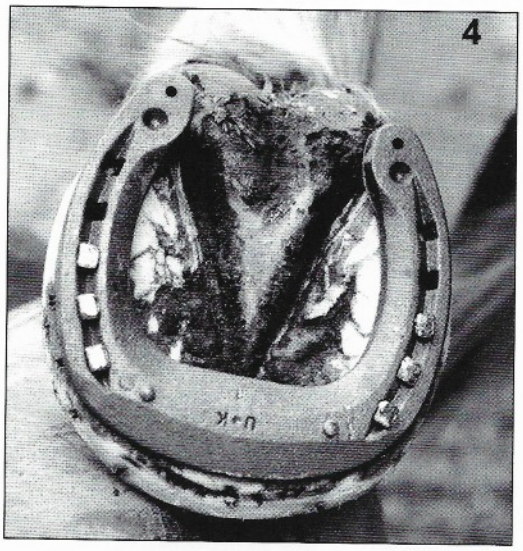
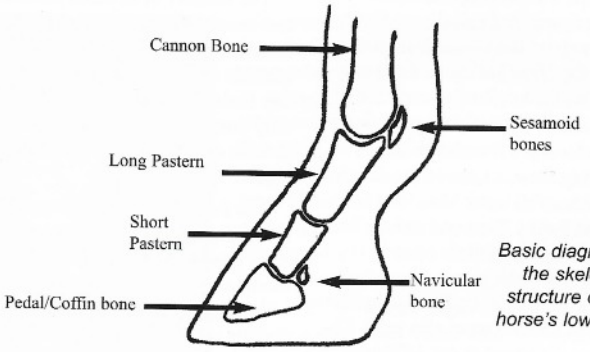
Best Foot Forward





Basic diagram of the skeletal structure of the horse's lower leg.

Long Toe Syndrome and Its Effects

A long toe configuration of the foot creates abnormal mechanical forces within the foot that will eventually lead to lameness. Long toe syndrome affects the performance of the horse because it places the foot at a mechanical disadvantage both in the way it leaves the ground and the way it impacts the ground.

The syndrome significantly affects breakover, which is the period of time when the heel leaves the ground and the toe leaves the ground.

A horse's limb pivots over its toe, with the length of toe determining the length of its lever arm. A long toe creates a long lever arm, causing delay in breakover.

Prolonged breakover causes the heel to remain on the ground for a longer time than normal. This becomes more significant at increased speeds, as it means that a horse has to increase its speed to minimise the time the hoof remains in contact with the ground.

The hoof angle that has been created by the long toe increases the stance phase (the period the foot is in contact with the ground) by delaying breakover. As a result the horse is forced to slow down, no longer able to seemingly 'fly' across the ground.

Furthermore, with delayed breakover, a horse's body continues to move forward over its leg before the foot starts to lift and the leg is able to advance. To offset this, the horse slows down and takes shorter steps. Because it is harder for the horse to 'dump its load' or to lift its foot in order to advance the forelimb, the back legs must also slow so they don't hit the forelimbs. In effect, the stride shortens and the horse's speed slows.

This also makes the horse less able to engage its haunches and push itself forward. The more steps a horse must take to cover the ground, the greater number of opportunities for a mis-step and the more concussion is received by the feet and limbs. This increases the chance of injury to the horse, and

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An insight into Cytek Shoeing

A modern approach in farriery

by Robert Meyrick RSS

The perfect shoeing is out of balance from the moment the shoe is placed on the hoof.

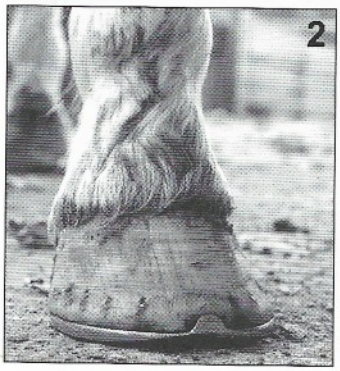
I have been a farrier for over 20 years. Recently farriery has had a bit of a shake up - primarily about foot balance, its definition, its importance, how to measure it and with which tool.

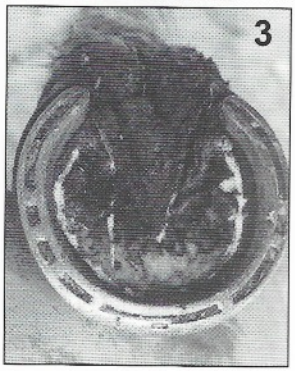
This has on occasion caused some confusion between farriers and customers, and certainly between farriers and vets. What has been widely accepted is a need to address foot balance both in the working and domestic environments of the modern horse.

The wall of the hoof of a feral horse grows from the top (coronary band) and is worn away by friction against the ground with every step. Domesticate the horse, put it to work with the added weight of a rider and/or the load of a cart and you speed up the wear of the foot.

Shoe the foot for protection, and now there is no wear at all so the foot grows long and out of shape. Over time, stress and pressure via leverage from the long toe will slow down the blood supply to the foot and increase wear and tear on tendons and ligaments. (See photo 1,2 & 3)

These days, horses are only really used for sport or leisure - the working horse is all but gone. In the past, regional differences in the land and farming, type and use of the horse, has meant farriers have customised shoeing to meet these requirements. A farrier's reputation was built on his ability to make a shoe for any horse, and for any requirement of that horse. The multitude of shoe types came about because farriery is a handmade craft, so one farrier's shoe is identifiable from another. Add to that the inventiveness of individuals for problems of the foot and limb, and you have an extensive range.





Photos (Right)

1 Normal feet after 6 weeks in traditional shoes

2 The fret of the shoe wears as the foot pivots over the extended breakover point. This wear is what a feral horse does naturally to its hoof to create its own breakover point under the toe.

3 Because the foot grows forward and down, a traditional shoe with a toe clip has to move foward with the foot making the heels of the shoe move forward and off the heels of the foot. A longer and wider shoe would be recommended which will help, but does nothing about the foot growing too long.

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decreases the rider's comfort, since the short choppy stride is less comfortable than a long flowing stride.

Muscles fatigue more quickly as a horse has to take extra steps to get the job done. Tired muscles lose their load dampening effect. The fetlock drops further with each step. Ultimately, hyper-extension of the fetlock can injure joint cartilage and/or the sesamoid bones. Also the flexor tendons or suspensory ligaments may be overly stretched.

As a horse's body continues to advance over a limb that is delayed in its lift-off by its long toe, more torque is placed on the low joints of the limb, especially the coffin and pastern joints. Additionally, the coffin, pastern and fetlock joints must flex more than usual to achieve sufficient force to move the foot.

Torque and flexion forces that are greater than normal create conditions for the development of sprain, strains, or arthritis in any of these joints.

Normally during breakover, there is some stretching of the deep digital flexor tendon (DDF), which attaches to the back of the coffin bone behind the navicular bone. Some tension in the DDF allows it to flex the coffin joint to lift the foot.

With a delayed period of breakover and a longer lever arm that is created by the long toe, there is increased tension on the DDF. Therefore the tendon must pull harder to lift the foot and achieve breakover.

The supporting ligaments of the navicular apparatus reach maximal stretch as the foot starts to breakover. In the horse with the long toe syndrome, the limb advances further forward before the foot breaks over. This creates an excessive amount of stretch on the suspensory ligaments of the navicular bone.

Because large arteries pass through the region of these ligaments, the excess tension may cause the circulation within the foot to be compromised.

The excessive tension on the DDF also amplifies compression of the DDF against the navicular bone and bursa. This leads to fraying of the tendon and abnormal friction along the bottom surface of the navicular bone.

Inflammation created by these occurrences leads to pain, shortened strides and potential lameness. The effect of long toe syndrome on the navicular apparatus and heel structures is dramatic.

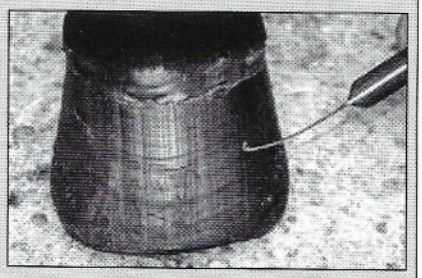
Horses with a broken back hoof pastem angle are more prone to developing heel soreness, navicular disease and deep digital flexor tendonitis.

The result is the lost opportunities for the horse to excel, possible loss of use due to lay-up time and financial costs involved in rehabilitating a lame horse. Therefore, any strategy that can be implemented to maximise the horse's stride will deter fatigue and reduce the likelihood of injury.

Testimonial from Jane Jordan

Jane Jordan has an 8 year old cob, Harry Boy. The 15.2hh Dales cross has good feet and has never suffered laminitis, but he was prone to stumbling, even when being led in from the field.

His first set of Cytek shoes was fitted at the end of February and the problems stopped overnight. "I never questioned shoeing as Harry Boy always appeared sound other than the tripping, but since we've had Cytek shoes on his action has changed completely. It's a lot smoother and he doesn't trip at all."



New horn, post Cytek, is shiny, smooth and visibly healthier. The new growth is coming down straight from the coronet and after 2 sets Harry Boy's hoof shape is changing

Jane says the hoof shape has changed too. Breakover is further back, nearer to the centre of the foot, his heels are wider and the hind feet are rounder and not pointed as before.

The texure of the new horn, post Cytek, is also different and there is a distinct line around all 4 hooves, showing where this new growth begins (see above). "His feet have all changed completely. The new growth is smoother, shinier and just looks a whole lot better than before, and his frog is wider and in much better shape. Nothing else in Harry B's day-to-day management, work or feeding routing has changed; the only difference is these shoes," Jane adds.

"The horses's conformation has also changed significantly, as has his way of going. He now stands straight and square and he isn't at all 'up front' like he was before", says Jane. "He feels more balanced and doesn't have an exaggerated cobby action any more. He now steps, rather than stamps, and he doesn't lurch into canter like he did before."

Although Harry B had no apparent foot problems, Jane says there was obviously something not quite right. "It makes me wonder what may have materialised in years to come", she said. "From an owner's point of view the Cytek system is pure logic. It makes sense, it works and I believe it has potential for all horses, no matter what they do."

A hoof with under-run heels is weaker and more prone to developing chronic heel bruising, navicular disease and deep digital flexor tendonitis. The fetlock joint also drops farther as the horse loads its limb, setting up conditions for a fetlock injury or arthritis.

In addition, more horizontally aligned hoof tubules are less able to retain natural hoof water. This lack of moisture retention ultimately leads to dry, brittle horn, resulting in cracks and chipping. Nails are less likely to maintain purchase in the weakened horn, so shoes are more frequently lost.

Fortunately, such faulty foot angulations are correctable with appropriate shoeing technique and time. The objective is to trim back the long toe and have the correct breakover point and loading of the hoof maintained between shoeing. Also adequate heel support must be maintained between shoeing, the shoe not being pulled forward as standard with the traditional style of shoeing.

Extract by Dr Nancy S Loving DVM
R Andrew Dalgleish, BV, M&S, MRCVS

Traditional Shoeing

Extract from "Foal to Racehorse" by Simon Curtis FWCF

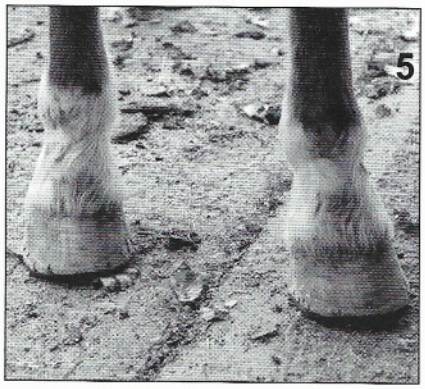
Purely by placing a traditional shoe onto the balanced foot of a horse, we unbalance it. The breakover point is moved away from the tip of the pedal bone and thereafter the relationship of the heel as the caudal point of support is altered.

In a natural environment, the horse wears his foot evenly while rolling the toe. When we as farriers, attach a shoe, the wear pattern of the foot is reversed. The toe is then protected and allowed to grow long; the heels wear away by expansion against the shoes. The hoof grows down at an angle of the horn tubules, not vertically. The shoe is therefore moved forward in relation to the limb from the day it is fitted.

Photos 4 and 5

4 (See top of page 24) This is the same foot shod with a Cytek shoe which has no clip and allows the toe to wear naturally. The horse's foot can breakover as if it were unshod. Each step it makes will wear the toe, keeping it short, while the shoe stops wear to the rest of the foot.

5 Top view of the finished front feet.



In conclusion

For those who will say horses have always been shod with a shoe with clips and that follows the contour of the wall, it should be noted that it has only been done in this way for around the last 150 years. Shoes that covered the sole of the foot, and were clipless were used for around 500-600 years prior to this.

Clipped, narrow shoes came about because of horses falling on cobbled streets. It might have been essential then, but not now, especially as we know that it doesn't do the foot any good. This isn't just my theory and more information can be found at Reading University's Rural Life Museum.

Three years ago I was introduced to Cytek shoeing which addresses the breakover problem so well that I now shoe all horses this way, and this is fine for hacking, dressage, eventing, showjumping, and endurance, but what about showing?

Owners are worried about being marked down for giving their horse both the movement and feet that it should have; not the shoe and feet that men wanted for extra grip when ploughing or pulling a load up and down hills, or the particular shoe for hunting, all from over a century ago!

All breed societies were informed over 2 years ago about Cytek shoes not being a remedial shoe, but a shoe that has been designed for the horse's requirements. There won't be a law to change this - it's up to owners, farriers, vets, and judges to require that the shod horse's foot be as close to the natural unshod foot as possible.

Robert Meyrick RSS

If anyone would like to know more about Cytek visit the website at *www.cytekhorse.com* or telephone the Cytek help line on 01344 893236.