# Equine low-stress handling during interventional procedures and hospitalisation

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During veterinary visits and hospitalisation, interventional procedures create a high potential for our equine patients to experience elevated levels of fear and anxiety. This can lead to the expression of undesirable behaviours or behaviours that have the potential to do harm to the veterinarian, the horse, and the human-animal bond (Boswell 2025).

The first step in behaviour modification is understanding the motivation behind the behaviour. In equine patients, undesirable behaviours are often motivated in fear, stress, and avoidance, rather than 'naughtiness' (Hothersal, Casey 2011). The “4 Fs” of the equine fear response are 'fight', 'flight', 'freeze', and 'fidget'. As prey animals highly adapted to “flight” in the presence of danger, avoidance is a common response to fear and stress in equine patients. Freezing is an uncommon response in horses, more consistently seen in donkeys and mules. The fidget response can be seen in an example of a horse pawing the ground or constantly shifting weight when in a stressful environment (Boswell 2025). Recognising early signs of stress can be critical to preventing escalation that can be dangerous to both the horse and the practitioner. Physiological signs of stress include mydriasis, elevated heart rate, and elevated respiratory rate. Increased muscle tension can be seen with a tight upper eyelid, tight chin, flared nostrils, elevated head, fixed ears and tail elevated or clamped. Vocalisations such as blowing and whinnying can be signs of fear and stress (Yuschak 2024). Recognising these signs early before the horse escalates to 'fight' or 'flight' can allow time for a change in approach and reduce the chances of escalating the fear response and risk harm to the horse and veterinarian.

Every experience, both positive and negative is an opportunity for learning. Whether intentional or not, the way we handle and respond to a horse’s behaviour is feeding back to them and creating associations between behaviours and consequences. This is an example of associative learning, where the animal learns to associate a stimulus with a consequence (Pearce and Bouton 2001). This can be further divided into classical and operant conditioning. Classical conditioning is the association between a biologically meaningful or unconditioned stimulus and a previously neutral stimulus (Foster 2025). An example of this is the learned association between a needle and syringe and the pain of intravenous injection. When a horse learns that the needle and syringe are a reliable predictor for jugular venipuncture, the fear and anxiety associated with the pain of injection is then associated with the needle and syringe, a previously neutral stimulus (Foster 2017). Operant conditioning is the learned association between a behaviour and a meaningful consequence. An example of this would be the removal of the needle and hand from the jugular furrow when the horse jerks its head. The horse learns to associate their action of head jerking, with their perceived reward of the needle being removed, therefore inadvertently reinforcing this behaviour in the future.

The four quadrants of operant conditioning are based on the principles of reinforcement and punishment. Reinforcement aims to promote the repetition of behaviour, either with the introduction of a rewarding stimulus (positive reinforcement) or the removal of an unpleasant stimulus (negative reinforcement). An example of positive reinforcement is the introduction of feed as a consequence of standing still for examination, encouraging repetition of that behaviour. Negative reinforcement is commonly used in equine handling. An example would be maintaining pressure on a lead rope, and then releasing when a horse steps back, encouraging that behaviour in the future (Caroll *et al.* 2022). Punishment aims to discourage the behaviour, either with the introduction of an unpleasant stimulus (positive punishment), or the removal of a rewarding stimulus (negative punishment).

The positive and negative in these definitions refers to the introduction or removal of stimuli as a consequence of the action, not the overall perception of the experience (Foster 2025). The use of punishment in behaviour modification is not recommended as it does not address the underlying cause for the behaviour and can be associated with increased fear and anxiety. It can lead to suppression of early warning signs of anxiety and internalisation of fear, potentially leading to further behaviour problems in the future (Foster 2017).

The 'Considerate Approach' is a key tenet in Fear Free equine handling (Boswell 2024). This describes the interactions between a veterinary team and the equine patient to work with the slower processing speed of horses and be attentive to their emotional state. Working slowly and deliberately, taking time to become acquainted with the patient and introduce positive reinforcers into the experience can be beneficial in the short term to facilitate the procedure, and in the long term for future veterinary visits (Boswell 2025). An example of this is approaching the patient slowly within their visual field at the balance point of the wither and offering a scratch or some other meaningful reward prior to starting the procedure. This gives the horse time to process the change in their environment, creates an opportunity for positive reinforcement, and allows you time to assess their level of fear and stress to guide your approach going forward. Other aspects of “Considerate Approach” include ways to reduce the noxiousness of a stimulus. Examples include selecting the smallest possible needle size that is appropriate for the procedure or adding something sweet as such molasses to oral medications to mask the bitter flavour (Boswell 2025).

Touch gradient refers to the way we initiate contact with equine patients and maintain that contact to minimise fear and stress. Contact is made at a neutral point such as the withers, and maintained, sliding your hands to the potentially sensitive area of interest. This allows the horse time to display subtle clues of anxiety, allowing time to slow down or change the approach, before they escalate to a more dangerous level of stress (Boswell 2025). This is particularly important when investigating sensitive regions such as the ventrum, distal limbs, or a painful area. An example of combining touch gradient with “Considerate Approach” principles and positive reinforcement can be made for auscultating borborygmi. Making contact at the withers with a brief scratch is an opportunity for positive reinforcement, as a common location for mutual grooming, scratching in this area is shown to promote parasympathetic tone (Nellist 2019). Introducing the stethoscope at this level and maintaining constant contact with the skin while sliding your stethoscope caudally and ventrally allows time for you to assess their response to your contact. This also prevents you from startling them by initiating contact in a sensitive area such as the ventrum.

Habituation is the type of learning where the horse simply 'gets used' to something with repeated exposure. This can be applied to many aspects of veterinary care, including approach, handling, interventions and medications. The principle of habituation is to slowly introduce the stimulus, decreasing a horse’s reactivity over time (Doherty 2025). Habituation is the opposite of sensitisation, where reactivity increases with exposure to the stimulus. This method can be used to introduce novel experiences or objects to horses, to prevent the development of sensitisation and the need to de-sensitise in order to achieve the goal of the visits without inducing fear and anxiety. An example that can be made with veterinary visits and hospitalisation is the introduction of oral medications. Habituation, in combination with reinforcement, touch gradient, and “Considerate Approach” principles can be used to successfully administer medication and improve behaviour for future treatments. Starting with 'Considerate Approach', approach the horse within their visual field, and make contact at a neutral point. Improving the palatability of the medication may be of use, adding something sweet such as molasses or apple sauce. Use the touch gradient to maintain contact with the horse from the withers to the mouth, taking time to pause, reassure, and re-start if the horse shows elevated levels of stress. Using a hand rather than the syringe to slide forward and make contact with the commissure of the lip may be better tolerated initially, graduating to the use of the syringe.

Negative reinforcement such as the removal of the stimulus to reward calm behaviour can be utilised, aswell as positive reinforcement with the introduction of wither scratches as the horse tolerates the oral dosing syringe or hand moving closer to their mouth. Only continue when the horse is calm and accepting of the most recent training step. It is also important to time the reinforcers carefully to be associated with the desirable behaviour. For example, remove the syringe and give scratches when the horse is standing calmly, not when they jerk their head to avoid you, as this would be inadvertently rewarding the avoidance behaviour. Habituation can be utilised by veterinarians, or through a training programme that owners complete themselves to facilitate medication in the future (Boswell 2024).

Systemic desensitisation involves exposing a horse to a low-level of an established 'scary' stimulus in order to reduce their reactivity towards it (Doherty 2025). A common example of its use in equine clinical practice is when dealing with needle-shy horses. Low-level exposure to the stimulus can start with the veterinarian grasping a pinch of skin to emulate the sensation of pressure that would precede a needle stick, at a site distant to the injection. As the horse tolerates this, the contact can slowly be moved closer to the site, increasing pressure and recreating the steps that precede injection. This can progress to the use of a capped needle at the injection site, before eventually progressing to the injection. It is then recommended to follow the aversive procedure with positive reinforcement such as treats or scratches, to create a positive association with the experience, rather than the lasting impression being that of the injection (Doherty 2025).

As veterinarians, we have a responsibility to promote the welfare of our patients (Littlewood *et al*. 2025). By prioritising welfare through the use of empathetic handling and "Fear Free" principles, we have the opportunity to reduce the potential negative impact of veterinary interventions (Boswell 2025).

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