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FROM THE EDITOR

What Makes Rural EMS in the US a Health Equity Concern?

Molly Nguyen, MD and Tanya Shenoy, MD

Emergency medical services (EMS) play critical roles in responding as soon as possible to health care needs of individuals across the United States, particularly in areas where access to a broad spectrum of critical health services is limited.[1] In many rural regions of the United States, EMS is often the first and most immediate point of contact for patients with urgent health needs, as it encompasses a network of transporters, first responders, emergency medical technicians, paramedics, and medical directors. However, despite their essential functions, rural EMS systems face challenges to an extent that health equity in many rural communities is severely compromised.

Geographic isolation is one of the barriers affecting rural EMS. Many rural communities are situated far from major hospitals or specialized medical services, which complicates the delivery of timely emergency care and can lead to poorer health outcomes for these patients.[1,2] This isolation is compounded by technological and infrastructure limitations that hinder the effectiveness and efficiency of emergency responses.[1] In particular, rural areas frequently grapple with inadequate or outdated medical equipment, limited access to advanced communication technologies, and insufficient infrastructure to support comprehensive emergency care.[1]

Additionally, rural EMS programs often operate on restricted budgets that are inadequate to cover the full range of operational needs.[1] This financial strain limits their ability to invest in essential resources, maintain updated equipment, and support ongoing training for personnel. Consequently, many rural EMS programs rely heavily on volunteers, who, while dedicated, are not always equipped to respond to a sufficiently full range of complex, emergent needs of patients.[3,4] On the other hand, low call volume in some rural areas can mean that professional EMS responders do not field sufficient numbers of cases to maintain their readiness to practice the full range of skills they developed during training.[3,4] In both cases, EMS staffing problems can compromise quality of care and negatively influence patient outcomes.

While technological advancements such as air transport and telehealth offer some solutions to the challenges posed by geographic remoteness or low population density, they are, in many cases, not substitutes for ground transport and hands-on care of sufficient quality to meet many patients' urgent needs. Air transport, although beneficial for rapid patient transfers, is costly and not always available. Telehealth can facilitate

consultation and follow-up but cannot replace the immediate, hands-on responses required during emergencies.

This issue of the *AMA Journal of Ethics* explores the multifaceted nature of rural EMS and its implications for health equity. Contributors address clinical, legal, and policy questions that are often overlooked in discussions of bioethics and health equity. Key topics include infrastructural and financial limitations on health service delivery, care quality, ethical implications of overreliance on volunteers, and policy reforms needed to enhance the sustainability and effectiveness of rural emergency services.

References

1. King N, Pigman M, Huling S, Hanson B. EMS services in rural America: challenges and opportunities. National Rural Health Association; 2019. Accessed November 4, 2024. https://www.ruralhealth.us/getmedia/cc0078fa-14d2-47eb-98a6-2bb6722e540c/2019-NRHA-Policy-Document-EMS-Services-in-Rural-America-Challenges-and-Opportunities.pdf
2. Alanazy ARM, Wark S, Fraser J, Nagle A. Factors impacting patient outcomes associated with use of emergency medical services operating in urban versus rural areas: a systematic review. *Int J Environ Res Public Health*. 2019;16(10):1728.
3. Patterson DG, Skillman SM, Fordyce MA. Prehospital emergency medical services personnel in rural areas: results from a survey in nine states. WWAMI Rural Health Research Center; 2015. Final report 149. Accessed November 4, 2024. https://depts.washington.edu/uwrhrc/uploads/RHRC_FR149_Patterson.pdf
4. Freeman VA, Rutledge S, Hamon M, Slifkin RT. Rural volunteer EMS: reports from the field. North Carolina Rural Health Research and Policy Analysis Center; 2010. Final report 99. Accessed November 4, 2024. https://www.shepscenter.unc.edu/wp-content/uploads/2014/10/FR99.pdf

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CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

When Is It Acceptable to Terminate Resuscitation in Prehospital Settings?

Christopher Libby, MD, MPH and Scott H. Pasichow, MD, MPH

Abstract

Given advances in resuscitation science that bring advanced cardiac life support (ACLS) to prehospital settings, emergency medical technicians (EMTs) and paramedics must make decisions about whether and when to terminate resuscitation and to transport a patient for whom ACLS is unsuccessful. Protocols for both vary across the United States. This article reviews ethical and scientific features of EMTs' and paramedics' decisions to initiate, continue, or terminate resuscitation.

Case

FF is 78 years old and found on the floor in her home by her adult child, JJ. FF is unresponsive and without a pulse; JJ immediately calls 911. A local volunteer emergency medical services (EMS) team—an ambulance with an emergency medical technician (EMT) and a paramedic—arrives promptly at the scene and initiates cardiopulmonary resuscitation (CPR) and advanced cardiac life support (ACLS). After 20 minutes without return of spontaneous circulation (ROSC), the paramedic determines FF to be dead. The paramedic explains to JJ that the team will call the county coroner to certify FF's death rather than transport FF to the nearest hospital, which is about 30 miles away. JJ asks, "Why don't you keep trying? Shouldn't you take FF to a hospital or at least call a doctor to make sure you've done all you can to save my mother?"

Commentary

Out-of-hospital cardiac arrest affects about 350 000 people per year in the United States; the rate of survival to discharge from the hospital is roughly 10.5% in the United States.[1] Factors such as a witnessed cardiac arrest, bystander CPR, duration of CPR less than 15 minutes, and response to initial treatments greatly improve the odds of not only ROSC but also survival to hospital discharge.[2,3] Advances in prehospital medicine have brought ACLS—similar to that provided in many emergency departments—to the patient in the field via highly trained paramedics, without the delays and interruptions in resuscitation that transport to the hospital entails while CPR and ACLS are ongoing. Given the advances in prehospital resuscitation that have brought ACLS to the patient before they are brought to the hospital, a decision must be made by prehospital clinicians about when and which patients should be transported to a hospital and when

to terminate resuscitation on scene because additional care would be futile, ie, would no longer accomplish the physiologic goal of survival.[4,5]

Decisions about whether to initiate, continue, or terminate resuscitation are some of the most challenging for clinicians to make and are followed by difficult family discussions. Clinicians not only must take into account the patient's and family's preferences and the potential benefits and harms of administering ACLS in the field but also must weigh the potential benefits of administering ACLS in the field against the harms of taking an ambulance out of service in the community for a longer period than if ACLS were initiated during transport. This case thus highlights how one of the most challenging discussions to have with patients' families is further complicated in the prehospital setting.

Prehospital Resuscitation

Prehospital resuscitation often begins with a bystander who, after calling EMS, communicates with a dispatcher who instructs the bystander on how to initiate CPR and dispatches emergency personnel of an appropriate level and number to a scene. EMS personnel are licensed or certified to provide prehospital care at 4 levels: emergency medical responder (EMR), EMT, advanced EMT, and EMT-paramedic. Paramedics are the only EMS personnel who are licensed to provide advanced life support (ALS) and ACLS throughout the country and are preferentially dispatched to cases involving cardiac arrest that would benefit from ACLS. Some EMS agencies might have limited access to paramedics and often dispatch EMTs to the scene to initiate basic life support until a paramedic can arrive or the patient can be transported to an emergency department. The scope of practice of EMS personnel is defined by a combination of national crisis standards of care, state regulatory requirements for licensure or certification, and protocols approved by their physician medical director.[6] The EMS medical director is responsible for not only the supervision of EMS personnel but also the continuous quality improvement of EMS policies and care delivery.[7] Whether the EMS team is volunteer or paid, the individuals on that team are all still credentialed and regulated by their own state regulatory agencies. In these ways, the EMS system can consistently ensure that the principles of beneficence, nonmaleficence, and justice are upheld at the patient and community level.

A decision of whether and when to start resuscitation is first and foremost made by prioritizing patient autonomy to the extent possible. In hospital settings, emergency personnel often have access to documentation regarding a patient's resuscitation preference if the patient has completed a Physician Order for Life Sustaining Treatment (POLST) or a Do Not Resuscitate (DNR) order with their physician. In the absence of a POLST or DNR or access to this documentation, a legal decision maker (if available), such as a health care proxy, legal guardian, or appropriate next of kin, should make the decision about resuscitation. If no one is available to assent to care, or those on scene do not refuse it, resuscitation is standard practice. However, resuscitation is not attempted if there are signs of irreversible death (eg, rigor mortis, dependent lividity [liver mortis], injuries not compatible with life, or decomposition).[8]

If a decision is made to attempt resuscitation, it must then be decided whether to treat a patient on scene or while transporting that patient to a hospital. Providing ACLS in a moving ambulance is particularly challenging due not only to the space limitations and unpredictability of a moving vehicle but also the limited number of personnel. Performing CPR is tiring, especially during a long transport, and not all EMS agencies

have access to automated compression devices that can provide consistent compressions during transport. Given these limitations—and that paramedics receive a high level of training to deliver a similar standard of care as in an emergency department—resuscitating a patient on scene not only is safer for the patient and EMS personnel but also can often result in better, uninterrupted care than trying to deliver care while moving the patient. A study of 15 383 matched patients showed that the survival rate with a favorable neurologic outcome among patients who were resuscitated on scene prior to transport was more than twice as high than among those who were immediately transported to the hospital.[9] This finding adds to the large body of literature demonstrating that high-quality CPR and ACLS with minimal interruptions provided by EMS on scene until ROSC leads to better outcomes for nontraumatic causes of cardiac arrest than extensive treatment during transport to the hospital.[10,11,12]

Terminating CPR

A decision to terminate resuscitation in hospital settings must account for many factors, including why the patient is suffering a cardiac arrest. Conditions such as acute blood loss can be more easily corrected than pulseless electrical activity caused by overwhelming sepsis. In the hospital, clinicians have access to more information about the patient's condition to guide their decision-making than in the prehospital setting. However, rates of survival and survival with meaningful neurologic function are still poor in the hospital setting. Studies have demonstrated that rates of survival of witnessed in-hospital cardiac arrests range from 7% to 26%.[3] Recent data have shown that performing ACLS immediately in the hospital setting does reach a point of diminishing returns: patients have less than a 1% chance of meaningful neurologic recovery (defined as moderate cognitive disability or better) at 32 minutes of ACLS and less than a 1% chance of survival to discharge at 39 minutes.[13,14] While this information is useful, it may not translate directly to the prehospital setting. In one study of out-of-hospital cardiac arrests, 90% of patients with good neurologic outcomes had ROSC within 20 minutes, and 99% within 37 minutes.[13] Those with favorable features—such as a shockable rhythm, bystander CPR, and a witnessed cardiac arrest—not only had a higher likelihood of ROSC with a favorable neurologic outcome but also shorter time to ROSC.[14] However, many EMS agencies work with their medical directors to create protocols for terminating CPR in the absence of robust professional society recommendations[15] that therefore have an exceedingly low likelihood of achieving a favorable outcome, similar to physicians making the decision in hospital settings.

Protocols

If ROSC is achieved by EMS personnel, transport to the hospital for continued care is the next step. However, CPR cannot continue indefinitely. For the patient, CPR is not without its own harms, such as broken ribs and anoxic brain injuries. When these risks outweigh the potential benefit of ROSC, offering continued CPR does not align with the principle of nonmaleficence. In addition, EMS agencies must consider whether it is fair to the rest of the community to have an ambulance unavailable to a patient suffering from a stroke, for example, in order to transport to the hospital a patient for whom the interventions that are possible are considered medically futile.[16] Providing care in an emergency vehicle can lead to injuries to EMS personnel, motor vehicle collisions, and decreased access to care for the community,[17,18] all of which harm the public.

EMS personnel work within protocols under the medical direction of a physician. Protocols for determination of when to terminate resuscitation are created by either state agencies or local agencies' EMS medical director. It is important to note that

physician oversight of the determination of death is necessary by state law but that this determination does not require a physician to be physically present with the patient at the time of determination. Thus, many protocols call for the paramedic on scene to act as a surrogate for the physician. To help guide the creation of these protocols, the National Association of EMS Physicians, the American Heart Association, and other organizations have endorsed criteria for the termination of resuscitation in the field.[17,19,20] The following are minimum criteria[21]:

- Cardiac arrest not witnessed by EMS personnel.
- Shockable rhythm not identified by an automated external defibrillator or electronic monitor.
- No ROSC during ACLS.

Since it has been shown that EMS personnel have low confidence in predicting the outcome of a cardiac arrest and can be conflicted about making a decision themselves,[22] discussion of terminating CPR in the field has focused on decision-aid protocols. Criteria for termination of resuscitation varies. For example, only around 50% of departments that have protocols for terminating resuscitation require online medical direction from a physician.[15] Additionally, even the duration of CPR in the emergency department before termination of resuscitation varies from 11 minutes to 45 minutes.[23] While no US-based agency has endorsed a specific duration for CPR, the European Resuscitation Council recommends at least 20 minutes.[24] When termination of resuscitation protocols are put into place, they become the standard of care for that department and, by following the protocol, the EMS personnel can feel confident that their decision-making is supported.

Conclusion

In this case, the EMS team performed ACLS for 20 minutes with no ROSC or other signs of reversible causes of cardiac arrest. Some have argued that, even in cases with exceedingly poor chances of ROSC in which the family desires resuscitation, EMS personnel should consider the family at bedside and perform CPR for a short time to show the family that everything was done and to help with closure.[25] However, continuing CPR when the chances of meaningful survival are exceedingly poor is also not always in the best interest of the patient whose chest is being compressed repeatedly. By following the department policy on termination of resuscitation approved by the medical director, a paramedic would be within the standard of care. Although difficult to make, decisions to terminate resuscitation must both respect the patient's dignity by not subjecting the patient to interventions with little benefit and uphold beneficence by emotionally supporting the loved one who is experiencing grief.[26] When discussing terminating resuscitation in the prehospital setting, the clinician must be honest about the futility of continuing treatment and make it clear that continued care would be the same as that delivered in an emergency department but is often at the expense of a patient's dignity.

References

1. Virani SS, Alonso A, Aparicio HJ, et al; American Heart Association Council on Epidemiology, Prevention Statistics Committee, Stroke Statistics Subcommittee. Heart disease and stroke statistics—2021 update: a report from the American Heart Association. *Circulation*. 2021;143(8):e254-e743.

2. Gräsner JT, Herlitz J, Tjelmeland IBM, et al. European Resuscitation Council guidelines 2021: epidemiology of cardiac arrest in Europe. *Resuscitation*. 2021;161:61-79.
3. Cheema MA, Ullah W, Abdullah HMA, Haq S, Ahmad A, Balaratna A. Duration of in-hospital cardiopulmonary resuscitation and its effect on survival. *Indian Heart J*. 2019;71(4):314-319.
4. Schneiderman LJ, Jecker NS, Jonsen AR. Medical futility: its meaning and ethical implications. *Ann Intern Med*. 1990;112(12):949-954.
5. Anderson NE, Gott M, Slark J. Beyond prognostication: ambulance personnel's lived experiences of cardiac arrest decision-making. *Emerg Med J*. 2018;35(4):208-213.
6. Hanfling D, Altevogt BM, Viswanathan K, Gostin LO, eds; Institute of Medicine. *Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response*. National Academies Press; 2012.
7. Physician oversight of emergency medical services. *Prehosp Emerg Care*. 2017;21(2):281-282.
8. Mancini ME, Diekema DS, Hoadley TA, et al. Part 3: ethical issues: 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2015;132(18)(suppl 2):S383-S396.
9. Grunau B, Kime N, Leroux B, et al. Association of intra-arrest transport vs continued on-scene resuscitation with survival to hospital discharge among patients with out-of-hospital cardiac arrest. *JAMA*. 2020;324(11):1058-1067.
10. Cheskes S, Schmicker RH, Verbeek PR, et al; Resuscitation Outcomes Consortium (ROC) Investigators. The impact of peri-shock pause on survival from out-of-hospital shockable cardiac arrest during the Resuscitation Outcomes Consortium PRIMED trial. *Resuscitation*. 2014;85(3):336-342.
11. Lo AX. Challenging the "scoop and run" model for management of out-of-hospital cardiac arrest. *JAMA*. 2020;324(11):1043-1044.
12. Adams BD, Benger J. Should we take patients to hospital in cardiac arrest? *BMJ*. 2014;349:g5659.
13. Reynolds JC, Grunau BE, Rittenberger JC, Sawyer KN, Kurz MC, Callaway CW. Association between duration of resuscitation and favorable outcome after out-of-hospital cardiac arrest: implications for prolonging or terminating resuscitation. *Circulation*. 2016;134(25):2084-2094.
14. Okubo M, Komukai S, Andersen LW, et al; American Heart Association Get With the Guidelines—Resuscitation Investigators. Duration of cardiopulmonary resuscitation and outcomes for adults with in-hospital cardiac arrest: retrospective cohort study. *BMJ*. 2024;384:e076019.
15. Li T, Koloden D, Berkowitz J, et al. Prehospital transport and termination of resuscitation of cardiac arrest patients: a review of prehospital care protocols in the United States. *Resusc Plus*. 2023;14:100397.
16. Slattery DE, Silver A. The hazards of providing care in emergency vehicles: an opportunity for reform. *Prehosp Emerg Care*. 2009;13(3):388-397.
17. National Association of EMS Physicians. Termination of resuscitation in nontraumatic cardiopulmonary arrest. *Prehosp Emerg Care*. 2011;15(4):542.
18. Ambulance Crash Subcommittee. Development of a comprehensive national ambulance crash data collection platform to better understand current crashes and guide future preventive strategies. National Emergency Medical Services Advisory Council; 2024. Accessed February 21, 2025.

https://www.ems.gov/assets/FINAL---[ad-hoc]---Comprehensive-Nat'l-Ambulance-Crash-Database---2024.05.02.pdf
19. Morrison LJ, Kierzek G, Diekema DS, et al. Part 3: ethics: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(18)(suppl 3):S665-S675.
20. Bosslet GT, Pope TM, Rubenfeld GD, et al; American Thoracic Society ad hoc Committee on Futile and Potentially Inappropriate Treatment; American Thoracic Society; American Association for Critical Care Nurses; American College of Chest Physicians; European Society for Intensive Care Medicine; Society of Critical Care. An official ATS/AACN/ACCP/ESICM/SCCM policy statement: responding to requests for potentially inappropriate treatments in intensive care units. *Am J Respir Crit Care Med*. 2015;191(11):1318-1330.
21. Libby C, Skinner RB, Rawal AR. EMS termination of resuscitation and pronouncement of death. In: *StatPearls*. StatPearls Publishing; 2022. Accessed March 31, 2025. https://www.ncbi.nlm.nih.gov/books/NBK541113/
22. Mao DRH, Ong MEH, Bang C, Salim MDT, Ng YY, Lie DA. Psychological comfort of paramedics with field death pronouncement: a national Asian study to prepare paramedics for field termination of resuscitation. *Prehosp Emerg Care*. 2018;22(2):260-265.
23. Cha WC, Lee EJ, Hwang SS. The duration of cardiopulmonary resuscitation in emergency departments after out-of-hospital cardiac arrest is associated with the outcome: a nationwide observational study. *Resuscitation*. 2015;96:323-327.
24. Bossaert LL, Perkins GD, Askitopoulou H, et al; The Ethics of Resuscitation and End-of-Life Decisions Section Collaborators. European Resuscitation Council guidelines for resuscitation 2015: section 11. The ethics of resuscitation and end-of-life decisions. *Resuscitation*. 2015;95:302-311.
25. Ågård A, Herlitz J, Castrén M, Jonsson L, Sandman L. Guidance for ambulance personnel on decisions and situations related to out-of-hospital CPR. *Resuscitation*. 2012;83(1):27-31.
26. Ferdynus MP. Why the term "persistent therapy" is not worse than the term "medical futility." *J Med Ethics*. 2022;48(5):350-352.

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Editor's Note

The case to which this commentary is a response was developed by the editorial staff.

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The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

According to Which Criteria Should a Return EMS Trip of Long Duration and Distance Be Deemed Ethically Justifiable?

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Abstract

Assessing and adequately documenting a patient's decision-making capacity is a responsibility and skill required of all emergency medical services (EMS) personnel. However, emergency medical technicians' and paramedics' training in a patient's refusal of EMS transport is often limited to evaluating that patient's alertness and orientation. This commentary argues that this approach is too narrow and outlines the obligation of prehospital care personnel to examine the patient thoroughly, obtain a complete set of vital signs, explain prospective risks and benefits of EMS transport, determine capacity, and express support for the patient. Finally, the commentary outlines what it means to appropriately document a prehospital interaction with a patient and express respect for decisions of patients with capacity.

Case

TJ is a paramedic on an emergency medical services (EMS) team that serves a rural community who responds to a call involving a patient, RB, suspected by the caller of having overdosed. TJ's team arrives and finds RB unresponsive, with shallow and irregular breathing, pinpoint pupils, and a bluish tint to the skin. TJ suspects opioid toxicity and administers naloxone. RB regains consciousness, then adamantly declines transport to the nearest hospital (50 miles away), saying, "I'll be charged with possession if I go to the hospital. I'm fine now, and I can manage on my own." RB is known to the local EMS community as previously having refused transport to the hospital. On one prior occasion, the same EMS team had to be called back to RB's home a couple of hours after the initial EMS visit because RB's condition had worsened. RB has the decision-making capacity to autonomously refuse, but TJ still considers how to best address RB's current refusal.

Commentary

What should be the nature and scope of EMS workers' regard for the autonomy of a patient whose risk of harm is exacerbated by long transport distance? Respect for patient autonomy is not just a principle but a crucial aspect of EMS clinicians' responsibilities, regardless of the distance and duration of the transport or return trip. All prehospital care personnel should receive focused education on determining and

documenting the presence, or lack thereof, of decision-making capacity, as this topic is included in national EMS core content.[1] Competence and capacity are commonly confused, with the former being a legal designation and the latter determined by clinical assessment. Up to 20% of EMS calls for service will result in a refusal of transport,[2] underlining this topic's importance. Initial and ongoing education on patient refusal, autonomy, and decision-making capacity must be proactively emphasized throughout prehospital education and training programs.

In my experience as an EMS educator and medical director, "alert and oriented x 3" (awake, alert, and oriented) alone is sometimes an adequate assessment of decision-making capacity. But EMS personnel should consider 4 specific areas to more fully assess a conscious patient's decision-making capacity.[3,4]

1. *Understanding.* A patient must be able to understand relevant information. Understanding can be assessed by asking a patient to state in their own words the problem, and, after an explanation has been provided, the recommended care (including transport), the benefits of accepting care, the risks of refusing care, and alternatives.

2. *Appreciation of the situation and consequences*. A patient must be able to appreciate their condition and how their decision to accept or refuse care will influence their condition.

3. *Reasoning*. The patient must be able to offer reasons for selecting an option and communicate why a particular option is better for them. Note that this element focuses on a patient's ability to reason, not on the outcome of the patient's choice, as patients are entitled to make choices not seen as reasonable from a clinical standpoint.

4. *Communication of choice*. A patient must be able to communicate a choice when presented with options.

External influences should also be considered. Drugs and alcohol, for example, can influence a patient's decision-making capacity, but substance ingestion does not always mean that a patient lacks capacity. Intoxication must be carefully and thoroughly evaluated via clinical examination of actions such as gait, speech, cognitive function, and ability to interact with the external environment (eg, by using their phones).

Prehospital care personnel then must ensure that a patient can express their choice in clear, understandable terms. A standard EMS and hospital refrain is to tell patients that "they could die" if they refuse care. This assertion is obviously true in some cases but hyperbolic in many others. It can express a legal self-protection impulse by the EMS clinician, but, importantly, this kind of worst-case scenario thinking tends to be clinician centered and might not result in transport conversion and adequate treatment initiation, which could be especially harmful if that patient is critically ill.

Lastly, concise yet thorough documentation of a patient's decision-making capacity is required, although prehospital protocols for refusal documentation that prompt capacity assessment are not consistently implemented[5,6] and there are no "gold-standard" criteria for prehospital capacity assessment.[7] Importantly, imperfect execution of

capacity determinations is not exclusive to emergency medical technicians (EMTs) and paramedics.[8]

Refusal of Transport

The rate of refusal of care in prehospital settings is much higher than the rate of discharge from a hospital against medical advice.[2,9] This finding is presumably due to the presence of second- and third-party callers in the prehospital environment. Patients are often attended to by EMS without ever having requested assistance themselves. An example that frequently results in transport refusals is when well-intentioned bystanders call 9-1-1 when driving past a motor vehicle collision; thus, not all refusals of EMS transport are high-risk refusals. In fact, most transport refusals pose only low risk.[10] High-risk refusals can be those in which EMS personnel identify signs of illness that suggest a higher likelihood of decompensation. These signs might be objective, such as abnormal vital signs, rather than subjective findings like diaphoresis or pallor. EMS protocols should delineate high-risk as well as "difficult" refusal situations, such as when a patient's decision-making capacity is in question. If these occur in tandem, one could assume a significant increase in patient risk. EMS systems should have protocols to escalate these critical situations to online medical director consultation, as physician input significantly increases conversion from refusal to transport.[11]

In the case of an opioid overdose with subsequent naloxone administration, EMS workers' respect for a patient's decision to refuse transport must be informed by their experience and training. A high-risk refusal, for example, could involve hypoxia and respiratory difficulty secondary to intoxication and altered mental status. Recent data suggest an increased risk of future overdose when a patient refuses EMS transport following naloxone administration.[12] However, prehospital care of opioid ingestion patients refusing transport has rapidly evolved to include "leave-behind" naloxone programs and buprenorphine protocol initiation.[13,14,15] These initiatives will drastically augment care options for prehospital care personnel attending to patients with opioid use disorder though they might not be available in many rural areas, where long distances and the availability of return transportation are just two of the many barriers that can increase the level of resistance to EMS transport. While repeat presentations can be frustrating for clinicians at all levels in all medical settings, it is essential to retain an open mind in every situation to provide high-level patient care.

Adequate documentation of prehospital interactions is the final piece of transport refusal. An EMS patient refusal record should contain substantially more than a generic signature. In our teaching at the Montgomery County Hospital District EMS system, we have implemented the FEARS mnemonic to guide EMS clinicians through the patient refusal process: F = full exam and vitals; E = explanation of actual patient-oriented risks of transport refusal; A = asking for assistance (eg, from family, law enforcement, other first responders) with conversion; R = recording of the event thoroughly and accurately; and S = supportive attitude throughout. Every patient refusal of transport should engender a healthy amount of "FEARS."

However, RB is concerned about being charged on arrival at the hospital, which suggests that RB perceives law enforcement as a hindrance to seeking care. Yet EMS and law enforcement partnerships are crucial in numerous patient care exigencies, such as mass casualty and disaster situations. Law enforcement officers can assist in persuading patients to seek necessary medical care, and police transport of penetrating trauma patients has even demonstrated similar outcomes to EMS transport.[16] In making

decisions about transport in these situations, I recommend that prehospital care personnel focus on medical necessity and potential for clinical decompensation, as this is their area of expertise. Further research and guidance are needed to better streamline law enforcement's and EMS' joint response to opiate overdoses, as law enforcement officers and paramedics value a collaborative relationship but struggle with competing clinical and public safety priorities.[17]

Return Trips?

When, if ever, is a signed refusal of transport form sufficient clinical, legal, or ethical justification not to make a return trip for a patient? Except in situations where prehospital care personnel safety is at risk, a past, signed refusal plays no role in the duty to respond to a 9-1-1 call for emergency medical care—the patient has the right to revoke their refusal of treatment at any time. When safety concerns are present, EMS staging while awaiting law enforcement clearance is standard practice. Dispatch caution notes can also be created that tag specific addresses and alert EMS crews to potential difficulties and dangers at particular locations. However, these notes should be monitored closely to avoid inadvertent care delays.

In rural communities that utilize volunteer EMTs and paramedics, it is important to remember that even volunteers must be licensed. Cash et al found that 13% of prehospital care personnel report a volunteer position as their main EMS job, with volunteers being more likely to be EMTs.[18] While core EMS educational content does include capacity assessment,[1] budgetary constraints in volunteer EMS systems may limit continuing medical educational opportunities in this high-risk area. Additionally, rural communities might have fewer transport units available, which affects a system's ability to respond to frequent 9-1-1 callers by lengthening transport durations.[19] Regardless of prehospital personnel pay status, location, or potential legal concerns, a patient-centric prehospital approach that includes EMS personnel establishing decision-making capacity while providing the patient with an explanation of actual risks, followed by appropriate documentation, is the key to obtaining a proper EMS refusal of transport.

References

1. Delbridge TR, Dyer S, Goodloe JM, et al. The 2019 core content of emergency medical services medicine. *Prehosp Emerg Care*. 2020;24(1):32-45.
2. Harrison NE, Ehrman RR, Curtin A, et al. Factors associated with voluntary refusal of emergency medical system transport for emergency care in Detroit during the early phase of the COVID-19 pandemic. *JAMA Netw Open*. 2021;4(8):e2120728.
3. Appelbaum PS. Clinical practice. Assessment of patients' competence to consent to treatment. *N Engl J Med*. 2007;357(18):1834-1840.
4. Patient autonomy and destination factors in emergency medical services (EMS) and EMS-affiliated mobile integrated healthcare/community paramedicine programs. *Ann Emerg Med*. 2018;72(4):e57-e58.
5. Stuhlmiller DF, Cudnik MT, Sundheim SM, Threlkeld MS, Collins TE Jr. Adequacy of online medical command communication and emergency medical services documentation of informed refusals. *Acad Emerg Med*. 2005;12(10):970-977.
6. Weaver J, Brinsfield KH, Dalphond D. Prehospital refusal-of-transport policies: adequate legal protection? *Prehosp Emerg Care*. 2000;4(1):53-56.
7. O'Connor L, Porter L, Dugas J, et al. Measuring agreement among prehospital providers and physicians in patient capacity determination. *Acad Emerg Med*. 2020;27(7):580-587.

8. Evans K, Warner J, Jackson E. How much do emergency healthcare workers know about capacity and consent? *Emerg Med J*. 2007;24(6):391-393.
9. Lee CA, Cho JP, Choi SC, Kim HH, Park JO. Patients who leave the emergency department against medical advice. *Clin Exp Emerg Med*. 2016;3(2):88-94.
10. Yeung T, Shannon B, Perillo S, Nehme Z, Jennings P, Olaussen A. Review article: outcomes of patients who are not transported following ambulance attendance: a systematic review and meta-analysis. *Emerg Med Australas*. 2019;31(3):321-331.
11. Burstein JL, Hollander JE, Delagi R, Gold M, Henry MC, Alicandro JM. Refusal of out-of-hospital medical care: effect of medical-control physician assertiveness on transport rate. *Acad Emerg Med*. 1998;5(1):4-8.
12. Zozula A, Neth MR, Hogan AN, Stolz U, McMullan J. Non-transport after prehospital naloxone administration is associated with higher risk of subsequent non-fatal overdose. *Prehosp Emerg Care*. 2022;26(2):272-279.
13. Naumann J, Benson J, Lamberson M, et al. At-risk patient documentation and naloxone dispersal for a rural statewide EMS "naloxone leave behind" program. *J Am Coll Emerg Physicians Open*. 2024;5(3):e13186.
14. Carroll GG, Wasserman DD, Shah AA, et al. Buprenorphine field initiation of rescue treatment by emergency medical services (Bupe FIRST EMS): a case series. *Prehosp Emerg Care*. 2021;25(2):289-293.
15. Hern HG, Lara V, Goldstein D, et al. Prehospital buprenorphine treatment for opioid use disorder by paramedics: first year results of the EMS buprenorphine use pilot. *Prehosp Emerg Care*. 2023;27(3):334-342.
16. Winter E, Hynes AM, Shultz K, Holena DN, Malhotra NR, Cannon JW. Association of police transport with survival among patients with penetrating trauma in Philadelphia, Pennsylvania. *JAMA Netw Open*. 2021;4(1):e2034868.
17. Menendez K, Curie R, Bales T, Greenfield K, Moore KA. EMS paramedics and law enforcement officers' experiences with joint-response efforts on suspected opioid overdose calls: a qualitative study. *J Behav Health Serv Res*. 2024;51(4):482-498.
18. Cash RE, Rivard MK, Chrzan K, Mercer CB, Camargo CA Jr, Panchal AR. Comparison of volunteer and paid EMS professionals in the United States. *Prehosp Emerg Care*. 2021;25(2):205-212.
19. MacKinney AC, Mueller KJ, Coburn AF, Knudson A, Lundblad JP, McBride TD. Characteristics and challenges of rural ambulance agencies—a brief review and policy considerations. Rural Policy Research Institute; 2021. Accessed February 4, 2025. https://rupri.org/wp-content/uploads/Characteristics-and-Challenges-of-Rural-Ambulance-Agencies-January-2021.pdf

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CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

When Is It Justifiable for an Inexperienced but Licensed Clinician to Perform a High-Risk but Low-Frequency Procedure on a Patient in a Prehospital Setting?

Elizabeth Reiche, DO, Shaila Coffey, MD, and Emma Zeratsky, NRP, FP-C

Abstract

In prehospital settings, clinicians make difficult decisions that need to be made in short periods of time and be within their scope of practice, procedural skill set, and appropriate to their training and preparation. This commentary on a case offers a just culture approach to learning, especially after sentinel events.

Case

A dispatcher fields a call in a rural community from parents whose child is in sudden respiratory distress from an unknown cause. An emergency medical technician (EMT) arrives at the scene and assesses the child, who struggles for breath with pronounced intercostal retractions and nasal flaring. The EMT concludes that the child's airway needs to be secured via intubation urgently and probably immediately on the scene. The child's respiratory distress escalates.

The EMT was recently certified in advanced cardiovascular life support (ACLS) through a program funded by the state to support rural emergency medical services (EMS). The EMT has, indeed, been trained to perform a pediatric intubation, which, despite being in the EMT's scope of practice, is infrequently needed, and the EMT has never actually intubated an adult or a child patient. Were the EMT to attempt to intubate the child, they would be drawing upon their textbook knowledge and patient simulation manikin training only. Despite their lack of experience, the EMT successfully intubated the patient.

In a subsequent debrief about this case, the EMT talked about feeling more relieved and fortunate that this specific intubation was successful than competent to perform the procedure.

Commentary

There are a few assumptions that need to be made before we discuss the scenario and its ethical implications.

1. The EMT-basic (EMT-basic, or EMT-B) is operating in a state in which it is within their scope of practice to intubate.

2. The EMT is not only certified in ACLS, as stated in the clinical scenario, but credentialed by their agency and medical director to perform intubation.

3. Intubation in the prehospital setting can be considered a high-risk, low-frequency procedure.

An understanding of scope of practice is imperative to discuss this case. In medicine, scope of practice is the legal description of the procedures and actions a clinician is authorized to perform. Generally, the EMT scope of practice does not include endotracheal intubation, based on the National EMS Scope of Practice Model.[1] The National EMS Scope of Practice Model document provides recommendations on scope of practice for emergency medical responder (EMR), EMT, EMT-advanced (EMT-A), and paramedic.[1] Based on the guidelines, intubation requires the additional didactic and psychomotor training provided at the paramedic level of education.[1] However, it is up to each state to determine what the specific scope of practice will be for each level of training. For this reason, the state is purposely not named in this scenario, and we can infer that this specific state allows EMTs to intubate.

Past research has examined EMTs' competence in performing intubation. In a study published in 1998 by Sayre et al, 66 EMT-Bs were "authorized to perform intubation in the field" after a course on airway management in which they accrued 10 hours of experience over a period of at least 2 weeks.[2] EMT-Bs attempted endotracheal intubation in 103 patients; the attempt was successful in 53, and the remainder, except 6, were intubated by paramedics. The relatively low success rate and repeated attempts (1 attempt at intubation was made in 52 patients, 2 attempts in 44, and 3 attempts in 7) suggest an inadequate endotracheal intubation training model at that time—specifically, in the 1994 EMT-B curriculum.[2] Also in 1998, Bradley et al compared EMT-B and paramedic success rates for intubation.[3] Thirty-four of 87 EMT-Bs who underwent 9 hours of airway manikin training and didactics, adapted from the national paramedic curriculum, attempted to intubate 57 eligible patients. Successful endotracheal tube placement was confirmed by the receiving physician in 49.1% of patients, whereas previous studies reported success rates for manikin-trained paramedics ranging from 76.9% to 90.6%.[3] Lastly, Pratt and Hirshberg prospectively evaluated over a 4-year period intubations by rural EMT-Bs who were participating in a special waiver project to give them training and supervised practice in the procedure.[4] The EMT-Bs were trained using a paramedic curriculum and performed live intubations on operating room patients undergoing cardiopulmonary or respiratory arrest, which sets this study apart from previous studies. Of 32 intubations performed over 4 years, 30 were successful and 2 were unsuccessful, and no esophageal intubations were noted. The study authors noted that these EMT-Bs were highly motivated, closely monitored, and achieved acceptable success rates in patients in cardiac and respiratory arrest.[4]

From the literature currently available, it is evident that, unless dedicated training is provided at a paramedic's educational level with close monitoring, EMT-Bs do not achieve intubation success rates comparable to those of paramedics.[2,3,4] These findings support the National EMS Scope of Practice Model recommendations that require first responders who perform intubation to have paramedic-level training.[1]

Risk-Benefit Analysis

Prior to doing any procedures, a clinician in a prehospital setting must perform a risk-benefit analysis. The risk of any medical procedure that is low frequency cannot be understated, as skill proficiency can diminish due to decreased utilization. In EMS, lower intubation success rates have been found in paramedics who attempt to perform fewer than 5 intubations a year.[5] ACLS training can introduce airway management, but it is not an airway course. The clinician in this case has no experience and very little training in the procedure in the first place, making mastery of the skill upon completion of initial training unlikely. In fact, the ACLS instructor materials state that clinicians should not perform skills learned in the course that are outside of their training level.[6] Such training provides theoretical knowledge but no real-world experience or precepted intubations. We can infer that the EMT in this case is not comfortable with the procedure by the EMT's feeling "more relieved and fortunate" about the successful intubation than competent to perform intubation generally. Therefore, it can be surmised that the training of the EMT was not adequate for performance of the procedure.

A risk-benefit analysis should also examine procedural complexity. Intubation can be incredibly complex. It is a skill that is honed by repetition. The complications of an ill-fated intubation are catastrophic. It is important for clinicians to be confident in their skill set and to have adjuncts as backup during these critical procedures or to have mutual aid personnel available. Supraglottic airways have been shown to be safer than endotracheal tube placement in the prehospital environment due to the low frequency of the latter.[7] Clinicians thus should have a sufficient knowledge base to make the call about advanced airway management and to assess which interventions might be needed to best help the patient.

Obtaining a history quickly from bystanders in a situation of respiratory distress enables the clinician to best prepare for care of the patient, along with placing the patient on the monitor and evaluating their vital signs before a procedure. The child in this case is in immediate danger with life-threatening respiratory distress. However, we do not know the etiology of the child's respiratory distress or any additional history, vital signs, or other information regarding patient presentation. There is a time sensitive window to intubate a hypoxic child, but preparation is key in these situations. Waiting might cause the patient to experience respiratory arrest and sustain an anoxic brain injury. Yet rushing can lead to missed steps and equipment, unsuccessful intubation of the patient, or, even worse, esophageally intubating the patient. Many EMS agencies have moved to airway checklists as a part of their rapid sequence intubation protocols to ensure that nothing is missed in these high-stress situations, along with scenario-based training to augment muscle memory for such a high-risk, low-frequency procedure. Implementing an airway checklist may be a consideration for this EMS system in future critical situations.

In general, clinicians must weigh the need for procedures against their risk while considering the ethical principles of beneficence and nonmaleficence. As clinicians, the procedures we do should benefit the patient and avoid harming the patient. In this case, we would conclude that the risk of intubation was justified based on the information provided in the clinical vignette.

If this scenario could happen again, which is possible in a rural community that may have few or no paramedics, then additional training in advanced procedures, fundamental airway assessment, and different scenarios are needed at the EMT level.

We recommend that the EMS physician medical director emphasize continuing education for staff in this personnel category, frequent manikin practice, and practice in low-frequency, high-risk procedures. There might be opportunities for the EMTs in this system to get time in the operating room to do precepted intubations, get education from anesthesiologists, and further hone their skill set to help keep themselves sharp and their patients safe.

Avoiding Unjustifiable Risk

In this situation, a sentinel event should prompt a "just culture" review of the event. Just culture is a concept describing how organizations strive to create a balanced response to errors and mistakes, fostering a culture in which individuals feel safe to report errors and near-misses in the spirit of patient safety. A just culture approach to error management simply asks what process is to blame instead of who is to blame and aims to bridge the gap between blame-free culture and punitive culture. Management and staff have shared accountability for behavioral choices that lead to risk or error as they work toward realizing error-free and patient-centered care.[8]

Taking a just culture approach, we must first assume the positive intent of the EMT in this case. Based on their training and scope of practice in their state, did they act as another reasonable EMT would act? Have they kept up on their continuing medical education and come to competency training and checkoffs with their physician medical director?

As clinicians, we have a duty to avoid unjustifiable risk or harm. By using a simple series of questions, we can categorize behaviors into 1 of 3 categories: simple mistake, at-risk behavior, or reckless behavior.[9] Focusing on the action of intubation of this child, was it the EMT's purpose to cause harm to the patient? I would argue no, based on the limited information given to us. Did the EMT consciously decide to cause harm? Yes or no. If yes, then ask was the harm—risking failure or complications—justified as the lesser of 2 evils, the other being the death of the patient? Yes. The outcome of this line of questioning would be to support the clinician.

If the answer to the question of whether the EMT consciously decided to cause harm is no, then the further question is whether the behavior represented a substantial and unjustifiable risk. In this case the risk leans towards justifiable, as the intention was to successfully intubate the child and save their life. The outcome from this series of questions would be to consider no punitive action against the employee. The EMT cannot be blamed for the system failure in this case.

Based on our analysis, we would categorize the behavior in this case as at-risk.

Debrief

In addition to the post-event analysis, the EMS supervisor should consider debriefing the EMT. EMTs may experience significant emotional trauma and distress after a critical incident like this.[10,11] However, there are considerations to be made here. There is literature on psychological debriefing and its effect on posttraumatic stress disorder (PTSD). In a systematic review, Rose et al found that critical incident stress, or psychological, debriefing, which is a one-time session of mandatory debriefing, after a traumatic event did not prevent secondary traumatization or reduce the risk of PTSD.[12] They proposed that a screen-and-treat model might be more appropriate, as single-session debriefing increased the risk of PTSD in studies in which follow-up was

conducted.[12] A debrief should occur—but after the EMT has had time to process the event and on the EMT's own terms, so that psychological trauma can be minimized.

In prehospital settings, there are many urgent treatment choices that must be made. We do not want to provide substandard care to our rural communities by lowering the bar for care, but we also do not want to make the standards so restrictive that no one meets them. By implementing a combination of the strategies listed above, EMS systems can significantly improve their ability to manage critical pediatric cases, even in resource-limited environments. One can always call one's medical director or a local hospital for guidance. This EMT may have demonstrated at-risk behavior, but, based on a just culture review of the event, they should be supported in their call. Although sentinel event review of this case is called for, system changes, such as additional educational opportunities, could be made to better support the EMTs and future patients in the community.

References

1. National Highway Traffic Safety Administration. National EMS scope of practice model 2019: including change notices 1.0 and 2.0. US Department of Transportation; 2021. DOT HS 813 151. Accessed March 31, 2025. https://rosap.ntl.bts.gov/view/dot/56917
2. Sayre MR, Sakles JC, Mistler AF, Evans JL, Kramer AT, Pancioli AM. Field trial of endotracheal intubation by basic EMTs. *Ann Emerg Med*. 1998;31(2):228-233.
3. Bradley JS, Billows GL, Olinger ML, Boha SP, Cordell WH, Nelson DR. Prehospital oral endotracheal intubation by rural basic emergency medical technicians. *Ann Emerg Med*. 1998;32(1):26-32.
4. Pratt JC, Hirshberg AJ. Endotracheal tube placement by EMT-basics in a rural EMS system. *Prehosp Emerg Care*. 2005;9(2):172-175.
5. Burton JH, Baumann MR, Maoz T, Bradshaw JR, Lebrun JE. Endotracheal intubation in a rural EMS state: procedure utilization and impact of skills maintenance guidelines. *Prehosp Emerg Care*. 2003;7(3):352-356.
6. *Advanced Cardiovascular Life Support Instructor Manual.* American Heart Association; 2020.
7. Ostermayer DG, Camp EA, Langabeer JR, et al. Impact of an extraglottic device on pediatric airway management in an urban prehospital system. *West J Emerg Med*. 2019;20(6):962-969.
8. National Association of Emergency Medical Technicians. NAEMT position statement: just culture in EMS. National Association of Emergency Medical Technicians. Accessed July 13, 2024. https://www.naemt.org/docs/default-source/advocacy-documents/positions/Just_Culture_in_EMS.pdf
9. Rogers E, Griffin E, Carnie W, Melucci J, Weber RJ. A just culture approach to managing medication errors. *Hosp Pharm*. 2017;52(4):308-315.
10. Wu AW. Medical error: the second victim. The doctor who makes the mistake needs help too. *BMJ*. 2000;320(7237):726-727.
11. Scott SD. The second victim phenomenon: a harsh reality of health care professions. Agency for Healthcare Research and Quality. May 1, 2011. Accessed August 1, 2024. https://psnet.ahrq.gov/perspective/second-victim-phenomenon-harsh-reality-health-care-professions
12. Rose S, Bisson J, Churchill R, Wessely S. Psychological debriefing for preventing post traumatic stress disorder (PTSD). *Cochrane Database Syst Rev*. 2002;(2):CD000560.

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MEDICAL EDUCATION: PEER-REVIEWED ARTICLE

How Should We Fund and Reimagine EMS to Support Sustainable Rural Health Infrastructure?

Michael Levy, MD

Abstract

Emergency medical services (EMS) care in rural areas of the United States has suffered from being chronically under-resourced and understaffed for many years. Deficits, to a large extent, are due to how EMS is funded and due to shortfalls in staffing and equipment. Licensed volunteers often staff EMS units in rural areas, but recruitment and retention of skilled professional and volunteer caregivers is stifled by waning numbers. If further expansion of our nation's ambulance deserts is to be avoided, policy action must be taken to adequately fund, as well as to reimagine, rural EMS care.

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Accidental Death and Disability

Rural, remote, and frontier areas in the United States are subject to scarce emergency medical services (EMS) resources, and, without significant changes in funding and staffing, there is every reason to be concerned that this situation will worsen. The Maine Rural Health Research Center identified "ambulance deserts" (areas where people live more than 25 minutes from an ambulance station) based on analysis of ambulance location data acquired for 41 of 50 states in 2021-2022, as well as US census data. Among the concerning findings were that 4.5 million people lived in such areas (52% are rural residents) and that 8 states had fewer than 3 ambulances covering every 1000 square miles of land area.[1] This article will examine the structure and funding of the US EMS system and delivery models and contrast US EMS to how other countries attempt to create a more equitable EMS response. To better understand how this inequity came to be, it is necessary to review a brief history of the US EMS system.

History of EMS

The origins of our EMS system are generally attributable to a seminal 1966 white paper by the National Academy of Sciences and National Research Council titled "Accidental Death and Disability: The Neglected Disease of Modern Society,"[2] which exposed the nation's lack of an effective system for treating and transporting the sick and injured. Initial federal funding for the system in the early 1970s was through the US Department

of Transportation but in 1981 was transitioned to block grants to states, where the organization and regulation of EMS resides to this day.[3] Ceding authority and funding to the states has led to each state overseeing its own EMS system and created significant nationwide variation and disparities. That the National Highway Traffic Safety Administration is the government agency that provides EMS oversight[4] illustrates that EMS was envisioned more as a transportation modality than as an extension of the health care system.

As EMS matured and became more professional, more complicated, and more expensive, rural EMS has not been able to keep pace. If rural EMS is to meet its potential and the needs of its population, it will require doing the following:

- Providing funding that is independent of the tax base in areas of low population density
- Ensuring predictable staffing and establishing training and certification that is appropriate to the geography and population needs
- Leveraging recruitment and retention through the sense of community and pride of place that is common among EMS volunteers yet only sustainable through measures such as salary support, tax credits, loan forgiveness, or other innovative payment-in-kind programs.

Funding EMS

Unlike law enforcement and fire protection services, EMS is not federally recognized as an essential government service and only designated by statute as such in roughly a quarter of states; in many of those states there is still no associated funding.[5,6] Thus, in most states, the provision and funding levels of EMS are determined at the community level.[7] States regulate EMS licensure, scope of practice, and ambulance standards,[8] among other aspects of how EMS is delivered, but, in the absence of specific regulations mandating the provision of EMS in communities, it falls upon the local jurisdictions to decide what, if any, EMS will be available. The EMS response in a town could be limited to basic first responders—a "squad" or other public servants, such as law enforcement, with first aid skills—while a neighboring town may provide EMS by using fire equipment and crews to provide care but without transport capability. Other communities may have ambulance services at a basic or advanced level. More services, more apparatus, and increased levels of EMS training would generally be deemed desirable but come with increased costs and complexity.

Funding for EMS in the United States is varied. Larger communities commonly fund EMS through tax assessments on property or similar means. Rural areas with lower population densities and lower per capita incomes are often unable or unwilling to level additional taxes for this purpose. While there is some ability to bill the patient for the service, reimbursement is mostly limited to payment for transport to the hospital, frequently amounting to less than the true cost of the service.[9] In rural areas with low patient volumes and often with a low prevalence of third-party insurance, the payments are paltry relative to expense.[9] In addition, there might be no reimbursement for readiness costs or the drugs or medical items (eg, gauze, splints) used in the patient's care that would fall upon the local agency, and it is uncommon for insurance to pay for providing on-scene care if there is no transport.[9] A rural volunteer EMS call in the middle of the night to a rollover car accident on a lonely highway with the fortunate occupants

having only cuts and scrapes and refusing transport results in no billable event despite the time spent and vehicle and supply costs, for example.

Personnel costs represent a major part of the cost of providing EMS. Rural EMS faces fundamental operational and staffing challenges.[10] A common model for rural, remote, and frontier communities is for EMS personnel to be provided through a volunteer fire department or, in other cases, unaffiliated volunteer agencies.[11] Although volunteer fire departments may have access to limited federal and state fire funds, overall, funding for these organizations often comes down to community contributions from bake sales, fish fries, and raffles. It is estimated that over half of the country's EMS care is provided by volunteer labor,[12] which is skewed heavily toward rural systems. Put differently, half of the EMS budget in some areas of the United States is "paid for" with volunteer hours. Does this affect the quality and quantity of care available in these areas?

Quality of Care

Rural communities have higher mortality and morbidity than urban areas for many time-critical, life-threatening emergencies.[13,14] Rural EMS often takes longer to get to someone experiencing one of these emergencies than most urban providers for various reasons, including the distance between the ambulance location and its destination, the lack of multiple ambulance locations to adequately cover a geographic area, and the staffing model for the agencies. While urban EMS strives for a response time of 8 minutes, rural EMS response times of 60 minutes are not uncommon.[15,16] The crisis of health care "deserts," exacerbated by the closure of 193 rural hospitals from January 2005 through December 2024,[17] is a major contributor to rural communities' increased mortality and morbidity for time-critical emergencies, as is the EMS system. If the tautology "every system is perfectly designed to achieve the results that it gets"[18] applies to EMS systems, would it be too harsh to say that rural EMS had been "engineered" to have poorer outcomes in time-critical medical emergencies?

In urban areas that also include rural communities in their response geography, the choice of physical location of EMS stations may be implicitly unfair to the rural population based on agency assumptions about best location of EMS resources. When agencies use a static location model for EMS deployment, the station will often be in an area of highest demonstrated call need. It could be said that, in these communities, urban patients are covered at the expense of rural patients. To address this inequity, a "bi-objective" location model for improving EMS in rural areas has been proposed. In this model, the usual goal of meeting maximal demand incorporates fairness as a secondary objective.[19] Keeney and Winkler differentiate between *ex ante* equity (resource allocation that leads to differences in service or health risks) and *ex post* equity (differences in health outcomes).[20] Qualitative measures of *ex ante* and *ex post* equity in public services and equity in facility locations have been proposed,[21,22] but the impact of these tools on EMS health equity is unknown. Norway, a country with significant rural and remote areas, has a national EMS model that also includes strategically located helicopter bases to meet defined response-time metrics for the population. Nevertheless, those in sparsely populated areas are unlikely to receive care within those parameters due to resources being concentrated closer to population centers.[23] Fairness in health care is a stated EMS value,[23] and the most efficient solution is typically not a fair one. To incorporate fairness in choosing helicopter base locations, Jagtenberg et al showed that using an iso-elastic social welfare function in the mathematical optimization model increased service levels in rural areas.[24]

Although health equity is certainly spoken of as a value in US health care, it is not apparent in EMS in rural, remote, and frontier regions, despite legislation in 1997 that created the critical access hospital designation, which is intended to reduce rural hospitals' financial vulnerability.[25] The norm is that access to health care in rural areas is limited, and programs that would allow expansion of EMS lack funding.

Licensed Volunteers

The culture and spirit of volunteerism is an inspiring facet of rural EMS and is a fundamental glue that holds this fragile system together. Policies that seek to improve care in rural areas would be wise to seek ways to incorporate the values and rewards of being a volunteer in one's community while making it more feasible for volunteers to continue to participate. Nonetheless, volunteerism is on the wane and likely to continue to diminish.[26] As such, to ensure available resources for the sick and injured in rural areas, EMS needs to be refinanced as well as reconceptualized.

Summary and Suggestions

The "EMS Agenda 2050: A People-Centered Vision for the Future of Emergency Medical Services" provides a high-level view of a reimagined system that is (1) inherently safe and effective, (2) integrated and seamless, (3) reliable and prepared, (4) socially equitable, (5) sustainable and efficient, and (6) adaptive and innovative.[27] Although the agenda was not envisioned as a solution to the challenges faced by rural EMS, it aptly provides a framework for operations, shaped by rural EMS needs, to which rural EMS can aspire. Certainly, rural EMS should be safe and effective. An integrated rural EMS system would use available health resources to the greatest extent possible without unnecessary regulatory impediments, such as who can do what and where, but with consideration of how to safely achieve the desired results and outcomes. Integration of EMS clinicians into local clinics and critical access hospitals to provide cross staffing, training, and clinical exposure would allow care to flow bidirectionally and better equip EMS to help with transitions to higher levels of care and to be more reliable and better prepared. Improvements in the system would be expected to be socially equitable, but care must be taken to ensure that equity is truly addressed and reiteratively confirmed. Efficiency and sustainability go hand-in-hand, with efficiency being one aspect of sustainability. Achieving efficiency may largely be a matter of leadership with sufficient authority and vision to "rearrange the board" by eliminating redundancy and breaking down silos. Yet improving efficiency often involves funding for improved technology or other key infrastructure. At some level, sustainability requires predictable funding at a level that meets at least operational minimums. EMS is also redefining its basic mission and the role of the EMS clinician. EMS as a transport service staffed by technicians trained with a focus on heart attacks and trauma is maturing into a mobile aspect of a system of care that provides a spectrum of person-centric care at the location most appropriate to the person's needs. EMS clinicians optimally would be trained in the model of community paramedicine aimed at overall community wellness, as opposed to simply reacting to emergencies.

References

1. Jonk Y, Milkowski C, Croll Z, Pearson K. Ambulance deserts: addressing geographic disparities in the provision of ambulance services. Maine Rural Health Research Center; 2023. Accessed March 27, 2025. https://digitalcommons.usm.maine.edu/cgi/viewcontent.cgi?article=1013&context=ems

2. National Academy of Sciences; National Research Council. Accidental death and disability: the neglected disease of modern society. National Academy Press; 1966.
3. Institute of Medicine. History and current state of EMS. In: *Emergency Medical Services at the Crossroads*. National Academies Press; 2007:31-72.
4. EMS.gov; National Highway Traffic and Safety Administration. The National Highway Traffic and Safety Administration Office of EMS. EMS.gov; National Highway Traffic and Safety Administration; 2023. Accessed January 10, 2025. https://www.ems.gov/assets/Office-of-EMS-one-pager-FNL_May-2023.pdf
5. George K. State policies defining EMS as essential. National Conference of State Legislatures. Updated April 25, 2024. Accessed February 9, 2025. https://www.ncsl.org/health/state-policies-defining-ems-as-essential
6. Barishansky RM. Of course EMS is an essential service. States need to make that official. *Governing*. September 5, 2024. Accessed February 9, 2025. https://www.governing.com/policy/of-course-ems-is-an-essential-service-states-need-to-make-that-official
7. Emergency medical services (EMS): local authority, funding, organization, and management. Centers for Disease Control and Prevention. October 9, 2024. Accessed February 9, 2025. https://www.cdc.gov/ems-community-paramedicine/php/us/local-authority.html
8. Flashner BA. State government in emergency medical services. *J Am Coll Emerg Physicians*. 1975;4(3):241-243.
9. National EMS Advisory Council. EMS system funding and reimbursement. National EMS Advisory Council; 2016. Accessed February 10, 2025. https://www.ems.gov/assets/NEMSAC_Final_Advisory_EMS_System_Funding_Reimbursement.pdf
10. MacKinney AC, Mueller KJ, Coburn AF, Knudson A, Lundblad JC, McBride TD. Characteristics and challenges of rural ambulance agencies. Rural Policy Research Institute; 2021. Accessed August 26, 2024. https://rupri.org/wp-content/uploads/Characteristics-and-Challenges-of-Rural-Ambulance-Agencies-January-2021.pdf
11. Rural emergency medical services (EMS) and trauma. Rural Health Information Hub. Updated July 18, 2024. Accessed August 26, 2024. https://www.ruralhealthinfo.org/topics/emergency-medical-services
12. Magee N. Why volunteers are critical to the future of EMS. *EMS1*. May 7, 2015. Accessed February 25, 2025. https://www.ems1.com/community-awareness/articles/why-volunteers-are-critical-to-the-future-of-ems-ch6ckyu984RRbtxV/
13. Johnston KJ, Wen H, Kotwal A, Joynt Maddox KE. Comparing preventable acute care use of rural versus urban Americans: an observational study of national rates during 2008-2017. *J Gen Intern Med*. 2021;36(12):3728-3736.
14. Mathiesen WT, Bjørshol CA, Kvaløy JT, Søreide E. Effects of modifiable prehospital factors on survival after out-of-hospital cardiac arrest in rural versus urban areas. *Crit Care*. 2018;22(1):99.
15. Stopyra JP, Crowe RP, Snavely AC, et al. Prehospital time disparities for rural patients with suspected STEMI. *Prehosp Emerg Care*. 2023;27(4):488-495.
16. Nikpay S, Tschautscher C, Scott NL, Puskarich M. Association of hospital closures with changes in Medicare-covered ambulance trips among rural emergency medical services agencies. *Acad Emerg Med*. 2021;28(9):1070-1072.

17. Rural hospital closures. University of North Carolina Cecil G. Sheps Center for Health Services Research. Accessed August 29, 2024. https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/
18. English W. Rewarding provider performance: aligning incentives in Medicare. *Ann Intern Med*. 2008;148(8):636.
19. Chanta S, Mayorga ME, McLay LA. Improving emergency service in rural areas: a bi-objective covering location model for EMS systems. *Ann Oper Res*. 2014;221(1):133-159.
20. Keeney RL, Winkler RL. Evaluating decision strategies for equity of public risks. *Oper Res*. 1985;33(5):955-970.
21. Marsh MT, Schilling DA. Equity measurement in facility location analysis: a review and framework. *Eur J Oper Res*. 1994;74(1):1-17.
22. Savas ES. On equity in providing public services. *Manage Sci*. 1978;24(8):800-808.
23. Jagtenberg CJ, Mason AJ. Improving fairness in ambulance planning by time sharing. *Eur J Oper Res*. 2020;280(3):1095-1107.
24. Jagtenberg CJ, Vollebergh MAJ, Uleberg O, Røislien J. Introducing fairness in Norwegian air ambulance base location planning. *Scand J Trauma Resusc Emerg Med*. 2021;29(1):50.
25. Critical access hospitals (CAHs). Rural Health Information Hub. Updated January 16, 2025. Accessed February 25, 2025. https://www.ruralhealthinfo.org/topics/critical-access-hospitals
26. McLaughlin C, Riutta O, Busko J. Rural EMS workforce: a call to action. National Rural Health Association. Accessed February 10, 2025. https://www.ruralhealth.us/getmedia/bbbb4334-99cb-4c35-b2c5-f7eca8e3ceda/NRHA-Policy-Brief-Rural-EMS-Workforce.pdf
27. EMS Agenda 2050 Technical Expert Panel. EMS agenda 2050: a people-centered vision for the future of emergency medical services. National Highway Traffic Safety Administration; 2019. DOT HS 812 664. Accessed March 31, 2025. https://www.slideshare.net/slideshow/ems-agenda2050/147495631

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STATE OF THE ART AND SCIENCE: PEER-REVIEWED ARTICLE

Which Technologies Should Be Used to Improve Prehospital Emergency Services?

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Abstract

Chief among the barriers to maintaining emergency medical services in rural areas are personnel shortages, long travel times, and austere settings in which clinicians must often provide care. These problems stem from a variety of sources, and some of those stemming from funding shortfalls might be remediable through technological innovation. This article examines how new technologies have recently been implemented and suggests how technology might be further integrated into prehospital emergency care.

One Emergency Medical Services System

There's a well-worn saying in the field of emergency medical services (EMS): *If you know one EMS system, you know one EMS system.* The ubiquity of this sentiment underscores the wide variation in EMS systems and operations domestically and internationally. There are distinct challenges that occur in certain environments, as the infrastructure and protocols that are successful in a densely populated region might not be successful in a sparsely populated region. Financially well-off communities or those with government funding might be able to pay their EMS workforce, while other communities might need to rely on volunteers. In general, guidance on how to navigate regional variation and the infrastructure and workforce issues that arise is often lacking. This lack of guidance is evident, especially in rural settings.

At the root of the problems faced by rural EMS are lack of nearby hospitals, financial instability of EMS agencies or patients, limited resources, and lower call volume, potentially resulting in less experienced EMS personnel.[1,2] Sometimes investment in rural medicine is considered a low-return investment since the communities served are less densely populated. This assumption works against upholding the ethical concept of justice, for it is often easier and more financially viable to provide medical resources across all levels of care—from prehospital to hospital and ambulatory settings—to patients living in urban environments.[1,3] The cost of delivering equitable care to rural patients can be prohibitively high and might sometimes only be feasible when supplemented by the government, as is the case with critical access hospitals.[1,3]

While these problems might be difficult to address, technological innovations can offer a

potential alternative solution. From artificial intelligence (AI) to telemedicine and drones, technology has already proven itself in other fields and could now provide much-needed assistance to EMS and the rural communities they serve.

Artificial Intelligence

AI is a broad term for any computer system-based technology that can perform problem-solving and adaptive reasoning tasks typically performed by humans. In the past few years, AI has advanced in leaps and bounds. New uses and applications of this technology are constantly being discovered, and it is clear that AI could become a useful tool in prehospital medicine.

With its combination of data analysis, fast processing, and machine learning, AI could provide cognitive off-loading for EMS personnel and dispatchers.[4] There is already evidence supporting the use of AI in accurately predicting critical care needs in the prehospital setting, which could justify the use of AI to ensure appropriate triage and allocation of resources to the scene.[5] During transport, AI could provide accurate traffic information, rerouting ambulances as needed and updating the receiving hospitals while EMS personnel concentrate on patient care.[4] On the dispatch side, AI can aid in picking up key words in conversations with patients and prompting further questions, in addition to providing interpreter services, for patients with limited English proficiency.[4] A study in Denmark showed that AI speech recognition software could be utilized during a phone call with a patient to detect if the patient was having a stroke.[6,7] While earlier and more accurate detection of stroke patients could decrease morbidity and mortality by ensuring that patients are properly triaged and rapidly transported and treated, this technology also demonstrates how AI can augment the job performance of an EMS dispatcher.[6,7]

For rural EMS systems, which are often short on human manpower, AI could provide much-needed relief. With the help of AI, fewer dispatchers could handle a greater number of calls with more efficient resource utilization. Moreover, response times could also be decreased by utilizing AI's ability to detect pathology even outside of listening in and analyzing a 9-1-1 call. One group of researchers trained a software program to detect agonal breathing, which is commonly heard in patients with cardiac arrest, which they then incorporated into common household smart devices such as Amazon Echo and Apple iPhone with a high degree of fidelity.[8] This innovation could aid early detection of cardiac arrests and thereby decrease response times and, hopefully, mortality.

Other studies have shown the utility of using AI as a prognostication tool in both the prehospital and the hospital setting by helping health care practitioners identify critically ill patients or those who might benefit from early intervention.[6,9,10] In rural areas, where staffing shortages and training challenges might necessitate an advanced life support (ALS) unit having 1 paramedic and 1 basic emergency medical technician (EMT) (as opposed to 2 paramedics), AI could provide key cognitive support.

Another area of study for AI in the prehospital setting is predicting the location of the next 9-1-1 call to better allocate ambulances and personnel to areas of high volume.[6,11,12] Doing so would help streamline efficiency by placing EMS resources in the area where they will likely be most needed.[6,11,12] Although the population sparsity of a rural setting makes it more difficult to apply AI in resource deployment, AI might still be superior to the current models (such as posting ambulances at the same location daily or at the EMS station) and warrants further investigation.

Where, however, do we draw the line of what we permit AI to do? Technology that can recognize agonal breathing in a cardiac arrest needs to be listening in at all times in order to catch the agonal breathing—which might constitute an invasion of privacy, especially if the data are stored and used by the AI company for other purposes. While using AI to help prognosticate and diagnose may be helpful, it could also potentially be problematic in the same way that facial recognition technology has been recognized as problematic in recent years.[13] That is to say, AI algorithms are currently only as good as the data they were trained on, which introduces the potential for bias and racism.[13]

Moreover, solutions provided by AI do not always come with reasoning, resulting in a "black box" problem wherein AI generates decisions without humans knowing why.[14] In the prehospital setting, this lack of transparency can be ethically questionable since, from a patient quality and safety perspective, the reasoning behind potentially life-changing decisions is important to understand. There is an additional concern about overreliance,[14] which, in the context of EMS, means that systems become overly reliant on AI technology and fail to invest in human capabilities and the training necessary for their upkeep, causing people's skills to deteriorate.

Although these ethical questions are still being explored and many of these technologies are still in early phases of development and implementation, for rural communities, the alternative might be substandard care or no care at all. Therefore, it would be prudent to continue to invest in and utilize AI in a thoughtful manner.

Telehealth

Advances in video call technology and sharing of electronic health information, in conjunction with concentration of many subspecialties in urban areas, have created a niche and a need for telehealth. Telehealth is, broadly speaking, health care delivered remotely rather than in person.[15,16] Telehealth and its ability to increase accessibility to specialists is especially useful when transfer of the patient is not feasible due to environmental conditions or the time-sensitive nature of the intervention required.[15,16] In conjunction with EMS, telehealth can also be used to provide physician services to patients in the field, with paramedics or EMTs providing assessment and interventions in person, such as taking vital signs, performing physical exam maneuvers,[17] and administering medication. With this type of remote consultation, paramedics could be able to provide more advanced and immediate care to patients in the field or, similar to the guiding principles behind community paramedicine, could be able to prevent a patient from being transported to the emergency department unnecessarily.[17]

Telehealth consults, whether with an EMS physician or a physician of a different specialty, have already been implemented by multiple EMS systems.[18,19,20] These consultations can be used to treat and discharge a patient in place, treat and then transport a patient, and triage where a patient should be transported.[18,19,20] Telehealth consults are especially important in rural communities, where tertiary hospitals might be few and far between. For example, a patient with symptoms concerning for stroke might need a different (and further) hospital destination than a patient with symptoms concerning for Bell's palsy or altered mental status due to sepsis. A consultation with a physician might be crucial in differentiating between these presentations and helping route the patient to the appropriate hospital. Moreover, physicians can also be used to educate patients or EMS personnel about the case at hand. While educating EMS personnel would enhance their knowledge and their clinical practice, educating patients could prevent unnecessary transportation to the hospital in certain cases. Telehealth

therefore has the potential to improve patients' experiences, increase access to care, and reduce costs.

Wearable smart technology, also known as wearable Internet of Things (IoT) devices, combines the advantages of AI and telehealth and could prove crucial to the advancement of prehospital medicine.[6] These technologies most commonly come in the form of smart watches, which include features such as photoplethysmography to measure heart rate, sensors to measure respiration rate, and single-lead electrocardiogram (ECG) for detecting atrial fibrillation.[21] Smart watches have been shown to be non-inferior to traditional methods of monitoring, such as ECG, Holter, and patch monitoring, for diagnosing atrial fibrillation.[21] Wearable IoT devices could therefore be utilized to supplement telehealth visits by providing the remote physician with longitudinal data or with acute data that a basic EMT might not be able to acquire (since, for example, obtaining an ECG is considered in most places to be a paramedic skill but not an EMT skill). This technology could be especially useful in rural settings where a paramedic might be a scarce resource.

A counterargument, though, is that telehealth in this sense might result in doctors directing paramedics to function and practice outside of their protocols. As long as paramedics are still within their scope of practice, it should be permissible for them to work outside of their protocol under the guidance of a physician, but to do so would mean that the physician takes responsibility—both legally and ethically—for the actions of the paramedic, which some physicians might be reluctant to do. Telehealth also necessitates that physicians make decisions based on information supplied to them by the EMS personnel. Remote physicians are not able to do a physical exam with their own hands and must rely on video and audio as a stand-in. These technologies are reliant on a strong internet connection, which in some rural locations might not be available.

Some could also argue that, at least right now, telehealth is not equivalent to in-person medicine with respect to patient care. There is much that can be seen or discovered through an in-person history and physical and through interventions that can only be provided in person. Therefore, are we doing our patients a disservice by encouraging them to utilize telehealth or by only giving them a telehealth option? A patient who could benefit from in-person physician services might be encouraged not to seek higher care if telehealth provides a more financially feasible and easier alternative. However, patients might place high value on the ease, comfort, and affordability of getting care delivered at home, which for many might outweigh the often only incremental gains they would obtain from visiting a tertiary hospital. Our job as ethical health care professionals is to ensure that patients understand their options and the risks and benefits that accompany those options so that they—and their communities—can make informed decisions on how best to integrate telehealth into health care.

Drones

Innovation in emergency medicine often comes first from battlefield medicine, and drones (also known as unmanned aerial vehicles) might prove to be another such instance. Lack of air superiority in recent conflicts has changed battlefield medicine from fast evacuations to prolonged field care.[22] While combat medics increasingly use drones to deliver medical supplies to the front lines for immediate care, the Ukraine-Russia war saw the first use of a cargo drone for a medical evacuation.[22] Being unmanned and airborne, drones have the capability to access places that humans cannot, either due to safety reasons or difficult terrain, which makes them a great asset

in battlefield medicine.[23] These same advantages lend themselves to rural prehospital medicine and other similarly austere environments. Austere environments, which generally mean a setting with limited access to resources, can include post-disaster regions, military outposts or combat zones, or communities without easy access to medical services or other necessities.

Drones can be used to deliver blood products, supplies such as oxygen canisters, medications, or vaccines.[23,24] Drone delivery can meet critical needs of rural patients in a timely manner, and, if utilized appropriately, can save lives and resources. For example, imagine a rural patient who has a cardiac arrest witnessed by his wife. A drone could likely reach the patient faster than an ambulance to deliver an automatic external defibrillator (AED) for his wife to use, with verbal guidance from either the AED, drone, or live dispatcher over the phone.[24] Faster time to defibrillation means higher likelihood of return to spontaneous circulation and reduced mortality.[24]

However, there are distinct disadvantages to drone use in prehospital settings. Drones are expensive, require skilled operators,[23,25] and are limited in how much weight they can bear and by weather conditions.[23,25] Even with correct and timely delivery of supplies, humans are still needed to retrieve and use the delivered items. A question then arises: How should we weigh rapid health care delivered by civilians, with only verbal instructions from a drone or via phone, against a patient's suffering while awaiting the arrival of EMS personnel? Should allowing bystanders to give lifesaving care be considered an undue burden of responsibility for these civilians? How to best integrate drones into an EMS system is still being investigated, and it might be difficult to justify their high costs when benefits are yet unproven.

Yet drone use potential goes beyond the military and rural EMS. Already, drones have proven themselves by helping to map out hazards and topography in disasters and hazmat incidences.[26] For example, as early as 2013, drones surveyed the areas affected by Typhoon Haiyon in the Philippines, which aided in relief efforts.[26] Not only can drones alert EMS and disaster relief personnel to environmental dangers, but, by reporting on the locations and conditions of patients, drones can assist in directing and prioritizing relief efforts.

As AI gets incorporated in drone technology, drones have the potential to become autonomous, which means that we will need to ensure that their decision-making skills fall along ethical lines. For example, in a mass casualty incident (MCI) with 3 equally critically injured patients, a drone that is the first on scene may have to decide to whom to offer treatment first. In MCIs and disaster scenarios, the needs outweigh the resources, and decisions have to be made about how best to allocate those resources.[27] Although guidelines and a framework have been created by the Institute of Medicine,[27] there are no definitive rules on how or when to instigate crisis standards of care and how to make decisions within this framework. Recognition of how to handle complex medical and ethical decisions in disasters remains as much an art as a science. In the hypothetical MCI with 3 patients and only 1 drone on scene, should the drone make a decision based on which patient it encountered first, which patient is the youngest with the fewest comorbidities, or which patient has insurance?

Yet the needs of rural communities are great, and drone technology has much to offer in terms of lowering barriers to accessing care, increasing efficiency of health care delivery, and aiding in difficult situations. Although implementation of drones in EMS should be

monitored and regulated, the advancement of technology should not be hampered by fear.

Guidelines for Integration

In rural communities, calls are often dispersed over a larger area due to the lower density of populations, which might make it more difficult to provide timely care. However, patients in rural areas are just as deserving of the standard of care provided in urban areas. While technological advances have clear advantages for and uses in rural EMS, investments in this technology must also be weighed against other shortcomings and challenges faced by EMS systems. Even with the assistance of drones or AI, the practice of prehospital medicine needs health care personnel on the ground, taking care of patients. It needs roads to reach patients, vehicles that can endure the rough environment, and community or critical access hospitals. Other initiatives, such as ameliorating overreliance on EMS volunteers, financing infrastructure projects, and creating a community paramedicine program, can add much value to rural communities.

That being said, the technological innovations in EMS should be embraced, as they offer improvement in the patient experience, easier access to care, and potentially lower costs for the patient. AI can decrease the cognitive burden of EMS personnel by streamlining dispatch and assisting them with prognostication. With telemedicine, a hospital admission or even a hospital transport can sometimes be avoided because EMS, in conjunction with telemedicine, can provide medical services to a patient in the comfort of their home. Meanwhile, drones can bring supplies to places that humans might not be able to access as quickly and provide key topographical data after natural disasters. The next step in incorporating these technologies in EMS systems is to develop guidelines for their safe and ethical use. Creating guidelines should be done with all stakeholders at the table, which means including not only technology experts, physicians, and EMS personnel but also communities and the patients these EMS systems serve. For, in a rural community, just as in any community, EMS and health care professionals should focus on serving patients, and a thoughtful use of new technologies can help achieve just that.

References

1. Wakefield M, Beale C, Coburn A, et al; Institute of Medicine. *Quality Through Collaboration: The Future of Rural Health*. National Academies Press; 2005.
2. Miller KEM, James HJ, Holmes GM, Van Houtven CH. The effect of rural hospital closures on emergency medical service response and transport times. *Health Serv Res*. 2020;55(2):288-300.
3. Gale J, Coburn A, Pearson K, Croll Z, Shaler G. Developing program performance measures for rural emergency medical services. *Prehosp Emerg Care*. 2017;21(2):157-165.
4. Clark M, Severn M. Artificial intelligence in prehospital emergency health care. *Can J Health Technol.* 2023;3(8):712.
5. Kang DY, Cho KJ, Kwon O, et al. Artificial intelligence algorithm to predict the need for critical care in prehospital emergency medical services. *Scand J Trauma Resusc Emerg Med*. 2020;28(1):17.
6. Chee ML, Chee ML, Huang H, et al. Artificial intelligence and machine learning in prehospital emergency care: a scoping review. *iScience*. 2023;26(8):107407.
7. Scholz ML, Collatz-Christensen H, Blomberg SNF, Boebel S, Verhoeven J, Krafft T. Artificial intelligence in emergency medical services dispatching: assessing the potential impact of an automatic speech recognition software on stroke

detection taking the capital region of Denmark as case in point. *Scand J Trauma Resusc Emerg Med*. 2022;30(1):36.
8. Chan J, Rea T, Gollakota S, Sunshine JE. Contactless cardiac arrest detection using smart devices. *NPJ Digit Med*. 2019;2(1):52.
9. Liu NT, Holcomb JB, Wade CE, et al. Development and validation of a machine learning algorithm and hybrid system to predict the need for life-saving interventions in trauma patients. *Med Biol Eng Comput*. 2014;52(2):193-203.
10. Khalifa M, Albadawy M. Artificial intelligence for clinical prediction: exploring key domains and essential functions. *Comput Methods Programs Biomed Update*. 2024;5:100148.
11. Huang H, Jiang M, Ding Z, Zhou M. Forecasting emergency calls with a Poisson neural network-based assemble model. *IEEE Access*. 2019;7:18061-18069.
12. Grekousis G, Liu Y. Where will the next emergency event occur? Predicting ambulance demand in emergency medical services using artificial intelligence. *Comput Environ Urban Syst*. 2019;76:110-122.
13. Libby C, Ehrenfeld J. Facial recognition technology in 2021: masks, bias, and the future of healthcare. *J Med Syst*. 2021;45(4):39.
14. Sujan M, Thimbleby H, Habli I, Cleve A, Maaløe L, Rees N. Assuring safe artificial intelligence in critical ambulance service response: study protocol. *Br Paramed J*. 2022;7(1):36-42.
15. Sharifi Kia A, Rafizadeh M, Shahmoradi L. Telemedicine in the emergency department: an overview of systematic reviews. *J Public Health (Berl)*. 2023;31:1193-1207.
16. Tsou C, Robinson S, Boyd J, et al. Effectiveness of telehealth in rural and remote emergency departments: systematic review. *J Med Internet Res*. 2021;23(11):e30632.
17. O'Sullivan SF, Schneider H. Developing telemedicine in emergency medical services: a low-cost solution and practical approach connecting interfaces in emergency medicine. *J Med Access*. 2022;6:27550834221084656.
18. Schröder H, Beckers SK, Borgs C, et al. Long-term effects of a prehospital telemedicine system on structural and process quality indicators of an emergency medical service. *Sci Rep*. 2024;14(1):310.
19. Janerka C, Leslie GD, Mellan M, Arendts G. Review article: prehospital telehealth for emergency care: a scoping review. *Emerg Med Australas*. 2023;35(4):540-552.
20. Varughese R, Cater-Cyker M, Sabbineni R, et al. Transport rates and prehospital intervals for an EMS telemedicine intervention. *Prehosp Emerg Care*. 2024;28(5):706-711.
21. Elbey MA, Young D, Kanuri SH, et al. Diagnostic utility of smartwatch technology for atrial fibrillation detection—a systematic analysis. *J Atr Fibrillation*. 2021;13(6):20200446.
22. Queyriaux B. The dronization of combat medical support. *Military-Medicine Journal*. October 26, 2023. Accessed Dec 26, 2024. https://military-medicine.com/article/4254-the-dronization-of-combat-medical-support.html
23. Surman K, Lockey D. Unmanned aerial vehicles and pre-hospital emergency medicine. *Scand J Trauma Resusc Emerg Med*. 2024;32(1):9.
24. Konert A, Smereka J, Szarpak L. The use of drones in emergency medicine: practical and legal aspects. *Emerg Med Int.* 2019;2019:3589792.
25. Laksham KB. Unmanned aerial vehicle (drones) in public health: a SWOT analysis. *J Family Med Prim Care*. 2019;8(2):342-346.
26. Rosser JC Jr, Vignesh V, Terwilliger BA, Parker BC. Surgical and medical

applications of drones: a comprehensive review. *JSLS*. 2018;22(3):e2018.00018.
27. Hanfling D, Hick JL, Stroud C, eds; Institute of Medicine. *Crisis Standards of Care: A Toolkit for Indicators and Triggers*. National Academies Press; 2013.

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POLICY FORUM: PEER-REVIEWED ARTICLE

How Should Rural EMS Funding Streams Be Improved?

James Small, MJA, CPM

Abstract

This article considers how to reliably provide emergency medical services (EMS). EMS responses are critical functions of local governments, yet, in rural areas, many are staffed by licensed volunteers. As requests for emergency health services increase and the workforce decreases, transitioning to a paid workforce is critical to maintaining response capacity. This article discusses the need and mechanisms for more robustly funding rural EMS systems.

Funding, Not Fundraisers

A poster at the gas station announced a fun community event: The Annual Public Works Fundraiser was back again with games, food, and music. The community's volunteer truck drivers spent the weekend putting on an event attended by almost everyone. They were excited to count the money and proudly announced how many roads would be repaired over the next year and that they could finally replace a 40-year-old dump truck.

But, in the United States, this isn't how communities fund most government functions, and public works fundraisers don't pay for roads and dump trucks. A lone exception is emergency medical services (EMS), as nearly every rural community uses volunteer staff[1] and fundraisers to provide this critical service. Volunteers, who provide emergency response for free, donate additional time to raise funds to purchase the equipment they need to provide that lifesaving response. This funding model, started in the 1960s,[2] has produced a crisis of collapsing EMS agencies today, as response times have lengthened,[3] and sometimes no ambulance arrives at all.[4] The volunteer EMS model has failed communities around the country, and local leaders are grappling with how to provide this essential service.

Critical Community Service

People access EMS by calling 9-1-1; the calls are answered in government-operated dispatch centers. Ideally, a 9-1-1 call leads to an ambulance being immediately sent into the community to provide emergency health care to someone who is sick or injured. Each ambulance is staffed with at least 2 people who have specialized training and state-level licensing as EMS responders, with scopes of practice ranging from basic life support to advanced care. These responders are trained to provide emergency care on

scene and during transport, which prepares patients for emergency department care, thereby improving health outcomes.

Delivery of EMS in the United States is a function of local municipal government and part of an emergency-response framework that includes law enforcement and firefighting. Municipal governments usually designate an EMS agency to be responsible for providing critical health services within its boundaries, either directly or by contracting with other organizations. Many EMS systems were formed in the 1960s and 1970s, with licensed volunteers providing labor and grant funding paying for start-up equipment. In 1973, Congress passed the Emergency Medical Services Systems Act, which provides funding for communities to purchase ambulances, develop EMS systems, and standardize emergency medical technician programs.[5] Grant and training programs like this led to the formation of EMS systems in communities across the nation.

As EMS agencies appeared and nationwide use of 9-1-1 for emergencies eased access to EMS, communities recognized many benefits. EMS improved health outcomes for citizens,[6] provided an additional point of access to social and community services, assisted with public health emergencies such as the COVID-19 pandemic, and became part of the emergency preparedness framework. Although these improvements increased demand for services without adding funding, the volunteer workforce allowed leaders to overlook the rising public demand and scope of services. A simple service with a wealth of volunteers functioned well in a way that more advanced services with falling volunteerism could not.

Finding Funding

Local governments face funding challenges when suddenly transitioning EMS from a nearly free volunteer service to a fully funded, paid staffing model, especially when a common public misconception is that taxes are already paying for EMS. Some communities are being asked to increase support from almost no financial contribution to allocating hundreds of thousands (or even millions) of dollars to pay for staffing.[7] EMS is also facing inflationary pressures, making this transition even harder. According to US Bureau of Labor statistics, from 2019 to 2022, the consumer price index increased by 15.7%.[8] A 2023 National Association of Emergency Medical Technicians national survey found similar increases in wages, with 14% of agencies reporting wage increases exceeding 25% during this time period.[3]

To meet these fiscal realities, communities use a combination of sources to fund EMS. First, EMS agencies bill patients (and health insurance providers) for services provided. Billing includes the fee for services plus a mileage rate to the hospital. According to US Census Bureau 2022 data, over 92% of the US population is covered by health insurance, with around 36% being covered by Medicare or Medicaid.[9] It is typical for an EMS agency to have more than 50% of its patients covered by Medicare or Medicaid.[10] However, there is a large disparity between the billed amount and the reimbursement Medicare and Medicaid provides. A 2022 report by Fair Health found that the average billed cost of basic life support ambulance services in 2020 was $940 while the average Medicare reimbursement for basic life support ambulance services was $390.[11] This reduced reimbursement makes rural EMS impossible to fund solely based on billing. As most EMS patients are covered by Medicare and Medicaid, there is a need for continued advocacy at the state and federal level to increase reimbursement rates to levels that recognize the cost of providing services.

Grants are an additional way to provide some revenue for services. The 1973 federal grant program that launched EMS expired in 1981,[12] and Congress has not provided any similar national programs to cover ongoing costs or personnel. While grants are sometimes available from state and local entities, there is no consistent and easy way to access EMS grant funding. Grants, when available, are best used to purchase a piece of equipment but do not provide sustainable recurring funding sources for operating costs. Development of state and federal grant programs to fund high-dollar capital items, such as ambulances, would allow local governments to focus their funds on daily operational costs.

A third source of support for rural EMS is volunteerism and local fundraising. According to SafeTechSolutions, as many as 80% of ambulances are staffed by volunteers, and these ambulances are predominantly in rural communities.[13] Although approximately 97% of the land in the United States is rural, only 21% of the population lived in rural communities in 2000.[12] That's a lot of ground to cover with a much smaller, largely volunteer workforce. Staffing one ambulance requires at least 17 520 hours annually (24 hours daily x 365 days x 2 people). In many communities, EMS systems were formed near the peak of volunteerism in the 1960s and 1970s, after which the EMS volunteer workforce declined for decades before reaching the current crisis point.[2] The impact of this major shift has been noticed by the media; a multitude of articles have been published on EMS systems in crisis across the United States.[14,15,16] It is rarely considered that when someone volunteers with an EMS agency they are personally subsidizing the cost of providing that service. Volunteerism shifts the cost of staffing from the community to the volunteer and their family, who are a key linchpin in the service existing at all. Continued dependency on volunteers to staff ambulances ignores a decades-long nationwide reduction in volunteerism.[17] This decline impacts not just EMS but many other community organizations as well.[18]

Finally, when all other funding sources are exhausted, local government is tasked with imposing taxes to fund the remaining cost of EMS. EMS competes with all other governmental services for scarce dollars. The Fair Health report found that the average allowed amount for ambulance service increased by 56% (from $486 to $758) for advanced life support and by 40% (from $373 to $522) for basic life support from 2017 to 2020.[11] These price increases reflect the increased cost of providing service while cost recovery on most of these bills is limited. Rapidly increasing service costs create a larger funding gap that must be filled by local tax dollars. Some municipal governments are mitigating the increase in costs by creating regionalized EMS with neighboring communities. In these systems, multiple local governments collaborate, sharing personnel and equipment to improve cost efficiencies and reduce the financial impact to each community. There are a variety of political challenges that come when local governments, which have been historically independent, begin to work together. These can range from disagreements on cost sharing to community disapproval of dissolving agencies that have served for decades.[19]

Rural EMS Crises

Decline in volunteerism has made reliable ambulance staffing nearly impossible. The rising cost of EMS has made it challenging for local municipalities to afford a paid service in a piecemeal, township-by-township manner. Meanwhile the system is crumbling around us.

Maine and Wisconsin are instructive. The Maine Rural Health Research Center released a report in 2023 that found that 4.3 million Americans live in ambulance deserts, which are defined as locations that are over 25 minutes away from an ambulance station.[20] Moreover, 4 of 5 rural counties have at least one ambulance desert.[20] A 2023 Wisconsin Office of Rural Health study on ambulance reliability reported that 62% of Wisconsin agencies serve rural communities and that 55% of these rural agencies have 6 or fewer people providing 80% or more of the staffing.[4] Moreover, 41% of Wisconsin's EMS agencies were not available continuously, ie, 24/7, every day of the year.[4] Of services relying on volunteer staffing, 63% failed to provide continuous service, and 15% of services with paid staff met the definition of unreliability.[4] Finally, 10 agencies reported that, in the communities they served in the previous year, an ambulance never reached a call for service because there was no staffed ambulance in the community and neighboring communities were unable to assist.[4]

When considering the Maine and Wisconsin studies together, it is likely that the issue of providing reliable rural EMS may be much larger than it first appears. The Maine study considered the location of agencies, and Wisconsin considered whether agencies are functioning. Unreliable staffing models appear to be leading to additional intermittent ambulance deserts where EMS is sometimes completely unavailable.

Sustainable Rural EMS Responsiveness

EMS is a government service used by ill and injured people when they are at their most vulnerable. Local, state, and federal governments must prioritize their roles in providing reliable EMS and commit to developing sufficient recurring funding sources that can be used to produce a sustainable workforce. Cost efficiencies through regionalization must be considered at the local level.

While continuing to use free labor is a seductive option for local governments balancing budgets, research indicates that the use of volunteer EMS responders increases the likelihood of unreliable service.[4] Elected leaders need to have the courage to consider alternative delivery methods to ensure reliable service within their limited financial means. To do so means confronting apprehension about changing from longtime EMS models and possibly cooperating with nearby communities to share workforce and financial resources. It is likely that neighboring communities are trying to solve similar challenges. Solutions like bringing together 2 struggling volunteer ambulances and forming 1 ambulance with paid staff servicing both communities can consolidate workforces and reduce the financial impact on each community of hiring its own paid staff. While this regionalization may potentially create ambulance deserts through the increased size of response areas, the improved reliability of a paid ambulance staff as compared to that of a volunteer service improves the likelihood of an ambulance arriving at a call. It should also be considered that the response times may be shorter due to reduced reliance on mutual aid.

Reliable EMS requires communities to make difficult decisions while allocating sufficient resources to EMS. Every community faces similar challenges but needs to find specific solutions that work within its means. The collapse of rural EMS is solvable but requires that communities no longer ignore the crisis of a failed response system and encourage elected leaders at the federal, state, and local levels to make courageous decisions by prioritizing EMS.

References

1. Colyer J, Anzaldua A, Blancato R, et al. Access to emergency medical services in rural communities: policy brief and recommendations to the secretary. National Advisory Committee on Rural Health and Human Services; 2022. Accessed February 21, 2025. https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/rural/access-to-ems-rural-communities.pdf
2. Lukens J. Recruitment and retention: overcoming the rural EMS dilemma. *The Rural Monitor*. February 7, 2018. Accessed January 2, 2025. https://www.ruralhealthinfo.org/rural-monitor/ems-recruitment-retention
3. National Association of Emergency Medical Technicians. 2023 national survey: EMS economic and operational models executive summary. National Association of Emergency Medical Technicians; 2023. Accessed January 2, 2025. https://www.naemt.org/docs/default-source/ems-data/ems-economic-and-operational-models-survey-02-20-2023-final.pdf?sfvrsn=1fb9f493_2
4. Wisconsin Office of Rural Health. The reliability of Wisconsin's 911 ambulance response. Wisconsin Office of Rural Health; 2023. Accessed January 2, 2025. https://worh.org/wp-content/uploads/2023/03/EMS-Reliability-Report_March2023.pdf
5. Harvey JC. The Emergency Medical Service Systems Act of 1973. *JAMA.* 1974;230(8):1139-1140.
6. National Highway Traffic Safety Administration. EMS makes a difference: improved clinical outcomes and downstream healthcare savings. A position statement of the National EMS Advisory Council. *Ann Emerg Med*. 2011;57(2):169.
7. Jonk Y, Wingrove G, Nudell N, McGinnis K. A consensus panel approach to estimating the start-up and annual service costs for rural ambulance agencies. Maine Rural Health Research Center; 2023. Accessed January 2, 2025. https://digitalcommons.usm.maine.edu/cgi/viewcontent.cgi?article=1016&context=ems
8. Meyers S, Paulin GD, Thiel K. Consumer expenditures in 2022. US Bureau of Labor Statistics. December 2023. Accessed February 21, 2025. https://www.bls.gov/opub/reports/consumer-expenditures/2022/
9. Keisler-Starkey K, Bunch LN, Lindstrom RA. Health insurance coverage in the United States: 2022. US Census Bureau; 2023. Accessed January 2, 2025. https://www.census.gov/content/dam/Census/library/publications/2023/demo/p60-281.pdf
10. Finance Committee. EMS funding and reimbursement. National EMS Advisory Council; 2016. Accessed February 27, 2025. https://www.ems.gov/assets/NEMSAC_Final_Advisory_EMS_System_Funding_Reimbursement.pdf
11. FAIR Health. Ground ambulance services in the United States: a study of private healthcare claims. FAIR Health; 2022. Accessed February 27, 2025. https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Ground%20Ambulance%20Services%20in%20the%20United%20States%20-%20A%20FAIR%20Health%20White%20Paper.pdf
12. Warden GL, Altman SH, Asplin BR, et al; Institute of Medicine. History and current state of EMS. In: *Emergency Medical Services at the Crossroads.* National Academies Press; 2007:31-72.
13. Reinert A. The state of our nation's rural EMS system. SafeTech Solutions; 2015. Accessed January 2, 2025. https://ambulance.org/wp-

content/uploads/2015/11/AAA-2015-State-of-our-Nations-Rural-EMS-Systems.pdf
14. Kafanov L. Rural ambulance crews are running out of money and volunteers. In some places, the fallout could be nobody responding to a 911 call. *CNN.* May 22, 2021. Accessed February 27, 2025. https://www.cnn.com/2021/05/22/us/wyoming-pandemic-ems-shortage/index.html
15. Watkins A. Rural ambulance crews have run out of money and volunteers. *New York Times*. April 25, 2021. Updated June 23, 2023. Accessed June 6, 2025. https://www.nytimes.com/2021/04/25/us/rural-ambulance-coronavirus.html
16. Rural ambulances on the brink of collapse as funds plummet. *Scripps News.* May 23, 2021. Accessed February 27, 2025. https://www.scrippsnews.com/politics/health-care/1-in-3-rural-emergency-services-in-danger-of-closing
17. McElwee CF. An overlooked crisis. *City Journal.* October 23, 2019. Accessed February 27, 2025. https://www.city-journal.org/article/an-overlooked-crisis
18. Lenkowsky L. Americans are volunteering less. What can nonprofits do to bring them back? *The Chronicle of Philanthropy*. February 14, 2023. Accessed February 21, 2025. https://www.philanthropy.com/article/americans-are-volunteering-less-what-can-nonprofits-do-to-bring-them-back
19. Cahill J. Mergers, volunteerism, and cost considerations. *Domestic Preparedness*. February 18, 2009. Accessed January 2, 2025. https://domesticpreparedness.com/articles/mergers-volunteerism-and-cost-considerations
20. Jonk Y, Milkowski C, Croll Z, Pearson K. *Ambulance Deserts: Geographic Disparities in the Provision of Ambulance Services*. Maine Rural Health Research Center; 2023. Accessed March 25, 2025. https://digitalcommons.usm.maine.edu/cgi/viewcontent.cgi?article=1013&context=ems

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MEDICINE AND SOCIETY: PEER-REVIEWED ARTICLE

EMS Service Integration in American Indian and Native Alaskan Rural Communities

Chelsea Tsasse and John Shufeldt, MD, JD, MBA

Abstract

This article outlines several initiatives to optimize and expand emergency medical services (EMS) in American Indian and Native Alaskan (AI/NA) rural communities. It highlights the significance of cultural humility, cost-effectiveness, equity, and tribal sovereignty in EMS licensure and describes key infrastructure improvements (eg, roads and communication systems) to EMS responsiveness in AI/NA rural communities. This article also examines practical and financial strategies for integrating telehealth and drone-based delivery of critical medicines into rural EMS response capacity.

Tribal Emergency Medical Service

Emergency Medical Services (EMS) play a vital role in providing prompt and optimal care, especially within American Indian and Native Alaskan (AI/NA) populations, which inequitably experience health vulnerabilities. With higher rates of chronic illnesses, injuries, and medical emergencies, these populations require stronger, more responsive EMS support to address their unique health needs.[1] However, existing infrastructure for EMS service in AI/NA communities falls short of expectations due to cultural barriers, legal limitations, austere environmental conditions, and insufficient resources. For instance, the Indian Health Service reported that the rate of fatal injuries is 2.5 times higher for AI/NA than for all races, making it pressing to strengthen EMS.[1]

This article proposes tangible strategies to reinforce EMS in these communities. By addressing cultural competence, sovereignty in licensing, infrastructure development, the integration of health care services, and inequity in resource allocation, it is possible to enhance the capacity of EMS to effectively serve AI/NA populations.

Cultural Competence Assessment

Cultural competence within the health care sector encompasses a specific set of skills, knowledge, and attitudes essential for health care practitioners to deliver high-quality care to patients from diverse cultural backgrounds. This competency is particularly critical in EMS, as it ensures that the services provided align with the cultural and linguistic requirements of the patients. For AI/NA groups, cultural competence is particularly important because their health beliefs may differ from prevailing societal

norms. EMS personnel might struggle to understand Indigenous perspectives; some lack awareness of Indigenous knowledge, community structures, and distrust of health care systems due to historical trauma.[2] This gap results in poor communication, poor adherence to treatment, and worse outcomes.[3]

To address these challenges effectively, it is crucial to design and implement comprehensive cultural competency training programs for individuals engaged in EMS. Such programs should address the histories of AI/NA populations, their unique health practices, communication methods, and inequity they face. Regular educational efforts and collaboration with tribal authorities would further support this goal. For instance, cultural competency training has been developed that involves exposure to cultural practice and partnering with Tribal authorities.[2] Such programs have yielded positive results, including increased patient satisfaction and trust in clinicians.[2] Another successful example is the University of Arizona Native American Advancement, Initiatives, and Research collaboration, which enhances collaborative research by providing cultural competency training resources to students and other professionals.[4] Strengthening cultural competence acknowledges both the patient's and the clinician's heritage, thereby promoting more suitable, respectful services for AI/NA communities.

Sovereignty in EMS Licensing

EMS operations within Tribal reservations may be governed by state policies, rules, and regulations that often fail to sufficiently meet the unique needs of Tribal nations and respect their sovereignty. There are multiple reasons why it is imperative for Tribal governments to possess the authority to establish and enforce their own EMS standards and regulations. Day opines that delegating such authority for programs and services through the Indian Self-Governance Demonstration Project demonstrates concern for Tribal sovereignty and enables Tribes to provide more local services.[5] Tribal governments, being closely connected to local needs, can create EMS protocols that are more effective than those devised by state or federal bodies. For instance, they might integrate Indigenous health practices or target region-specific health concerns.

Supporting Tribal sovereignty in EMS licensing could encourage local ownership and motivation to maintain culturally aligned services. It could also enhance emergency response and lead to better results overall. One case exemplifying the benefits of enhanced Tribal governance is the Choctaw Nation of Oklahoma, which has strengthened services by implementing protocols specifically designed for its members.[6] This approach has also shaped federal budget decisions for the Indian Health Service that improve the general health of Indigenous communities nationwide.[7] Another example is the Navajo Nation, which has empowered itself to regulate EMS service and developed training programs, which can lead to more culturally sensitive treatment.[8]

Reservation Infrastructure Development

AI/NA reservations encounter substantial obstacles in maintaining effective EMS due to insufficient structural support. These challenges are exacerbated by the geographical isolation of many reservations, which are often situated in remote or rural areas that are difficult to access. Consequently, EMS response times are frequently prolonged, potentially leading to adverse outcomes in critical situations. Addressing these challenges requires a comprehensive approach to infrastructure enhancement. Key recommendations include improving road conditions to ensure reliable, year-round access—an essential step in reducing response times and improving emergency outcomes. Additionally, the expansion and optimization of communication networks are

essential for the efficient coordination and dispatch of EMS resources. Tools like GPS and advanced mobile systems can close the gap between outlying areas and EMS centers, thereby raising overall efficiency in emergencies. For example, the Blackfeet Nation in Montana adopted an updated dispatch system to boost EMS accuracy and dependability.[9]

Health Services Integration

Integration of EMS with other health services on reservations is important for creating a broad and efficient health care framework. This approach aims to enhance the timeliness of and sustainability of patient care. Integration between hospitals, clinics, and EMS ensures that emergency care is delivered not only when the patient comes into contact with EMS personnel but also during hospital care and follow-up, so as to bridge all the care gaps and thereby improve the patient's health.[10] The integration of telemedicine systems is frequently employed to enhance health care delivery, particularly in rural and remote areas. Telemedicine enables EMS personnel to engage in real-time consultations with physicians, thereby facilitating the immediate initiation of medical assessments and interventions prior to patient transport to health care facilities. This approach is especially critical in settings such as reservations, where the nearest health care center may be several hours away.

Additionally, emerging technologies, such as drone-based medication delivery, are poised to become vital components in improving health care access in these regions. Drones offer a reliable means of transporting essential medications and medical supplies to remote areas. A notable example of drone use to deliver supplies is the Navajo Nation, where drone trials have demonstrated efficient delivery of medications and other supplies[11] to households situated at considerable distances from health care facilities. These efforts demonstrate technology's capacity to ensure timely delivery of essential resources, thereby strengthening existing services in Indigenous communities.

Sources of EMS Financing and Distribution of Resources

Insufficient funding represents a significant challenge for EMS within AI/NA territories,[12] threatening the acquisition of necessary equipment, the hiring of qualified personnel, and the provision of adequate training. Addressing these constraints requires a robust and diverse financial strategy that incorporates advocacy efforts, federal and state grants to strengthen EMS in Indigenous communities, and partnerships with nonprofit organizations dedicated to improving health care services. The success of this approach is evident in partnerships like the one between the Cheyenne River Sioux Tribe and Boston Children's Hospital to improve pediatric emergency care.[13]

Conclusion

This article has explored key strategies for enhancing the equity and effectiveness of EMS for AI/NA populations, highlighting critical factors such as cultural and linguistic considerations, Tribal sovereignty in EMS licensing, infrastructure development, integration of health services, and funding mechanisms. Given the significant barriers these communities face, addressing these challenges is essential for improving health outcomes. Achieving meaningful progress will require coordinated efforts among policy makers, health care providers, and Tribal leadership to advocate for and implement sustainable solutions. By prioritizing these initiatives, stakeholders can enhance emergency medical response and ultimately reduce health care disparities in AI/NA communities.

References

1. Disparities. Indian Health Service. October 2019. Accessed February 10, 2025. https://www.ihs.gov/newsroom/factsheets/disparities/
2. Nahian A, Jouk N. Cultural competence in caring for American Indians and Alaska Natives. In: *StatPearls*. StatPearls Publishing; 2025. Accessed March 26, 2025. https://www.ncbi.nlm.nih.gov/books/NBK570619/
3. McQuaid EL, Landier W. Cultural issues in medication adherence: disparities and directions. *J Gen Intern Med*. 2018;33(2):200-206.
4. Native American Advancement, Initiatives and Research. Indigenous resilience: cultural competency training. University of Arizona. Accessed February 26, 2025. https://nptao.arizona.edu/events/indigenous-resilience-cultural-competency-training
5. Day S. Implications of tribal sovereignty, federal trust responsibility, and congressional plenary authority for Native American lands management. In: Wolters EA, Steel BS, eds. *The Environmental Politics and Policy of Western Public Lands.* Oregon State University Press; 2020:chap 14. Accessed January 8, 2025. https://open.oregonstate.education/environmentalpolitics/chapter/implications-of-tribal-sovereignty/
6. Wakeling S, Jorgenson M, Michaelson S, Begay M. *Policing on American Indian Reservations*. US Department of Justice; 2001. Accessed February 12, 2025. https://www.ojp.gov/pdffiles1/nij/188095.pdf
7. Indian Health Service (IHS) budget. National Indian Health Board. Accessed February 13, 2025. https://www.nihb.org/category/government-affairs/indian-health-service-ihs-budget/
8. Our story: historical timeline of Navajo EMS. Navajo Nation Emergency Medical Service. Accessed February 11, 2025. https://www.navajoems.org/our-story
9. The Blackfeet Nation. *Blackfeet Emergency Operations Plan 2018*. The Blackfeet Nation; 2018. Accessed February 11, 2011. https://documents.ncsl.org/wwwncsl/Energy/blackfeet-eop-2018-12-14-17.pdf
10. Venkataraman A, Lim SHC, Hao LJ, Wee JCP. From fragmentation to integration in emergency medicine: providing care our patients deserve. *Med Res Arch*. 2024;12(4):1-17.
11. Becenti A. Native company demonstrates drones for delivering essentials to remote locations. *Durango Herald*. February 10, 2022. Accessed February 11, 2025. https://www.durangoherald.com/articles/native-company-demonstrates-drones-for-delivering-essentials-to-remote-locations/
12. Quick KS, Dufour S, Narváez G. Emergency medical services in American Indian reservations and communities: results of a national survey. Roadway Safety Institute; 2019. Accessed May 22, 2025. https://rosap.ntl.bts.gov/view/dot/42699
13. Lopez-Carmen VA. Harvard-hospital partnership tackles pediatric emergencies in Lakota country. *Forbes.* February 27, 2023. Updated March 1, 2023. Accessed February 26, 2025. https://www.forbes.com/sites/victorlopez-carmen/2023/02/27/harvard-hospital-partnership-tackles-pediatric-emergencies-in-lakota-country/

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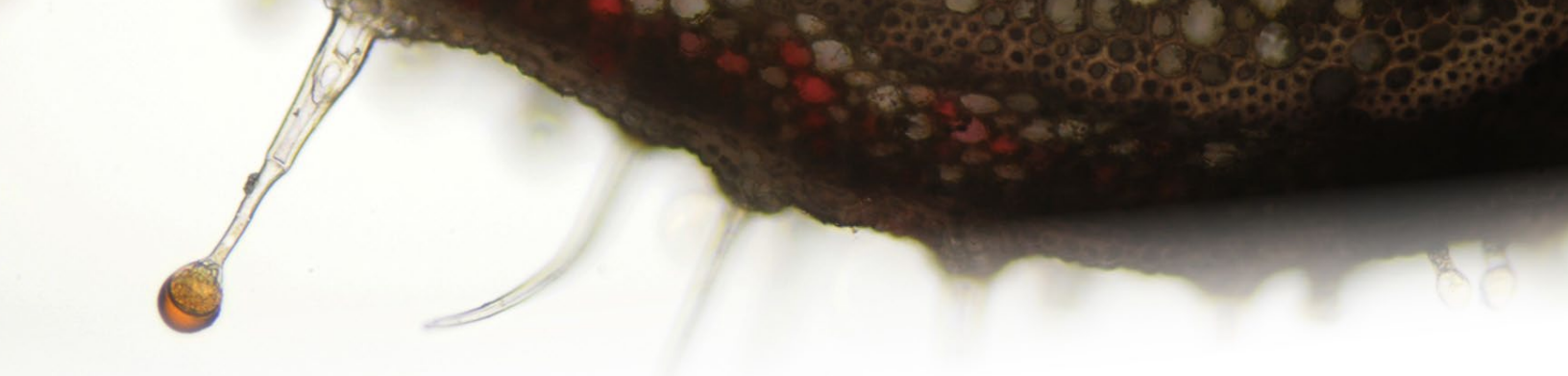

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HISTORY OF MEDICINE: PEER-REVIEWED ARTICLE

What Might the Past Suggest About Rural Emergency Services Amidst Critical Access Hospitals' Decline?

Siân Lewis-Bevan, MD, MPH, EMT-B and Stephen Powell, MD

Abstract

Critical access and other rural hospitals have struggled to remain open, which exacerbates inequity in rural residents' access to routine and emergency health services and strains already-taxed rural emergency medical services (EMS). This article discusses the recent history of rural hospital closures and their effects on rural emergency care. This article also suggests modifications to EMS policy and practice that could improve rural community members' access to health services and bolster EMS services in rural areas.

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Low Population Density and Low Reimbursement

The rise, and subsequent fall, of critical access hospitals (CAHs) across the United States is rooted in financial failure of a historic rural hospital model. During the 1980s and 1990s, the closure of more than 400 rural hospitals was secondary to many factors, including low population density and relatively low reimbursement rates.[1] In response to these closures, Congress created the CAH designation as part of the Balanced Budget Act of 1997.[2] The CAH designation is given by the Centers for Medicare and Medicaid Services (CMS). To receive the designation, a hospital must participate in Medicare; have fewer than 25 acute inpatient beds; be over 35 miles from the closest hospital (15 miles in areas with mountainous or secondary roads); have an average length of stay under 96 hours; have agreements with other hospitals to facilitate transfers; and maintain 24/7 emergency care.[2] CAH designations theoretically provide financial benefits to rural hospitals: they increase reimbursement from CMS; allow for decreased staffing requirements, such as not requiring on-call physicians to remain on-site, which lowers personnel costs; and provide funding for quality improvement and operational functions.[2,3] As of October 2024, there were 1369 CAHs across the country, in all but 5 states.[2] In 2005, the average distance from a CAH to the closest transfer hospital was 64 miles.[4]

Since the creation of CAHs, the program has been modified by several pieces of legislation that increase financial benefits and support operational aspects, such as

reducing workforce shortages and incentivizing technological advancements.[2] The unifying theme of the CAH legislative updates has been bolstering rural facilities, largely financially, with increasing reimbursement rates and decreased staffing requirements. Despite the intent of providing financial support, a CAH designation has not regularly led to the ability of a given hospital to remain functional. Some facilities have only partially closed, losing certain services such as obstetrics but maintaining emergency departments and basic inpatient care.[5] But other rural hospitals, both CAHs and non-CAHs, have continued to close. From 2005 to the end of 2024, 193 rural hospitals closed, 71 of them CAHs.[6] The closure rate has been relatively stable, but since 2011, hospital closures have surpassed new facilities openings.[7]

Unfortunately, rural emergency medical services (EMS) face many of the same financial struggles as CAHs. Both contribute to the inequalities in health care and health disparities faced by residents of rural areas. As health care providers and policy makers work to address challenges facing CAHs, rural EMS agencies should receive similar attention.

Steady Decline

CAH closure trends magnify broader rural hospital closure trends.[6] Despite the increased reimbursement rates from CMS, financial losses have been the biggest factor in the continued closures of CAHs and other rural hospitals.[7,8] Most closures have occurred in states that did not expand Medicaid after passage of the Affordable Care Act in 2010.[7] Many patients in rural areas do not have insurance, even Medicaid, and therefore CAHs were unable to capitalize on the increased reimbursement that Medicaid expansion would have provided.[7] The COVID-19 pandemic dealt multiple blows to rural hospitals; in the initial stages of the pandemic, routine procedures were cancelled, and hospitals could no longer rely on those payments.[9] Smaller hospitals providing fewer services and working within a narrower profit margin felt the brunt of this loss more sharply than larger facilities. Patients were also afraid of being exposed to COVID-19 and thus hesitant to seek care, adding to the decrease in revenue.[10] As a result, a total of 38 rural hospitals, including 14 CAHs, closed completely between the start of the pandemic in 2020 and the end of 2024.[6]

As CAHs continued to close, Congress created a new designation, rural emergency hospital (REH), in the Consolidated Appropriations Act of 2021 to increase reimbursement up to 105% for facilities that do not provide inpatient care.[11] This designation allows rural facilities that lose inpatient beds and other services, such as obstetrics or psychiatry, to still function as emergency departments. This model is similar to that of CAH but targets even smaller facilities than CAHs that are not able to meet the CAH requirements. While REHs are intended to prevent further gaps in rural health care, they are still under threat of closure from pressures similar to those faced by CAHs, and only 36 hospitals met the requirements for REH status between January 2023 and January 2025.[12]

Ambulance Deserts

EMS is not designated an essential service in most states, meaning that local governments are not required to provide funding for it as they are for fire and police services.[13] If funding is provided, it comes largely from state and local governments or from grants, with relatively little federal support.[14] EMS is reimbursed by CMS based on a flat fee plus mileage; a call involving resource-intensive care for a critically ill patient gets reimbursed for the same amount as does care for a stable patient.[10] CMS also

does not reimburse EMS for patients not transported to a hospital, such as those who refuse care or who need simple assistance, such as getting up after a fall.[13,15] Under- or uninsured patients, who make up a large portion of the rural population, are often unable to pay for EMS care or transport.[7,15] As a result, rural EMS agencies struggle to make their operating costs (eg, equipment and staffing), often rely on volunteers rather than paid employees, and have fewer ambulances available and more difficulty staffing them than their urban counterparts.[10,16]

When patients need EMS to treat them and transport them to a hospital, the closest ambulance may be several towns over. These "ambulance deserts" often overlap geographically with areas without hospitals.[10,16,17,18] Rural EMS agencies have always had longer transport times on average than urban agencies; CAH and other rural hospital closures force ambulances to travel further to transport patients, more than doubling transport times for some patients and increasing the time that an ambulance crew spends with one patient.[10,19,20] Another patient who needs care in that time may have to wait longer to receive care and could have a bad outcome because of the delay.[13,16,17,18]

Rural EMS agencies also lose leadership when local hospitals close. An EMS agency owned and operated by a CAH is forced to close or find new ownership and funding when the CAH closes.[21] Rural and isolated EMS agencies are more likely to have volunteer medical directors and less likely to have access to real-time medical direction to guide patient care than urban and large rural EMS agencies.[22] A hospital closure causes physicians to leave the area,[7] decreasing the availability of appropriate medical direction. With fewer local resources, EMS clinicians also must travel further to receive appropriate training and continuing education, adding to difficulties with staff retention.[15] These challenges bring the long-term sustainability of rural EMS agencies into question.[13,17,23,24]

Policy Reform

Emergency medicine, and by extension EMS, is considered the safety net of the health care system: patients with poor health literacy, limited access to primary care, poor social support, and limited or no health insurance often seek care in the emergency department because of an inability to access appropriate care elsewhere. These patients frequently access the emergency department via EMS because of a lack of alternate transportation. To ensure continued access to EMS for rural populations, changes must be made to improve funding for rural agencies. To achieve this goal, multiple policy changes should be introduced, starting with listing EMS as an essential service, a designation that this crucial part of the health care system does not currently receive in most states.[15] Enacting legislation at the state level to include EMS as an essential service would guarantee increased government funding.[15] Although changes to federal regulations would be difficult to implement due to states' authority under the Tenth Amendment,[25] several states have passed their own laws making EMS an essential service.[26] Other states should follow this example, especially ones with large ambulance deserts. Increased funding from all sources must be used to support paid EMS clinicians, rather than forcing rural agencies to rely on volunteers.[22,23]

In addition, the CMS payment model for EMS must be reexamined. EMS clinicians are currently considered "transportation suppliers" rather than health care personnel and therefore have lower base payments because transport alone requires less funding than clinical education or medical equipment.[15] As part of payment reform, agencies should

be reimbursed for calls that do not result in transportation, as well as for calls that result in transportation to non-hospital facilities. Emergency Triage, Treat, and Transport (ET3) was a payment model implemented in 2021 that was limited to EMS agencies, mostly urban, that met specific requirements.[10] The aim of ET3 was to allow for reimbursement for transports to urgent care facilities, psychiatric stabilization centers, and substance use facilities. This model was discontinued in 2023 due to a number of factors, including lower-than-expected participation and interventions.[27] Introducing a similar or expanded payment model that would allow EMS agencies to receive reimbursement for treating patients on-scene or for transporting patients to a local, non-hospital health care facility, such as urgent care or a primary care office, would not only lead to increased revenue for the agency but also decrease the transport time required for agencies in areas where CAHs have closed. Doing so would pave the way toward a thoughtful health care system focused on patient-centered outcomes, one where a patient can receive focused and appropriate care rather than defaulting to the emergency department. Allocating funding and resources to improving rural EMS clinicians' education would also serve to achieve this goal, as clinicians would likely need extra training to be able to appropriately direct patients to these alternate destinations rather than the closest emergency department.

Innovation should be embraced, and forward-thinking models such as mobile integrated health (MIH) and community paramedicine (CP) should be considered essential aspects of EMS. In rural areas with low patient volumes, MIH or CP programs must integrate with local health care providers and other agency partners to maximize efficiency. Implementing field use of telemedicine, which has been widely adopted since the pandemic,[10] would also help EMS clinicians triage patients and determine appropriate destinations, thereby minimizing unnecessary long-distance transports, while mitigating the effects of low-call frequency on staff experience.

Broad changes in EMS will be challenging to implement due to the fragmented oversight of EMS agencies. EMS oversight is mostly done at the local and state level, with minimal guidance at the federal level. Each state has its own set of regulations, protocols, and policies, which in some states even vary regionally. Consolidation of some aspects of EMS oversight and data collection at the local, state, and federal levels could allow for improved efficiency of services and coordination, as long as agencies remain able to adapt to local challenges. This limited consolidation in turn would allow for improved data collection and research, leading to more focused policy recommendations that will be necessary to support these vital rural resources.

Having access to CAHs, REHs, or alternative destinations will aid rural EMS agencies in decreasing their transport times and improve opportunities for education and for collaboration between EMS personnel and other health care practitioners. Moving forward, policy makers should learn from the factors that have contributed to CAH closures and their repercussions and plan future legislative reforms to protect and support REHs and other rural health care facilities, as well as the EMS agencies working with them and the communities they serve.

References

1. Spencer R. America's rural hospitals in critical condition. *Washington Post*. March 17, 1989. Accessed February 6, 2025. https://www.washingtonpost.com/archive/politics/1989/03/18/americas-rural-hospitals-in-critical-condition/5a6d6ee1-ae06-452b-8eaa-c961a1cd2e5e/

2. Critical access hospitals (CAHs). Rural Health Information Hub. Updated December 10, 2024. Accessed December 27, 2024. https://www.ruralhealthinfo.org/topics/critical-access-hospitals
3. Gaston SM, Walker BW. Critical access hospitals: meeting underserved community needs. *Nursing*. 2018;48(5):51-54.
4. Freeman VA, Walsh J, Rudolf M, Slifkin RT, Skinner AC. Intensive care in critical access hospitals. *J Rural Health*. 2007;23(2):116-123.
5. Healy J. It's 4 A.M. The baby's coming. But the hospital is 100 miles away. *New York Times*. July 17, 2018. Accessed February 10, 2025. https://www.nytimes.com/2018/07/17/us/hospital-closing-missouri-pregnant.html
6. Rural hospital closures. University of North Carolina Cecil G. Sheps Center for Health Services Research. Accessed February 10, 2025. https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/
7. Wishner J, Solleveld P, Rudowitz R, Paradise J, Antonisse L. A look at rural hospital closures and implications for access to care: three case studies. KFF. July 7, 2016. Accessed February 10, 2025. https://www.kff.org/medicaid/issue-brief/a-look-at-rural-hospital-closures-and-implications-for-access-to-care/
8. Frakt A. A sense of alarm as rural hospitals keep closing. *New York Times*. October 29, 2018. Accessed February 10, 2025. https://www.nytimes.com/2018/10/29/upshot/a-sense-of-alarm-as-rural-hospitals-keep-closing.html
9. Levinson Z, Godwin J, Hulver S. Rural hospitals face renewed finacial challenges, especially in states that have not expanded Medicaid. KFF. February 23, 2023. Accessed March 25, 2025. https://www.kff.org/health-costs/issue-brief/rural-hospitals-face-renewed-financial-challenges-especially-in-states-that-have-not-expanded-medicaid/
10. Colyer J, Anzaldua A, Blancato R, et al. Access to emergency medical services in rural communities: policy brief and recommendations to the secretary. National Advisory Committee on Rural Health and Human Services; 2022. Accessed August 25, 2024. https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/rural/access-to-ems-rural-communities.pdf
11. Rural hospitals. Rural Health Information Hub. Updated November 20, 2024. Accessed February 13, 2025. https://www.ruralhealthinfo.org/topics/hospitals
12. Rural emergency hospitals. University of North Carolina Cecil G. Sheps Center for Health Services Research. Accessed February 10, 2025. https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-emergency-hospitals/
13. Edwards E. What if you call 911 and no one comes? Inside the collapse of America's emergency medical services. *NBC News.* October 22, 2019. Accessed August 25, 2024. https://www.nbcnews.com/health/health-care/there-s-shortage-volunteer-ems-workers-ambulances-rural-america-n1068556
14. Emergency medical services (EMS): local authority, funding, organization, and management. Centers for Disease Control and Prevention. October 9, 2024. Accessed December 27, 2024. https://www.cdc.gov/ems-community-paramedicine/php/us/local-authority.html
15. MacKinney AC, Mueller KJ, Coburn AF, Knudson A, Lundblad JP, McBride TD. Characteristics and challenges of rural ambulance agencies—a brief review and policy considerations. Rural Policy Research Institute; 2021. Accessed August

25, 2024. https://rupri.org/wp-content/uploads/Characteristics-and-Challenges-of-Rural-Ambulance-Agencies-January-2021.pdf
16. Jonk Y, Milkowski C, Croll Z, Pearson K. Ambulance deserts: geographic disparities in the provision of ambulance services. Maine Rural Health Research Center; 2023. Accessed August 25, 2024. https://digitalcommons.usm.maine.edu/cgi/viewcontent.cgi?article=1013&context=ems
17. Hassanein N. What if the ambulance doesn't come? Rural America faces a broken emergency medical system. *USA Today*. June 26, 2023. Accessed August 25, 2024. https://www.usatoday.com/story/news/health/2023/06/26/no-ambulances-closing-hospitals-the-crisis-facing-rural-america/70342027007/
18. Sisk T. Life in a rural "ambulance desert" means sometimes help isn't on the way. *CBS News*. August 21, 2023. Accessed August 25, 2024. https://www.cbsnews.com/news/ambulance-emergency-health-care-rural-hospitals/
19. Troske S, Davis A. Do hospital closures affect patient time in an ambulance? University of Kentucky Rural and Underserved Health Research Center; 2019. Accessed August 25, 2024. https://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1007&context=ruhrc_reports
20. Miller KEM, James HJ, Holmes GM, Van Houtven CH. The effect of rural hospital closures on emergency medical service response and transport times. *Health Serv Res*. 2020;55(2):288-300.
21. Ramesh T, Gee E. Rural hospital closures reduce access to emergency care. Center for American Progress. September 9, 2019. Accessed February 12, 2025. https://www.americanprogress.org/article/rural-hospital-closures-reduce-access-emergency-care/
22. Patterson DG, Skillman SM, Fordyce MA. Prehospital emergency medical services personnel in rural areas: results from a survey in nine states. WWAMI Rural Health Research Center; 2015. Final report 149. Accessed August 25, 2024. https://depts.washington.edu/uwrhrc/uploads/RHRC_FR149_Patterson.pdf
23. Freeman VA, Rutledge S, Hamon M, Slifkin RT. Rural volunteer EMS: reports from the field. North Carolina Rural Health Research and Policy Analysis Center; 2010. Final report 99. Accessed August 25, 2024. https://www.shepscenter.unc.edu/wp-content/uploads/2014/10/FR99.pdf
24. Koeze E, Patel JK, Singhvi A. Where Americans live far from the emergency room. *New York Times*. April 26, 2020. Accessed August 25, 2024. https://www.nytimes.com/interactive/2020/04/26/us/us-hospital-access-coronavirus.html
25. US Const Amend X.
26. Hassanein N. More states push to recognize EMS as "essential service." *EMS1*. September 12, 2023. Accessed December 27, 2024. https://www.ems1.com/politics/articles/more-states-push-to-recognize-ems-as-essential-service-CIUlBa0k2kdZoHV7/
27. ET3 program comes to an abrupt end. *JEMS*. June 28, 2023. Accessed February 13, 2025. https://www.jems.com/major-incidents/et3-program-comes-to-an-abrupt-end/

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PERSONAL NARRATIVE

I Pressed Down

David M. Sine, DBioethics

Abstract
In emergency medical services prehospital care, situational awareness means that not everything is in a textbook and that not all care is about the patient in front of you.

Still Learning

I pressed down just as I had been taught in my cardiopulmonary resuscitation (CPR) training— just as I had practiced a hundred times—arms and back straight, and I felt his old ribs crack under my overlapped hands. I wasn't prepared for that sound; I was sure that the whole room could feel and hear. Would they now know how I had just injured my first-ever patient?

My unfortunate patient and I found each other on a warm Chicago evening as I began a career as a fire department paramedic. My ambulance had arrived on a tree-canopied street on Chicago's North side, evening light fading as streetlights added golden halos to a purple June sky. Falling in behind my senior officer, who was still technically responsible for my final field-based training, we gathered our equipment and sprinted up the stairs to the second floor of a red brick 3-flat. Waving arms and urgent encouragement from 7 gathered family members guided us through an open second-floor apartment door and signaled our attention to the patient lying on the living room floor.

I was about to learn from my senior officer and others more skilled than I in the art of prehospital care that many things you need to know are not in a textbook and that good emergency medical services is sometimes not only about the patient in front of you.

Situational Awareness

This scene is but a small piece of a larger story that unfolded that night, offering lessons I would carry with me throughout my career about how field-based clinical and ethics reasoning and decision-making needs to be case based and context specific rather than rule based and principle guided. As the dynamic of that evening unfolded, I slowly began to realize that apartments in this building were all occupied by siblings and that it was their father who was in distress on the floor. As I began CPR, as he was intubated, as one intravenous (IV) line was quickly started in one thready vein and then in a second, our actions were witnessed by a growing number of members of 3 generations of this

family. I remember in vivid detail the beige shag carpeting, a plastic-covered tufted brocade couch, tasseled lamp shades, and even a swag ceiling lamp in the center of the room. I suspected this family had made it through their evening meal and dessert together, since my first few breaths into this father's mouth tasted like orange sherbet. I remember my surprise and relief when I noticed the arrival of a second ambulance crew, who helped us move the patient to a better location on the floor to continue CPR. Most of all, I remember knowing that this man was probably dead before we arrived.

Yet we continued CPR. We connected the telemetry of our defibrillator and transmitted electrocardiogram (EKG) strips to a local emergency department, where the patient's death was confirmed. Nevertheless, we poured in cardiac drugs—epinephrine, atropine, more epinephrine, more sodium bicarb. We shocked the patient—once, twice, three times. Still nothing but a ruler-straight line on the EKG, and still we continued the then-current protocol for CPR and squeezed the ventilator bag: 5 compressions and a pause for a squeeze, 5 and a squeeze, 5 and a squeeze.

More family members gathered to witness our efforts. They stood silently in several huddles, speaking quietly in whispers. The sound of our activity in tearing open IV tubing kits and the rhythmic gasp of the ventilator bag filled the room as we labored. After what seemed like half an hour, the second ambulance crew helped us move the man to a gurney. He was heavy. His bowels were loose. Sweating, we continued CPR as we carried the gurney, man, defibrillator, and portable oxygen tank down the stairs and into the ambulance. After a brief discussion with the patient's eldest son about to which hospital we'd drive and who might ride with us, we left the scene and drove quickly into the humid night. Red lights of our vehicle strobed against street signs and storefronts, and darkened windows of businesses on a main street reflected the white flash of the ambulance speeding away.

What Just Happened There?

I rode in the back. We stopped the CPR we all knew was futile and radioed the hospital to confirm the "triple zero," trade talk for a death. At the hospital, we entered with our patient through the ambulance entrance, which allowed us to keep our somber business away from other patients and the waiting room. Our patient was wheeled behind a curtained cubicle and transferred by an aide to a bed. No staff rushed to our assistance. "We were done here," we well knew, as was our patient's life journey, and everyone on the inside of the system knew it. We gathered our equipment and retreated back outside to the parking lot. The evening had cooled, and I felt some of the heat of exertion drift from my body into the night.

I locked eyes with my senior officer for a long moment. "What just happened there?"

"Wadaya mean?" he asked.

I continued, "Back there, in the apartment. We had 2 crews work on a dead guy for nearly an hour. Why didn't we just call the code? It's a busy night."

My senior officer explained, "Well, there was his family. We could have called it. But they were all there watching, and, well, by working it, that whole family will always get to say, 'Those people from the Fire Department did everything that they could for Gramps and it was just his time to go.' Sometimes, Dave, the performance matters more than the outcome."

Treating the Whole Scene

Paramedics' medicalizing and deconstructing an ill or injured person into that scene's clinical components often too narrowly construes a patient in terms of clinical data.[1] A drug overdose, for instance, would be distilled into focused elements of drug type (if known), the route of administration (inhalation, oral, or IV), prophylactic use of naloxone, a guarded airway, perfusion, and respirations. Paramedics are trained to perform a rapid assessment, to stabilize and package, and to transport with an absolute adherence to protocol and medical professionalism: time and efficiency are critical. Medicalization assumes that the victim is suspended in a clinical vacuum and not a part of a larger environment in which he or she receives care in front of witnesses. A virtual "privacy curtain" is drawn around the victim and clinician behind which a quiet struggle ensues for the paramedic between empathy for the patient and a need to remain objective and distant.[2]

However, firefighters and paramedics are trained to "treat the whole scene." This roughly translates into being aware of your surroundings and is sometimes referred to as situation awareness or mindfulness.[3,4] My previous understanding of mindfulness was to be sensitive to environmental context. A shift in wind if you'd rather be upwind than down, a whiff of diesel at a vehicle accident, or the smell of natural gas in a basement. Or, to continually test how spongy the roof of a burning building feels under your boots or to always be fearful of the bow truss roof that, with a snap of a main chord, can crush you beneath its unbearable weight on a snowy day. To be mindful and to treat the whole scene means to watch the crowd at a shooting and to make sure you don't end up with more victims than you started with (arrival at a shooting often starts with the question by a paramedic of "Who's got the gun?"). Paramedics engage with and are witnessed by family members and bystanders as they provide care on the public streets and in private homes under the most challenging of circumstances. Because paramedics are guests of honor at someone else's surprise party, what paramedics do and where they do it puts them in a larger environment of care than their hospital-bound contemporaries, with paramedics' mistakes and missteps committed in public view. Readers are sure to recognize that truth telling as an ethical value is also at risk in this story. Equity, perhaps, too, is at risk, as 2 ambulance crews are not available to meet needs elsewhere in the community. So, too, at risk are characters and values of paramedics who recognize potential for futility of care they provide and consider whether and when deceiving onlookers, including members of a patient's family, is ethical.

The new mindfulness meant that the accident scene and all of its occupants become players in a larger clinical picture and elements in a larger assessment and a larger plan of care. When the drowsy-lidded, thick-tonged, drug-overdosed attempted suicide earnestly asks the paramedic, "Who called you?" (a completely uninteresting bit of information to the clinically focused), she may actually be asking if a lover called 9-1-1 after a farewell call or text message. She is asking, "Who cares about me?" in addition to "Who cares for me?" Thus, treating the whole scene, as I was learning, also meant to treat the whole patient as well as family, friends, and bystanders. To focus only on curing or stabilizing injury clinically denies the opportunity to help heal the illness, which is shared by the larger community that orbits the patient.

Decades later, with a new job in a small coastal town in Connecticut, I left the village coffee shop one sunny morning and noticed a small crowd gathered across the street at the gas station pumps. I approached and could see that an elderly gentleman was lying

on the ground. Two other men were kneeling on either side of him, speaking at him and trying to rouse him by gently shaking him. I joined them at their friend's side and checked for a pulse and looked for signs of life. Nothing. I positioned myself and checked again. Still nothing. I looked up and saw that I was now surrounded by a sea of sunburned knees, plaid shorts, and Sperry Topsiders and heard myself say, "Let's help this man.... Call 9-1-1." I felt for the zyphoid process, positioned and overlapped my hands on his sternum, and.... I pressed down.

References

1. Frank AW. *The Wounded Storyteller: Body, Illness, and Ethics*. University of Chicago Press; 1995.
2. Chambers T. *The Fiction of Bioethics*. Routledge; 1999.
3. Endsley MR. Towards a theory of situation awareness in dynamic systems. *Hum Factors*. 1995;37(1):32-64.
4. Weick KE, Sutcliffe KM. *Managing the Unexpected: Resilient Performance in an Age of Uncertainty*. 2nd ed. Josey-Bass; 2007.

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