

AAEVT's Equine Manual for Veterinary Technicians

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General Horse Management

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Facilities

Stable Management

The design of an equine facility should consider positioning of the stables to maximize the health of the horse and to provide easy access in case of an emergency. Stables should be designed to enhance ventilation to minimize respiratory disease. The average stall size is 12' × 12'. Foaling stalls and stallion stalls are even larger. The floor of all stalls should be designed to drain effectively. Each stall should be equipped with two water buckets and a feed bucket. The water buckets should be washed daily and refilled frequently. Some farms with a large numbers of horses will choose to use automatic watering systems in which the horse will drink out of a small bowl of water that will continuously refill. Although this system is convenient, it does not allow monitoring of the horse's water consumption. The use of hay racks is controversial because they create an abnormal eating posture for the horse, increasing the amount of dust it will inhale when chewing hay. However, if a horse has a painful neck and cannot bend to eat off the floor, a hay rack or hay net is a good option.

Grain should always be stored in a secured room to prevent any loose horses from eating large quantities of it because grain overload can result in severe endotoxemia and death. Grain transported in wheel barrows should be secured in a safe place for the same reason. The grain should be stored in airtight containers to minimize rodent contamina-

tion. In warm climates, the grain should be stored in air-conditioned spaces to prevent the formation of mold. Consumption of moldy corn can result in a severe neurologic condition called *leukoencephalomalacia*, which is often fatal.

Hay should be stored in a separate building rather than the stable. Studies have shown that stabling horses in close proximity to hay increases respiratory disease, and it is also a fire hazard. Hay should be stored in an area where it can be stacked off the floor on palettes, kept dry from blowing rain, and have minimal sun exposure. To eliminate the chance of spontaneous combustion, hay must be properly cured before placing it the barn. It is advisable to store tractors and other gasoline-powered equipment in a separate area to decrease the risk of fire.

Bedding should be stored in a separate facility to minimize dust and reduce the risk of fire. Common types of bedding are wood shavings, straw, and occasionally shredded paper. Wood shavings from Black Walnut trees should never be used because they can cause severe laminitis. Shredded paper has the least amount of dust and is preferred for horses with respiratory disease. Stalls are cleaned on a daily basis and the removal of all urine and feces are common practice. Accumulation of ammonia from poor sanitation is detrimental to the respiratory tract. Many stall products have been developed to absorb ammonia in excessively wet areas within the stall. Removal of manure waste should be considered in the design plans of any facility. The manure can be composted or taken off site to a disposal area. Good hygiene is essential to minimize

the spread of diseases, control flies, and prevent the spread of intestinal parasites.

Equine Hospitals

Equine hospitals should be designed with all the basic principles previously stated plus consideration for the type of patients that it will house. For example, when treating critical care neonates, it is helpful to have a divided stall in an environment that is climate controlled. This type of stall will allow the mare to stay with her sick foal but provide adequate space for nursing care. There should also be plenty of lighting and electrical outlets and a ready supply of oxygen. Stalls that have fully padded walls and a hoist are helpful when caring for recumbent horses. Most facilities will use a 2-ton hoist for lifting neurologic horses.

The stall floor and walls should be composed of a surface that can be appropriately disinfected between patients. Concrete walls and rubber floors are typically used in large animal hospital settings. Each stall should be fitted with a fluid hanger that can be used to hold at least 10 to 20 L of fluid at a time (Figure 1.1).

Each hospital should have an area that is appropriate for working up cases. Stocks are ideal for managing critical patients. The stocks keep the horse stationary while multiple staff members attend to the horse at the same time. Rectal examinations and diagnostic procedures are easy to accomplish in stocks. The floor should be non-slip and easy to disinfect. The workup area should be in a quiet area away from mainstream traffic yet convenient to supplies and diagnostic equipment (Figure 1.2).

Isolation Facilities

To minimize the risk of spreading contagious diseases, every hospital and farm should have an isolation area and a corresponding protocol (Figure 1.3). The common contagious diseases are listed in Table 1.1. Contagious diseases can be spread between horses through contact with feces, aerosolization, or indirect contact with fomites such as water buckets, manure forks, and contaminated tack or brushes. It is important to be able to distinguish between con-

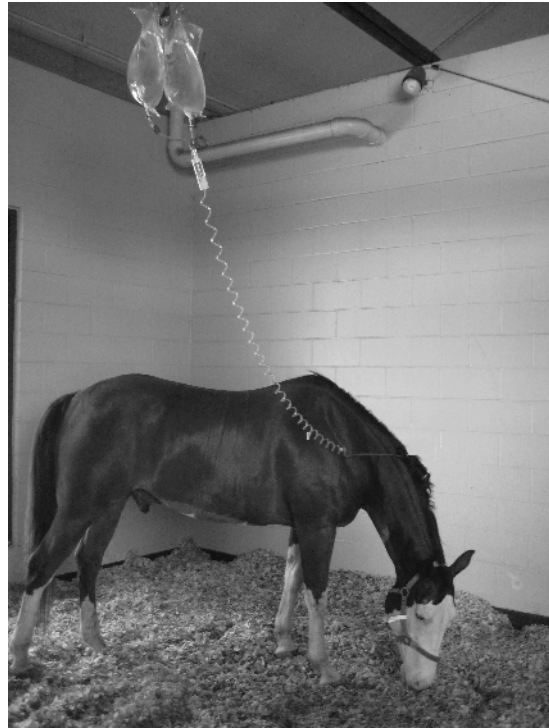


Figure 1.1. Fluid hangers that swivel and a rope to raise and lower them as needed should be placed in the center of the stall.
Courtesy Dr. Dana Zimmer.



Figure 1.2. Stocks should be placed on a nonslip floor that can be disinfected. Notice the sides of the stocks can be raised or lowered or completely removed as needed to perform procedures.
Courtesy Dr. Dana Zimmer.



Figure 1.3. Isolation facility with a perimeter fence.
Courtesy Dr. Dana Zimmel.

Table 1.1. Common contagious diseases.

Gastrointestinal	Salmonellosis
	Rotavirus
	Cryptosporidia
Respiratory	Strangles (<i>Streptococcus equi equi</i>)
	Equine influenza
	Equine herpesvirus (EHV-1 and EHV-4)
Neurologic	Equine viral arteritis
	Equine herpesvirus (EHV-1)
Reproduction/Abortion	Equine herpesvirus
	Equine viral arteritis
	Leptospirosis
	Contagious equine metritis (CEM)
Dermatologic	Dermatophytosis (ringworm)
	Dermatophilus
Blood	Equine infectious anemia (EIA)

tagious diseases and infectious diseases. A contagious disease is spread between horses, and an infectious disease is caused by a specific agent such as a bacteria, virus, or parasite.

In hospitalized settings, an isolation facility is required when dealing with horses that may have the neurologic form of equine herpesvirus (EHV) or *Salmonella*. These two contagious diseases can cause life-threatening illness and can be spread to other patients within the hospital.

Horses at risk of developing *Salmonella* infections are horses with colic, diarrhea, or who have

had exploratory abdominal surgery. The criteria for housing horses in the isolation unit may vary between hospitals but usually includes the combination of fever, diarrhea, and a low white blood cell count. Fecal cultures for *Salmonella* are used to confirm a positive case. Because the organism is intermittently shed, five fecal samples collected 12 to 24 hours apart are required to rule out the disease.

The protocol for isolating horses that may have contracted the neurologic form of EHV is more challenging. This form of herpes can be spread through nasal secretions. If horses are coming from a location where a horse has tested positive for EHV, the horse in question should be isolated until testing is complete. Nasal swabs and blood samples are used to test for the presence of the virus. Likewise, if any horse has developed sudden onset of fever and neurologic signs, it is best to place the horse in isolation if its clinical signs are consistent with EHV. Common neurologic signs for EHV include ataxia, poor tail tone, poor anal tone, and urinary incontinence.

Isolation stalls should be self-contained with water and electricity and connected to an anteroom that serves as a boundary area for supplies and equipment. The stalls should be composed of a non-porous surface that is easy to clean. Typical isolation protocol requires the use of plastic booties, barrier clothing, and gloves (Figure 1.4). All materials are discarded after each use. Foot baths should be strategically placed to dip feet at least twice between the contaminated area and the clean area. Special red garbage bags are used to signify contagious waste. Manure and stall waste should be disposed according to state regulations. Each stall should have its own veterinary equipment, brushes, buckets, and stall cleaning equipment.

The stall and all of the equipment is disinfected between patients. All organic debris must be removed first, and then the surface may be scrubbed with the appropriate disinfectant. Chlorine compounds (bleach) can be used by adding three-quarters cup of bleach to 1 gallon of water. Bleach is inactivated in the presence of organic debris, so it is imperative that all the surfaces be cleaned first. Phenolic compounds are used in a hospital setting



Figure 1.4. Horses in isolation should be handled with gloves, barrier clothing, and plastic foot covers.
Courtesy Dr. Dana Zimmel.

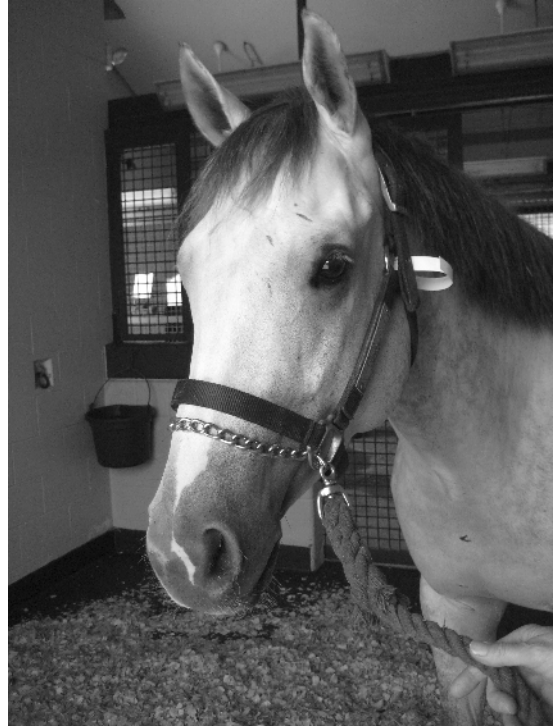


Figure 1.5. Figure A lead shank with a nose chain is used to control excitable horses.
Courtesy Dr. Dana Zimmel.

because they are effective against both rotavirus and Salmonella organisms. Iodophors and alcohol are commonly used for handwashing.

Restraint of Horses

Horses are trained to be handled from the left side. A halter and lead rope should always be used when working with a horse. The lead rope should never be wrapped around the hand or arm of the handler. Some horses may resist to being tied and will panic. For this reason, horses should not be tied unless the handler is sure the horse has received appropriate training. A horse should always be tied with a cotton lead rope with no chain attached and a quick release knot in case the horse needs to be released suddenly. For veterinary procedures, it is best to hold the horse rather than tie them to a wall or post.

The most common methods of restraint include a lead shank with a nose chain, lip chain, and nose

twitch. The lead shank with a nose chain is an appropriate method to lead horses that are fractious (Figure 1.5). A lip chain is a method of significant restraint and is commonly used to control young racehorse or stallions. The chain portion of the lead shank is placed under the upper lip of the horse. Constant steady pressure is applied, and the handler should never jerk the rope suddenly (Figure 1.6).

A nose twitch is a good method of restraint for veterinary procedures because it will immobilize the horse. There are three types of twitches: one made of metal called a humane twitch and two with a wooden handle that has either a chain or rope loop at the end. The humane twitch is useful for weanlings because it is small and the pressure is fairly mild. The wooden handle of a rope or chain twitch is approximately 45 to 50 cm long. The small rope loop is placed around the upper lip, and the handle is twisted until the rope is tight (Figure 1.7). The handler should hold the twitch firmly and use



Figure 1.6. A lead shank with chain applied under the upper lip is a method of restraint used commonly in the breeding shed or to perform veterinary procedures on excitable horses.

Courtesy Dr. Dana Zimmer.



Figure 1.7. The rope twitch is common method of restraint for passing a nasogastric tube or doing a rectal examination.

Courtesy Dr. Dana Zimmer.

the lead rope to stabilize the head. The handler should be positioned on the side of the horse by the shoulder and should never stand in front of the horse. A nose twitch is used commonly to restrain the horse to pass a nasogastric tube, perform a rectal examination, or suture a wound. A twitch may be applied for short procedures and is often combined with chemical restraint. A skin twitch is another method of restraint that requires the handler

Table 1.2. Benefits of a national equine identification plan.

- The plan may reduce the potential effects and enhance control of equine disease outbreaks by identifying the contagious animals and isolating them quickly.
- Maintain freedom of transport in cases of disease outbreaks, such as vesicular stomatitis, equine herpesvirus, or strangles.
- Assist horse shows, rodeos, and races in securing a healthy environment for participating athletes.
- Aid in recovery of horses when lost as a result of natural disasters, theft, or accidents. The identification system may be able to link the horse to a premise.
- Improve import and export of horses into the United States each year by providing a standard method of identification.
- Uphold the equine industry as a responsible member of the livestock community and counter bioterrorism.

to grab a fold of skin along the neck and roll it until snug. This technique is appropriate to keep a horse still when administering an injection.

Methods of Identification

There are a variety of methods used to identify horses. In the United States, all horses must have a negative Coggins test, which tests for equine infectious anemia (EIA). The Coggins test form includes a hand-drawn picture depicting the white marks on the head, legs, and body. This form is often used as a legal document of identification for the owner. In some states the Coggins test results are printed on a laminated card with the horse's photo in color similar to a driver's license photo.

In the Thoroughbred industry, horses are identified by a tattoo placed on their upper lip. Freeze brands are common under the mane or hindquarters. The brand may be the registration number or signify the horse's breed.

The implantation of a microchip is easy and practical method for identification. A small chip encapsulated in biocompatible glass vial (about the size of a grain of rice) is inserted into the ligament of the neck 1 inch below the crest on the left side. A 12-gauge needle is used to implant the device. The device is inexpensive ranging from \$25 to \$100 to implant. The American Horse Council has identified several potential benefits of using microchips as part of a national identification plan (Table 1.2).

Hoof Care

Daily foot care is important in maintaining a healthy hoof. The feet should be cleaned each day with a hoof pick and stiff brush. The foot should be inspected for the presence of gravel along the hoof wall if the horse is barefoot. Mud and debris should be removed to keep the foot dry. If the horse is shod, the shoe should be inspected for fit and tightness. If the shoe becomes loose, the horse may lose it during exercise and damage the hoof wall. As the hoof grows, the shoe may shift and fail to provide the proper support resulting in lameness.

The hoof will grow 0.6 inches per month in a foal, 0.5 inches per month in a yearling, and 0.25 to 0.35 inches per month in an adult. The toe grows faster than heel. The feet should be trimmed every 6 to 9 weeks. If the horse is shod, the shoes will need to be reset every 6 weeks.

Shoes are used for a variety of reasons such as to protect the feet when the horse is worked on hard surfaces or to correct defects in hoof structure and growth. Shoes can assist in correcting the gait and can aid in gripping slick ground.

To remove a shoe, the clenches must be raised and each nail individually removed with a nail puller. This is an important skill for the veterinary technician to be comfortable performing. Removing shoes are necessary to evaluate the hoof, take radiographs of the feet, or to place a horse in the magnetic resonance imaging (MRI) unit (Table 1.3).

The hooves should be monitored for excessive moisture or extreme dryness. Excessive moisture from standing in mud or wet bedding can result in thrush. The loss of moisture, standing in urine and feces, and some astringent hoof dressings damage the protective layer of the hoof and may reduce the

Table 1.3. Farrier tools.

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- Hoof testers
 - Nail pullers
 - Hoof knife (right or left handed)
 - Shoe pullers
 - Rasp
 - Nippers
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quality of the horn, thereby predisposing it to cracks.

Transportation of Horses

Health Concerns for Long Distance Travel

Many horses travel long distances via road, train, or air without complications. In human athletes, traveling can directly impact performance. Horses that travel long distances may encounter impaired respiratory health, fatigue, and stress resulting in decreased performance. A small percentage of horses will become severely ill developing shipping fever and subsequent pneumonia.

Studies have confirmed that mucociliary clearance is decreased when horses maintain an elevated head and neck position for as little as 6 hours. This is a common position for horses cross-tied during transport. The decrease in mucociliary clearance results in increased mucus, bacteria, and neutrophils in the trachea, predisposing the horse to pneumonia. Shipping horses in a box stall, which allows them to put their head and neck down, is a better option to reduce respiratory stress. After arrival at the final destination, the horse should have its temperature monitored every 12 hours for the next 2 days to detect early signs of respiratory infection.

Another problem that occurs when shipping horses long distances is mild colic. Horses are reluctant to drink on the road and become dehydrated. It is best to stop and offer water every few hours to encourage drinking. Minimizing clothing on the horse during travel is better than allowing them to overheat with a blanket. This can help to reduce their chances of becoming dehydrated (Table 1.4).

Table 1.4. Guidelines for long distance transport of horses.

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- Take the temperature before and after transport to detect pyrexia.
 - Offer water during the entire trip.
 - Minimize clothing on the horse during travel.
 - Plan for a recovery period after long transport. At least one overnight rest per 8 hours of road travel or one day of rest for every 2 hours of flying.
-

Shipping Sick or Injured Horses

- Horses that have severe colic should not be tied in the trailer during transport. If possible, they should be shipped in a box stall to have room to move around as needed.
- Sick neonatal foals should be separated from the mare with a divider if possible. If they are hypothermic, they should be placed in the cab of the vehicle or be covered in warm blankets.
- Neurologic horses do better if they are shipped in a confined space that supports them on all sides. However, if they are weak, they may not be able to remain upright during travel. It is important that they are shipped in a van that has removable paneling in case they fall during transportation. A ramp will help load and unload weak and ataxic horses. One person should be on the head and one person should take the tail to help stabilize the horse during loading.
- Horses with a distal limb fracture should be shipped similarly to neurologic horses. A snug fit may help them balance during the ride. The trailer should be equipped with removable panels that allow the horse to turn around in the trailer to exit.

Loading Ramps

If horses have not been well trained, loading them can be easy or challenging. Horses that are neurologic or have head injuries can be dangerous to load. Experienced horsemen should be in charge of this when possible. Often the veterinarian will be asked to sedate the horse to decrease the risk of the horse hurting itself.

Commercial vans will require the use of a loading ramp (Figure 1.8). Construction of a loading shoot should be considered for all hospitals to facilitate the safe loading of horses (Figure 1.9). The shoot keeps the horse from running backward and does not allow space for the horse to escape along the side of the trailer. The only option for the horse is to move forward onto the trailer. To minimize slipping and injury, it is best to load and unload horses in a dirt area, not a concrete area. The area where



Figure 1.8. A loading ramp should have tall sides and good footing. Courtesy Dr. Dana Zimmel.



Figure 1.9. A loading shoot will help load difficult horses. Courtesy Dr. Dana Zimmel.

the horse is to be loaded should be completely fenced so if the horse becomes loose it does not get out on the road.

References and Further Reading

- McCurnin, D., and J. Bassert. 2006. *Clinical Textbook for Veterinary Technicians*. 6th ed. St. Louis: Elsevier.
- Marlin, D. J. 2004. Transport of horses. In *Equine Sports Medicine and Surgery*, ed. K. Hinchcliff, A. Kaneps, and R. Goer. St. Louis: Elsevier.

