

Brief Behavioral Treatment for Insomnia (BBTI): Evidence-Based Practices for Improved Sleep in the Military

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Disclosures

- Maj Jeffrey J. Smith has no relevant financial or non-financial relationships to disclose relating to the content of this activity.
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At the conclusion of this activity, participants will be able to:

- 1. Discuss the prevalence of insomnia experienced by military personnel and shift worker challenges.
- 2. Summarize concepts of the Two-Process (Homeostatic & Circadian) Model.
- **3.** Explain the etiology of insomnia using the 3P model.
- 4. Evaluate patients for sleep disorders using a brief, sleep-focused assessment consistent with the primary care model and wearable technology.
- 5. Describe Brief Behavioral Treatment for Insomnia (BBTI).
- 6. Integrate basic sleep principles and sleep hygiene into psychoeducation.





Sleep Problems in the Military

- Military lifestyle includes continuous operations in garrison, training, and deployment.
- Stressful environments present challenges to achieve consolidated, restorative sleep.
- Significant mental and physical derangements caused by degraded metabolic, cardiovascular, skeletomuscular, and cognitive health results from insufficient sleep and/or circadian misalignment.
- Insufficient sleep and fatigue compromises personal safety, mission success, and national security
- Long-term, chronic insufficient sleep and circadian rhythm disorders have been associated with other sleep disorders (e.g., insomnia, obstructive sleep apnea, and parasomnias)





Health & Readiness Optimization (HeRO) Report

- Improve the health status, influence mission readiness, and force projection
- Uses Worksite wellness model
- Provides:
 - Education, behavioral, policy, and environmental evidencebased strategies to make healthier food choices
 - Increase physical activity, optimize sleep, and live a tobacco/nicotine free life



(Health Promotions United States Air Force, 2024)





Sleep Disorders in the Military



Obstructive Sleep Apnea





Nightmares

(Center for Deployment Psychology, 2020)





Insomnia in the Military



(Center for Deployment Psychology, 2020)





Military Shift Work (Sleep Challenges)

- The military works around the clock: Requires nights and weekends.
- Long hours while deployed or standing duty overnight, providers critical mission coverage.
- Staying alert and focused while on the job is vital, especially when you work outside the traditional 9-to-5 day.
- Working "odd-shifts" get in the way of getting a good night' sleep.
- Shift work impacts your sleep health
- Improve sleep quality when you need to work non-traditional hour







Guidance for Military Shift Workers (1 of 3)

- Adjusting to shift work and a new sleeping routine takes time.
- Shift work impacts each person differently.
- Explore routine that works best for your patient take some trial and error. Try
 practical tips to help you improve your sleep and better cope with shift work:
 - Keep a consistent sleep schedule. If you work the night shift, stay on the same sleep schedule even on your days off.
- Rotating shift workers, adjust sleep time before a schedule change to prevent disruption/Do not delay going to bed.







Guidance for Military Shift Workers (2 of 3)

- Rotating shift workers, adjust sleep time before a schedule change to prevent disruption/Do not delay going to bed.
- After night shift go to bed. The longer you put off sleep the more likely one will feel awake due to the body's internal clock.
- Create the right sleep environment. Make sure your bedroom is quiet, dark and at a cool temperature. Try using a sleep mask, blackout curtains, earplugs and/or a noise canceling machine or app for better sleep.
- Manage screen and light exposure. Wear sunglasses to limit sun exposure. Avoid screen time before bed. (blue light can make it harder to fall asleep)





Guidance for Military Shift Workers (3 of 3)

- Share your sleep schedule. Let family and/or roommate know work schedule and when one needs to rest.
- Nap strategically. Prior to shift can reduce sleepiness and increase alertness.
 Whether you have a bed available or just your rucksack/Napping can be a great tool to improve performance and combat sleep loss.
- Avoid caffeine and alcohol close to bedtime. While you may find yourself falling asleep faster after a drink, alcohol causes you to wake up more in the night and disrupts sleep quality/Eat light snacks at night.





Two-Process (Homeostatic & Circadian) Model of Sleep



(Center for Deployment Psychology, 2020)





Spielman 3P Factor Model

- Predisposing Factors
 - Physiological factors
 - Psychological diatheses (susceptibility to specific conditions)
 - Genetic predisposition
- Precipitating Factors
 - Psychological stressors
 - Physiological factors that contribute to acute insomnia symptoms
 - Trauma, stress
 - Other health-related conditions
- Perpetuating Factors:
 - Involve psychological, physiological, environmental and behavioral factors persistently interfere with establishment of sleep cycles
 - Maladaptive thoughts/behaviors



(Center for Deployment Psychology, 2020)



Sleep Focused Assessment Tools

- Insomnia Severity Index (ISI):
 - The ISI had strong scalar invariance across gender, combat deployment experience, and endorsed trauma symptoms. Receiver operator characteristic (ROC) analysis supported the measure's discriminate ability
 - A recent study contributes the first validation of the ISI among military personnel
 - Findings support the ISI use as an insomnia screening instrument among the military population and inclusion in the U.S. Department of Veterans Affairs/Department of Defense (VA/DoD) clinical practice guidelines
- Epworth Sleepiness Scale (ESS):
 - The Epworth Sleepiness Scale is an 8-item self-report of perceived likelihood of dozing off in various situations.
 - The Epworth Sleepiness Scale was used to assess excessive daytime sleepiness
 - Assesses a variety of sleep disorders, including sleep apnea, narcolepsy, and sleep deprivation





Sleep Focused Assessment Tools, continued

- Obstructive Sleep Apnea (OSA):
 - The STOP-Bang test detects patients at high risk of obstructive sleep apnea.
 - STOP-Bang: Snoring history, Tired during the day, Observed stop of breathing while sleeping, High blood pressure, Body mass index (BMI) > 35 kg/m2 (or 30 kg/m2), Age > 50 years, Neck circumference > 40 cm and male Gender
 - Relies heavily on high blood pressure, age, and body mass index.
 - STOP-Bang score correlates with apnea-hypopnea index (AHI) and is useful for predicting OSA severity.
 - Data show an upward trend in the incidence and prevalence of sleep disordered breathing (SDB) in the military.
- Pittsburg Sleep Quality Index (PSQI):
 - Designed to evaluate overall sleep quality in these clinical populations.
 - 19 self-reported item questionnaire & Seven subcategories:
 - Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use sleeping medication & daytime dysfunction.
 - Five additional questions rated by the respondent's roommate or bed partner are included for clinical purposes and are not scored.





Wearable Sleep Tracking Technology

- Accurate assessment of sleep is critical to understand & evaluate its role in health and disease.
- The boom in wearable technology is part of the digital health revolution.
- Produces many novel, highly sophisticated and relatively inexpensive devices.
- Collecting data from multiple sensors and extracts information about users' behaviors, including sleep.
- Wearable technology and behavioral treatment strategies are innovative approaches that can inoculate service members against sleep-related challenges.
- This has shown to improve health and performance which promotes force readiness.



Wearable Sleep Tracking Technology, continued







Technological Solution



FATIGUE SCIENCE







Fatigue Science & Sleep Active Fatigue Effectiveness (SAFTE)

- (SAFTE) Biomathematical model used to predict the effects of fatigue on performance
- (SAFTE) predicts cognitive performance based on input parameters, to include accumulation of sleep over time, accounting circadian processes and time of day
- Fatigue Avoidance Scheduling Tool (FAST)
- The SAFTE model has widespread use among transportation (e.g., aviation, rail) agencies and the US Department of Defense.
- Allows for construction of schedules to avoid performance impairment attributable to fatigue







Fatigue Science & Actigraphy & Alertness Estimation

- Fatigue Science sleep-activity tracker uses three-dimensional accelerometer technology to measure movement and infer sleepwake states. Relies on an automated proprietary algorithm to determine sleep-onset time
- In terms of sleep-wake variables, the outputs standard characteristics, including period-specific (e.g., nightly) sleep duration, sleep-onset latency, sleep-efficiency, and Wake-After-Sleep-Onset.
- Inter-Device reliability determining sleep-wake states is high.
 95% among healthy individuals in a recent study. In terms of validity, is like other research-grade actigraphs when evaluated relative to polysomnography





Quality Improvement Project (1 of 3)

Fatigue Science 360° Management: Mitigating Cognitive Fatigue and Improving Sleep Through the Use of Wearable Technology and Evidence-Based Practice







Quality Improvement Project (2 of 3)

Fatigue Science 360° Management: Mitigating Cognitive Fatigue and Improving Sleep Through the Use of Wearable Technology and Evidence-Based Practice

Target for Population



DeviantArt, 2024

Service Member Received 30-minute visit (BBTI) Core Concepts

Brief Behavioral Treatment for Insomnia (BBTI)

Lifestyle Sleep Health

To Achieve optimal health, performance, and readiness, one must have sleep and the more sleep obtained the better. Inadequate sleep weakens performance and can jeopardize the mission. Sleep readiness consists of three components:

Duration, because the health and functioning of the brain depends on the amount of sleep obtained

 Timing, because the ability to initiate and maintain sleep (and thus maximizing the amount of sleep obtained) is strongly influenced by the brain's internal clock.

 Continuity, because the the extent to which sleep is undisturbed by arouse and awakenings influences both the duration and depth of sleep. Deeper sleep is more restorative. (Advisable for an adult to get 1 to 3 hours of deep sleep per 8 hours of nightly sleep each night

Sleep Disrupters •Random Sleep Schedules

Accord & Caffeine
 Nicotine products & tobacco
 Other substances
 A poor sleep environment
 (best badroom temperature for sleep
 65 degrees Patrenheit
 Watching the clock/ruminating
 Irregular Daytime napping
 Increased evening liquid intake
 Exposure to Artificial and bue light
 (avid 2 to 3 hours before bedtime)
 Stress

Tips for Better Sleep

 Following the "4 rules for better sleep" #1 Reduce your time in Bed #2 Don't go to bed unless you're sleepy #3 Oon't stwin bed unless you're sleepy

#4 Get up at the same body of day every day of the week, no matter how poorly you slept the night before

Sleep Management Goals

Setting goals around sleep health is a great way to increase your sleep quality. It's often easier to achieve positive goals. An example of a positive sleep goals. I, " will begin a new bedrime routine of shutting off the television and instead, read a book for at least 30 minutes before hed. four ninther this week."

Specific - What are you going to do to improve your sleep quality

- Measurable How much time, how many sessions?
 - nable Do you have what it takes to follow through?

Realistic - What can you actually do? (improvement over perfection Time-Connected - How frequent? How long will you commit?





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STAGES



do to improve your sleep quality/



Quality Improvement Project (3 of 3)

Fatigue Science 360° Management: Mitigating Cognitive Fatigue and Improving Sleep Through the Use of Wearable Technology and Evidence-Based Practice

Target for Population



DeviantArt, 2024

Fatigue Science 360° Service Member Volunteers Complete a Post (4-Week) Insomnia Severity Index Sleep Qualitative Data Provided and Satisfaction Survey

Completed



(healthquality.va.gov, n.d.)





Quality Improvement Project Results

- Eighty-six service members participated. A paired t test showed that insomnia severity significantly improved from pre-trial (mean=13, SD=5) to post-trial (mean=8, SD=5), t83=5.23; p<.0001, a change of nearly 33%.
- 7/86 (8%) had an ISI score indicative of severe insomnia, 12/86 (12%) had scores indicative of no insomnia, the remaining 67/86 (78%), had mild to moderate insomnia
- Following four weeks of sleep-tracking and 30 minutes of BBTI, over half of participants (42/86) had ISI scores indicative of *no* insomnia while none of the participants (0/48) had severe anxiety
- Post-trial satisfaction questionnaires had a relatively low response rate of 42/86 (49%).
- 100% (42/42) reported feeling that the Readi One Wearable Device was between somewhat to very effective for tracking sleep, and 100% (42/42) answering that they were between somewhat to very confident that they could make the necessary changes in their behavior to improve sleep





Quality Improvement Project Results, continued

- Sleep Onset Latency (SOL): < 30 minutes
- Sleep Onset Latency (SOL) + Wake After Sleep Onset (WASO) < 30 minutes
- Sleep Efficiency (SE): 85%
- Total Sleep Time (TST): 6.5
- Reduce prevalence of Early Morning Awakenings (EMA)
- Reduce Frequent Night Awakenings (FNA)





Target for Population

(DeviantArt, 2024)



Quality Improvement Project Conclusion

- Wearable Technology paired with Behavioral Treatment Strategies are innovative approaches that can inoculate service members against sleep-related challenges.
- Innovation and the use of technology can improve health, performance, and promote force readiness.
- Interventions show strong potential for addressing military's past limited success in combating fatigue.
- Future controlled trials with larger numbers are warranted.





Clinical Assessment for Sleep (1 of 4)

- Trouble Falling or Stay Asleep? Waking up in the Middle of the Night?
- Waking up prior to set awake time?
- Nightmares? Other Behaviors?
- Ruminate/Worry in Bed? Stay in bed when you cannot sleep?
- Snoring & Gasping for Breaths at Night?
- Duration? Identified factors correlating with the onset?
- Alleviating/Aggravation Factors, Current/Previous Treatment, Functional Impairment





Clinical Assessment for Sleep (2 of 4)

- Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-V-TR)
 Disorder Class: Sleep-Wake Disorders
- A. Predominant complaint of dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms: Difficulty initiating sleep. (In children, this may manifest as difficulty initiating sleep without caregiver intervention.)
 - 1. Difficulty maintaining sleep, characterized by frequent awakenings or problems returning to sleep after awakenings. (In children, this may manifest as difficulty returning to sleep without caregiver intervention.)
 - 2. Early-morning awakening with inability to return to sleep.
- B. The sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.





Clinical Assessment for Sleep (3 of 4)

- DSM-V-TR Disorder Class: Sleep-Wake Disorders (Continued)
- C. The sleep difficulty occurs at least 3 nights per week.
- D. The sleep difficulty is present for at least 3 months.
- E. The sleep difficulty occurs despite adequate opportunity for sleep.
- F. The insomnia is not better explained by and does not occur exclusively during the course of another sleep-wake disorder (e.g., narcolepsy, a breathing-related sleep disorder, a circadian rhythm sleep-wake disorder, a parasomnia).
- G. The insomnia is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication).
- H. Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia





Clinical Assessment for Sleep (4 of 4)

- DSM-V-TR Disorder Class: Sleep-Wake Disorders (Continued)
- *Specify* if: With non-sleep disorder mental comorbidity, including substance use disorders
 - With other medical comorbidity
 - With other sleep disorder

Coding note: The code 780.52 (G47.00) applies to all three specifiers. Code also the relevant associated mental disorder, medical condition, or other sleep disorder immediately after the code for insomnia disorder in order to indicate the association.

- *Specify* if: Episodic: Symptoms last at least one month but less than three months.
 - Persistent: Symptoms last 3 months or longer.
 - Recurrent: Two (or more) episodes within the space of one year.

Note: Acute and short-term insomnia (i.e., symptoms lasting less than three months but otherwise meeting all criteria with regard to frequency, intensity, distress, and/or impairment) should be coded as another specified insomnia disorder







Quantitative Indicators of Insomnia

- The most defensible quantitative criteria for insomnia:
- Sleep onset latency (SOL) or wake time after sleep onset (WASO) > 30 minutes, occurring ≥ 2 nights per week for > 6 months
- Time in bed (TIB)
- Sleep onset latency (SOL)
- Total sleep time (TST)
- Wake after sleep onset (WASO)
- Sleep efficiency percentage (SE%)
- Number of awakenings longer than 5 minutes (NA > 5)





Sleep Principles & Sleep Hygiene

- Regular Sleep Schedule: Bed Time/Wake Time
- Difficulty Falling Asleep: Don't stay in bed unless asleep
- Set Aside Time to Unwind: Allow yourself at least an hour before bedtime
- Avoid Naps: No more than 15-30 minutes if you decide to nap
- No Caffeine: No caffeine 6-8 hours before bedtime
- Avoid Nicotine: Avoid nicotine before bedtime
- Avoid Alcohol: Avoid alcohol after dinner
- No Sleeping Pills/Sleep Aids: Effective only temporarily
- **Regular Exercise:** Exercise can aid sleep
- Bedroom Environment: Moderate temp, quiet, dark and comfortable
- Eating: A light bedtime snack may help in promoting sleep







Brief Behavioral Treatment for Insomnia (1 of 4)

- Insomnia is a threat to the well-being and combat readiness of military personnel
- Cognitive behavioral treatment for insomnia (CBTI) is an effective treatment of insomnia
- There are insufficient CBTI providers of the population who have insomnia.
- Brief behavioral treatment for insomnia (BBTI) is a 4-session manualized treatment paradigm administrable in medical settings by non-psychological health professionals.
- BBTI is effective in reducing symptoms of insomnia, such as sleep onset latency, wake after sleep onset, and sleep efficiency. BBTI can result in full remission from insomnia





Brief Behavioral Treatment for Insomnia (2 of 4)

- Behavioral Treatment of Insomnia: Why do it?
 - 1. Changing sleep habits (behaviors) can change sleep
 - 2. Studies show that it works and that improvements last
 - 3. Fewer possible side effects than medications
- Brief Behavioral Treatment of Insomnia: How to do it?
 - 1. Provide information about your sleep using: o Sleep questionnaires
 - Weekly Sleep Log
 - 2. Then, make specific changes to your sleep habits to improve the quality of your sleep.
 - 3. The treatment requires a dedicated effort to the new recommended schedule and behavioral changes.







Brief Behavioral Treatment for Insomnia Protocol Overview

- Appt 1: Initial Mini-Assessment, Introduce Sleep Log (In Person)
- Appt 2: Score Sleep Log, Psychoeducation, "Four Rules" (In Person)
- Appt 3: Adherence Check (Phone / In Person)
- Appt 4: Score Sleep Log, "30/30 Rule" for Sleep Titration (In Person)
- Appt 5: Review Progress, Sleep Titration, Relapse Prevention (Phone / In Person)





Brief Behavioral Treatment for Insomnia (3 of 4)









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<u>CBT-i Coach | VA Mobile</u>

Brief Behavioral Treatment for Insomnia (4 of 4)

What controls sleep?

- Sleep Drive -- how long you have been awake
- Biological Clock-- complex mechanism in the brain that works to keep us awake, then works to keep us asleep
- Mental activity and physical or medical issues-- thinking, worrying, bad dreams, injuries, medications, other sleep problems



(Center for Deployment Psychology, 2020)





Brief Behavioral Treatment for Insomnia

The "Four Rules" of BBTI

i. Reduce time in bed

ii. Wake up at the same time every day

iii. Do not go to bed unless sleepy

iv. Do not stay in bed unless you are asleep

(Center for Deployment Psychology, 2020)





Brief Behavioral Treatment for Insomnia, continued







Brief Behavioral Treatment for Insomnia: Your Sleep Goals

Current total sleep amount: _____

Current total time in bed: _____

Target total time in bed =

Current Sleep amount + 30 minutes = _____

Your New Sleep Schedule: New Bedtime: _____

New Rise Time: _____





Brief Behavioral Treatment for Insomnia: Review Sleep and Problems Solving

What went well in the past two weeks?

What kinds of changes have you noticed in your sleep?

How about changes in your daytime?

Let's review the difficult parts and brainstorm.

Solutions?

List them here:





Brief Behavioral Treatment for Insomnia

Behaviors That <u>Help</u> Sleep:

Consistent wind-down routine

A comfortable sleep environment (quiet, dark, safe, cool temperature (65°F), without pets) Exercising in the late afternoon or early evening Hot bath in the late afternoon or early evening

Behaviors That <u>Hurt</u> Sleep:

Alcohol, Caffeine, Tobacco, Other substances A poor sleep environment, Watching the clock Daytime napping Excessive evening liquid intake Exercising too close to bedtime







Brief Behavioral Treatment for Insomnia Week's Action Plan

- Wake-up time every day: ______
- Bed time at night: No earlier than
- Total time in bed at night: ______
- Activities in the evening:
- Activities at night:
- Activities in the morning:



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Brief Behavioral Treatment for Insomnia: Modifying Your Sleep Schedule: 30/30 Rule

When can I increase my sleep time? IF during the previous week, you are... Falling asleep in less than 30 minutes AND Spending less than 30 minutes awake during the middle of the night... THEN...

You can increase your time in bed by 15 MINUTES during the next week.

When do I know I have enough sleep?

IF you notice more trouble with sleep (taking longer than 30 minutes to fall asleep OR spending more than 30 minutes awake during the middle of the night)... THEN...

REDUCE your time in bed by 15 minutes during the next week



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Brief Behavioral Treatment for Insomnia: Week's Action Plan

- Wake-up time every day: ______
- Bed time at night: No earlier than ______
- Total time in bed at night: _____
- Activities in the evening:
- Activities at night:
- Activities in the morning: ______



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Maintaining Your Progress

- Maintaining Your Progress
 - Changes in sleep are gradual, and not necessarily steady



- Poor nights will occasionally happen in future
 - A relapse occurs when you respond to poor nights with behaviors that may hurt sleep
 - Possible times you are likely to have poor nights:
 - Strategies to help sleep after poor nights







Key Takeaways

- There is a higher prevalence of insomnia and other sleep-related disorders than their civilian counterparts
- There is empirically validated sleep focused assessment tools for military service members that can be quickly administered
- The Spielman 3P Factor Model and Two Process Sleep Model can help the Provider or Patient to conceptualize influences that affect sleep
- Wearable Technology paired with Behavioral Treatment Strategies are innovative approaches that can inoculate service members against sleep-related challenges.





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Questions?

How to Obtain CE/CME Credits

2024 MAY CCSS: Bridging Gaps and Building Resilience in Primary Care

Complete the course evaluation and posttest for the session(s) you attended by **11:59 PM ET on Thursday**, **May 23**, **2024**, to receive CE/CME credit or a certificate of attendance.

- 1. <u>Log in</u> to your account.
- 2. Go to the main event page and select the session you want to complete under the TAKE COURSE tab.
- 3. On the session page, click TAKE COURSE under the TAKE COURSE tab.
- 4. Progress through the required course items by clicking START under the Course Progress menu tabs located on the left of the screen or by clicking Start Course at the bottom of the page.
- 5. Complete the evaluation and pass the posttest with a score of 80% or above to select your credits and download your certificate.

All completed courses and certificates are available in <u>your account</u>. Refer to your <u>Pending Activities</u> for sessions you have yet to complete. You must complete the required course items by <u>Thursday, May 23</u>, to receive credit.

Questions? Email DHA J7, CEPO at <u>dha.ncr.j7.mbx.cepo-cms-support@health.mil</u>.



