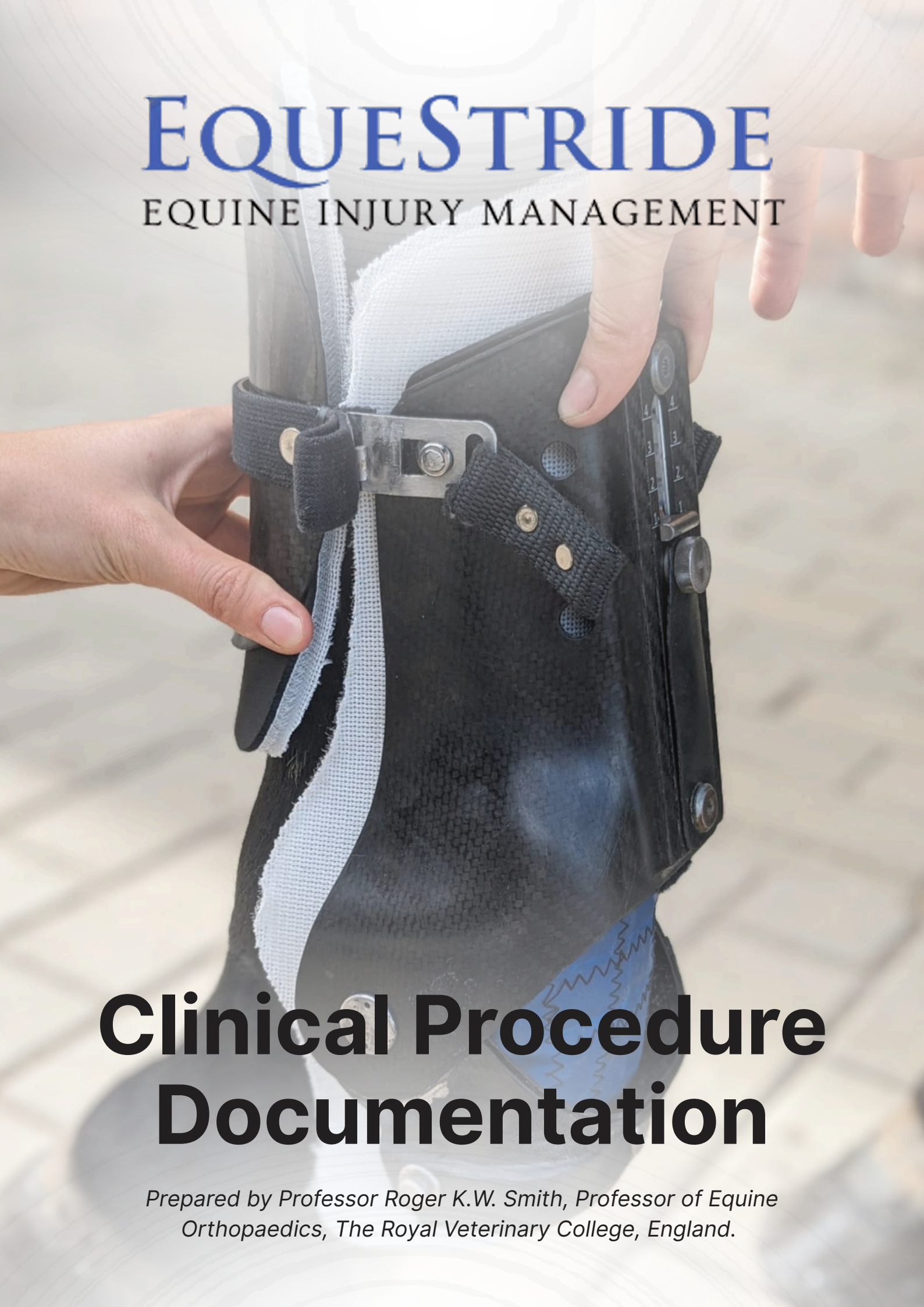




EQUESTRIDE

EQUINE INJURY MANAGEMENT

Clinical Procedure Documentation

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Background

The (EqueStride™) tendon support is an adjustable therapeutic system for the improved management of flexor tendon and suspensory ligament injury in horses. The device has variable support enabling a fully controlled exercise regime during injury rehabilitation. The (EqueStride™) tendon support is designed to resist overextension of the metacarpophalangeal or metatarsophalangeal ('fetlock') joint when the limb is loaded using a tension band principle. It has been manufactured to the highest engineering standards and has been validated both in vitro and in vivo (see Smith, et al., 2002¹). This validation confirmed that the (EqueStride™) support is the only device capable of resisting extension of the fetlock joint under loads experienced at the walk (and higher gaits) compared to currently available simple protective boots or a thick Robert Jonesstyle bandage. The only other device capable of providing significant support at these loads is a cast.

However, the significant advantage of the (EqueStride™) support is that once in place, it can be used while the horse is exercising, making it perfectly suited to the rehabilitation of tendon and ligament overstrain injuries of the palmar/plantar metacarpus/metatarsus. Furthermore the amount of support can be adjusted enabling the healing soft tissues to be gradually loaded to greater amounts during the rehabilitation process which will optimize the quality of the healing tissue, maximizing the chance of a successful return to full work, while still providing protection at higher loads. It can be fitted on a horse much more easily than a cast and takes only moments to apply or remove.

¹ Smith, R.K.W., McGuigan, M.P., Hyde, J.T., Daly, A.S.G., Pardoe, C.H., Lock, A.N., and Wilson, A.M. (2002) In vitro evaluation of non-rigid support systems for the equine metacarpophalangeal joint. *Equine vet J.*, 34, 726-31.

Indications

Fetlock collapse related to:

Forelimb:

Superficial Digital Flexor Tendon Overstrain Injuries
(‘bowed tendon’)

Suspensory Ligament Overstrain Injuries

Hindlimbs:

Degenerative Suspensory Ligament Desmitis

Severe Proximal Suspensory Desmitis

Superficial Digital Flexor Tendon Injuries

Both Fore and Hind Limbs:

Flexor Tendon and Suspensory Ligament Lacerations

Distal Sesamoidean Ligament Injuries

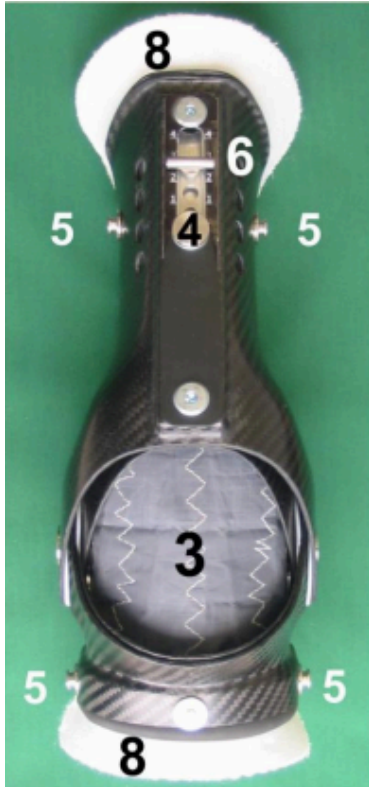
Rehabilitation of Fetlock Joint Subluxations/Luxations

The support is particularly useful to be applied after cast removal for any soft tissue injury with association to the fetlock joint.



Diagram of Components

Back View



Front View



Side View



1 - Dorsal metacarpal plate

2 - Dorsal pastern plate

3 - Tension band

4 - Locking screw for settings

5 - Locking stud for attachment straps

6 - Settings adjustment

7 - Hinge

8 - Inner lining

9 - Metacarpal pad

10 - Pastern pad

Technique of Use

Stage 1 - Application and fitting of the support device

1 - As the support device is designed to fit snugly onto the limb, the limb should be unclipped and unbandaged. If a wound is present, it should be covered with a nonadherent dressing and a thin layer of orthopaedic felt.

2 - The device should be disassembled into its three component parts – the main boot, the dorsal metacarpal plate (1) and the dorsal pastern plate (2). The desired setting should be selected by unscrewing the locking screw (4) on the back of the device (figure 1) and sliding the adjuster (6) so that it matches the setting number.

Setting 1 – Only provides support at full fetlock extension. Used during the later stages of rehabilitation when the horse is trotting and cantering.

Setting 2 – Provides support at the walk and trot.

Setting 3 – Provides some support to the fetlock joint at all times.

Setting 4 – Provides a significant level of support when the horse is standing. Used when there is significant hyperextension of the fetlock joint.

Thus the setting should be gradually reduced during the rehabilitation period to increase the proportion of load taken by the palmar/plantar soft tissues.

Note that the setting can be changed while the device is on or off the limb. When adjusting the setting while on the limb, the foot must be raised and the MCP joint flexed.

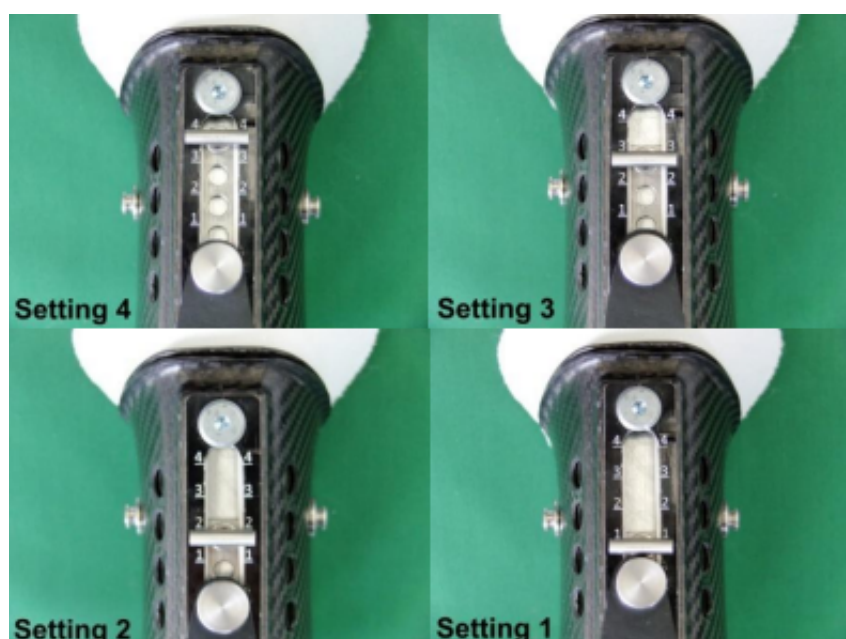


Figure 1 – The four settings that can be selected relating to the amount of fetlock support required.

3 - Before Application for the first time, Support Setting One should be selected. The main device should be applied to the palmar aspect of the limb with the limb weightbearing (figure 2) or lifted so that the device hinge is opposite the fetlock (figure 2).

4 - The dorsal metacarpal plate is then clipped onto the device using the eyed metal attachments (figure 3), ensuring that the plate is orientated correctly ('top' should be proximal on the limb)

5 - Finally, the dorsal pastern plate is fixed to the device in the same way as for the dorsal metacarpal plate, once again ensuring that the plate is orientated correctly (figure 4).

6 - After application, it is recommended that a bandage, such as a cohesive bandage is applied over the entire outside surface of the device. A demonstration of this can be seen on the accompanying DVD in the "Application and Removal" chapter. The outer bandage will ensure that the horse does not damage or interfere with the device while in place on the leg, particularly during initial period when it is becoming accustomed to it. External wrapping also has the added benefits of keeping any dirt away from the injury and the moving parts of the device aswell as improving the overall security of the fasteners and adjustment mechanisms while in use.



Figure 2 – Placing the boot on the back of the limb with the device hinge opposite the joint.



Figure 3 – Attaching the dorsal metacarpal plate



Figure 4 – Applying the dorsal pastern plate with the limb raised

Sizing, Fitting & Adaptation for Smaller Animals e.g. Foals and Yearlings

The (EqueStride™) tendon support device is available in three sizes - Small, Medium and Large.

To determine the correct size it is necessary to measure the width of the fetlock joint at the widest point when viewed from the front.

- **Small-Size** is suitable for animals with a fetlock joint width measurement ranging from 70mm to 85mm approximately.
- **Medium-Size** is suitable for animals with a fetlock joint width measurement ranging from 85mm to 100mm approximately.
- **Large-Size** is suitable for animals with a fetlock joint width measurement ranging from 100mm to 110mm approximately.

The Small-Size device is made for adult Thoroughbred type horses and ponies but it can also be adapted very effectively for smaller animals such as foals or yearlings. In such applications the device's own soft Inner Lining material (8) is removed and replaced with a custom made cotton & cohesive bandage of a suitable thickness as required to fill the extra space. When doing this it is important that the bandage be applied as evenly and smoothly as possible to avoid varying thickness and any uneven pressure under the device. The bandage should extend from the knee or hock level all the way down to the coronet band of the hoof. When the correct thickness of cotton & cohesive bandage is achieved the device should then fit snugly over the bandage without requiring excessive pressure to apply.



Note: In this method of adapting to smaller animals, it is important to remember that it is only necessary to replace the Inner Lining Material (8) with the cotton bandage. The front foam pads (9) and (10) must always be used.

Exercise Bandage applied underneath

Stage 2 - Selecting the Correct Support Setting.

After the initial sizing and application to the limb is complete, selecting the correct support setting can begin. The level of fetlock support required can vary greatly from one case to another and depends on the stage of recovery and the degree of fetlock joint hyperextension that is present.

Overall during the support setting selection phase we are looking for a normal fetlock joint angle, a reduction in lameness if lame and/or signs of a general improvement in the horse's comfort level. In general the correct support setting is the one that restores the most normal looking gait and which provides the most comfort for the horse.

For the early stages of injury rehabilitation when there is significant hyperextension of the fetlock joint, for example immediately after cast removal:

- 1) Before application to the limb, the Support Device should be set to **Support Setting Four (The highest support setting)**.
- 2) After application to the limb, the foot of the affected limb should be lowered carefully to the ground. Particular care must be taken to ensure that the horse does not put the foot down before the device is securely applied

For the initial fitting to horses that are commencing an exercise rehabilitation programme, the following procedure for selecting the correct support setting should be followed:

1 - The Support Device should be set to **Setting One** prior to application to the limb. After application, the foot should be picked up by the Veterinary Surgeon and the fetlock joint and knee/hock fully flexed manually. The horse should then be walked a few steps in hand at the lowest **Support Setting One** (provided the healing soft tissue is judged by the Veterinary Surgeon to be strong enough to do so). The sole purpose now is to allow the horse to become accustomed to the sensation of the Support Device in place before any support is included. Be careful not to walk the horse excessively at this point as the injured soft tissue is not supported at the walk at **Support Setting One**.

2 - Once the horse is accustomed to the sensation of the device in position, increasing the support level can then begin. The support level should then be increased to Support **Setting Two**. The adjustment to the Support Setting is most easily made while the device is still applied to the limb. Again the horse should be walked a few steps in hand at Support Setting Two and the degree of hyperextension and general comfort in the horse should then be noted and compared to Support Setting One. Take care not to walk the horse excessively.

3 - The support device should then be increased to **Support Setting Three**. Again the horse should be walked a few steps in hand at Support Setting Three and the degree of hyperextension and general comfort in the horse should then be noted and compared to Support Setting Two, taking care not to walk the horse excessively at this point.

4 - The support device should then be increased to **Support Setting Four**. Again the horse should be walked a few steps in hand at Support Setting Four and the degree of hyperextension and general comfort in the horse should then be noted and compared to Support Setting Three.

Throughout this adjustment phase the Veterinary Surgeon will see a marked variation in the degree of fetlock joint angle, particularly at the walk. In most cases when commencing an exercise rehabilitation program, Setting Four provides too much support at that early stage of the exercise rehabilitation programme. In the majority of cases it will be found that either Setting Three or Setting Two are the best when commencing the exercise rehabilitation programme.

Following the above adjustment procedure, the Veterinary Surgeon can then make a judgment and select the best support setting based on the following criteria:

A) The setting that best restored a normal MCP joint angle (in cases where fetlock joint hyperextension is evident).

B) The setting that restored the most normal looking gait and the most comfort to the horse.

Note: The above sequence of adjustments is more easily carried out while the device remains applied to the limb. It is important to ensure that after each adjustment is made, the locking screw (4) is fully screwed back in as far as it can go. Failure to do this could result in damage to the support device. Adjusting the locking screw (4) should be done by hand only. A tightening tool should not be used.

Removal

The application process is essentially reversed.

- 1 - The limb is lifted and the dorsal pastern plate pushed against the pastern to unclip it from both sides of the boot (figure 6). It is then removed.
- 2 - The dorsal metacarpal plate is unclipped in the same way (figure 7).
- 3 - The device is then eased off the back of the limb.

When applying - Metacarpal Plate (1) on first, Pastern Plate (2) on last.
When removing - Pastern Plate (2) off first, Metacarpal Plate (1) off last.



Figure 6 – Removing the dorsal pastern plate first with the limb raised

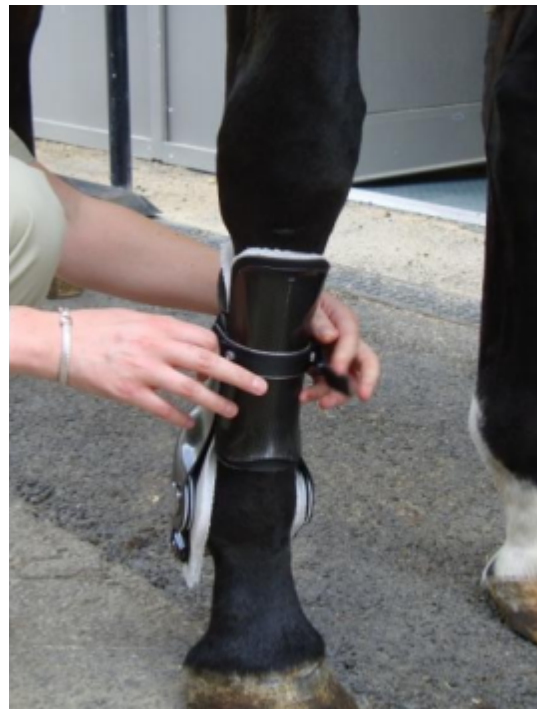


Figure 7 – Removal of the dorsal metacarpal plate

Period of Use

The EqueStride™ Support Device is primarily intended to be worn during exercise only and it enables horses recovering from tendon or ligament injury to walk, trot or canter safely during rehabilitation improving the quality of the heal and giving the maximum chance of full recovery. It also means that horses can get back into light work quicker and the amount of pain suffered by the horse is noticeably reduced. While the EqueStride™ Support Device can in cases of severe tendon or ligament laceration be used as a stable support, it is **not** intended as a replacement for a conventional stable cast or splint.

1 - Early stages of injury rehabilitation when there is significant hyperextension of the fetlock joint



The device has four variable settings that take only seconds to adjust. The amount of support that the system provides to MCP joint extension and suspensory ligaments depends on which of the four settings is selected. The highest setting (setting 4) provides total support to the limb and is used for immediate post-injury treatment when maximum support is required.

The device at setting 4 can also be used as an emergency aid to stabilize an acute injury and is an excellent means of instantly enabling a severely injured horse to walk into an ambulance and transport it from the racetrack to the hospital. Used in this way the device will also reduce the risk of further injury occurring during the immediate post injury period and in transportation.

2 - Later stages of injury rehabilitation when the horse is exercising.



As the rehabilitation progresses, the device should then be used intermittently for exercise sessions ranging from 10 to 15 minutes per 24 hour period for the first 10 days of use. The short daily exercise sessions are to minimize the risk of pressure sores developing during the early stages of rehabilitation which could inhibit the continuation of the treatment. If it is judged by the Veterinary Surgeon that after the first 10 days the skin is tolerating the treatment well, then the daily exercise session can be increased above 15 minutes per 24 hour period if necessary.

As the injured flexor tendon or suspensory ligament improves over time, the setting is gradually reduced through settings 3 and 2, down to the lowest setting 1 which is for the later stages of rehabilitation when the horse can once again resume training. Thus once fetlock support has returned, the device can be used when there is an increase in the exercise level – for example the introduction of trotting or initial turn-out. At the same time, there would be a gradual reduction in the settings so that there is a gradual increase in the amount of load applied to the soft tissues while still providing support and higher loading. Once the horse is considered by the Veterinary Surgeon to have made a significant recovery, use of the device can then cease.



The importance of not over-supporting for too long.

While it may seem sensible to give constant support to an injury, over-supporting for too long or depriving a horse of exercise altogether, can in itself have adverse effects such as poor quality healing and laxity in the limb. Therefore it is important to reduce the support setting as healing progresses. Without challenging the injured tendon or ligament in this way, the tendon or ligament's capacity to heal and regain its own independent strength and resilience is reduced. The EqueStride Tendon Support, at the correct setting, allows the soft tissue injury to be challenged safely.

It is important to check regularly for the development of any sores. These are unlikely if the device is correctly fitted and applied but the most common sites are the pressure points of the device which are dorsal pastern and metacarpal/metatarsal regions, palmar/plantar fetlock and medial and lateral fetlock. If any bandage material is applied to the limb this should be replaced on a daily basis at the same time



Contra-indications

1) Wounds present directly under the pressure points of the device which are dorsal pastern and metacarpal/metatarsal regions, palmar/plantar fetlock and medial and lateral fetlock.

For further information, please contact EqueStride™

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The Equestride System is protected by European Patent Number EP1449497 and United States Patent Number US7559910B2.