How to Effectively Perform Emergency Rescue of Equines

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Emergency rescue operations of equines should optimize both rescuer safety and the victim's prognosis for post-incident recovery. This can be achieved by the selection of appropriate rescue procedures and the implementation of an organized team approach among veterinarians and other emergency responders. Authors' addresses: Animal and Veterinary Sciences Department, Clemson University, Clemson, SC 29634 (Tomas Gimenez, Johannessen); U.S. Army Veterinary Corps, Ft. Bragg, NC 28310 (Baker); 2472 Six and Twenty Road, Pendleton, SC 29670 (Rebecca Gimenez)

1. Introduction

The veterinary literature has limited information available demonstrating techniques for equine emergency technical rescue.[1,2] The last 20 yr have seen development in the animal care and disaster response fields of small animal rescue techniques, including emergency and critical clinical field evaluation, and follow-up care in these animals. Within the large animal species, the tendency has been to attempt to apply the same techniques to animals that are several-fold larger or to treat large animals as inanimate objects during rescue extrications. Rescuers often get hurt, and the victims may be more injured by the rescue than they were during the accident.

The basic tenet of rescue is to use the *simplest, safest*, and *lowest tech* approach to an incident, thus reducing the risk of injury to both the victim and rescuers. For various reasons, such as lack of training or inherent tendency of rescuers to use sophisticated equipment, an unjustified *difficult, dangerous*, and *high tech* approach (i.e., helicopter) is sometimes employed by rescuers. As a general rule, the more elaborate the procedure, the greater the risk to the rescuers' and victim's safety. The excitement of rescues tends to break down the use of teamwork and common sense, causing prioritization of rescue methods to be overlooked. The priority of rescue methods for large animals includes several increasingly technical procedures between the simplest (a polymer web) and the most complicated (a helicopter).

Emphasis should be placed on teaching veterinary practitioners about the technical aspects of large animal emergency rescue applicable to horses.[3–5] Many of the large animal rescues promoted on television networks show only one part of the story—close review of these cases has revealed that many of these rescues caused either further injury or precipitated death of the animal(s) involved. In most

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Fig. 1. Placement of the 4-in.-wide nylon web with a "larksfoot" between the fore legs for the forward assist procedure.

cases, these losses were caused by the use of procedures and equipment inappropriate to the rescue. Injuries in these incidents were caused by untrained volunteers as well as veterinary-related personnel. The television networks are highlighting the rescue efforts—but failing to show the long-term deleterious effects on the health of the animal victim. The duplication of these mistakes is frequent and is based on what was shown on the media and not on appropriate large animal rescue standard methods.

It is important for the equine practitioner to be aware of the various techniques used in rescuing horses from both manmade and/or natural disasters as part of the definition of a successful rescue.

1. To ensure a safe rescue environment for both rescuers and victim (horse)
2. To avoid iatrogenic injuries during the rescue that may cause permanent dysfunction or a prolonged recovery
3. To be able to work as a team member in a rescue operation with other emergency responders on scene

The increase in the urban population that own horses, the number of transported trailers with horses, and the number of horses used for entertainment has resulted in an increased occurrence of incidents necessitating rescue of horses. Thus, it is important for veterinary practitioners to be aware of the correct procedures, causing minimal injury during the extrication and removal of large animals (including horses). It is not uncommon for horses to be involved in overturned or separated trailer accidents, trapped in mud, trenches, pools, or septic tanks; loose on surface roads; trapped in barn fires; and hung in fencing or equipment. These occur as a result of manmade emergencies and natural disasters. There is currently no regional or national database available to track the number or frequency of these incidents.

Aspects of equine emergency rescue that will be emphasized in this paper is to avoid (whenever possible) using the legs and head/neck as handles and to increase the surface area of the contact area on the horse used for the rescue. Most emergency rescues involving equines in the past have approached the removal of this large animal with methods one would use on equipment or recovery of carcasses, which are inappropriate to a successful rescue (i.e., lassos around the neck and/or legs). Attending veterinarians should be aware that they are on the scene as part of a team—first to assess and possibly stabilize the medical condition of the horse and second to assist as a team member in the selection of the most appropriate rescue procedure. In many cases, the veterinarian may be neither in charge of the rescue operation nor the operational rescuer.

This article describes six basic procedures used in equine emergency rescue, including temporary containment, forward assist, backward drag, lift from dorsal recumbency, simple short-term lift of the standing horse, and transport of recumbent horses.

2. Equipment and Procedures

For all of the techniques below, we will assume that the rescuer can place a halter or emergency rope halter on the animal, not to use it as an anchor to move the animal, but for guidance and restraint. It is recommended that any equipment used for res-

Fig. 2. Use of a web sling for backward drag. This technique is useful when rescuing a horse from a confined space such as an overturned trailer. This technique exerts no pressure on the posterior abdomen, and the hind legs are not tied.

Fig. 3. A simple and efficient system for short-term lifting. Sections of firehose with loops stitched on each end can be used in place of certified webbing.

cues be certified for the weight and forces being placed on the equipment (i.e., rescue-grade rope, rescue-rated web, etc.) Depending on the circumstances, use of a sedative may or may not be indicated. Use of sedation as a chemical restraint of animals in rescue situations is beyond the scope of this article and has been detailed elsewhere.[6]

Although beyond the scope of this article, a basic understanding of the Incident Command System (ICS), community disaster response guidelines, low-angle rappelling techniques, flood and swift water rescue techniques, and the use of rescue ropes, anchors, and accessories is essential to increase safety, risk assessment, and a successful rescue of large animals. Numerous short courses, workshops, and publications are available on these topics. A partial list of resources is included in the references.[7–9]

3. Temporary Containment of Loose Animal(s)

Polygrid[a] (temporary and movable) fencing is lightweight plastic fencing with polyvinyl chloride (PCV) support approximately every 10–12 ft along the length and is an invaluable aid in containment of most domestic animals and horses. It is cheaper, more flexible, and lighter than corral panels. Rolled, it takes up minimal room in a vehicle, and it can be used to guide animals off surface roads, funnel them into a trailer for transport, and hold them until more personnel can arrive. Movement of the fencing takes minimal training, and bystanders may be used in the implementation of the fence. Animals may or may not be haltered for individual restraint. Some European Fire Departments also include one or two hay bales as part of their rescue equipment to help contain and "tranquilize" livestock loose on roads.[10]

4. Entrapment Rescue Techniques

Forward Assist

The forward assist procedure is used to *assist* an animal that is ambulatory and capable of using its head and neck for balance, but unable to negotiate an incline or obstacle without assistance (Fig. 1).[11] Such can be the case in a ravine, down an embankment, in flowing water, or in situations with entrapped or sternally recumbent animals, where the rescuer only has access to the anterior end of the animal.

A 25-ft-long, 4-in.-wide nylon web[b] with sewn loops on each end is placed around the girth area and larksfooted (push one loop through the other). The free end of the web is pulled between the front legs and attached to 50 ft of rescue rope with a carabiner. This allows the assisting team to stay as far to the front of the animal as possible to prevent being charged by the horse. A 50-ft line is attached to the halter—but is to be used by the animal handler for guidance only, not to pull on the animal.

Backward Drag

The backward drag technique is used to remove a laterally recumbent animal that is not ambulatory or is incapable of using its head/neck for balance (Fig. 2).[11] This might be inside an overturned trailer, culvert, under a collapsed structure, or situations where the rescuer only has access to the posterior end of the horse.

A 25-ft-long, 4-in.-web with sewn loops on each end is placed around the pelvic bones, pulled between the rear legs, and attached to 50 ft of rescue rope with a carabiner. This transfers the contact area of the pull to the pelvic area instead of the hind limbs. Alternatively, a sheet-bend knot can be tied

Fig. 4. The rescue glide provides an efficient means for moving a recumbent horse during a rescue operation or for transport in a horse ambulance.

Fig. 5. Placement of 4-in.-wide straps over the horse's chest and posterior abdomen. Tightening the straps until they start to pull on the plastic will still allow the horse to breathe adequately.

on the tail hairs behind the last coccygeal vertebra to pull the animal.

Hobbled Lift

The hobbled lift is used to lift a horse in dorsal recumbency. This might be in a narrow trench or in a collapsed structure. Vertical lift using four limbs or pull-over using two limbs are options, depending on location, health status, and personnel available.

Rescue-grade hobbles, triple or quadruple Prussik hitch, or rescue web larksfoot are placed around the pastern at P1 between the fetlock and the hoof. Felt, cloth, or other materials to reduce trauma at the contact site must be carefully employed to ensure the hobble does not slip. The time that the hobbles are tightened around the extremities should be minimal to reduce pressure on soft tissues and minimize long-term damage.

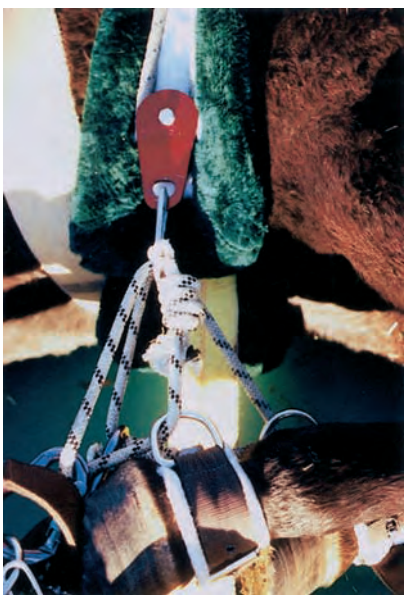

Fig. 6. Placement of hobbles for transport of a recumbent horse. Note the use of fleece pads to protect the skin.

For vertical lift, all four hobbled limbs can be attached to a metal frame[c] or other suitable collection method (i.e., steel hook), which has already been attached to a rescue rope system, chain hoist, or crane. Support of the head and neck should be attempted by attachment of the halter to the frame through the lead rope or by physical support from humans.

For pull-over into a sternally recumbent or normal standing position, the front two hobbled limbs are attached to 50-ft rescue rope with carabiners, and moving anchors (rescue personnel) are used to pronate the animal over its hindquarters. A separate line is attached to the halter to provide guidance and control of the head and neck during this technique.

Simple Vertical Lift Web Sling

In the majority of cases where a horse needs to be lifted out of an entrapment, the simple vertical lift system provides an easy, inexpensive, and practical means of moving a horse for a short period of time onto safe ground (Fig. 3). In addition to the two pieces of web located posterior to the forelegs and anterior to the hind legs, an additional section of webbing must be secured across the horse's chest to prevent forward slippage. The components are as follows: two rescue rope Prussik loops between spread bar and lifting mechanism, one 36-in.-long spread bar (2-in.-square aluminum tubing) with four

Fig. 7. The sedated horse is ready for transport. The rescue glide has two "D" rings in the front part that facilitate forward pulling.

shackles, two large steel carabiners, two rescue rope Prussik loops to connect carabiners to web slings, two wide (4–8 in.) × 6-ft-long nylon slings, and one chest piece (such as a saddle girth).

If the horse's location is such that it is not possible to pass the webbing material, a semicircular section of 1-in. conduit (18-in. radius) with eyebolts attached on both ends can be used to guide the webbing material under the horse.

5. Transport of Recumbent Horses

The rescue glide,[d] modified from the Massachusetts Society for the Prevention of Cruelty to Animals (SPCA)[12] (Figs. 4 and 5), provides a practical means of moving a recumbent, injured horse from the site of an accident to a horse ambulance for transport to a veterinary facility. A horse must be fully sedated during transport in the rescue glide to prevent further injury (Fig 8).

1. Place head protection on horse's head.
2. Slip a section of nylon webbing under the horse behind the front legs. This will be used to help slide the horse onto the glide.
3. Slide the horse on the glide using the nylon web, the tail, and the head. Make sure the front legs are not obstructing an anchor opening on the glide.
4. One person must keep control of the horse's head all the time.
5. Place one of the ratchet straps behind the front legs and secure both ends of the strap to the glide (Fig. 6). Put tension on the strap until the glide starts to lift. Place the fleece pads so they protect the skin from the strap and ratchet.
6. Place the other ratchet strap in front of the hind legs in the same manner.
7. Attach the four hobbles to the pastern area on the legs.
8. Using the carabiner, connect the front and back hobbles from the same side to each other. If the horse has an injured leg, then only the non-injured legs are hobbled and the injured leg is left extended after placement of bandaging, splint, etc.
9. Tie one end of the rope to the same opening where the horse's dorsal side of the front ratchet is attached to the glide.
10. Connect the carabiner attached to the pulley to the Prussik loops on the hobbles (Fig. 7).

Fig. 8. Accessories for the rescue glide. (1) Three-inch ratchet straps with fleece pads. (2) Webbing with velcro for securing head to glide. (3) Rope, pulley, and carabiner for pulling hobbles. (4) Leg hobbles with Prussik loops and carabiners. (5) Fleece pad protection for rope. (6) Head protection. (7) Ten foot or longer nylon web (not shown).

11. Slide the free end of the rope through the same anchor opening where the other end is tied to the glide.
12. Place a fleece pad under the rope over the horse's chest.
13. Using the free end of the rope, flex all four legs as close as possible to the body.
14. Tie the free end of the rope to the glide.
15. Secure the head to the glide with the velcro strap, guiding it through the front slit opening.
16. The horse is ready to be moved.

6. Discussion

Much more common than natural disasters are everyday emergency incidents involving one or more horses. Trailer accidents on the highway, barn fires, and even a herd of horses that have escaped out of their pasture onto a country road: these are events for which the equine veterinarian will most likely be called to the scene. In addition to highway incidents, horses fall into trenches, ravines, collapsed septic tanks, and other confined spaces. The old adage "You can put a horse into a padded stall and he'll still find a way to get into trouble" rings true. Any equine veterinarian has a bank of stories about horses trapped in some predicament or another.

The ICS is a method used by emergency response personnel to identify leadership and resources in emergency situations. Paramedics and other Emergency Medical Services (EMS) responders receive training and follow strict standards of care in extrication and on-scene treatment of human accident victims. For example, a paramedic would never remove an injured victim from the scene by pulling them out by the arms or without stabilization of their spine with a backboard and neck brace. However, we commonly see horses dragged from confined spaces (such as trailer accidents) by their legs, head, or neck. Amazingly, these standards of care, which include safety and patient assessment protocols, are often disregarded or completely forsaken when the rescue involves animals. Critical analysis of videos shown by the media identifies serious breeches in safety and general common sense, not to mention apparent lack of horse-handling savvy by emergency response personnel.

Most veterinarians have little knowledge of ICS or experience working within the emergency management system. A veterinarian called to the scene of a highway accident involving fire/rescue, emergency medical, and law enforcement personnel often finds confusion in terms of who is in charge of the situation. In some cases, EMS personnel defer decisions to the veterinarian, who has no understanding of basic technical rescue or extrication techniques and thus is prone to make decisions that can place the animal victim, humans, and/or personal property in further danger. Other times, EMS personnel disregard medical concerns of the veterinarian on scene or forgo calling a veterinarian to the scene at all, purely out of ignorance of veterinary medicine. Working knowledge of the ICS and basic rescue technology will allow the equine practitioner to work as an effective part of the emergency response team in these emergencies. At the same time, education and training of law enforcement and emergency response personnel in basic horse behavior and handling will allow them to prevent further harm to the horse until a veterinarian arrives. Providing training to EMS personnel, introducing ICS and basic technical rescue training into veterinary school curriculum, and promoting the importance of continuing education to practicing veterinarians in this subject can help standardize incident management methods and improve on-scene and pre-hospital care of horses in the field.[13]

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13. Gimenez T. Large animal emergency rescue. Available online at http://www.clemson.edu/ep/lart. Accessed on July 30, 2002.

[a]Polygrid Ranch Fence, Cheraw, SC 29520.
[b]New Haven Equipment, San Leandro, CA 94577.
[c]CDA Products, Porter Valley, CA 95469.
[d]B & M Plastics, Greenville, SC 29607.