



**UW PACC**

Psychiatry and Addictions Case Conference

UW Medicine | Psychiatry and Behavioral Sciences

# COGNITIVE BEHAVIORAL TREATMENT OF INSOMNIA (CBTI)

## PART II: IMPLEMENTING THE “B” IN CBTI



# SPEAKER DISCLOSURES

✓ No conflicts of interest

# LEARNING OBJECTIVES

- Provide an overview of the impact of insomnia, and a model of how chronic insomnia develops
- Review the basics of cognitive behavior therapy for insomnia (CBT-i)
- Describe some challenging situations that arise in treating insomnia, and how to handle these

# RESEARCH EVIDENCE FOR CBT-I

- Conclusively demonstrated that CBT-I is effective in treating insomnia across many different settings and patient populations
- Stimulus control and time-in-bed restriction are the most important components of CBT-I
- Dissemination of CBT-I has been slow

Vitiello, McCurry, & Rybarczyk,  
2013

# DEFINING AND DIAGNOSING INSOMNIA

- Difficulty initiating or maintaining sleep
- Difficulty functioning during the day (includes distress regarding insomnia)
- Frequency and duration definitions
  - $\geq$  3 months duration
  - Frequency of difficulty with sleep onset, middle-of-the-night awakening, or awakening too early
- Definitions sometimes include nonrestorative sleep
- Insomnia is a *subjective* problem

# INDICATIONS FOR CBT-I

- Indications:
  - Insomnia symptoms + maladaptive behaviors or conditioned arousal
- Insomnia defined as trouble initiating or maintaining sleep
  - Average sleep latency
  - Wake after sleep onset (WASO)
  - Early morning awakenings

# TOOLS FOR ASSESSMENT AND TREATMENT

- Insomnia Severity Index (Morin et al, 2011)
- Epworth Sleepiness Scale (Johns, 1991)
- STOP-BANG Screening for Sleep Apnea
- Sleep Diary
- Initial Interview

# THE SLEEP DIARY

Fundamental to assessing progress and identifying problems

Based on patient recall of the events of the night (and day) before

Compliance with keeping it is good when it is assigned with care



# SLEEP DIARIES

- Consensus Sleep Diary
  - Varying degrees of complexity
  - Provides considerable data (potentially)
  - Various means of calculating the parameters of interest
- Visual Sleep Log
- CBTi Coach App

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
In Bed							
Time to Fall Asleep							
Awake After Sleep Onset							
Time Out of Bed							
Time in Bed TIB							
Total Sleep Time - TST							
Sleep Efficiency							

Week 1			day 1	day 2	day 3	day 4	day 5	day 6	day 7	AVERAGE
5/1-5/8	sample	1/1/2011								
<b>Dates</b>										
<b>Bedtime</b> (Time went into bed)	Q1_BT	23:30								#DIV/0! Bedtime
<b>Lights out</b> (Try to go to sleep)	Q2_LO	23:45								#DIV/0! Lights out
<b>Latency to sleep</b> (minutes to fall asleep)	Q3_SL	30								#DIV/0! Latency to fall asleep
<b>minutes awake in middle of night</b> (how long awakenings last)	Q5_WASO	60								#DIV/0! Minutes awake in middle of night
<b>awakening)</b>	Q6a_WT	7:00								#DIV/0! Wake time
<b>Mins awake too early</b> (how many minutes earlier)	Q6c_EMA	30								#DIV/0! minutes awake too early
<b>Out of bed</b> (out of bed for the day)	Q7_OB	8:00								#DIV/0! out of bed for day
	BT	-0.50								#DIV/0!
	LO	-0.25								#DIV/0!
	WT	7.00								#DIV/0!
	OB	8.00								#DIV/0!
<b>Time in Bed</b> TIB		8.25								#DIV/0! Time in Bed
<b>Total Sleep Time</b> TST		5.75								#DIV/0! Total Sleep Time
<b>Sleep Efficiency</b> SE (%)		69.70%								#DIV/0! Sleep Efficiency

# TWO WEEK SLEEP DIARY

**INSTRUCTIONS:**

(1) Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation. (2) Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise. (3) Put a vertical line (|) to show when you go to bed. Shade in the box that shows when you think you fell asleep. (4) Shade in all the boxes that show when you are asleep at night or when you take a nap during the day. (5) Leave boxes unshaded to show when you wake up at night and when you are awake during the day.

*SAMPLE ENTRY BELOW: On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn't get back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7 AM.*

Date	Day of the week	Type of Day (Work, School, Day Off, Vacation)	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Midnight	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	
sample	Mon.	Work		E					A													C	M				

week 1  
week 2

# 24-HOUR SLEEP INTERVIEW

- What time do you get out of bed in the morning? Is it the same on weekends?
- How do you spend your day?
- Do you take naps?
- Do you drink alcohol with dinner? Use cannabis?
- What is your routine before bed?
- What time do you get in bed?
- When do you try to fall asleep?
- How long does it take to fall asleep? What do you think about?
- How often do you wake up during the night?
- What do you do when you wake up during the night?
- Are there environmental disturbances at night?

# CONDITIONS REQUIRING REFERRAL TO A SLEEP CLINIC

- Excessive daytime sleepiness
- Sleep-disordered breathing
  - Obstructive sleep apnea (OSA)
  - Central sleep apnea (CSA)
  - Upper airway resistance syndrome (UARS)
  - Obesity hypoventilation syndrome (OHS)
- Restless Legs Syndrome (RLS) or Periodic Limb Movement Disorder (PLMD)
- Circadian Rhythm Disorders
- Parasomnias

# SITUATIONS IN WHICH CBTI IS CONTRAINDICATED

- Seizure Disorder
- Bipolar Disorder
- Excessive Daytime Sleepiness (Epworth Sleepiness Scale  $\geq 11$ )
- Untreated or suboptimally treated sleep apnea
- Unstable medical conditions
- Unstable psychological conditions
- Active substance abuse (may include heavy drinking)

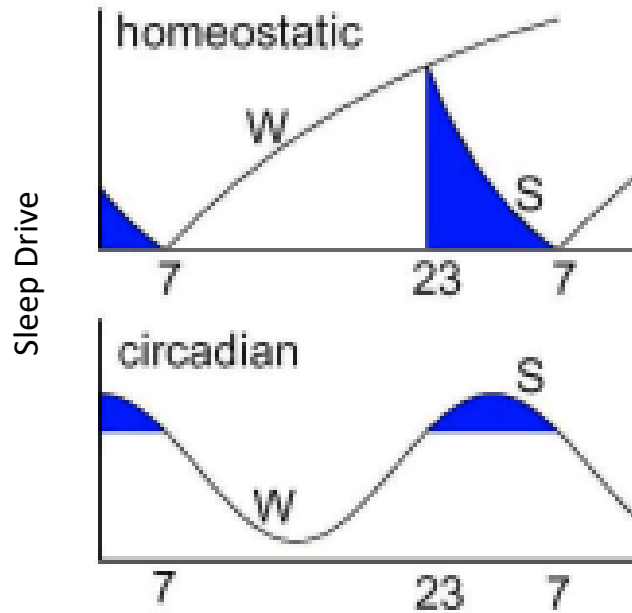
# SLEEP – A BRIEF PRIMER

Sleep is a function of 3 processes

- Process C is the Circadian Clock – we sleep best at night
- Process S is the homeostatic drive for sleep (called sleep drive, sleep pressure) – everybody sleeps!
- Arousal level – too much arousal (physiological, cognitive, or conditioned) can override Process C and Process S
- It is normal to have difficulty sleeping during periods of acute stress
- Social and environmental timekeepers (Zeitgebers) also play a role

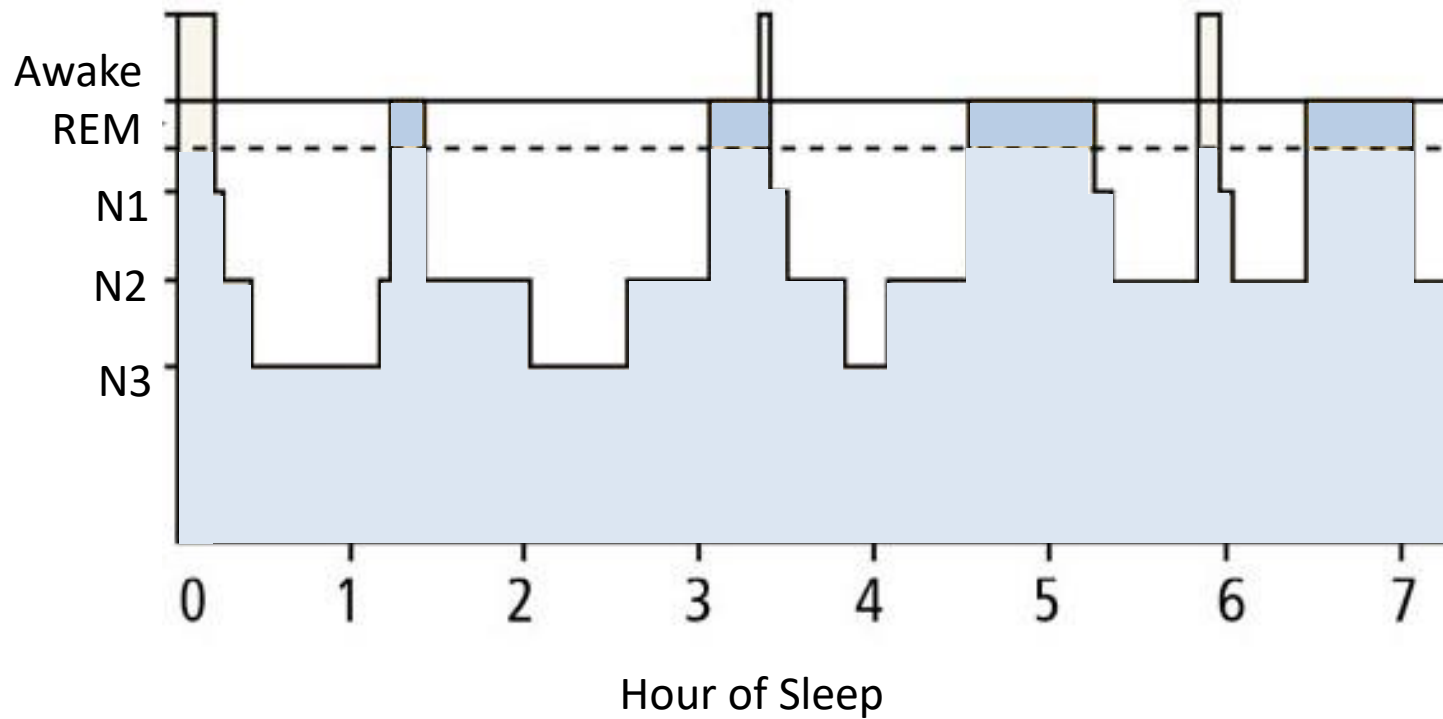


# TWO-PROCESS MODEL OF SLEEP

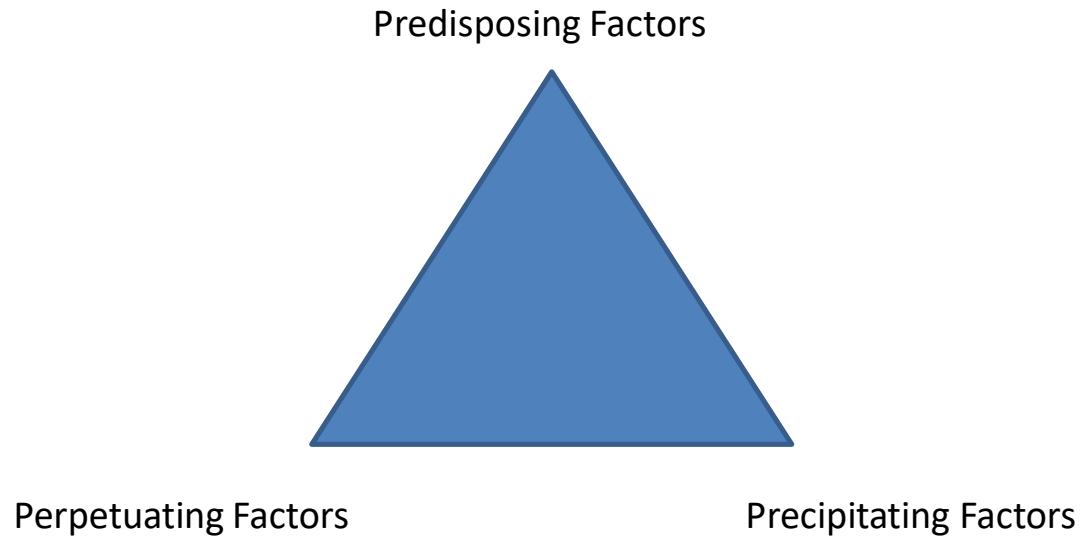


Borbély & Achermann, 1992

# SLEEP ARCHITECTURE DURING THE NIGHT



# THE “THREE P’S” OF INSOMNIA



Spielman, Caruso, & Glovinsky, 1987

# THE “3 P’S” MODEL OF CHRONIC INSOMNIA

- Predisposing factors
  - Anxious disposition
  - Lifestyle factors
- Precipitating factors
  - Acute Stress
  - Other temporary sleep disruptors
- Perpetuating Factors
  - Things people due to address transient disruptions in sleep
  - CBTi addresses perpetuating factors

Ellis et al, 2021

# COMPONENTS OF CBTI

- Psychoeducation
- Behavioral Components
- Sleep Hygiene
- Cognitive Components
- Sleep Diary

# PSYCHOEDUCATION

- Provide a general description of the role of circadian rhythms and sleep drive in achieving a good night's sleep
- Normalize the experience of insomnia
- Explain sleep requirements vary from person to person, and across the lifespan
- Explain that acute stress is associated with difficulty sleeping
- Find examples of good functioning despite a poor night of sleep
- Describe, if necessary, the pattern of sleep architecture over a typical night

# BEHAVIORAL COMPONENTS

- Stimulus Control of Sleep
- Time-in-Bed Restriction (Sleep Restriction)

# STIMULUS CONTROL OF SLEEP

- Conditioning – the bed should only be associated with sleep and sex
- Instructions:
  - Use the bed only for sleep and sex
  - Go to bed only when drowsy
  - If you are lying in bed for 20-30 minutes and wide awake, frustrated, unable to sleep; get out of bed
  - Go to another room and sit there and read or do some other relaxing activity until you feel drowsy, then return to bed
  - Repeat as necessary until you fall asleep, or it is time to be out of bed for the day
  - Get out of bed at the same time every day, regardless of how well you have slept
  - Do not take naps



# ELECTRONICS AND SOCIAL MEDIA

- Televisions don't belong in bedrooms
  - Often a large light-emitting source
  - Often recalcitrant regarding removal
- Laptops, tablets, smartphones:
  - Introduce a light source (screen)
  - Provide too much stimulation (games, surfing)
  - Introduce outside worries into the bedroom (e-mail, texting, social media)

# TIME-IN-BED RESTRICTION (“SLEEP RESTRICTION”)

- Used to increase sleep drive at bedtime and throughout the night
- Based on the calculation of Sleep Efficiency over a 1-2 week period
- Sleep Efficiency is Total Sleep Time (TST) divided by Time in Bed (TIB)
  - $SE = TST/TIB$
  - People with insomnia have lower Sleep Efficiency than good sleepers. Example:

John spends 10 hours in bed each night, on average. But he only sleeps 6 hours, because it takes him 2 hours to fall asleep and he is also awake for 2 hours in the middle of the night. His SE is  $6/10 = 60\%$

# TIME-IN-BED RESTRICTION, CONTINUED

- Prescription for TIB is based on Total Sleep Time (TST) + 30 minutes
- Never fall below a prescription of less than 5 hours
- Timing is negotiated with the patient
- When the patient returns with SE > 85% (some use 90%), assign more sleep
- Continue increasing TIB until SE starts to decline again (think of it as titrating the amount of time in bed)
- Teach the patient to be able to figure this out for themselves

# CONCERNS ABOUT TIB RESTRICTION: ISN'T A GOOD NIGHT'S SLEEP IMPORTANT?



Most people with insomnia, as well as most people in general, have had to function without getting a good night's sleep



Sleeping poorly means sleep drive will be high the following day



Ask the patient for examples from their own life experience.

# CONTRAINDICATIONS FOR TIME-IN-BED RESTRICTION (SLEEP RESTRICTION) COMPONENT

- Use should be modified in patient who will not be able to tolerate sleep deprivation or excessive daytime sleepiness
  - Poorly controlled seizure disorder
  - Bipolar disorder who have a history of manic and/or hypomanic episode triggered by sleep loss in the past
  - Recent change in health status (illness, accident, surgery)
  - Excessive sleepiness during the day (underlying sleep disorder)
  - Unacceptable occupational risks due to increased sleepiness (DOT)

Edinger et al, 2021

# COGNITIVE COMPONENTS

- Worrying about sleep – address beliefs about sleep and misattributions related to sleep
  - “I need to take sleeping pills to sleep”
  - “I cannot stay awake in the afternoons at work because I sleep poorly at night”
  - “If I do not get at least 8 hours of sleep at night, something bad will happen”
- Worrying about “things” – use Constructive Worry Time

# ADDRESSING UNHELPFUL BELIEFS AND MISATTRIBUTIONS ABOUT SLEEP

- Thought Records
- Guided discovery during session
- Evidence for and against
- Further psychoeducation (ask-tell-ask)

# CONSTRUCTIVE WORRY TIME

- Set aside a time during the day to “worry” even if you do not feel you need to.
- Use the time for active problem-solving and planning.
- Provide yourself with a reminder that you have this time set aside for worry.



# SLEEP HYGIENE

- Limit use of caffeinated beverages
- Limit use of alcohol
- Get exercise (but not late in the evening)
- Keep bedroom quiet and dark
- Avoid an overly heated bedroom

# TROUBLESHOOTING

- Studio apartments and stimulus control
- “Fading out” use of television
- Simplified Sleep Logs
- Noisy bed partners
- Remaining awake during the afternoon lull
- Addressing physiological arousal at bedtime
- Noncompliance

# SLEEPING PILLS



# THINGS PEOPLE TAKE WHEN THEY CANNOT SLEEP

- Sedative-hypnotics
- Antidepressants
- OTC sleep aids
- Alcohol
- Cannabis
- Melatonin
- Herbal supplements

# SLEEP DISORDER (SEDATIVE-HYPNOTIC) DRUGS

- zolpidem
- eszopiclone
- zaleplon
- flurazepam
- quazepam
- triazolam
- temazepam
- ramelteon
- doxepin
- diphenhydramine
- doxylamine

FDA, 2015

# ANTIDEPRESSANTS

- trazodone
- nefazodone
- mirtazapine
- nortriptyline

# ANTIDEPRESSANT EFFECTS ON SLEEP

Class/Medication	Pharmacology	Effects on Sleep
TCA	Serotonin and norepinephrine reuptake inhibition, histamine H <sub>1</sub> antagonism	Decreased sleep latency, REM suppression, increased REM latency
SSRI	Serotonin reuptake inhibition	REM suppression, increased REM latency
Selective SNRI	Serotonin and norepinephrine reuptake inhibition	REM suppression, increased REM latency
Trazodone, nefazodone	Serotonin-2 antagonism	Decreased sleep latency, increased slow wave sleep
Mirtazapine	Serotonin-2 and histamine H <sub>1</sub> antagonism	Decreased sleep latency, increased slow wave sleep
Bupropion	Norepinephrine and dopamine reuptake inhibition	Increased REM sleep

Winokur & Demartinis, 2012

# EDUCATION REGARDING NEGATIVE DAYTIME EFFECTS OF Z-DRUGS

- 2014 meta-analysis: single-dose medium effect sizes on verbal memory for zolpidem and zopiclone
- Medium effect size on attention for zolpidem
- Smaller effect size on processing speed for zolpidem
- Smaller effect size on processing speed for zopiclone
- Too few studies for zalepon and eszopiclone

Stranks & Crowe, 2014



# RIGID TAPERING SCHEDULE


- “PRN” reinforces distorted beliefs about needing to use a sleep aid
- PRN provides few opportunities to test assumptions about “perfect sleep = perfect day”
- PRN rewards being anxious before bedtime (relief is reinforcing)

# MONITOR DAYTIME CONCERNS

- Behavioral test of actual worries
- Encourage alternative explanations for perceived deficits
- Do others notice?

# COLLABORATION

- Collaborate is key to successful work between sessions
- Reinforce rationale
- Ask for suggestions
- Encourage positive expectancy for between-session work
- No right or wrong answers

A photograph of a bed with white linens and pillows. The bed is made with a white sheet and a white duvet cover. There are several white pillows. The background is a plain, light-colored wall.

PLEASE CONTACT ME IF YOU HAVE QUESTIONS!!!!

Barbara McCann, PhD  
[mccann@uw.edu](mailto:mccann@uw.edu)