

## Worshipful Company of Farriers Equine Veterinary Studies Award 2021

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With a long-standing interest in horses, I was delighted to receive this award and have the privilege to shadow farrier Rob Rush, an associate of the Worshipful Company of Farriers, for a week. I was excited to have such an amazing opportunity to learn about the farrier profession, the skills and craftsmanship involved, and improve my knowledge of remedial farriery. Before this placement I was unaware of the complexities and capacity of remedial farriery, and the degree to which it can improve comfort and promote healthier movement patterns. Below I will explain how I will take forward what I learnt from my week with Rob to help horses in my future career.



*Figure 1: Holding the steel shoe I made with Rob at his forge.*

My week with Rob started with a visit to shoe two horses. The first horse had a broken back hoof pastern axis (HPA) of her forelimbs, and radiographs taken by the vets showed that the 3rd phalanx were dorsally rotated leading to lameness. Rob had used remedial farriery to improve the HPA and support the hoof to reduce the rotation of P3. For the previous few times the horse was shod, he had used a bar shoe with a slight graduation of the caudal shoe to support the rotation. Whilst the graduation countered the rotation of P3, it being greater than two-three degrees meant that frog support was needed to prevent sinkage of the frog or crushing of the heels. This horse's foot had caudal one-third packing for this purpose. The shoe also added 20% onto the heel which supported the overhanging coronet band. For this shoeing Rob changed from the bar shoe to a concave shoe. He explained that while a bar shoe can be beneficial short-term, care needs to be taken with long-term use of this type of shoe as it can lead to compression of the deep digital cushion and contraction of the frog. This may result in cracks of the hoof wall which need further remedial treatment for stabilisation the cracks, and future treatment must allow movement of the heel for restoration of normal heel function. The concave shoes that replaced the bar shoes were adjusted using the portable forge and anvil to widen the caudal bars of the shoe and the grinder was used to create the graduation. The grinder was also important in softening the edges of the shoe to reduce the risk of injury if the shoe strikes another limb. The horse's right hoof was smaller than the left, so Rob did not need to add length to the shoe, unlike for the left forelimb, but adapted it by only widening the heel. If length was added this would have resulted in the toe growing longer, which is undesirable for a broken back HPA. This horse also had lateral extensions for the hind-feet which helped improve stability and increase the distance between the back feet during foot placement, reducing brushing. The lateral extensions are added from where the foot first contacts the ground and Rob explained that once the lateral bar becomes wider, it cannot go narrow again or foot stability is lost.

The second horse was a routine hot shoeing where manufactured concave shoes were heated and shaped to the individual foot. Rob showed me how this horse wore more of her lateral bar down, so after shaping the shoe with the forge and anvil, the grinder was used to simulate some of the lateral wear to ease the breaking-in of the new shoes by the horse. The wear pattern of shoes is important and can be an early indicator of changes in foot placement and lameness. Again, the grinder was used to smooth the edges of the shoe to reduce the risk of injury. From just these first two horses, I felt I had already learnt so much, although I was also beginning to realise how much I did not know about this very skillful and specialist profession!

From seeing how manufactured shoes could be adapted for both remedial and routine farriery, Rob then



*Figure 2: Fitting one of the custom-made hind shoes with a lateral extension.*

introduced me to the craftsmanship of shoe making. He made a set of hind shoes for horse a with hock osteoarthritis we went on to shoe later in the week (and the horse I had the opportunity to remove a shoe from). To aid the stability of the hindfeet and reduce the adduction of the hindfoot flight pattern, lateral extensions were added. Rob explained that it is important when adding these, that the depth of the shoe remains the same throughout, and the lateral heel does not become thinner during the widening process, otherwise an unintentional gradient is created. Rob showed me how the process of going from a straight bar of steel (length of bar = length + width + 2 inches) to a shaped shoe involved multiple heating and anvil manipulation cycles, which, later in the week, I put into practice through making a shoe of my own!

After shaping the shoe and adding the lateral wedge, Rob explained how the position of the nail holes and subsequent placement of nails is chosen. The most caudal nails are at the widest point of the hoof (Duckett's dot), which can be measured as an eighth of an inch caudal to the frog apex. Nails should not be routinely further caudal than this otherwise heel function can be compromised. Other nails are placed more cranially at the toe quarter and the toe nail. When the nails are hammered into the wall, they should come out about one-third of the way up the hoof with two-thirds of the shank in healthy wall, and above the old nail holes. Both kinesthetic and acoustic signals can indicate if the nail is well placed. Placement of the clips is also important: toe clips can be used on front feet of riding/ jumping horses to prevent the shoe shifting backwards on impact; whilst side clips for front shoes gives leverage reduction or can help bring long toes back quicker. Quarter clips are usually used on hind feet to protect the soft tissues of the front limbs, although toe clips may be used for the hind shoes of driving horses to prevent shoe displacement. Clips can either be cut/ burnt into the hoof wall so they become part of the wall, increasing the resistance to shoe movement relative to the foot. Or the clips can lay on the hoof wall, reducing the connection between the shoe and hoof, but it causes less damage to the hoof wall, which is more important for the power-generating hindlimbs.

Visiting an equine charity further my understanding of remedially farriery. Several small ponies with chronic laminitis were shod with glue-on shoes where the plastic was heated to become malleable and shaped to the trimmed foot before the glue set, holding the shoe firmly onto the hoof wall. The glue-on shoes meant nails did not need to be hammered into the wall, which would irritate the already inflamed lamini through the concussive force of nailing. These shoes also give frog support, taking weight off the toe. Before the shoe is glued, preparation is key to prevent bacteria being harboured by the shoe, therefore the foot is dressed and cleaned. The toe of the glue-on shoes was taken off to reduce the breakover point (when the toe leaves the ground), highlighting how breakover can be influenced by shoeing. Rob explained that having side-clips, equilibrium shoes, rocker toes (turning toe of shoe up) and raised heels can also reduce the breakover point. If glue-on shoes are overused, due to the way the glue binds the hoof wall, it can degrade the wall. Care must also be taken when removing the shoe to rasp the entirety of the glued rim off or the hoof wall will be ripped off. During the week Rob gave me the opportunity to fit a glue-on shoe, and from this experience I learnt how important ensuring good contact between the glue and hoof wall was, and how useful the freeze spray was!



*Figure 3: The glue-on shoe I helped fit.*

I saw the heart bar shoe being used as an alternative to glue-on shoes for chronic laminitic ponies. This type of shoe has additional frog support compared to a bar shoe, with the further option of adding synthetic or leather pads for additional support and comfort. I saw one of the ponies have her heart bar shoe customised to fit the left front hoof that had a prominent frog. The metal frog support was adapted by giving it a graduation, leaving the frog to move onto the support when the foot comes down, rather than the frog being under constant pressure. This pony was also developing boxy feet, because of the heel being too high compared to the toe. Rob explained how the ratio of wall to heel is ideally three-to-one, therefore this ponies heels were taken down and a bigger shoe was fitted to allow the toe to grow out while supporting the heels.

Shoe adaptation is also needed when the frog is small and non-functional. For another pony, in order to stimulate improved frog function, a frog support pad was placed between the hoof and shoe, with the dead-space filled with putty. When the foot came into contact with the ground, the frog is stimulated to expand, and subsequently contract when the foot is lifted, restoring more normal frog function.

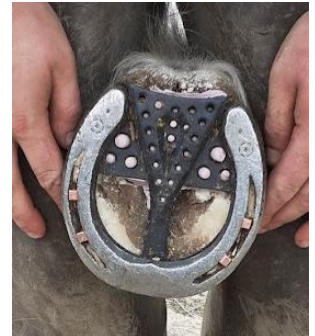


Figure 4: Remedial farriery for a small, non-functional frog.

Another common reason for remedial farriery is due to hoof wall cracks. These are important to treat or bacteria can be harboured, preventing the crack from healing. The crack needs to be dug out using the search knife, allowing the crack to aerate and killing anaerobic bacteria. This is similar to seedy toe (bacteria entering the white line) and thrush (bacteria trapped in the frog) where opening these up for aeration is important. The crack can be filled with putty, but Rob prefers to leave it open to the air. To take the pressure off the crack, quarter-clips are used. Rob explained that the crack often occurs at the breakover point, especially with long toes, and the horse has a corresponding notch in P3 on radiographs.



Figure 5: From left to right - the hoof crack before treatment, after paring out the crack, and after shoeing with quarter clips for pressure relief and leaving the crack left open to the air.

During my week with Rob I was also able to learn more about farriery for foals. Rob explained how the first trim should be when the foal is four weeks old as the window to effect change is up to twelve weeks old. This window would normally allow three trims to take place. Trimming can help correct angular limb deformities, as can adding lateral, medial, cranial or caudal extensions. If there are lax tendons after four weeks, caudal extensions as far back as the fetlock can be added. If corrective shoeing is done the foal should be checked every two weeks, and it is important to take the shoe off and dress the foot to allow proper assessment of the changes.

On my final day with Rob, we visited a horse with very poor hoof quality. Rob introduced me to a relatively new method of remedial farriery, using cast tape. The horse's hindfeet were dressed and then the cast tape was applied, covering the hoof wall up to the coronet band, and the whole of the planter surface. Water was then applied to the tape, stimulating it to set. Once the tape was set, the edges were checked for impingement onto soft tissue, and the frog and heels were cut out. The shoe was then shaped to the hoof,

before being nailed on. The cast tape acts as a synthetic wall into which the nails are knocked into. This technique allows a shoe to be fitted despite very poor hoof quality, and it helps give the hoof wall time to recover. There is the possibility that the hoof looks worse when the cast tape comes off, as a result of the lack of aeration and normal hoof movement. Rob recommended that the horse was put onto a supplement to help strengthen the hoof walls over time, indicating the importance of diet in hoof quality.



*Figure 6: From left to right - the hindfeet with very poor hoof quality and cracks, after the cast tape was fitted, after the hindfeet were shod using the cast tape as a synthetic wall.*

I would like to thank Rob and his apprentices for being so welcoming during my week with them. I really enjoyed my time with Rob and his team, and I am grateful for the time they gave me. I would also like to thank Dr Lydia Brown for coordinating this week and her support for making this placement happen. I also thank the Worshipful Company of Farriers for providing the opportunity to learn from highly skilled professionals. It was an amazing insight and opportunity to learn a huge amount about this very important and skillful profession, and I look forward to applying the lessons I have learnt from this week as I enter equine veterinary medicine.