

Innovations in Overdose Response

Strategies Implemented by Emergency Medical Services Providers

Accidental drug overdose in the United States has escalated over the past two decades, and national statistics indicate that the overdose fatality rate has [quadrupled](#) since 1999. The rate of overdose deaths accelerated sharply in 2013 with the proliferation of synthetic opioids like fentanyl.¹ Over the past year, the COVID-19 pandemic has coincided with [another surge](#) in fatal overdoses.^{2,3} Responding to this growing crisis, public and private agencies across multiple sectors (e.g., public health, law enforcement, corrections, healthcare, behavioral health) have implemented or supported overdose prevention, treatment, recovery support, and harm reduction strategies.⁴ Emergency medical services (EMS) providers play a critical role in overdose response efforts because they are often the first and sometimes the only healthcare professionals to have contact with persons who overdose, especially in rural areas.⁵ Recognizing this fact, some EMS agencies have integrated a range of novel and innovative strategies that extend beyond providing immediate respiratory support, administering naloxone, and transporting overdose patients to the emergency department (ED).

Involving EMS providers in state and local efforts to prevent overdose is important because EMS providers are more likely than other healthcare providers to have regular contact with overdose survivors at the highest risk for overdose death.⁶ The primary reason for this is that persons who use drugs often refuse care after being revived from an overdose and may not seek care until experiencing multiple nonfatal overdoses. The reluctance to seek care may be explained by personal factors—such as denying having a substance use disorder, not being ready to abstain from drugs, and fearing the social stigma attached to facility-based care—and/or logistical factors, such as a lack of health insurance and a lack of affordable transportation to access needed healthcare.⁷ Taking these factors into consideration, it is clear why EMS runs serve as critical touchpoints for intervention.

Overview of Environmental Scan

This report is based on an environmental scan ASTHO conducted from March 2020 through March 2021 in collaboration with the National Association of EMS Officials about innovative overdose response strategies involving EMS providers. Strategies were considered innovative if they (1) extended beyond the standard protocol of providing immediate respiratory support, administering naloxone, and transporting overdose patients to the ED; and (2) appeared promising but lack rigorous evidence. We focus on innovative and not evidence-based strategies because EMS-involved strategies lack rigorous evaluation support. The environmental scan included:

- **An ad-hoc EMS and public health committee that met in March 2020 to discuss emerging areas of innovation.** The group had 22 members, including state and local EMS officials and representatives from state public health agencies, CDC, and the National Highway and Traffic Safety Administration. The two-day meeting included facilitated discussions about innovative overdose-response strategies, how these strategies might positively impact communities, and perceived barriers to implementing new overdose prevention initiatives.

- **A survey of 1,140 EMS providers between August and November 2020.** ASTHO and the National Association of EMS Officials engaged in a consensus-building process to identify strategies to be evaluated in a nationwide EMS provider survey. 1,140 individuals from 47 states, as well as one individual from the territories and freely associated states, participated in this survey (see Figure 1 for the geographic distribution of survey respondents). The survey explored the prevalence of the identified strategies, how much they are valued, and key implementation barriers. The survey also gathered additional information on strategies EMS providers are implementing.

Figure 1. Geographic Distribution of Participants



- **A literature review related to EMS involvement in overdose response efforts.** ASTHO completed a literature review to contextualize the survey results, identify additional strategies, and find local examples. An iterative database search uncovered only a few studies evaluating these strategies, and none had sufficient rigor to permit conclusions.

Innovative Emergency Medical Services Strategies

Overall, the environmental scan revealed 15 strategies, which we grouped into five categories (see Table 1). This section discusses the most prominent strategies identified from the environmental scan, in that each strategy discussed has a significant level of EMS involvement. Strategies noted by only two out of 1,140 respondents (“predictive mapping” and “social support/counseling”) as well as strategies mentioned in the qualitative portion of the survey (“non-opioid pain medications,” “referral to behavioral health services,” “community or family outreach,” and “partnerships and coalitions”) are omitted from the discussion because they rarely involve EMS or because they lack specificity. For the strategies discussed during the ad-hoc EMS and public health committee meeting, this report summarizes survey findings related to how much EMS providers implement them, how much they value them, and what barriers affect their implementation. Figure 2 displays survey findings for each of the strategies assessed in the survey, ordered from least to most frequently implemented.

Table 1: Overdose Response Strategies*

Strategies identified by meeting participants	Additional strategies identified by survey participants	Additional strategies from narrative review
Sharing Data for Improved Public Health Surveillance and Response		
Data sharing with health department (N=575)		
Analyzing Data for Improved Public Health Surveillance and Response		
	Predictive mapping for identifying opioid overdose trends (N=2)	
Increasing Access to Treatment and Recovery Services		
System of care approach (N=444)	Other medical interventions, such as non-opioid pain medications (N=7)	
Reimbursement for transport to alternative treatment locations (N=60)	Referral to behavioral health services (N=47)	Safe stations
	Providing social support or counseling (N=2)	Mobile integrated health clinics
Field administration of buprenorphine (N=24)	Community or family outreach (N=23)	
“Quick response teams” (or post-overdose response teams)		
Providing Life-Saving Resources to Overdose Survivors		
Leave-behind materials (N=182)		
Collaborating with Partners		
	Partnerships or coalitions to address opioid overdose (N=17)	

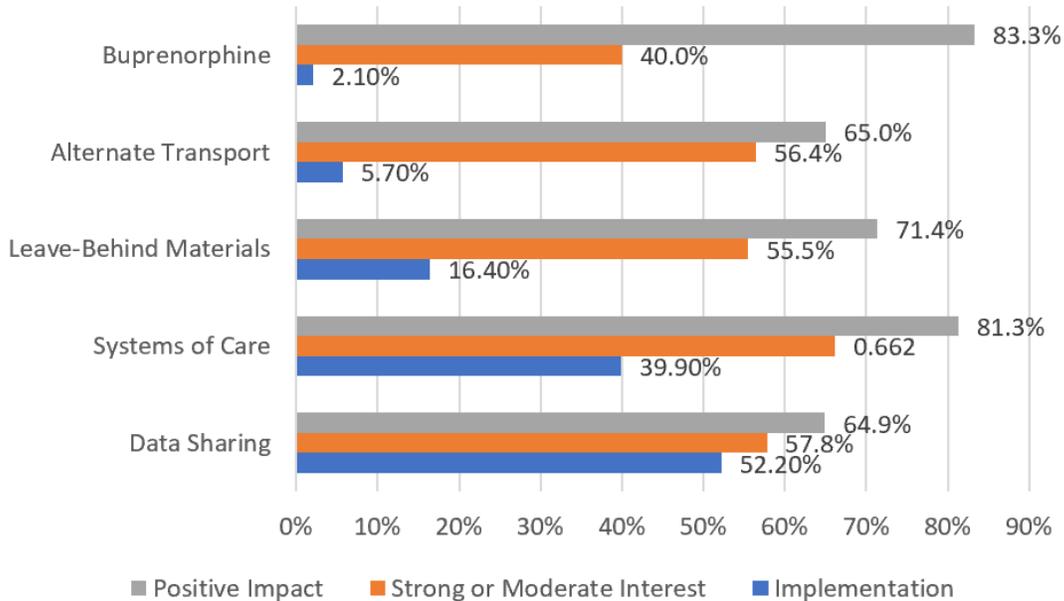
*“N” reflects the number of survey respondents who are currently implementing the strategy.

Sharing Data for Improved Public Health Surveillance and Response

Unlike hospital or death certificate data, EMS data are geographically indexed and can be accessed within a short period of time, so they help public health entities quickly identify when and where overdose outbreaks are occurring. EMS data reflect a larger pool of overdose cases than data from other healthcare systems because many overdose patients refuse further medical attention or transport to the hospital after EMS providers resuscitate them. Slightly over half (52.2%) of survey respondents indicated that they currently share data with their state or local public health agency, and almost two-thirds (64.9%) of respondents report that data sharing has a positive impact. Among those not sharing data, 57.8% indicated a strong or moderate interest in doing so in the near future.

After each EMS run, EMS providers must complete an [Electronic Patient Care Report](#), which is uploaded to the state office of EMS. In some jurisdictions, the office of EMS de-identifies these data and transmits them to the [National Emergency Medical Services Information System](#), a database developed by the National Highway and Traffic Safety Administration’s Office of EMS that standardizes, aggregates, and utilizes point of care EMS data at a local, state, and national level to inform policy and practice. Public health researchers can use the public-release dataset to examine trends in naloxone administration, non-fatal overdose, and other overdose-related events.^{8,9,10}

Figure 2. Summary of Survey Findings



Starting in April 2017, many EMS agencies across the country have been using the [Overdose Detection Mapping Application Program](#), (ODMAP), a reporting system developed by the Baltimore/Washington High Intensity Drug Trafficking Area to address the overdose crisis. One benefit of ODMAP is that it provides near real-time suspected overdose data so that public safety and public health can mobilize an immediate response to overdose spikes or clusters. If overdoses in a particular area exceed a predetermined threshold within a 24-hour period, the public health and public safety agencies receive a “spike alert” by email. Other ODMAP benefits include facilitating non-fatal overdose reporting, equitable reporting across communities with different financial resources, and data sharing across sectors and jurisdictions to identify emerging patterns and trends. In some states, such as Connecticut, Florida, and Maryland, the use of ODMAP is standard practice. Florida and Maryland have developed and implemented an application programming interface to automatically populate the state ODMAP system with National Emergency Medical Services Information System data.

Further, since June 2019, EMS providers in Hartford, Connecticut have participated in the [Statewide Opioid Reporting Directive](#), an initiative originating from an interagency collaboration between the Connecticut Department of Health and poison control and healthcare settings. This initiative requires that EMS providers report all suspected opioid overdoses in Hartford to the Connecticut Poison Control Center by calling the 800 number and answering a series of 10 questions, including demographic information about the patient.

Increasing Access to Treatment and Recovery Services

EMS agencies are uniquely positioned to link patients with treatment and recovery services if desired. ASTHO found that there are about nine ways in which EMS providers link patients to care. (This section is limited to the first six strategies because they had adequate specificity and were reported by at least 20 respondents.)

- Using a system of care approach
- Receiving reimbursement for non-ED transport
- Administering buprenorphine
- Quick response teams (or post-overdose response teams)
- Safe stations
- Mobile integrated health clinics
- Referral to behavioral health services
- Community or family outreach
- Administering non-opioid pain medication or another medical treatment

Using a System of Care Approach

Nearly 40% of the 1,119 survey respondents indicated they implement an “approach that builds partnerships to create a broad, integrated process for meeting a patient's multiple needs,” and another 17.1% indicated they were planning on using this system of care approach. Among those implementing this strategy (N=444), a large majority of respondents (81.3%) reported positive impacts. Among those not implementing this strategy (N=654), most (66.2%) reported having a strong or moderate interest in implementing this strategy in the near future. One respondent commented that their agency works with partners to maintain an [overdose system of care](#), stating, “We have a county-based Recovery and Resilience Network that is over 100 agencies strong, facilitated by the United Way, centered in creating and maintaining a [Recovery Oriented System of Care](#) around mental health and substance use disorders.”

Receiving Reimbursement for Non-Emergency Department Transport

In February 2019, the Centers for Medicare and Medicaid Services launched a five-year pilot program called the [Emergency Triage, Treat, and Transport model](#), which is being rolled out across different cohorts of EMS providers. This model allows participating EMS agencies (approved by the Centers for Medicare and Medicaid Services) to be reimbursed for partnering with qualified healthcare providers to deliver treatment in place (on-scene or via telehealth) and for [transporting](#) patients to destinations that are more conducive to recovery from an overdose than the emergency department, such as urgent care clinics and community health centers.

ASTHO’s EMS survey found that only 5.7% of respondents reported currently receiving reimbursement for transporting overdose patients to locations other than the ED. About two-thirds (65%) of those currently receiving reimbursement for an alternative destination transport felt it was having a positive impact. Among respondents in agencies not receiving reimbursement, a large majority (72.9%) had a strong or moderate interest in getting reimbursed for alternative destination transport in the near future. The gap between implementation and interest might be because non-ED transport is outside of EMS protocols or simply because many respondents do not provide transportation or conduct billing. During the ad hoc committee meeting, ASTHO learned that Delaware is utilizing [stabilization centers](#) as alternative treatment destinations. Stabilization centers seek to link overdose patients revived by EMS or emergency department providers (or patients who require acute management for substance use disorder) to treatment.

Administering Buprenorphine

Only 2.1% of survey respondents (24 respondents representing 16 states) indicated they are [administering buprenorphine](#), and only 3.2% reported they were actively planning on using this strategy.¹¹ However, among the few respondents currently implementing this strategy, 83.3% indicated

they felt the strategy was having a positive impact. Among those not dispensing buprenorphine, 60% indicated little or no interest in doing so in the near future. Although it is too soon to know whether this strategy is effective, evidence from a study of ED-initiated buprenorphine suggests that buprenorphine initiated in an emergency context may increase treatment engagement in the short term.¹² In April 2021, [HHS made a rule change](#) that makes eligible clinicians exempt from having to obtain a Drug Addiction Treatment Act of 2000 waiver to prescribe buprenorphine to up to 30 patients. Now that buprenorphine can be prescribed more readily to persons with opioid use disorders, buprenorphine administration will become more widely practiced by EMS providers and emergency department physicians.¹³

Quick Response Teams, Safe Stations, and Mobile Integrated Health Clinics

Quick response teams, safe stations, and mobile health clinics were not selected during the consensus-building process as high-priority innovations for inclusion in the survey. However, there is considerable interest in these strategies nationally, as demonstrated in the literature review. These strategies and examples are described below.

[Quick response teams \(or “post-overdose response teams”\)](#) are multidisciplinary teams that follow up with overdose patients who refuse treatment shortly after they have been revived from an overdose. Quick response teams were first deployed in 2015 in [Colerain Township, Ohio](#) in response to the area’s disproportionately high rate of drug overdose deaths, and now exist across the country. The teams are dispatched within one week of a reported non-fatal overdose to connect overdose survivors to treatment during this critical period and divert them from the criminal justice system. These teams are made up of at least three people and can include fire-paramedics, addiction specialists, other healthcare professionals, police officers, social workers, peer mentors, and faith leaders.

[Safe stations](#) are fire stations where people who use drugs can access care 24/7 without fear of arrest. Upon arrival, the individuals are medically evaluated, and if they need immediate medical care, they are sent to the appropriate healthcare facility. After the medical issues are resolved, provided there is no active warrant for a violent offense, the crisis response team connects them with station-based recovery coaches. This low-cost intervention is being replicated across the United States, including in [Providence, Rhode Island](#); [Annapolis, Maryland](#); [Anne Arundel County, Maryland](#); [Tacoma, Washington](#); [Chattanooga, Tennessee](#); and [Whitehall, Ohio](#).

[Mobile integrated health clinics](#) are another novel way EMS can increase access to care. Deployed to rural communities, urban neighborhoods, retail centers, and other locations, these clinics combat the stigma attached to seeking help for addiction at drug-treatment facilities and remove transportation barriers. Although not all such clinics include EMS providers, some do, like those dispatched from the Houston Emergency Opioid Response System. Houston’s system responds to EMS runs involving naloxone administration by deploying a mobile response team, including a peer recovery coach and a licensed paramedic, to the site of the incident.¹⁴ An economic evaluation of Houston’s mobile integrated health clinic found it to be associated with fewer transports to the emergency department and lower healthcare costs than ambulance-based responses.¹⁵

Providing Life-Saving Resources to Overdose Survivors

Only 16.5% of 1,129 respondents reported leaving materials for patients. “Leave-behind” materials typically provide health education and contact information for substance use treatment and/or recovery services. They may also state where to access naloxone and clean syringes. Some EMS providers, like those with the [Howard County Naloxone Leave-Behind Program](#), provide naloxone kits to supplement community-based naloxone distribution efforts. One evaluation of a naloxone leave-behind program found that patients receiving naloxone kits were more likely than those not receiving kits to connect with a peer recovery support specialist, especially when they received them from family members or peers.¹⁶ Other evaluations of naloxone leave-behind programs suggest they are a feasible and promising means of augmenting community-wide naloxone distribution.^{17,18} Of the 182 EMS providers who reported providing leave-behind materials, 71.4% reported that the practice has a positive impact. Among those not leaving behind resources for overdose patients, a little over half (55.5%) reported they had a strong or moderate interest in doing so in the near future.

Implementation Barriers

Implementation barriers must be considered when attempting to launch any strategy. This section reviews each barrier that surfaced in the environmental scan, discusses survey findings, and includes examples, where identified in the literature. Surprisingly, only 15.7% of 1,008 respondents indicated that COVID-19 had affected their agency's ability to respond to opioid overdoses.

Funding

Funding is a barrier for most public services, including public health.¹⁹ The majority (58.7%) of survey respondents identified funding as a barrier affecting their ability to provide leave-behind materials; this may be due to the cost of naloxone.²⁰ Funding was the most commonly cited barrier for all strategies, except for “data sharing with health departments,” where only about one-third of respondents (32.7%) cited funding as a barrier.

Interagency Collaboration

For EMS to be part of a comprehensive, integrated, and coordinated approach to address the overdose crisis, interagency collaboration with public health and public safety partners is needed. The majority of survey respondents (57.7%) noted that interagency collaboration is more important than funding when it comes to sharing data. Many also noted that collaboration was needed for service delivery and for adapting services to respond to COVID-19. Survey respondents reported that they partner with local health departments (77 respondents), state health departments (75 respondents), and law enforcement (10 respondents). Two ways to facilitate interagency collaboration is to join overdose fatality review teams, like the [Morris County Overdose Fatality Review Team](#), or join coalitions like the [Wake County Drug Overdose Prevention Coalition](#).²¹ However, efforts to engage in interagency collaboration may not need to be as formal. Forming partnerships is a good first step and is seen by some as the key to program success.²²

Community Buy-In

Community buy-in is needed for all public efforts to combat drug overdose because they utilize public funds to address an unpopular problem. For example, when the fire-rescue department in [Havelock, North Carolina](#) initially attempted in 2016 to launch the country's first-ever needle-exchange program, where firefighter paramedics provide sterile needles to overdose patients, the community was against the idea, feeling that providing needles would increase heroin use and that tax dollars should not

support the program. However, after being informed about the evidence base for needle-exchange programs and after learning that program materials were being donated by the North Carolina Harm Reduction Coalition, the department was able to achieve community buy-in and launch the program in November 2017.

Staff Burnout

Studies have found that compassion fatigue, secondary trauma, and burnout are common among EMS providers.^{23,24,25} Burnout can lead to low staff retention rates and other issues that can undermine program implementation.²⁶ The survey asked respondents to rate “burnout support for EMS staff.” Despite how pervasive burnout is among EMS providers, only 4 out of 10 (42.1%) survey respondents reported having access to burnout support. Among those receiving burnout support (N=471), a large majority (80.5%) rated it as having a positive impact. Among survey respondents who lack burnout support (N=634), a large majority (81.7%) rated themselves as having strong or moderate level of interest in type of intervention. This is not a surprise given that EMS providers must, at times, resuscitate the same patient multiple times in a week or even in one day.

Recommendations and Conclusion

EMS agencies have an opportunity to play an active role in curbing the overdose epidemic. Most EMS providers expressed that innovative overdose response strategies have (or could have) positive impacts on their local EMS agency. Furthermore, many providers noted that their agencies have collaborative relationships with other public agencies. These relationships could be leveraged to achieve greater coordination of care between sectors and develop the partnerships required for implementing innovative strategies that rely on interagency collaboration, such as quick response teams, safe stations, and mobile integrated health clinics.

Although many EMS overdose response strategies seem promising, the critical role that EMS can play in helping communities fight the drug overdose epidemic is not widely recognized. As a result, the funding, resources, and supports needed for EMS agencies to effectively engage in overdose response might not be sufficient. Public health agencies are positioned to support partnerships with EMS that acknowledge their unique role and opportunities for innovative approaches.

Overall, three unexpected findings emerged from this environmental scan. First, administering buprenorphine was the most favored strategy (being rated as having a positive impact by the greatest percentage of respondents who reported that they administer the drug), yet very few EMS providers report any interest in this strategy. This finding may be explained by the fact that the decision to administer buprenorphine requires approval from a higher level of authority.

The second finding is that a large majority (71.4%) of EMS professionals who are providing leave-behind materials reported that they felt the practice has a positive impact, yet only 16.5% of survey respondents indicated they implement this strategy. This strategy may not be widely implemented due to EMS provider perceptions around whether lay persons can administer naloxone effectively without receiving proper training, since EMS providers themselves are encouraged to receive training. Finally, the survey revealed that almost all (94.3%) respondents do not receive reimbursement for transporting overdose patients to non-ED locations. However, 65% of those receiving reimbursement for alternate transport reported a positive impact, and the majority of respondents (56.4%) indicated at least a moderate interest in receiving support for this strategy in the near future.

Some recommendations for health agencies include:

- Consider EMS and their unique role in the community when funding overdose response and surveillance activities.
- Partner with EMS to support their public health and healthcare functions (e.g., providing overdose data, linking to care, providing buprenorphine).
- Support policies that reimburse EMS agencies for transporting overdose patients to alternate (non-ED) destinations, such as stabilization centers or addiction treatment programs.
- Promote interagency collaboration between public health and public safety sectors (e.g., consider involving EMS in an overdose fatality review or overdose prevention coalition).
- Make resources for alleviating staff burnout available to EMS professionals when possible.

EMS providers have been on the front lines responding to overdoses for decades and are a crucial partner in any comprehensive response to the opioid epidemic. By virtue of their contact with and knowledge of their community, they are uniquely positioned to effectively treat and prevent overdose by providing access to additional treatment and recovery services. EMS data offer opportunities for states to monitor and respond to overdose outbreaks rapidly to prevent death.²⁷ Initiatives like buprenorphine bridge programs, safe stations, and ODMAP demonstrate that there is promise in partnering effectively with EMS agencies to address funding and policy barriers, messaging the importance of overdose response to the community, and alleviating burnout.

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