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SLEEP MEDICINE UPDATE 2023

May 1-5, 2023

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COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA

Brendon Colaco, MBBS, MS, MHA



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DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIP(S) WITH INELIGIBLE COMPANIES

- Nothing to disclose

REFERENCES TO OFF-LABEL USAGE(S) OF PHARMACEUTICALS OR INSTRUMENTS

- Nothing to disclose

All relevant financial relationships have been mitigated.

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LEARNING OBJECTIVES

- Understand principles of cognitive behavior therapy
- Review common models of insomnia
- Discuss different approaches to patients presenting with insomnia
- Review commercial products available for cognitive behavior therapy for insomnia
- Review some of the latest literature on cognitive behavior therapy for insomnia

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ICSD-3 DIAGNOSTIC CRITERIA FOR INSOMNIA

A: Patient reports/ caregiver observes, difficulty initiating/maintaining sleep, waking up earlier than desired, resistance to going to bed, caregiver or parent intervention needed to go to bed

B. Daytime consequences e.g., fatigue, memory impairment, EDS etc.

C. Not explained by inadequate opportunity or circumstances

D. A least 3 times per week

E. Present for at least 3 months

F. Not explained by another sleep disorder

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THEORETICAL FRAMEWORK

Predisposing

- Anxious predisposition
- Circular thinking
- Generalized hyperarousal
- Trauma

Precipitating

- Emotional distress
- Medical or psychiatric disorder
- Medications
- Substances

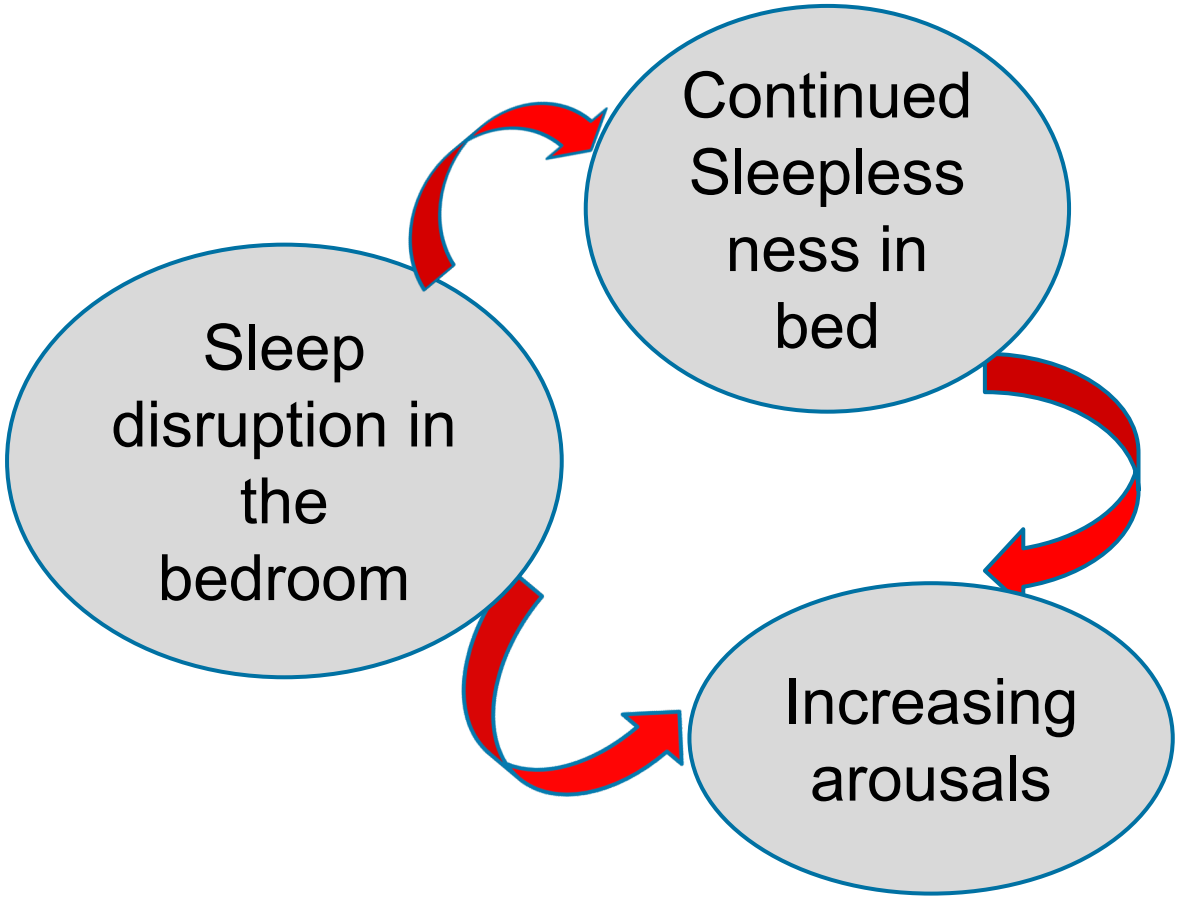
Perpetuating

- Learned negative behaviors and cognitive distortions

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THEORETICAL FRAMEWORK

- Conditioned arousal and sleep-related hyperarousal



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CLINICAL AND PATHOPHYSIOLOGICAL SUBTYPES

- Psychophysiological insomnia
- Idiopathic insomnia
- Paradoxical insomnia (Sleep-state misperception)
- Inadequate sleep hygiene

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APPROACH TO THE PATIENT WITH CHRONIC INSOMNIA

- Detailed History → pre-sleep routine and sleep routine
- Domestic and environmental history
- Review of medications
- Asses for sleep disordered breathing or periodic limb movements
- Asses for comorbid medical and psychiatric conditions- Depression, OCD, PTSD, Anxiety, Asthma, COPD, Hypothyroidism
- Identify candidates for CBT-I

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COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA

- Constellation of techniques drawn from cognitive and behavioral schools of psychology
- Aimed at identifying and altering sleep-maladaptive thoughts and behaviors
- Customed to the individual patient
- Emphasis on education and helping patient understand the rationale for treatment
- Treatment duration 4 and 8 weeks

Edinger, J. D., Wohlgemuth, W. K., Radtke, R. A., Marsh, G. R., & Quillian, R. E. (2001). Cognitive behavioral therapy for treatment of chronic primary insomnia: a randomized controlled trial. *Jama*, *285*(14), 1856-1864.

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BASELINE EVALUATION

- **Diagnostic confirmation**
- r/o insufficient sleep syndrome
- r/o circadian rhythm sleep-wake phase disorders

- **Patient eligibility and interest**
- Engaged in multi-session approach
- Interested in a non-pharmacological approach

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BASELINE EVALUATION

- **Precautions**
- Poorly controlled seizures
- Untreated bipolar disorder
- Acute change in health status
- Hypersomnolence due to OSA
- Occupations requiring sustained alertness



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POLL OPEN

WHICH OF THE FOLLOWING IS A CANDIDATE FOR CBT-I ?

1. ✓ 49 F with chronic insomnia for 30 years. Her life “revolves around sleep”. She believes she needs 8 hours of sleep to function.
2. 23 M graduate student who falls asleep at 4 am and does not respond to zolpidem at 10 pm.
3. 28 F with difficulty falling asleep and staying asleep. She has chronic back pain despite receiving current treatment
4. 53 F with persistent early morning awakening at 4 am. She endorses low mood, loss of interest, difficulty concentrating, loss of appetite.

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RATIONALE

- 49 F with chronic insomnia for 30 years. Her life “revolves around sleep”. She believes she needs 8 hours of sleep to function. *This patient is the best candidate for CBTI. She has ingrained beliefs about sleep. She is anxious about her sleep which is a chronic problem.*
- 23 M graduate student who falls asleep at 4 am and does not respond to zolpidem at 10 pm. *This patient has delayed sleep phase syndrome and behavior therapy to advance his phase and resent circadian rhythm is helpful.*
- 28 F with difficulty falling asleep and staying asleep. She has chronic back pain despite receiving current treatment *This patient has back pain affecting her sleep hence her sleep will improve once her pain issues are resolved.*
- 53 F with persistent early morning awakening at 4 am. She endorses low mood, loss of interest, difficulty concentrating, loss of appetite. *This patient is suffering from depression and her insomnia is part of her major depression hence she needs to be treated for depression.*

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Sleep Hygiene

Stimulus Control



Sleep Education

Principles of CBTI

Counter-arousal measures

Sleep Restriction/ Sleep compression

Cognitive therapy



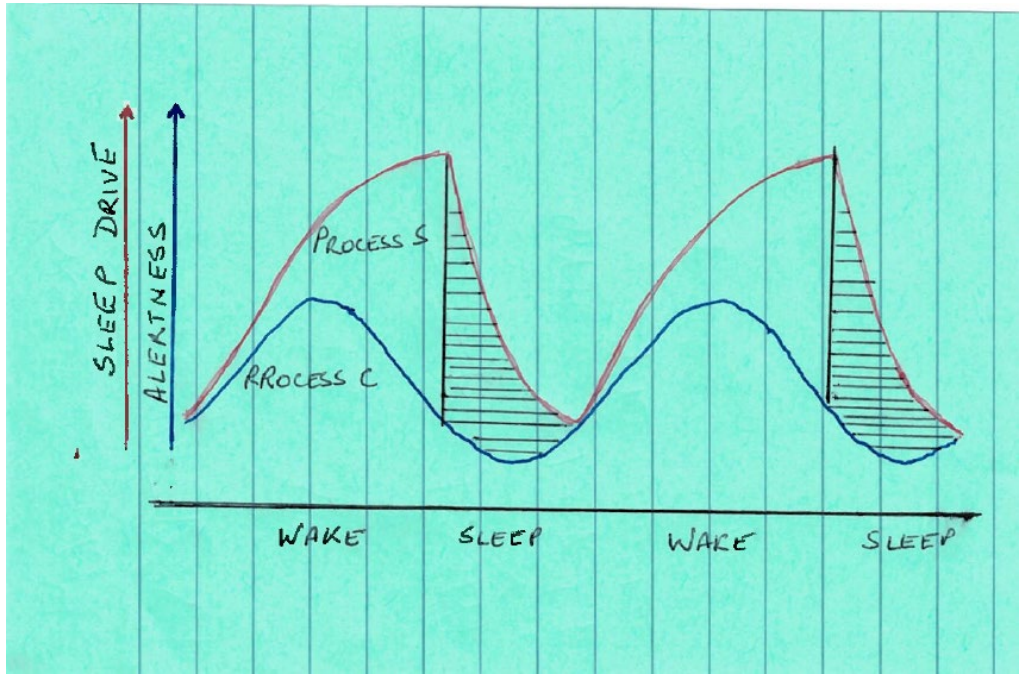


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SLEEP EDUCATION

- "3 P's" model of how insomnia develops
- Two-process model of sleep regulation: sleep drive and circadian rhythms
- Cognitive and physical arousal and the need for reducing arousal near bedtime



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SLEEP RESTRICTION

- Increase natural sleep drive or “sleep hunger” by reducing opportunity for sleep within the 24-hour day
- Restricting time in bed to improve sleep efficiency
- Avoiding daytime naps
- Improves conditioning of the sleep response over time
- Use numbers and percentages to explain concept to patient
- Importance of sleep diary
- Ongoing therapy with sleep specialist/therapist

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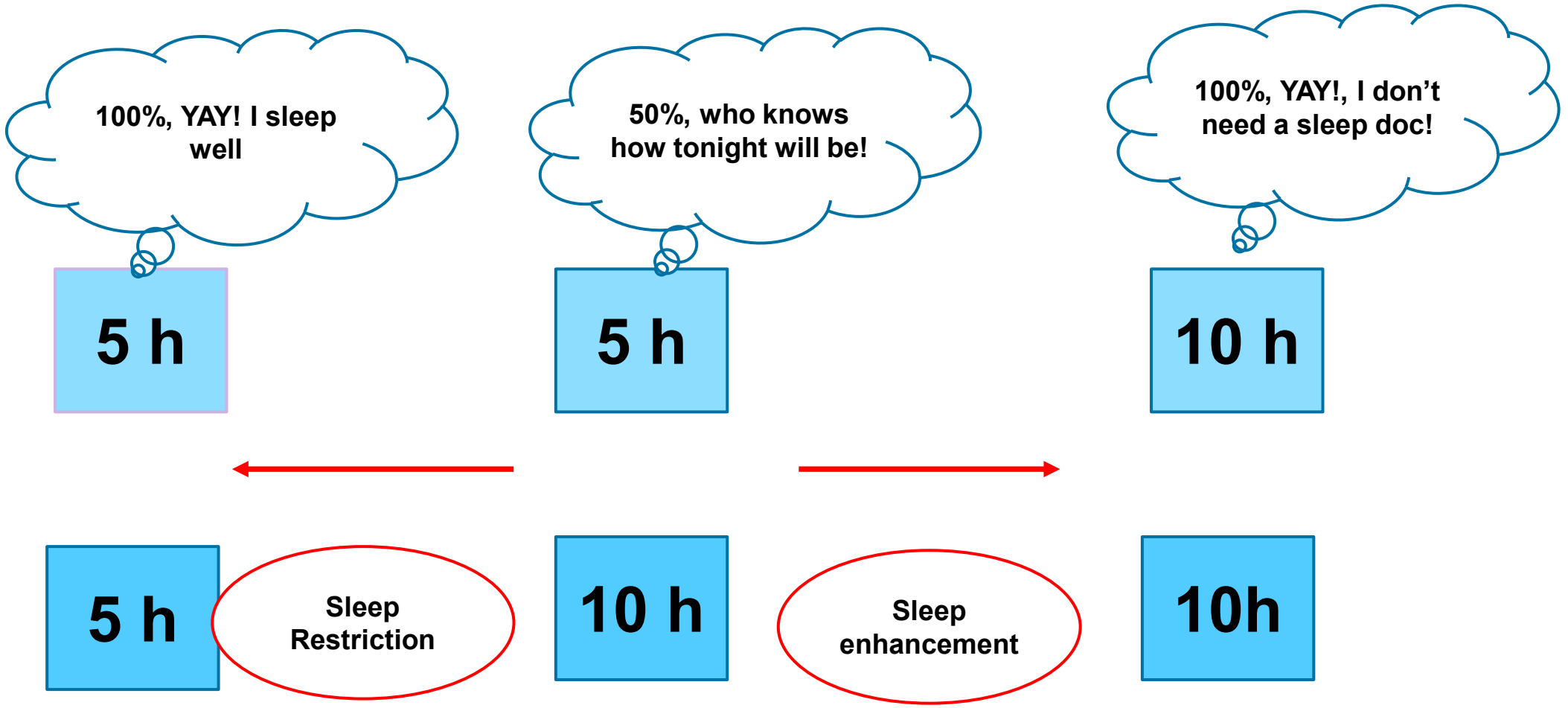
SLEEP EFFICIENCY

- Percentage of night asleep compared to % of the night awake
- Sleeping 5 out of 10 hours represents 50% sleep efficiency
- Sleeping 10/10 hours is 100 % sleep efficiency
- Target should be around 85% sleep efficiency or greater
- CBTI is aimed at improving sleep efficiency overtime

- 5 hours out of 10 hours= 50% sleep efficiency
- 10hours out of 10 hours= 100% sleep efficiency
- 5 hours out of 7 hours = 71% sleep efficiency
- 4 hours out of 7 hours= 57% sleep efficiency

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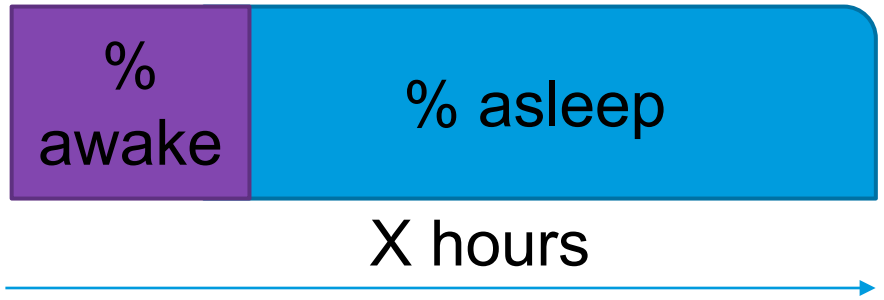
SLEEP RESTRICTION

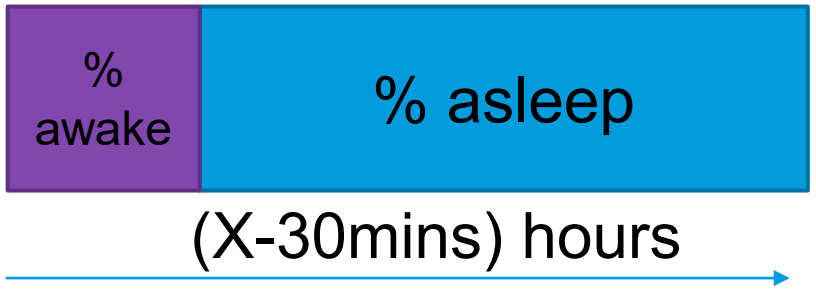


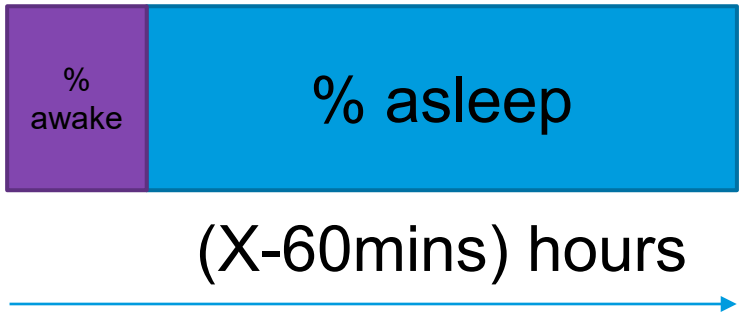
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SLEEP COMPRESSION THERAPY

- Patient maintains a sleep diary for 1 or 2 weeks to calculate the average time in bed.
- Patient time in bed window is set to match average time in bed with fixed bedtime and rise time
- Patient told not to nap
- Patient returns in two weeks with new diary. If sleep efficiency < 85%, then time in bed window is compressed by 30 mins and patient returns in 2 weeks .
- Process repeated till sleep efficiency is >85% or patient does not feel sufficiently rested in which case the time in bed window is maintained.





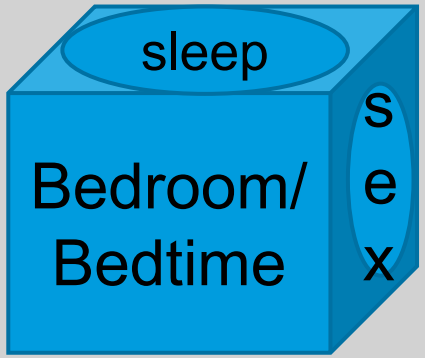


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STIMULUS CONTROL THERAPY

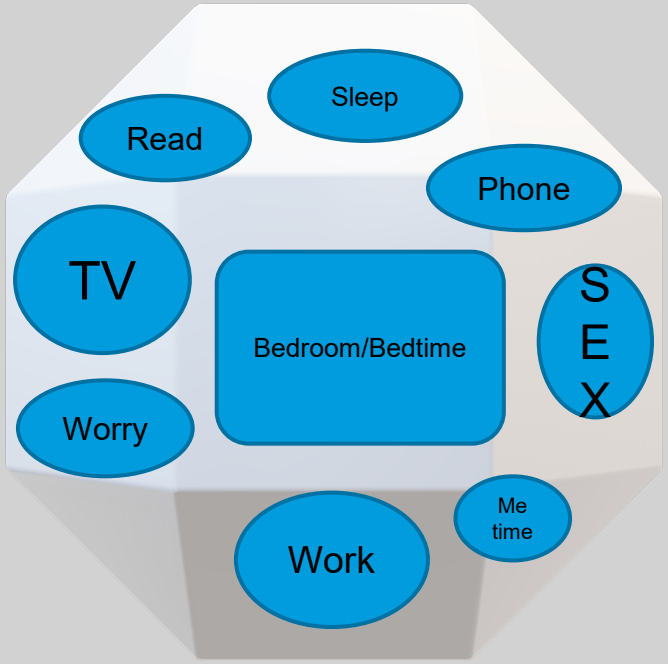
Good stimulus control

- Odds ½



Stimulus Dyscontrol

- Odds 1/8 or more

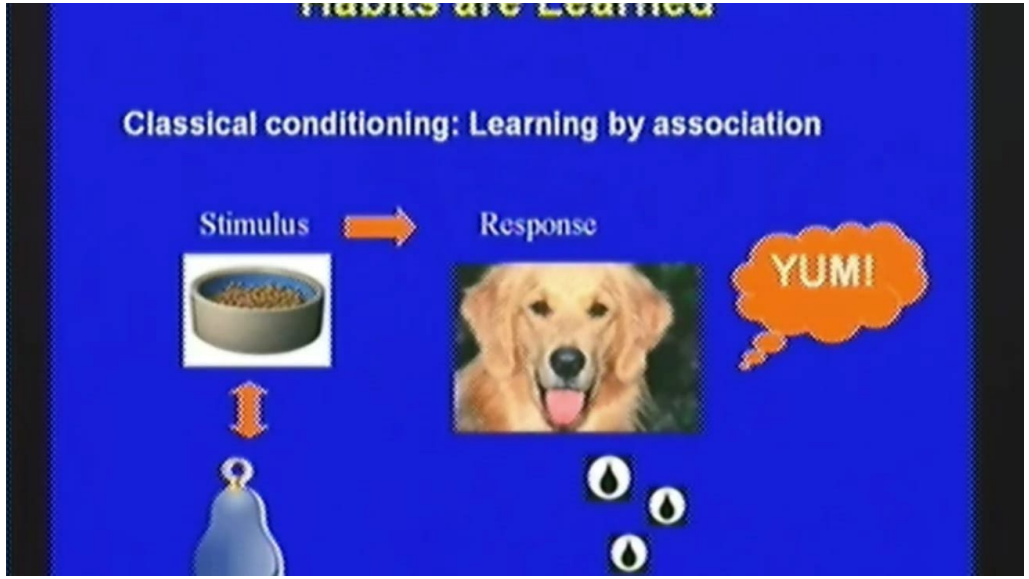


Perlis, M., Shaw, P. J., Cano, G., & Espie, C. A. (2011). Models of insomnia. *Principles and practice of sleep medicine*, *5*(1), 850-850

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STIMULUS CONTROL

- Based on classical (Pavlovian) conditioning therapy
- To strengthen conditioned associated between bed, bedroom, bedtime with the response of sleep/sleepiness
- Extinguished conditioned association between bed or bedroom and wakefulness
- Re-establish consistent sleep-wake schedule





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SLEEP HYGIENE

- Consistent bedtime and rise time
- Avoiding electronics and blue light before bedtime
- Appropriate sleep environment
- Appropriate time interval between dinner and sleep
- Avoiding physical and mental stimulation before bed
- Avoiding clock watching
- Using wearables and other monitoring devices with perspective



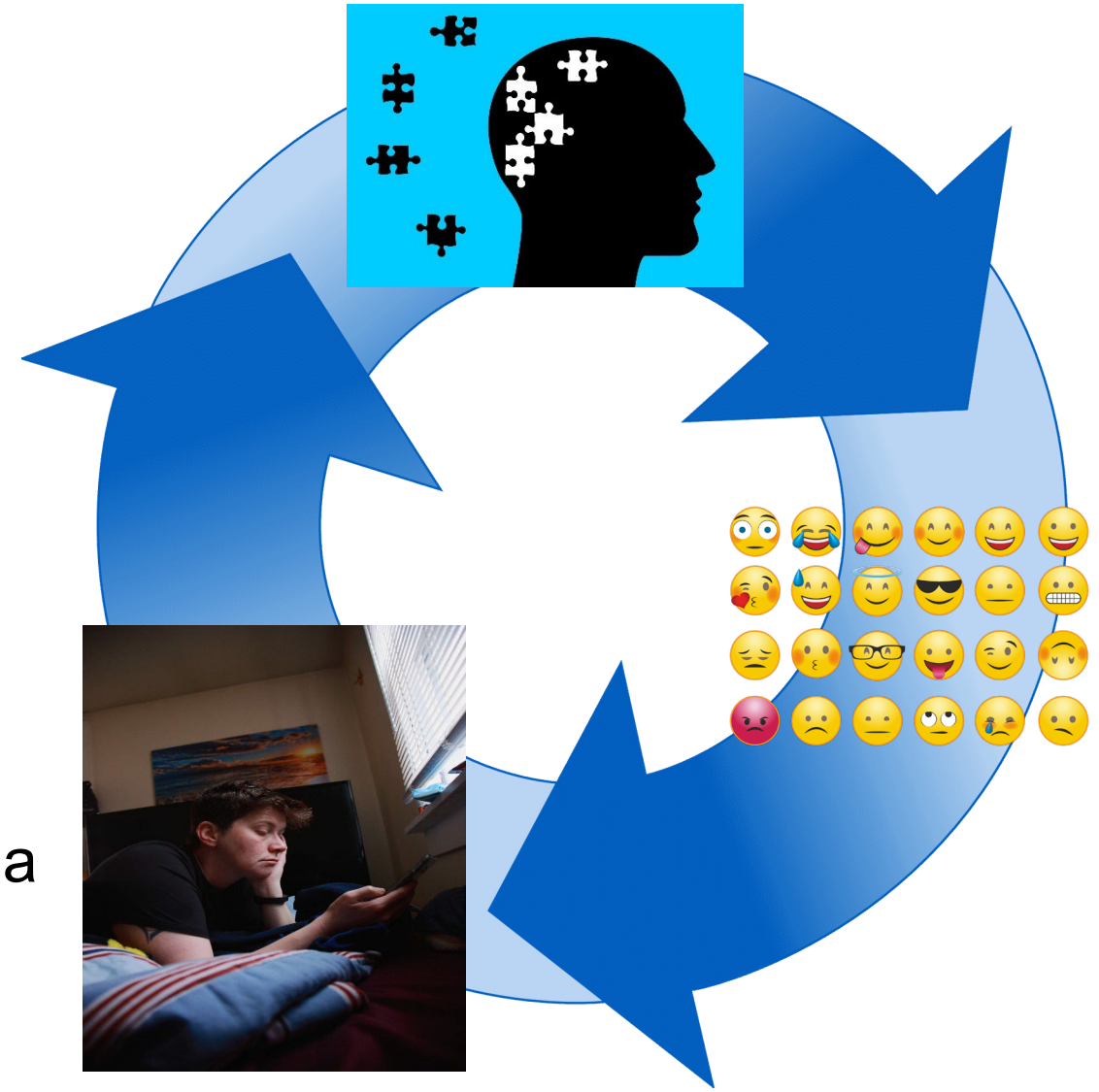


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COGNITIVE THERAPY

- Aimed at reducing anxiety and mental hyperarousal
- Identifying ingrained beliefs about sleep
- Debunking myths
- Reviewing emotions
- Recognizing behavior patterns that promote or enable propagation of insomnia
- Establishing expectations



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BEHAVIORS

- Behavioral aspect focuses on replace unhealthy sleep behaviors with healthy behaviors



- Behavioral portion focuses on behaviors over time to
  - Overcome incorrect beliefs by
    - Modifying sleep habits to
      - Engage in sleep promoting behaviors and
        - Desist from sleep hindering behaviors

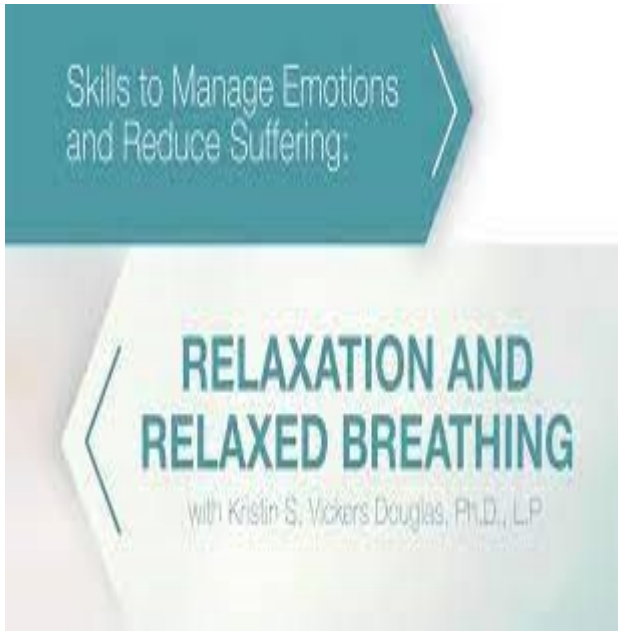






TOOLS TO DECREASE AROUSALS

- **Progressive muscle relaxation**: learning to elicit a physical relaxation response by tensing & relaxing different muscle groups in the body, focusing on a relaxed state
- **Diaphragmatic breathing**: a technique for breathing promoting relaxation by balancing oxygen and carbon dioxide levels
- **Mindfulness**: Contact with the present moment & engagement with experiences and emotions



Ong JC, Ulmer CS, Manber R. improving sleep with mindfulness and acceptance: a metacognitive model of insomnia. Behav Res Ther. 2012;50(11):651. Epub 2012 Aug 20.

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RELAXATION



- Decreases arousals and hyperarousal from sleep
- Meditation and Yoga
- Progressive muscle relaxation
- Mindfulness training
- Massage
- Acupuncture
- Tai Chi



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TOOLS FOR CBT-I

Sleep Log

Completing a sleep log helps identify sleep patterns and things that may be contributing to sleep problems.

How to fill out your sleep log:

1. Put your sleep log somewhere close to your bed (example: nightstand) and fill it out when you get up in the morning.
2. Do not fill it out during the middle of the night.
3. Draw a ↓ when you go to bed at night, and a ↑ when you get up in the morning. Color in the times you were sleeping during the day or night. It is ok if the times are not exact, just make your best estimate.
4. If you miss a day, start again the next day instead of trying to guess at what you did a few days ago.

DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
EXAMPLE							↓							↑											4.5	7.5
DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
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DATE	6p	7p	8p	9p	10p	11p	12a	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	HRS	TIB
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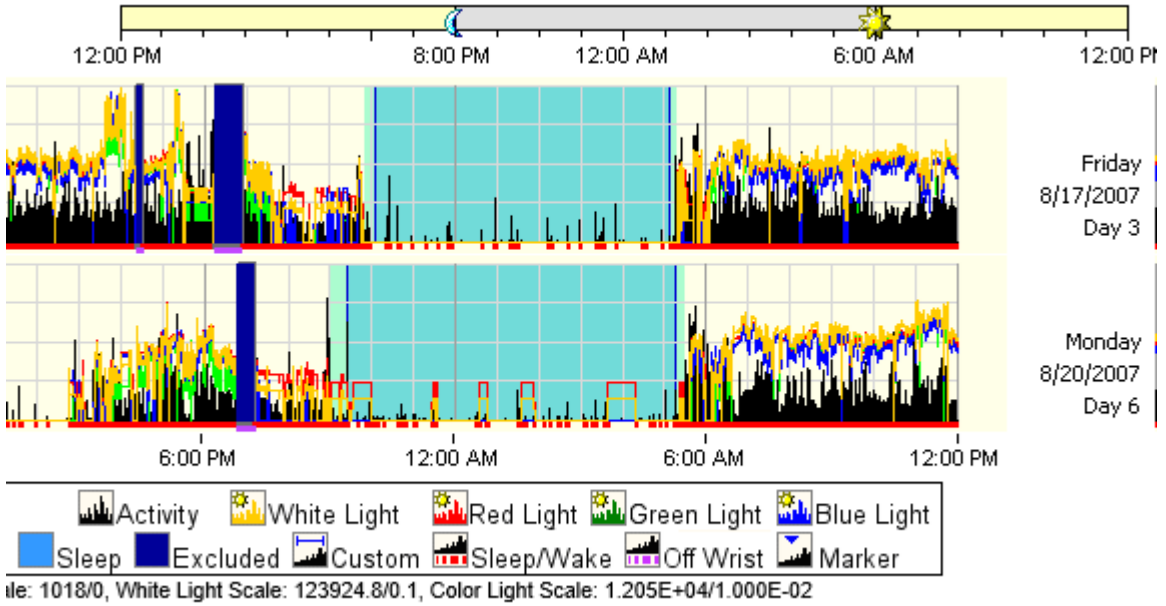
Sleep Efficiency = $\frac{\text{Sum of HRS}}{\text{Sum of TIB}}$

HRS = Hours you were sleeping; TIB = Total time spent in bed

TOOLS

Actigraphy

- Measures trend of activity over 1 or 2 weeks
- Helpful to corroborate with sleep diary
- Ideas regarding time spent inactive versus active →can be used as an estimate of time in bed or sedentary & sleep debt





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CASE

- 48 year old college professor presents to clinic with difficulty falling asleep.
- She describes feeling very sleepy in the living room before she goes to bed, yet when she gets into bed, she feels wide-awake, physically tense, and unable to fall asleep.
- When trying to fall asleep, she reports that she is consumed with anxious thoughts about one of the bad things that will happen the next day if she does not fall asleep right away.
- Which component of CBT-I would she benefit from?

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CASE

- 25-year-old woman complains of difficulty falling asleep for more than 1 year.
- She is in bed awake for up to 2 hours every night.
- During that time, she wonders about not taking over the next day and that her tiredness will result in her getting fired from her job.
- Although she is awake, she feels that she must stay in bed because she is getting some rest.
- She is frustrated by her inability to fall asleep and finds herself checking the time on her phone throughout the night, which leads to even more tension and distress about being awake.
- Which component(s) of CBTI-I would she benefit from?

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CASE

- 48-year-old urologist presents with difficulty maintaining sleep.
- He reports that he spends up to 90 minutes attempting to return to sleep when he wakes during the night.
- He has tried counting sheep in bed
- He tired reading urology literature but that did not help and he just stayed awake
- He does not report snoring or leg jerking during sleep.
- His Epworth score is 7/24.
- Which component of CBT-I would he benefit from?

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POLL OPEN

QUESTION

45-YEAR-OLD MAN WITH PSYCHOPHYSIOLOGICAL INSOMNIA FEELS THAT MEDICATIONS ARE NOT WORKING FOR HIM. HE HAS KEPT A SLEEP LOG FOR THE PAST 2 WEEKS WHICH SHOWS AN AVERAGE SLEEP DURATION OF 6 HOURS BUT VARIABLE BED AND RISE TIMES AN APPROXIMATE TIME OF 9 HOURS IN BED EACH NIGHT. WHICH OF THE FOLLOWING DIRECTION SHOULD BE GIVEN AS PART OF HER SLEEP RESTRICTION PLAN?

1. Continue with 9 hours time in bed but fix the bed and rise time
2. Restrict time in bed to 8 hours but ok to continue with night-to-night variability in bed and rise time
3. Set the patient's bedtime for 9 hours after they wake up in the morning
4. Set bedtime and wake up time to approximate the mean TST, with the goal of achieving greater than 85% sleep but fix the time to go to bed and the rise time by setting a fixed rise time first.

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ANSWER

D. Set bedtime and wake up time to approximate the mean TST, with the goal of achieving greater than 85% sleep but fix the time to go to bed and the rise time by setting a fixed rise time first.

The basis for therapy here is to restrict sleep to improve efficiency but also to fix schedule and the time to go to bed. This is best done by setting a wake up time and working back from it.

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POLL OPEN

Telemedicine for CBTI.

Question: Is telemedicine as effective for CBTI when compared with face-to-face visit

1. Yes
2. No

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ANSWER YES

Arnedt (2021). Telemedicine versus face-to-face delivery of cognitive behavioral therapy for insomnia: a randomized controlled noninferiority trial. *Sleep*, *44*(1), zsaa136.

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TELEMEDICINE AND CBTI

- COVID 19 & Insomnia
- Using telemedicine to continue CBTI
- **Telemedicine CBTI as effective as Face-to-face CBTI**
- Telemedicine based platforms combining therapist patient visits and modular assignments for patients





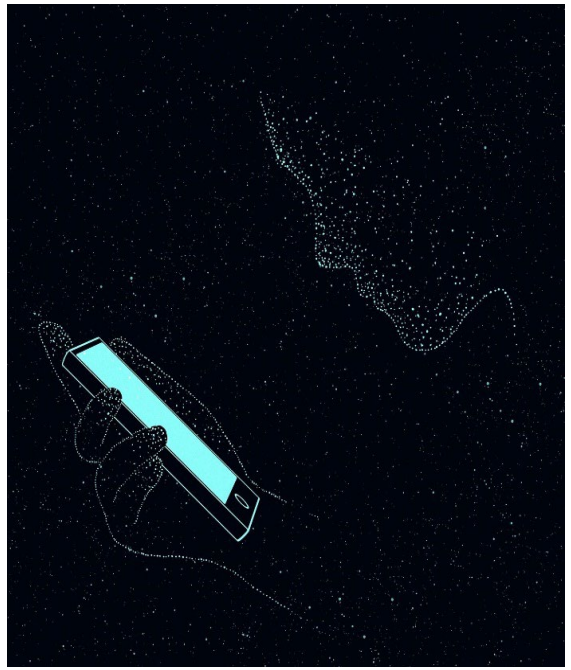
.

Espie (2012). A randomized, placebo-controlled trial of online cognitive behavioral therapy for chronic insomnia disorder delivered via an automated media-rich web application. *Sleep*, *35*(6), 769-781.

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WEARABLES AND APPS IN MANAGEMENT OF INSOMNIA





- Help or hinder?
- Wealth of information
- No guideline on how to use the information
- No research on how information impacts individual patients





De Zambotti, M., Cellini, N., Goldstone, A., Colrain, I. M., & Baker, F. C. (2019). Wearable sleep technology in clinical and research settings. *Medicine and science in sports and exercise*, *51*(7), 1538.

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COMMON ONLINE PROGRAMS FOR CBTI- PRESCRIPTION DIGITAL THERAPEUTIC- PDT

- Somryst - Home | Somryst for Chronic Insomnia
- Mayo Clinic online CBTI program - https://kcmsprodmccmscntntncstg.blob.core.windows.net/$web/PatientEducation/PatientLearning/index.html#/
- Cleveland Clinic online CBTI program- https://shop.clevelandclinicwellness.com/products/go-to-sleep-online ($40)
- CBT-i Coach mobile app (free)
- CBT for Insomnia online program ($50-70): cbtforinsomnia.com
- Somnio online program ($239): somnio.org
- Sleepio online program ($400): sleepio.com- 6-week online program (computer or iphone)
- Return2Sleep

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BRIEF BEHAVIORAL THERAPY FOR INSOMNIA

4 session manualized treatment paradigm

Shorter duration of therapy, more access. Less trained personnel

Focussed on Stimulus control and sleep restriction

Gunn HE, Tutek J, Buysse DJ. Brief Behavioral Treatment of Insomnia. Sleep Med Clin. 2019 Jun;14(2):235-243. doi: 10.1016/j.jsmc.2019.02.003. Epub 2019 Apr 1. PMID: 31029189.



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EFFICACY OF CBTI

- ✓ Proven effectiveness in patients with and without comorbidities
- ✓ Improvement in time to fall asleep and time awake after falling asleep
- ✓ Effects last for 6 to 12 months after completion of therapy
- ✓ No side effects from the medications

Trauer JM, Qian MY, Doyle JS, Rajaratnam SM, Cunnington D. Cognitive Behavioral Therapy for Chronic Insomnia: A Systematic Review and Meta-analysis. Ann Intern Med. 2015;163(3):191.

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FEW PRACTICAL SUGGESTIONS

SUGGEST CBTI, DO NOT FORCE IT

TALK ABOUT **EXPECTATIONS**, SET THE BAR LOW

DIFFUSE STRESS AND ANXIETY WITH HUMOR AND REASSURANCE

IF PATIENT IS ON MEDICATION, **DO NOT THREATEN STOPPING MEDICATION,** INSTEAD GET THE PATIENT ON BOARD WITH CBTI BEFORE TALKING ABOUT TAPERING THE MEDICATION

USE REINFORCEMENT THROUGH RETURN VISITS, PHONE CALLS OR VIRTUAL PLATFORMS

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CULTURALLY TAILORED CBTI

Culturally tailored CBTI is more effective than standardized CBTI or Sleep education

Greater compliance with therapy and better outcomes



Zhou ES, Ritterband LM, Bethea TN, Robles YP, Heeren TC, Rosenberg L. Effect of Culturally Tailored, Internet-Delivered Cognitive Behavioral Therapy for Insomnia in Black Women: A Randomized Clinical Trial. *JAMA Psychiatry.* 2022;79(6):538–549. doi:10.1001/jamapsychiatry.2022.065



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BARRIERS TO CBTI

- System barriers with limited access to CBTI and sleep behavioral providers
- Provider barriers due to inherent beliefs, low levels of screening for insomnia
- Patient barriers due to lack of knowledge, beliefs and poor access

- Koffel, E., Bramoweth, A.D. & Ulmer, C.S. Increasing access to and utilization of cognitive behavioral therapy for insomnia (CBT-I): a narrative review. *J GEN INTERN MED* **33**, 955–962 (2018). https://doi.org/10.1007/s11606-018-4390-1

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LITERATURE FOR FURTHER REVIEW

- Sleep hygiene, daily exercise and light exposure for 1 hour, 3 hours before sleep improved sleep time in community dwelling dementia patients (McCurry et al, 2005)
- Exercise for Insomnia: meta-analysis (Amiri et al, 2021)
- CBT-I in patients with co-morbid depression, anxiety, post-traumatic stress disorder (PTSD), and substance abuse disorders is generally effective for insomnia and sometimes the co-morbid disorder as well (Taylor et al, 2014)
- Group CBTI for Insomnia in a primary care setting associated with improvement in sleep and mood measures (Davidson et al. 2019)

Taylor, D. J., & Pruiksma, K. E. (2014). Cognitive and behavioural therapy for insomnia (CBT-I) in psychiatric populations: a systematic review. *International review of psychiatry*, *26*(2), 205-213.
Davidson, J. R., Dawson, S., & Krsmanovic, A. (2019). Effectiveness of group cognitive behavioral therapy for insomnia (CBT-I) in a primary care setting. *Behavioral Sleep Medicine*, *17*(2), 191-201.

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POLL OPEN

HOW MANY SESSIONS FOR CBTI ARE NECESSARY?

1. 1-2 sessions
2. 2-4 sessions
3. 4-8 sessions
4. Single session

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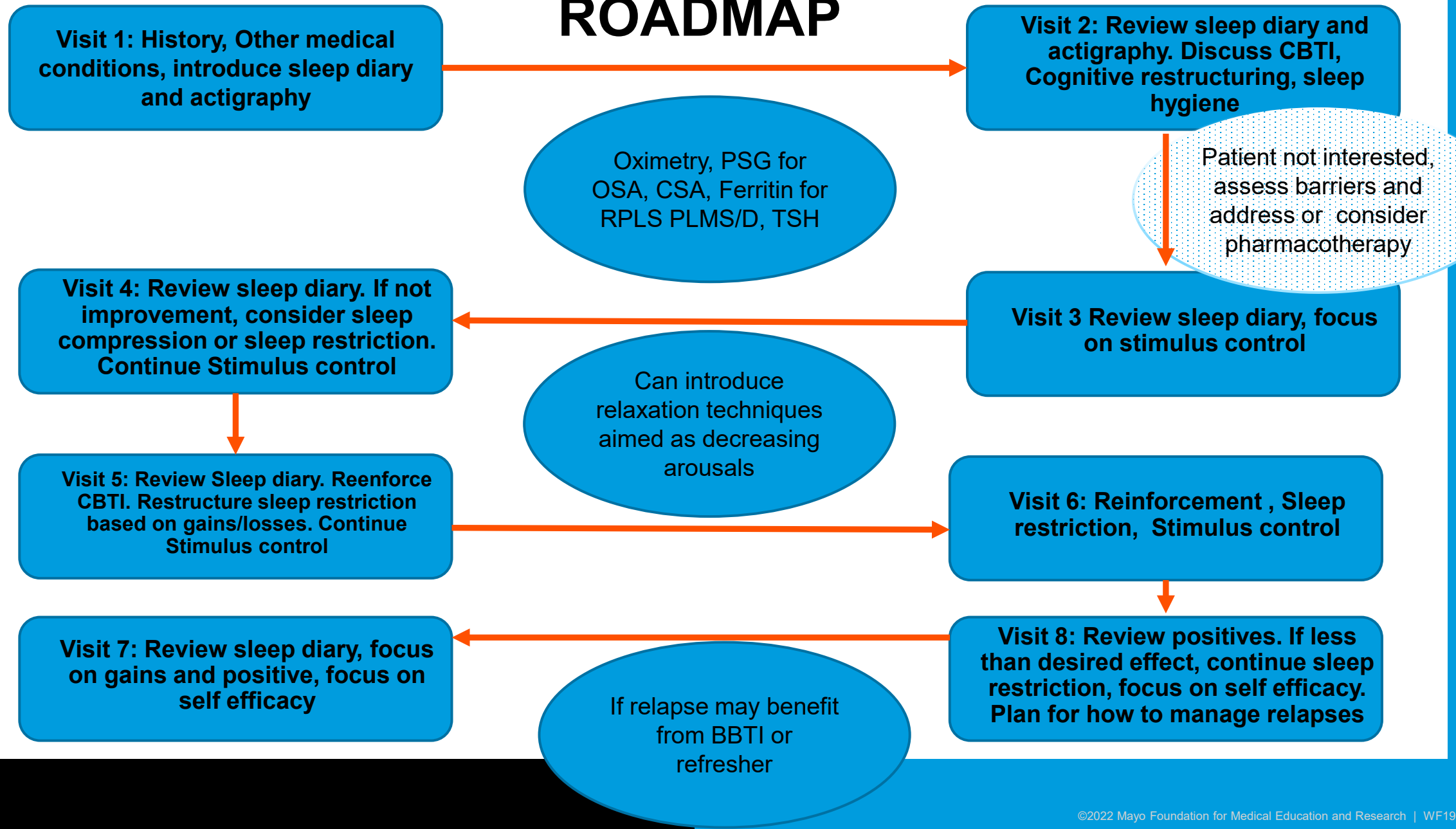
IDEAL NUMBER OF RECOMMENDED SESSIONS



Edinger JD, Wohlgemuth WK, Radtke RA, Coffman CJ, Carney CE. Dose-response effects of cognitive-behavioral insomnia therapy: a randomized clinical trial. Sleep. 2007;30(2):203.

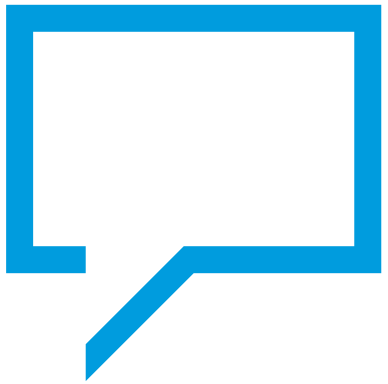
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ROADMAP



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QUESTIONS & DISCUSSION



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THANK YOU

QUESTIONS AND DISCUSSION

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