



# Sleep: The Secret Weapon for Battlefield Overmatch

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Opinions are mine and do not represent those of the Department of Defense, Department of the Army, or federal government

**Conflicts of Interest:** Consultant to National Academy of Sports Medicine, WHOOP, Inc., Momentous, Inc., FitAid, Inc.



# Sleep Deprivation Kills





# The Problem (in Combat)



## LOSS OF COMBAT EFFECTIVENESS US Army Artillery Study

	7 Hours	6 Hours	5 Hours	4 Hours
Combat Effectiveness	98%	50%	28%	15%



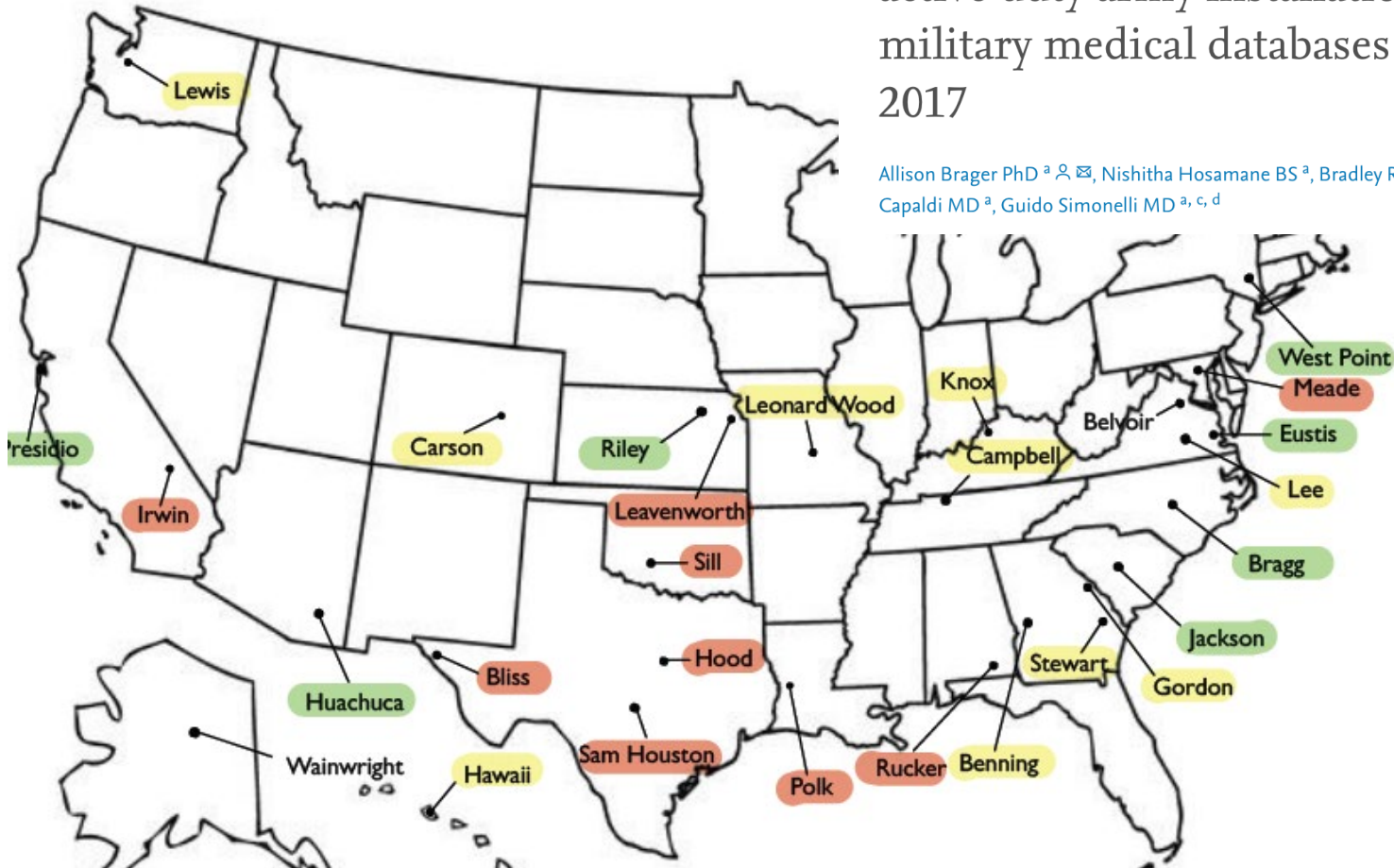
# The Problem (in Garrison)



- < 1 SD from mean
- < 2 SD from mean
- < 3 SD from mean

Geographically based risk assessment of sleep disorders and disease states impacting medical readiness across active duty army installations from military medical databases in fiscal year 2017

Allison Brager PhD <sup>a</sup> , Nishitha Hosamane BS <sup>a</sup>, Bradley Ritland PhD, DPT <sup>b</sup>, Vincent Capaldi MD <sup>a</sup>, Guido Simonelli MD <sup>a, c, d</sup>





# Fatigue Management Policies Help



## Sleep Health: Journal of the National Sleep Foundation

### Commanding Fatigue Management in the Army's Fleet of Commercial Truck Drivers

Quarterly Travel	Type of Day	# Times **
	Full Travel Day	166
	Maintenance Day	64
	Recovery Day	50

\*\* 10 trucks on the road per quarter

#### Restrictions:

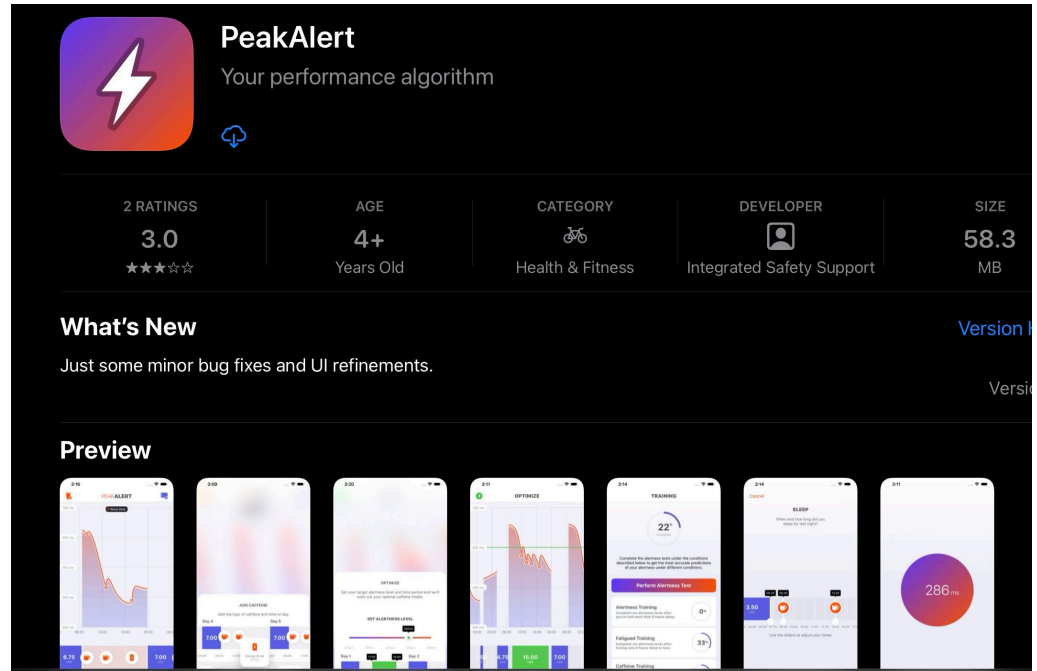
- Both driver and TC (Truck Commander) are CDL-licensed
- Drive no more than 585 miles in a day
- Drive only during daylight hours (more travel days between events required during winter)



# Fatigue Management Tools Help



Machine-learning app (iPhone/Android) to identify *inter-individual differences in waking performance and how to counteract it with caffeine under restricted sleep.*



**Caffeine gum** – Originally developed for Soldiers during the Gulf War by scientists at Walter Reed. Each piece of gum contains 100 mg of caffeine and for purchase on Amazon.



[www.nature.com/npp](http://www.nature.com/npp)

Neuropsychopharmacology

NEUROPSYCHOPHARMACOLOGY REVIEWS **OPEN**

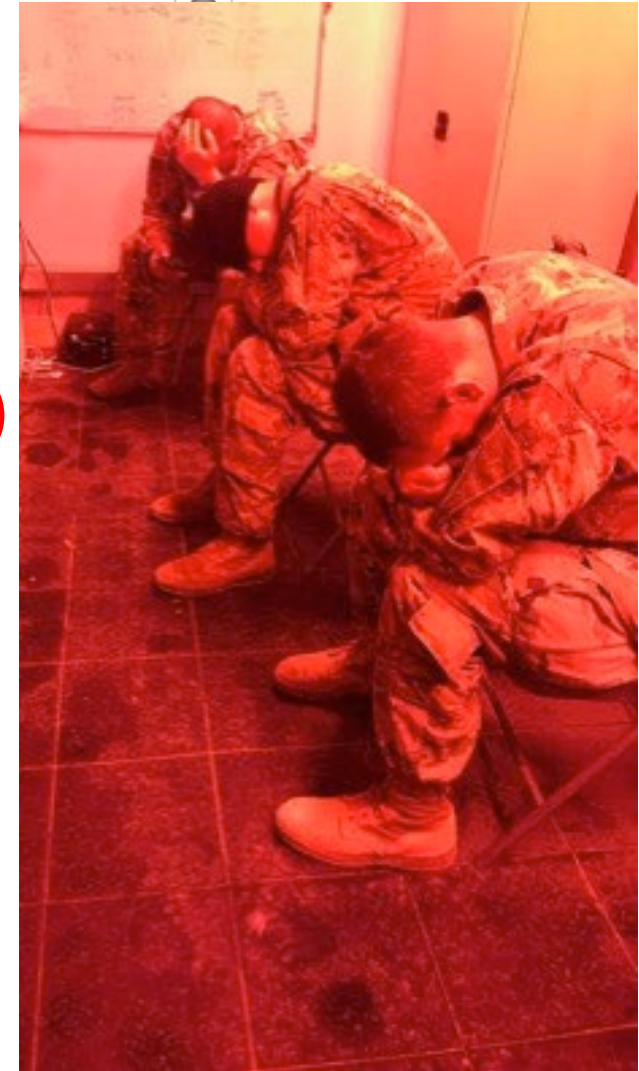
## Sleep in the United States Military

Cameron H. Good<sup>1</sup>, Allison J. Brager<sup>2</sup>, Vincent F. Capaldi<sup>3</sup> and Vincent Mysliwiec<sup>4</sup>

**1. Sustained Operations (Sleep Amount)**

**2. Night Operations (Sleep Timing)**

**3. Austere Environments (Sleep Continuity)**







1. Sustained Cyber Operations (Sleep Amount)
2. Night/Subterranean Operations (Sleep Timing)
3. Austere Environments (Sleep Continuity)

Article | [Open Access](#) | Published: 26 July 2019

## Sleep, napping and alertness during an overwintering mission at Belgrano II Argentine Antarctic station

Agustín Folgueira, Guido Simonelli, Santiago Plano, Camila Tortello, Juan Manuel Cuiuli, Abel Blanchard, Alejandro Patagua, Allison J. Brager, Vincent F. Capaldi, André E. Aubert, Marta Barbarito, Diego A. Golombek & Daniel E. Vigo [✉](#)

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Current state of sleep-related performance optimization interventions for the E-sports industry

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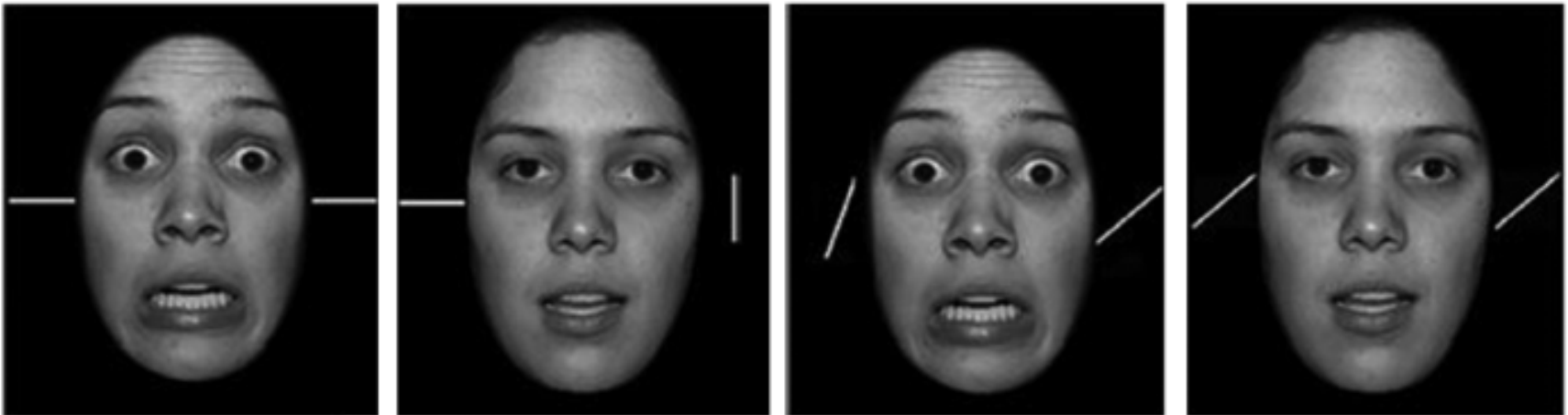


ORIGINAL ARTICLE

## Effect of cognitive load and emotional valence of distractors on performance during sleep extension and subsequent sleep deprivation

Sara E. Alger<sup>1,\*</sup>, Allison J. Brager<sup>1</sup>, Thomas J. Balkin<sup>1,2</sup>, Vincent F. Capaldi<sup>1</sup> and Guido Simonelli<sup>1</sup>

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# Future Gaps and Capabilities - Resiliency

## Military Culture

### The military's obsession with energy drinks is contributing to PTSD, study finds

By: [J.D. Simkins](#)

October 26, 2018



	Optimal Caffeine	Energy Drinks:
Amount	< 200 mg/time	<b>Monster: 240 mg</b>
OPTEMPO < 24 h	4- 6 hours/ stop at 1800	<b>Rockstar: 240 mg</b>
OPTEMPO > 24 h	4 -6 hours, as needed	<b>Bang: 300 mg</b>



# Executive Summary



- Lack of sleep directly (and exponentially) compromises safety, performance, morale, health, and welfare
- Fatigue management policies and strategies can mitigate risk
- Operational environments requires optimized performance under limited sleep opportunities
- Although capabilities have been identified, gaps remain in how to monitor, mitigate, and predict military performance



Sleep Research Center  
Walter Reed Army Institute of Research