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Creating a Culture of Safety in EMS: for Clinicians and Patients

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Teen driver dies from Omaha ambulance crash injuries

17-year-old pickup driver was transported from the scene in 'extremely critical condition'



The teenage driver of a pickup truck involved in an accident last week in Omaha has died.

By Gina Dvorak
Published: Dec. 27, 2023 at 4:27 PM EST

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▶ Autoplay 1 of 5 ◀◀ ▶▶

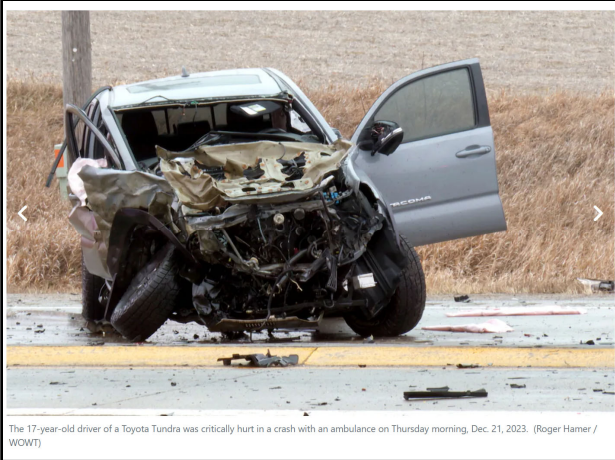


Emergency personnel responded to a crash involving multiple vehicles, including an ambulance, at 204th and Harrison streets, on Thursday morning, Dec. 21, 2023. (Roger Hamer / WOWT)

Debra Brookhouser of Gretna was pronounced dead at the scene of the crash near the Douglas County line. Reports state that the ambulance had lights and sirens on and was en route to a hospital at the time of the crash.

Three from the Gretna Volunteer Fire Department were also injured in the crash.

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Lights & Siren Use by EMS:

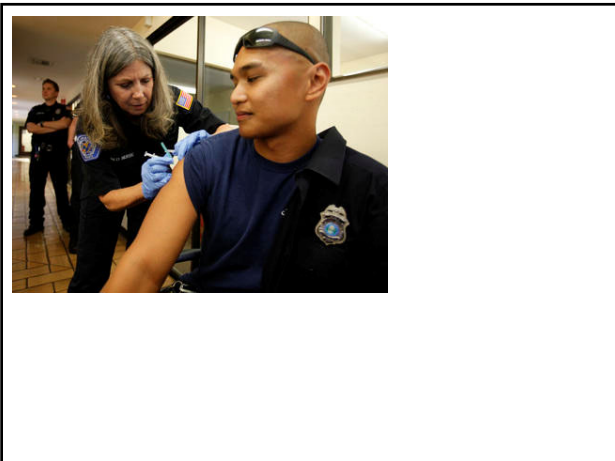
**Above All,
Do No Harm**

Available at:
[ems.gov](https://www.ems.gov)

U. S. Department of Transportation
National Highway Traffic Safety Administration
Office of Emergency Medical Services (EMS)

Lights and Siren Use by Emergency Medical Services (EMS): Above All Do No Harm
Author: Douglas F. Kopas, MD, EMT-P, FAEMS, FACEP
Submitted by: Mays Consulting, Inc.
For NHTSA Contract D17N02-14-F-00079

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Xylazine HCl

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Outline




The Problem
Patient Safety
EMS Clinician Safety
Creating a Culture of Safety

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Outline

The Problem
-EMS Risks
Patient Safety
EMS Clinician Safety
Creating a Culture of Safety



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EMS Patient Safety Themes from Published Literature

- Clinical judgment
- Adverse events and error reporting
- Communications
- Ground vehicle safety
- Aircraft safety
- Interfacility transport
- Field intubation

Bigham BL, et al. Prehosp Emerg Care 2012;16:20-35.

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Insurance Industry

Top EMS risks

Injuries to patients:

1. during carrying/moving
2. in ambulance crashes
3. from medication error
4. from procedure errors
(misplaced endotracheal tube)

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EMS Risks

EMS Clinician Work-Related Fatalities

- 12.7/100,000 EMS workers
 - HEMS crew rate = 113
- Similar to PD and FD
- 250% higher risk than average workers
- Transportation risk 500% higher than average
 - exceeds PD and FD

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2020 FDNY EMS Fatality Risk

- Historical fatality rate for EMS = 12.7/100,000
- Jan-Aug 2020 risk for FDNY EMS providers = 249.5/100,000
- 14 x greater than FDNY firefighters
- Fatality rate / 100,000
 - COVID 90.7
 - Suicide 68

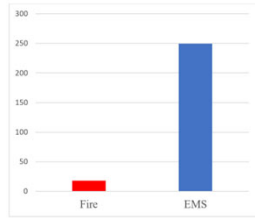


Figure: FDNY Fire vs EMS fatality rate/100,000 employees Jan-Aug 2020
Brian J Maguire, et al

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Outline

The Problem

Patient Safety

- Transition/ Hand-over
- Checklists
- Medications
- Equipment

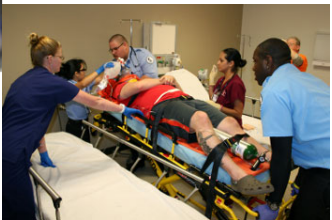
EMS Clinician Safety

Creating a Culture of Safety



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Opportunity for Safety Hand-off/Hand-over/ Transfer of Care



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Opportunity for Safety Checklists

- Ensures care based upon best guidelines
- Helpful in high stress/complex situations
- Proven to reduce medical adverse events



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Refusal of Treatment Checklist Pennsylvania Statewide EMS Protocol

Pennsylvania Department of Health Operations 111-BLS - Adult/Peds

EMS Patient Refusal Checklist

EMS Agency: _____ Date: _____ Time: _____
 Patient Name: _____ Age: _____ Phone #: _____
 Incident Location: _____ Incident #: _____
 Situation of Injury/Illness: _____

Check marks in shaded areas require consult with Medical Command before patient release

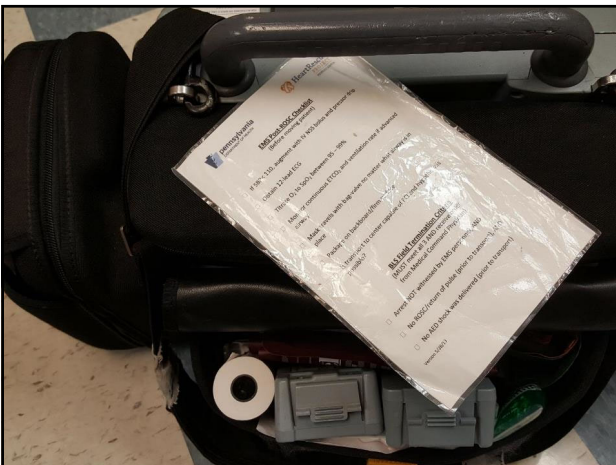
Patient Assessment:
 Suspected serious injury or illness based upon patient history, mechanism of injury, or physical examination: Yes No

18 years of age or older: Yes No Any evidence of: Suicide attempt? Yes No
 Head Injury? Yes No
 Intoxication? Yes No
 Patient Oriented to: Person Yes No Chest Pain? Yes No
 Place Yes No Dizziness? Yes No
 Time Yes No Syncope? Yes No
 Event Yes No

Vital Signs:	Consult Medical Command if:	If altered mental status or diabetic (ALS only):
Pulse _____	>50bpm or >100 bpm	Chemstrip Glucosester: _____ mg/dl < 60mg/dl
Sys BP _____	<100 mm Hg or >200 mm Hg	
Diastolic BP _____	<50 mm Hg or >100 mm Hg	If chest pain, S.O.B. or altered mental status --
Resp _____	<12bpm or >24bpm	SpO2 (if available) _____ % <input type="checkbox"/> 95%

Risks explained to patient: Yes No
 Patient understands clinical situation: Yes No
 Patient verbalizes understanding of risks: Yes No
 Patient's plan to seek further medical evaluation: _____

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Medication Safety Issues in EMS

- Safety issues with EMS medication storage and use:
 - Space limits organization of medications
 - Less providers to double check dosing
 - Temperature changes affect medication potency
 - Technology (infusion pumps) less practical



Kupas DF, Shayhorn, et al. Prehosp Emerg Care 2012 Jan;16(1):67-75

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Have you looked in your agency's drug bag/box?



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Opportunity for Safety Technology

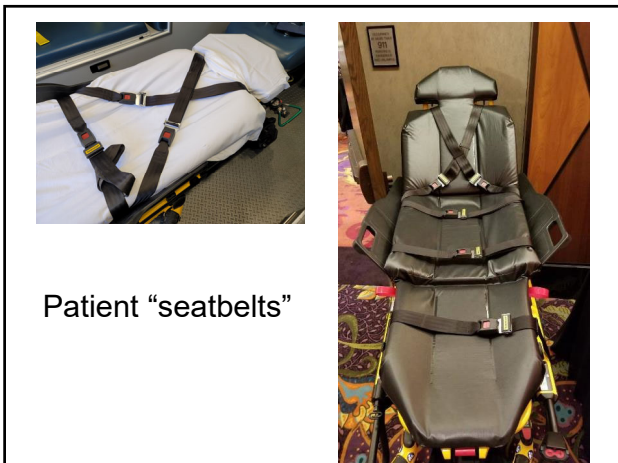
- Technology can reduce errors due to human factors, for example:
 - Capnography eliminates misplaced endotracheal tubes
 - Environmental carbon monoxide monitoring ensures scene safety and identifies CO poisoning
- Caution – technology can both reduce and create patient safety issues



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Patient "seatbelts"

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Outline

The Problem
Patient Safety

EMS Clinician Safety

- Human Factors
- Vehicle Operations
- Vehicle Design
- Outside of the Vehicle

Creating a Culture of Safety



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Human Factors

- Fatigue
 - 21 hours awake = 0.08 BAC
 - **Shifts/ Duty Hour Limits**
- **NHTSA Evidence-based EMS Fatigue Guidelines**


RECOMMENDATIONS FOR MITIGATING FATIGUE

- 1


Reliable and/or valid fatigue and sleepiness survey instruments should be used to measure and monitor fatigue in EMS personnel. ¹


- 2


EMS personnel should work shifts shorter than 24 hours in duration. ²


- 3


EMS workers should have access to caffeine as a fatigue countermeasure. ³


- 4

EMS personnel should have the opportunity to nap while on duty to mitigate fatigue. ⁴


- 5

EMS personnel should receive education and training to mitigate fatigue and fatigue-related risks. ⁵



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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: 2100 | Shift Duration (Hours): 12 | Days On: 3 | Days Off: 2 | Commute Time (Minutes): 30-60 | Napping: No | Fatigue Requests: 4

Pattern Repeat	Average Effectiveness	Minimum Effectiveness	Risk Level
1 (Day 1-3)	76.3	63.1	High Risk
2 (Day 4-6)	72.5	60.3	High Risk
3 (Day 7-9)	71.9	59.9	High Risk
4 (Day 10-12)	71.8	59.8	High Risk
Overall	73.1	60.8	High Risk

Schedule Recommendations
Fatigue can occur under any circumstances, but allowing adequate time for sleep and recovery can help reduce risk. Here are some specific adjustments which can be made to this schedule that will help reduce risk and increase estimated effectiveness.


- Fatigue will be worse when working during the night. To reduce risk, try selecting a start time between 0600-1800, shortening the shift duration, or permitting napping on-shift.
- Permitting napping on shift may help reduce fatigue risk and improve effectiveness for this schedule.
- Fatigue will accumulate over the course of a schedule. To reduce risk, try shortening the number of times a schedule repeats, shortening the number of days on, or increasing the number of days off between shifts.

www.emsfatigue.org
<https://www.emsfatiguerisk.ibrinc.org/>

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Human Factors

- Distractions (Sterile Cockpit Concept)
 - Radio
 - Cell phone
 - Pager
 - Texting



Facebook
NBC 10
74° 4:54

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Outside of the Vehicle

- Wellness Program
 - Biggest Loser
- Back Injury Prevention
 - Weight of bags/ equipment
 - Power-lift stretchers
 - Stair devices
- High-visibility wear
 - ANSI II/III highway requirements
 - Boots on the ground = Hi-Viz policy



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Outline



The Problem
Patient Safety
EMS Clinician Safety

Creating a Culture of Safety

- Adverse Event Reporting
- Just Culture
- Safety Committee

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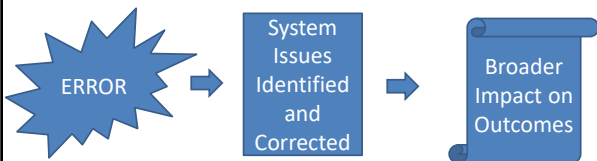


Formerly PA EMS Safety
Event Reporting System

<http://event.clirems.org>

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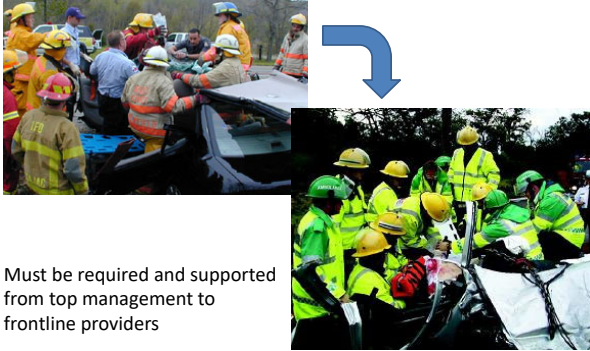
Just Culture No Blame



To err is human, to forgive divine
- Alexander Pope, 1711

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EMS Safety Culture



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EMS Culture of Safety

- **Start a Safety Committee**
 - In PA, 5% reduction in Worker’s Comp insurance
- **Safety Rounds in vehicles, drug bags, and stations**
- **Event Reporting (non-punitive)**
- **Pay attention to fatigue/ scheduling**
- **Thoughtful Vehicle Design**
 - Forward facing seats
- **Agency Policies**
 - Wear seatbelts/restraints at almost all times!
 - Distracted Driver/Sterile Cockpit
 - **Drug storage/ pharmaceutical practices**

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Conclusion

EMS Medical Director must set example



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