



Sleep Health Center

Experts in Insomnia and Related Conditions

Future Direction for CBT-I

Ryan G. Wetzler, PsyD, C.BSM, DBSM, ABPP

Goals of this Session

- Review the History of management of insomnia and CBT-I.
- Discuss current trends in insomnia treatment.
- Discuss future directions of CBT-I.

Credit to Edward J. Stepanski, PhD

The history aspect of this talk was adapted from Dr. Stepanski's article published in the first Behavioral Sleep Medicine Journal.

Stepanski, E., (2003) *Behavioral Sleep Medicine: A Historical Perspective.*,
BEHAVIORAL SLEEP MEDICINE, 1(1), 4–21

Behavioral Sleep Medicine/Sleep Psychology

Beginnings

- Edmund Jacobson, PhD, MD
 - His well-known work on insomnia can arguably be cited as the beginning of BSM (Jacobson, 1934).
 - Jacobson developed the tenets of progressive muscle relaxation (PMR), based on his work with patients he felt to have somatic problems that were stress related. He theorized that heightened arousal contributed to a number of common medical complaints. PMR was a central treatment, but other stress management techniques were included in his treatment programs.
 - He provided a precise description of what would eventually be called “psychophysiological insomnia” in *You Can Sleep Well* (Jacobson, 1938).
- Nathaniel Kleitman, PhD
 - He is recognized as the father of modern sleep research, and is the author of the seminal 1939 book *Sleep and Wakefulness*.
 - The work of Kleitman is better known to sleep researchers of today because of his role in the discovery of REM sleep, his mentorship of Dement, in addition to his many scientific contributions documented in his text book, *Sleep and Wakefulness* (Kleitman, 1939).

Quote from Jacobson's book
"You Can Sleep Well"

*"What with electric lighting, automobiles, motion pictures, radios and other innovations, life after dark has become so attractive that most of the evening hours up to midnight are commonly occupied by some form of amusement—if only talking things over with friends and neighbors".
(p. 182)*

Historical Perspective on Sleep Medication (Alvarez, et. al., 1942).

Today in most states sleeping medicines can be obtained only on a doctor's prescription, and this regulation has some merit because there are a few undisciplined persons who, if left to their own devices, would take large doses of these drugs every night without waiting to see if they were necessary for the obtaining of sleep. Many would rather take a drug than to make an effort to control emotions and calm down in the evenings. (p. 25)

History of Sleep Medication

- Chloral hydrate was replaced by barbituates due to unwanted effects.
- Barbituates (Phenobarbital) were replaced by benzodiazepines due to unwanted effects
- Benzodiazepines (Ativan, Restoril, Halcion) were replaced by non-benzodiazepine receptor agonists due to unwanted effects.
- Non-benzodiazepine receptor agonists (Ambien, Lunesta) are suffering a similar fate as all previous sleep medications.
- Alternatives began to be developed:
 - Rozerem was approved by the U.S. Food and Drug Administration on July 22, 2005.
 - Belsomra was approved by the U.S. Food and Drug Administration (FDA) on Aug 13, 2014.
- Currently, many who had historically taken Ambien or Lunesta are being switched to Trazadone or Seroquel.
- What's next????.....If history tells the story, then much of the the same.

Advances of the 1960's: Thank you Dr. Rechtschaffen!

- Much of this research took place at the University of Chicago under the direction of Allan Rechtschaffen, PhD.
 - Monroe (1967), Hauri (1968), Robinson (1969), and Zimmerman (1967) showed how increased physiological and, to some extent, cognitive arousal contributed to poor sleep.
 - The role of physiological and cognitive hyperarousal as contributing factors in chronic insomnia continues to receive empirical support (Stepanski, Zorick, Roehrs, Young, & Roth, 1988; for a review see Bonnet & Arand, 1997, and Morin, 1993).

Changing Perspectives on Insomnia

- There was a struggle during the 1960s and 1970s about whether insomnia was always related to a psychiatric or medical disorder, or could be “learned.”
- The view that a primary psychiatric disorder was always to blame may be found in the writing of Kales and Kales (1984).
- Acceptance of insomnia as a learned behavior was signified in the original nosological system published by the ASDC (1979).
- The term “psychophysiological insomnia” was used to denote an association between increased arousal and poor sleep, similar to the prevailing view that arousal might lead to hypertension or ulcers.

Relaxation-Based Treatments for Insomnia

- The work of Joseph Wolpe and Jacobson led the way for empirical studies of relaxation-based treatments for insomnia during the 1970s and early 1980s.
- Progressive muscle relaxation was the intervention most often studied.
- Studies using self-report measures of sleep tended to find a greater magnitude of change (Haynes, Sides, & Lockwood, 1977; Lacks, Bertelson, Gans, & Kunkel, 1983; Nicassio & Bootzin, 1974), than did those studies obtaining EEG measures of sleep (Borkovec, Grayson, O'Brien, & Weerts, 1979; Borkovec & Weerts, 1976; Coursey, Frankel, Gaarder, & Mott, 1980).
- Use of a hypnotic relaxation approach was also shown to be effective (Stanton, 1989).
- However, relaxation treatments generally did not show large effect sizes, and were not better than placebo in some trials (Borkovec & Fowles, 1973; Nicassio, Boylan, & McCabe, 1982).
- The American Academy of Sleep Medicine (AASM) practice parameter paper for chronic insomnia rated PMR as empirically validated and well-established (Chesson et al., 1999).

Biofeedback for Insomnia

- Peter Hauri, PhD published well-controlled studies demonstrating the efficacy of biofeedback in the treatment of insomnia in the early 1980s (Hauri, 1981; Hauri, Percy, Hellekson, Hartmann, & Russ, 1982).
- This research was particularly notable because differential treatment efficacy depended on the match between patient characteristics and type of treatment.
 - For example, increased arousal measured by EMG levels predicted successful treatment with EMG biofeedback, but not with EEG biofeedback.
- The AASM practice parameter paper rated biofeedback as empirically validated and probably efficacious as a treatment for chronic insomnia (Chesson et al., 1999).

Individualizing Insomnia Treatment

- Attempts to match treatment to features of the insomnia have not been successful, and some have even shown that the treatment modality predicted to perform poorly provided greater benefit than the predicted treatment (Espie, Lindsay, Brooks, Hood, & Turvey, 1989).
- There still has not been a successful trial involving matching treatment to features of insomnia.
- This suggests that deconstruction of multi-component CBT-I in an effort to save time or improve feasibility is not a good idea (i.e. just doing SRT or SCT).

Relaxation and Biofeedback not used as much, although they work.

- Over the past 30 years, relaxation therapies have gradually been incorporated into or replaced by other behavioral approaches and multi-component cognitive behavioral therapy (CBT).
- Biofeedback in particular appears to have fallen out of favor and is little used today.
- Most likely reason for these not being used as often as they should are attempts to reduce treatment time, but at what cost?

Stimulus Control Therapy

- Systematic intervention research investigating treatments for chronic insomnia had a renaissance in the 1970s.
- Principles of behavioral theory were applied to the problem of insomnia, and many new treatment approaches were formulated at this time.
- Richard Bootzin, PhD used learning theory to create stimulus control therapy (SCT) for insomnia (Bootzin, 1972).
 - This innovative approach was based on principles of operant conditioning and proscribed sleep-incompatible behaviors and lying awake in bed as key targets of treatment.
- Many investigators included SCT in their outcome research on treatment efficacy, and showed significant improvement using self-report measures of sleep initiation and maintenance (Lacks, Bertelson, Gans, & Kunkel, 1983; Lacks, Bertelson, Sugerman, & Kunkel, 1983).
- SCT continues to be one of the most commonly used behavioral treatments for insomnia, and is included in multi-component treatment programs.
- The AASM practice parameter recommendations for behavioral treatment of insomnia found that SCT had strong empirical evidence to support its efficacy, and rated it as empirically validated and well-established (Chesson et al., 1999).

Sleep Hygiene

- A list of rules to follow to promote better sleep in patients with insomnia was published and called “sleep hygiene” (SH) by Peter Hauri, PhD (1977).
- This approach is extremely popular, and SH education is almost universally recommended for the treatment of insomnia (Buysse et al., 1997).
- The rules considered to constitute SH have evolved over the years. There are few studies of SH as a “stand-alone” treatment, and, instead, it appears to be considered a **necessary, but not sufficient**, approach in the treatment of insomnia (Stepanski & Wyatt, 2003).
- The practice parameter recommendations from the AASM found that there was **insufficient evidence** to recommend SH as a single therapy (Chesson et al., 1999).

Chronotherapy

- Chronotherapy was the first behavioral treatment developed to realign the biological and environmental sleep–wake schedules (Weitzman et al., 1981).
 - This approach required that the patient delay their bedtime by 1–3 hours each night until the desired schedule was reached.
 - The approach was based on the assumption that the cycle length of the intrinsic circadian rhythm was a little more than 25 hours, and therefore it would be much easier for individuals to delay, rather than advance, their sleep phase.
 - Discoveries since the initial description of chronotherapy suggest how this treatment, as initially conceived, might have limited efficacy.
 - First, we now know that the intrinsic rhythm is about 24.2 hours, so the daily tendency to delay is slight (Czeisler et al., 1999).
 - Second, and more important, the impact of exposure to bright light can be profound depending on its placement according to the phase response curve (Czeisler & Khalsa, 2000).
 - Treatment with standard chronotherapy instructions, without regulating an individual's exposure to sunlight, would not be expected to produce a predictable shift in phase given the robustness of bright light in regulating circadian phase.
 - An individual could potentially be exposed to sunlight upon arising, which would precipitate a phase advance, instead of a delay.
 - ***For this reason and the practical difficulties of conducting chronotherapy, this treatment has been supplanted by bright light therapy in the morning to accomplish the same goals for patients with DSPS.***

Sleep Restriction Therapy

- In the 1980s, sleep restriction therapy (SRT) was developed by Arthur Spielman, PhD and colleagues (Spielman, Saskin, & Thorpy, 1987).
 - This behavioral treatment systematically reduces time in bed in order to increase homeostatic drive for sleep, and then increases time in bed once sleep efficiency improves. SRT has become a widely used treatment, and is routinely included as part of CBT treatment programs for insomnia.
- SRT was rated as empirically validated and probably efficacious according to the AASM practice parameter paper (Chesson et al., 1999).
 - *This somewhat lesser rating occurred because most of the studies of SRT are of multi-component programs, and there is limited empirical support for SRT as a single treatment approach (Morin, Hauri, et al., 1999).*

The 3-P Model of Insomnia

- Theoretical model for understanding the development of chronic insomnia and its evolution over time (Spielman, 1986).
 - This model classified factors contributing to chronic insomnia as predisposing, precipitating, or perpetuating.
 - This model is important because it provides a framework for understanding what is otherwise a disparate set of features associated with the causes and consequences of insomnia.
 - Additionally, it can serve to organize clinical interventions by targeting the appropriate set of factors based on the status of an individual patient.

Cognitive Therapy

- The dread of being awake during the night and the fretful anticipation of daytime impairment are common worries of patients with insomnia and have long been appreciated by clinicians (Jacobson, 1962, p. 182).
- Patients themselves are also more likely to attribute their sleep difficulty to heightened cognitive arousal, rather than somatic arousal (Lichstein & Rosenthal, 1980).

“Relaxation is more likely to come if the would-be sleeper hasn’t any fear of insomnia; hence the physician does well when he keeps reminding a patient that nothing terrible need happen to him if he does not sleep. There are thousands of persons working hard and enjoying fair health who haven’t had a good night’s sleep for years. They do not go insane or come to any bad end. (Alvarez et al., 1942)

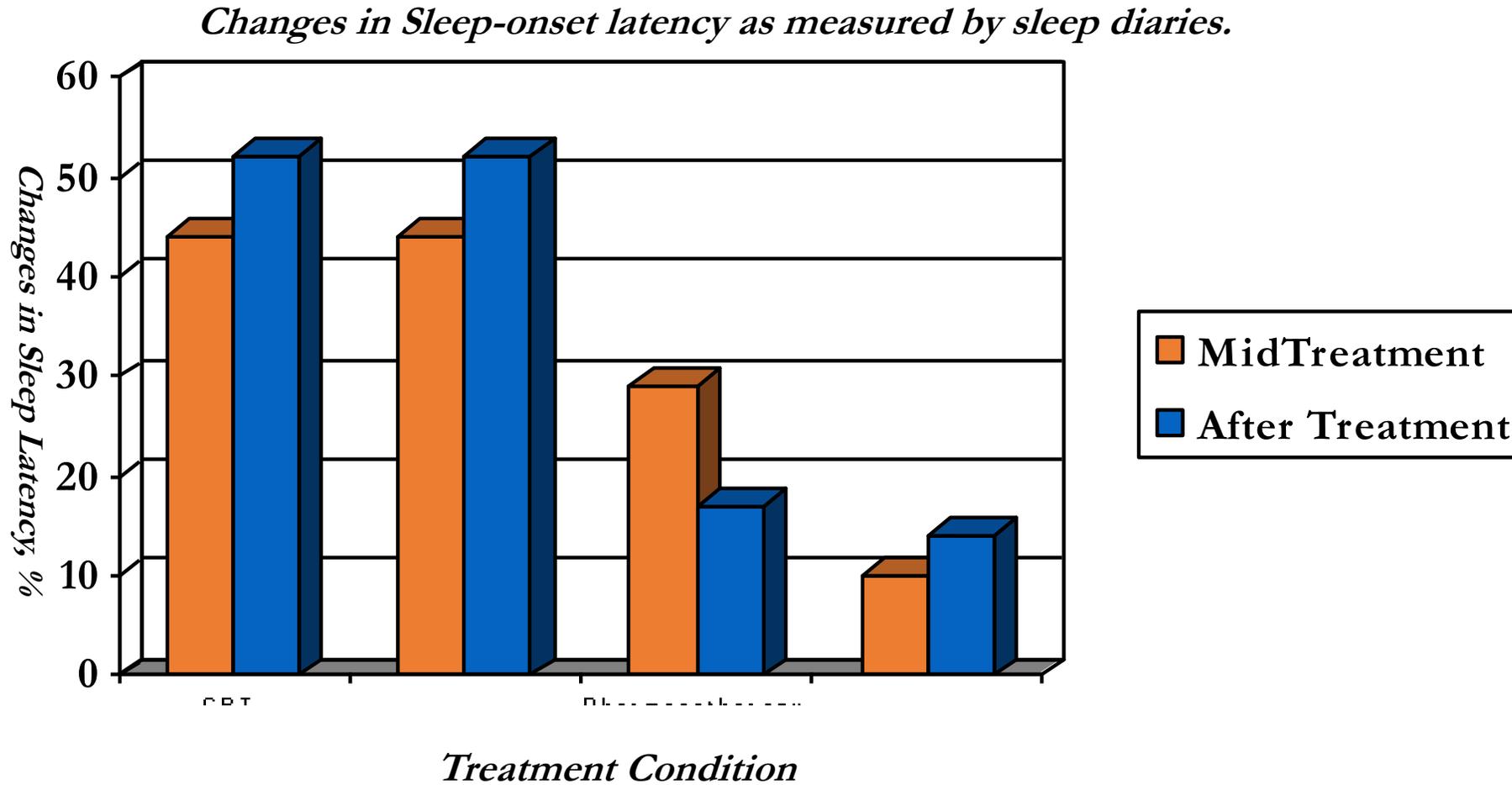
Cognitive Therapy: Charles Morin, PhD

- Although the cognitive component of insomnia has been noted for decades, a formal structure of cognitive therapy for insomnia is an innovation from the 1990s.
- A formal description of programmatic cognitive therapy designed for patients with insomnia is well described by Morin (1993).
 - Morin explains how misattributions, unrealistic expectations, and various cognitive errors contribute to emotional arousal and, ultimately, to insomnia. He then applies cognitive restructuring techniques that have been effective in the treatment of anxiety disorders and depression to changing these maladaptive cognitions that accompany insomnia.
 - Cognitive restructuring teaches the patient to evaluate their response to sleeplessness with a more realistic perspective.
 - Integrating cognitive therapy with the behavioral therapies described previously is **essential** because many of the cognitive features inherent to insomnia lead to the behavioral changes that exacerbate the insomnia. For example, fearing that he or she is getting fewer than 8 hr of total sleep time, the patient may spend excessive time in bed (Stepanski, 2003).

Multi-Component CBT-I Programs

- In 2001, state of the art in the cognitive–behavioral treatment of insomnia combined SH, SCT, SRT, and cognitive therapy (Morin, Colecchi, Stone, Sood, & Brink, 1999; Edinger, Wohlgemuth, Radtke, Marsh, & Quilian, 2001).
 - This approach recognizes the difficulty of predicting which treatment will benefit a particular patient, and it avoids this problem by providing all treatment components to each patient.
 - For relapse prevention, it is also best to integrate education regarding physiologic hyperarousal and to teach relaxation techniques.
 - Integration of education on circadian rhythms and chronotherapeutic approaches are also an essential component.
- Since 2001, virtually all modern CBT-I outcome studies have use multi-component approaches!

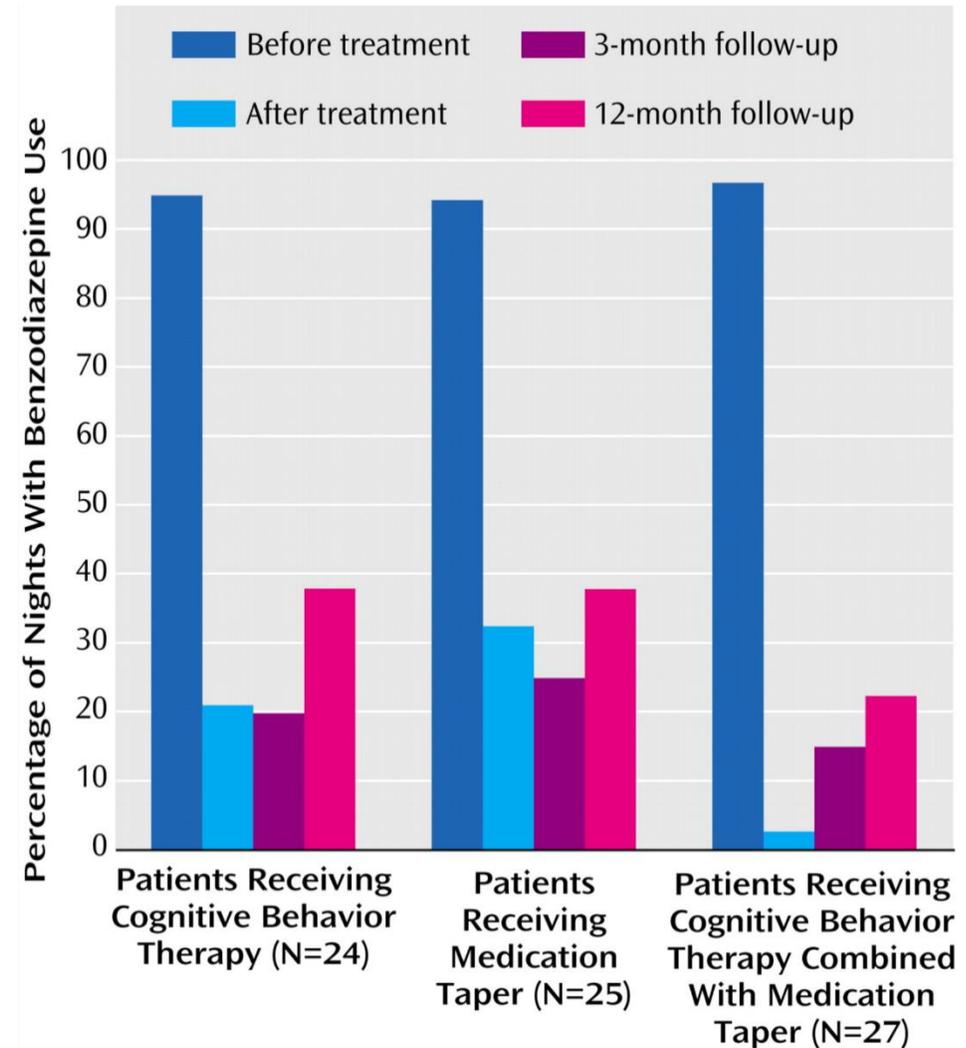
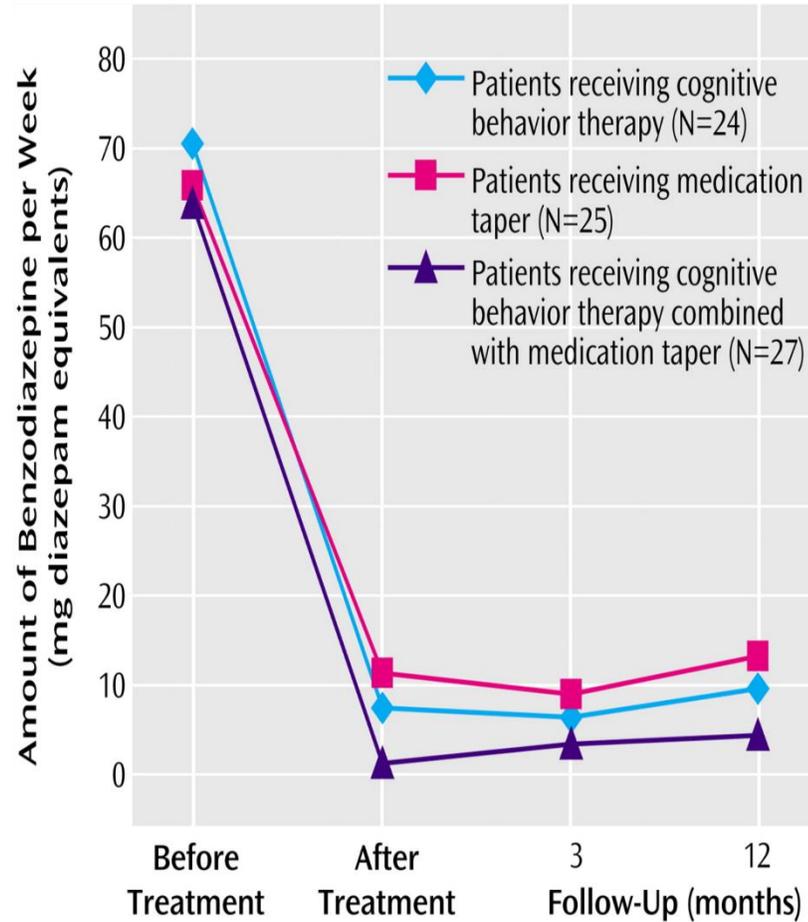
CBT-I vs Zolpidem



Jacobs et. al. (2004). Cognitive behavior therapy and pharmacotherapy for insomnia.
Archives of Internal Medicine, 164, 1888-1896.

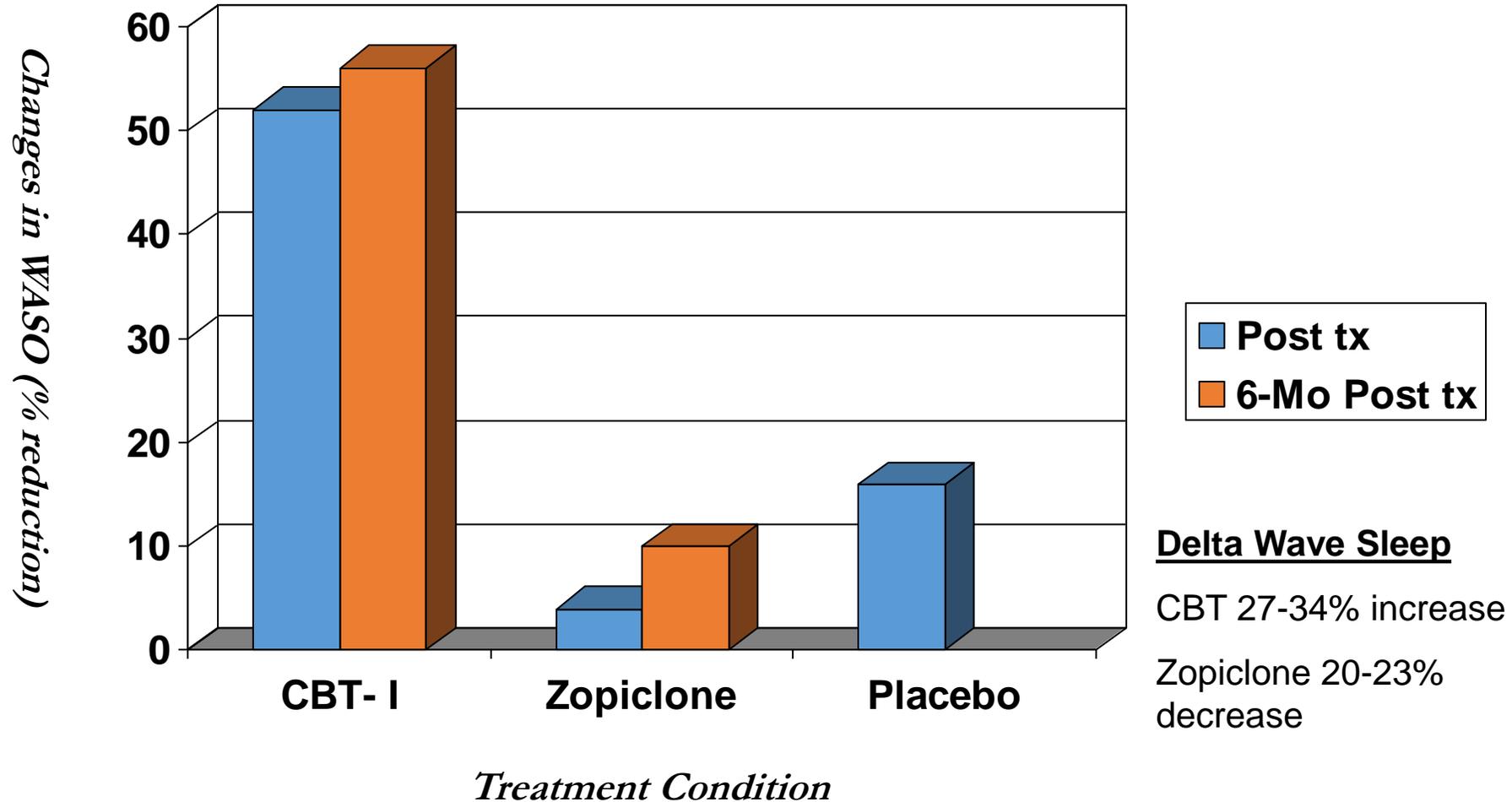
Randomized Clinical Trial of Supervised Tapering and Cognitive Behavior Therapy to Facilitate Benzodiazepine Discontinuation in Older Adults With Chronic Insomnia

MORIN, BASTIEN, GUAY, ET AL. Am J Psychiatry. 2004;161(2):332-342. doi:10.1176/appi.ajp.161.2.332



CBT vs. Zopiclone in older adults

Changes in WASO as measured by polysomnography.



CBT-I recognized as a first line treatment

- NIH State-of-the-Science Conference Statement on Manifestations and Management of Chronic Insomnia in Adults (2005).

- <http://consensus.nih.gov/2005/insomniastatement.pdf>



The Efficacy and Safety of Drug Treatments for Chronic Insomnia in Adults: A Meta-analysis of RCTs (2007) Buscemi, Vandermeer, Friesen, Bialy, Tubman, Ospina, Klassen, & Witmans

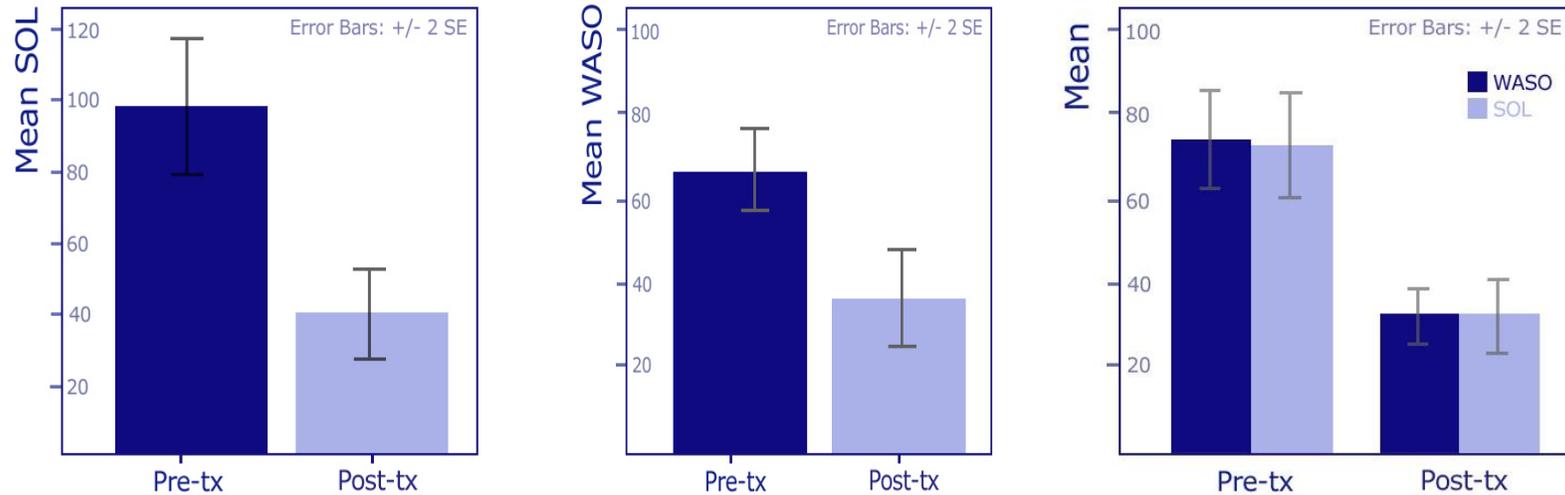
Conclusion: Hypnotics put people to sleep **12 minutes** faster than placebo pills according to polysomnography and **17 minutes** faster according to sleep diaries.

Insomnia and Depression

- Rachel Manber, PhD (2008) comparing CBT-I to a systematic desensitization control in Major Depressive Disorder patients with insomnia receiving Lexapro (escitalopram).
 - CBT-I group had greater remission of insomnia (50% vs. 8%)
 - CBT-I group had greater remission of depression (61.5% vs. 33.3%).
- Colleen Carney, PhD successfully replicated this study in 2017 through a multisite trial.
 - Randomization was to one of three groups: antidepressant AD (escitalopram) + CBT-I, CBT-I + placebo pill, or AD + sleep hygiene (SH).
 - **Multicomponent CBT-I groups were the only ones who improved on PSG determined sleep parameters.**
 - **Sleep worsened in those in the antidepressant + sleep hygiene group.**
 - All groups improved on depression, even the group with absolutely no depression-focused treatment component (CBT-I + placebo).

Effectiveness of CBT-I in a clinical setting

Wetzler, et. al., 2009, Journal of Sleep and Sleep disorders Research (Abstract Supplemental)



Outcome Variable	Mean Difference	<i>T</i> (63)	<i>p</i>	Cohen's <i>d</i>
Number of Awakenings	-.61	2.711	.009	.34
Nights/Week Sleep Medication use	-2.1	4.970	<.0001	.62
Sleep Efficiency %	17.9	10.296	<.0001	1.29
Total Sleep Time (hours)	.58	4.344	<.0001	.54

Remission rates: Sleep onset insomnia 57.8%; Sleep maintenance insomnia 50%; Both 66% SOI, 56% SMI

78% successfully discontinued use of sleep medication

BMJ

Effectiveness of non-benzodiazepine hypnotics in treatment of adult insomnia: meta-analysis of data submitted to the Food and Drug Administration (2012)

Huedo-Medina, Kirsch, Middlemass, Klonizakis, & Siriwardena

Conclusions:

- “These data suggest that the placebo response is a **major** contributor to the effectiveness of Z drugs”.
- “The remaining effect needs to be balanced against the harms associated with these drugs”.

CBT-I as a first line treatment

- American College of Physicians (2016).
- “Cognitive behavioral therapy for insomnia is an effective treatment and can be initiated in a primary care setting,” said ACP President Wayne J. Riley, MD, MPH, MBA, MACP. “
- Cognitive behavioral therapy can be conducted through individual or group therapy sessions, telephone or web-based modules, and/or self-help books.

American Academy of Sleep Medicine:
Clinical Practice Guideline for the Pharmacologic Management of
Chronic Insomnia in Adults (2017)

- **All** agents were given a **WEAK** recommendation.
- *CBT-I is a **standard of treatment** with a significantly favorable risk ratio.*
- ***ALL*** patients with chronic insomnia should receive CBT-I as a primary intervention.
- *Medication for chronic insomnia disorder should be considered mainly in patients who are unable to participate in CBT-I, who still have symptoms despite participation in such treatment, or in select cases, as a temporary adjunct to CBT-I.*

Present State Insomnia Treatment

- Multi-component CBT-I is the best treatment option, however there are still few expert providers.
- In response, some are applying single elements of CBT-I or just sleep hygiene education due to the impracticality of formal multicomponent CBT-I.
 - BSM experts are concerned about this trend as some patient may believe they are doing CBT-I when introduced to these abbreviated methods.
 - Treatment inoculation
 - Patients may falsely believe they have failed CBT-I
- A better approach involves improving access to Multi-component CBT-I.

Required Components of CBT-I

- If you expect similar outcomes to the published literature, you need to apply CBT-I in the way it was applied in the study.
 - Sleep Education (circadian rhythms and review of scientific rationale for each CBT-I component)
 - CBT-I Components: Sleep Hygiene, Chronotherapeutics (if clinically indicated), Sleep restriction or consolidation therapy, Stimulus Control Therapy, Relaxation Training, Cognitive Therapy.
 - Maintaining a sleep log that is scored, used at follow-ups for discussion of progress, and to inform sleep schedule changes.
 - Follow up appointments every 2-weeks.
- In-person CBT-I takes a great deal of clinician time to do in a way that works.

Telehealth

- CBT-I can be successfully conducted via telehealth technologies (videoconferencing)
- An obstacle to telehealth involves insurance related regulations (i.e. medicare only paying for services provided at a designated healthcare facility and in an area of demonstrated need).
 - As such patients still couldn't see providers from their home.
- We are in process of offering CBT-I via telehealth technologies on a fee-for-service basis to individuals in their homes.
 - There is increased willingness to pay for the convenience and time savings of telehealth.

Technology is helping improve access...

- With estimates of qualified CBT-I providers ranging from 75 to 300, there simply aren't enough to treat the 60 million Americans with insomnia.
- Online and app based CBT-I has risen as a solution.
- Given that it's available online and through smart phones, online and app based CBT-I could scale to meet demand.

Pros and cons of online and app based CBT-I

Pros:

- Online and app based CBT-I is **available to anyone with an internet connection**. With online CBT-I, you can work through your therapy on your terms and your schedule, as there's no need to schedule an appointment with a provider.
- Many studies show online and app based CBT-I to be **just as effective** as traditional CBT-I.
- Depending on your health insurance coverage, online and app based CBT-I can be **less expensive** than traditional therapy.

Cons:

- For self-motivated individuals, following their own online or app based therapy program is no problem.
 - But many people benefit from the **accountability inherent with in-person therapy**: simply knowing someone is expecting them to keep their sleep diary and complete their homework helps them stay motivated to do it.
- Along the same lines as the point above, online and app based CBT-I programs tend to have a **higher dropout rate**, so there is less likelihood of the individual completing treatment and experiencing insomnia relief.
- Online and app based CBT-I cannot help individuals whose insomnia is due to **underlying condition**.

Online CBT-I programs and CBT-I apps

Online CBT-I Programs:

- SHUTi (\$149)
- Sleepio (\$400)
- RESTORE (£99.00)
- Conquering Insomnia Program (\$49.95)

CBT-I Apps:

- Night Owl-Sleep Coach (\$9.99)
- CBT-I Coach (Free)
 - Unlike the other programs listed above, CBT-I Coach is designed as a digital supplement to help patients in face-to-face CBT-I therapy. It does not provide guidance on sleep schedule changes and is not a stand-alone approach.

Future Considerations

- Technology will enable Behavioral Sleep Experts to expand their reach to many more patients.
- With consideration of the cons of in-person and online/app-based CBT-I, treatment models incorporating elements of both could optimize treatment.
- Apps may be used to reduce face-to-face treatment time.
- App-Assisted CBT-I could enable multicomponent CBT-I to be delivered in a variety of settings through enabling more efficient treatment process.



Night Owl line of CBT-I Assisting Apps

- **Night Owl—Sleep Coach:**
 - CBT-I in the palm of your hand. This was our first app. It was designed to be a stand alone CBT-I app.
 - Treatment outcomes were presented at SLEEP 2018 with results consistent with more expensive online programs.
- **Sleep Log Night Owl:**
 - This represents the first digital sleep log that calculates sleep parameters essential for conducting CBT-I including sleep efficiency, sleep latency, wake after sleep onset, and sleep time.
 - It was designed to ease patient and clinician burden by eliminating the need for paper sleep logs.
 - Scoring and interpreting sleep logs (an essential task in CBT-I), takes about 15 minutes of each CBT-I treatment visit.
 - This app has patients keep logs digitally through their smart phone. The app scores the log and this can be emailed to the provider.
- **CBT-I Helper Night Owl:**
 - This app is currently under development. It will include the sleep log app, along with videos of typical educational aspects of CBT-I. The educational aspects of CBT-I typically take 15-30 minutes of each in-person CBT-I visit.

Conclusions:

- Insomnia treatment and CBT-I has evolved over the past 75-years.
- Multicomponent CBT-I is the preferred treatment method.
- Online and App-based CBT-I can be of help, although treatment attrition is a problem
- The future of CBT-I involves creative incorporation of technology to:
 - Increase access
 - Improve practicality without sacrificing substance.
 - Reduce treatment cost

Thanks for your Attention!!

Follow-up Questions?

Want to partner or collaborate?

Contact information:

email: drwetzler@sleephealthlou.com

practice website: www.sleephealthlou.com