

# QUALITY IMPROVEMENT NEWSLETTER



A publication from the Maine EMS Quality Improvement Committee

## EMS Transport Safety



### OVERVIEW

Do you know that driving to the scene of an emergency and transporting a patient to the hospital are some of the most dangerous activities we perform? We need to be as good at this skill as we are with all our EMS skills. You must maintain situational awareness and stay focused -- your life, the lives of fellow crew members, other vehicle occupants, and the general public depend on it. Ensure all equipment is in good working order. Report safety-related concerns immediately. When you are overtired, you are more likely to make mistakes or get injured. Irregular schedules and night shiftwork are associated with reduced alertness on the job and challenge optimal sleep health. Taking care of yourself, eating properly, and getting enough rest before your shift are other keys to your safety.

Scan the QR Code to view the "Fatigue Risk Management in EMS Project Summary and Webtool Demo." Reflect on your own EMS safety and how the topics presented can be applied as you read on.



### TAKE AWAYS:

- Every transported patient is entitled to the safest transport possible.
- L&S responses and transports are one of the most dangerous interventions we perform.
- Traffic Incident Management Responder training (free) is available for EMS clinicians to aid them in developing best techniques for maintaining situational awareness on chaotic roadway scenes.
- Although complete road closure and detours may be inconvenient to the traveling public, they should be considered at scenes with limited visibility and/or unsafe separation between traffic and emergency responders
- Dispatch determinant codes may be used by responders to help determine which patients get a hot response and which do not.

#### Quality Improvement Leaders should think about:

- Assessing your own agency's performance on the NEMSQA Safety 1 & 2 measures in the MEFIRS Report Writer report titled "Safety Measures"
- Having an agency policy/plan to address sleep and clinician fatigue
- Does your agency train to perform road closures following an ICS structure?

## Lights & Sirens Response In Maine

EMS clinicians often use lights and sirens to reach a medical emergency scene. However, it's important to remember that this intervention comes with risks. As healthcare professionals, the primary role of EMS clinicians is to deliver care while minimizing harm to the patient. This critical evaluation of interventions' potential benefits and risks is a standard practice in medicine. Ultimately, the safety and well-being of the patient and crew should always be the top priority. Please take the time to review the research linked with the QR code; *Lights and Siren Use by Emergency Medical Services (EMS): Above All Do No Harm* by Dr. Douglas Kupas.<sup>2</sup>



The Maine EMS Quality Improvement Committee is reviewing two specific performance measures related to safety,

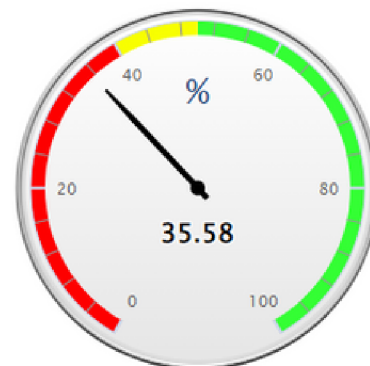
- the percentage of EMS responses originating from a 911, intercept, or mutual aid request in which lights and sirens were not used during the response (Safety-01),<sup>3</sup> and
- the percentage of EMS transports originating from a 911, intercept, or mutual aid request during which lights and sirens were not used during the patient transport (Safety-02).<sup>4</sup>

Strong guidelines and published studies support the limited use of lights and sirens to protect not only the public but also EMS clinicians and patients from the potential dangers of lights and sirens usage. Maine EMS target goals for these measures are less than 50% of responses to 911, intercept, or mutual aid requests have NO lights or sirens used during the response, and 95% of patient transports not using lights and sirens.

### NEMSQA Safety-01<sup>5</sup>

**35.58% -- Target is >50%**

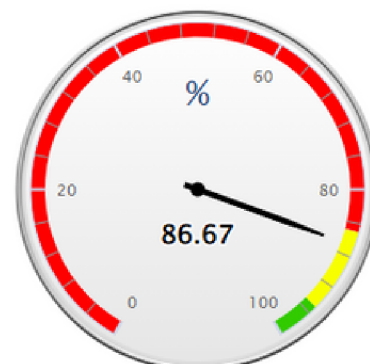
Percentage of EMS responses originating from a 911, intercept, or mutual aid request in which lights and sirens were **NOT** used during response.



### NEMSQA Safety-02<sup>6</sup>

**86.67% -- Target is >95%**

Percentage of EMS transports originating from a 911, intercept, or mutual aid request during which lights and sirens were **NOT** used during patient transport.



2. Kupas, D. F. (2017, May). Lights and Siren Use by Emergency Medical Services (EMS): Above All Do No Harm. Retrieved August 29, 2022, from <https://www.naemt.org/docs/default-source/ems-health-and-safety-documents/health-and-safety-documents/lights-and-siren-may-2017-maryn-final2-pdf.pdf?sfvrsn=2>

3. Murphy, S. (n.d.). Measures. Retrieved January 13, 2023, from <https://www.nemsqa.org/nemsqa-measures>

4. NHTSA's Office of EMS. (n.d.). EMS.Gov Safety Resources. EMS.gov. Retrieved January 13, 2023, from <https://www.ems.gov/resources/search/?category=safety&sort=date>

5. 83,015 of 233,316 records (35.58%)

6. 130,337 of 150,376 records (86.67%)

## Traffic Incident Management Responder Free Training

Three crashes resulting in injury occur every minute in the United States. On an average day, approximately 39,00 public safety professionals participate in these responses and are placed in harm's way.<sup>7</sup> Congestion from these incidents often generates secondary crashes, further increasing traveler delay and frustration. The longer responders remain at the scene, the greater the risk they and the traveling public face. A cadre of well-trained responders helps improve traffic incident response. Better incident response improves the safety of responders and drivers, reduces crashes that occur because of incident-related congestion, decreases traffic delays caused by incidents, and can cut incident scene time. The National Traffic Incident Management Responder Training was created by responders for responders. This course provides first responders a shared understanding of the requirements for safe, quick clearance of traffic incident scenes; prompt, reliable, and open communication; and motorist and responder safeguards. First responders learn how to operate more efficiently and collectively.

**Learn more by scanning the QR Code to the right, or by navigating to:**

[https://www.nhi.fhwa.dot.gov/course-search?course\\_no=133126A](https://www.nhi.fhwa.dot.gov/course-search?course_no=133126A)



## EMD Determinant Codes

The Medical Priority Dispatch System offers more than 1,800 potential determinant codes (EMD codes). EMD codes are used to preplan an emergency response for a variety of emergency situations taking patient acuity, scene safety, and the need for specialty resources into consideration. Basic life support (BLS) calls are often identified by the ALPHA, BRAVO, and OMEGA determinant levels, whereas advanced life support (ALS) calls are often identified by the CHARLIE, DELTA, and ECHO determinant levels. EMS clinicians can also use EMD determinant levels to make decisions about the use of lights and sirens when responding to calls for service. For example, OMEGA, ALPHA, and CHARLIE level calls are usually non-time sensitive and do not indicate a lights and siren intervention; whereas, BRAVO, DELTA, and ECHO level calls may identify a time-life sensitive situation indicating a lights and siren intervention.<sup>8</sup>

## Clinician Fatigue

Shiftwork and irregular work schedules exemplify how individual, social, and environmental demands can challenge optimal sleep health. Night shift work requires us to be awake when our biology prepares us for sleep and to sleep when our biology prepares us for wakefulness. Current research suggests that nighttime shiftwork is associated with reduced alertness on the job and reduced duration and quality of sleep during the day. Night shift workers are also at risk for obesity and metabolic dysfunction.<sup>9</sup> Scan the QR Code to view the "Fatigue Risk Management in EMS Project Summary and Webtool Demo."



7. Course search. National Highway Institute. (n.d.). Retrieved January 17, 2023, from [https://www.nhi.fhwa.dot.gov/course-search?course\\_no=133126A](https://www.nhi.fhwa.dot.gov/course-search?course_no=133126A)

8. Braunschweiger, A. (2017, November 17). Determinant codes. IAED Journal. Retrieved January 13, 2023, from <https://www.iaedjournal.org/determinant-codes>

9. Buysse, D. J. (2017, September 11). Evidence-based guidelines for fatigue risk management in emergency medical services: A step in the right direction toward Better Sleep Health. Taylor & Francis. Retrieved August 26, 2022, from <https://www.tandfonline.com/doi/full/10.1080/10903127.2017.1380099>



### **Visibility Standards for Vehicles**

According to the FEMA Emergency Vehicle Safety Initiative report in 2014, the federal government established the Triple-K standard in the 1960s and 1970s as a requirement for all ambulances purchased with federal money. The Triple-K requirements for standard coloring, striping, lettering, and markings were borne from the awareness that increased visibility was necessary to reduce traffic-related casualties among public safety responders but were not evidence-based and cited no references but warranted further study.

When the GSA announced it would no longer maintain the Triple K standards in 2008, the NFPA released NFPA 1917, a voluntary standard, as a replacement. NFPA 1917 vehicle visibility standards were developed based on the limited research available at the time on conspicuity<sup>10</sup> and retroreflective<sup>11</sup> marking and materials, as well as human behavior in visual attention, interpretation, and reaction. Like the Triple K standards, NFPA 1917 sets a minimum width or height for striping and lettering; however, NFPA 1917 does not require specific coloring and is overall less standardized. Rather, it recommends contrasting colors, certain patterns (like the chevron), minimum surface area coverage, and general placement of markings demonstrated to increase visual attention and support rapid interpretation and appropriate response from other motorists.

In addition to the Triple K and NFPA 1917, the Commission on Accreditation of Ambulance Services (CAAS) has developed a Ground Vehicle Standard for Ambulances. Regarding markings, caution, and identification, CAAS refers ambulance purchasers to consider information from FEMA's Emergency Vehicle Visibility and Conspicuity Study (2009). This study repeatedly states that insufficient research was available at the time and cites the need for more evidence to efficiently and effectively maximize visibility and safety for emergency personnel and vehicles on roadways, a theme repeated in the 2014 FEMA Vehicle Safety Initiative Report.

Chapter Three of the Maine EMS Rules adopted January 10, 2021, requires all ambulances manufactured after July 1, 2021, to meet one of these three standards to be licensed.<sup>12</sup>

### **Evidence-based ambulance visibility standards from different sources include**

- Using reflective striping and lettering with a minimum height/width of 6" and covering at least 75% of the patient compartment's length and 25% of the length of the cab.
- Outlining vehicle boundaries with "contour" or "edge" markings
- Striping placement maximizes reflectivity at the level of most vehicle headlights.
- Using a contrasting color scheme with the body of the ambulance and striping, lettering, and markings all meet ASTM D4956 retroreflective standards.
- Use of color(s) not typically found in the environment, like fluorescents.

10. Conspicuity refers to the ability of a vehicle to draw attention to its presence, even when other road users are not actively looking for it.

11. Retroreflectivity refers to reflecting light to an external light source which can be maximized with angles such as those of a chevron pattern.

12. Maine EMS Rules Chapter 3, Sect. 13, Paragraph 2

## Transport Safety (Clinicians & Patients)

How do you transport children in your ambulance? According to NHTSA, in 2020, 42% of the children killed in motor vehicle crashes were unrestrained, an increase of 2% from 2019. Transporting pediatric patients and newborns unrestrained in an ambulance is extremely dangerous. Clinicians are encouraged to review current EMS protocols (Pink 11 & 12 on pgs 137-138) for guidance.<sup>13</sup> You can also visit the EMS for Children tab on the Maine EMS website and click on “EMS Pediatric Care Resources” for pediatric transport device comparisons, how to document these in MEFIRS, and other information to help you and your agency. You may also scan the QR code below to view the EMS Pediatric Care website. The Maine EMS for Children program has sample devices for your evaluation and can help you with questions and other resources. Contact Marc Minkler at [marc.a.minkler@maine.gov](mailto:marc.a.minkler@maine.gov)



## Ambulance Crash Data

Ambulance crashes present a serious risk to patients, the public, and EMS clinicians. While ambulance safety has received more attention in recent years, several challenges remain, from simple solutions such as increasing the use of safety restraints for EMS clinicians and patients to more complicated ones, like conducting ambulance crash tests and designing safer ambulances. Use the QR code to download the ambulance safety infographic and share it with your EMS colleagues on social media and in the station.

<https://www.ems.gov/assets/NHTSAOEMSAmbulanceInfographic.pdf>



**WHEN AMBULANCES CRASH**  
**EMS Provider & Patient Safety**



13. MDPB. (2021, December 1). Maine EMS - Prehospital Treatment Protocols. Maine EMS. Retrieved March 16, 2023, from <https://www.maine.gov/ems/sites/maine.gov/ems/files/inline-files/Final-2021-Protocol-ALL-compressed.pdf>

The data included in this report is retrospective and originates from the 271 EMS agencies and the approximately 6,200 EMS clinicians and emergency medical dispatchers (EMDs) in the State of Maine who collectively provide data to the EMS Run Reporting system MEFIRS.