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## EMERGENCY MANAGEMENT OF ORTHOPAEDIC INJURIES

Genuine emergencies are genuinely stressful! No one can argue that point but clients rely on their veterinarian not only to deal with the situation but also help them make the best decision. The biggest mistake to be made by an attending veterinarian is acting without appropriate knowledge. A rush to euthanasia is certainly indicated in terribly catastrophic injuries but euthanasia is exceptionally difficult to reverse so it should not be done immediately if you are even slightly uncertain about the “fixable” nature of the injury. The reality is that many severe lacerations and orthopaedic injuries appear to be far worse than they are. In today’s information-rich world, it is both possible and undesirable to have an owner find out *after* a horse has been euthanized that there have been other horses with the same injury successfully treated. Be wary of offering a prognosis unless you really *do* know a lot about that specific injury. Have a good relationship (more importantly, their cell phone number....) with an expert (or experts) you trust to provide an accurate second opinion. With proper sedation and simple emergency bandaging, a large proportion of “catastrophes” can be humanely managed until a thoughtful decision has been made.

### *1-Errors with splinted coaptation:*

Perhaps the most critical determinant of the outcome for a horse with an extremely unstable injury of the distal limb (radius/tibia down to the hoof) is whether or not the skin remains intact and how much soft tissue and further bone injury occurs prior to surgical treatment. Proper splinting during transportation may well be a life-saving procedure. Having some appropriate materials immediately available can make all the difference. The most versatile and inexpensive material remains thick-walled PVC pipe (~6 inch diameter) cut into staves of appropriate curvature and length. The PVC can be readily cut to length with just about any type of saw in a field situation. It is strong, light and the curvature of variously cut 6” pipe staves will generally fit a reasonably padded bandage. Other materials (electrical conduit, rebar, strong enough/light enough wood, thermoplastics, molded fiberglass cast tape) can be used but for ease of use and price, the simple PVC staves are difficult to beat.

Good recommendations for the selection and application of splints have been published.<sup>(1,2)</sup> An excellent online graphical reference is: [https://www.acvs.org/sites/default/files/files/EQ\\_Frac\\_SplintingChart.pdf](https://www.acvs.org/sites/default/files/files/EQ_Frac_SplintingChart.pdf)

A more text-based online resource is:  
[http://www.merckvetmanual.com/mvm/emergency\\_medicine\\_and\\_critical\\_care/equine\\_emergency\\_medicine/equine\\_trauma\\_and\\_first\\_aid.html](http://www.merckvetmanual.com/mvm/emergency_medicine_and_critical_care/equine_emergency_medicine/equine_trauma_and_first_aid.html)

The most common errors with a splinted bandage are:

- Placing too heavy a bandage. This adds weight to the limb and makes it more awkward for the horse to move. Use just enough padding to allow a tightly wrapped bandage not to act as a tourniquet. The outdated concept that a Robert Jones Bandage needs to be 3-5X the diameter of the limb is not sound, especially when splints are used. The mechanical value of a splint is diminished the farther it is placed away from the limb. If you use splints, make the bandage light enough to get the splints closer to the skin. Interestingly, there is a recent publication using a bandaging model that supports the (somewhat obvious) mechanical concept that the splint should be close to the skin surface<sup>(3)</sup>.
- Using elastic tape for attaching splint will nearly always result in the splint shifting/slipping. Both elastic adhesive (e.g. Elastikon®) or self adhesive (Vetrap), bandage material is good for the bandage itself but splints should be securely attached with NON-elastic material such as duct tape or packing tape. If multiple staves are placed around the limb, metal hose clamps also can assist to help compress the splints against the padded bandage and hold them in alignment.
- Incorrect length of a splint may lead to more harm than good. If possible, it is still a good principle to stabilize a joint above and a joint below the injury. The most common error for cannon bone, carpal, tarsal, radial and tibial fractures is not to have the splint reach the ground. If it does not, motion and gravity will tend to shift it down.
- Splinting the incorrect side of the lower limb can be avoided if you remember to apply at least one of your splints to the *convex* or “open” side of the injury. I.e. if the horse’s fetlock is deviated laterally (valgus), place at least one splint on the medial

side and incorporate the foot. For severe carpal/tarsal, radial and tibial fractures always have the splint in contact with the shoulder/pelvis.

- An excessively heavy splint (e.g. a 2X4) will often make the limb more cumbersome and possibly serve to worsen the situation. Do your best to get appropriate material.
- In severe lower limb injuries (e.g. traumatic disruptions of the suspensory apparatus, comminuted phalangeal fractures), use the splint to hold the bones “stacked” vertically as well as possible. A Kimzey Lifesaver splint is easiest if you have it but a simple dorsal PVC splint over a light bandage with the heel taped up to it will work well. Pulling/holding the heel up with the metacarpus and phalanges aligned simulates the position of the Kimzey and is quick and practical.
- Another major error to avoid is failure to splint the carpus of a horse with a fractured ulna. Splinting for radial and tibial fractures will afford modest stability and only slightly relieve anxiety but a horse with a properly splinted ulnar fracture will immediately relax and be able to maneuver itself with some confidence.

### *2- Transportation errors:*

Clients often make serious errors when shipping an injured horse. The foremost error, *by far*, is made with the best of intentions. The owner/trainer/trucker insists that the injured horse be given “as much room as possible” in the trailer/van. The situation is not like airline seating; more room is not better. Make sure the horse is shipped in as tight a condition as it can be placed. Nearly every adult horse will be able to protect its injured limb optimally if it can lean its body/shoulder/pelvis against firm support.

The other major shipping error is often made with foal fractures. Foals get tired quickly when they are stressed and balancing on three limbs. Place an intravenous catheter. Take the time to get the foal in recumbency on the trailer and, if at all possible, keep an attendant armed with drugs with the foal to maintain it in recumbency during shipping. This is especially important in more proximal fractures that are difficult to stabilize with a splinted bandage, e.g. radius and tibia. Protect the eyes of any recumbent foal/horse during transport.

If possible, ship the horse with the injured limb closest to the rear of the trailer/van. Smooth acceleration (loading the south end of a horse headed north) is easy. Smooth braking is not always possible.

### *3- Errors in wound management:*

Wound management is usually very difficult in a seriously injured horse. If you have a truly severe fracture that will require emergency surgery it will be nearly impossible to do a meaningful debridement. Valuable time and resources will be spent attempting something that will need to be repeated. It is probably wiser in such instances to wrap the site up in an antiseptic soaked gauze and ship to a referral facility as quickly as possible. Broad spectrum antimicrobials should be administered intravenously if a wound of any kind is evident in a horse with a suspected fracture.

### **References**

1. Smith JJ. Emergency fracture stabilization. *Clinical Techniques Eq Practice*. 2006;5(2):154-60.
2. Mudge MC, Bramlage LR. Field fracture management. *Vet Clinics of NA, Eq Practice*. 2007;23(1):117-33.
3. Lutter JD, Cary JA, Stephens RR, Potts LB. Relative stiffness of 3 bandage/splint constructs for stabilization of equine midmetacarpal fractures. *J Vet Emerg Crit Care*. 2015;25(3):379-87.