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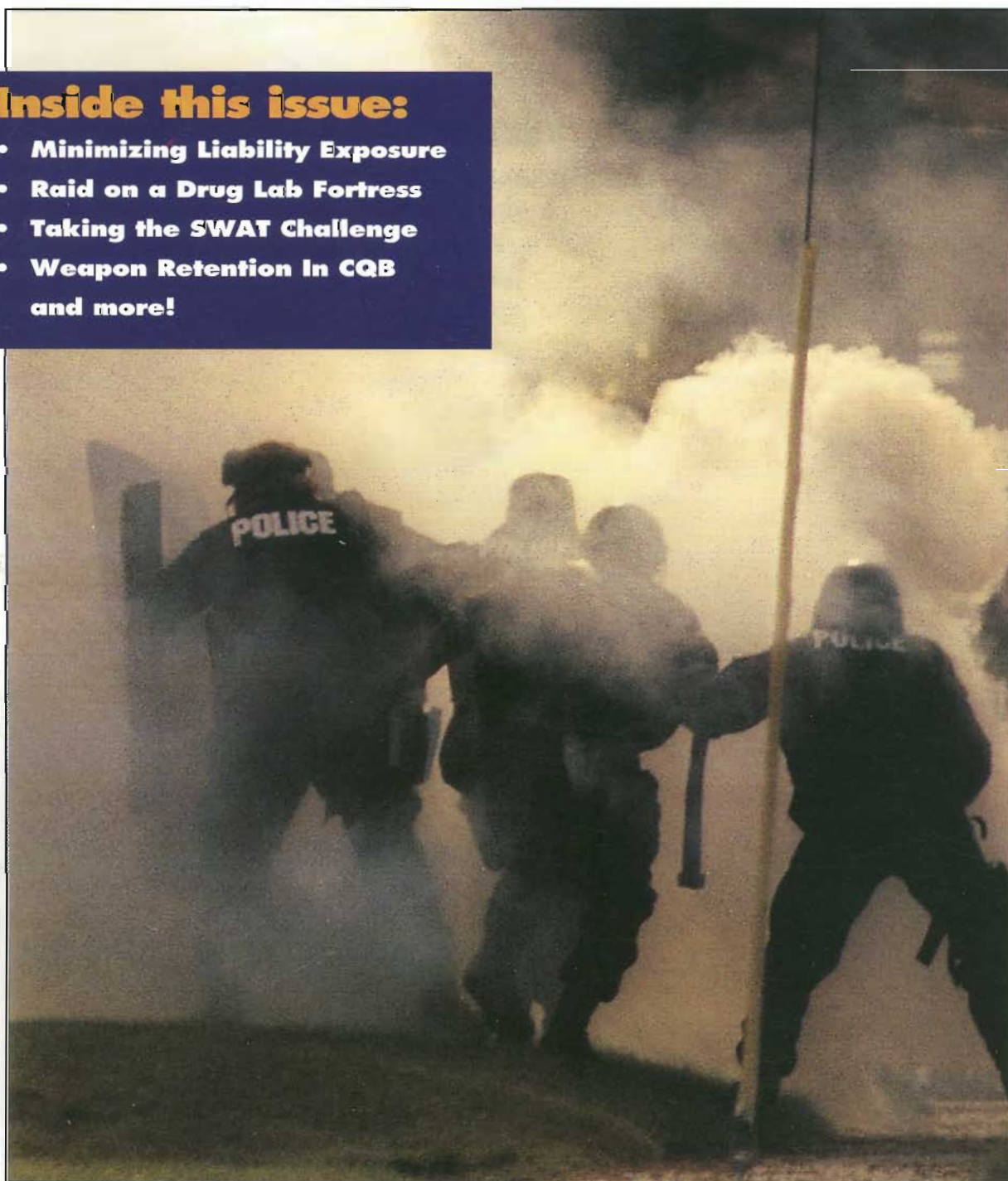
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TACTICAL EDGE

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Medical Management of K-9 Emergencies

By Lawrence E. Heiskell, M.D., FACEP and David H. Tang, M.D., FACEP

The first of two articles on emergency medical care for canines.



Photo 1. Application of a muzzle prior to handling an injured dog.

THE USE OF CANINES is now commonplace with many SWAT teams during tactical operations. Canines have demonstrated their usefulness in maintaining perimeters against fleeing suspects and assisting in clearing buildings. Fully trained K-9s are expensive, usually costing the department anywhere from \$3,500 to \$7,000. Additional costs include patrol car modifications, ongoing training for the dog and handler, food, kenneling, and veterinary expenses. A strong bond develops between the dog and the handler as well as the rest of the team. For all of these reasons, it is important for the medical component of the tactical team to be able to provide first aid and initial trauma life support to their K-9 team member.

The purpose of canine first aid is to relieve suffering and to stabilize the dog's vital signs until professional help is obtained. This article provides information on the techniques of administering lifesaving care to an injured canine.

In this two-part series, the injuries most likely to occur to a K-9 during a tactical operation are outlined and discussed. Part 1 covers restraints, transport, airway management, fluid therapy, wound management, and CPR. Although the application of CPR is similar in humans and dogs, there are some modifications. We recommend that medical personnel and dog handlers take the time to learn canine CPR. In Part 2, other medical emergencies will be addressed including a discussion and list of suggested supplies to help you prepare and maintain a first-aid kit designed for use on canines.

Handling An Injured Dog

When a dog has been injured and is in pain, its actions are unpredictable. Regardless of how docile a dog is normally, it may turn and bite instinctively when in pain. This action is a totally unpredictable reflex. Thus, it is necessary to take precautions before doing anything that might hurt or excite the dog, and result in human injury. Once the dog is properly restrained it will usually calm down and accept treatment.

There are several steps in restraining an injured dog. First, approach the dog slowly, speaking in a reassuring tone of voice. Move toward the dog without touching it. Stoop down to the dog and observe its eyes and facial expressions. If it is growling, do not attempt to pet the dog. At this point place a leash around the dog's neck and tie it to a fixed object. Pull the dog against the object, securing the leash so that the dog cannot move its head.

A quick and easy emergency muzzle can be made from a piece of cloth, a necktie, silk stocking, or tape. The muzzle can be made by looping a leash around the jaws and tying a single knot under the chin. The ends are then brought behind the ears and tied in a bow. At this point you can begin medical evaluation and treatment (see Photo 1).

Rapid Assessment

Remember the ABCs: Airway, Breathing, and Circulation. Check to see if the dog has a clear, unobstructed airway. Next, make sure the dog is breathing adequately. Finally, look for signs of sufficient cardiovascular function. Note and control any external hemorrhaging (see Photo 2).

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K-9 First Aid

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A = Airway AIRWAY MANAGEMENT

The airway takes precedence over all other procedures. The airway in canines can be effectively managed the same way as in adults, including endotracheal intubation and bag-mask ventilation. First, determine if the dog is breathing on its own. If the dog's level of consciousness is decreased and it is not breathing on its own, you must breathe for it. If you have the capability of intubating the dog, proceed at once. The usual tube size for a German Shepherd, Labrador Retriever, or Belgian Malamute is 9 to 10mm (internal diameter). If the dog is unconscious and not breathing, you should suspect total airway obstruction and proceed with the following:

1. **Extend the neck, pull the tongue forward, and sweep the pharynx with your finger.**
2. **Give 5 or 6 abdominal thrusts.**
3. **Repeat the finger sweep and ventilate the dog using the mouth-to-mouth technique described under Artificial Respiration, below (see Photo 3).**
4. **Consider tracheotomy, if the airway is still obstructed.**
5. **If there is no evidence of obstruction, proceed with intubation.**

B = Breathing ARTIFICIAL RESPIRATION

1. **Determine if a heartbeat exists.**
To do so, place two fingers firmly on the dog's chest about two inches behind its elbow in the center of its chest (see Photo 4).
2. **Place the dog on a flat, firm surface.**
3. **Open the mouth and clear away debris or secretions.**
4. **Grasp the tongue and pull it forward and close the mouth.**
5. **Seal the lips with your hand.**
6. **Place your mouth over the dog's nose and breath in steadily for 3 seconds. Then release and allow the air to come out.**
7. **Positive-pressure ventilation should continue at a rate of 25-30 breaths per minute.**
8. **Continue until the dog breathes on its own, or for as long as a heartbeat can be felt.**

C = Circulation HEART MASSAGE

When feeling for a pulse, check the neck and the chest about two inches behind the elbow for a heartbeat. You may also attempt to locate a pulse over the femoral artery, which is located under the hind leg in the groin. As in



Photo 2. Primary assessment of an injured canine includes checking the ABCs—Airway, Breathing, and Circulation.



Photo 3. Positive-pressure ventilation using the mouth-to-nose technique.

human beings, artificial respiration combined with heart massage is an emergency procedure used to assist breathing and blood circulation in an unresponsive, unconscious dog. Heart massage is utilized when a heartbeat is not felt or heard. When this is combined with artificial respiration, it is called CPR or cardio-pulmonary resuscitation.

1. **Feel for a pulse or heartbeat.**
2. **Lay the dog on a flat surface.**
3. **Place the heel of your hand on the ribcage just behind the elbow, which is the area over the heart (see Photo 5).**
4. **Perform simultaneous chest compressions with ventilation every 2 to 3 compressions.**
5. **Chest compressions should continue at a rate of 80 - 120 per minute.**
6. **Continue chest compressions until the dog has a heartbeat or until no pulse can be detected for 5 minutes.**

Shock

Shock is a serious life-threatening condition. Any direct trauma or serious injury can cause shock. It is the number one killer of dogs in accidents. The most common cause of traumatic shock in dogs is being hit by a car. Other causes include dehydration, heatstroke, and hemorrhage. Basically, shock is a lack of blood flow to the body's vital organs and tissues. Any condition adversely affecting the blood volume, heart, or blood vessels can induce shock. A sudden rapid blood loss secondary to a penetrating injury from a gunshot or stab wound will produce shock in a dog.

Dogs may tolerate blood loss better than man due to the ability of their spleen to contract when the blood volume is lowered. However, once the reserve is used, shock will proceed rapidly. Signs of shock in dogs include shivering, listlessness, weakness, cold feet, pale skin, pale gums, and a weak pulse.

When shock is present you need to reverse the process. This can be done by elevating the hindquarters to allow more blood to reach the brain. Next, stop any obvious bleeding to prevent a drop in blood pressure. Finally, wrap the dog in warm blankets to help maintain an adequate body temperature. Full oxygen should be administered via a face mask. This can be easily made by covering the head with a plastic bag and running the oxygen tubing into the bag.

If the dog is in severe shock, the application of ace bandage extremity wraps may be needed to increase blood pressure. Simply wrap the rear limbs and tail, starting at the feet and moving up to wrap the pelvis and abdomen. Once rapid intravenous fluid volume replacement is achieved and blood pressure increases, the extremity wraps should be slowly released.

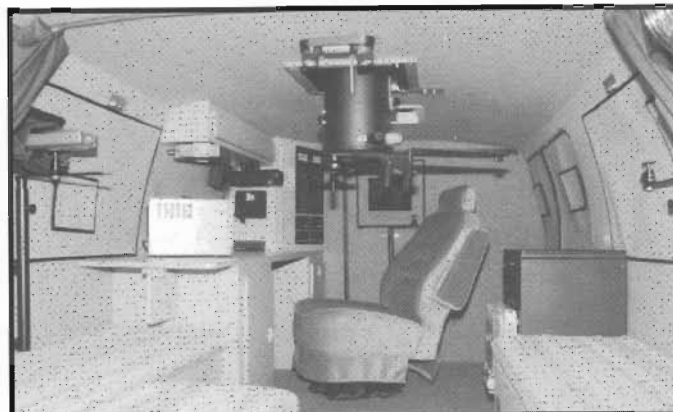
Treatment of Shock

1. If no breathing or pulse is found, proceed with CPR.
2. Lift the dog's upper lip and examine the gums. Pale gums indicate the dog is probably in shock (see Photo 6).
3. Determine the heart rate. Count the number of beats in 10 seconds and multiply by 6. A heart rate of 150 beats per minute or above may indicate shock.
4. Control bleeding with direct pressure.
5. Prevent further aggravation of shock.
6. Cover the dog with a warm blanket.
7. Transport to a veterinarian immediately.

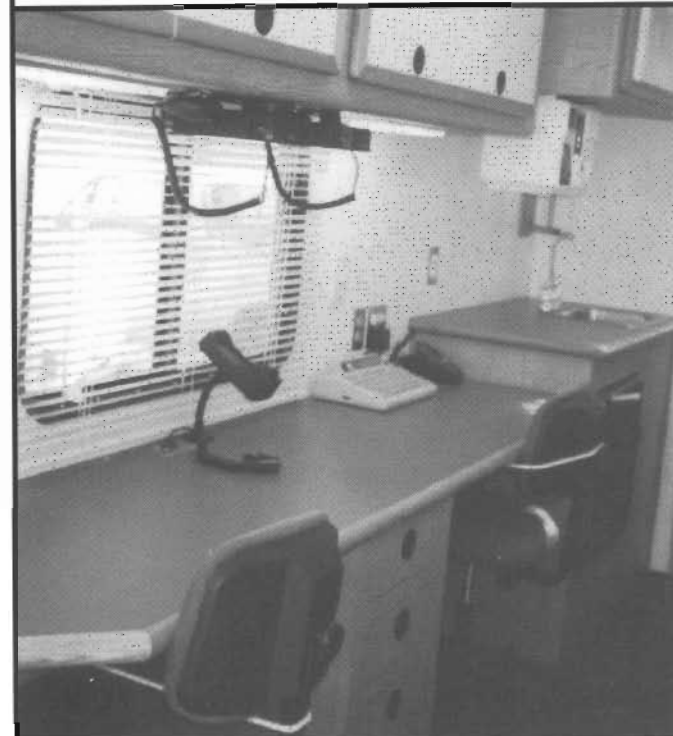
Wounds

In the tactical environment, penetrating injuries to K-9s are always a threat. Dogs are often sent in to clear a house, building, or attic. In addition, an armed perpetrator can fatally injure a dog with a gunshot or stab wound. The field management of penetrating wounds to dogs has basically two main objectives.

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Photo 4. To check for a pulse, place two fingers firmly on the dog's chest about two inches behind its elbow.



Photo 5. Chest compressions are performed by placing the heel of the hand on the ribcage just behind the elbow.



Photo 6. Lift the dog's upper lip. Pale gums indicate the dog is probably in shock.

K-9 First Aid

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The first is to stop the bleeding to prevent shock from occurring. Bleeding may be arterial, coming from a torn or punctured artery. This is seen as the spurting of bright red blood. The bleeding could also be venous, the source being a torn or punctured vein. This type of bleeding is usually seen as the oozing of dark red blood. The pressure dressing is a simple, quick and easy way to stop most types of bleeding. This can be accomplished by taking several pieces of clean or sterile gauze and placing them over the wound, then applying firm, even pressure. After the bleeding is controlled, an appropriate bandage can then be applied (see Photo 7).

The second objective is to prevent infection. All wounds are contaminated with dirt and bacteria. Taking precautions, along with proper care and handling, can prevent infections. Before treating a wound, make sure your hands and instruments are as clean as circumstances allow. At the edge of the wound, clip the hair back to expose the area. Clean the edges of the wound with a dampened gauze pad of Betadine solution. Apply a sterile dressing, comfort the dog, and seek veterinary consultation (see Photo 8).

Fluid Therapy

If time permits, a needle catheter may be placed in the cephalic vein. This is located on the dorsal aspect (on top) of either front leg. Use the largest bore needle possible, usually 16 or 18 gauge. Normal saline is the fluid of choice among veterinarians, and the rate of infusion in large dogs is 90cc/kg in the first hour.

Transporting An Injured Canine

When a canine has been injured, try not to move the dog any more than necessary. Have a team member notify the departmental veterinarian to make sure the vet is prepared to receive the dog. If the dog's injuries are not serious, it can be lifted by placing one arm around its chest, and the other around the back legs. If you suspect a spine

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injury, use a flat board as a stretcher. The standard backboard used by EMS agencies has handholds and works quite well. Before the dog is transported, be certain that the board will fit into the vehicle used for transport.

Place the board next to the dog, put the ties underneath the board, and gently lift or slide the dog onto the board. Next fasten the ties over the dog and secure it to the board. Cover the dog with a warm blanket. The canine now may be safely transported.

Conclusion

Unlike human medicine, animals are unable to let us know where they hurt. Therefore, one must be able to identify signs that point to the problem. Armed with knowledge, common sense, and the appropriate equipment, the tactical team medical support component should be able to effectively treat and manage most life-threatening medical emergencies to man's best friend until transport to the veterinarian can be arranged.

Most law enforcement agencies that utilize K-9s have a local veterinarian who provides routine checkups and medical care for their dogs. The tactical medical team should establish a rapport with a veterinarian, and keep the appropriate phone and pager numbers with them should a canine medical emergency arise during a tactical operation. ■

Further Reading:

Kirk, Robert W., Bistner, Stephen I. and Ford, Richard B., *Handbook of Veterinary Procedures & Emergency Medical Treatment*, 5th Edition, Philadelphia: W.B. Saunders Company, 1990.

Plunkett, Signe J., *Emergency Procedures for the Small Animal Veterinarian*, Philadelphia: W.B. Saunders Company, 1993.

Photos courtesy of the authors.



Photo 7. Application of a pressure dressing is simple, quick, and an effective way to stop most bleeding.



Photo 8. An injured animal needs comforting.

About the Authors

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