



**United States Army Medical Research
Directorate- West (USAMRD-W)**

**Sleep and Performance in
Military Settings**


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Disclaimer

The opinions, interpretations,
conclusions, and recommendations are
those of the presenter and are not
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Outline

- Overview of the neurophysiology of sleep
- Impact of poor sleep on health and performance
- Sleep patterns in the military
- Impact of poor sleep on readiness and combat mission performance
- Improving sleep in the military

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What is the Definition of Sleep?

“Sleep is a dynamic behavior...a special activity of the brain controlled by precise and elaborate mechanisms”
-Hobson, 1989

Sleep serves a homeostatic function in the body and is marked by reduced consciousness, reduced response to environmental stimuli, and dreaming.

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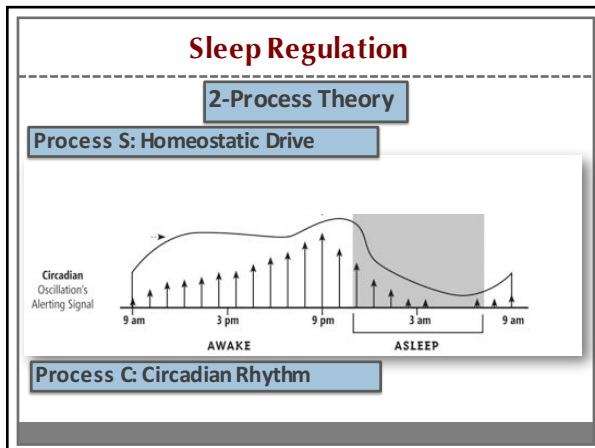
Sleep Regulation

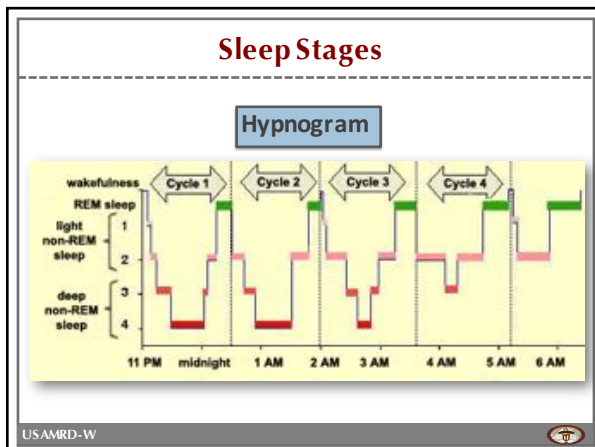
- Circadian Rhythm
- Suprachiasmatic Nucleus
- Pineal Gland
- Melatonin

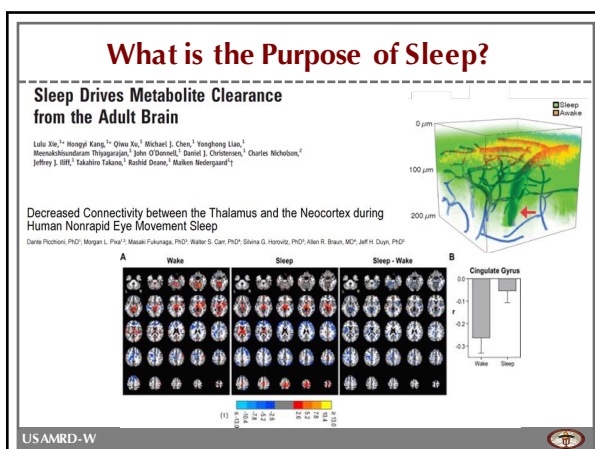
Pineal

Hypothalamus
Pituitary

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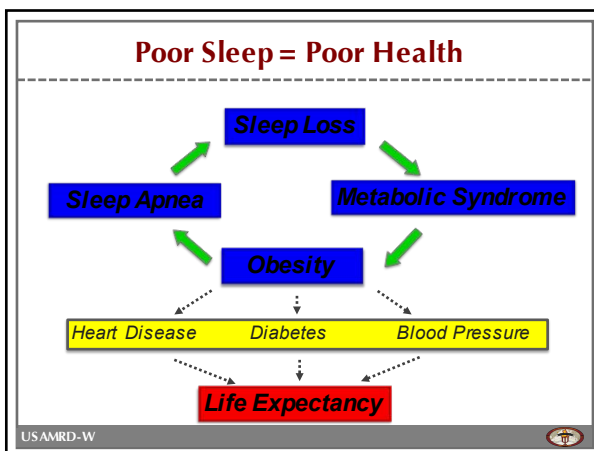
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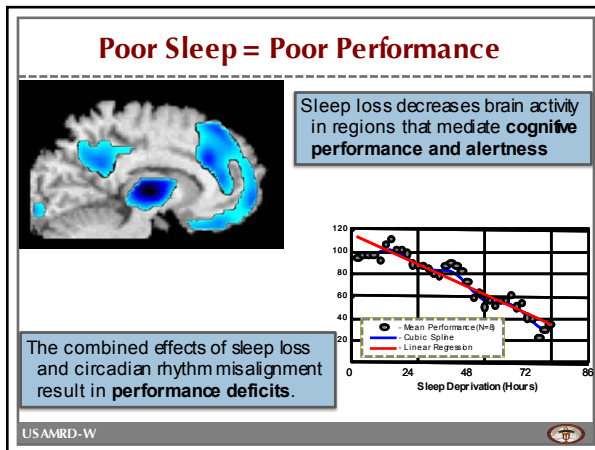
Poor Sleep = Poor Health

Lack of sufficient sleep has been linked to....

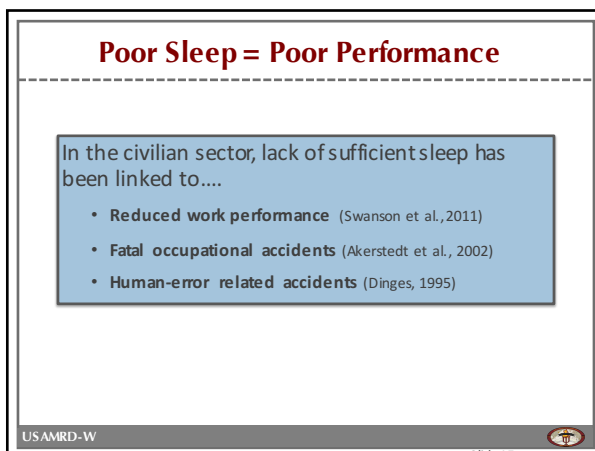
- **Impaired immune function** (Dinges et al., 1995)
- **Reduced resilience to stress-related disorders** (Breslau et al., 1996, Wright et al., 2011)
- **Cardiovascular disease** (Hoevenaer-Blom et al., 2011)
- **Type II diabetes** (Cappuccio et al., 2010)
- **Metabolic syndrome/weight gain** (Van Cauter et al., 2008)
- **Mortality** (Ferrie et al., 2007)
- **Alzheimer's disease** (Hahn et al., 2013)

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Sleep in the Military

Military Service Members

- ~6.5 hours (Seelig et al., 2010)
- 6.5 hours (Peterson et al., 2009)
- 5.8 hours (Luxton et al., 2011)
- 5.7 hours (Adler et al., in prep)

Sleep Reported in Mental Health Advisory Teams in OEF

Year	Sleep (hours)
2007	5.4
2009	5.3
2010	5.5
2012	5.4
2013	5.3

***Universal recommendation is 7 to 8 hours of sleep per night**

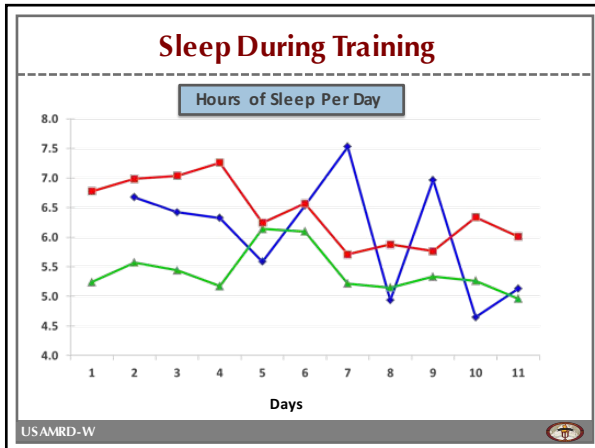
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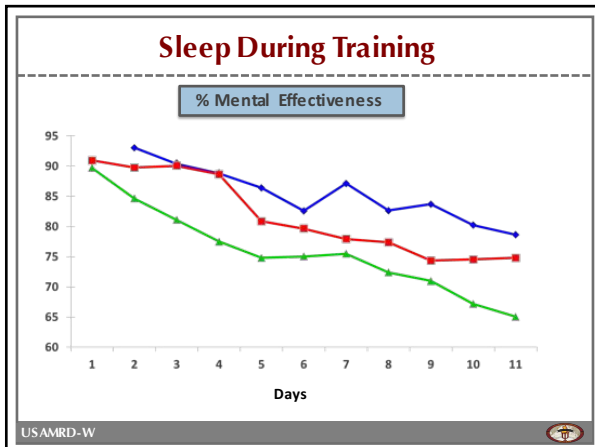
Sleep in the Military

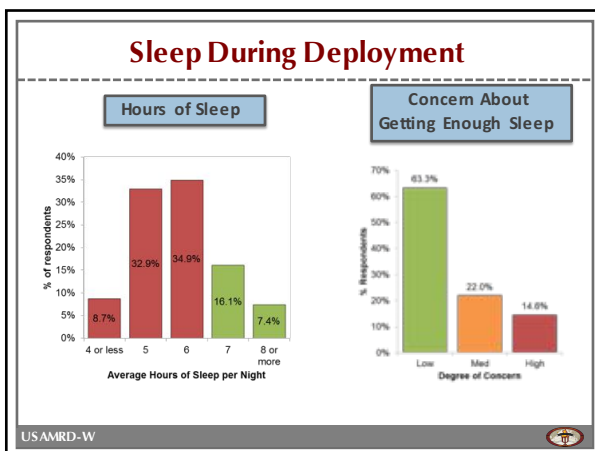
Reported Hours of Sleep Among Soldiers and Civilians

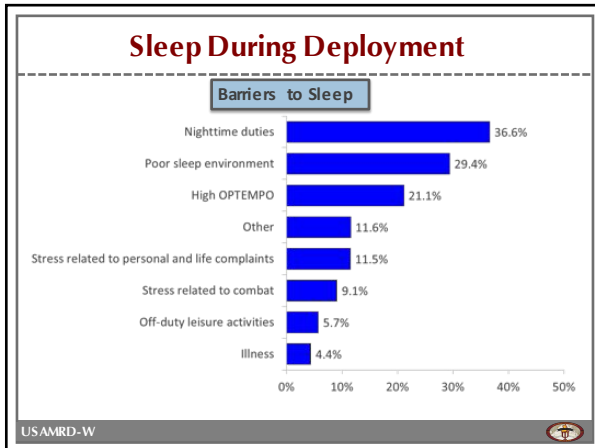
Hours of Sleep Per Night	Soldiers (%)	Civilians (%)
≤5	61%	8%
6	25%	21%
7	10%	31%
≥8	4%	41%

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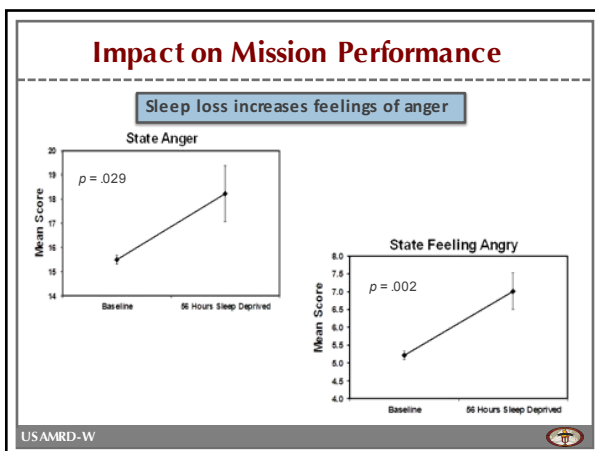


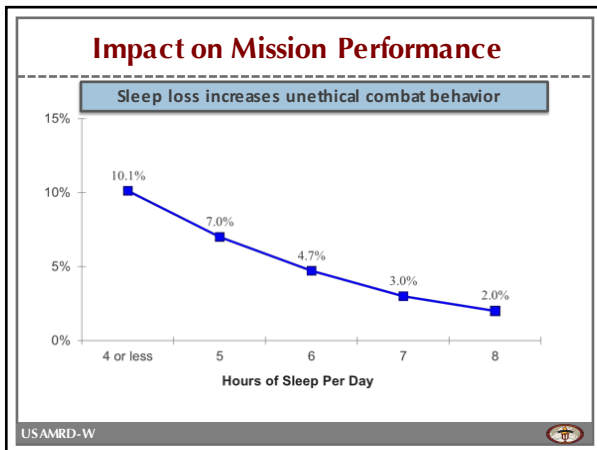


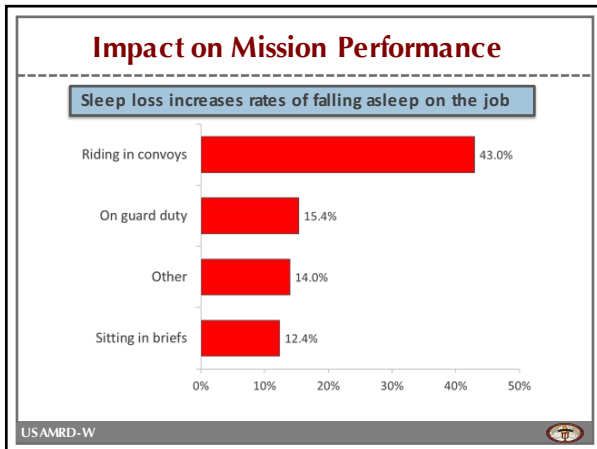


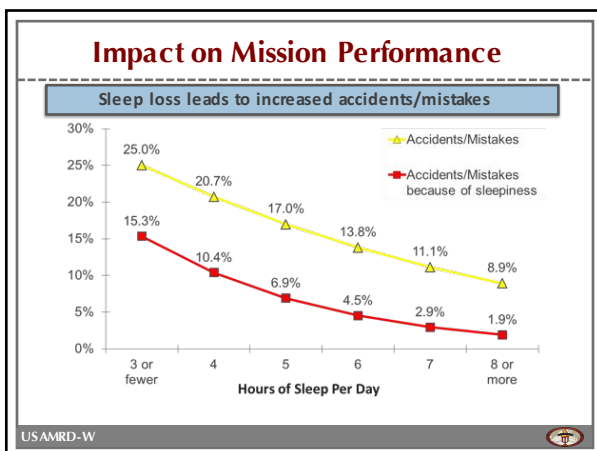


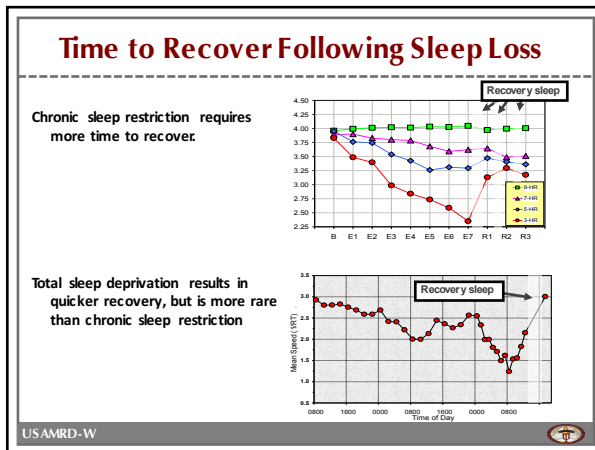
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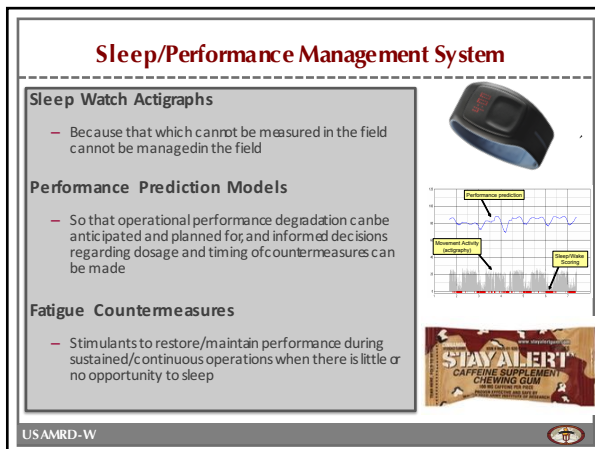


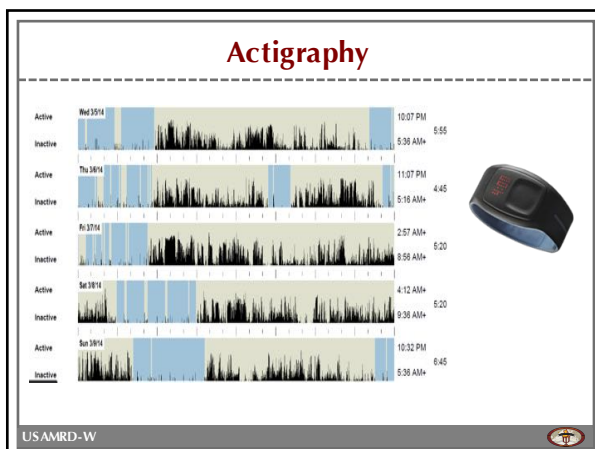
Sleep loss results in deficits that impact effectiveness and safety in training and operational environments

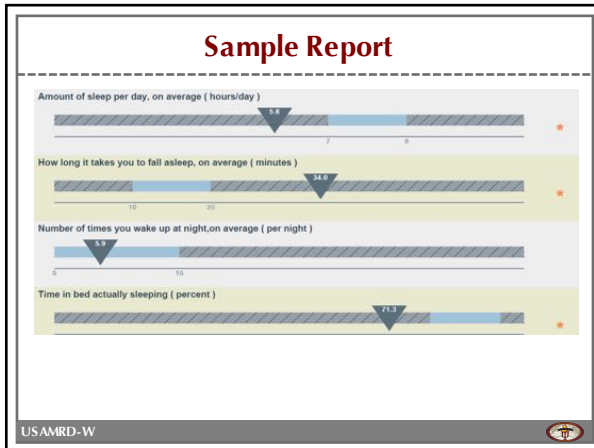
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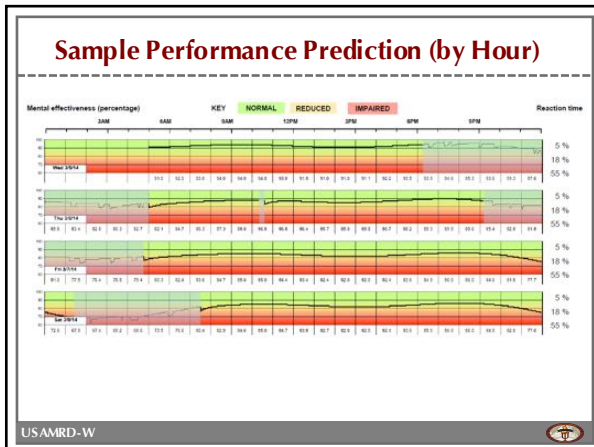
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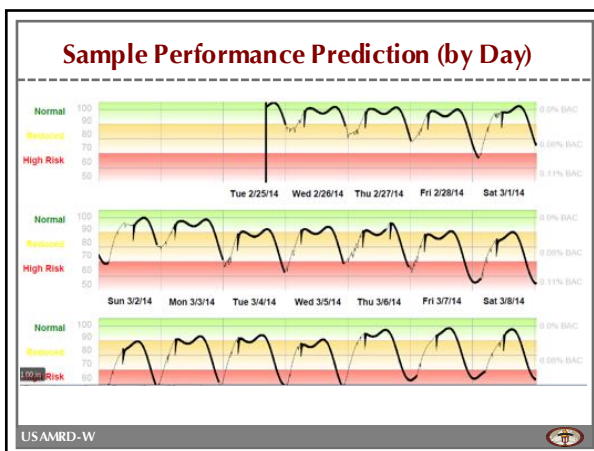








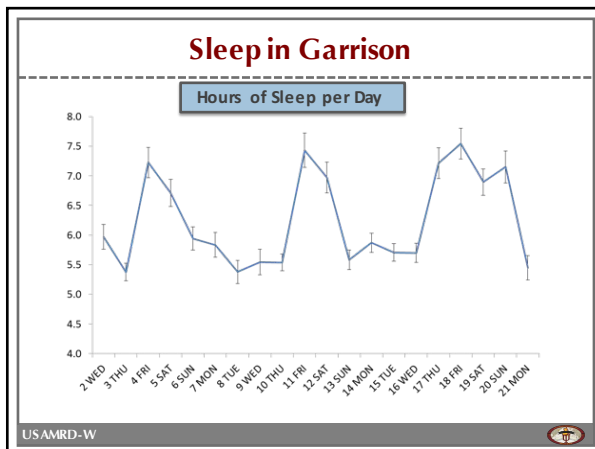


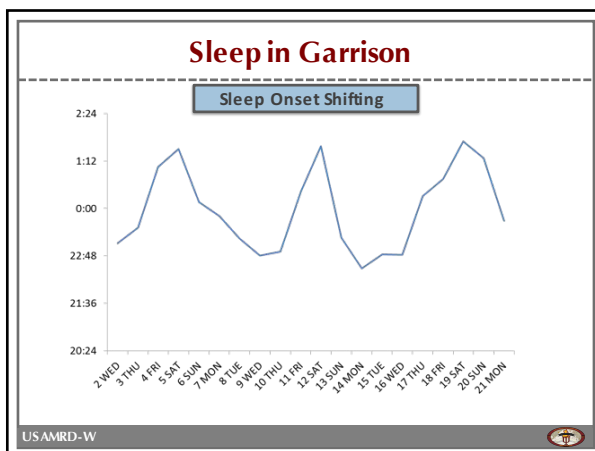


“Easy” Fixes

- **Improve the sleep environment**
 - Climate control
 - Strategic billeting
 - Remove “distractions”
- **Work/Rest Scheduling**
 - Manage OPTEMPO (e.g. continuous operations)
 - Understand effects of reverse schedules (e.g. night operations)
- **Address behavioral health issues**

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Tactical Fatigue Risk Management


Additional recommendations for the training setting:

Guidance:

- Strive for a total of 7 to 9 hours of sleep every 24 hours. Nap 15 to 30 to 60 minute intervals as needed to achieve total sleep time.
- Use earplugs and/or a sleep mask to reduce noise and light in sleeping environment.

Notes:

- Whenever possible, sleep course starts times the day after night training operations to allow for student and instructor rest and recovery.
- Incorporate "light" or low physically/mentally demanding tasks in training days following night operations.




Additional recommendations for the operational setting:

Guidance:

- Whenever possible, strive for 7 to 9 hours of total sleep time per 24 hours.
- Nap in 15 to 30 minute increments to reduce stress and fatigue.
- Take breaks from non-essential tasks to reduce fatigue.
- Use caffeine to temporarily sustain mental performance.
- When return from operations, sleep at least 7 to 9 hours per night until return to regular schedule.

Notes:

- Whenever possible, strive for 7 to 9 hours of total sleep time per 24 hours.
- Nap in 15 to 30 minute increments to reduce stress and fatigue.
- Take breaks from non-essential tasks to reduce fatigue.
- Use caffeine to temporarily sustain mental performance.
- When return from operations, sleep at least 7 to 9 hours for at least a week for cognitive rest and recovery.



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Get It When/Where You Can



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Changing Military Sleep Culture

Leader Support of Sleep

Encourage SMs to get extra sleep before missions that require long hours	36.3%
Consider sleep as an important planning factor	31.6%
Encourage SMs to get adequate sleep	29.0%
Encourage SMs to nap when possible	24.0%
Encourage SMs to get to sleep on time	22.4%
Work to ensure SMs have a good sleep environment	19.7%
Discourage use of caffeine or nicotine within several hours before sleep	9.6%
Support appropriate use of prescription sleep meds	7.9%
Ask SMs about sleeping habits	6.1%

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Sleep Leadership

- **Managing soldiers in a way that:**
 - Builds awareness of the importance of sleep
 - Optimizes sleep
 - Reduces ongoing fatigue
- **Leads by example**

General Leadership

+

Sleep Leadership

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Better Sleep, Behavioral Health, Unit Climate

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Questions?

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