

POSITION PAPER

NATIONAL ASSOCIATION OF EMS PHYSICIANS

CONSIDERATIONS IN ESTABLISHING EMERGENCY MEDICAL SERVICES RESPONSE TIME GOALS

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POSITION STATEMENT

- The response interval is defined as the elapsed time from emergency medical services (EMS) dispatch notification to the time of arrival on scene.
 - Response interval performance standards should be developed using a broad-based consensus process that realistically assesses the resources and attributes of the community.
 - Fractile response intervals should be calculated and used instead of mean response intervals to assess performance within an EMS system.
 - Medical directors should have the authority to lead the establishment of response interval performance standards and possess the resources needed to monitor response interval data.
- The dispatch process should be carefully analyzed and streamlined. Calls should be prioritized based on severity and response interval performance standards established for emergent, urgent, and nonurgent complaints.
 - Assessment of response intervals should be ongoing and change should be incremental.

INTRODUCTION

Since its inception, the concept of prehospital care has centered on rapid response, treatment, and rapid transport to an emergency care facility. Awareness of EMS has driven public demand for timely responses by EMS. However, financial constraints limit the number of units, personnel, equipment, and resources available to a system.

Many systems are setting response interval performance standards as a way of measuring EMS quality. This is a complex undertaking that entails considering medical and patient care issues, financial, political, and social factors, and the public's perceived needs.

Except for cardiac arrest,¹ there is little or no scientific evidence suggesting a causal relationship between response interval and improved patient outcomes. There is little evidence linking improved response intervals to improved survival in critical trauma,² and there is no literature suggesting that

rapid response intervals improve outcome for noncritical patients. However, there is a public expectation that when EMS is requested, an ambulance will appear within a reasonable time no matter what the complaint. The definition of "reasonable time" can vary considerably between communities of varying population density.

It is the purpose of this paper to provide guidelines for establishing response interval goals, not to define ideal response intervals.

DISCUSSION

Response interval goals will vary from community to community. Medical necessity and community expectations must be weighed against logistics and resources. Predetermined EMS response interval performance standards should be developed using a broad-based consensus process that realistically assesses the resources and attributes of the community.

Response interval performance standards should be driven by medical considerations with vital input from EMS professionals, including physicians, EMS field providers, dispatchers, and administrators. Citizen input from civic groups, political representatives, and special needs group, as well as input from legal and financial experts, is required. Response interval goals should be developed at the governmental level, be it city, county,

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regional, or state, which bears responsibility for the EMS system and best minimizes fragmentation while recognizing the heterogeneity of most EMS systems.

The response interval should reflect the patient's perspective. It begins with the time that a caller notifies the dispatch center and ends with unit arrival at the scene as generally available time points in every EMS system. Some systems might choose to also evaluate an earlier event such as the time the call is first answered by a public safety answering point or a later event such as arrival at the patient's side.

A data dictionary should clearly define each response data point. Spaite et al.³ developed a data dictionary that defines time points throughout the EMS incident. For the purpose of this position paper, the two points defined by Spaite et al. as "time dispatch notified" and "time of arrival at scene" were used to define the response interval. Use of such a standard data dictionary will ensure accuracy and consistency and improve the ability to compare different systems. Definitions used should be universal so that one system can benchmark itself with other EMS systems.

Once the response interval performance standards have been established, the system should monitor how well the goals are being met. Historically, the mean or average response interval has been used. This is inherently flawed because roughly 50% of the time the response interval exceeds the preset standard. A more accurate method involves determining for what percentage of calls the fractile goal is being achieved. The fractile time indicates that a predetermined response interval is being met for a defined percentage of events. This is a much better measure of system performance and thus fractile response intervals should be calculated and used instead of the mean response inter-

val.⁴ The use of the 90% fractile (90% of the calls responded to within a certain response interval) should be considered.

Medical considerations are important in the establishment of response interval performance standards. Medical directors should have the authority to lead the establishment of response interval goals and possess the resources needed to monitor response interval data. Ongoing continuous quality improvement (CQI) should monitor how response intervals compare with the predetermined goal. This will allow the medical director to advocate for changes to the response system to enhance patient care.

Cardiac and respiratory arrest and airway obstruction complaints should be prioritized and dispatched rapidly and compliance measured at a fractile set by the system. These patients require medical intervention within 4 to 6 minutes of collapse to reduce the mortality and morbidity of hypoxia. Telephone emergency medical dispatcher instructions can enable bystanders to function as limited first responders.

Rapid first response is medically necessary for cardiac and respiratory arrest and airway compromise. The population density and unit resources available must factor into establishment of first-responder response intervals. Non-traditional EMS responders, such as automated external defibrillator (AED)-equipped police units and workplace AED-equipped first responders can be incorporated into the response plan to supplement traditional first responders, such as staffed fire-suppression apparatus. Every community should assess its EMS first-response system and initiate incremental improvements that can be realistically sustained. This can increase the percentage of calls responded to within the 4- to 6-minute physiological barriers imposed by hypoxia.

Certain patient populations require special dispatch and response considerations. This stems from their need for specialized definitive care in a time-limited fashion. For example, patients with myocardial injury or patients experiencing critical trauma demand complex interventions by the health care system. Trauma patients require response intervals targeted toward delivering the patient to definitive trauma care to prevent mortality and morbidity from shock. Patients experiencing myocardial injury require rapid reperfusion. These interventions can be expedited by a timely EMS response.⁵ These critical patient populations should constitute a special focus of response interval analysis.

Less urgent calls should be effectively and expeditiously triaged and transmitted to the responding units to meet time parameters established by the system.

Assessment of response intervals should be ongoing and change should be incremental. Improvements should occur within the confines of the system's resources and be realistically sustainable. Changes should be data-driven and evidence-based, making improved patient care and customer satisfaction the top priorities.

The dispatch process should be carefully analyzed and streamlined. Calls should be prioritized based on severity. Clawson⁶ developed the National Association of EMS Physicians position paper outlining the need for prioritization of calls, and a previous position paper has outlined modes of response and the appropriate use of lights and sirens.⁷

Research is needed to determine the impact of response intervals on patients and the community. The response timeline should be objectively defined using a universal data dictionary that is applicable across system lines. Outcomes should include mortality, morbidity, patient comfort, public satisfac-

tion, and safety for patients, providers, and the public. If available, research should follow a uniform reporting template such as Utstein,⁸ which allows results to be more easily compared with those of other systems.

CONCLUSION

Emergency medical services are time-driven. Response intervals can affect patient care and are thus a medical issue. Medical directors must have the authority to guide the establishment of response interval performance standards based on patient care considerations. These response interval goals must be based on medical considerations, but must also consider the social, political, and financial realities inherent to the given system. Once established, response intervals should undergo continued evaluation with incremental improvements to the EMS system as needed. The data collected should be well defined and readily benchmarked.

Shorter response intervals are not without costs. Beyond monetary costs are safety costs as well. Shorter response intervals, especially when augmented by the inappropriate use of lights and sirens, carry established, significant safety risks for EMS providers and the public alike.⁷ For this reason, simply going faster is not the solution. More important is the

proper triage of calls to determine which ones require rapid "lights and siren" responses and which ones can be handled in a timely but safer fashion.

Systems should be driven to optimize response intervals for cardiac arrest and critically ill and injured patients. This includes optimizing the dispatch process and first-responder resources as well as assessing the resuscitation process using a uniform template. This will allow comparison between like systems and the sharing of new ideas.

Further outcomes research is needed. Medical as well as financial and customer satisfaction outcomes should be studied to determine how EMS systems can best meet the needs of a community in the most time- and resource-efficient manner. To date, there are little data to support or refute any given EMS response interval parameters. Those parameters that do exist have been established for patients experiencing cardiac arrest and define the time to initial system activation, CPR, defibrillation, and advanced life support care, which maximize resuscitation.

No two EMS systems are the same. Each functions within its own unique constellation of assets and constraints. No one set of response interval performance standards will fit every system. What all systems do have in common is the variety of internal and

external forces that shape the type of resources available to meet patient needs. Consideration of these forces, led by medical beneficence, with ongoing reassessment will improve the EMS response available in a community.

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