

# How to Rehabilitate Horses with Injection Shyness (Or Any Procedure Non-Compliance)

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## Introduction

In our referral equine behavior practice we frequently become involved in the rehabilitation of horses that are perceived by their owners and veterinarians as intractably non-compliant with one or more veterinary procedures—such as injections, nasogastric tubing, genital examination, washing of the penis for breeding, or other manipulation about the head, legs, genitals, or hind quarters. We have found that a combination of straightforward behavior modification techniques adapted to the horse, including classical conditioning, operant conditioning, systematic desensitization, and counter conditioning, are highly effective in regaining and maintaining compliance, even in once dangerously resistant animals. The methods we use rely mostly on positive reinforcement. Excessive restraint and punishment are specifically avoided. Occasionally, counter-conditioning is required to eliminate a specific undesirable avoidance behavior. After initial training, and with consistent handling and intermittent reinforcement, clients and referring veterinarians typically describe the patients as now “enjoying” veterinary visits and appearing to solicit procedures. These results are consistent with our

experience with training research horses and ponies to comply with veterinary procedures.

Our experience suggests that behavior modification directly with patients and through education of clients is a professional service that is highly valued by many equine clients. In particular, aversions to veterinary procedures is among the most frequent and impassioned issues expressed in our recent telephone and email horse behavior inquiries. Owners commonly suggest that behavior modification services for fee and/or client education should be offered by or through veterinary practices. A related common suggestion both from clients and from referring veterinarians is that veterinary school and continuing education should include more behavior modification principles and skills, specifically concerning behavioral aversion to veterinary procedures. Sadly, many clients see problems such as head-shyness and injection-shyness as created or exacerbated by some veterinarians.

This paper will describe the behavior modification procedures that we use specifically for rehabilitating veterinary procedure-shy horses, with injection shyness as an example. My goal is to describe these procedures in sufficient detail that you may consider expanding the formal behavior modification services for fee in your practice.

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## NOTES

## Methods and Materials

### Equipment

Usual equipment that we use includes:

- One lead shank with a 28–40' chain lead
- Sweet feed or other highly palatable food treat
- Comfortable safety vest, helmet, and shoes as preferred to afford greater confidence
- Items for the veterinary procedure (needle and syringe in wrappers or as typically presented to your patients, alcohol wipe or spray if used).

### Work Area

We find that the best work area is a large enclosure with good footing and headroom, as opposed to any type of confining stall or stocks. Based on the horse's behavioral history, we like to contemplate all possible outcomes, and to select and clear the workspace to avoid any negative consequences of resistance to the procedure, such as crashing into objects, slipping or falling, etc. We also prefer to work in a quiet area away from animal movement, telephones, and other distractions. A large outdoor grass paddock in good weather is ideal in most cases.

### Personnel

For most horses and procedures, a team of two persons who work and communicate well together is sufficient. One is the principal procedure technician and the other assists with equipment and handling as needed. For injection shyness and other procedures near the head, sometimes it is more efficient for one handler to both hold the horse and perform the procedure. In such cases, the assistant can help with positive reinforcement. For injection shyness in particular, I like to work alone, with an assistant on site for emergency help. It is important for the hands-on team as well as observers to be able to remain patient, calm, relaxed, and methodical. For example, if someone fears injections themselves, they may not be able to avoid conveying fear to the animal.

### Procedures

We encourage the view that behavior modification is just another opportunity for the horse to learn that it can work for a positive outcome. The *work* in this case is tolerance of a mildly aversive experience. This view puts the focus on establishing a new positive behavior pattern for the horse (and sometimes for the people) as opposed to eliminating undesirable behavior. With the understanding that animals are born naïve to veterinary procedures, the horse's current non-compliant behavior is likely the result of a keen ability at associative learning. That same ability will enable the horse to now learn positive associations that form the basis of compliance instead of resistance. I firmly believe that the smarter the horse is in classical and oper-

ant learning paradigms, the more likely it is to develop problems in the first place.

We customize and implement a plan for each horse and facility within the framework of systematically providing the animal the opportunity to simultaneously learn three related simple "concepts": (1) the procedure is not too painful; (2) the procedure is followed by a reward; and (3) ordinary resistance or reaction will not stop the procedure nor direct the technician's behavior.

**For the horse to learn that the procedure really doesn't hurt**, it must experience one or more replicates of the procedure with minimal pain, stress, or commotion. Of course, it helps to ensure that the procedure is in fact as painless as possible, at least at first. For injection shyness, this means a small gauge needle (26 gauge for training, and as small as possible for continued treatments), an expeditious gentle single stick, relaxed body posture and a calm and quiet manner of technician and handler, minimal restraint, and avoidance of any commotion or accidents associated with the procedure. A large part of conveying this concept involves allowing some "wiggle room," at least initially. Working in an open area allows the horse to move somewhat without crashing into objects, getting cornered, or otherwise creating a wreck. Aggressive restraint and accidents and other commotion in essence confirm to a horse that these procedures are actually negative.

**For the horse to learn that the procedure leads to a reward**, it needs to experience one or more replicates of the procedure (or successive tolerable approximations or sequential elements of the procedure) followed immediately with positive reinforcement. Unlike the naïve horse, the non-compliant horse has likely learned by negative experiences that the procedure is negative. So a greater number of rewarded replicates may be necessary for the elements and the sequence to lose their negative value and take on appreciable positive value to the horse.

We begin with an assessment of exactly how the horse responds to the procedure. We want to determine at what point in the preparation and the procedure the horse begins to resist, and exactly how the horse resists. Based on when the horse appears to begin to anticipate the impending aversive procedure, you can back up to perform and reward for steps preliminary to the point of anticipation. You may need to go through the preliminary steps of a procedure several times reinforcing each element individually without actually performing the potentially aversive aspect. We think of this as reversing the valence of each element from negative to positive. Then the positive elements can be gradually linked into the orderly sequence, finally adding the actual aversive portion (actual needle stick) of the procedure. Each increment of progress in the sequence is rewarded.

Thus, for the example of a jugular stick, if the horse turns out to begin to react negatively just as you remove the needle cap, you can initially begin the training by repeating and reinforcing each of the earlier preliminary elements—approaching the horse, taking the syringe out of your pocket, taking the syringe out of the wrapper, applying the alcohol (if you do that), holding off the jugular, tapping the vein, or whatever else you do specifically. Once each of these preliminary elements are well tolerated and appear to be a conditioned stimulus for a reward, then proceed on to the uncapping of the needle and the remaining elements. In this process, we use behavioral criteria for moving on to the next element. Specifically, we observe for signs of anticipation of the reward as an indicator that the horse now perceives a particular element as positive. For even the most procedure-shy cases, it typically takes less than 10 replicates of an element to reach this behavioral criterion. For some technicians, it is fun to watch and compare horses on the number of replicates “to reach behavioral criterion,” while for others it seems simpler to just work in replicates of 10 rewards for each element. Either approach works well. Once all the preliminary elements appear to be perceived as positive, start building and rewarding the orderly sequence of the procedure. Finally, add the actual needle stick, or an approximation of it followed immediately by reward. Sometimes it is useful to simultaneously offer the reward and stick. The movement of the head into a deep grain bucket can simultaneously serve to partially distract the horse from the actual aversive stick.

The reward we almost always find most useful is a highly palatable food treat such as sweet feed (primary reinforcer) and/or a verbal phrase (secondary reinforcer) that becomes positive by association with the primary reinforcer. Initially use sweet feed paired with the phrase “Good Boy/Girl” spoken in consistent intonation and rhythm. If people have difficulty maintaining a standard secondary verbal reinforcer, a clicker or other auditory tone can be substituted. These usually require the use of a hand to deliver, so are not as handy as a spoken phrase. Once people appreciate the power of the consistent verbal phrase they usually can concentrate to maintain consistent spoken delivery, even in near-crisis situations. We routinely use a few grains of sweet feed in a deep bucket, as opposed to feeding a treat from the hand. Feeding the reward from one specific bucket limits the development of “mouthiness.” A few grains in the bottom of the bucket take advantage of the learning principle that small rewards that require some effort appear to be more effective than readily available generous amounts. Also, if the horse takes large mouthfuls for each increment in progress, satiation will effectively diminish the reward value. We also sometimes find it useful to withhold one or more grain feedings before training to increase the value of the

food reinforcer. Initially, give the reinforcement on a continuous schedule (every successful increment in compliance).

Throughout the process, the goal is a general trend of progress, rather than instantaneous compliance with the entire procedure. Individual session goals can be custom-defined to fit the horse, technician, and situation. It is also helpful for the technician to appreciate that eventually successful horses sometimes have decrements in compliance along the way. We recommend that decrements be calmly ignored (not punished and not rewarded). It is useful to try to end a session with improvement, or at least a positive response. Strong voice tones, rigid body postures, over-restraint, or explosive wrecks can represent inadvertent punishment sending the message that this really is a nasty procedure and with which the person doing it is to be avoided and feared. If this should happen, simply return to a task with which you are sure that the horse will successfully comply before ending a session. Then make plans to move forward from there in future sessions.

**For the horse to learn that ordinary resistance does not interrupt the procedure,** we recommend anticipating the resistance and organizing the situation so that you can calmly stay with the horse as much as is safely possible. These sessions often begin with the horse exhibiting mild resistance—moving away, lifting the head, threatening to kick or bite. Calmly “riding it out” rather than pausing will allow the horse to learn that simple movement or mild resistance is not effective in stopping the procedure. Another common inadvertent mistake is to react (scold, hit, or simply flinch or jump back) each time the horse flinches or moves. Some horses appear to read your reaction as confirmation that this is indeed scary. Also in this situation, some horses tend to quickly learn a game of directing your behavior. They flinch—you jump—they flinch—you jump. This has two inherent rewards for the horse. The horse effectively avoids what it perceives as a threatening procedure, and it plays the apparently amusing game of “Make person jump!” Again, a large open space with good footing without hazardous obstacles better facilitates calmly committing to “riding out” the procedure. For some procedures it is easier for a single handler/technician than for a team to effectively stay with a moving horse. Also, safety gear can increase the confidence of the personnel to stay with the horse.

Eventually the horse should be weaned off continuous primary reinforcement. Intermittent primary and continuous secondary reinforcement for completion of major increments or the entire procedure is the eventual goal. Say “Good Boy” for increments of compliance, but give a grain treat as needed to maintain its positive value.

#### Dangerous Resistance

In extreme cases, the horse has learned to avoid the procedure by aggressively resisting. For example,

in the cases of severe injection-shyness the horse may throw its head, rear, and/or lunge toward the handler each time the veterinarian approaches. In such cases we begin with specific operant and counter-conditioning procedures aimed at teaching the horse to stand on the ground for a food reward in the presence of the veterinarian and the preliminary steps of the procedure. We do this by either waiting for the horse to stand still and lower its head in submission and then offering the reward, or alternatively by applying gentle pressure of a relaxed hand on the bridge of the nose until the horse lowers its head and relaxes. This is repeated, rewarding each lowering of the head until the horse responds immediately, showing signs of learning the association of his behavior and the reward. Again, about 10 replicates of this procedure alone, followed by 10 replicates of one or more elements of the veterinary procedure which tended to provoke the resistance, is typically adequate. In some cases, we have found it necessary to counter-condition the horse to take three steps backward and then lower the head as a substitute for rearing or lunging behavior.

### Results and Discussion

Using the methods described, we have had excellent success regaining and maintaining compliance with quite a variety of mildly aversive veterinary procedures. These methods have been remarkably successful with horses of all ages and sizes, now including hundreds of client-owned and research horses. Results have been positive regardless of past experience of the horse or degree of "intractability" at the time of referral. We have also had reasonable success teaching people of all levels of horse experience to do these procedures. Timing of reinforcement and consistent response-contingent reinforcement are the major skills for people to master to become most efficient at these procedures. In addition to their usefulness in rehabilitating specific problem cases, these techniques are useful with all equine patients to avoid the development of problems. The same techniques are useful in general management of horses, to gain compliance with ear clipping, fly spraying, or mane and tail grooming. The same procedures also work with all species. An investment in acquiring the basic behavior modification skills is usually judged well worthwhile.

These methods take advantage of the horse's strong capacity for positive reinforcement-based associative learning, and its apparently strong willingness to "work" for primary and secondary reinforcement. Species comparisons indicate that horses learn these associations much faster than dogs, for example. The actual hands-on time for rehabilitation is typically very low (minutes for mild aversions to a few hours total time for severe cases). Ongoing intermittent reinforcement to maintain compliance requires little additional time.

Effort is obviously much less than that required to continually "deal with" a non-compliant horse.

An interesting aspect of this type of behavior modification is that once the animal learns that the aversive aspect of the procedure is followed by reward, it typically appears to willingly tolerate, and sometimes solicit, mildly aversive procedures. For example, it is at this point that horses often run up to the veterinarian apparently soliciting veterinary procedures. At this point, most horses show behavioral signs of appreciating where you are in the procedure, as indicated by body postures, sighs, and salivation in anticipation of the reward as the procedure nears the end.

A common question concerns possible usefulness of sedatives or tranquilizers as an adjunct to rehabilitation, particularly for dangerously procedure-shy individuals. Most horses learn best when fully awake and alert. So sedation at a level that effectively quiets such a horse usually severely delays learning. The common anxiolytic drugs, such as diazepam, release aggressive behavior in horses. This is typically counterproductive in violently procedure-resistant horses. If used in the case of injection-shy horses, oral medications as an aid in rehabilitation are the more practical than injectable.

A common mistake is to fail to maintain simple compliance-contingent reinforcement. In other words, there is a tendency to drift toward using too much or non-contingent positive reinforcement (too many meaningless treats and "Good Boy"s). The drift typically begins soon after one recognizes the remarkable power of positive reinforcement. For the animal to learn, it has to "understand" the contingencies. Extraneous reward can be confusing. Similarly, most horses progress more rapidly when verbal conversation is limited to just the one standard secondary reinforcement phrase ("Good Boy"). When there is too frequent or too complicated or too varied conversation with the horse, speech becomes meaningless or confusing. Also, when a once non-compliant horse shows a remarkable increment of improvement, it seems natural for the people to burst out into exuberant verbal and tactile praise. In some situations, this appears to complicate the learning environment and slow progress. A methodical, calm, simple manner seems to enhance progress.

Another common mistake probably stems from some of the other ways of "dealing with" procedure-shy horses. Some people tend to vary, abbreviate, or skip the preliminary steps, as if to fool or sneak up on the horse. For example, they may even cover an eye on the side of the injection. This is completely counterproductive for this type of training. The goal is to teach the horse that this procedure and all that leads up to it is positive. So you should specifically try to do as many preliminary steps as methodically and conspicuously as possible, at least initially. Eventually most horses will reach a point of generalized compliance and trust with any procedure in any order. But initially, con-

spicuous consistency will speed progress on any particular procedure.

Positive reinforcement-based behavior modification is also extremely efficient for gaining compliance of horses that are naïve to veterinary procedures. In an ongoing study, we have been recording the time and specific effort required to acclimate naïve and previously unhandled semi-feral ponies to a battery of handling and research veterinary procedures using similar methods. The specific veterinary procedures include jugular stick, intramuscular and subcutaneous injection, measurement of testicles, placement of rectal thermometers, and manipulation of mouth, eyes, ears, belly, perineum, feet, and legs. The requirement is to achieve compliance to a level that any of these procedures can be done efficiently at pasture by a single handler/technician using a simple lead rope as needed (no halters). Our training technician is a high school student with some previous equine handling experience and two hours of professional orientation to behavior modification with semi-feral equids. Most of the work was done in open pastures. On some occasions, smaller holding pens were used to isolate family groups from other dominant social groups vying for access to the food rewards. In the first year of this study, the average training time to achieve full compliance (30 animals) has ranged from between one and two hr per animal (in 15- to 30-min sessions over a period of one month). So far we have seen no difference due to age at which training was initiated (one month to 4 years) or due to gender (stallions or mares). Compliance has been maintained uneventfully with intermittent primary reinforcement (1:10 variable ra-

tio) and continuous secondary reinforcement (“Good Pony”). We have seen examples of the recognized phenomenon in maintaining compliance with mildly aversive procedures. The more often the aversive procedure and reward is performed the easier it is to maintain and strengthen compliance. This often seems counterintuitive, but it follows the laws of learning for animals. The more opportunity to learn, the greater the learning. The more frequently a pony is bled and rewarded, the more eagerly it volunteers.

Most clients are eager to participate and incorporate similar methods in their routine management. Outlining and charting goals, action plans, and expected and achieved increments of progress help to maintain the human behavior side of the behavior modification process. I also find that people make the greatest progress when they recognize that behavioral compliance or non-compliance of an animal is mostly the result of the animal’s experience with people, rather than the basic temperament of the animal. It is useful to focus on the horse’s ability to learn as a positive attribute under our direct control. “Just as the horse learned to dislike injections, it can learn to like injections.” This helps to get away from the non-productive view of “stupid horse” that needs “attitude adjustment.” A realistic understanding of the mechanisms controlling behavior is much more productive. One down-side is that some people tend to waste time dwelling on blame, past abuse, and other issues related to how a problem horse learned the aversion. It’s more productive to just get on with the show.