

OVERVIEW OF COMBAT TRAUMA IN MILITARY WORKING DOGS IN IRAQ AND AFGHANISTAN

MAJ Janice L. Baker, VC, USAR CPT Christina A. Truesdale, VC, USA CPT(P) Justin R. Schlanser, VC, USA
Previously published in *The United States Army Medical Department Journal / The United States Army Veterinary Corps* January - March 2009.

INTRODUCTION

Military working dogs face the same dangers in combat as human servicemembers, and serious traumatic injuries are not uncommon in these dogs. Ballistic, explosive, and blunt trauma has occurred in many dogs and veterinarians in combat zones must be prepared to manage these cases. Even before reaching veterinary care, dog handlers, medics, and other human medical providers are faced with providing lifesaving treatment on canine servicemembers at the point of injury.

DEPLOYED VETERINARY PERSONNEL

Historically, veterinary teams in deployed units tasked with caring for working dogs have not been trained, staffed, or equipped to manage major trauma, focusing instead on day-to-day care and medical management of working dogs in their respective theater of operations.¹ The majority of their work in theater actually focuses on food safety, which, overall, is the largest portion of their daily duties. Occasional serious injury or illness was considered the exception rather than the rule, to be dealt with when it occurs. Training given to Army Veterinary Corps officers and enlisted animal care specialists (veterinary technicians) to ensure proficiency in managing these cases was proportional to the likelihood of it actually occurring, which was considered unlikely. With occasional exceptions, veterinarians assigned to these units are usually veterinary field officers (AOC* 64A), often junior captains who usually have no formal clinical training after graduation from veterinary school. In rare cases, they entered the military after internship or residency training. Internship or residency training is not a requirement to practice veterinary medicine, and only a small percentage of graduate veterinarians pursue this advanced post-graduate training. The Veterinary Corps has an extensive program which allows veterinarians to complete clinical residency training, but there are no assigned positions within the deployable units for residency-trained clinical specialists. Veterinarians preparing to deploy often complete the Army's Veterinary Clinical Proficiency Course, an intense 1-week classroom and hands-on review of common emergency and surgical treatments, along with certain diagnostic methods.

In both Operations Iraqi Freedom and Enduring Freedom, there are only a handful of veterinary treatment facilities among the extensive number of bases which house working dogs, and transport time to veterinary care may be anywhere from hours to days, depending on the situation. Human medical providers such as medics, physician's assistants, and physi-

cians are often faced with providing lifesaving care to injured working dogs until they can be transported to a location with a veterinary treatment facility in-theater.

Since 2005, a veterinary clinical medicine officer (AOC 64F), either a surgeon or internal medicine specialist, has been assigned to the deployed veterinary unit in Iraq to augment the existing veterinary capabilities. This has proven very helpful with serious medical and surgical cases, although some serious trauma cases still present to the veterinary field officers at remote forward operating bases throughout the theater. Thus, the veterinary field officer may be the only veterinarian in the area and is responsible for managing major canine trauma. A veterinary clinical specialist has not been specifically assigned to the Afghanistan Theater. However, the Army Reserve has provided veterinary coverage in that theater. Many Army Reserve veterinarians are practicing clinical veterinarians in civilian life and therefore come to theater with extensive clinical experience.

The current conflicts in Iraq and Afghanistan have defied doctrine and the "status quo" of deployed veterinary operations. The likelihood of seeing a critically wounded military working dog increased profoundly with the rise of the insurgency. Veterinary officers and enlisted animal care specialists deploying with deployable veterinary units must be prepared for this occurrence. Despite the limitations in equipment, staff, and training, deployed veterinarians have adapted to the challenge and done an excellent job in managing these cases.

INJURIES AND WOUND DISTRIBUTION

There is currently no standardized database to capture injury data in working dogs, such as the Joint Theater Trauma Registry for injuries in human servicemembers. Studies to analyze canine injuries or illness in theater have relied on massive data calls, word-of-mouth reporting, or screening records of deceased working dogs once the medical record is sent for archiving at the Department of Defense Working Dog Center at Lackland Air Force Base. Although several studies are currently underway, and a few have been presented as preliminary data, apparently none have been published since the beginning of Operations Iraqi Freedom and Enduring Freedom.

Preliminary data in a study of gunshot wounds in U.S. military working dogs shows a survival rate of 33% in 21 dogs. Of the surviving dogs, there is a return to duty rate of 71%, with the remaining 29% undergoing continued care and

* Area of concentration

expected to eventually return to full duty. This data also shows that five of the seven dogs that survived their injuries were considered in critical condition at some point in following their injuries, requiring advanced lifesaving care by medics in the field or by veterinarians at the deployed veterinary treatment facilities.²



This military working dog incurred a gunshot wound to the head. Following intensive care and treatment for skull fracture, detached retina, and traumatic brain injury, he recovered fully and returned to duty four months after the injury.



An animal care specialist provides postoperative physical therapy to a working dog who had received a gunshot wound to the shoulder. The dog underwent extended physical therapy at the DoD Dog Center at Lackland, Air Force Base, Texas, and returned to full duty.

Currently there is no standardized injury severity score methodology for dogs as there is for human trauma victims. However, classification of canine casualties for these studies is modeled as closely as possible to human studies. The terms killed in action (KIA), died of wounds (DOW), wounded in action (WIA), and disease, nonbattle injury (DNBI) are defined to allow comparison to human morbidity and mortality studies. A dog is considered KIA if it dies prior to reaching care of a veterinarian in a facility capable of resuscitative treatment or surgery. A dog is considered DOW if it arrives at veterinary care as defined above, but subsequently dies of the wounds, or are euthanized because death is imminent. The term WIA indicates the dog ultimately survived its wounds, and DNBI is used for cases of injury or illness not caused by combat action. According to the preliminary ballistic wound data, none of the injured dogs were categorized as DOW; they either died instantly from catastrophic trauma or survived to return to their home station.² One study of human combat casualties showed approximately 12% of patients died with injuries which were determined to be potentially survivable.³ That is, they suffered injuries from which, with proper identification and treatment of those injuries, they could possibly have survived. No canine casualties in the ballistic wound study have been identified in this category.

Wound distribution for these cases does not appear to mirror wound distribution for human combat casualties. For example, wounds to the thorax from any cause (ballistic, explosive, blunt trauma) appear to be more common in canines than in human service members.^{3,4} This is probably due to several factors, including the four-footed, head-forward stance of dogs rather than the upright stance of humans, as well as the fact that dogs generally do not wear body armor. While it is commercially available, it is quite heavy, does not carry the same ballistic rating as human body armor, and is thought to contribute to fatigue and heat injury in dogs. The practicality of its use is limited. The U.S. military does not issue body armor to its working dogs, although some improvised or commercially-acquired types have been used in theater.

Explosive injuries and blunt trauma make up the majority of other major combat trauma in dogs.⁵ Improvised explosive devices and mortar and rocket attacks have caused injuries in dogs as well, and, anecdotally, such events appear more likely to result in a combined mass casualty event where both human and canine casualties occur.

INTEGRATION OF VETERINARY CARE INTO THE HUMAN MEDICAL ASSETS IN THEATER

As mentioned above, deployed veterinary teams are not specifically equipped, staffed, or trained to manage serious canine trauma cases. Most locations lack diagnostic imaging and comprehensive laboratory equipment, and are minimally staffed with skilled veterinary providers. Integration with human medical resources such as a combat sup-

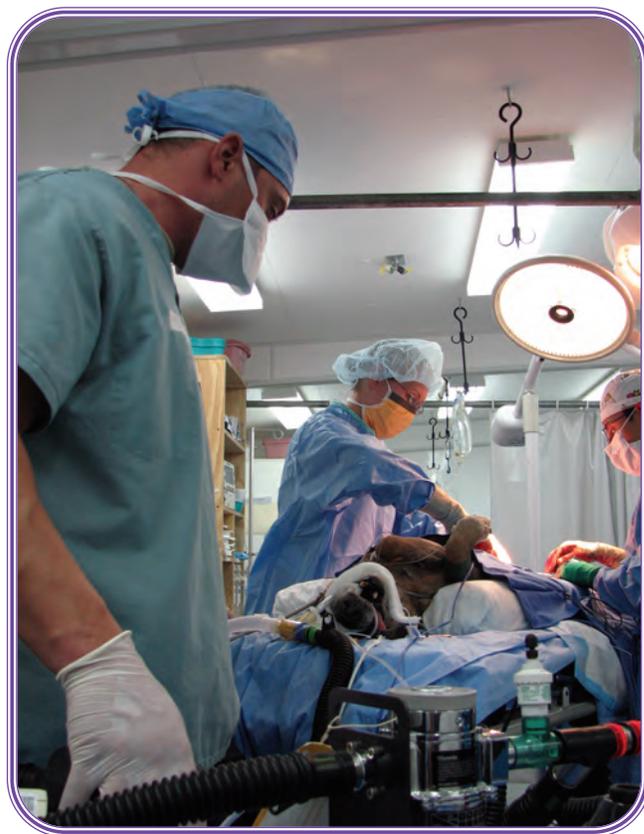
port hospital, Air Force theater hospital, or other human medical facilities is vital to providing advanced veterinary care to critically injured dogs.

In one notable case, a working dog and several human servicemembers were seriously injured when an improvised explosive device caused a building to collapse, trapping the servicemembers and the dog under the rubble. The dog was placed on the evacuation helicopter along with the injured humans, and taken to the Air Force theater hospital in Balad where they were treated side-by-side in the emergency department. Emergency department personnel were assigned to assist the veterinarian with emergency care of the dog until he could be stabilized and transferred to the veterinary treatment facility adjacent to the hospital. Separating the dog from the handler to go straight to the veterinary treatment facility, while the handler was sent to the hospital would have caused confusion with medical operations within the medical evacuation system, and would have required additional personnel to triage and transport the dog to a separate location. They treated the dog as another combat casualty, and brought the veterinarian into the emergency department as the veterinary provider. This allowed a smoother and more efficient flow in treatment of all of the casualties. In addition, proximity of the dog to an injured handler is important to morale of the team, and calmness of a potentially aggressive working dog.

In another case, a dog suffered multiple fragmentary wounds following a suicide bombing in close proximity to the dog and handler. The dog and handler were taken back to the forward operating base, where they were immediately separated. The handler was taken to the combat support hospital, while the dog was taken straight to the veterinary treatment facility. The veterinary field officer quickly recognized signs of shock and the need for emergency exploratory surgery which she felt was beyond her capabilities and that of her staff in their facility. She immediately transferred the dog back to the hospital where she performed lifesaving splenectomy and intestinal resection and anastomosis with the assistance of human trauma surgeons, a certified registered nurse anesthetist, and other surgical staff. This action effectively turned Level I veterinary capability into Level III capability at that location without costly addition to veterinary equipment or manpower.

Those are just two cases illustrating how the deployed veterinary teams are adapting to their situation to provide excellent care to dogs with combat trauma. Integration with human medical resources is vital and perhaps should be made doctrinal. Several individual cases have been reported of medical facility commanders refusing to allow dogs treatment in their facilities. An unwarranted and unscientific fear of contamination seems to be the driving cause of this. In reality, there are very few infectious or zoonotic diseases that can be transmitted from dogs to humans, and many of these are mitigated through prophylactic vaccinations (i.e., rabies) and strict prophylactic

antibiotic regimens that working dogs undergo while deployed.⁶ There has been no formal study in the military sector to support this, but it is likely that working dogs pose no more of a health threat to humans in the medical facility than other humans in that same facility. As long as routine body substance isolation and local decontamination measures are followed, medical facility commanders should not use this as a reason to refuse dogs emergency care in their facilities.



A veterinarian and human trauma team join forces to perform life-saving surgery on a working dog injured by an explosion.

TACTICAL CANINE COMBAT CASUALTY CARE: STANDARDS BASED ON EVIDENCE AND COMBAT DATA

Tactical combat casualty care for human casualties has well-defined standards of care, as does advanced trauma management, damage control surgery, and critical care. Standards exist for everything from use of tourniquets to use of fluids, blood, and blood products in resuscitation.⁷ These standards are based on casualty data and multiple formal studies on actual combat casualties and trauma management in the civilian sector.^{8,9} Since there has been no casualty database from which to compile and analyze data for canines, veterinarians in deployed environments have been left to manage these cases based on their own individual experience, “gut feeling,” or other available resources.

Similarly, until recently there was no standardized canine first aid training for working dog handlers, and no known

formal military training available for human medical personnel who may be responsible for caring for dogs at the point of injury. Dog handlers and human medical personnel who requested this training from their area's military veterinarian received training based on the comfort level and experience of that individual veterinarian. The reality, unfortunately, was that few veterinarians had been deployed and even fewer had experience with combat trauma. Virtually none had experience with point-of-injury, prehospital care, but were asked to train battle-experienced medics and human medical providers in this area. Add to that the fact that they were training these providers on guidelines that were neither evidence-based nor standardized, and the guidance was often conflicting.

Veterinarians were understandably reluctant to train nonveterinarians on life-saving procedures, such as needle thoracotomy, that they themselves had never performed on an actual patient. However, lessons learned from combat have shown that human medical personnel will improvise when faced with a critically injured dog far from veterinary care, extrapolating from their medical skills. There are multiple cases in which they have performed these lifesaving procedures on injured dogs with good success.² Because they will proceed with this care regardless of whether they have received training or not, a new thought is emerging about this training. It may be time to develop evidence-based standards of care that can be used by veterinary personnel as well as the human medical providers who provide prehospital canine care on the battlefield. Recently, Vogelsang's excellent article summarized the basics of military working dog care for human medical providers who may be faced with this situation in deployed locations.¹⁰ This was the only article we could find in the literature to address this concept and it is likely the first of its type, a situation that only emphasizes the need for this type of training and information.

THE WAY AHEAD

The increase in severe combat trauma in dogs has led to a different way of thinking in the Army Veterinary Corps, and also with human medical providers and units employing dogs on the battlefield. Work is underway to develop a canine injury database similar to the Joint Theater Trauma Registry. Clinical training of junior veterinary officers and enlisted animal care specialists has increased immensely over the last few years, with new interest and focus on management of trauma and critical care transport. Special Operations and flight medic students are given introductory instruction on managing canine emergencies. Several studies are underway regarding combat injuries, morbidity, and mortality of dogs in combat theaters, and of medical evacuation and en route care of working dogs from theater.

Recommendations for continued advancement in this area include creation of doctrine that specifies human medical facilities can be used in treatment of canine casualties, continued recording of canine morbidity and mortality statistics, and integration of brief standardized blocks of instruction for ca-

nine casualties in combat medic, flight medic, and other medical provider courses. In addition, prior to deployment, veterinary officers and animal care specialists should be required to gain hands-on training and experience in civilian veterinary emergency and critical care facilities through formal arrangements with veterinary teaching hospitals and veterinary specialty centers.

The area of canine combat trauma management lags behind its human counterpart in resources, standardization, and training, but certainly not in motivation or resourcefulness. Deployed veterinarians have done a fantastic job in adapting to their situation and providing excellent care to injured canine servicemembers.

REFERENCES

1. Tofolli CA, Rolfe DS. Challenges to military working dog management and care in the Kuwait Theater of Operation. *Mil Med*. 2006;171:1002-1005.
2. Baker JL, Truesdale CA, Schlanser J, Lacy WA, Miller LA. Gunshot wounds in military working dogs in OIF and OEF, 2003-2008. Paper presented at: 2008 Force Health Protection Conference; August 13, 2008; Santa Fe, NM.
3. Holcomb JB, McMullin NR, Pease L, Caruso J, Wade CE, Oetjen-Gerdes MA, Champion HR, Lawnick M, Fair W Rodriguez S, Butler F. Causes of death in U.S. Special Operations Forces in the Global War on Terrorism, 2001-2004. *Ann Surg*. 2007;245: 986-991.
4. Kelly JF, Ritenour AE, McLaughlin DF, et al. Injury severity and causes of death from Operation Iraqi Freedom and Operation Enduring Freedom: 2003- 2004 vs 2006. *J Trauma*. 2008;64:S21-S27.
5. Foster A. Current veterinary operations in Afghanistan. Paper presented at: 2008 Force Health Protection Conference; August 14, 2008; Santa Fe, NM.
6. *Deployment Guidelines for Military Working Dogs*. Falls Church, VA: US Dept of Defense Veterinary Service Activity; 2004. Memorandum DODVSA 17 May 2004.
7. U.S. Army Institute of Surgical Research. Joint Theater Trauma System clinical practice guidelines for damage control resuscitation at level lib and III. Updated April 2008. Available at: <http://www.usaisramedd.army.mil/cpgs/2008%2004%20CPG%20Damage%20Control%20Resuscitation%20for%20Level%20IIB-III.pdf>. Accessed January 13, 2009.
8. Johnson JW, Gracias VH, Schwab W, et al. Evolution in damage control for exsanguinating penetrating abdominal injury. *J Trauma*. 2001; 51:261-271.
9. Shapiro MB, Jenkins DH, Schwab W, Rotondo MD. Damage control: A collective review. *J Trauma*. 2000; 49:969-978.
10. Vogelsang R. Care of the military working dog by medical providers. *JSOM* 2007;7(2):33-47. Available at: <https://jsoupublic.socom.mil/publications/jsom/jsomql07.pdf>. Accessed January 12, 2009.

AUTHORS

At the time this article was written, MAJ Baker was Command Veterinarian, Joint Special Operations Command, Fort Bragg, North Carolina. CPT Truesdale is Command Veterinarian, Joint Special Operations Command, Fort Bragg, North Carolina. CPT(P) Schlanser is Regimental Veterinary Surgeon, 75th Ranger Regiment, Fort Benning, Georgia.