

Fatigue Risk Management in Emergency Medical Services



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Announcements

- This session is being recorded. Following any necessary editing, you will be able to find the recording on NASEMSO's YouTube Channel and linked from the project website at www.emsfatigue.org.
- The slides will be posted as a handout/attachment to this presentation via the GoToWebinar Control Panel.
- Please enter any questions in the Control Panel (Questions or Chat) - they will be answered at the end of the presentation as time allows.
- Continuing education credit is not available for this session.

Background of the EMS Fatigue Project

- NEMSAC Advisory January 2013: Fatigue in Emergency Medical Services
- Work performed with funding from the U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA) to the National Association of State EMS Officials (NASEMSO): contract/grant number: DTNH2215R00029.
- Input from subject matter experts, national organizations, medical directors, EMS educators, EMS administrators, and EMS field personnel was received throughout the project.
 - Kathy Robinson, RN served as the Project Manager for NASEMSO
 - P. Daniel Patterson, PhD, NRP from the University of Pittsburgh served as the Principal Investigator on Fatigue Risk Management EBGs (Phase 1) and Experimental Study (Phase 2)
 - Jaime Devine, PhD, Neuroscientist for Institutes for Behavior Resources, Project Coordinator for the webtool (Phase 3)
 - Jordan Blenner, JD, PhD served as NHTSA's Contracting Officer Representative
 - Plus countless contributors...

The EMS Fatigue Risk Management Project Is...

- Intended to create **awareness** about the risks and impact of fatigue on EMS workers
- Intended to provide **education and guidance** to improve sleep health among EMS workers
- Intended to help **improve safety** for EMS workers and patients
- NOT intended to establish rules, regulations, or other mandates for employers
- NOT intended to address or be used to negotiate EMS resources, working conditions, wages, or other employer benefits

Key Points About Fatigue:

- Fatigue is an unsafe condition in the workplace.
- *Like other risk factors, fatigue can be managed.*

Source: [Fatigue Risk Management in the Workplace](#)

Journal of Occupational and Environmental
Medicine 54(2):231-258, February 2012

doi: 10.1097/JOM.0b013e318247a3b0

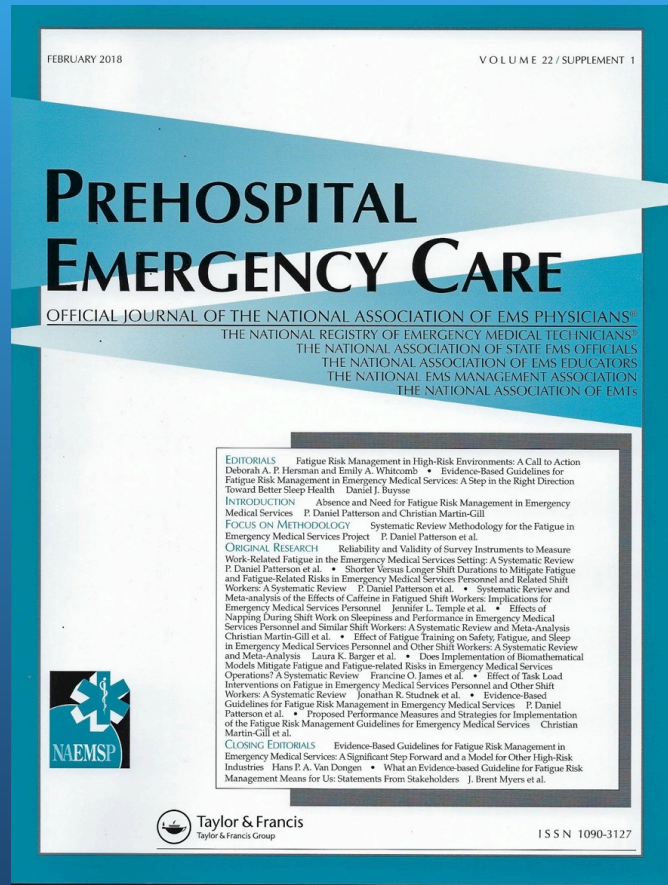
*Developing
Evidence Based*
Fatigue Risk Management
Guidelines



for Emergency Medical Services

Project web site: www.emsfatigue.org

PEC Supplement - February 2018



- Evidence Based Guidelines
 - GRADE Methodology
- EMS Focused
- 15 manuscripts - 118 pages
- 8 Systematic Reviews
- 7 PICO questions
- 5 Recommendations
- 3 Meta-analyses

Evidence-Based Guidelines for EMS

1. Recommend using fatigue/sleepiness survey instruments to measure and monitor fatigue in EMS personnel.
2. Recommend that EMS personnel work shifts shorter than 24 hours in duration.
3. Recommend that EMS personnel have access to caffeine as a fatigue countermeasure.
4. Recommend that EMS personnel have the opportunity to nap while on duty to mitigate fatigue.
5. Recommend that EMS personnel receive education and training to mitigate fatigue and fatigue-related risks.

About the EMS Fatigue Risk Management Guidelines (Phase 1)

- A systematic review of EMS EBGs using the AGREE II Validation Tool recognized the project's EMS fatigue guidelines as the highest ranked American-based EMS Evidence Based Guidelines of all time!
 - Turner S, Lang ES, Brown K, Franke J, Workun-Hill M, Jackson C, Roberts L, Leyton C, Bulger EM, Censullo EM, Martin-Gill C. Systematic Review of Evidence-Based Guidelines for Prehospital Care. Prehosp Emerg Care. 2021 Mar-Apr;25(2):221-234. doi: 10.1080/10903127.2020.1754978. Epub 2020 May 7. PMID: 32286899.

Phase 2: Experimental Study

- Task concluded October 2021; Manuscripts in progress
- 10 learning modules- [1] Hazards of Fatigue; [2] Sleep Physiology; [3] Sleep Health; [4] Work Related Stress; [5] Sleep Disorders; [6] Fatigue Recognition; [7] Adequate Sleep; [8] Diet and Exercise; [9] Alertness Strategies; and [10] Managing Fatigue.
- Total enrollment 678 individuals across 36 agencies (paid and volunteer)
- Agency type was comprised of 3 strata: fire-based model (12), hospital-based (7), third-service model (7), air-based (2), and other type of EMS agency model (8).
- All geographical regions of US: Northeast (5), South (12), Mid west (12), and West (7)

Phase 2: Main Findings

Experimental Study

- Among EMS clinicians who viewed the education modules, the greater the number of modules viewed, the greater the improvement in sleep quality and greater the reduction in fatigue.
- The largest improvement in sleep quality was observed among EMS clinicians that viewed 8 to 10 education modules.

Phase 3 - Fatigue Modeling Tool for EMS -

Similar Models Used Everyday in Aviation, Rail, Maritime, Trucking....



Source: Aviation: <http://www.cos-mag.com/ohs-laws-regulations/34098-transport-canada-proposes-new-rules-on-flight-crew-fatigue/>.
Rail: <http://calgaryherald.com/business/local-business/cp-rail-union-at-odds-over-worker-fatigue>.
Trucking: <https://www.wsj.com/articles/independent-truckers-tell-court-e-logs-violate-constitutional-rights-1459444146>

The Webtool

- Model developed by Dr. Steven Hursh and neuroscientists at the Institutes for Behavior Resources, Inc in Baltimore, MD
- Evidence-based biomathematical model calibrated with EMS data
- Prediction of fatigue risk is based on an algorithm that estimates sleep patterns around work duties and performance levels
- The fatigue risk analyzer maps to a percentage of individual performance based on psychomotor vigilance tasks

Limitations

- Based on a limited range of hypothetical work schedules (i.e. can't predict risk for every possible scenario)
- The level of risk for working schedules which have not been observed in EMS cannot reliably be calculated
- Can't calculate rotating shifts or different duty start times/durations in one schedule
- Cannot adequately assess risk when an individual is working multiple jobs or back-to-back shifts with different employers
- Does not “save” previous work or individual results; must use “print” option to download the output

EMS Fatigue Risk Analyzer

- One tool among many to mitigate fatigue risks
- Can be used to evaluate shift patterns at risks of fatigue
- Cannot be used to create work schedules
- Anonymous: no login required; no inputs are saved
- Print output available
- Focuses on shift workers whose job activity requires multiple episodes of intense concentration and attention to detail per shift, with serious adverse consequences potentially resulting from a lapse in concentration

EMS Fatigue Risk Analyzer

- Now available!!
- STRONG recommendation that users access tabs re: **Instructions, FAQs, and Definitions** before using the webtool
- <https://emsfatiguerisk.ibrinc.org/>

EMS Fatigue Risk Analyzer

[Instructions](#) [FAQ](#) [Definitions](#) [Print](#)



Emergency Medical Services

Shift Schedule Fatigue Risk Analyzer

This tool can be used to perform fatigue risk analysis on simple repeating shift work schedules.

Use the buttons at the top of the page to view the Instructions, Frequently Asked Questions, and Definitions.

Customize values in each field to see the risk level for various schedules. See the Standard Work Week example below, and modify as necessary:

Shift Start Time	Shift Duration (Hours)	Days On	Days Off	Commute Time (Minutes)	Napping	Pattern Repeats
09:00	8	5	2	31-60	No	4

Minimal Risk

[Show Analysis Details](#)

Shift Start Time	Shift Duration (Hours)	Days On	Days Off	Commute Time (Minutes)	Napping	Pattern Repeats
				31-60	No	4

This tool is a free and publicly-available tool based on a biomathematical fatigue model designed specifically for the EMS community to help agencies create and evaluate work schedules that can help minimize the effects of fatigue. The tool can predict risk for a limited range of hypothetical work schedules based on previous data about sleep and fatigue that has been collected from EMS personnel. The tool cannot predict fatigue for every possible work schedule; for example, it cannot evaluate schedules that rotate or are a combination of different duty start times and/or durations. Sleep and fatigue modelling is based on [SAFTE-FAST](#) software systems.

Our thanks to Jaime Devine, PhD for the demonstration....

Need more information?

- Project Website: www.emsfatigue.org

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