



EMS Utilization of Lights and Sirens: An Old Debate Continues...

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In 2010, our team published a study of EMS utilization of lights and sirens. This study was conducted after becoming aware of several deaths of low acuity patients who were being transported. Our research found that transporting patients with lights and sirens only saved 2.62 minutes. A similar study found only 43.5 seconds were saved using lights and sirens.

In the 2.62 minutes of time saved, no patient received any treatment that changed their outcome. Our team followed up on the study in 2012, with a prospective study comparing a standard use of a limited lights versus a limited use protocol. The limited use protocol had no effect on patient outcome. Kupas et al created another medical protocol to limit lights and sirens transport. They successfully decreased the utilization of lights and sirens and found no adverse outcomes in the non-lights and sirens transport group.

In 2019, Watanbee et. al. published a study in Annals of Emergency Medicine, utilizing NEMESIS Data, demonstrating that the crash rate during the transportation phase was more than twice as high when using lights and sirens, 17.1/100,000 vs 7.0/100,000, (AOR 2.9; 95% CI 2.2 to 3.9).

Seventy percent of fatal ambulance crashes occur during utilization of warning lights and sirens. The siren is an inadequate warning device, effective only at short ranges and low speeds. In a four year period in New York State, there were six fatalities and 1,894 injuries reported. In a 27-month period in San Francisco, there were a reported 135 collisions injuring 20 people. According to the National Highway Traffic Safety Administration (NHTSA), between 1992 and 2011, there were an estimated mean of 4,500 motor vehicle crashes involving an ambulance every year. Of these crashes, 65% resulted solely in property damage, 34% resulted in an injury and less than 1% ended with a fatality. Still, that less than 1% represented an annual mean of 33 people.

The current and previous evidence suggests no significant improvement on patient outcomes and potential worsening of certain aspects of patient care during transport. Yet, we continue to write about this topic because we still have no universal protocol. Additionally, use

of lights and sirens increases the stress experienced by patients, adversely affecting their vital signs and blood chemistry. Why does this risky behavior continue?

Position papers, such as, “Use of warning lights and siren in emergency medical vehicle response and patient transport,” from the National Association of EMS Physicians (NAEMSP), state that protocols should be in place for all uses of lights and sirens because of the risks associated with ambulance collisions, including injuries, deaths, and substantial financial costs. No study, to date, has demonstrated lives saved or improvement in morbidity associated with the use of lights and sirens.

Operator error is typically a contributing factor toward fatal crashes, suggesting the need for better training. In a survey of more than 230,000 EMS personnel through the National Registry of EMTs, seven percent reported having been in a crash, and 100% of these crashes were while using lights and sirens. In this study, weather was not a factor in any of these crashes.

Despite dozens of studies and multiple review articles since the early 1990s, we still are overusing lights and sirens in EMS. While some regions have created protocols that limit its use, other areas still routinely overuse lights and sirens during patient transport, endangering the lives of the patient and EMS crew. Dispatch and transport policies can and should be developed to utilize call interrogation algorithms in order to identify those patients who might benefit from lights and sirens response, while prohibiting lights and sirens response for most other calls.

Extremely few patients benefit from a rapid response to their emergency by EMS. In fact, the most important time interval that correlates statistically to morbidity and mortality, is the total time from initial symptoms to definitive care (i.e., hospital care with physician intervention). This includes dispatch processing, response to scene, time on task (i.e., treating the patient at the scene— notably the lengthiest time segment of them all), transport to the hospital and turn over to hospital clinicians (often the second longest time period).

Cambridge Consulting has significant expertise in understanding best practice of risk mitigation in establishing lights and sirens protocols. Our group has studied and published original research and implemented such protocols. We also have a keen understanding of the current science of lights and sirens and can assist organizations in implementation of protocols and case reviews of collision investigations.

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