

EMS Safety and Prehospital Emergency Care of Animals

Katharyn T. Kryda, DVM, MPH;¹ Ashley Mitek, DVM, MS, DACVAA;² Maureen McMichael, DVM, MEd, DACVECC³

1. Association of Schools and Programs of Public Health (ASPPH)/National Highway Traffic Safety Administration (NHTSA) Public Health Fellow, Washington, DC USA
2. Teaching Assistant Professor, Veterinary Clinical Medicine, University of Illinois College of Veterinary Medicine, Urbana, Illinois USA
3. Professor, Emergency and Critical Care, Auburn University College of Veterinary Medicine, Auburn, Alabama USA

Correspondence:

Katharyn T. Kryda, DVM, MPH
Association of Schools and Programs of Public Health
US Department of Transportation
NHTSA Office of Emergency Medical Services
1200 New Jersey Ave SE
Washington, District of Columbia
20590-3504 United States
E-mail: katharyn.kryda.ctr@dot.gov

Conflicts of interest/funding: This publication was supported by Cooperative Agreement Number DTNH2215H00494 from the US Department of Transportation (DOT), National Highway Traffic Safety Administration (NHTSA), and the Association of Schools and Programs of Public Health (ASPPH). The findings and conclusions of this publication do not necessarily represent the official views of NHTSA or ASPPH. The authors declare no conflicts of interest.

Keywords: animal; disaster preparedness; Emergency Medical Services (EMS); One Health; veterinary

Abbreviations:

EMS: Emergency Medical Services
LEK9: law enforcement canine

Abstract

Emergency Medical Services (EMS) personnel frequently encounter animals in situations ranging from injured law enforcement canines (LEK9s) to pets with smoke inhalation injury. In recent years, several US states have enacted laws that legally allow EMS personnel to provide basic emergency care to certain animals. Currently, nine states allow some type of emergency medical treatment and/or ambulance transport of animals by EMS, and five states limit liability for vehicle damage resulting from rescuing animals trapped inside. Despite this expanding body of legislation encouraging EMS to assist animals, EMS personnel are not typically trained in the safe handling or medical treatment of animals. Interaction with veterinary patients can pose serious injury and infectious disease risks to untrained EMS personnel. Furthermore, relationships with veterinarians must be built and treatment and transport protocols must be developed for EMS agencies to appropriately care for these animals. This report serves as an initial framework from the veterinary perspective for EMS consideration regarding current legislation, safety concerns, transport protocols, and common life-saving treatments in the prehospital emergency care of animals. Increased collaboration between EMS personnel and veterinary professionals provides an opportunity to develop quality training programs for EMS and to improve disaster preparedness of the whole community.

Kryda KT, Mitek A, McMichael M. EMS safety and prehospital emergency care of animals. *Prehosp Disaster Med.* 2021;36(4):466–469.

Disclaimer

The information contained within is not intended to diagnose or treat a veterinary patient. It is provided for educational purposes only and is not a substitute for professional medical advice, diagnosis, or treatment. The authors are not responsible or liable for any advice, course of treatment, diagnosis, or service.

It is essential that Emergency Medical Services (EMS) personnel be familiar with their state laws before treating or transporting an animal. Many states have not yet legalized the treatment of animals by non-veterinarians. Readers should review their state's laws and scope of practice before providing emergency care to animals.

Extreme caution should always be exercised when working around live animals. Emergency Medical Services personnel may be at risk of bite wounds, opioid exposure, or infectious disease exposure when handling animals. Injured, ill, or stressed animals may be aggressive and pose a serious health risk to humans. Law enforcement canines (LEK9s) can exert bite forces up to 800psi and may be trained to bite with all of their teeth in multiple places until the handler commands a release.¹

To the extent possible, EMS agencies should collaborate with veterinary emergency facilities to establish treatment and transport protocols prior to encountering a LEK9 or pet in distress. They should also work with law enforcement partners in advance to better understand LEK9 programs and to develop response protocols for ill or injured LEK9s.

Received: November 5, 2020

Revised: January 11, 2021

Accepted: January 25, 2021

doi:[10.1017/S1049023X21000364](https://doi.org/10.1017/S1049023X21000364)

© The Author(s), 2021. Published by Cambridge University Press on behalf of the World Association for Disaster and Emergency Medicine.

Introduction

Animal exposure presents an emerging safety risk among EMS personnel. First responders are often called upon to assist when a LEK9 is injured in the line of duty, when families evacuate with their pets during a natural disaster, when a service animal accompanies an EMS patient, or when a dog is trapped in a hot car.

Emergency Medical Services personnel respond to thousands of 911 calls for animal bite injuries every year,² and research suggests animal-related injuries presenting to hospital emergency departments are expected to increase nation-wide.³ Law enforcement canines are commonly used for narcotic detection and can potentially expose first responders working alongside them to opioids (eg, fentanyl powder around a LEK9's nose). Working dogs are more prevalent in society, as programs expand to support aviation security,⁴ border security,⁵ search and rescue, law enforcement, and people living with disabilities. Domestic demand for working dogs currently outstrips supply, and efforts are underway to expand quality breeding programs to meet this demand.⁶ At the end of 2016, 57% of all US households owned a pet, and 85% of owners considered their dogs to be family members.⁷ There were 76.8 million dogs and 58.4 million cats in the US, and the pet dog population has increased 10% since 2011.⁷ These factors are all likely to increase the frequency with which EMS personnel encounter animal scenarios during the routine course of their work.

Further contributing to this emerging safety risk for EMS is the changing landscape of US state laws across the nation. Individual states have proposed and enacted new laws specifically addressing prehospital treatment and transport of animals by EMS. Most states limit the provision of medical care for animals to licensed veterinary professionals, but EMS personnel routinely encounter animals in need of emergency treatment (eg, a dog or cat suffering from smoke inhalation after a house fire). New legislation directly addresses this issue, offering Good Samaritan protection to EMS personnel who provide basic emergency care to animals in distress and recommending appropriate training for EMS. Injured and sick animals are stressed, more likely to be aggressive, and may present an increased safety risk to EMS personnel.

Report

New State Legislation

Several US states now allow EMS personnel to provide some form of emergency care to animals. Additional states have proposed similar legislation. Some state legislation is limited to LEK9s, while other states include pets. As more states consider these laws, it is possible that EMS treatment and transport of LEK9s and house pets may become legal in more areas of the country. Currently, Illinois,⁸ Michigan,⁹ Mississippi,¹⁰ and New York¹¹ allow ambulance transport of injured LEK9s if no human patient needs the ambulance. In 2014 and 2016, Colorado and Ohio, respectively, enacted laws that allow EMS personnel to provide emergency medical care to a dog or cat being transferred to a veterinarian.^{12,13} This emergency care is limited to an EMS practitioner's current scope of practice level for services provided to a human patient. In 2017, Maryland passed a law stating that, in certain emergency situations, "prohibitions relating to the practice of veterinary medicine do not apply" and those giving care to an animal will be protected from civil liability.¹⁴ In 2018, California and Wisconsin enacted new laws that allow appropriately trained EMS personnel to provide prehospital emergency care to dogs and cats and exempts EMS from civil liability.^{15,16}

In addition to enacted laws discussed above, several states have proposed new legislation related to prehospital treatment and transport of animals. In 2019, Massachusetts, Minnesota, New Jersey, New Mexico, New York, Pennsylvania, Texas, and Washington introduced legislation to allow for prehospital emergency care of dogs, cats, or LEK9s.¹⁷ All 2019 bills failed to advance. In 2020, Illinois introduced a bill which would allow EMS to render prehospital emergency care to a dog or cat to the extent they have received commensurate training,¹⁸ and New Jersey introduced multiple bills that would provide EMS immunity from civil liability when providing emergency care or transport to an animal at the scene of an accident or during disasters.¹⁹

States have also passed recent laws facilitating the rescue of trapped animals from vehicles. In 2018, Louisiana²⁰ and Pennsylvania²¹ enacted laws that limit liability for vehicle damage resulting from rescuing animals in apparent distress due to extreme temperature or other dangerous circumstances. Louisiana's law applies to the general public, while Pennsylvania's law specifically addresses emergency responders. In 2017, Colorado,²² Indiana,²³ and New York²⁴ enacted laws similar to that of Louisiana.

Treatment

In the wake of these new laws, a significant void was created. There are no standardized EMS protocols for the safe prehospital care of LEK9s or pets, and the importance of safety when working around animals cannot be overstated. Most EMS personnel lack training by veterinary professionals to properly handle an injured pet or working dog, which presents a potential risk to the health of both EMS personnel and animal patients. The risk of injury to EMS personnel can be substantially reduced by the correct placement of a basket muzzle. A basket muzzle is necessary to have on hand and is the only type of muzzle recommended, as it allows the dog to pant (an essential cooling mechanism for preventing heat-related conditions).

Emergency Medical Services may be able to provide life-saving treatment to an injured animal depending on local legislation, presence of trained personnel, available equipment (human patients take priority), and overall scene safety. When these criteria are met, EMS often have the required equipment and knowledge to save an animal's life. The three most common life-saving and easily accessible treatments are covered below.

Naloxone—In a 25kg (55lb) canine patient who has experienced a suspected opioid overdose, 4mg of naloxone can be administered intranasally or intramuscularly.²⁵

Please note: Many LEK9s are strong and potentially dangerous, especially when injured or protecting the handler. Even when sedated (eg, opioid overdose), dogs can have violent outbursts. Naloxone administration can cause profound behavioral changes that pose a safety risk to personnel, including increased aggression or agitation. Muzzling prior to administration is recommended.

Oxygen and Ventilatory Support—In a 25kg (55lb) canine patient who is spontaneously breathing and suspected to have hypoxemia, oxygen delivery via a loose-fitting face mask or alternate delivery device to the nose and mouth can be provided at a flow rate of 2-3L/min. If a patient has suffered respiratory arrest, and trained personnel with appropriate equipment are available to intubate, positive pressure ventilation can be initiated.

Please note: Mouth-to-snout ventilation should not be attempted, and intubation should never be attempted in a conscious animal.

Hemorrhage Control and Fluid Therapy—Hemorrhage can be controlled by placing a tourniquet proximal to the injured artery. When a tourniquet cannot be placed, pressure should be applied to the hemorrhaging area only if there is no risk of internal damage. An isotonic solution can be administered intravenously at a dose of 20mL/kg as an initial bolus, during which time a veterinarian should be contacted via phone to assess additional fluid therapy needs.

Readers are directed to previously published comprehensive treatment protocols for additional guidance.^{26,27}

Transport

The lack of EMS protocols for animal transport also presents challenges. Transport destination for animal patients is unlikely to be previously determined or programmed into vehicle GPS. Veterinary clinics and emergency facilities may not have the appropriate equipment or staff to treat a severely injured animal. Operating hours differ, and not all facilities are open continuously. Ideally, a board-certified veterinary criticalist and a board-certified veterinary surgeon would be available at all times. This assures that the clinic is capable of handling severe trauma and equipped to perform emergency surgery.

In the absence of specialists, experienced emergency veterinarians should be contacted. Transporting an animal with severe trauma to a clinic that is not equipped to handle this type of care will prolong the time until necessary interventions can be initiated and may increase patient mortality. Establishing and building a relationship with the nearest, appropriately equipped veterinary emergency facility prior to an incident will be invaluable for communication and will enable an EMS agency to properly plan for potential animal patients. For further information, readers are directed to the previously published transport protocol for LEK9s developed by veterinarians, EMS directors, EMS physicians, and LEK9 handlers.²⁸

Ambulance decontamination protocols also need to be established for the vehicle to safely return to use for human patients. Dogs and cats that do not receive routine preventive veterinary care (ie, timely vaccinations and parasite control) are more likely to be a source of common zoonotic diseases (ie, infectious diseases transmitted from animals to humans)^{29,30} and caution should be taken. Rabies, leptospirosis, borreliosis (Lyme disease), bartonellosis (cat-scratch disease), dermatophytosis (ringworm), multiple types of gastrointestinal and external parasites, and antimicrobial resistant strains of cutaneous flora are among the most commonly cited zoonotic pathogens transmitted from pets to humans.^{31–33} Standard precautions for personal protective equipment³⁴ are likely sufficient to protect EMS personnel against most common zoonotic diseases, but further study is warranted and infection prevention protocols are needed.

Discussion

Released in 2019, EMS Agenda 2050 provides the vision for an inherently safe EMS system designed to minimize exposure to injury, infections, illness, and stress.³⁵ Increased focus on injury prevention among EMS personnel will further develop a culture

of safety in EMS. In addition to animal bites and opioids, infectious disease exposures present a serious health risk to EMS personnel and patients. Rabies is a fatal human disease spread by infected animals that requires awareness of the risk to take preventive actions or respond appropriately after a possible exposure. Infectious diseases of animal origin have been responsible for several large-scale outbreaks in recent years (eg, COVID-19, 2009 H1N1, and 2014 Ebola), and EMS is on the front lines of patient care during an epidemic. Multiple studies have reported occupational exposure to infectious diseases among EMS personnel and recommended improved infection prevention programs.^{36–38}

While some resources on prehospital animal care have been developed for the Federal EMS community, there is a lack of coordinated guidance for the civilian EMS community. The US Department of Homeland Security (DHS; Washington, DC USA) collaborated with veterinary experts to create a Working Dog Handler Medical Care Manual³⁹ and successfully trained thousands of Federal EMS personnel and canine handlers. Civilian EMS personnel face different scenarios on the ground, operate in a different legal environment, and need guidance for staying safe when working around animals.

Increased collaboration between EMS and veterinary medicine is needed to create high-quality, expert-informed EMS resources. While the National EMS Education Standards include bites and envenomations (implying potential EMS exposure to animals), there is no mention of animals or infection prevention in the National EMS Education Standards⁴⁰ or the National EMS Scope of Practice Model.⁴¹ The development of prehospital guidance for first responders would leverage the veterinary profession's leadership in One Health⁴² – a multi-sectoral approach recognizing the connections between human, animal, and environmental health – and provide a unique opportunity to train EMS personnel on specific veterinary interventions in addition to general principles of zoonotic diseases, health security, and infection prevention. Building a partnership between these two professions would be mutually beneficial. Veterinarians would gain a better understanding of EMS systems and their role at the intersection of human health care, public health, emergency management, and public safety. Expanded knowledge of how these systems function could help to establish working relationships and streamline communications during incidents involving animal control, during emergency treatment of a veterinary patient, and during disaster responses affecting the whole community.

Conclusion

With increasing exposure to animal scenarios and expanded legal authority to potentially treat animals in some US states, the risk of animal-related injury or illness to the EMS workforce also increases. The authors propose the development of national best practices for prehospital treatment and transport of animals by EMS personnel. This increased collaboration between EMS and veterinary medicine presents an opportunity to improve EMS workforce safety, disaster preparedness, and familiarity with infectious diseases.

References

1. Bodnar RJ. K9 patrols: physical and psychological deterrence. *Am Jails*. 1990;4(2):35–38.
2. National Emergency Medical Services Information System. EMS Data Cube. <https://nemsis.org/view-reports/public-reports/ems-data-cube/>. Accessed September 17, 2020.
3. Forrester JD, Forrester JA, Tennakoon L, Staudenmayer K. Mortality, hospital admission, and healthcare cost due to injury from venomous and non-venomous animal encounters in the USA: 5-year analysis of the National Emergency Department Sample. *Trauma Surg Acute Care Open*. 2018;3(1):e000250.

4. US Department of Homeland Security. Transportation Security Administration. TSA Canine Requirements and Expansion Program: Fiscal Year 2018 Report to Congress. <https://www.dhs.gov/sites/default/files/publications/TSA%20-%20TSA%20Canine%20Requirements%20and%20Expansion%20Program.pdf>. Published 2018. Accessed September 17, 2020.
5. US Department of Homeland Security. FY2019 Budget in Brief. <https://www.dhs.gov/sites/default/files/publications/DHS%20BIB%202019.pdf>. Accessed September 17, 2020.
6. Leighton EA, Hare E, Thomas S, Waggoner LP, Otto CM. A solution for the shortage of detection dogs: a detector dog center of excellence and a cooperative breeding program. *Front Vet Sci*. 2018;5:284.
7. American Veterinary Medical Association. *AVMA Pet Ownership and Demographics Sourcebook*. 2017–2018 Edition. Schaumburg, Illinois USA: American Veterinary Medical Association; 2018.
8. Illinois HB2661. Illinois General Assembly: Bill status of HB2661. Amendment to the Emergency Medical Services Systems Act. <https://www.ilga.gov/legislation/BillStatus.asp?DocTypeID=HB&DocNum=2661&GAID=14&SessionID=91&LegID=103948>. Accessed September 17, 2020.
9. Michigan Senate Bill 1234. Michigan legislature. <http://www.legislature.mi.gov/documents/2017-2018/publicact/pdf/2018-PA-0600.pdf>. Accessed September 17, 2020.
10. Mississippi Senate Bill 2091. Mississippi legislature. <http://billstatus.ls.state.ms.us/documents/2018/html/SB/2001-2099/SB2091PS.htm>. Accessed September 17, 2020.
11. New York Senate Bill S4990A. New York State Senate. <https://www.nysenate.gov/legislation/bills/2015/s4990>. Accessed September 17, 2020.
12. Colorado SB 14-039. Colorado General Assembly. https://www.leg.state.co.us/clics/clics2014a/csl.nsf/fsbillcont3/B3EC94E7F310DEB687257C3000061C8E?Open&file=039_enr.pdf. Accessed September 17, 2020.
13. Ohio HB 187. Ohio legislature. <https://www.legislature.ohio.gov/legislation/legislation-summary?id=GA131-HB-187>. Accessed September 17, 2020.
14. Maryland SB 269. Maryland legislature. <https://legiscan.com/MD/text/SB269/2017>. Accessed September 17, 2020.
15. California SB 1305. California legislature. https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=20170180SB1305. Accessed September 17, 2020.
16. Wisconsin Act 166. Wisconsin legislature. <https://docs.legis.wisconsin.gov/2017/related/acts/166>. Accessed September 17, 2020.
17. American Veterinary Medical Association. AVMA State Legislative Update: 2019 Annual Report. <https://www.avma.org/sites/default/files/2020-03/State-Legislative-2019-Annual-Report.pdf>. Accessed September 17, 2020.
18. American Veterinary Medical Association. AVMA State Legislative Update: February 2020. <https://www.avma.org/sites/default/files/2020-03/SLU-February2020.pdf>. Accessed September 17, 2020.
19. American Veterinary Medical Association. AVMA State Legislative Update: January 2020. https://www.avma.org/sites/default/files/2020-02/SLU-January2020_0.pdf. Accessed September 17, 2020.
20. Louisiana SB 156. Louisiana legislature. <http://www.legis.la.gov/Legis/BillInfo.aspx?i=233475>. Accessed September 21, 2020.
21. Pennsylvania HB 1216. Pennsylvania General Assembly. <https://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?syear=2017&sind=0&body=H&type=B&bn=1216>. Accessed September 21, 2020.
22. Colorado HB 17-1179. Colorado General Assembly. <https://leg.colorado.gov/bills/hb17-1179>. Accessed September 21, 2020.
23. Indiana HB 1085. Indiana General Assembly. <https://iga.in.gov/legislative/2017/bills/house/1085>. Accessed September 21, 2020.
24. New York A5609. New York State Assembly. http://nyassembly.gov/leg/?default_fid=%0D%0A&leg_video=&bn=a5609&term=2017&Summary=Y. Accessed September 21, 2020.
25. Palmer LE, Gautier A. Clinical update: the risk of opioid toxicity and naloxone use in operational K9s. *J Spec Oper Med*. 2017;17(4):86–92.
26. Mitek AE, McMichael MA, Weir WB, Smith MJ, Schneider DC. The Carle-Illinois (Urbana, Illinois USA) treatment protocol for law enforcement K9s: guidelines for Emergency Medical Services. *Prehosp Disaster Med*. 2019;34(4):428–437.
27. Hanel RM, Palmer L, Baker J, et al. Best practice recommendations for prehospital veterinary care of dogs and cats. *J Vet Emerg Crit Care*. 2016;26(2):166–233.
28. Weir WB, Mitek AE, Smith M, Schneider D, McMichael MA. The Carle-Illinois (Urbana, Illinois USA) transport protocol for LEK9s: guidelines for Emergency Medical Service providers. *Prehosp Disaster Med*. 2019;34(4):422–427.
29. Monath TP. Vaccines against diseases transmitted from animals to humans: a one health paradigm. *Vaccine*. 2013;31(46):5321–5338.
30. Healthy Pets, Healthy People: About Pets & People. US Centers for Disease Control and Prevention website. <https://www.cdc.gov/healthypets/health-benefits/index.html>. Accessed September 21, 2020.
31. Chomel BB. Emerging and re-emerging zoonoses of dogs and cats. *Animals (Basel)*. 2014;4(3):434–445.
32. Day MJ. Pet-related infections. *Am Fam Physician*. 2016;94(10):794–802.
33. Damborg P, Broens EM, Chomel BB, et al. Bacterial zoonoses transmitted by household pets: state-of-the-art and future perspectives for targeted research and policy actions. *J Comp Pathol*. 2016;155(1 Suppl 1):S27–40.
34. US Department of Health and Human Services, Office of the Assistant Secretary for Preparedness and Response, ASPR TRACIE. EMS Infectious Disease Playbook. <https://www.ems.gov/pdf/ASPR-EMS-Infectious-Disease-Playbook-June-2017.pdf>. Published 2017. Accessed September 21, 2020.
35. US Department of Transportation. National Highway Traffic Safety Administration. EMS Agenda 2050: A People-Centered Vision for the Future of Emergency Medical Services. <https://www.ems.gov/pdf/EMS-Agenda-2050.pdf>. Published 2019. Accessed September 21, 2020.
36. Reichard AA, Marsh SM, Tonozzi TR, Konda S, Gormley MA. Occupational injuries and exposures among Emergency Medical Services workers. *Prehosp Emerg Care*. 2017;21(4):420–431.
37. Bledsoe BE, Sweeney RJ, Berkeley RP, Cole KT, Forred WJ, Johnson LD. EMS provider compliance with infection control recommendations is suboptimal. *Prehosp Emerg Care*. 2014;18(2):290–294.
38. Harris SA, Nicolai LA. Occupational exposures in EMS providers and knowledge of and compliance with universal precautions. *Am J Infect Control*. 2010;38(2):86–94.
39. US Department of Homeland Security. Working Dog Handler Medical Care Manual. <https://www.hsdl.org/?view&did=818543>. Published 2017. Accessed September 21, 2020.
40. US Department of Transportation. National Highway Traffic Safety Administration. National Emergency Medical Services Education Standards. <https://www.ems.gov/pdf/National-EMS-Education-Standards-FINAL-Jan-2009.pdf>. Published 2009. Accessed September 21, 2020.
41. US Department of Transportation. National Highway Traffic Safety Administration. National EMS Scope of Practice Model 2019. https://www.ems.gov/pdf/National-EMS_Scope_of_Practice_Model_2019.pdf. Published 2019. Accessed September 21, 2020.
42. One Health. US Centers for Disease Control and Prevention website. <https://www.cdc.gov/onehealth/index.html>. Accessed September 21, 2020.