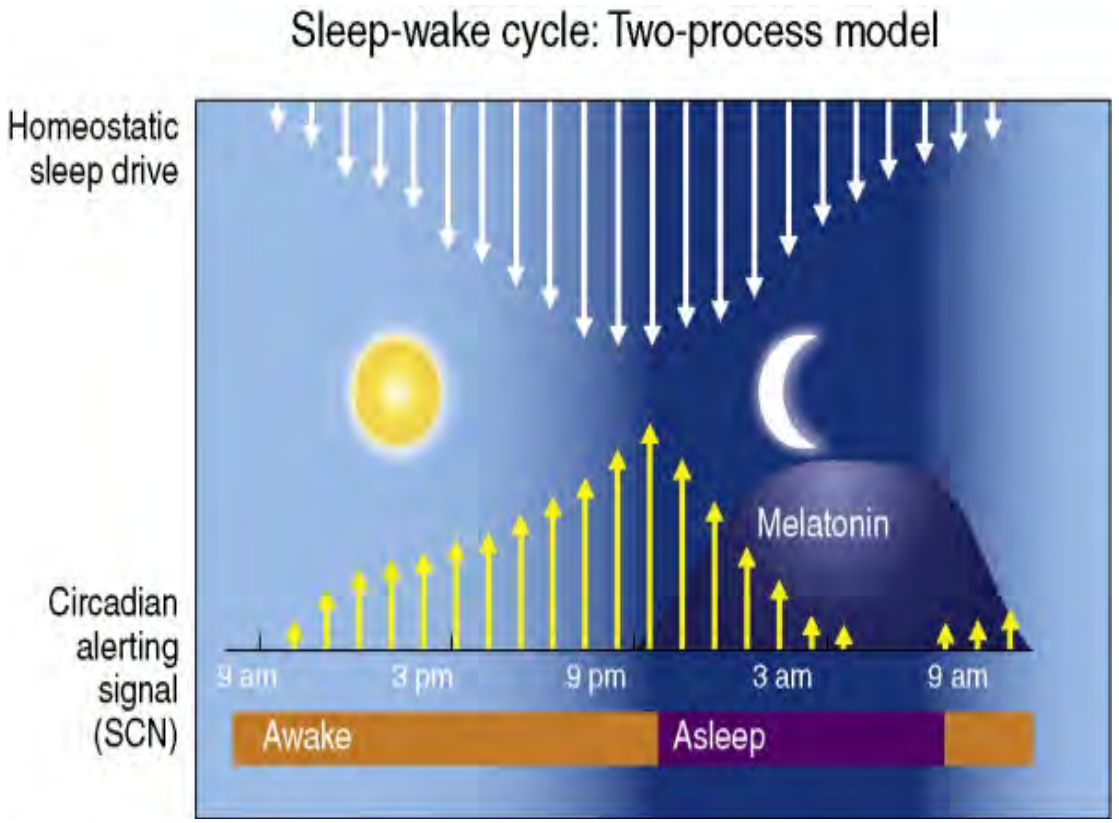
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Cognitive
  - Identify and correct negative thinking associated with sleep
- Behavioral
  - Practice good sleep habits
  - Alter schedule to promote sleep



Optimizing Sleep Duration
Why Practice Good Sleep Habits?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative



Homeostatic drive for sleep

- Behaviors

Circadian rhythm

- Internal clock

It's All About The Sleep-Wake Cycle

Optimizing Sleep Duration
What Behaviors Can Hinder Our Ability to Fall Asleep?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Caffeine

Napping

Optimizing Sleep Duration
Non-Pharmacological Strategies for Insomnia

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Eliminate naps
- No caffeine after 2 pm
- Keep a consistent sleep schedule
- Stimulus control - Keep the bed for sleep only!
  - Trains the brain to keep the room for sleep by advising the patient to go to bed only when sleepy
  - If unable to fall asleep or stay asleep after 20 minutes, the patient should be instructed to go into another room and perform a relaxing activity
- Relaxation training
  - Tensing and relaxing various muscles in the body, with the goal of calming a patient's state of arousal

Morganthaler TI, Owens J, Alessi C, et al. Sleep. 2006; 29(10):1277-1281.

How Do We Treat Obstructive Sleep Apnea (OSA)?

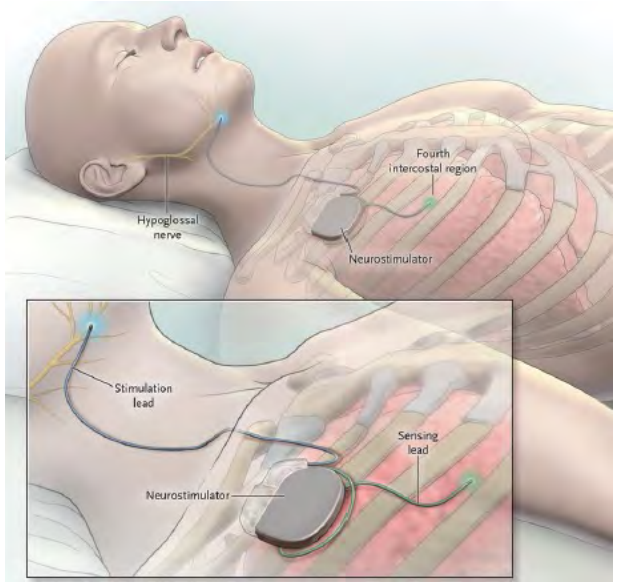
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Continuous Positive Airway Pressure (CPAP)

How Do We Treat Obstructive Sleep Apnea (OSA)?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Alternative Treatments



Surgical options

Oral appliances

Positional therapy

Strollo PJ Jr, Soose RJ, Maurer JT, et al. N Engl J Med. 2014;370(2):139-149.
https://zzomaosa.com/

How Do We Treat Restless Legs Syndrome (RLS)? *Non-Pharmacological Management*

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Check iron status
- Recommend mentally alerting activities
  - Decrease times of boredom
- Wean or abstain from caffeine
- Review the medication list
- Moderate (not intense) exercise may also be helpful

Silber MH, Becker PM, Earley C, et al. Mayo Clinic Proc. 2013; 88(9):977-986.

How Do We Treat Restless Legs Syndrome (RLS)? *Pharmacological Management*

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Dopamine agonists
  - Ropinirole or pramipexole
  - Caveat: Impulse control disorders and augmentation
- Alpha-2-delta calcium channel ligands
  - Gabapentin or Pregabalin
- In refractory cases, low-dose opioids

Silber MH, Becker PM, Earley C, et al. Mayo Clinic Proc. 2013; 88(9):977-986.

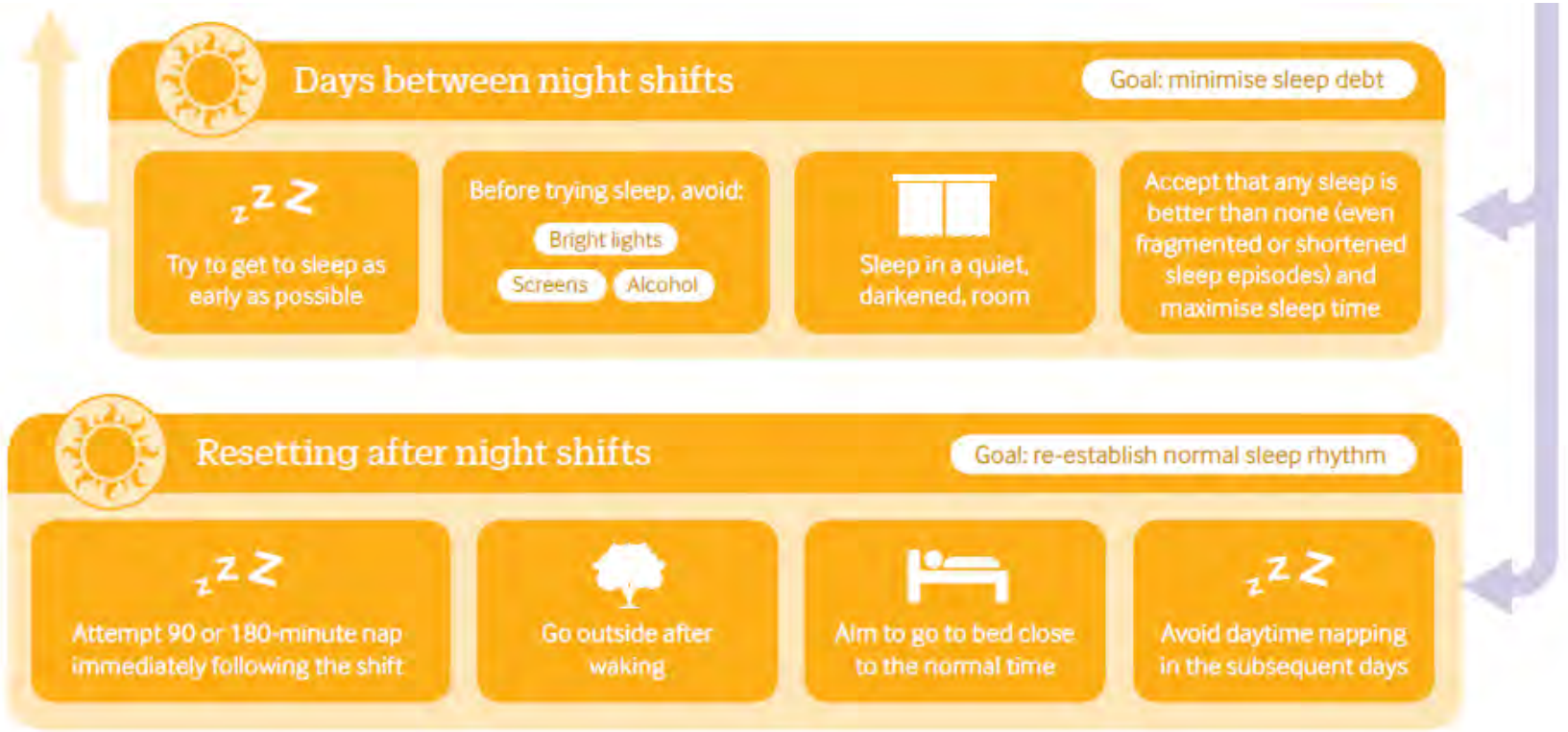
How Can We Optimize Sleep in Shift Workers?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

BMJ. 2018;360:j5637.

How Can We Optimize Sleep in Shift Workers?

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative



BMJ 2018;360:j5637.

General Tips to Improve Sleep

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

- Consistent sleep schedule
  - Regular sleep time and bedtime routine
  - Seven to nine hours of sleep a night (18-65 years old)
- Optimal treatment of medical and psychiatric conditions
- Review of medication lists
- No naps
  - Limit to less than 30 minutes a day if necessary
- No caffeine use after 2 pm
- Avoid nicotine and alcohol before bedtime
- Maintain bedroom for nighttime activities only
- Cool, comfortable environment

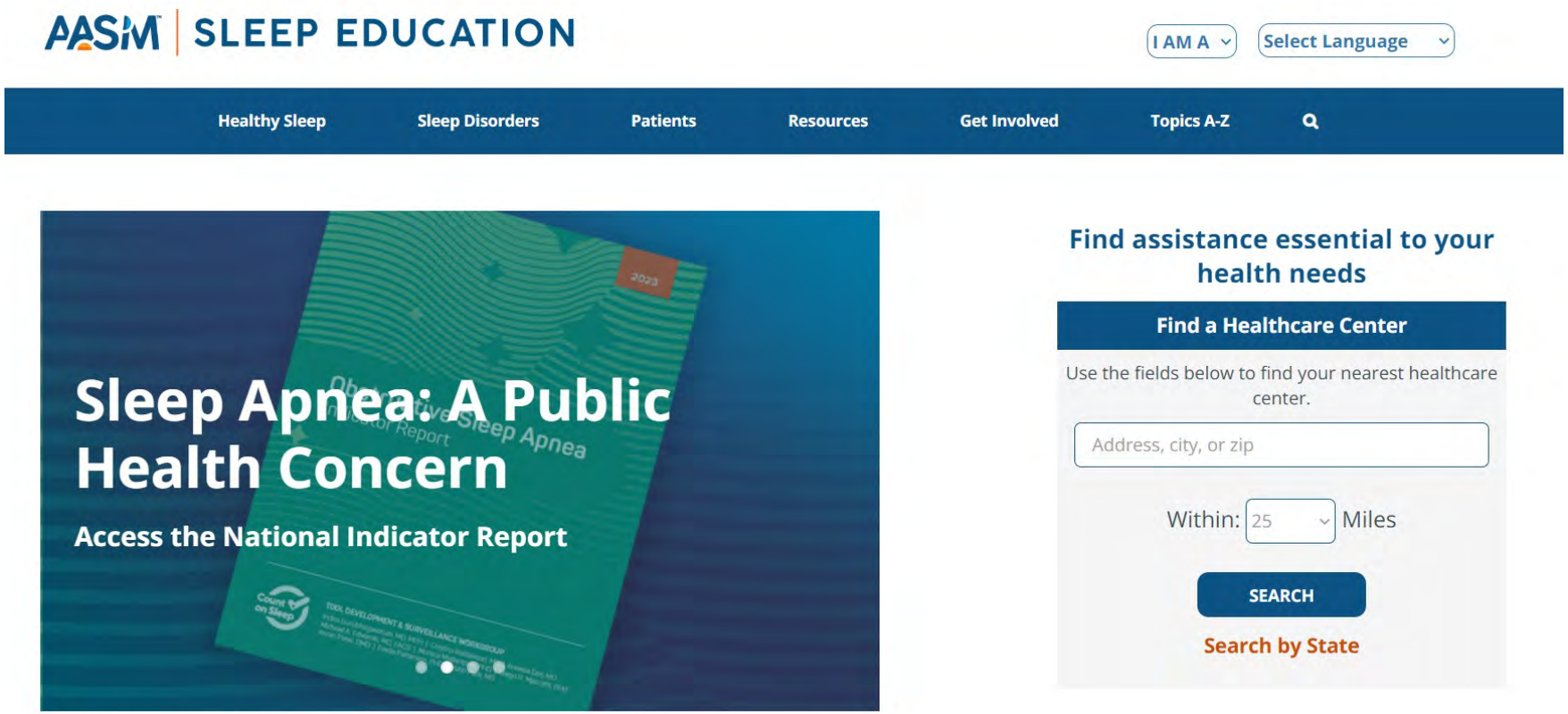
Learning Objectives

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

1. Identify the cardiovascular implications of sleep conditions
2. Screen patients at risk for sleep conditions
3. Counsel patients on how to optimize sleep health

Resources

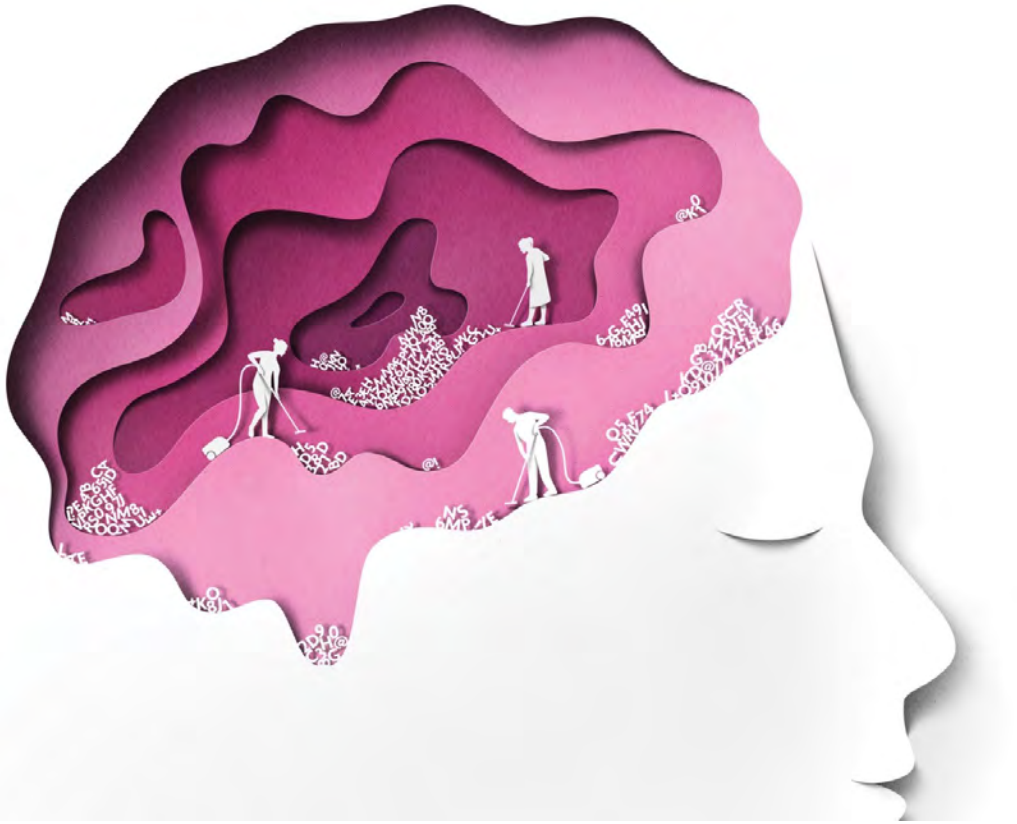
CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative



sleepeducation.org

Thank You

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative



Konnikova M. NY Times Sunday Opinion. 2014.
Lloyd-Jones DM, Allen NB, Anderson CAM, et at. Circulation. 2022;146:e18-e43.

CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative

Audience Question and Answer

Amy Zack, MD

Case Western Reserve University School of Medicine

Speakers

REMINDER:
Submit questions using the 'Q&A' feature

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Jennifer Molano, MD
University of Cincinnati College of Medicine

Amy Zack, MD (Moderator)
Case Western Reserve University School of Medicine

CARDI·OH

Ohio Cardiovascular and Diabetes Health Collaborative

Next Steps and Wrap Up

Shari Bolen, MD, MPH
Case Western Reserve University School of Medicine

CME Reminder

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

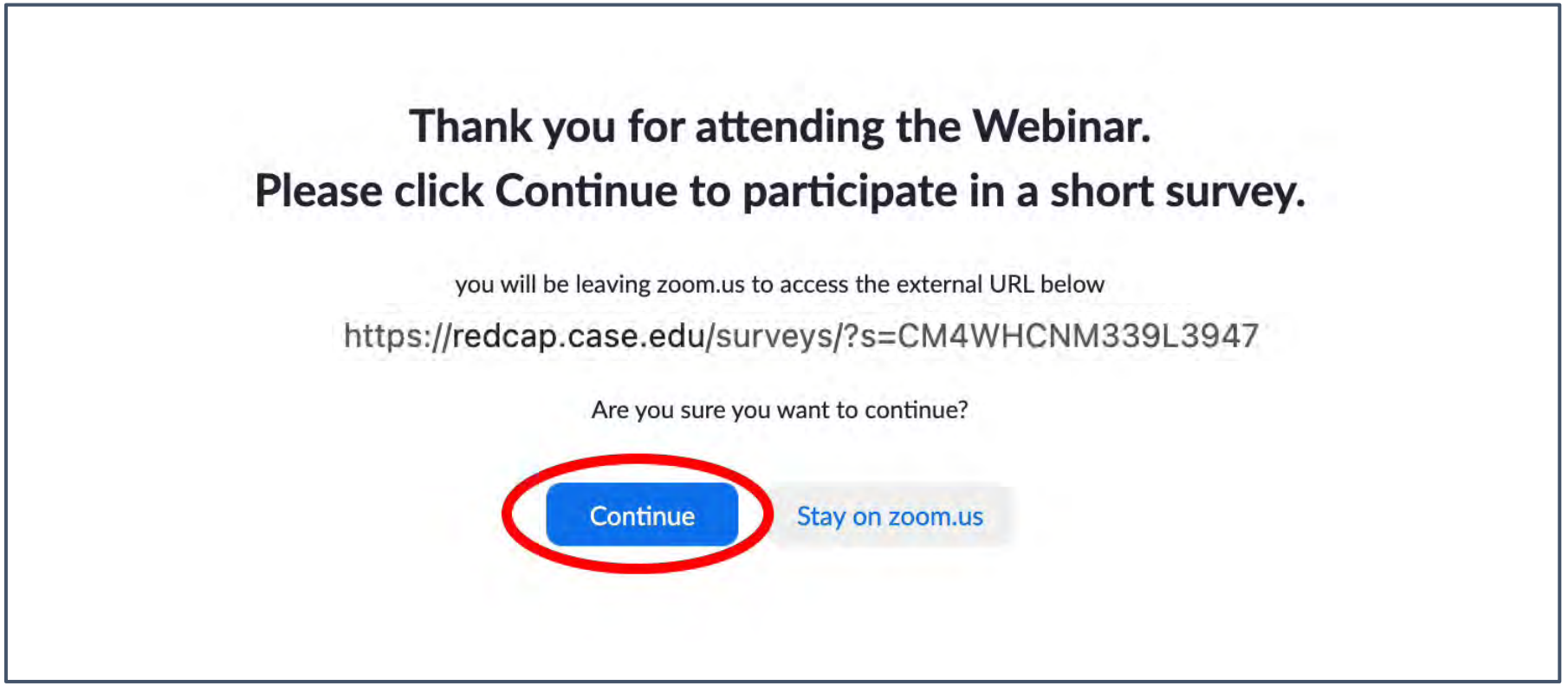
- Registration is required for CME credit:

URL in chat window **OR** Use QR Code

We Want to Hear from You!

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Please complete a brief evaluation of the webinar.



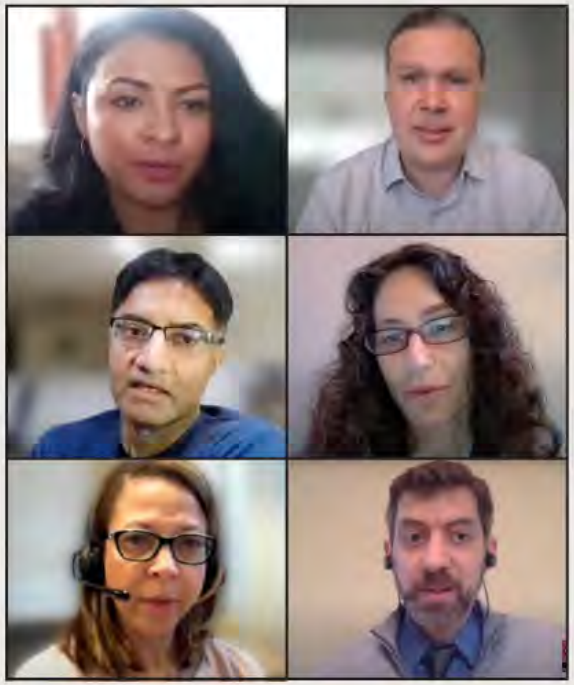
Hit the **Continue** button in your new browser tab to access the evaluation survey.
The survey link will also be emailed to you.

Health Equity and Cardiovascular Risk

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Project ECHO®

Expert-led didactics and interactive case-based learning for primary care teams across Ohio.



Starting September 14, 2023
12-week virtual clinic
Thursdays, 8-9 a.m. ET

Register at Cardi-OH.org
CME credits offered at no cost

Ohio Cardiovascular and Diabetes Health Collaborative

THANK YOU!

CARDI·OH
Ohio Cardiovascular and Diabetes Health Collaborative

Learn More!

Visit Cardi-OH.org to learn more about the collaborative, read up on the latest best practices, and subscribe to the Cardi-OH *Update* newsletter.

Follow Us!

Twitter @cardi_OH
Facebook @cardiohio

The Ohio Cardiovascular and Diabetes Health Collaborative is funded by the Ohio Department of Medicaid and administered by the Ohio Colleges of Medicine Government Resource Center. The views expressed in this presentation are solely those of the authors and do not represent the views of the state of Ohio or federal Medicaid programs.