

HENRY FORD HEALTH[®]

Digital Zzz's: Online Platforms for Tackling Insomnia

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Accreditation Statement

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Conflict of Interest Disclosures for Speakers

Maren Hyde-Nolan, PhD has no relevant financial relationships with ineligible companies to disclose.

Learning Objectives

Upon completion of this course, attendees should be able to...

1. Understand the different modalities for delivering behavioral insomnia treatment
2. Identify the various digital platforms available for Cognitive Behavioral Therapy of Insomnia (CBT-I)
3. Understand the limitations of digital CBT-I (dCBT-I) and how best to utilize these tools in clinical populations

The Growing Problem of Insomnia

- Prevalence:
 - 10% of adults meet diagnostic criteria; 33% of adults endorse symptoms¹⁻²
- Consequences:
 - Reduced quality of life, exacerbation of comorbid health conditions, increased risk of depression, anxiety, and substance use disorders³⁻⁶
 - Economic burden including reduced productivity and increased work absences⁷⁻⁸

¹Morin CM, *et al.* Epidemiology of insomnia: prevalence, course, risk factors, and public health burden. *Sleep Med Clin.* 2013;8(3):281–297.

²Kalmbach DA, and Cheng P. Embracing telemedicine and digital delivery of cognitive behavioral therapy for insomnia: Where do we come from and where are we going? *Sleep* 2023;46(1).

³Katz DA, *et al.* The relationship between insomnia and health-related quality of life in patients with chronic illness. *J Fam Pract.* 2002;51(3):229–235.

⁴Taylor DJ, *et al.* Comorbidity of chronic insomnia with medical problems. *Sleep.* 2007;30(2):213–218.

⁵Taylor DJ, *et al.* Epidemiology of insomnia, depression, and anxiety. *Sleep.* 2005;28(11):1457–1464.

⁶Roth T, *et al.* Sleep problems, comorbid mental disorders, and role functioning in the national comorbidity survey replication. *Biol Psychiatry.* 2006;60(12):1364–1371.

⁷Daley M, *et al.* The economic burden of insomnia: direct and indirect costs for individuals with insomnia syndrome, insomnia symptoms, and good sleepers. *Sleep.* 2009;32(1):55–64.

⁸Kessler RC, *et al.* Insomnia and the performance of US workers: results from the America insomnia survey. *Sleep.* 2011;34(9):1161–1171.

How Do We Best Treat Insomnia?

Pharmacological Treatment



Cognitive-Behavioral Therapy for Insomnia (CBT-I)



Barriers to Face-to-Face CBT-I

- Shortage of providers trained in CBT-I¹⁻²
- Geographic distance to providers who are predominately located in metropolitan areas²
- Incompatibility between therapist availability and work schedules³
- Lack of reliable transportation for low income individuals⁴

¹Perlis ML, Smith MT. How can we make CBT-I and other BSM services widely available? *J Clin Sleep Med JCSM Off Publ Am Acad Sleep Med.* 2008;4(1):11–13.

²Thomas A, et al. Where are the behavioral sleep medicine providers and where are they needed? A geographic assessment. *Behav Sleep Med.* 2016;14(6):687–698.

³Hennebry J, McLaughlin J, Preibisch K. Out of the loop: (in)access to health care for migrant workers in Canada. *J Int Migr Integr.* 2016;17(2):521–538.

⁴Andrade LH, Alonso J, Mneimneh Z, et al. Barriers to mental health treatment: results from the WHO World Mental Health surveys. *Psychol Med.* 2014;44(6):1303–1317.

eHealth for Insomnia

- Telemedicine
 - Randomized controlled trials (RCTs) show that telemedicine CBT-I is noninferior to face-to-face CBT-I¹⁻²
 - Pros: Improves geographic and transportation limitations³
 - Cons: Does not address provider shortage or schedule incompatibility
- Digital CBT-I (dCBT-I)
 - Increases accessibility to anyone with an internet-capable device (computer, phone, tablet)⁴
 - Meta-analyses of RCTs provide evidence of the efficacy of dCBT-I compared with wait list controls⁵⁻⁶

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

²Gehrman P, et al. Randomized noninferiority trial of telehealth delivery of cognitive behavioral treatment of insomnia compared to in-person care. *J Clin Psychiatry*. 2021;82(5):20m13723.

³Kalmbach DA, and Cheng P. Embracing telemedicine and digital delivery of cognitive behavioral therapy for insomnia: Where do we come from and where are we going? *Sleep* 2023;46(1).

⁴Cheng P, et al., Patient perspectives on facilitators and barriers to equitable engagement with digital CBT-I, *Sleep Health*: 2023(in press).

⁵Zachariae R, et al. Efficacy of internet-delivered cognitive-behavioral therapy for insomnia—a systematic review and meta-analysis of randomized controlled trials. *Sleep Med Rev*. 2016;30:1–10.

⁶Luik AI, et al. Digital delivery of cognitive behavioral therapy for insomnia. *Curr Psychiatry Rep*. 2019;21:50.

Conquering Insomnia CBT-I Program

- One of the oldest online programs, developed by Dr. Gregg D. Jacobs, PhD in 2005
- Based on Dr. Jacobs' 2004 study on the effectiveness of CBT-I¹
 - Young and middle-aged adults with chronic sleep-onset insomnia
 - 85% improvement in sleep quality
 - 80% reduction on reliance of sleeping pills
 - 70% increase in total sleep time, up to an hour
 - Fewer overall insomnia nights
- No effectiveness studies of the program itself; testimonials on the website²

¹Jacobs GD, Pace-Schott EF, Stickgold R, Otto MW. Cognitive behavior therapy and pharmacotherapy for insomnia: a randomized controlled trial and direct comparison. *Arch Intern Med.* 2004 Sep 27;164(17):1888-96.

²Information found from the program's website: <https://www.cbtforinsomnia.com/>

Conquering Insomnia Continued

- PDF-based treatment plan
 - Designed to last 5 weeks – one session per week²
 - Session 1: Basic facts about sleep; Conducting your own insomnia assessment
 - Session 2: Sleep scheduling and stimulus control techniques
 - Session 3: Cognitive restructuring techniques; Sleep medication tapering techniques
 - Session 4: Daytime relaxation techniques; Developing stress-reducing, sleep-enhancing attitudes and beliefs
 - Session 5: Bedtime relaxation techniques; Lifestyle habits that improve sleep
 - Cost²
 - Basic (\$49.95) – PDF program
 - Plus (\$59.95) – PDF program & Relaxation Techniques MP3
 - Premium (\$69.95) – PDF program, Relaxation Techniques MP3 & CBT E-mail Q&A with Dr. Jacobs

¹Jacobs GD, Pace-Schott EF, Stickgold R, Otto MW. Cognitive behavior therapy and pharmacotherapy for insomnia: a randomized controlled trial and direct comparison. *Arch Intern Med.* 2004 Sep 27;164(17):1888-96.

²Information found from the program's website: <https://www.cbtforinsomnia.com/>

CBT-I Coach

- Smartphone app developed in 2013 by the VA's National Center for PTSD
- Based on the therapy manual, Cognitive Behavioral Therapy for Insomnia in Veterans
- Meant to be used as an adjunct to face-to-face therapy
- A survey by the U.S. Department of Veterans Affairs assessed the impression of the app by VA-trained CBT-I clinicians¹
 - Before release, CBT-I Coach was perceived favorably
 - Two years after release, 60% of clinicians using it with patients to improve adherence to homework and outcome
- Cost: Free, available on iOS and Android

¹Kuhn E, *et al.* CBT-I Coach: a description and clinician perceptions of a mobile app for cognitive behavioral therapy for insomnia. *J Clin Sleep Med* 2016;12(4):597–606.

CBT-I Coach Continued

- Key features of CBT-I Coach¹
 - Interactive sleep diary
 - Automatic calculation of sleep schedule
 - Uses Insomnia Severity Index to track monthly progress
 - Tools for improving sleep: relaxation, coping self-statements, checklist for sleeping area
 - Educational materials about sleep, barriers, sleep hygiene, CBT-I
 - Customizable alert reminders
 - Relapse prevention

RESTORE CBT for Insomnia

- Launched in 2006 and designed by Dr. Norah Vincent²
- Distributed by Cobalt Therapeutics
- Available in English and Spanish
- Received international attention when the RCT was published in 2009¹
 - 118 adults with chronic insomnia participated
 - 81% reported at least mild improvement; over a third rated themselves as “much or very much improved”
 - >30% were sleeping a full hour more and had a reduction in racing thoughts at bedtime
 - 33% attrition rate > traditional therapy (~22%)

¹Vincent N and Lewycky S. Logging on for Better Sleep: RCT of the Effectiveness of Online Treatment for Insomnia. *Sleep*. 2009;32(6):807–815.

²Information found from the program’s website: <http://www.cobaltrx.com/Products/restore.html>

RESTORE Continued

- 7-session program designed to be completed in 5 weeks¹
- Downloadable educational materials
 - Sleep hygiene, mindfulness, stimulus control, applied relaxation, sleep restriction, medication taper, and cognitive therapy
- Cost²
 - Silver (£99.00) – printable worksheets
 - Gold (£179.00) – printable worksheets and 60-minute coaching session and clinician support
 - Platinum (£229.00) - printable worksheets, 60-minute coaching session and clinician support & additional resources to help manage panic and phobias, OCD, diet, and depression

¹Vincent N and Lewycky S. Logging on for Better Sleep: RCT of the Effectiveness of Online Treatment for Insomnia. *Sleep*. 2009;32(6):807–815.

²Information found from the program's website: <http://www.cobaltrx.com/Products/restore.html>

Go! To Sleep

- 6-week online course developed by Cleveland Clinic
- Clinical study (2017) tested the program's effectiveness¹
 - Clinically meaningful improvement in insomnia severity (Insomnia severity index)
 - Adults with primary and comorbid insomnia
 - Results were sustained over 4 months
- Cost: \$40²

¹Bernstein AM, et al. "Go! To Sleep": A web-based therapy for insomnia. *Telemedicine and e-Health*. 2017;23(7):1-10.

²Information found from the program's website: <https://www.clevelandclinicwellness.com/Pages/GoToSleep.htm>

Go! To Sleep Continued

- Program contents²
 - Six weeks' worth of effective sleep therapy
 - An online sleep log and daily sleep efficiency
 - Daily sleep improvement recommendations
 - Activities to help you get the sleep you need
 - Daily articles to help you get the most out of the program
 - Personal progress charts
 - Six specially crafted relaxation practices

¹Bernstein AM, et al. "Go! To Sleep": A web-based therapy for insomnia. *Telemedicine and e-Health*. 2017;23(7):1-10.

²Information found from the program's website: <https://www.clevelandclinicwellness.com/Pages/GoToSleep.htm>

Somryst (formerly SHUTi)

- Launched in 2012 as SHUTi (Sleep Healthy Using the Internet)
- Developed by Charles Morin, PhD and Lee Ritterband, PhD
- First and only FDA approved Prescription Digital Therapeutic (PDT) – 2020
- Two randomized controlled trials¹⁻⁴
 - >50% of patients showed clinically meaningful improvement in insomnia symptoms
 - >40% achieved remission after 9 weeks of treatment
- Developed for adults aged 22 years and older¹

¹Morin CM. Profile of Somryst Prescription Digital Therapeutic for Chronic Insomnia: Overview of Safety and Efficacy. *Expert Rev Med Devices*. 2020 Dec;17(12):1239-1248.

²Ritterband LM, Thorndike FP, Ingersoll KS, *et al*. Effect of a web-based cognitive behavior therapy for insomnia intervention with 1-year follow-up: a randomized clinical trial. *JAMA Psychiatry*. 2017;74(1):68–75.

³Christensen H, Batterham PJ, Gosling JA, *et al*. Effectiveness of an online insomnia program (SHUTi) for prevention of depressive episodes (the GoodNight Study): a randomised controlled trial. *Lancet Psychiatry*. 2016;3(4):333–341.

⁴Batterham PJ, Christensen H, Mackinnon AJ, *et al*. Trajectories of change and long-term outcomes in a randomised controlled trial of internet-based insomnia treatment to prevent depression. *BJPsych Open*. 2017;3(5):228–235.

Somryst (formerly SHUTi) Continued

- Designed to parallel traditional face-to-face CBT-I; includes clinician dashboard
- 6 Cores of exercises over a period of 6-9 weeks¹
 - Core 1: Education about CBT-I and goal setting
 - Core 2: Sleep restriction and consolidation
 - Core 3: Stimulus control
 - Core 4: Cognitive restructuring
 - Core 5: Sleep hygiene
 - Core 6: Relapse prevention
- Recently acquired by Nox Health – Employers and Health Plans
 - Not currently available according to website: <https://www.somryst.com/>

¹Morin CM. Profile of Somryst Prescription Digital Therapeutic for Chronic Insomnia: Overview of Safety and Efficacy. *Expert Rev Med Devices*. 2020 Dec;17(12):1239-1248.

Sleepio

- Developed in 2011 by Colin Espie and distributed by Big Health
- 2012 Randomized placebo-controlled trial¹
 - 164 adults (18-78 years)
 - Randomized to CBT, Image rehearsal therapy (IRT), or wait-list control
 - 20% improvement in sleep efficiency (SE), and maintained for follow-up
 - Sleep onset latency (SOL) reduced by 56%
 - Wake after sleep onset (WASO) reduced by 63%
- Cost: \$400 for a year²
 - Research study
 - Covered by insurance plan

¹Espie CA, Kyle SD, Williams C, Ong JC, Douglas NJ, Hames P, & Brown JS. A randomized, placebo-controlled trial of online cognitive behavioral therapy for chronic insomnia disorder delivered via an automated media-rich web application. *Sleep*. 2012;35(6):769-81.

²Information found from the program's website: <https://www.bighealth.com/sleepio/>

Sleepio Continued

- Program structure¹⁻²
 - Short sleep questionnaire – lifestyle and sleep problems
 - 6 weekly, 20-minute sessions personally tailored with “The Prof” (animated digital therapist)
 - Designed to resemble face-to-face CBT-I
 - behavioral (e.g., sleep restriction, stimulus control)
 - cognitive (e.g., putting the day to rest, thought re-structuring, imagery, articulatory suppression, paradoxical intention, mindfulness) strategies
 - relaxation strategies (progressive muscle relaxation and autogenic training)
 - advice on lifestyle and bedroom factors (sleep hygiene)

¹Espie CA, Kyle SD, Williams C, Ong JC, Douglas NJ, Hames P, & Brown JS. A randomized, placebo-controlled trial of online cognitive behavioral therapy for chronic insomnia disorder delivered via an automated media-rich web application. *Sleep*. 2012;35(6):769-81.

²Information found from the program’s website: <https://www.bighealth.com/sleepio/>

Limitations of dCBT-I

- Racial and ethnic minorities are largely overlooked in CBT-I trials¹
 - Culturally-tailored dCBT-I program for Black women produced increased engagement, completion, and greater improvements in sleep²
- Evidence suggests that minoritized individuals (low socioeconomic status and racial minorities) are more likely to develop insomnia³
- Those with lower income and/or education are 2-3 times less likely to complete treatment⁴
- Lack of language diversity in dCBT-I programming⁵
- Lack of insurance coverage for digital therapeutics⁵

¹Edinger JD, Arnedt JT, Bertisch SM, *et al.* Behavioral and psychological treatments for chronic insomnia disorder in adults: an American Academy of Sleep Medicine systematic review, meta-analysis, and GRADE assessment. *J Clin Sleep Med.* 2021;17(2):263-298.

²Zhou 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.

³Gellis LA, Lichstein KL, Scarinci IC, *et al.* Socioeconomic status and insomnia. *J Abnorm Psychol.* 2005;114(1):111.

⁴Cheng P, Luik AI, Fellman-Couture C, *et al.* Efficacy of digital CBT for insomnia to reduce depression across demographic groups: a randomized trial. *Psychol Med.* 2019;49(3):491-500.

⁵Manber R, *et al.* Integrating technology to increase the reach of CBT-I: state of the science and challenges ahead. *Sleep.* 2023;46(1).

Limitations of dCBT-I Continued

- Digital CBT-I may be less effective than clinician-led CBT-I¹
- Greater likelihood of dropout than face-to-face CBT-I²
 - May be combated with an additional level of support to increase motivation³
- Concerns regarding safety for patients with comorbid conditions
 - Bipolar disorder, Schizophrenia, epilepsy, sleep-related breathing disorder, high risk for falls, and any degenerative or unstable disorders where sleep restriction therapy may exacerbate the condition

¹Kallestad H, *et al.* Mode of delivery of cognitive behavioral therapy for insomnia: a randomized controlled non-inferiority trial of digital and face-to-face therapy. *Sleep*. 2021 Dec 10;44(12).

²Lancee J, *et al.* Guided Online or Face-to-Face Cognitive Behavioral Treatment for Insomnia: A Randomized Wait-List Controlled Trial. *Sleep*. 2016;39:183–191.

³Lancee J, *et al.* Motivational support provided via email improves the effectiveness of internet-delivered self-help treatment for insomnia: a randomized trial. *Behav Res Ther*. 2013;51:797–805.

How to Best Utilize dCBT-I

- Stepped-care model approach¹
 - First stage: offering digital CBT-I to all
 - Second stage: non-responders receive clinician-led CBT-I
- Identifying those individuals who may not benefit as much from dCBT-I and utilizing patient preference in treatment²
- Blended therapy²
 - Integration of digital technology with clinician-led CBT-I
 - Preserving clinician time for more complex treatment aspects

¹Drake CL, et al. Sleep to Reduce Incident Depression Effectively (STRIDE): study protocol for a randomized controlled trial comparing stepped-care cognitive behavioral therapy for insomnia versus sleep education control to prevent major depression. *Trials*. 2022;23(1):967.
²Manber R, et al. RCT of the effectiveness of stepped-care sleep therapy in general practice: the RESTING study protocol. *Contemp Clin Trials*. 2022;116:106749.

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Any Questions?