Reimagined: Is ‘Regression’ the Key to Future Emergency Medical Services Delivery?

- Thomas Wieczorek, Director, Center for Public Safety Management
- Matt Zavadsky, EMS SME, Center for Public Safety Management

ICMA | conference

Local Government REIMAGINED CONFERENCE
APRIL 2–4, 2025 MILWAUKEE, WISCONSIN

Common misconceptions about EMS response

- Majority of 911 EMS calls are for a potentially life-threatening condition.
- Response times make a difference in patient's outcomes.
- There should be a paramedic on every EMS response.
  - And 2 are better!
- The more paramedics in the EMS system the better.

Economic Challenge…

- **Cost Drivers**
  - Response time
    - Faster = More cost
    - ‘Slower’ = Less cost
  - ALS vs. BLS
    - All ALS = More cost
    - Tiered (ALS & BLS) = Less cost
  - Deployment Model
    - Fixed (24/48, or 48/96 schedule) = More cost
    - Flexible (10’s & 12’s, peak staffing) = Less cost

EMS Related News Reports

Summary: Jan 11, 2021 - Feb 28, 2025
Article Count: 2,790

Keywords	Tag Count	% of Total
Staffing	1,143	41.0%
Funding, Tax Levy	1,071	38.4%
Total	**2,214**	**79.4%**

Other	Tag Count	% of Total
Closure/Takeover	219	7.8%
Response Time	402	14.4%
Staffing + Response Time	**1,545**	**55.4%**
Staffing+Funding+Response Time	**2,616**	**93.8%**

AMERICAN AMBULANCE ASSOCIATION
Caring for people—first.

AIMHI
ACADEMY OF INTERNATIONAL MOBILE HEALTHCARE INTEGRATION

https://aimhi.mobi/news

System Design Hallmarks?

- BLS Ambulances
- Little to no response time expectations
- ALS QRV – 'Intercept'

Where did this “Need for Speed” come from…

Cardiac Resuscitation in the Community

Importance of Rapid Provision and Implications for Program Planning

“If ***CPR*** was initiated within ***four*** minutes **and** if ***definitive care*** was provided within ***eight minutes***, *43% of patients survived*. If either time was exceeded, the chances of survival fell dramatically.

The time to initiation of CPR and ***definitive care*** are factors directly influenced by emergency medical service program decisions.

A realistic option to improve time to initiation of CPR is widespread citizen CPR training. A possible option to improve the time to ***definitive care*** is the training of emergency medical technicians in ***defibrillation***.”

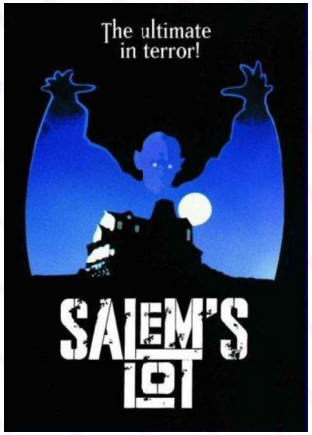
ICMA | conference

JAMA
The Journal of the American Medical Association

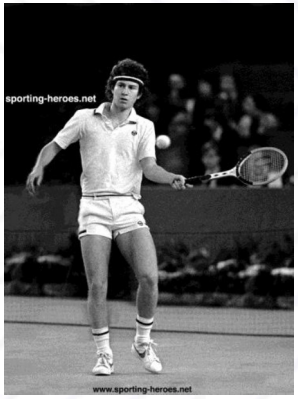
Local Government REIMAGINED CONFERENCE
APRIL 2-4, 2025 MILWAUKEE, WISCONSIN

JAMA. XXXX May 4;241(18):1905-7. doi: 10.1001/jama.241.18.1905


RALLYE


The ultimate
in terror!
SALEM'S
LOT


CHIC


sporting-heroes.net
www.sporting-heroes.net

1979!!

Jarvis J, Taigman M. Using Red Lights and Sirens for Emergency Ambulance Response: How Often Are Potentially Life-Saving Interventions Performed?
Prehospital Emergency Care, 25(4), 549–555.
https://pubmed.ncbi.nlm.nih.gov/32678993/
Conclusions: *In this large national dataset, RLS responses were very common (86%) yet potentially life-saving interventions were infrequent (6.9%). These data suggest a methodology to help EMS leaders craft targeted RLS response strategies.*

Price L. Treating the clock and not the patient: ambulance response times and risk.
Qual Saf Health Care. 2006;15(2):127–130.
https://pubmed.ncbi.nlm.nih.gov/16585114/
Conclusions: *The results of this study suggest that the 8 minute response time is not evidence based and is putting patients and ambulance crews at risk. There is a need for less simplistic quality indicators which recognise that there are many stages between a patient's call for help and safe arrival in hospital.*

Lights and Siren Use by Emergency Medical Services (EMS): Above All Do No Harm
NHTSA Study & Report by Dr. Doug Kupas
https://www.ems.gov/assets/Lights_and_Sirens_Use_by_EMS_May_2017.pdf
Summary: *The time saved by using L&S during response and transport has been evaluated by several studies. These all show that a relatively short amount of time is saved by L&S use. While this may be of clinical importance to patient outcome in critical time-sensitive conditions like cardiac arrest, the consensus among the researchers in this field is that the time is not significant in most of the responses or transports.*

Pons P, Markovchick V. Eight minutes or less: does the ambulance response time guideline impact trauma patient outcome?
J Emerg Med. 2002;23(1):43–48.
https://pubmed.ncbi.nlm.nih.gov/12217471/
Conclusions: *After controlling for other significant predictors, there was no difference in survival after traumatic injury when the 8 min ambulance RT criteria was exceeded (mortality odds ratio 0.81, 95% CI 0.43-1.52). There was also no significant difference in survival when patients were stratified by injury severity score group. Exceeding the ambulance industry response time criterion of 8 min does not affect patient survival after traumatic injury.*

Swor R, Cone D. Emergency medical services advanced life support response times: Lots of heat, little light.
Acad Emerg Med. 2002;9(4):320–321.
https://pubmed.ncbi.nlm.nih.gov/11927458/

Conclusions: *In this observational study, emergency calls where RTs were less than 5 minutes were associated with improved survival when compared with calls where RTs exceeded 5 minutes. While variables other than time may be associated with this improved survival, there is little evidence in these data to suggest that changing this system's response time specifications to times less than current, but greater than 5 minutes, would have any beneficial effect on survival.*

Pons P, Haukoos J, Bludworth W, Cribley T, Pons K, Markovchick V. Paramedic response time: Does it affect patient survival?
Acad Emerg Med. 2005;12(7):594–600
https://pubmed.ncbi.nlm.nih.gov/15995089/

Conclusions: *A paramedic response time within 8 minutes was not associated with improved survival to hospital discharge after controlling for several important confounders, including level of illness severity. However, a survival benefit was identified when the response time was within 4 minutes for patients with intermediate or high risk of mortality. Adherence to the 8-minute response time guideline in most patients who access out-of-hospital emergency services is not supported by these results.*

Jarvis J, Johns D, Ratcliff T, et. al. The impact of using time critical intervention-based dispatch thresholds on lowering lights and siren use to EMS 911 incidents.
JACEP Open 2024;5:e13232
https://doi.org/10.1002/emp2.13232

Conclusions: *Using Time Critical Intervention-based dispatch thresholds, we decreased L&S use and increased accuracy with minimal increased response time. Our results support the use of this methodology to determine EMS response modes.*

Jensen, J.T., Møller, T.P., Blomberg, S.N.F. et al. Racing against time: Emergency ambulance dispatches and response times, a register-based study in Region Zealand, Denmark,
2013–2022. Scand J Trauma Resusc Emerg Med 32, 108 (2024).
https://doi.org/10.1186/s13049-024-01284-0

Conclusions*: Even though response times increased during the study period, improving these may not be a solution to improve overall patient outcomes, because the diagnoses where shorter response times are important ultimately represent only a smaller proportion of the patients that are dispatched to an emergency ambulance.*

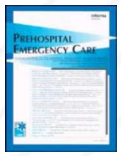
Position Statement

Joint Statement on Lights & Siren Vehicle Operations on Emergency Medical Services Responses

Douglas F. Kupas, Matt Zavadsky, Brooke Burton, Shawn Baird, Jeff J. Clawson, Chip Decker, ...show all

Pages 459-461 | Received 04 Feb 2022, Accepted 16 Feb 2022, Published online: 10 May 2022

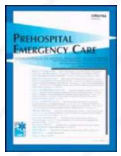
This document is a joint position statement with the Academy of International Mobile Healthcare Integration, American Ambulance Association, American College of Emergency Physicians, Center for Patient Safety, International Academies of Emergency Dispatch, International Association of EMS Chiefs, International Association of Fire Chiefs, National Association of EMS Physicians, National Association of Emergency Medical Technicians, National Association of State EMS Officials, National EMS Management Association, National EMS Quality Alliance, National Volunteer Fire Council, and Paramedic Chiefs of Canada.



https://pubmed.ncbi.nlm.nih.gov/35475941/

The sponsoring organizations of this statement believe that the following principles should guide L&S use during emergency vehicle response to medical calls and initiatives to safely decrease the use of L&S when appropriate:

- The primary mission of the EMS system is to provide out-of-hospital health care, saving lives and improving patient outcomes, when possible, while promoting safety and health in communities. ***In selected time-sensitive medical conditions, the difference in response time with L&S may improve the patient's outcome***.
- EMS vehicle operations using L&S pose a significant risk to both EMS practitioners and the public. Therefore, during response to emergencies or transport of patients by EMS, ***L&S should only be used for situations where the time saved by L&S operations is anticipated to be clinically important to a patient's outcome***. They should not be used when returning to station or posting on stand-by assignments.
- ***Communication centers should use EMD programs developed, maintained, and approved by national standard-setting organizations with structured call triage and call categorization to identify subsets of calls based upon response resources needed and medical urgency of the call. Active physician medical oversight is critical in developing response configurations and modes for these EMD protocols. These programs should be closely monitored by a formal quality assurance (QA) program for accurate use and response outcomes, with such QA programs being in collaboration with the EMS agency physician medical director.***



https://pubmed.ncbi.nlm.nih.gov/35475941/

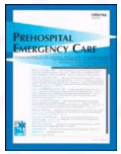
The sponsoring organizations of this statement believe that the following principles should guide L&S use during emergency vehicle response to medical calls and initiatives to safely decrease the use of L&S when appropriate:

- ***Municipal government leaders should be aware of the increased risk of crashes associated with L&S response to the public, emergency responders, and patients. Service agreements with emergency medical response agencies can mitigate this risk by using tiered response time expectations based upon EMD categorization of call. Quality care metrics, rather than time metrics, should drive these contract agreements.***

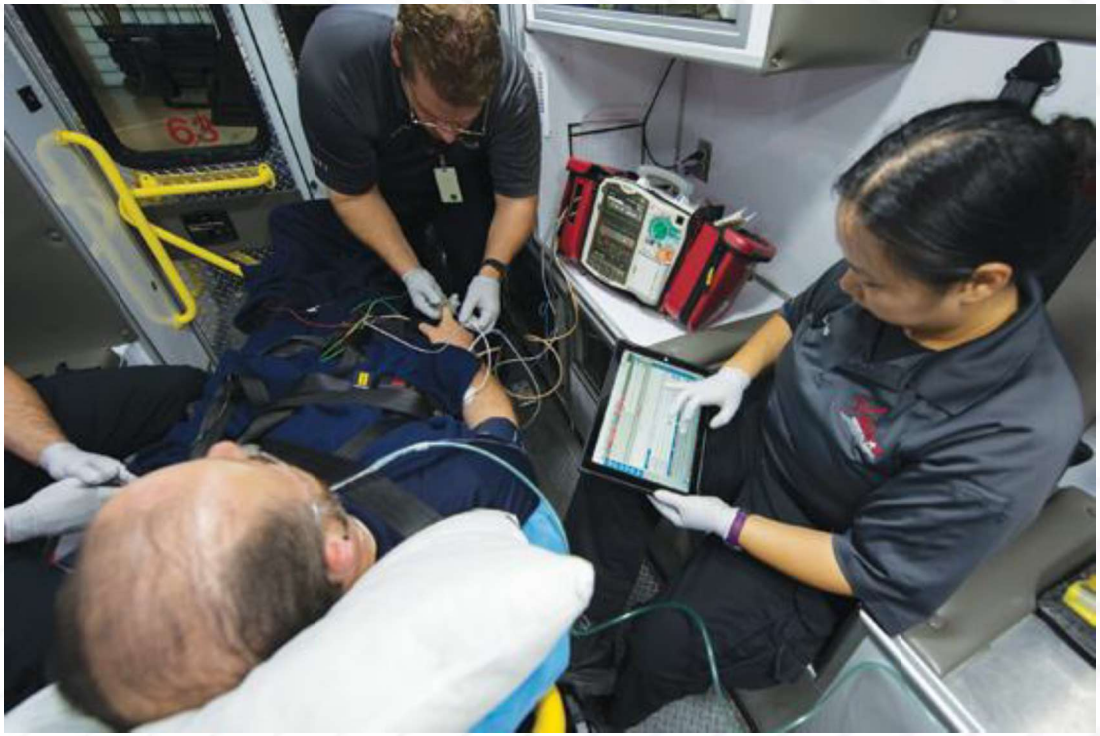
Sponsoring Organizations and Representatives:

- Academy of International Mobile Healthcare Integration
- American Ambulance Association
- American College of Emergency Physicians
- Center for Patient Safety
- International Academies of Emergency Dispatch
- International Association of EMS Chiefs
- International Association of Fire Chiefs
- National Association of EMS Physicians
- National Association of Emergency Medical Technicians
- National Association of State EMS Officials
- National EMS Management Association
- National EMS Quality Alliance
- National Volunteer Fire Council
- Paramedic Chiefs of Canada

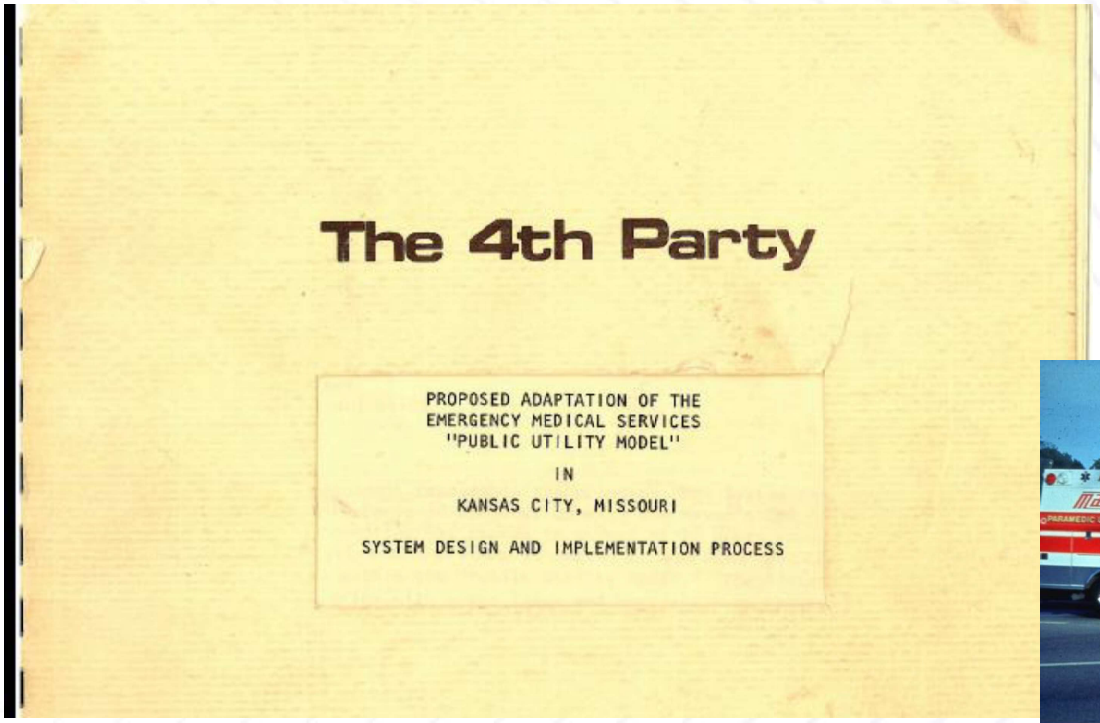
https://pubmed.ncbi.nlm.nih.gov/35475941/



Where did this all-ALS thing come from?



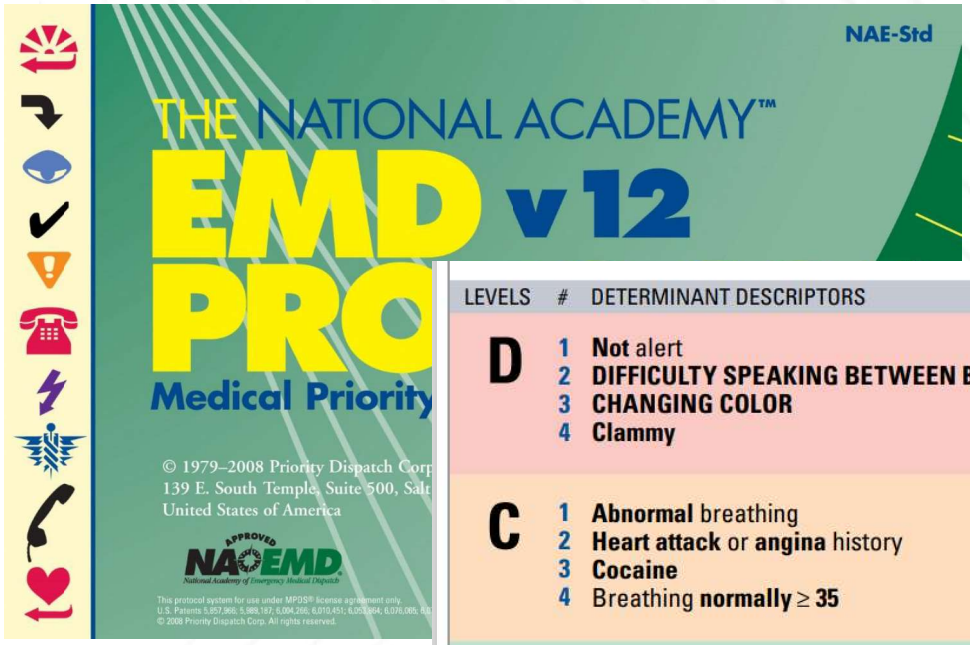
The Impact of the Public Utility Model



ALL ALS - The Rationale

A substantial percentage of all ambulance calls received by dispatchers are "borderline" -- that is, from the information available on the telephone, it is impossible to determine with certainty whether the call should be classified as a life-threatening emergency, a non-life-threatening emergency, or a request for nonemergency routine transportation.

The *NEXT* Year



LEVELS	#	DETERMINANT DESCRIPTORS	CODES	RESPONSES	MODES
D	1	**Not** alert	10-D-1		
	2	**DIFFICULTY SPEAKING BETWEEN BREATHS**	10-D-2		
	3	**CHANGING COLOR**	10-D-3		
	4	**Clammy**	10-D-4		
C	1	**Abnormal** breathing	10-C-1		
	2	**Heart attack** or **angina** history	10-C-2		
	3	**Cocaine**	10-C-3		
	4	Breathing **normally** ≥ **35**	10-C-4		
A	1	Breathing **normally** < **35**	10-A-1		

AMPDS® v12.2, NAE-std, 120301

Sanghavi P, Jena AB, Newhouse JP, Zaslavsky AM. Outcomes after out-of-hospital cardiac arrest treated by basic vs advanced life support.
JAMA Intern Med. 2015 Feb;175(2):196-204.
https://pmc.ncbi.nlm.nih.gov/articles/PMC4314335/

Conclusions: *Patients with out-of-hospital cardiac arrest who received BLS had higher survival at hospital discharge and at 90 days compared with those who received ALS and were less likely to experience poor neurological functioning.*

Band RA, Salhi RA, Holena DN, Powell E, Branas CC, Carr BG. Severity-adjusted mortality in trauma patients transported by police.
Ann Emerg Med. 2014 May;63(5):608-614.e3
https://pmc.ncbi.nlm.nih.gov/articles/PMC5912155/

Conclusion: *We found no significant overall difference in adjusted mortality between patients transported by the police department compared with EMS but found increased adjusted survival among 3 key subgroups of patients transported by police. This practice may augment traditional care.*

Levy, M. J., Crowe, R. P., Abraham, H., Bailey, A., Blue, M., Ekl, R., ... Myers, J. B. (2024). Dispatch Categories as Indicators of Out-of-Hospital Time Critical Interventions and Associated Emergency Department Outcomes.
Prehospital Emergency Care, 1–6.
https://www.tandfonline.com/doi/full/10.1080/10903127.2024.2342015

Conclusions: *In general, Determinant levels aligned with time-critical responses; however, a notable minority of lower acuity Determinant level Protocols met criteria for unsafe to hold. This suggests a more nuanced approach to dispatch prioritization, considering both Protocol and Determinant level factors.*

Dyson K, Bray J. Paramedic Exposure to Out-of-Hospital Cardiac Arrest Resuscitation Is Associated With Patient Survival
Circulation: Cardiovascular Quality and Outcomes Volume 9, Number 2
https://www.ahajournals.org/doi/10.1161/CIRCOUTCOMES.115.002317

Conclusions: *Patient survival after OHCA significantly increases with the number of OHCAs that paramedics have previously treated.*

Vrotsos, K. M., Pirrallo, R. G., Guse, C. E., & Aufderheide, T. P. (2008). Does the Number of System Paramedics Affect Clinical Benchmark Thresholds?
Prehospital Emergency Care, 12(3), 302–306.
https://www.tandfonline.com/doi/full/10.1080/10903120802101355

Conclusions: *These data show a decreased opportunity and a wide variability in the frequency of successfully completed paramedic technical skills and experiences in this EMS system.*

Persse, David E. et al. Cardiac arrest survival as a function of ambulance deployment strategy in a large urban emergency medical services system
Resuscitation, Volume 59, Issue 1, 97 – 104
https://www.resuscitationjournal.com/article/S0300-9572(03)00178-3/abstract

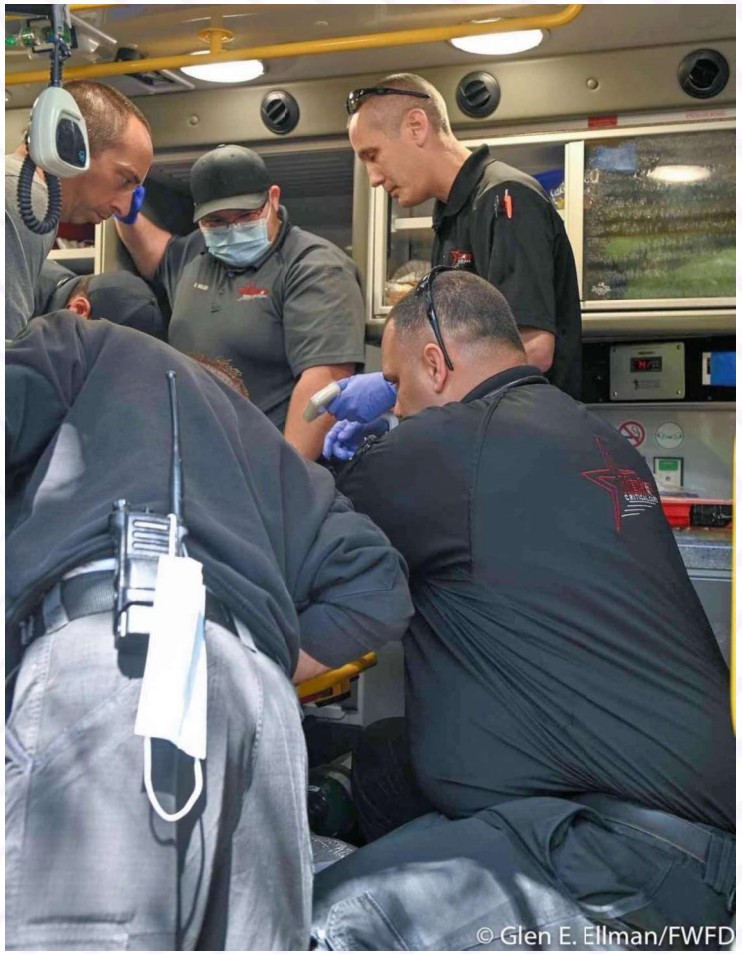
Conclusions: *This study shows improved outcomes for a subset of patients with cardiac arrest when they are cared for in an area that uses tiered response compared to an area that uses a uniform response EMS system.*

System Redesign…

- **Service delivery model**
  - Patient ***navigation*** vs. ***transport***

- **All ALS to Tiered Response**
  - Right Resource ➔ Right Patient
    - ALS/BLS/NP/PA/Community Paramedic/Behavioral Health

- **Changing response time expectations**
  - 9 minutes?
  - 11 minutes?
  - 30 minutes?
  - 60 minutes?
  - At all…?
    - Call Triage/Alternate Response



Response Configuration Change

- **New Configuration**
  - E/D 10:59 – FR RL&S; Ambulance RL&S
  - C/BH 12:59 – FR RL&S; Ambulance RL&S
  - **Sierra 30:00** – FR RL&S; **Ambulance No RL&S**
  - BC/A **60:00** – No FR; Ambulance No RL&S
  - OTO **90:00** - No FR; Ambulance No RL&S

Colorado Springs Fire Department debuts new emergency response system for 911 calls

By Debbie Kelley

Mar 1, 2022

As of Tuesday, some Colorado Springs residents may hear something different when they call 911.

"A unit will respond when a unit is available," call takers will say to residents in the south part of town who contact the emergency service for non-emergency situations — for example, when symptoms indicate the flu, a sprained ankle or a fractured hip.

Instead of immediately dispatching an ambulance, firetruck or other substantial vehicle, new Community Medicine Response Units — in medically outfitted SUVs that are on back order — will arrive at the scene.

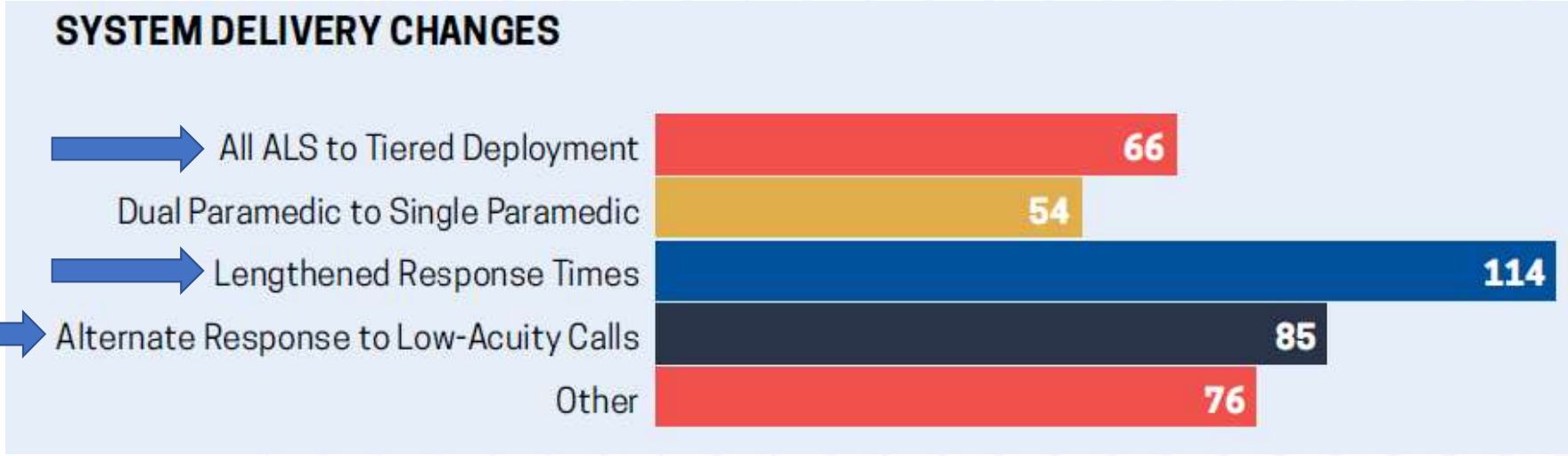
The appropriate response could be EMTs requesting an ambulance to transport the patient to a hospital; setting a telehealth appointment for the patient; sending the patient to an urgent care center; or applying a splint, dispensing pain medication and helping the person get connected with an orthopedic center, said Fire Chief Randy Royal.

"With an ankle sprain, you may not want to sit in an emergency department for several hours," said Dr. Matt Angelidis, co-medical director for the Colorado Springs Fire Department.

https://gazette.com/news/local/colorado-springs-fire-department-debuts-new-emergency-response-system-for-911-calls/article_8a6caa10-99a8-11ec-bb56-3791da481e37.html

SURVEY HIGHLIGHTS

System Delivery Changes



Nearly three-quarters (72%) of respondents reported changes to system delivery, deployment, or staffing between 2019 and 2022. Of these agencies, nearly half (49%) reported they lengthened response times; over one-third (36%) reported alternate response to low-acuity calls; and over one-quarter of agencies reported moving from all ALS to tiered deployment (28%) and transitioning from dual paramedic to single paramedic deployment (23%).

https://naemt.org/docs/default-source/ems-data/ems-economic-and-operational-models-survey-02-20-2023-final.pdf?sfvrsn=1fb9f493_2

Table 7: Response Time Goal

Agency Name	High Acuity Call Compliance Standard	Low Acuity Call Compliance Standard
Emergency Medical Services Authority (Oklahoma City, OK)	90% < 10:59	90% < 24:59
Emergency Medical Services Authority (Tulsa, OK)	90% < 10:59	90% < 24:59
Mecklenburg EMS Agency (Charlotte, NC)	90% < 10:59	90% < 60:00
Medic Ambulance (Solano, CA)	9:00	25:00
MEDIC EMS (Davenport, IA)	90% < 07:59	90% < 14:59
MedStar Mobile Healthcare (Fort Worth, TX)	85% < 11 minutes, no more than 1.5% > 16:30	85% < 17 minutes, no more than 1.5% > 25:30
Metropolitan EMS (Little Rock, AR)	90% < 08:59	90% < 12:59
Northwell Health Center for EMS (Syosset, NY)	90% < 12:00	90% < 30:00
Novant Health New Hanover EMS (New Hanover County, NC)	N/A	90% < 19:59
Pinellas County EMS - Sunstar (Pinellas County, FL)	91% < 10:00	No Standard
Pro EMS (Cambridge, MA)	90% < 14:59	No Standard
Regional Emergency Medical Services (Reno, NV)	8:59	90% < 20:59
Richmond Ambulance Authority (Richmond, VA)	90% < 8:59	90% < 29:59

Take-Home Messages…

- **We created this mess!**
  - It's up to us to change the expectations through education & evidence
- **Design changes being implemented today would have been considered heresy 5 years ago**
  - Tiered Deployment
  - Extending response times
  - BLS systems with paramedic QRVs
  - Dispatch triage

Take-Home Messages…

- **EMS Systems are the most challenged they have been, *EVER***
  - Regardless of the provider/delivery model
    - Staffing
    - Economics
    - Supply Chain
- **Systems are being re-designed based on science and evidence**
  - **Realistic** public expectations
    - Economic and customer service balance
- **Response time is NOT a quality measure**
  - EMS Systems should be evaluated on ***what matters***
    - Clinical outcomes/bundle compliance
    - Cost of service delivery
    - Patient experience

ICMA | conference

Local Government REIMAGINED CONFERENCE
APRIL 2–4, 2025 MILWAUKEE, WISCONSIN

https://youtu.be/uTPTaKe7_us

Contact Information

Thomas Wieczorek
TWieczorek@cpsm.us
616-813-3782

Matt Zavadsky MS-HSA, NREMT
MZavadsky@cpsm.us
817-991-4487