

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY***K9-TECC Working Group Initiative***BACKGROUND:**

Operational K9s (OpK9s) consist of Police canines, Military Working Dogs, Force Protection K9s, and Search and Rescue (SAR) canines. These animals have continuously proven to be a force multiplier in the success of many military, law enforcement, SAR, and humanitarian operations. These K9s selflessly dedicate their lives to protect us, defend us, and lead the way in times of danger. Current active shooter, military operations, and disaster events over the past couple of decades, and even more recently, have increased the demand for these invaluable operators. The increased utilization of these K9s across the globe has also subjected them to an increase in risk of injury and death while in the line of duty. Similar to their human counterparts, working animals deployed in a tactical or high threat environment also remain at high risk for suffering preventable deaths. Despite their in safeguarding our society's freedoms, a large gap in prehospital trauma care (e.g., standardized guidelines, funding, training, logistical resources, research, etc.) for these OpK9s still remains.

As of August 2015, the K9 Officer Down Memorial Page (ODMP) (<http://www.odmp.org/k9>), has reported nineteen Line of Duty Operational K9 deaths for 2015. The causes of K9 deaths listed on the ODMP were classified into: Animal related: 2; Automobile accident: 1; Drowned: 1; Fire: 2; Gunfire: 3; Heat exhaustion: 8; Poisoned: 1; and Struck by vehicle: 1. The most recent Op-K9 death listed was Falko; a Toledo, Ohio Police Department K9. Falko was shot and killed on 12 Aug 2015 in the line of duty while chasing down a pair of suspected car thieves into a vacant house in Ohio. On the same day, Wix a Brown County Sheriff's Office Police K9 succumbed to heat stroke after the air conditioning unit and heat monitoring alarm failed inside the patrol car. These are just a few of the OpK9 deaths that have been reported on the K9 ODMP; no doubt, there are more OpK9 deaths that have not been recorded on the K9 ODMP. Stojasih et al. conducted an analyses on the causes of death of civilian law enforcement canines from 2002 to 2012 as reported on two working dog and law enforcement officer memorial websites. Their analyses revealed 36.7% (318/867) of reported canine deaths were categorized as traumatic in nature. The three leading reported causes of traumatic canine deaths included: vehicular trauma, 25.8% (82/318); heatstroke, 24.8% (79/318); and penetrating ballistic trauma, 23.0% (73/318). Despite the limitations of this review (e.g., retrospective in nature, inability to validate the data, etc.), the analyses does provide some insight into the nature and risk of injury OpK9s are exposed to while in the Line of Duty.

**PURPOSE**

The purpose of this white paper is to bring awareness to the Veterinary and EMS communities regarding the main challenges hampering the provision of appropriate and timely prehospital care for Operational K9s injured in the line of duty. The goal is to invoke a collaborative initiative between the two communities to resolve these challenges in order to provide the best care possible to Op-K9s.

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CHALLENGE ONE:****Lack of Standardized Prehospital Trauma Care Guidelines**

In human trauma care, the National Association of Emergency Medical Technicians (NAEMT) has standardized the approach to civilian non-tactical, prehospital trauma care with the development of the Prehospital Trauma Life Support (PHTLS) program. For the tactical, high-threat scenario the Committee for Tactical Emergency Casualty Care ([www.c-tecc.org](http://www.c-tecc.org)) has drafted and published evidence-based, best practice Tactical Emergency Casualty Care (TECC) principles for the tactical EMS (TEMS) community. Both PHTLS and TECC have gained international acceptance and remain a vital component for improving prehospital trauma survival rates in humans.

In veterinary medicine, standardized prehospital trauma guidelines do not currently exist. The American College of Veterinary Emergency and Critical Care, Veterinary Committee on Trauma, is currently developing evidence-based, best practice veterinary prehospital care guidelines. Although similar to human PHTLS guidelines, the veterinary guidelines mainly focus on prehospital care for the non-tactical, companion animal. They do not necessarily take into account the constraints of providing trauma care during a high-threat situation. Although Canine – Tactical Combat Casualty Care (C-TCCC) guidelines are available, C-TCCC are military-based and do not account for the factors that are unique to the civilian Op-K9 serving in a non-combat, but high threat environment (e.g., available resources, operational environment, occupational hazards, injury risks). In addition, C-TCCC principles mirror human TCCC principles and only address the three known preventable deaths for the human combat casualty (massive extremity hemorrhage, airway obstruction, tension pneumothorax); C-TCCC does not address other life-threatening conditions unique to K9s such as heat-related injuries, gastric dilatation and volvulus, and illicit drug or explosive compound exposures. Based on these limitations, the value of applying C-TCCC principles to the civilian Operational K9 remain questionable.

Standardized trauma care guidelines have been associated with improved survival and decreased complication rates. Although no current data evaluating the impact of nonstandardized prehospital guidelines in veterinary medicine is available; based on the human experience, standardization should result in improved survival rates for OpK9s. Due to their significant contribution toward achieving mission success and their high risk for sustaining life-threatening injuries, standardized prehospital trauma care principles for OpK9's need to be developed and taught to first responders.

**CONSIDERATIONS TO MITIGATE C-1**

The K9 TECC working group was formed with the intent of developing evidence-based, best practice prehospital trauma guidelines for the Op-K9 injured in the high threat environment. The working group consists of experts in the field of tactical medicine, veterinary medicine, EMS / Fire, SAR, special operations, and K9 handlers. In conjunction with available scientific evidence-based medicine, K9 TECC incorporates practical experience from end-users in the field to mold their final recommendations.

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**CHALLENGE TWO (C-2):**

Lack of Out-of-Hospital Emergency Medical Service (EMS) due to interpretation of language in state's Veterinary Practice Acts

Veterinary EMS resources do not exist in most places nor do veterinary personnel typically deploy as part of a tactical or SAR response element when an OpK9 team is called into action; therefore, out-of-hospital, point of injury (POI) care for these injured K9s remains grossly lacking. The implementation of human EMS services for injured OpK9s is primarily hindered by issues regarding EMS scope of practice. Each state has an established Veterinary Practice Act (VPA) that defines the requirements to practice veterinary medicine.

Example citation from AVMA Model VPA

(<https://www.avma.org/KB/Policies/Pages/Model-Veterinary-Practice-Act.aspx>)

*“No person may practice veterinary medicine or veterinary technology in the State who is not a licensed veterinarian or the holder of a valid temporary permit issued by the Board or a credentialed veterinary technician unless otherwise exempt pursuant to Section 6 of this Act.”*

In addition, each state's VPA also outlines specific exemptions to “*practice of veterinary medicine without a license*”. The K9 TECC working group formed an ad hoc team to investigate which, if any, state VPAs cited an exemption that specifically allow licensed or certified EMS personnel, in performance and scope of their official duties, to render emergency prehospital care to Op-K9s injured in the Line of Duty. The findings from the analysis revealed that neither the language cited under Section 6 (entitled “*Exemptions*”) of the American Veterinary Medical Association (AVMA) Model VPA nor any of the States individual VPAs explicitly outline a provision for non-veterinary paraprofessionals to render lifesaving emergency prehospital care to Op-K9s without the direct or indirect supervision a licensed veterinarian.

The analysis did find that the following exemptions were cited, in some form or fashion, in the AVMA Model VPA and in many of the States' individual VPAs.

**1. Current Applicable Exemption:**

*“Subject to the State's [animal cruelty law(s)], an owner of an animal and any of the owner's regular employees caring for and treating the animal belonging to such owner, except where the ownership of the animal was transferred for purposes of circumventing this Act. Individuals must comply with all laws, rules and regulations relative to the use of medicines and biologics.”*

**Interpretation:**

*The agency that has purchased the animal (e.g., local law enforcement agency, ATF, FBI, CIA, etc.) is considered the “owner”; therefore, any licensed professional (e.g., EMS provider or K9 Handlers) employed by that organization should have the authority to provide emergency medical care in an out of hospital environment.*

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**2. Current Applicable Exemption:**

*Any person who, without expectation of compensation, provides immediate veterinary care in the event of an emergency or accident situation.*

**Interpretation:**

*This statement reflects “Good Samaritan” laws that are used by most State’s EMS laws and statutes and, therefore, would allow the provision of emergency medical aid by First Responders.*

**Limitation of “Good Samaritan” Exemption:**

- *Although the Good Samaritan law (GSL) may allow some provision for prehospital care by EMS responders, it may inhibit the ability of EMS providers render aid to injured operational working animals in the course of their official duties where they receive compensation for their services.*
  - *According to the Model VPA, in order for EMS personnel to qualify for exemption under the GSL, they must perform their services “without expectation of compensation...” As worded and in its true sense, the GSL does not actually prohibit EMS personnel from receiving compensation for their services, only that they may not expect or request compensation. When on official duty, EMS personnel are compensated for their actions, so many interpret that too mean that EMS providers could not be protected by the GSL if they render aid to an animal while responding to an official call.*
  - *Despite its true intent, many still interpret the GSL to read that EMS personnel cannot receive compensation, whether expected or not, for their services. In some regards, the latter interpretation may be preferred by EMS agencies in order mitigate any grey zones in the interpretation of the GSL that may ultimately lead to legal reprisal.*
  - *The fear of legal reprisal for accepting any form of compensation may limit the ability of EMS agencies to provide prehospital care to injured OpK9s; specifically transport services. Ambulance transports may cost anywhere from \$500 to \$2,000 depending upon the location (rural vs. urban), distance transported, and services provided (e.g., transport only vs. administration of oxygen, IV fluids, medications, etc.). The financial loss incurred by transporting and treating an injured OpK9 may not be feasible for some EMS agencies and, therefore, would further hinder the ability of affording injured K9s access to vital prehospital care and transport.*
- *The qualifications for the GSL varies from State to State and EMS providers should NOT assume that their actions will automatically fall under protection of ALL states’ GSL.*

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- *Some states reject the use of GSL when care is provided by personnel that already have a pre-existing duty to provide care to injured casualties (e.g., EMS personnel); this inherently would make EMS providers ineligible for protection under the GSL.*
- *Particular consideration an EMS provider would have to take into account prior to rendering aid to an injured Op-K9, is whether or not a licensed veterinarian was within reasonable distance to transport the K9 too rather than attempting to perform a life-saving intervention themselves.*
- *Some states have specific parameters defining what types of patients (trauma-related, etc.) and in what environments (out-of-hospital) the GSL may be applicable. Unfortunately, the interpretation and eligibility for protection under the most GSL are left to the subjectivity of the interpreter. This subjectivity may not favor the EMS provider; particularly if the Op-K9 succumbs to their injuries and does not survive.*

Although the aforementioned ‘exemptions’ may be interpreted as allowing prehospital services by non-veterinary, paraprofessionals, their lack of specificity restricts state and individual EMS agency Medical Directors from rendering emergency prehospital care to OpK9s due to fear of legal reprisal for practicing veterinary medicine without a license. Further, the interpretation of these exemptions remains subjective and is left in the hands of the interpreter

**CONSIDERATIONS TO MITIGATE C-2**

Recommend the AVMA and each individual State insert an additional Exemption Clause to “*Practice Veterinary Medicine without a License*” into their respective Veterinary Practice Acts:

The combined lack of readily available point of injury care and high-risk of traumatic injury are a recipe for high mortality rates for these invaluable K9s. As a member of our team, OpK9s require access to the same out-of-hospital care equal to the best human prehospital trauma care available in order to ensure their continued survival and value to our society. On the battlefield, a retrospective analysis by Baker et al. revealed that Military Working Dogs suffering gunshot wounds were able to be successfully treated for life-threatening injuries at the point of injury by non-veterinary, paraprofessionals. Similarly, accounts of OpK9s injured in the line of duty being provided life-saving medical care in the field by non-veterinary personnel have also been reported from other non-military organizations. (Baker *et al*, 2015) Without these life-saving first aid interventions, it is highly probable that many of these canines would have succumbed to their injuries before transport to a veterinarian. Considering the invaluable role Op-K9s play as a force multiplier, it remains imperative that veterinarians and EMS organizations partner together to foster an avenue for affording emergency prehospital care to Op-K9s injured in the line of duty.

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In order to eliminate any legalities that may interfere with an injured OpK9 receiving appropriate and timely prehospital care, the K9 TECC Working Group would like to petition a motion to have an additional exemption added to the AVMA's Model and each state's individual VPAs. The exemption would allow trained EMS responders, in the performance of their official scope of duties, to render lifesaving emergency prehospital care to OpK9s without direct or indirect supervision of a licensed veterinarian.

An example of a proposed Exemption statement follows:

*“License Requirements Exemption:*

*When a licensed veterinarian is not available within a reasonable length of time, Emergency Medical Services may be rendered to Operational Working Animals by non-veterinary licensed individuals without the direct or indirect supervision of a licensed veterinarian, under the following conditions:*

- 1. A non-veterinary, licensed or certified emergency medical responder is acting in the course of their official duties AND up to the level of their training and jurisdictional scope of practice in human patients AND the person(s) is acting with informed owner consent from the owner / client when available, OR*
- 2. The person(s) is/are an employee of the agency that owns or has medical authority over the animal (e.g., applicable to K9 Handlers and EMS personnel assigned within the agency); OR*
- 3. The person(s) is/are performing these tasks in compliance with a written protocol developed and approved in consultation with a licensed veterinarian,*
- 4. The above person(s) rendering aid MUST:*
  - a. Have the intent to transfer the animal to a licensed veterinarian's care as soon as practicable, and*
  - b. Have received proper training in First Responder care for the species of Working Animal injured, and*
  - c. Comply with all laws, rules and regulations relative to the use of medicines and biologics, as it pertains to their scope of practice when rendering aid to human patients, AND*
  - d. Shall not diagnose, prescribe or perform surgery.”*

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CHALLENGE 3 (C-3):****Lack of Language in Current State EMS Practice Acts and Statutes allowing for Prehospital Medical Care to Animals by EMS Personnel without Direct or Indirect Veterinary Oversight**

Similar to the analysis evaluating each states' VPS, an analysis was conducted to investigate the provision each State's EMS Practice Acts and Statutes cite for providing EMS services to non-human patients. Currently only Colorado has approved a bill (Senate Bill 14-039) granting limited authority to state EMS personnel for voluntarily rendering emergency preveterinary care to dogs (to include OpK9s) and cats. SB 14-039 states:

*"Preveterinary emergency care means the immediate medical stabilization of a dog or cat by an emergency medical service provider, in an emergency to which the emergency medical service provider is responding, through means including oxygen, fluids, medications, or bandaging, with the intent of enabling the dog or cat to be treated by a veterinarian."*

*"Notwithstanding any other provision of law, an emergency medical service provider may provide preveterinary emergency care to dogs and cats to the extent the provider has received commensurate training and is authorized by the employer to provide the care. The provision of preveterinary emergency care to dogs and cats by emergency medical service providers in accordance with this paragraph (b) is not a violation of this article."*

On the surface, SB 14-039 appears to afford immunity to EMS personnel when rendering preveterinary aid to injured OpK9s; however, the bill does not absolutely define which entity is overall liable if the animal succumbs to its injuries or for actions rendered by the EMS provider that result in death. The lack of clarity in SB 14-039 leaves the door open for legal reprisal against EMS personnel if the "owner" of the animal elects to pursue legal action for negligence. While SB 14039 does not ensure full immunity against EMS personnel, it does ensure their actions are no longer in violation of the Colorado VPA.

**CONSIDERATIONS TO MITIGATE C-3**

The K9 TECC working group advocates that each state's EMS organization petition their legislature to enact statutes, similar to Colorado SB 14-039, that specifically provide immunity for EMS providers that render emergency prehospital care to injured Op-K9s injured in the line of duty without the direct or indirect supervision of a licensed veterinarian.

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**CHALLENGE 4 (C-4):**

Concern for Lack of Veterinary Oversight if Non-Veterinary Personnel are allowed to provide Medical Care to Animals without Direct or Indirect Veterinary Oversight

In order for state VPAs and EMS statutes to change and grant EMS personnel the authority or the immunity to provide emergency prehospital care to injured Op-K9s, there must be a common front and partnership established between the Veterinary and EMS communities. The greatest opposition for allowing such a change in current practice acts most likely will come from the leaders in the veterinary community due to the lack of veterinary oversight of the medical care being provided by non-veterinary EMS providers. The opposition from the EMS community is mainly based on current legal ramifications of being charged with *practicing veterinary medicine without a license* and followed by the potential zoonotic risks associated with handling animals. The former concern by the EMS community may be easily mitigated by the additional *exemption* clause to practice veterinary medicine added to each state's VPA, while their latter concern for potential zoonotic transmission will be addressed later in this paper.

The opposition to foster a change in the VPAs does not come without validity. Concern by the veterinary community most likely will arise over the lack of oversight for the level of medical care EMS providers may render to injured animals. Although fundamentally, the physiology between humans and K9s is similar and that many of the medical interventions and techniques used in human EMS are applicable to K9s, there are several unique anatomical, physiological, and pharmacological species differences that hinder direct application of human first responder knowledge and skills to K9s. Some examples of differences include:

- *Tourniquets*: Human commercial tourniquets tend not to work effectively for upper extremity hemorrhages in K9s due to their tapered conformation, nor are tourniquets typically needed to stop extremity hemorrhage in K9s (direct pressure is preferred) due to a lower proportion of highly vascular muscle mass in the K9 extremity as compared to humans.
- *Gastric Dilatation and Volvulus or GDV (aka. "Bloat")*: Op-K9s may suffer GDV that would require gastric needle decompression in the field using a large bore catheter (e.g., 14 GA x 3.25"). Gastric decompression is not a technique EMS personnel are routinely trained to deal with or perform.
- *Heat Dissipation*: K9s do not have sweat glands located throughout their skin. Instead they rely on evaporative losses through panting instead of perspiration through sweating to dissipate heat and mitigate heat-related injuries. It is not uncommon for people unfamiliar with OpK9s to initially place a tight-fitting muzzle on the K9. Although safety should always be a main concern of any first responder and placing a muzzle may be appropriate, it is important to understand that an open basket type muzzle allows panting and heat dissipation while protecting the responder.



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- *Prevalent traumatic Injuries:* The three most common preventable deaths reported in human combat casualties are massive extremity hemorrhage, upper airway obstruction, and tension pneumothorax. To date, the most common preventable deaths in Op-K9s remains unknown; however, a recent analyses officer memorial webpages evaluating the most prevalently reported trauma related deaths in civilian Op-K9s revealed the three leading causes of traumatic Op-K9 deaths were: vehicular trauma, 25.8% (82/318); heatstroke, 24.8% (79/318); and penetrating ballistic trauma, 23.0% (73/318).

These are only a few of the species differences that EMS providers may experience. Even though the majority of the injuries encountered by the EMS providers may primarily only require basic “ABC” interventions (e.g., direct pressure, oxygen supplementation, etc.), the need for more intensive interventions requiring the provider to have a basic knowledge of K9 anatomy and physiology is always possible. As a result, the opposition from the veterinary community is based on the premise of “*Do No Harm*”.

**CONSIDERATIONS TO MITIGATE C-4**

In order to belay any major concerns regarding the lack of veterinary oversight with administration of prehospital care by non-veterinary EMS providers, the K9 TECC working group proposed “Exemption Clause” as cited above provides criteria that state governing bodies consider when drafting changes the their VPA’s “Exemptions” for practicing veterinary medicine without a license. The bold and underlined words and phrases in the proposed exemption clause below constitute the criteria that may help mitigate any concern for lack of veterinary oversight:

Proposed Exemption Clause with Explanations:

*“License Requirements Exemptions:*

*When a licensed veterinarian is not available within a reasonable length of time, Emergency Medical Services may be rendered to Operational Working Animals by non-veterinary licensed individuals without the direct or indirect supervision of a licensed veterinarian, under the following conditions*

**Justification:** The addition of the above underlined phrase will hopefully ensure the EMS service will only provide emergency prehospital care when no veterinary resources are available within a “reasonable amount of time”. The reasonable amount of time will vary for each situation and injury mechanism, however, many will consider a < 20 minute transport time from POI to reception of definitive care as a reasonable amount of time for pursuing “*Scoop and Run*” to the nearest Veterinary Treatment Facility (VTF).

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1. *A non-veterinary, licensed or certified emergency medical responder is acting in the course of their official duties AND up to the level of their training and jurisdictional scope of practice in human patients AND the person(s) is acting with informed owner consent from the client when available, OR*

**Justification:** Since there are different levels of scope of practice for human EMS providers (e.g., EMT-Basic, Advanced EMT, Paramedic, etc.) the above statement ensures the EMS provider does not perform procedures outside their scope of practice that may cause further harm to the K9 and constitute “negligence”. In addition a list defining the scope of practice for each provider level may also be included in the VPA.

2. *The person(s) is/are an employee of the agency that owns or has medical authority over the animal (e.g., applicable to K9 Handlers and EMS personnel assigned within the agency); OR*
3. *The person(s) is/are performing these tasks in compliance with a written protocol developed and approved in consultation with a licensed veterinarian,*

**Justification:** Addition of this statement will hopefully foster a cohesive partnership between EMS agencies and VTFs and at least allow an avenue for indirect veterinary oversight. Together the Medical Director of the EMS agency and VTF may work together to develop veterinary-approved prehospital protocols that are appropriate for the EMS providers scope of practice and available resources (see further explanation under “Memoranda of Understanding” Section).

4. *The above person(s) rendering aid MUST:*
  - a. *Have the intent to transfer the animal to a licensed veterinarian’s care as soon as practicable, and*
  - b. *Have received proper training in First Responder care for the species of Working Animal injured, and*
  - c. *Comply with all laws, rules and regulations relative to the use of medicines and biologics, as it pertains to their scope of practice when rendering aid to human patients, AND*

**Justification:** Similar to EMS requirements for treating human patients, it should be a requirement that EMS agencies supporting Op-K9 units receive training in K9 First Responder Care. As mentioned earlier, unique species differences may hamper EMS providers from providing appropriate field care to an injured Op-K9 and or place the EMS provider at a liability risk for ‘negligence’. This statement also carries the intent of fostering a working relationship between EMS agencies and VTFs. The goal would be that VTFs provide an avenue for training partner EMS personnel in K9 First Responder care as well as potentially allowing them to shadow in the clinics to gain a better understanding of species differences for medical care.

5. *Shall not diagnose, prescribe or perform surgery*

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Additionally, the VPA may further define what constitutes as “Emergency life-saving interventions”. For example, South Carolina’s Regulation 120-9 (B); Section B. (4) defines “**Emergency Conditions**” as:

*(a) Life-saving aid and treatment:*

- i. Apply tourniquets and/or pressure bandages to control hemorrhage.*
- ii. Resuscitative procedures.*
- iii. Apply temporary splints or bandages to prevent further injury to bones or soft tissues.*
- iv. Apply appropriate wound dressings and external supportive treatment in severe wound and burn cases.*
- v. Perform external supportive treatment in heat prostration cases.*
- vi. Place intravenous catheters and administer pharmacological agents and fluids*

Again the goal of the added exemption is to legally afford non-veterinary licensed paraprofessionals the authorization to render initial life-saving resuscitation and stabilization for injured OpK9s in emergent situations when no veterinary personnel are readily available.

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**CHALLENGE 5 (C-5):****Lack of Working Partnership between EMS and Veterinary Communities**

On a national level, a working partnership and line of communication between the EMS and veterinary communities is currently lacking. Although in a few of the larger cities (e.g., New York, Los Angeles, etc), some local, privately-owned entities have established an ambulance service for transporting injured or critically ill patients, there currently is no mechanism or funding readily available for establishing a nationwide or even state-wide veterinary EMS agency.

Lack of veterinary EMS jeopardizes the welfare of the Op-K9. In addition, when a human EMS unit responds to scene and is asked to render aid and or transport an injured Op-K9, this request places the EMS unit in a difficult situation. Most EMS teams would love to oblige the request and help the Op-K9; however, they remain at risk for both legal and medical liabilities by doing so. As discussed elsewhere in this paper, the liability issues may be mitigated by a change in the language cited in current state EMS statutes and VPAs. Beyond the challenges of changing language in the aforementioned legislature, developing a working relationship between EMS agencies and veterinarians may provide an avenue for establishing indirect veterinary oversight which, therefore, may mitigate some of the legal and liability issues. In addition, funding and resources to establish a nation-wide veterinary EMS system is also grossly lacking. Since a human EMS system is already funded and in place, it seems reasonable that the veterinary community would want to take steps to support and become involved in an already established service; if for no other reason, than the added care and chance for survival it could provide veterinary casualties.

**CONSIDERATIONS TO MITIGATE C-5**

**Memoranda of Understanding (MOU):** Consider drafting a MOU to be used between EMS Agencies and local Veterinarian / Veterinary Treatment Facilities (V/VTF). Within the MOU, a partnership can be established between the Medical Director of the EMS agency and the Medical Director (or equivalent representative) of the local VTFs. The MOU will hopefully serve to foster a cohesive partnership with EMS agencies and V/VTF. Although each MOU will be individualized based on the needs of the entities involved but an MOU should serve the purpose of:

1. Establishing liaisons between the V/VTF and EMS agency to foster a:
  - a. Direct line of communication between EMS personnel (either EMS Medical Director or EMS responders) and the Veterinarian or V/VTF to discuss and resolve any treatment issues while the patient is en route to the V/VTF.
    - i. If the EMS Medical Director has established the direct line of communication with V/VTF during a call, then medical Director will relay the veterinarian(s)' recommendation to their responding EMS providers.

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- b. Partnership that allows EMS providers to receive initial and annual refresher training in K9 First Responder care as well as veterinary personnel gaining an understanding of what resources and capabilities EMS providers have available.
  - c. A quality assurance program that affords a process for V/VTFs to review the EMS provider's veterinary skills and knowledge. (*Ex. monthly morbidity and mortality rounds, grands rounds to discuss common cases EMS personnel, or monthly protocol meetings to evaluate if changes need to be made to current protocols and or standing orders*).
2. Identifying locations, resources, and hours of operations for V/VTFs in the EMS agency's area of operation. This information becomes important for Pre-mission threat assessments during tactical EMS responses.
  3. Allowing an avenue for indirect veterinary oversight for the administration of emergency prehospital medical care to injured animals by non-veterinary licensed paramedical professionals.
    - a. The licensed veterinarian and EMS Medical Director work together to develop veterinary-approved medical protocols and standing orders for prehospital K9 care. Protocols are based on the current training and resources the EMS providers have on hand during a response. The Medical Director provides these veterinary approved protocols to their responding units to follow when rendering care to an injured animal.
    - b. Veterinary approved protocols will also help mitigate any potential liability issues regarding "standard of care" which is often the basis for evaluating a claim of negligence in human EMS. The standard of care is determined by what a reasonable, prudent EMS provider of similar training, skills, and experience would do in like circumstances.
      - i. When establishing protocols for EMS providers, veterinarians should refer to available veterinary best practice guidelines such as the *Veterinary Committee on Trauma's Best Practice Prehospital Care Recommendations for Companion Animals* or the *K9 Tactical Emergency Casualty Care (K9 TECC) Principles*.
    - c. In addition, the Medical Director and Licensed Veterinarian may partner together to develop an approved list of prehospital medications that an Advanced First Responder (AEMT / Paramedic) may administer provided that the AEMT/Paramedic:
      - i. Is under direction of the Medical Director and or Licensed Veterinarian, and
      - ii. Has received appropriate training regarding the administration of such medications.
    - d. A medication that does not appear on the approved list SHALL NOT be added to the department's protocol without prior consultation between the EMS Medical Director and Licensed Veterinarian

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4. Further stipulations to consider incorporating into the MOU to ensure quality control of care and allow the EMS providers to assume responsibility of OP-K9 care may also include:
  - a. Medical Control and the V/VTF must be informed that EMS services are responding for an OpK9
  - b. Approval to provide services to an OpK9 must be authorized by the EMS agency's Medical Director
  - c. The EMS responder must be willing to assume responsibility for the OpK9 until relieved by a veterinarian that has an active, current state veterinary license
  - d. The Medical Director must not require their EMS professionals to perform any procedures or institute any treatment that is beyond the provider's scope of practice and or they are not trained to perform on a K9
  - e. The EMS provider will be held to the same standards of *negligence* and *abandonment* as pertains to human patients
    - i. The defining parameters of *negligence* include:
      1. Duty to act
      2. Breach of Duty
      3. Breach of duty caused an effect
      4. Damage has been inflicted by another
    - ii. Medical *Abandonment* is generally considered when the caregiver-patient relationship is terminated without making reasonable arrangements with an appropriate provider so that appropriate care may be continued.
      1. In this instance, the EMS provider should maintain responsibility of care until the K9 is transferred to a veterinary representative that is licensed or certified in the state in which the injury occurred.

**EXAMPLE OF PARTNERSHIP IN ACTION:**

In South Carolina, Charleston county EMS and the Veterinary Emergency Care collaborated together to create a training program to educate paramedic and EMTs as "unlicensed veterinary assistants." They also worked together to develop procedural and medical protocols that EMS providers are to abide by that will help ensure OpK9's are afforded timely and lifesaving prehospital care while minimizing the risk of legal reprisal to EMS providers. <http://veterinaryspecialtycare.com/news-events.php>

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CHALLENGE 6 (C-6):**

Human Emergency Medical Service (EMS) concern for zoonotic pathogen transmission and contamination of medical assets used on human patients subsequent to treating injured OpK9s

Depending on your practice location and species you treat, the list of zoonotic threats will vary. Some of the more common infectious diseases for EMS providers to consider when handling an OpK9 include oral contact diseases [e.g. salmonellosis, campylobacteriosis, toxoplasmosis, and gastrointestinal parasites (e.g., giardia, cryptosporidium, tapeworms, roundworms, and hookworms)], skin break- or acquired disease (e.g. rabies, leptospirosis, bartonellosis, brucellosis, and tularemia), inhaled infections (e.g. histoplasmosis and tuberculosis), and contact diseases (e.g. ringworm and sarcoptic mange).

Rabies and leptospirosis are probably the two most concerning zoonotic risks; however, nearly all OpK9s are vaccinated for rabies and most are vaccinated against leptospirosis. Similarly, nearly all OpK9s are treated preventively for gastrointestinal parasites; therefore, transmission of these pathogens become less of a zoonotic risk as well. Suffering a bite wounds is a hazard when working around injured and painful canines. Considering the number of bacteria residing in the canine mouth, bite wounds may easily become infected, but pursuing immediate and appropriate medical treatment for the wound mitigates the risk of infection from developing.

**CONSIDERATIONS TO MITIGATE C-6**

Considering many of the aforementioned pathogens are transmitted via direct contact with organisms, then the same safe work practices and training in biosecurity and infectious disease management that EMS providers implement and receive to prevent transmission of infectious diseases when handling human patients (e.g., HIV, hepatitis, etc.) also provide protection for reducing many of potential zoonotic risks from K9s. Although the concern for transmission of zoonotic pathogens is valid, the actual risk is no greater than the risk of infectious disease transmission from human patients.

Safe work practices include:

- Donning appropriate personal protective equipment (e.g., gloves, eye and face protection, etc.),
- Washing hands after working with animals and before eating or drinking
- Keeping hands away from mouths and eyes
- Thoroughly cleaning and disinfecting non-disposable equipment after contact with K9s
- Disposing of any contaminated bedding or other disposable items that come into contact with animals

## CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY

Recommended training for EMS providers to pursue for handling injured OpK9s include:

1. K9 Biosecurity and Infectious Disease Management to include:
  - Common K9 zoonotic diseases and routes of disease transmission
  - Standard precautions that are used in treating K9 patients to prevent infection
  - Appropriate personal protection from airborne and bloodborne pathogens
  - Post-exposure management of bite wounds and or exposure to K9 body fluids
  - How to decontaminate the ambulance and equipment after treating K9s



**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CHALLENGE 7 (C-7):****Human Emergency Medical Service (EMS) Injury Risk subsequent to Handling Injured OpK9s**

Operational K9s have a very different set of drive, focus, and alertness for surrounding events and potential approaching threats as compared to the typical everyday companion dog; particularly those OpK9s tasked as part of a tactical response team. Many law enforcement (LE) K9s inherently are selected for controlled dominance and aggression, lack of fear, and drive to bite on command. For those LE K9s, in particular, it becomes nearly impossible for just any one to approach or handle them safely. Even the most obedient and docile SAR K9 may become dangerous and unpredictable to handle when the stress, pain, and or “fear” associated with a traumatic event is added into the situation.

Canine handlers are trained how to properly and safely work around and restrain their OpK9. Due to the close bond and trusting relationship a K9 handler and OpK9 have developed as a team, it seems evident that the K9 handler is the best person to handle and care for their injured OpK9. In addition, handlers typically have the most accurate information about the OpK9s past and current health-related problems; therefore, it is paramount that the handler or their agent is always involved in all aspects of triage, treatment, and evacuation of the K9 casualty.

What happens when the handler gets injured and goes down and is not available to restrain or provide commands for their OpK9? Not only will care be needed for the handler, but someone will need to accept the responsibility of restraining the OpK9 and evacuating them to safety. When faced with these types of situations, then calling upon another trained K9 Handler to approach and restrain the OpK9 would be ideal; however, another handler may not be readily available on scene. In order to gain access to the injured handler quickly, the responsibility to restrain the OpK9 then falls upon the tactical medic or other non-K9 first responder present at the scene.

Approaching and restraining an OpK9 may be no simple task. Although not injured themselves, in stressful situations there are many reasons why the OpK9 may appear aggressive and / or difficult to approach. First consider that it is not in the nature or even in the training of most OpK9s to give into restraint, and most will do anything to protect themselves and their handler when faced with a stressful situation. When their handler goes down, the OpK9 senses something is wrong with their partner; therefore similar to being injured themselves, these K9s will be in a heightened state of stress, anxiety, and awareness, and / or will go into a “protective” mode. In addition, without their handler by their side to provide direction and comfort, the OpK9 may be sent into a state of confusion and disorientation that may make them more unpredictable. To help avoid any undue injury to the first responder team, it is paramount for everyone on a response team (e.g., Tactical, SAR, etc.) that deploys with a K9 team to possess at least basic knowledge on how to properly approach and restrain a potentially aggressive, stressed, and or fearful OpK9.

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CONSIDERATIONS TO MITIGATE C-7**

In order for EMS providers to reduce occupational safety hazards subsequent to rendering aid to an injured or aggressive OpK9s protecting their downed handler, it is recommended for Medical Directors to ensure their EMS personnel:

1. Maintain team safety by ensuring, when feasible, that the K9 handler is involved when handling an injured K9. If the original K9 Handler is also incapacitated, then EMS personnel should consider contacting Dispatch to request another K9 Handler on the scene.
2. Receive familiarization training regarding safe K9 handling and restraint to include:
  - a. Recognize K9 body language and behavioral cues that may be displayed by the Op-K9 during states of fear, aggression, and submission.
  - b. Recognize how the provider's body language may influence K9 behavior and how to alter their approach to make the K9 feel more relaxed.
  - c. Proper restraint
    - Positions of restraint (lateral, head restraint, etc.)
    - Using the least stressful technique
  - d. Concepts of Muzzling
    - Muzzle types
    - Muzzle application
    - When to and when not to muzzle
  - e. Lifting and extrication techniques
3. Partner with K9 units they support to learn common approaches to K9 handling; become familiar with and practice working around, performing a physical examination and taking vitals on Op-K9s.

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CHALLENGE 8 (C-8):****Lack of Scientific Evidence-Based Medicine Relevant to Prehospital Trauma Care for OpK9s**

Over the past 20 years, out-of-hospital trauma care for the civilian tactical or high-threat environment has undergone a dramatic transformation. The formation of Tactical Emergency Medical Services (TEMS) along with the development of Tactical Emergency Casualty Care best practice recommendations have fostered improved tactics, techniques, and procedures (TTPs) that have greatly enhanced the capability of first responders as well as a prehospital care environment with an improved chance of patient survival. Although much time and research has been placed into improving EMS TTPs for the human casualty, very little time, funding or scientific efforts have been placed into enhancing out-of-hospital trauma care for the OpK9.

Take for example heat-related injuries. Despite heat-related injury being a very common condition and reported cause of death in K9s (Stojsih *et al* 2014), there remains a very sparse scientific data. Recently, Baker et al. published an evidence-based review evaluating the scientific evidence (or lack thereof) currently surrounding heat-related injuries in MWDs. Their comprehensive review, addressed some very important and elusive topics to include: a) what are the normal and abnormal temperature ranges for athletic dogs undergoing strenuous exercise, and b) what evidence is there to support the best practices or contraindications relating to methods of cooling K9s suffering heat-related injuries. Unfortunately, this review found no viable evidence-based medicine surrounding canine heat-related injuries.

The fact remains that as a veterinary and medical community, there is very little scientific data and / or evidence-based medicine to support what TTPs are most advantageous for treating this special population of K9s. Most of the information the veterinary community uses to guide veterinary care for OpK9s is based mostly off anecdotal clinical experience, retrospective analyses of MWDs in combat, or extrapolated from experimental animal models or human observational studies. Most veterinary clinical trials are limited by the small number of animals enrolled in any given trial. Whereas most human clinical trials have a (n) numbering in the 100's to 1000's, it is not uncommon that veterinary trials rarely have a (n) > 30 – 50, and in many cases,  $n \leq 10$ . Whereas most human clinical trials have a population (n) numbering in the 100's to 1000's, it is not uncommon that veterinary trials rarely have a (n) > 30 – 50, and in many cases,  $n \leq 10$ .

**CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY****CONSIDERATIONS TO MITIGATE C-8**

It seems obvious that veterinary and EMS communities need to partner together to fund and pursue more scientific-based, prospective clinical trials related to prehospital care for the OpK9. Many governmental agencies (e.g., DHS, TSA, CIA, FBI, USMS, USCBP, USAR, etc.) utilize OpK9s to successfully accomplish their mission; therefore, these agencies have a vested interest in ensuring their K9s receive the best medical care possible. As such, many of these organizations would be open to supporting efforts towards improving prehospital care through scientific research. Considering the large population of K9s these organizations have at their disposal, they serve a viable source for acquiring a sample size that provides adequate power. With these facts in mind, it seems prudent for the veterinary community to establish a partnership and liaison with these organizations to foster and pursue avenues for clinical research. Some of the prehospital trauma care topics that are currently lacking evidence-based medicine for the OpK9 include:

1. Fluid resuscitation (e.g., Scoop and Run, hypotensive resuscitation, etc.)
2. Appropriate field analgesia and sedation
3. Treatment relevant to heat-related injuries
4. Effectiveness of CPR (CAB vs. ABC, use of AEDs, etc.)
5. Novel hemostatic agents (e.g., Vetigel®), etc)
6. Antifibrinolytics (e.g., TXA, EACA)
7. Advanced airway techniques (e.g., cricothyrotomy, BIAD, etc.)
8. Junctional Tourniquets
9. High-altitude injuries and treatment
10. Field Monitoring devices

## CHALLENGES FACING PREHOSPITAL CARE FOR OPERATIONAL K9S INJURED IN THE LINE OF DUTY

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