



Outline



Nightmare
Definition/Prevalence/Evaluation



Nightmares in the Military



Treatment

Non-pharmacologic Treatment
Pharmacologic Treatment

Nightmares are the Most Prevalent Parasomnia in Pediatric and Adult Populations in the US

Parasomnia	Adult Lifetime Prevalence (%)	Children Prevalence (%)*
NREM		
• Sleepwalking	22.4	17.0
• Confusional Arousal	18.5	17.3
• Sleep Terror	10.4	6.5
• Sleep-related eating disorder	4.5	
• Sexual act during sleep	7.1	
REM		
• REM behavior disorder	15.0	
• Sleep related groaning	31.3	
• Nightmares	66.2	10-50

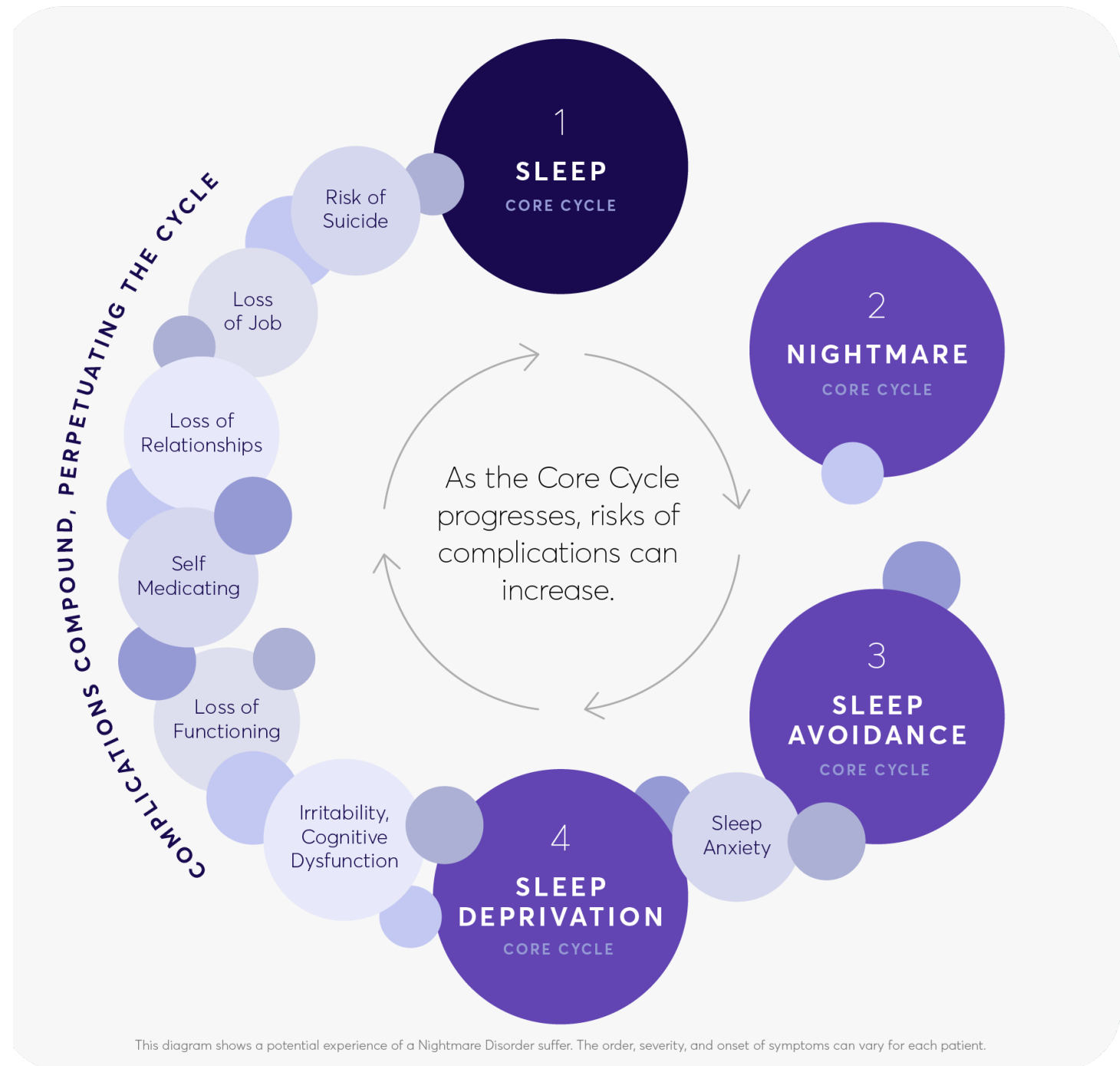
*Under 15 years of age

NREM, non-rapid eye movement; REM, rapid eye movement

Singh S et al. *Cureus* 2018; 10(12): e3807

Nightmares

- Associated with anxiety, depression, and PTSD
- Associated with heightened risk of suicidal ideation
- Treatment can lead to improvement in comorbid anxiety, depression, and PTSD




Nightmare Disorder (NDO)

- Repeated occurrences of disturbing, well-remembered dreams that cause clinically significant distress or impairment
- Trauma related nightmares (TRN) follow a traumatic experience
- Clinically significant nightmares occur at least weekly
- Few studies evaluate NDO in military personnel

Diagnostic Criteria for Nightmare Disorder (NDO)

Minimal Diagnostic Criteria: 3rd Edition ICSD¹

Nightmare disorder (ND)



- A.** Repeated occurrences of extended, extremely dysphoric, and well-remembered dreams that usually involve threats to survival, security, or physical integrity
- B.** On awakening from the dysphoric dreams, the person rapidly becomes oriented and alert
- C.** The dream experience, or the sleep disturbance produced by awakening from it, causes clinically significant distress or impairment in social, occupational, or other important areas of functioning as indicated by the report of at least one of the following:
1. Mood disturbance (e.g., persistence of nightmare effect, anxiety, dysphoria).
 2. Sleep resistance (e.g., bedtime anxiety, fear of sleep/subsequent nightmares).
 3. Cognitive impairments (e.g., intrusive nightmare imagery, impaired concentration, or memory)
 4. Negative impact on caregiver or family functioning (e.g., nighttime disruption)
 5. Behavioral problems (e.g., bedtime avoidance, fear of the dark)
 6. Daytime sleepiness
 7. Fatigue or low energy
 8. Impaired occupational or educational function
 9. Impaired interpersonal/social function

Per the American Academy of Sleep Medicine, NDO affects 4% of the adult population in the US²

DSM-5: NDO Criterion

- A. Repeated occurrences of extended, extremely dysphoric, and well remembered dreams that usually involve threats to survival, security, or physical integrity and that generally occur during the second half of the major sleep episode.
- B. On awakening from the dysphoric dreams, the person rapidly becomes oriented and alert.
- C. The sleep disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The nightmare symptoms are not attributable to the physiological effects of a substance.
- E. Coexisting mental and medical disorders do not adequately explain the predominant content of dysphoric dreams.

Descriptors			
Severity		Duration	
Mild	< 1 per week on average	Acute	≤ 1 month
Moderate	>1 per week	Subacute	>1 month and < 6 months
Severe	Nightly	Chronic	≥ 6 months

PSQI

- Pittsburgh Sleep Quality Index

During the past month:

1. What time have you usually gone to bed at night? BED TIME _____
2. How long (in minutes) has it taken to you to fall asleep each night? NUMBER OF MINUTES _____
3. What time have you usually gotten up in the morning? GETTING UP TIME _____
4. A. How many hours of actual sleep did you get at night?
B. How many hours were you in bed? _____

5. During the past month, how often have you had trouble sleeping because you:	Not during the last month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
A. Cannot get to sleep within 30 minutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Wake up in the middle of the night or early morning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Have to get up to use the bathroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Cannot breathe comfortably	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Cough or snore loudly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Feel too cold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Feel too hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Have a bad dream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Have pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Other reason(s), please describe including how often you have had trouble sleeping because of this reason(s): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. During the past month, how often have you taken medicine (prescribed or over the counter) to help you sleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. During the past month, how often have you had trouble staying awake while driving, eating or engaging in social activity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?
 Not a problem at all (0) Only a very slight problem (1) Somewhat of a problem (2) A very big problem (3)
9. How would you rate your sleep quality overall?
 Very good (0) Fairly good (1) Fairly bad (2) Very bad (3)



ELSEVIER

Psychiatry Research

Volume 28, Issue 2, May 1989, Pages 193-213



The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research

PSQI-A

- Pittsburgh Sleep Quality Index Addendum for PTSD

During the past month, how often... (can be based on report of roommate or bed partner)	Never	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week	I do not know
...do you wake with a headache?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you wake with a dry mouth?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you stop breathing while sleeping?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you wake gasping or choking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you snore loudly enough to be noticed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you snore loudly enough that you were told you bothered some else's sleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you have leg twitching or jerking while you sleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...are you BOTHERED by the urge to move your legs for comfort as you fall asleep or sit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you grind/clench your teeth at night?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you walk in your sleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...do you experience very vivid dreams while falling asleep or waking up?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...are you unable to move while falling asleep or waking up?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...are you unable to move arms or legs when laughing or feeling other strong emotions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...have you had memories or nightmares of a traumatic experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...had episodes of terror or screaming during sleep without fully awakening?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...had episodes of "acting out" your dreams such as kicking, punching, running, or screaming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





Journal of Anxiety Disorders

Volume 19, Issue 2, 2005, Pages 233-244



A brief Sleep Scale for Posttraumatic Stress Disorder: Pittsburgh Sleep Quality Index Addendum for PTSD

Anne Germain^a  , Martica Hall^a, Barry Krakow^{b,c}, M. Katherine Shear^a, Daniel J. Buysse^a



Sleep
Research
Society®

SLEEPJ, 2021, 1–11

doi: 10.1093/sleep/zsaa254

Advance Access Publication Date: 27 November 2020

Original Article

ORIGINAL ARTICLE

The Nightmare Disorder Index: development and initial validation in a sample of nurses

Jessica R. Dietch^{1,*†,•}, Daniel J. Taylor^{2,†,•}, Kristi Pruiksma^{3,•},
Sophie Wardle-Pinkston^{2,†}, Danica C. Slavish^{4,•}, Brett Messman⁴, Rosemary Estevez⁵,
Camilo J. Ruggero⁴ and Kimberly Kelly⁴

¹Department of Psychiatry and Behavioral Sciences, Stanford University, Palo Alto, CA ²Department of Psychology, University of Arizona, Tucson, AZ ³Department of Psychiatry and Behavioral Sciences, University of Texas Health Sciences Center at San Antonio, San Antonio, TX ⁴Department of Psychology, University of North Texas, Denton, TX ⁵Mental Health Flight, Maxwell Air Force Base, AL

Nightmare Disorder Index

Thinking about a typical night in the last month ...

1. How many nights a week did you have nightmares (i.e., disturbing, extended, well-remembered dreams)?	0 nights per week (0)	< 1 nights per week (1)	1-3 nights per week (2)	4-6 nights per week (3)	7 nights per week (4)
---	--------------------------	----------------------------	----------------------------	----------------------------	--------------------------

Skip to next questionnaire if answered "0" above.

2. How often do you wake up from your nightmares AND quickly become alert?	Never (0)	Rarely (1)	Sometimes (2)	Often (3)	Always (4)
3. To what extent have nightmares troubled/distressed you in general?	Not at all (0)	A little (1)	Somewhat (2)	Much (3)	Very Much (4)
4. To what extent have nightmares caused difficulties in social, work, or other areas of life?	Not at all (0)	A little (1)	Somewhat (2)	Much (3)	Very Much (4)
5. How long have you been bothered by nightmares?	Less than 1 week (0)	Less than 1 month (1)	1-6 months (2)	6-12 months (3)	>12 months (4)

Categorical Scoring Instructions:

Items 1-4 on the NDI correspond to the *DSM-5* criteria for nightmare disorder and thus are used to obtain diagnostic categories. Item 5 is not used in the assessment of categorical scores but can be used to denote the acuity specifier. Please note that a diagnosis cannot be made without a clinical interview; the NDI is meant to serve as a screening tool and should not be used to assign a definitive diagnosis.

No Nightmare Disorder: A respondent is assigned this category if they answer "0" for item 1.

Subthreshold/Partial Nightmare Disorder Symptoms: A respondent is assigned this category if they respond 1-4 (i.e., <1 night per week to 7 nights per week) on item 1 AND respond 0 or 1 for any item 2-4. This indicates that while the respondent has experienced nightmares on a consistent basis in the past month, they do not endorse all symptoms at a level severe enough to be included in the category of probable nightmare disorder.

Probable Nightmare Disorder: A respondent is assigned this category if they respond 1-4 on item 1 AND ≥ 2 on all items 2-4.

A severity specifier can be assigned to respondents falling in this category based on the response to item 1 as follows: 1 – Mild; 2-3 – Moderate; 4 – Severe.

An acuity specifier can be assigned to respondents falling in this category based on the response to item 5 as follows: 1 – Acute; 2 – Subacute; 3-4 – Persistent



Degree of Trauma Exposure

- Dream recall/nightmares after Loma Prieta earthquake
 - Assessed college students
 - Witnessed direct impact
- School shooting night
 - 63% in school yard
 - 56% of those in the school
 - 43% of those at home
 - 33% of children geographically away

Proximity effects dream content

Trauma and Dream Recall Frequency

Changes in dreaming

- Severely traumatize dreams
- Palestinian children dreams compared to children living in peaceful Galilee
 - Increased trauma

Temporal changes in dream recall

- Recall increases with stress/trauma
- Tends to decrease months to years after trauma

Nightmares: Prevalence among the Finnish General Adult Population and War Veterans during 1972-2007

Nils Sandman, MSc^{1,2}; Katja Valli, PhD^{2,3}; Erkki Kronholm, PhD⁴; Hanna M. Ollila, PhD¹; Antti Revonsuo, PhD^{2,3}; Tiina Laatikainen, PhD^{4,5}; Tiina Paunio, MD, PhD^{1,6}

Frequent nightmares

- Men: 3.5%
- Women: 4.8%
($p < 0.0001$)

Prevalence affected by

- Sex
- Age
- Year of survey

War experiences

- nightmares
- insomnia

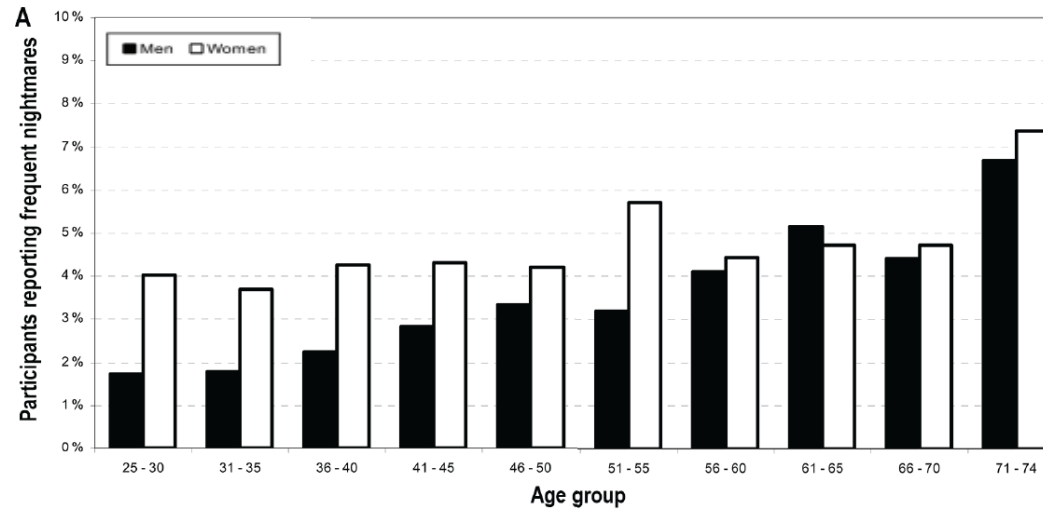


Table 5—Nightmares and symptoms of insomnia, depression, and anxiety among the war generation and the general population in the combined sample of participants of the years 1972, 1977, 1982, 1987, and 1997

	General population		War generation	
	Men	Women	Men	Women
n	17,705	17,754	5,300	5,915
Nightmares often (%)	2.8	4.6	7.2	7.0
Insomnia often (%)	5.4	6.1	10.9	13.9
Depressed often (%)	3.7	6.5	7.1	9.6
Anxious often (%)	7.3	9.8	11.0	12.0

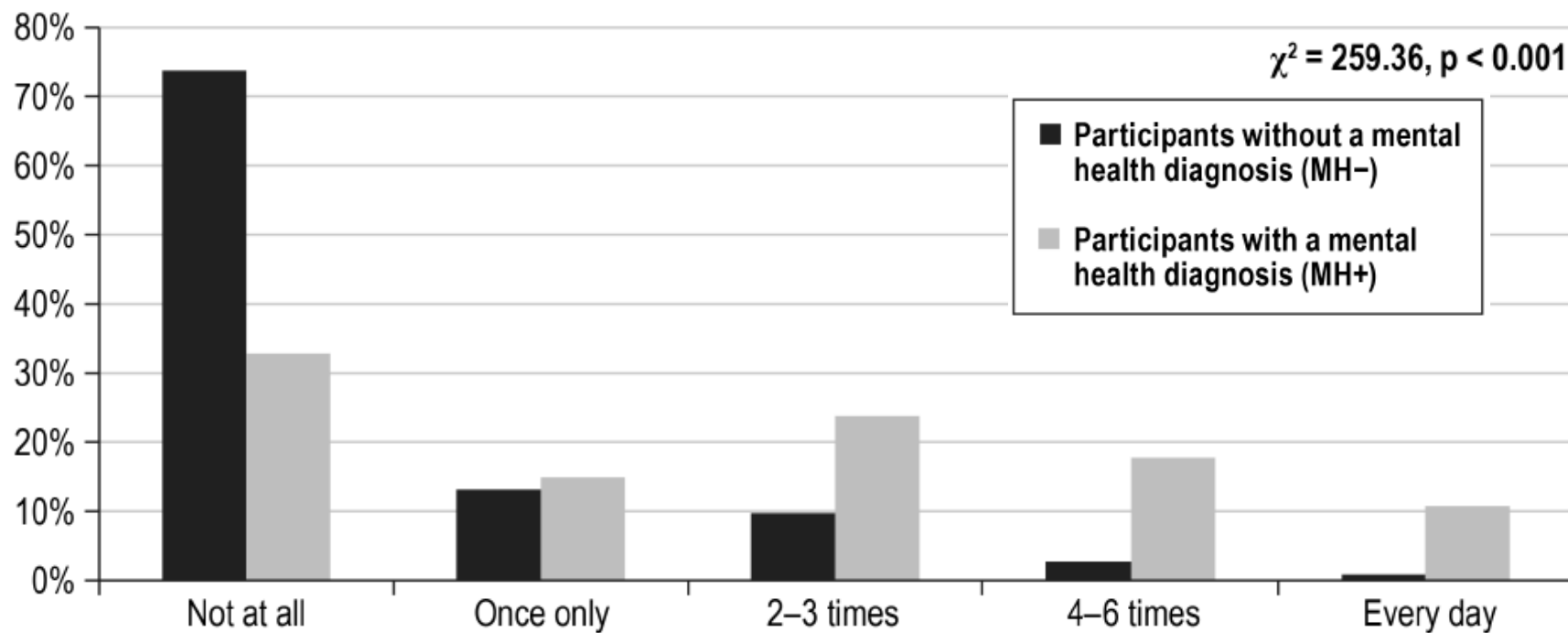
SLEEP 2013;36(7):1041-1050.

A Comparison of Sleep Difficulties among Iraq/Afghanistan Theater Veterans with and without Mental Health Diagnoses

Christi S. Ulmer, PhD^{1,2}; Elizabeth Van Voorhees, PhD^{1,2}; Anne E. Germain, PhD³; Corrine I. Voils, PhD^{1,4}; Jean C. Beckham, PhD^{1,2,5}; the VA Mid-Atlantic Mental Illness Research Education and Clinical Center Registry Workgroup⁵

¹Durham Veterans Affairs Medical Center, Durham, NC; ²Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC; ³University of Pittsburgh, Departments of Psychiatry and Psychology, Pittsburgh, PA,

⁴Department of General Internal Medicine, Duke University Medical Center, Durham, NC; ⁵VISN 6 Mental Illness Research, Education, and Clinical Center, Durham, NC *J Clin Sleep Med* 2015;11(9):995–1005.

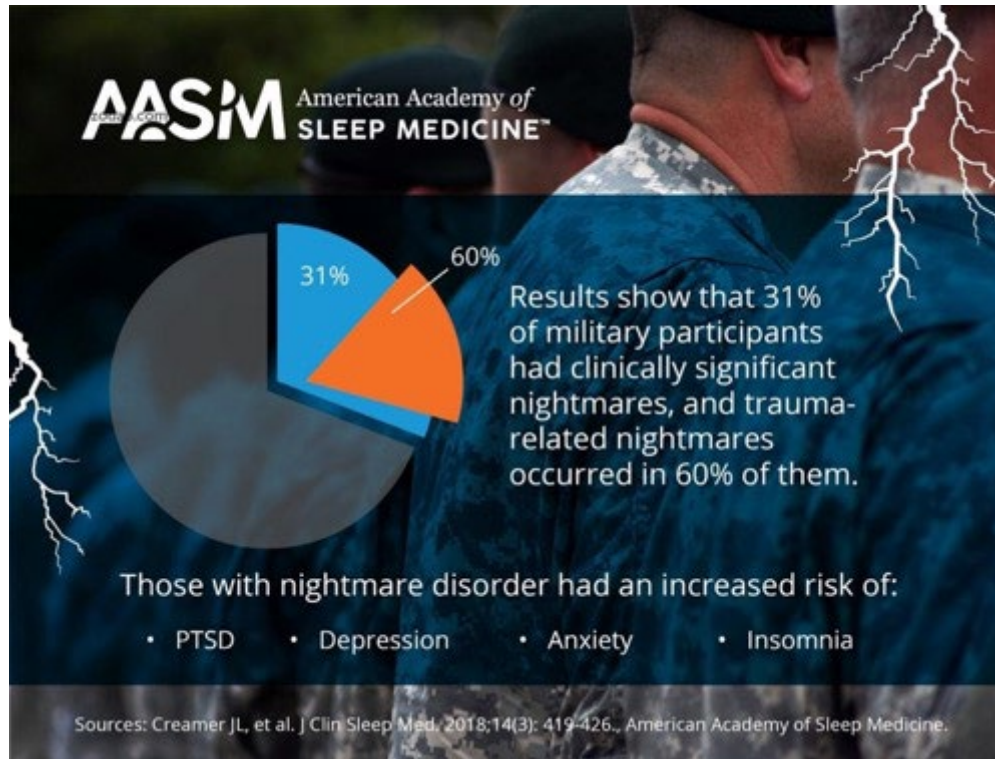


Distressing dreams of a traumatic event (frequency)

Nightmares in United States Military Personnel With Sleep Disturbances

Jennifer L. Creamer, MD¹; Matthew S. Brock, MD²; Panagiotis Matsangas, PhD³; Vida Motamedi, BA⁴; Vincent Mysliwiec, MD²

¹Martin Army Community Hospital, Sleep Center, Fort Benning, Georgia; ²San Antonio Military Medical Center, Department of Sleep Medicine, JBSA-Lackland, Texas; ³Operations Research Department, Naval Postgraduate School, Monterey, California; ⁴National Institutes of Health, National Institutes of Nursing Research, Bethesda, Maryland



- Despite 31% reporting at least weekly nightmares, only 3.9% reported nightmares as a reason for sleep evaluation
- A majority of those with NDO, reported having TRN (60%)
- NDO/TRN were more common in patients with comorbid anxiety, depression, PTSD, and TBI
 - TRN appeared to be the driving force behind this association
- 86% of those with NDO had insomnia
 - Insomnia symptoms worse in TRN
 - Sleep quality improved on PSG in TRN

0669

PREVALENCE AND CORRELATES OF NIGHTMARES IN ACTIVE DUTY SERVICE MEMBERS

*Kristi Ensor Pruiksma, PhD¹, Danica Slavish, PhD²,
Sophie Wardle, BS², Alyssa Ojeda, BS², Daniel Taylor, PhD⁴,
Alan Peterson, PhD¹, Kevin Kelly, MD⁵, Douglas Maur⁵,
Jim Mintz, PhD¹, Brett Litz, PhD⁶, Elisa Borah, PhD⁷,
Antoinette Brundige¹, Stacey Young-McCaughan, PhD¹,
Douglas Williamson⁸*

¹UT Health Science Center at San Antonio, San Antonio, TX, USA, ²University of North Texas, Denton, TX, USA, ³UT Health Science Center at San Antonio, UT Health San Antonio, TX, USA, ⁴UT Health Science Center at San Antonio, Denton, TX, USA, ⁵Carl R Darnall Army Medical Center, Fort Hood, TX, USA, ⁶Boston University School of Medicine, Boston, MA, USA, ⁷University of Texas at Austin, Austin, TX, USA, ⁸Duke University Medical Center, Durham, NC, USA.

-
- Pre-deployment processing
 - 2010-2011
 - 39.9% experienced nightmares

Nightmare disorder in active-duty US military personnel

Brian A. Moore, PhD^{a*}, Allison Brager, PhD^b, Jason Judkins, DSc, PhD^c, Vincent Mysliwiec, MD^d



^a *Department of Psychological Science, Kennesaw State University, Kennesaw, Georgia, USA*

^b *Marketing & Engagement Brigade, United States Army Recruiting Command, Fort Knox, Kentucky*

^c *Military Performance Division, United States Army Research Institute of Environmental Medicine, Natick, Massachusetts*

^d *Department of Psychiatry and Behavioral Health, University of Texas Health Science Center at San Antonio, San Antonio, Texas*



- Data taken from Defense Medical Epidemiology Database
- NDO incidence (per 10,000 service members) between 2016-2019
 - High 2016: 11.3
 - Low 2018: 6.9
- Higher rates in older senior service members, female, and Black service members



Unexplained Clinical Findings in Combat Veterans

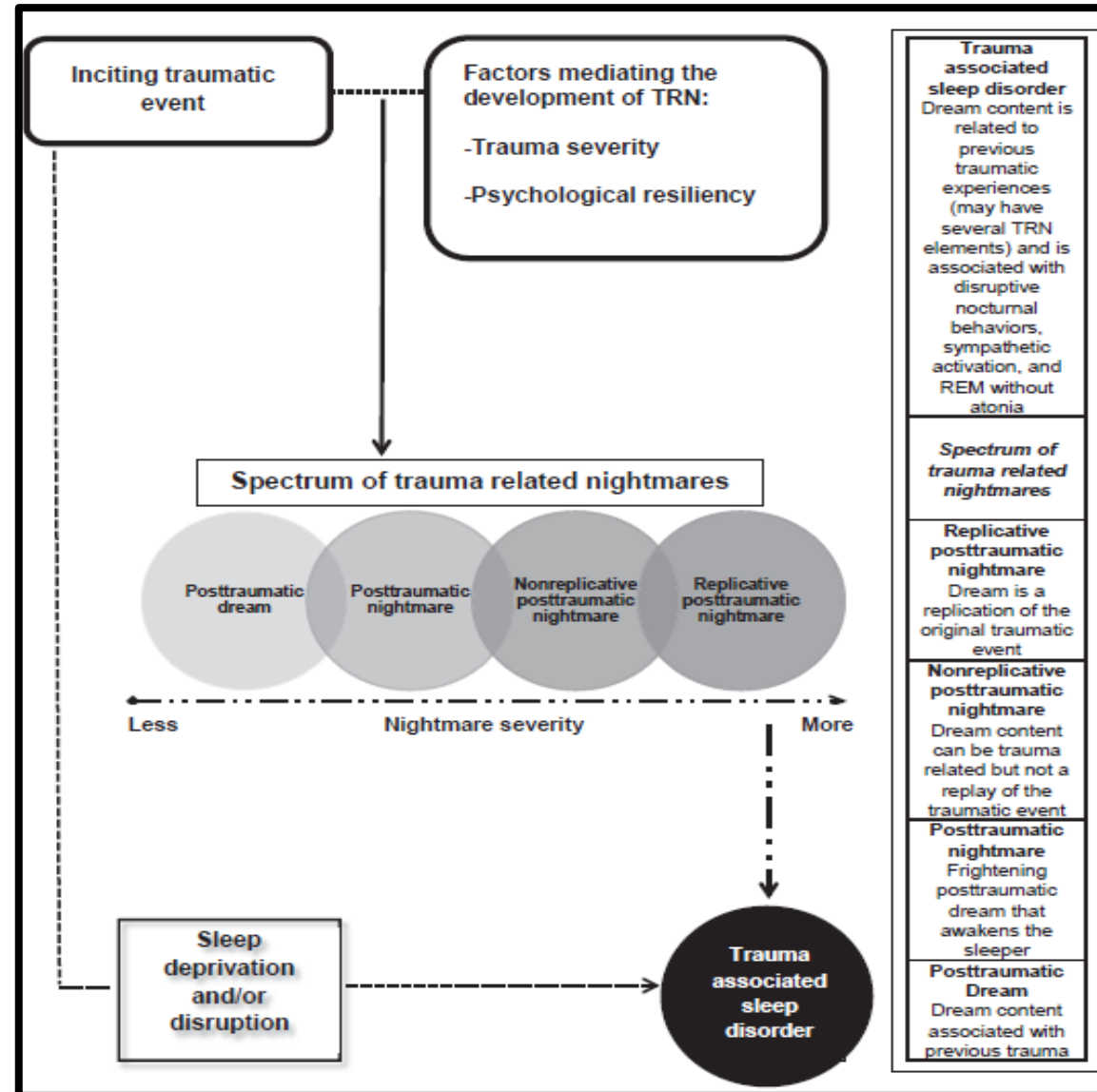
Constellation of:

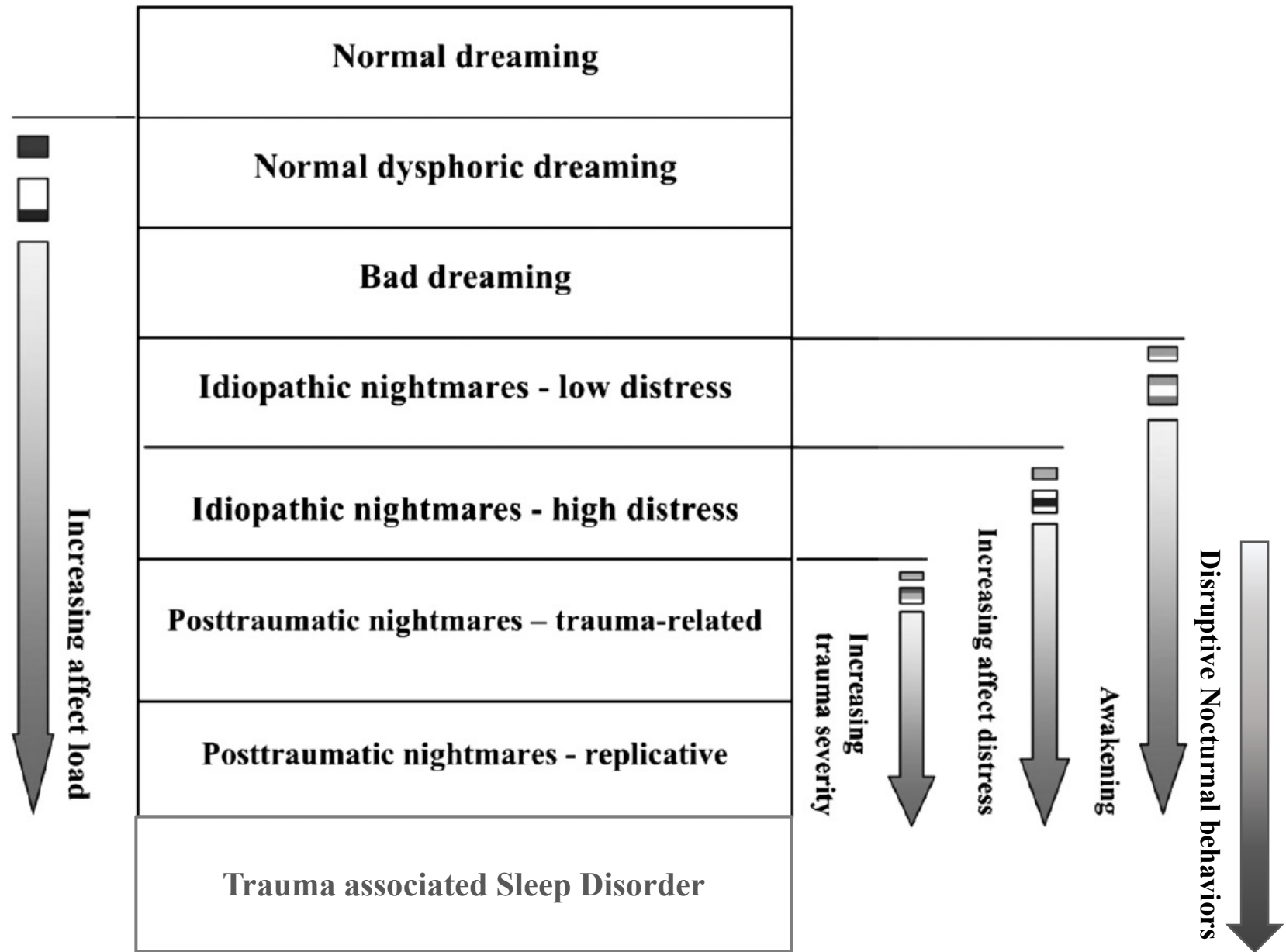
1. Nightmares
 - a. With and without dream recall
2. Disruptive nocturnal behaviors
 - a. Combative behaviors
 - b. Vocalizations
 - c. Somnambulism
3. Autonomic hyperactivity
 - a. Night sweats
 - b. Racing heart



Trauma associated sleep disorder: A parasomnia induced by trauma

Vincent Mysliwiec ^{a,*}, Matthew S. Brock ^a, Jennifer L. Creamer ^b, Brian M. O'Reilly ^b,
Anne Germain ^{c,d}, Bernard J. Roth ^b *Sleep Medicine Reviews* 37 (2018) 94–104





Diagnostic Criteria for TSD

- A.** Onset of symptoms after combat or other traumatic experience
 - B.** A history of altered dream mentation that is related to prior traumatic experience
 - C.** Self or witnessed reports of disruptive nocturnal behaviors to include at least one of the following:
 - 1. Abnormal vocalizations
 - a.* Moaning, screaming, or yelling
 - 2. Abnormal motor behaviors in sleep
 - b.* Tossing, turning, or thrashing
 - c.* Combative behaviors such as striking bedpartner
 - D.** Symptoms of autonomic hyperarousal or PSG monitoring demonstrates one or more of the following associated with dream mentation:
 - 1. Tachycardia
 - 2. Tachypnea
 - 3. Diaphoresis
 - E.** There is an absence of EEG epileptiform activity on PSG and the disturbance is not better explained by another sleep disorder, mental disorder, medical disorder, medication, or substance use
- Notes:
- 1. PSG may demonstrate:
 - a.* Variable amounts of REM sleep without atonia
 - b.* Dream enactment behavior in REM sleep
 - 2. Onset is typically in close temporal proximity to trauma exposure, often in the setting of sleep deprivation/disruption
 - 3. Patients with TSD frequently have comorbid insomnia and/or obstructive sleep apnea

REVIEW

Open Access

The spectrum of disorders causing violence during sleep

Carlos H. Schenck



Table 1 Differential diagnosis of sleep-related injury and violence

1. REM Sleep Behavior Disorder (RBD)
2. NREM Sleep Parasomnias (Sleepwalking, Sleep Terrors)
3. Parasomnia Overlap Disorder (RBD + NREM Sleep Parasomnias)
4. Obstructive Sleep Apnea
5. Sexsomnia (Sleep Related Abnormal Sexual Behaviors)
6. Sleep Related Dissociative Disorder
7. Trauma-Associated Sleep Disorder/Post-Traumatic Stress Disorder
8. Periodic Limb Movement Disorder
9. Rhythmic Movement Disorder
10. Nocturnal Scratching Disorder
11. Sleep Related Eating Disorder
12. Nocturnal Seizures
13. Miscellaneous/Mixed Disorders

THE TRIAL OF ALBERT J. TIRRELL, CHARGED WITH THE MURDER OF MRS. MARIA A. BICKFORD. BEFORE THE SUPREME COURT IN BOSTON:



BOSTON,
DAILY MAIL REPORT—FULL AND COMPLETE.

Only a Small Percentage of Patients Experiencing Nightmares Seek Professional Help

Seeking professional help for nightmares:
A representative study

Eur. J. Psychiat. Vol. 27, N.º 4, (259-264)
2013

Michael Schredl

Central Institute of Mental Health, Medical
Faculty Mannheim/Heidelberg University

SCIENTIFIC INVESTIGATIONS

Interest in Information about Nightmares in Patients with Sleep Disorders

Michael Schredl, PhD¹; Lara Dehmlow, cand. psych.¹; Judith Schmitt, MD²

¹Sleep Laboratory, Central Institute of Mental Health, Medical Faculty Mannheim / Heidelberg University, Mannheim, Germany; ²Abteilung für Schlafmedizin, Theresienkrankenhaus und St. Hedwig-Klinik GmbH, Mannheim, Germany

? “Every eighth person with frequent nightmares, defined as every other week or more often, **sought** at one time of his/her life for **professional help** for coping with nightmares.” - Schredel 2013

□ “**Nightmare frequency correlated with seeking professional help**” - Schredel 2013

□ “Overall, **12.24%** of 972 participants with valid answers for this item **reported that they had sought help for their nightmares**. The figure for the patients with frequent nightmares (once a week or more often) was higher (33.00%)” - Schredl 2016

Nightmares: Under-Reported, Undetected, and Therefore Untreated

Michael R. Nadorff, PhD^{1,2}; Danielle K. Nadorff, PhD¹; Anne Germain, PhD³

? “Our results indicate that **most** participants with clinically significant nightmare symptoms **are unlikely to report nightmares to a healthcare provider**” - Nadorff 2015

SCIENTIFIC INVESTIGATIONS

Nightmares in United States Military Personnel With Sleep Disturbances

Jennifer L. Creamer, MD¹; Matthew S. Brock, MD²; Panagiotis Matsangas, PhD³; Vida Motamedi, BA⁴; Vincent Mysliwiec, MD⁵

□ “**Only 3.9% of military** receiving a sleep study **reported nightmares** as the reason for evaluation” Creamer 2018

Barry Krakow, MD

Michael Hollifield, MD

Lisa Johnston, MA, MPH

Mary Koss, PhD

Ron Schrader, PhD

Teddy D. Warner, PhD

Imagery Rehearsal Therapy for Chronic
Nightmares in Sexual Assault Survivors
With Posttraumatic Stress Disorder
A Randomized Controlled Trial

“Only **14 [of 142]** women [with a history of chronic nightmares and a history of sexual or physical assault] ever **sought help for the problem of nightmares**” Krakow 2002

Psychologist/Psychotherapist are More Likely to Hear About Nightmares than other Providers

Barry Krakow, MD

Michael Hollifield, MD

Lisa Johnston, MA, MPH

Mary Koss, PhD

Ron Schrader, PhD

Teddy D. Warner, PhD

Imagery Rehearsal Therapy for Chronic Nightmares in Sexual Assault Survivors With Posttraumatic Stress Disorder
A Randomized Controlled Trial

“Women who sought help for nightmares **sought help in the context of psychotherapy** for other psychiatric symptoms”
Krakow 2002

SCIENTIFIC INVESTIGATIONS

Interest in Information about Nightmares in Patients with Sleep Disorders

Michael Schredl, PhD¹; Lara Dehmlow, cand. psych.¹; Judith Schmitt, MD²

¹Sleep Laboratory, Central Institute of Mental Health, Medical Faculty Mannheim / Heidelberg University, Mannheim, Germany; ²Abteilung für Schlafmedizin, Theresienkrankenhaus und St. Hedwig-Klinik GmbH, Mannheim, Germany

- “The largest group of healthcare professionals that were asked for help were **psychologists/psychotherapists (about 70%)**, psychiatrists (about 10%), general practitioners (about 6%), sleep specialists (about 5%)” - Schredl 2016

Prevalence, correlates and treatment of nightmares in secondary mental healthcare

Annette van Schagen

- “**Nightmare disorder might be ignored** in mental health care because according to DSM-IV-TR criteria nightmares can only be classified as a nightmare disorder if they do not occur exclusively during the course of another mental disorder” -van Schagen 2016
- “**Nightmares are highly prevalent** in psychiatric practice and our data suggest they are **often missed in psychiatric assessment**” - van Schagen 2016

Medications Associated with Nightmares

Medication Category	Examples
Acetylcholinesterase inhibitors	Donepezil, galantamine, rivastigmine
Antidepressants	Bupropion, MAOIs, mirtazapine, SNRIs, SSRIs, TCAs
Antihistamines	Chlorpheniramine
Antimicrobials	Ciprofloxacin, efavirenz, erythromycin, ganciclovir, mefloquine
Atypical antipsychotic medications	Clozapine, olanzapine, risperidone
Beta blockers	Labetalol metoprolol, propranolol
Calcium channel blockers	Verapamil
Dopaminergic drugs	Amantadine, amphetamine, levodopa, methylphenidate, pramipexole, ropinirole, selegiline
Sedative hypnotics	Alcohol, barbiturates, temazepam, triazolam
Statins	Atorvastatin
OTC	Melatonin



Best Practice Guide for the Treatment of Nightmare Disorder in Adults

Standards of Practice Committee:

R. Nisha Aurora, M.D.¹; Rochelle S. Zak, M.D.²; Sanford H. Auerbach, M.D.³; Kenneth R. Casey, M.D.⁴; Susmita Chowdhuri, M.D.⁵; Anoop Karippot, M.D.⁶; Rama K. Maganti, M.D.⁷; Kannan Ramar, M.D.⁸; David A. Kristo, M.D.⁹; Sabin R. Bista, M.D.¹⁰; *[Name obscured]*, M.D.⁸

- Level A (both PTSD and idiopathic nightmares):
 - Prazosin
 - Image Rehearsal Therapy
- Level B
 - Systematic desensitization and progressive deep muscle relaxation training for idiopathic nightmares
- Level C
 - Clonidine for PTSD-associated nightmares

Term	Level	Evidence Levels	Explanation
Recommended / Not recommended	A	1 or 2	Assessment supported by a substantial amount of high quality (Level I or II) evidence and/or based on a consensus of clinical judgment
Suggested / Not Suggested	B	1 or 2—few studies 3 or 4—many studies and expert consensus	Assessment supported by sparse high grade (Level I or II) data or a substantial amount of low-grade (Level III or IV) data and/or clinical consensus by the task force
May be considered / Probably should not be considered	C	3 or 4	Assessment supported by low grade data without the volume to recommend more highly and likely subject to revision with further studies

Prazosin summary

- 12 studies
 - 5 placebo controlled trials (
 - 4 open label
 - 4 retrospective chart reviews
- Prazosin effective, but doses up to 10-15mg are often needed.
- Consider daytime prazosin if BP can tolerate



**Position Paper for the Treatment of Nightmare Disorder in Adults:
An American Academy of Sleep Medicine Position Paper**

Timothy I. Morgenthaler, MD¹; Sanford Auerbach, MD²; Kenneth R. Casey, MD, MPH³; David Kristo, MD⁴; Rama Maganti, MD⁵; Kannan Ramar, MD¹; Rochelle Zak, MD⁶; Rebecca Kartje, MD, MSHI, MBA⁷

Behavioral therapy

- **Image Rehearsal therapy**
- PTSD Nightmares: CBT, CBT-I, eye desensitization and reprocessing, and exposure, relaxation, and rescripting therapy
- NDO: CBT, hypnosis, lucid dreaming therapy, progressive deep muscle relaxation, sleep dynamic therapy, self-exposure therapy, systemic desensitization, and testimony method

Pharmacologic therapy

- PTSD Nightmares: prazosin, atypical antipsychotics, clonidine, cyproheptadine, fluvoxamine, gabapentin, nabilone, phenazine, topiramate, trazodone, and tricyclic antidepressants
- NDO: prazosin, nitrazepam, and triazolam



VA/DOD CLINICAL PRACTICE GUIDELINE FOR
THE MANAGEMENT OF POSTTRAUMATIC
STRESS DISORDER AND ACUTE STRESS
DISORDER

Version 3.0 – 2017

e. Prazosin

28a	For global symptoms of PTSD, we suggest against the use of prazosin as mono- or augmentation therapy.	Weak Against	Reviewed, New-replaced
28b	For nightmares associated with PTSD, there is insufficient evidence to recommend for or against the use of prazosin as mono- or augmentation therapy.	N/A	Reviewed, New-replaced

Discussion

Four small, published trials of variable quality met the threshold for review.[\[185-188\]](#) These trials contained a total of 167 subjects, all of whom were Veterans or active duty Service Members. Most of these trials had promising results, particularly for nightmares. However, in a much larger, well-designed VA Cooperative multi-site trial with 304 subjects, prazosin failed to separate from placebo in the treatment of both global symptoms of PTSD and nightmares.[\[189\]](#) Interestingly, this study had not been published at the time of our review, three years after its completion. Nonetheless, we believed it was important to include in our analysis due to its significance and availability in the public domain (www.clinicaltrials.gov, identifier NCT00532493).

The NEW ENGLAND
JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

FEBRUARY 8, 2018

VOL. 378 NO. 6

Trial of Prazosin for Post-Traumatic Stress Disorder
in Military Veterans

M.A. Raskind, E.R. Peskind, B. Chow, C. Harris,* A. Davis-Karim, H.A. Holmes, K.L. Hart, M. McFall, T.A. Mellman,
C. Reist, J. Romesser, R. Rosenheck, M.-C. Shih, M.B. Stein, R. Swift, T. Gleason, Y. Lu, and G.D. Huang

concern that the condition of potential participants would deteriorate clinically during 6 months of receiving placebo could have motivated providers to use available open-label prazosin rather than refer patients for trial participation. Further-

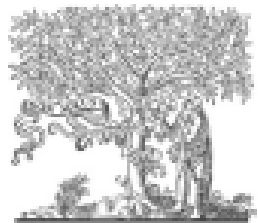
more, the exclusion of participants who were unwilling or unable to discontinue trazodone, an antidepressant with α_1 -adrenoreceptor antagonist activity, may have eliminated potential participants who would have had a response to

less likely to be ameliorated with antiadrenergic treatment. Concern about the increasing incidence of suicide and of violent behavior among veterans led the planning committee to make psychosocial instability an exclusion criterion for participation in the trial. None of the previous smaller randomized trials of prazosin for PTSD¹⁰⁻¹⁵

Active Duty Service Members Prazosin Use

- Army, Navy, Marines, Air Force
- MTF Encounters
- 2004 to 2021
- Prescribed at least a 90 day supply of prazosin

Calendar Year	Nbr with Sleep Nightmares diagnosis	Nbr with Meds in year of diagnosis
2004	1094	8
2005	1124	15
2006	1383	31
2007	1824	98
2008	2609	252
2009	4827	382
2010	4811	549
2011	5968	974
2012	6573	1346
2013	5999	1557
2014	5612	1330
2015	5915	1385
2016	7226	1611
2017	6459	1392
2018	6141	1068
2019	6577	1144
2020	5974	1027
2021	7472	1291

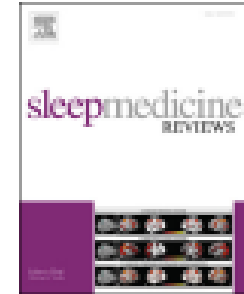


ELSEVIER

Contents lists available at [ScienceDirect](#)

Sleep Medicine Reviews

journal homepage: www.elsevier.com/locate/smr



GUEST EDITORIAL

Toward a personalized medicine approach to trauma-related nightmares



Murray A. Raskind
*Department of Veterans Affairs Northwest Network Mental Illness
Research, Education and Clinical Center, USA*

*Department of Psychiatry and Behavioral Sciences, University of
Washington, Seattle, USA*
E-mail address: Murray.Raskind@va.gov.

20 January 2020
Available online 25 January 2020

Prazosin Treatment for Nightmares

Prazosin Dosing:

1. 1mg 30 minutes prior to sleep for 3 days.
2. 2mg 30 minutes prior to sleep for 3 days.
3. 4mg 30 minutes prior to sleep for 5 days.
4. 5mg 30 minutes prior to sleep until you are seen back in clinic.
5. The usual dose to result in nightmare improvement is 6-8 mg. Some patients require a higher dose (i.e. 12-16mg), some patients require a lower dose (i.e. 2-4 mg). This depends on how you respond to the medication.

Prazosin Side effects:

1. Light headedness/dizziness. To minimize this side effect, get out of bed slowly.
2. Passing out, rarely.
3. Never take with Viagra.

PTSD and OSA in veterans

PAP ADHERENCE IN VETERANS WITH PTSD

Positive Airway Pressure Adherence in Veterans with Posttraumatic Stress Disorder

Ali A. El-Solh, MD, MPH^{1,2,3}; Lakshmy Ayyar, MD²; Morohonfolu Akinnusi, MD²; Sachin Relia, MD⁴; Opeoluwa Akinnusi, MD⁴

¹The Veterans Affairs Western New York Healthcare System, Buffalo, NY; ²Division of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, ³Department of Social and Preventive Medicine, and ⁴Department of Psychiatry, State University of New York at Buffalo School of Medicine and Biomedical Sciences and School of Public Health and Health Professions, Buffalo, NY

Study Objectives: To determine the short-term positive airway pressure (PAP) adherence rates and to identify non-mask-related risk factors associated with 30-day nonadherence to PAP in a population of veterans with obstructive sleep apnea (OSA) and posttraumatic stress disorder (PTSD).

Design: A retrospective study.

Settings: A Veterans Affairs hospital.

Patients: One hundred forty-eight PTSD veterans newly diagnosed with OSA and a control group of OSA without PTSD matched for age, gender, BMI, and severity of OSA.

- **PTSD associated with poor CPAP adherence**
- **Increased EDS associated with improved PAP adherence**
- **Increased PAP adherence associated with decreased nightmare frequency**

The Impact of Posttraumatic Stress Disorder on CPAP Adherence in Patients with Obstructive Sleep Apnea

Jacob F. Collen, M.D.; Christopher J. Lettieri, M.D., F.A.A.S.M.; Monica Hoffman, M.D.

Pulmonary, Critical Care and Sleep Medicine, Walter Reed National Military Medical Center, Bethesda, MD

45 Veterans (PTSD+OSA) vs. 45 age-matched control+OSA

More comorbid insomnia w/PTSD (25.8% vs 11.1%)

PTSD = significantly less CPAP use

Nights used: 61.4% vs. 76.8%, $p = 0.001$

Mean nightly: 3.4 vs 4.7, $p < 0.001$

Regular use: 25.2% vs. 58.3%, $p = 0.01$

58% relative reduction in PAP use *J Clin Sleep Med* 2012;8(6):667-672.

Co-Morbid PTSD, OSA & Insomnia

Insomnia, nightmares, and sleep avoidance common

Insomnia reported in 64-100%

Likely due to a hypervigilant state

Portends worse outcomes

Increased risk for Major depressive disorder

Independent risk factor for suicidality

Less response to anti-depressant therapy

Increased risk of relapse

Negative impact on PAP use/adherence

Low Arousal Threshold in Patients with PTSD+OSA

Explored prevalence and impact of low arousal threshold in patients with Co-morbid PTSD+OSA with and without Insomnia

Insomnia common in PTSD, with increased prevalence in those with comorbid OSA

Hyperaroused state in PTSD may reflect a LAT

Found 55% of those with PTSD+OSA have LAT

LAT in 76% of those w/ PTSD+OSA+Insomnia

Represents a significant barrier to PAP use

SCIENTIFIC INVESTIGATIONS

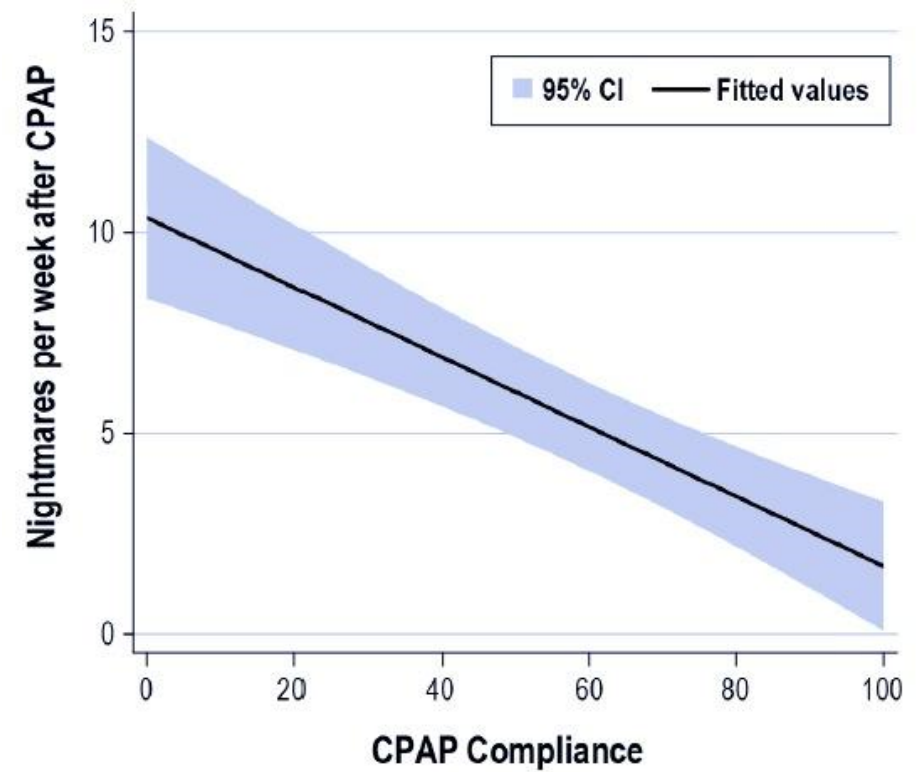
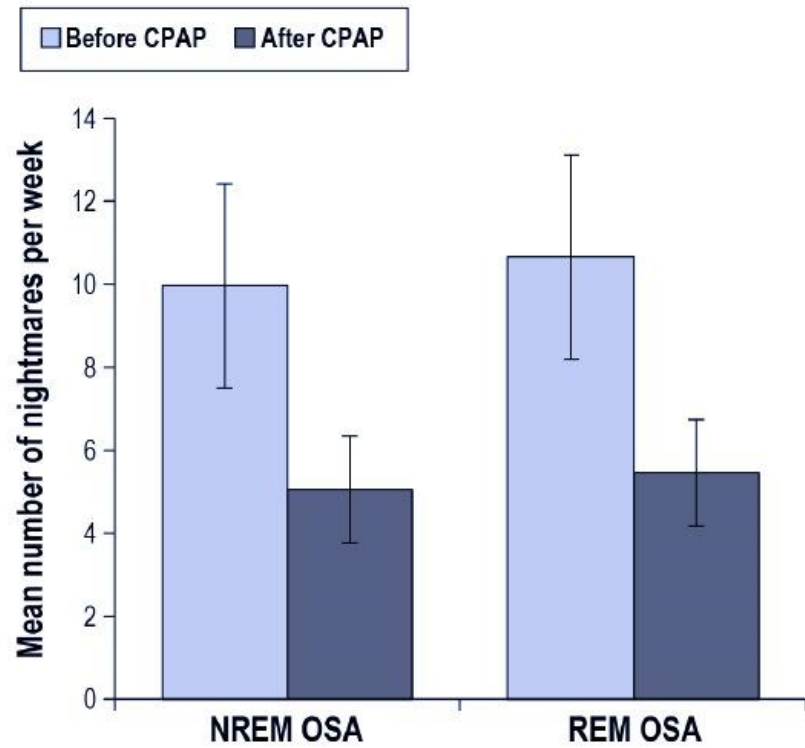
Treatment of OSA with CPAP Is Associated with Improvement in PTSD Symptoms among Veterans

Jeremy E. Orr, MD¹; Carolina Smales, BS²; Thomas H. Alexander, MD, MHSc^{2,3}; Carl Stepnowsky, PhD²; Giora Pillar, MD⁴; Atul Malhotra, MD¹; Kathleen F. Sarmiento, MD^{1,2}

- 32 Veterans with PTSD+OSA, treated w/ CPAP
- Significant reduction in PTSD symptoms, measured by PCL-S score
 - (60.6 ± 2.7 versus 52.3 ± 3.2 points; p < 0.001)
- Less reported sleepiness
- Improved subjective sleep quality
- Increased daytime functioning and quality of life
- Less depression



PAP Effect on PTSD Nightmares



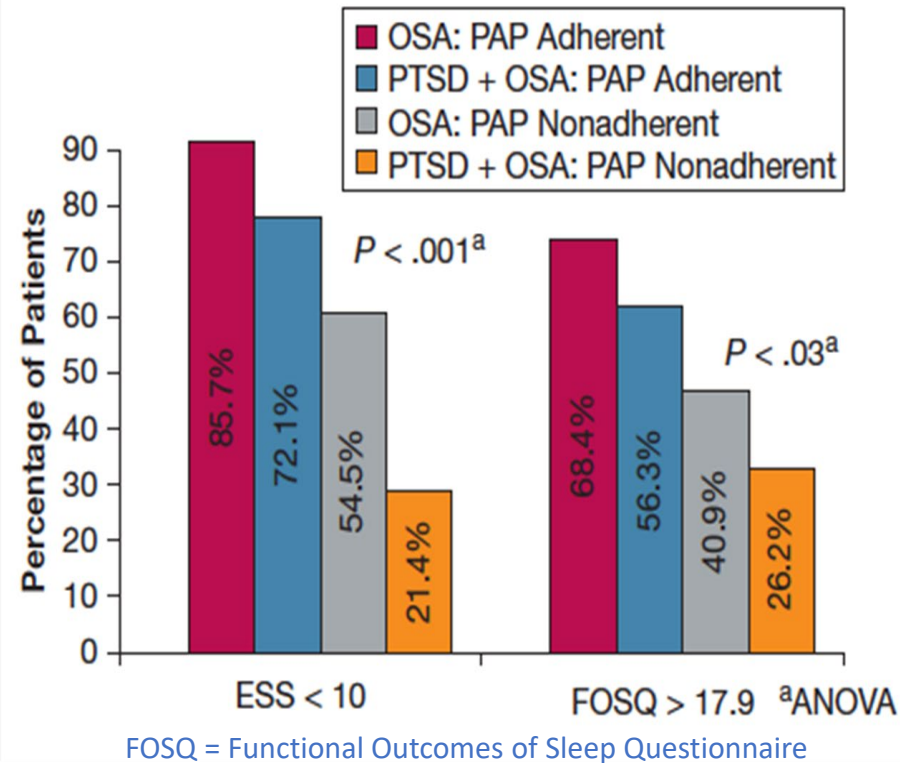
OSA Syndrome and Posttraumatic Stress Disorder



Clinical Outcomes and Impact of Positive Airway Pressure Therapy

Christopher J. Lettieri, MD; Scott G. Williams, MD; and Jacob F. Collen, MD

CHEST 2016; 149(2):483-490



- Sleepiness, function, and QoL worse in those with OSA+PTSD compared to either condition alone
- Patients with PTSD+OSA
 - Diminished response to PAP
 - Less resolution of symptoms

Oral Appliances in OSA

OAs similar to PAP with improvements in
neurocognitive function
somnolence,
depressive symptoms

Adherence with OA consistently greater than PAP

Benefit in PTSD?

A Randomized Crossover Trial Evaluating Continuous Positive Airway Pressure Versus Mandibular Advancement Device on Health Outcomes in Veterans With Posttraumatic Stress Disorder

Ali A. El-Solh, MD, MPH^{1,2,3}; Gregory G. Homish, PhD^{3,4}; Guy Ditursi, DDS, MBA¹; John Lazarus, DDS¹; Nithin Rao, DDS¹; David Adamo, RPSGT¹; Thomas Kufel, MD^{1,2}

¹VA Western New York Healthcare System, Buffalo, New York; ²Division of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, New York; ³Department of Epidemiology and Environmental Health, School of Public Health and Health Professions, University at Buffalo, Buffalo, New York; ⁴Department of Community and Health Behavior, School of Public Health and Health Professions, University at Buffalo, Buffalo, New York

Randomized Cross Over Trial in PTSD newly diagnosed with OSA

12 weeks each of CPAP and MAD

CPAP was more efficacious in reducing AHI and improving nocturnal oxygenation than MAD ($P < .001$ and $P = .04$, respectively)

Both treatments – similar reductions in PTSD severity scores and PSQI

Adherence to MAD significantly higher than CPAP ($P < .001$)

58% preferred MAD to CPAP



A randomized sham-controlled clinical trial of a novel wearable intervention for trauma-related nightmares in military veterans

Nicholas D. Davenport, PhD^{1,2}; J. Kent Werner, MD, PhD^{3,4,5}

¹*Research, Minneapolis VA Health Care System, Minneapolis, MN*

²*Departments of Psychiatry and Psychology, University of Minnesota, Minneapolis, MN*

³*Center for Neuroscience and Regenerative Medicine, Uniformed Services University, Bethesda, MD*

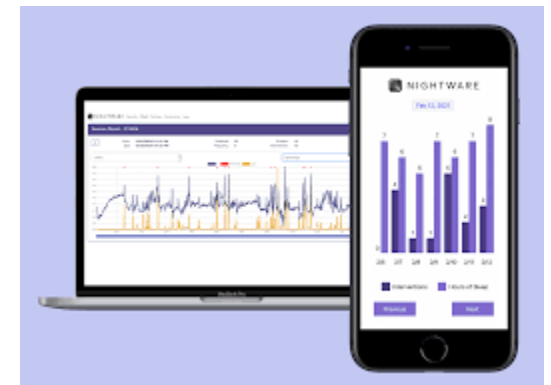
⁴*Department of Neurology, Uniformed Services University, Bethesda, MD*

⁵*Sleep Disorders Center, Walter Reed National Military Medical Center, Bethesda MD*

- Number Nine article on JCSM Top 10 Articles of 2022
Via Altmetric Scores

A randomized sham-controlled clinical trial of a novel wearable intervention for trauma-related nightmares in military veterans

- 65 Veterans with impaired sleep d/t to TRN
- Sleep quality, PTSD/depression symptoms, and QOL were looked at over 30 days
- Both groups demonstrated statistically significant improvements on all measures
 - Post hoc analysis with significant improvement in perceived sleep quality with Active Device vs. Sham



NightWare is a therapeutic platform that treats nightmares

- Digital prescription therapeutic
- Software on an Apple Watch and iPhone
 - Hardware has almost no other functions
 - Not downloadable to a patient's own devices
- Interrupts nightmares without disrupting sleep
- NightWare improves sleep in patients with nightmares



Machine Learning In Action

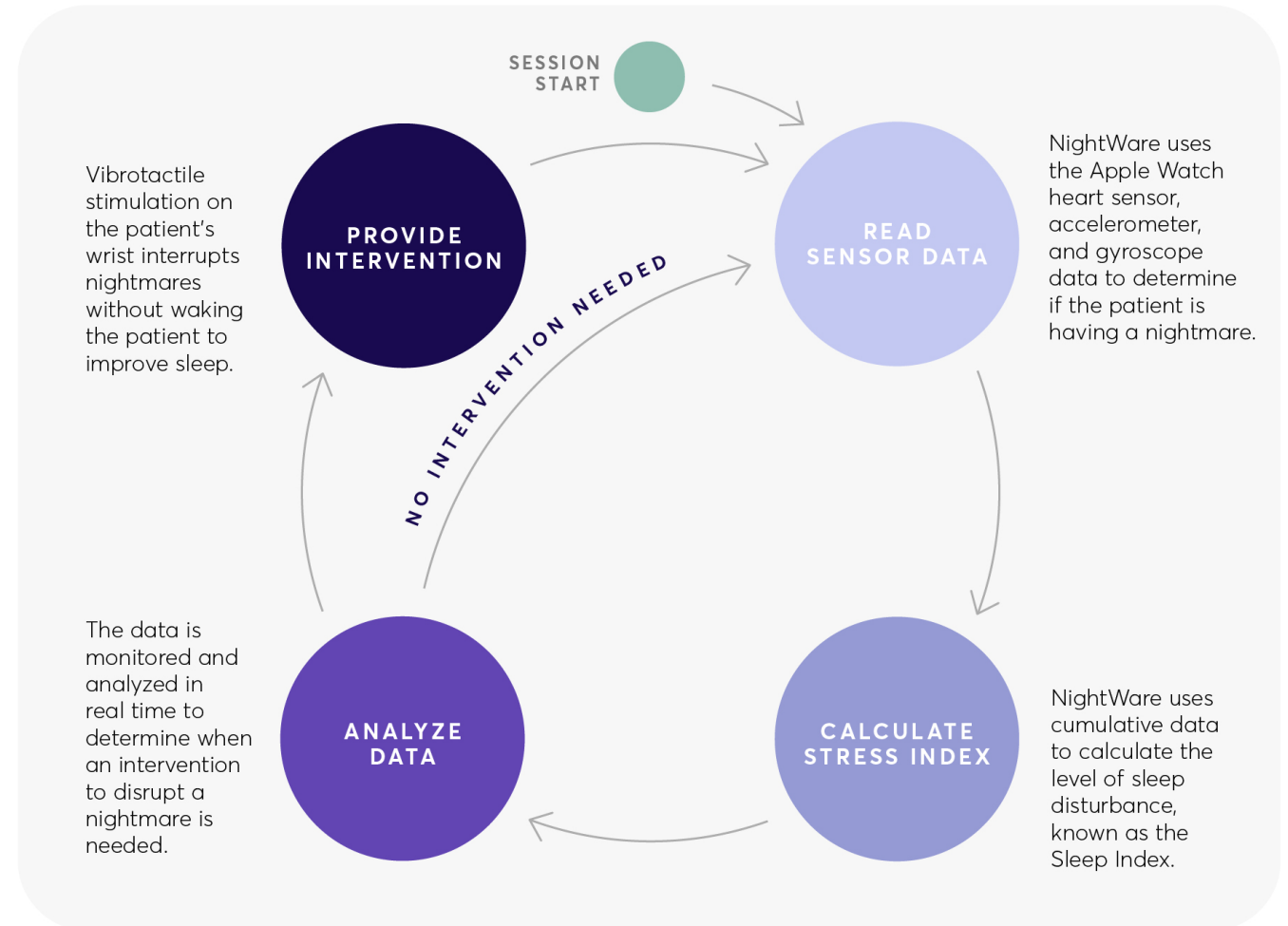
Initial Learning Period of 500 minutes

Recalibration with each session

NightWare creates a unique intervention specific to each patient's individual sleep patterns.

NightWare continuously adjusts to the patient's movement and heart rate

NightWare Intervention Cycle





Nightmare Disorder

Under-recognized

Evaluation can lead to earlier
treatment and improved
outcomes

Treatment is an individualized
approach