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Veterinary Care Systems for Military Working Dogs

Autor: Robert Vogelsang, DVM; Cheryl Sofaly, DVM; Mark Richey, DVM

Upravil: Jaroslav Duchoň

## **ABSTRACT**

A previous JSOM article (Spring 2007) discussed military working dogs (MWD) in SOF and their care by SOF medical personnel. MWDs are becoming more commonly utilized within SOF in current theaters and are subject to similar injuries and illnesses experienced by their human counterparts. SOF personnel can only provide basic care, as described in the earlier article, requiring more severely injured/ill dogs be evacuated to a conventional veterinary treatment facility. This article discusses current conventional veterinary capability and utilizes a case study to help demonstrate the spectrum of veterinary care for MWDs, from point of injury, to CONUS rehabilitation and eventual return to duty. It is important that SOF medical and planning personnel understand what veterinary support exists, its capabilities and locations to ensure the best care possible can be provided to their dogs.

## **OBJECTIVES**

1) Understand conventional military veterinary support doctrine for working dog care. 2) Recognize potential problems/shortfalls within the veterinary care system. 3) Understand capabilities of conventional military veterinary care for the military working dog.

## **DOCTRINAL CARE OF THE WORKING DOG USING A CASE STUDY – “MR. D”\***

\*Identities of Special Operations members must be protected due to the sensitive nature of their work and as such, only the dog’s initial has been used. This article will use a case study that follows a wounded dog from point of injury to return to duty to demonstrate the care a MWD receives throughout the entire veterinary health care spectrum.

### **Signalment:**

Mr. D is a 5 1/2 year-old, male, Belgian Malinois working dog.

### **Injury:**

Mr. D received a single 7.62mm gunshot wound entering the right-dorsal aspect of neck, exiting distal and lateral to the scapulohumeral joint creating a wound approximately 12x8cm in size (Figs. 1 and 2).

### **Immediate first aid:**

Mr. D was first treated on the objective by his handler who described brisk and significant bleeding from the wound (spurting/pulsing stream of blood arcing up out of the wound). The handler packed the wound with non-elastic gauze and applied a pressure dressing using an elastic bandage. The dog was included in the unit CASEVAC plan and Mr. D was subsequently evacuated to the nearest veterinary unit with surgical capability. Flight time was approximately 10 minutes. The unit Medic attempted to initiate an intravenous (IV) catheter, but was unsuccessful due to darkness, vibration, and that the limb was not clipped, so he began administering lactated Ringer’s solution (LRS) subcutaneously (SQ) in an attempt to get some fluids into the patient. The dog had received approximately half a liter upon arrival at the medical treatment facility (MTF). The unit’s CASEVAC plan for a critically ill dog states to evacuate the dog to the MTF landing zone, where the veterinary team will receive the dog in the Level III human facility and move to the veterinary treatment facility (VTF) when stabilized.

### **Level II-III care:**

Upon arrival, Mr. D was laterally recumbent and conscious, but shocky and painful. Mr. D was taken to the Air Force Theater Hospital emergency room (ER) where, initially, ER providers attended to him with guidance from an Army Veterinary Corps Officer (VCO). In the ER, an IV catheter was placed in a dorsal

(anterior) metatarsal vein which is not a location generally used for catheters in veterinary medicine; more often the IV is placed into cephalic veins in fore limbs and lateral saphenous veins in hind limbs. In this case; however, it was found by veterinary personnel to be a good place for catheterization as the dog appeared to tolerate it well after surgery and it was away from the area requiring surgical intervention. He received approximately 1.5 liters of LRS IV plus the subcutaneous half liter prior to the veterinary team taking him to their facility. The dog was given 0.05mg of fentanyl IV for pain. Biplanar radiographic views of the chest taken to assess for air or fluid in the thorax, with none found. By the time Mr. D was transported approximately 100 to 150 meters to the veterinary clinic, four VCOs and one 68T had gathered, so one team worked on preparing the wounds for surgery while the second team prepared the surgery room and managed fluids, records, drugs, etc. The hair around the wounds was shaved and cleaned of gross debris prior to anesthetic induction while he was receiving fluids and the surgery room prepared. He received butorphanol and glycopyrrolate as premedications which facilitated this process. Induction was made with ketamine plus diazepam IV; isoflurane was used for maintenance anesthesia via endotracheal tube. In surgery, the non-elastic gauze packing was removed, the wounds cleaned and debrided, and the wound tract copiously lavaged. Damage was generally confined to the subcutaneous tissues surrounding the tract, plus disruption to the muscles around the shoulder joint (Fig. 3). No nerve damage was sustained. The acromion process of the scapula was found to be fractured, but there was no apparent damage to the scapulohumeral joint itself. No attempt was made to repair the acromion fracture as it appeared too splintered to be reattached. Penrose drains were placed and the transected muscle bellies reapposed as well as possible. Dead space under the skin along the wound tract was obliterated with subcutaneous sutures and the skin then closed with the drain exiting ventral to the ventral extent of the wound tract. For the first three days following surgery, a full limb bandage was applied to the right front leg to minimize swelling. The limb was also put in a modified sling to prevent weight-bearing (Fig. 4). Wound dressings were placed over drain exits and laced in place using umbilical tape through loops of suture placed in the surrounding skin. These wound dressings were used to absorb exudate and prevent skin irritation. They were changed as often as needed until drains were removed. Two days post-op, passive range-of-motion exercises were conducted daily and leash walking commenced on day four. Drains were removed by day six when they were no longer productive. Skin sutures were removed prior to departure from theater on day 10 when Mr. D redeployed with his unit. Note that in a case like this where the dog is friendly and easy to handle by veterinary staff, the handler can return to the unit and participate in missions while the dog is convalescing. At departure, he was walking/trotting well, but with a noticeable limp. He did develop a small seroma at the distal aspect of the dead space after the drain incision closed which resolved without further treatment. Antibiotics used were IV cefazolin plus metronidazole, switching to oral enrofloxacin plus metronidazole once he was back on food. Pain management post-op included oral carprofen plus intermittent butorphanol for three days, then oral carprofen only through departure from theater.

### ***Level V Care:***

After arrival at home station, arrangements for referral and transport to Lackland AFB were made between the unit and the DOD Military Working Dog Veterinary Service (DODMWDVS). The dog was flown by commercial carrier to Houston and then driven onward to Lackland. The dog could not be flown into San Antonio as the commercial airport there would not accept an extra-large shipping kennel. The dog and escort were met by DODMWDVS personnel and Mr. D admitted as a patient. The assessment by DODMWDVS staff was that Mr. D had obvious right forelimb lameness. It did not appear to be painful and the lameness diagnosed to be functional in its etiology. This was attributable to significant loss of range of motion (ROM) in his right shoulder, specifically loss of extension. Mr. D's ROM was measured to be 75 degrees (130 degrees at maximum extension to 55 degrees at maximum flexion). In a dog of his breed and size, normal ROM is expected to approximate 110 degrees (165 at maximum extension to 55 at maximum flexion).<sup>1</sup> The evaluation found gross muscular atrophy around the shoulder joint including the supraspinatus, infraspinatus, and acromial deltoid muscles; additionally, extensive fibrosis within this area was suspected. Lateral (Fig. 5) and craniocaudal (Fig. 6) view radiographs of the shoulder were taken which showed the fractured acromion (yellow markers). Repair of the fractured acromion was not considered as it was suspected that the fragment was firmly encased in fibrous tissue, it was not significantly contributing to the lameness, and

the anesthesia and surgical trauma to attempt such a repair would be more detrimental to the dog than leaving the acromion in place as it was. Mr. D was placed into a physical therapy/rehabilitation program overseen by a Certified Canine Rehabilitation Practitioner (CCRP) with the goals of: 1) Gaining ROM (extension) in the right shoulder; 2) Gaining muscular mass in the musculature of the lateral shoulder; 3) Minimizing further fibrous contraction at the surgical site and release of fascial planes. He averaged four therapy sessions per week for the six weeks he was at the DODMWDVS. His regimen consisted of:

- Underwater treadmill (UWTM) therapy three times weekly for 15 minutes at gradually increasing speed (Fig. 7)
- Passive range of motion and stretching, 30 repetitions each session, three times weekly following each UWTM session (Fig. 8)
- Therapeutic ultrasound therapy at the scar/surgical site twice weekly for eight minutes at 1MHz/1.2W/cm<sup>2</sup>.
- Electrical stimulation for the supporting musculature surrounding the shoulder twice weekly (sedated).
- Stretching (focus on extension) under sedation twice weekly following the electrical stimulation therapy.
- Two treatments of local aquapressure/scar injection with Vitamin B complex for stimulation of local acupuncture sites and release of intramuscular trigger points.

After treatment at Lackland, Mr. D was released to his unit with a ROM in his right shoulder of 100 degrees, or about 91% of expected normal ROM, an excellent progression from the initial presentation of only 68%. The muscle mass around the shoulder was considered near normal as was his gait (Fig. 9). The unit was advised not to deploy the dog for two months and instructed to continue stretching and passive range of motion exercises and allow the dog to play and exercise without limitations. If Mr. D continued to remain improved at the end of the two-month period, the veterinary staff believed he could return to unlimited duty and deployment.

### **MILITARY VETERINARY ORGANIZATION**

The Army is the DOD Executive Agent for Veterinary Services and, as such, is the only Service which provides animal care to all of the other Services. While the Air Force has some veterinarians, these personnel function as Public Health Officers who apply preventive and public health techniques to reduce and control the incidence of communicable diseases and occupational illnesses and do not have a role in the care of animals. There are currently seventeen documented and authorized veterinary positions that exist in SOF, all are within USASOC. These positions are filled with VCOs and/or Army Military Occupational Specialty (MOS) 68T, Animal Care Specialist/NCO.

\*VCO in each Special Forces Group (Abn) x 7 VCO at 95th Civil Affairs Bde VCO in each Civil Affairs Bn VCO and 68T (2) at the Joint Special Operations Medical Training Center \*VCO in the USASOC Sustainment Brigade (SO) (Abn) VCO on the USASOC Surgeon's staff

Future FY veterinary positions approved to be filled include: \*VCO and 68T at HHC, 75th Ranger Regt (VCO is currently assigned)\*VCO and 68T at Support Company, MARSOC Special Operations Support Group VCO on the USSOCOM Surgeon's staff (VCO currently assigned)

\*Denotes veterinary staff which do/will have working dog care responsibilities; remaining positions are staff or perform functions generally distinct and apart from working dog care.

Within the conventional Army, there are two TO&E (Table of Organization and Equipment) veterinary unit types; the Medical Detachment, Veterinary Service (MDVS) and the Medical Detachment, Veterinary Medicine (MDVM). The MDVS requires 57 personnel, is authorized 55 (with two Professional Filler System positions), and organized with a HQ section and six subordinate teams of seven personnel each. Of the six subordinate teams, only five (Veterinary Service Support Team or VSST) have working dog care responsibility and capability; the other team is dedicated to food inspection and laboratory analysis. These teams are generally dispersed throughout an area of operation, sometimes at great distances from their headquarters. Each VSST has one VCO and one 68T; however, only one team has a gas anesthesia machine, while the other VSSTs have intravenous anesthesia capability, operating table, surgical light set, and scrub sink. None of the VSSTs has a holding capability. The team with surgical equipment can provide Level II care though this can be debated since all VSSTs have an operating room (OR) table, surgical light, point of care chemistry (iSTAT), ultrasound, and total intravenous anesthesia capability. At best, VSSTs provide Level II since they do not have radiology, chemistry analyzer, clinical specialists, or holding capability. The term "level" in this description is in reference to capability of care generally associated with medical treatment facilities for human patients. It should be noted that, as defined in Army Field Manual 4-02.18, Veterinary Service

Tactics, Techniques, and Procedures,<sup>2</sup> there are some differences in the doctrinal description of “level” capability between medical and veterinary care. Chapter 3, Section III, Part 3 to 11 of FM 4-02.18 states, “Level I (unit level) veterinary care for MWDs includes medical triage, EMT, stabilization, and evacuation. Level II veterinary care is the same as Level I except it has additional capabilities that include having anesthesia and being able to perform some limited surgical procedures.” Though each team has a 68T, many times the MDVS will reorganize to create an “animal support team” and combine many 68Ts within the detachment into this squad whose main responsibility is animal care. When such reorganization occurs, the other teams generally have only a VCO which can provide working dog care. The mission of the MDVM unit is specifically to provide animal care, especially to military working dogs. It includes three VCOs and nine 68Ts. This unit has surgical, x-ray, ultrasound, and some laboratory capability. The MDVM has some holding capacity; but, since it cannot provide definitive care for more complicated cases, dogs which cannot be returned to duty within an established evacuation policy generally would be evacuated to fixed facilities in Vogelweh (Kaiserlautern), Germany, or Okinawa, Japan (analogous to Level IV); or the DOD Military Working Dog Veterinary Service at Lackland AFB, TX (analogous to Level V, the Walter Reed/Bethesda of the Veterinary Corps).

### ***VETERINARY SUPPORT TO OEF/OIF***

At present, one complete MDVS detachment supports Operation Iraqi Freedom (OIF) in Iraq. A portion of another MDVS (U.S. Army Reserve) supports OIF in Kuwait, Qatar, and the Horn of Africa. A portion of another MDVS (U.S. Army Reserve) supports Operation Enduring Freedom (OEF) in Afghanistan. Currently, none of the three existing MDVM detachments is deployed. One VCO is deployed in support of OEF-P, but he has no facilities or equipment or animal technicians; unlike Iraq and Afghanistan, this area of operations has few MWDs. The VSSTs are dispersed across a total of nearly 20 locations throughout their respective AOs; some 68Ts are further forward at certain Forward Operating Bases (FOBs) or other areas that may have high MWD populations. For example, one detachment is spread out over nine locations that are able to provide some veterinary care to dogs (some sites may only have one technician). However, there are reported to be over 700 military and contract working dogs, spread over at least 50 locations, in Iraq alone. Due to the great dispersion of the dog population and relatively non-permissive environment, it is sometimes challenging to get dogs to veterinary units and vice versa. The MEDEVAC system can be used to transport dogs; however, most of these transports are routine and the dog and handler may be kept away from their duty site for up to a week awaiting transportation back to their FOB after pursuing a simple treatment for minor illnesses or injuries.

### ***DOD MILITARY WORKING DOG VETERINARY SERVICE***

The DOD Military Working Dog Veterinary Service is the largest military veterinary hospital in DOD. There are approximately 30 personnel on staff include VCOs who are board-certified in surgery, internal and/or emergency medicine, and radiology. The DODMWDVS has two operatories equipped with full instrumentation for orthopedic, general/soft tissue, laparoscopic, and neurological surgery. A full laboratory provides complete blood count and most chemistry panels. Imaging capabilities include digital radiography, fluoroscopy, and ultrasound. The DODMWDVS has a canine physical therapy/rehabilitation section with an underwater treadmill and is staffed by a board-certified physical therapist/rehabilitator. A brand new facility will open in late spring or early summer of 2008 which will include a CT machine in addition to all current capabilities. The DODMWDVS serves as the referral center for all MWDs and provides professional and technical assistance to VCOs and 68Ts throughout DOD.

### ***OVERVIEW OF VETERINARY CARE***

Few units will have veterinary personnel deployed with them to support their dogs and those that do will not likely have those assets with them at point of injury. As such, the handler will be the first responder, unless the handler has been incapacitated. In that situation, the Medic would likely perform initial first aid. Though basic Tactical Combat Casualty Care phases of care can be directly applied to the injured canine,

by both handler and Medic must plan for and address a few differences for canine treatment. First, the Combat Application Tourniquet will not work on a canine limb due to the limb's relatively small diameter of the canine limb. Tourniquets for the canine patient will need to be improvised using a cravat/windlass, Penrose drain, or similar expedient method. Hemostatic dressings; however, should be used on the dog as they would on a human. Obviously, the nasopharyngeal airway will not be useful in the canine casualty and the combat pill pack contents are not appropriate for the dog. Moxifloxacin is not yet commonly used in the dog, but what evidence that does exist implies a dose of 2 to 5mg/kg as appropriate (personal communication). As such an average working dog would receive 150 to 200mg orally. Maximum therapeutic meloxicam dose (per package insert) for a dog is only 0.2mg/kg which would be approximately 6mg for an average SOF dog. The combat pill pack dose of meloxicam is more than twice the dog dose (15mg). High doses of non-steroidal anti-inflammatory drugs (NSAID) in the dog can cause significant to deadly sequelae. Acetaminophen is not frequently used in dogs as it can cause methemoglobinemia and hepatic necrosis.<sup>3</sup> With the current combat pill pack for humans, a working dog could receive half a tablet of the moxifloxacin and half a tablet of the meloxicam; that is if you could get the dog to swallow the medications. If the dog is distressed, it may not allow hands in its mouth or may not swallow the tablets if they could be placed in the mouth. In the author's opinion, no acetaminophen should be administered. As the use of dogs in combat becomes more frequent, development of a Tactical Canine Combat Casualty Care (TCCCC or TC4) program should be entertained. One of the most important things that will help ensure the best outcome for MWDs is prior veterinary support planning. CASEVAC/MEDEVAC for dogs must be incorporated into the medical support plan. Units should know where the closest veterinary units are located, what their capabilities are, and how to contact veterinary personnel. Units wishing to get deployed veterinary unit locations and contact information may contact the USASOC or USSOCOM Command Veterinarians. Once the dog is received by the deployed veterinary team/detachment, the dog's unit must maintain contact with the veterinary unit. In some cases, a dog may not allow veterinary care to be given without being with its handler and the handler may be required to remain with the dog at the veterinary unit's location. Should a dog need further treatment at a Level IV or V veterinary facility, it is the responsibility of the supporting veterinary detachment to coordinate evacuation with their supporting medical regulating office for movement and referral arrangements with the receiving veterinary facility. Note that the USSOCOM liaison officer (LNO) at the Landstuhl Regional Medical Center is responsible for assisting with human casualties and will also assist with canine casualties going through Germany. The LNO has previously arranged lodging and transportation for evacuated dogs and their handlers/escorts, which has proven to be very helpful. The Landstuhl USSOCOM LNO office phone is DSN (314) 486-7776; cell phone is 0162-273-0111. Veterinary units and dog-owning units must maintain communication as there is no real in-transit visibility on canine patients. Once the dog has been treated/rehabilitated, the veterinary facility will make arrangements with the owning unit for release and travel to home station or other location as required. Dogs are being used with increasing frequency by SOF units, as they are with conventional units. With larger numbers of dogs performing more at-risk missions, it is imperative that these valuable and difficult-to-replace assets are cared for in a manner and to a standard similar to that for our human service members. All SOF medical personnel are encouraged to stay engaged with their unit veterinary personnel where such exist. It is important for all providers to understand and be familiar with canine trauma/emergency management principles and planning considerations. For other SOF units with dogs, but no organic veterinary support, work with your local installation veterinary treatment facility personnel for canine first aid and emergency treatment. Questions regarding canine care and planning can be addressed to the USASOC Command Veterinarian at (910) 396-1589 or the USSOCOM Command Veterinarian at (813) 826-6031.

## REFERENCES

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COL Vogelsang is currently the USSOCOM Deputy Surgeon for Clinical Operations as well as Command Veterinarian. He graduated from Michigan State University with a DVM in 1988. He completed a residency in small animal surgery at the University of California, Davis in 1995 and is a Diplomate of the American College of Veterinary Surgeons. He has twenty years' experience directly caring for or planning/coordinating care for Military Working Dogs. COL Vogelsang has previously served as Chief of Surgery and Dentistry, DOD Military Working Dog Veterinary Service (DODMWDVS) and as Group Veterinarian, 3rd Special Forces Group (Airborne); deploying to Kuwait/Saudi Arabia during Desert Shield/Storm. He will be moving to Lackland AFB, TX this summer to become the Director, DODMWDVS

LTC Sofaly is currently serving as Chief of Veterinary Medicine, 43rd Medical Detachment (VS) (FWD). She obtained her DVM degree from Colorado State University in 1995 and entered the Army Veterinary Corps that same year. She received a Masters in Veterinary Preventive Medicine from Ohio State University in 2003. LTC Sofaly attained board certification from the American College of Veterinary Internal Medicine in 2003. Previous to deployment, LTC Sofaly commanded the 28th Medical Detachment (VM); she is currently projected to assume command of the 43rd Medical Detachment (VS), Ft. Hood, TX upon return from Iraq.

MAJ Mark Richey is currently serving with the Department of Defense Military Working Dog Veterinary Service at Lackland AFB, Texas. He earned his Doctorate of Veterinary Medicine from Colorado State University in 1995. He accepted a direct commission to the Veterinary Corps in 1998. MAJ Richey received a Master's degree in Specialized Veterinary Medicine (Surgery) from North Carolina State University in 2005, and obtained board certification from the American College of Veterinary Surgeons in 2007. He served as the Commander, 129th MED DET (Veterinary Medicine) in Yongsan, South Korea from 2005 to 2007.



Jaroslav Duchoň