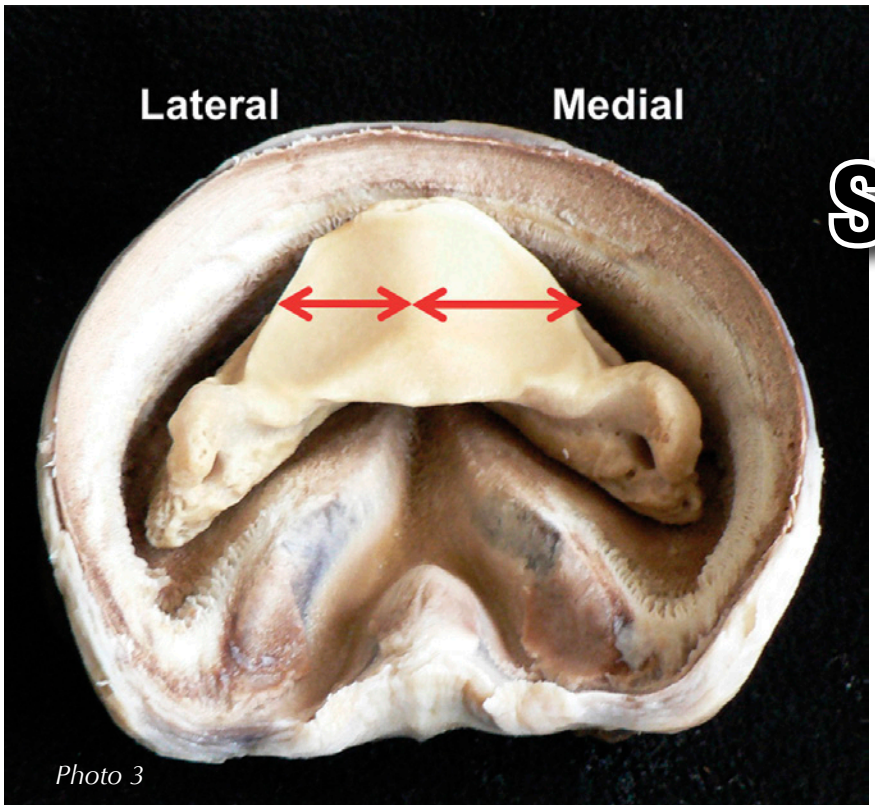

Photo 3

Symmetrical Hooves?

Why don't hooves hold their balance and symmetry when they grow longer between farrier visits?

And why does a farrier have to 'chase' balance further with each subsequent trim?

By Andrew Bowe B.Sc.App., Master Farrier
All photos courtesy of www.barehoofcare.com

Picture this:

The farrier arrives to trim (or shoe) your horse which is tied up, standing square and clean on a perfectly flat slab of concrete. Show season has arrived and you want the best possible job done. The light is good, the horse is good and the farrier is good. Blue ribbons here we come!

Afterwards, when you are standing in front of the horse and admiring the exceptionally neat job, you imagine if a plumb bob line was dropped down the middle of the cannon bones, there would be exactly the same amount and shape of hoof either side of the midline. Perfect symmetry that catches the eye.

But why then doesn't such 'perfect' balance hold?

When the farrier returns in 6 weeks to redress the hooves, not only are they out of balance, but they have a greater level of imbalance than before the previous trim and it is a bigger job to return again to that perfect balance.

Why don't hooves hold their balance and symmetry when they grow longer between farrier visits? And why does a farrier have to 'chase' balance further with each subsequent trim?

Is the quest for symmetrical hooves flawed?

The reality is that horses' hooves are not symmetrical. They actually form mirrored pairs with their opposing hoof, but are individually asymmetrical.

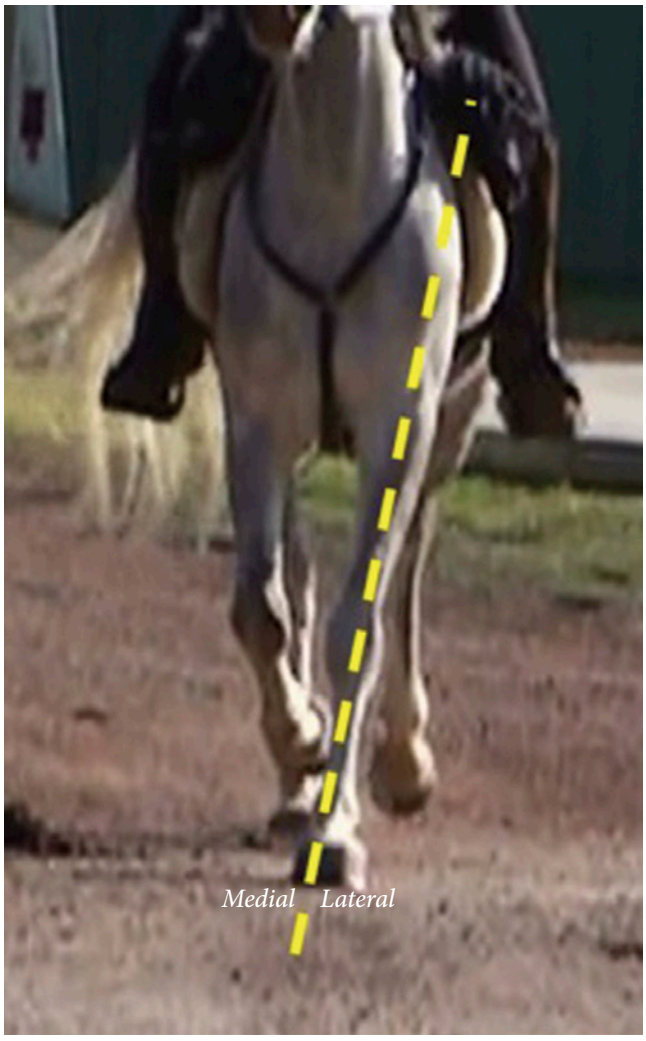

Photo 1 (right): When a horse moves, its legs swing in towards the centre of gravity.


Photo 2a

"Hooves get shaped by the huge forces that constantly push on them from the body above and from the ground below.

It is normal for a well conformed, well balanced horse moving on a good surface to swing noticeably in - towards the midline - and to land lateral side first."


Photo 2b

Why are hooves not symmetrical?

Hooves are not like pieces of rigid dead timber, that forever hold the shape they are rasped into. They are more like a robust plastic that is malleable enough to be able to change shape when put under pressure. And boy, do they get put under pressure! Have you had a horse stand on your toes lately?

Hooves get shaped by the forces that constantly push on them from the body above and from the ground below. But the thing is, such forces do not act uniformly (see photo 1 on left).

The biomechanics

When a horse moves, its legs swing in towards the centre of gravity of the body; towards the midline. This means that their hooves don't land flat. They actually land slightly lateral side (outside) first.

(See the photo series of video stills on this page.)

This series of slow motion images shows how a well conformed, well balanced horse moving on a good surface swings noticeably in towards the midline and lands lateral side first. This is normal.

When the medial (inside) side of the hoof lands slightly in arrears of the lateral side, it bears most of the descending weight of the horse. In response to this, the 'plastic' hoof changes shape and develops a medial side that is steeper and a lateral side that is more oblique.

Horses are well adapted for this and even their bones are not symmetrical. The medial condyles of all the bones from the carpus down are always slightly bigger in width and surface area than the lateral condyles (the condyles are the 'knuckles' of the hinge joints, the rounded prominence at the end of a bone that articulates with another bone) See photo 3.

This pedal bone still inside its hoof capsule clearly shows the right condyle (the medial side) is wider than the left condyle (the lateral side).

Normal is therefore slightly asymmetrical.

Photo 4 on the next page shows a healthy specimen with slight asymmetry.

Can you tell which is the steep side?

If hooves grow excessively long, the inherent asymmetry is magnified, which in turn magnifies the landing action and leads to excessive snapping down into the medial side. This has the effect of driving the medial wall higher and steeper. Too steep, and the hoof wall passes beyond vertical and becomes underrun (see photo 5).

continues next page...


Photo 2c

"When hooves grow excessively long, the inherent asymmetry is magnified, which in turn magnifies the landing action. This has the effect of driving the medial (inside) wall higher and steeper."

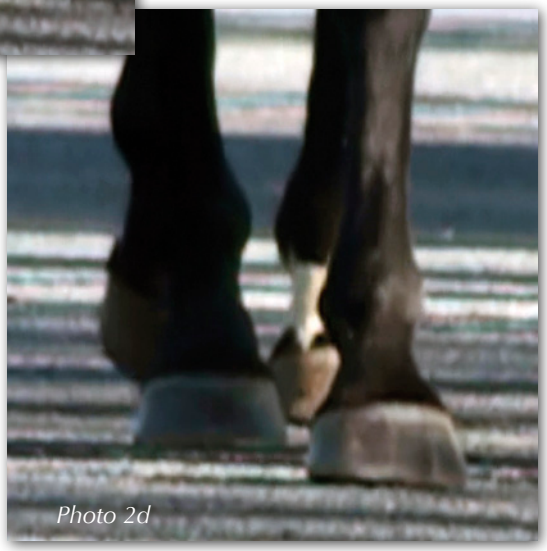
Photo 2d

Photo 4: This photo shows a healthy specimen with slight asymmetry.
Can you tell which is the steep side?

"Successful hoof management always comes back to a horse's owner. Whether the horse is shod or barefoot, discipline is needed and its hooves should be attended to regularly."

Photo 5: Too steep on the medial side... and the hoof wall passes beyond vertical and becomes underrun

If such an imbalance is allowed to continue, a sheared heel may develop which is when the medial heel actually tears up and away from the lateral heel. Painful! (See photo 6).

Greater problems arise when a horse has a conformation that directly contradicts normal biomechanical action. What we are talking about here, are all of those horses that have the steeper wall on the lateral side and the oblique wall on the medial side. You guessed it – pigeon toes (see photo 7).

These soldiers have to brace themselves to create the correct lateral first landing, but mostly only manage to land flat and often land medial side first. Apart from the fatigue, this has the effect of sending the impact up the lateral side of the lower leg, through the smaller, weaker condyles.

The perceived value of pigeon toed horses is a hot topic. Far better stockriders than the author may well argue that such animals go better in the rough and maybe they do, but in the author's humble opinion (at risk of making a generalisation), they don't see out their life in full soundness. Pigeon toed horses seem to be more likely to prematurely succumb to ringbone.

Hoof management

How does the grand equine design account for a hoof that is not only asymmetrical, but the longer it grows, the further it departs from symmetry?

Very simply, it doesn't!

Equine hooves are not designed to grow long. Horses are prairie animals; nomads that cover vast distances over rough terrain. In their normal environment, they are getting their hooves constantly abraded so they never grow long. Their hooves remain short and in a state of asymmetrical balance.

Photo 6: A sheared heel is when the medial heel actually tears up and away from the lateral heel. Painful!

Photo 7: A pigeon toed conformation directly contradicts normal biomechanical action.

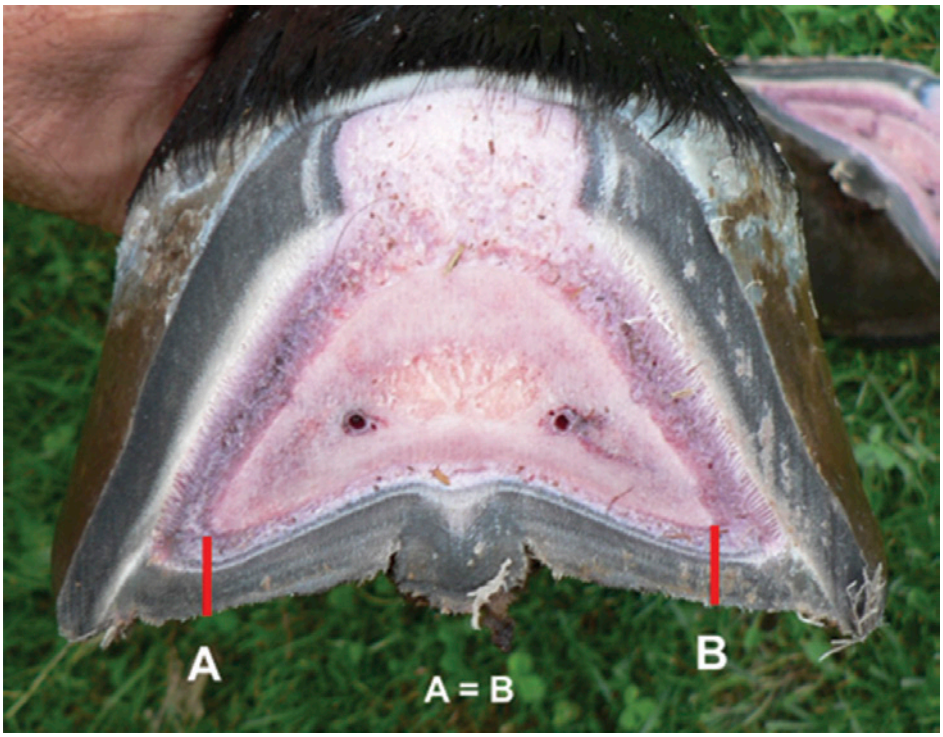

Photo 8: The sole plane is the guide because it is an extrapolation of the solar surface of the pedal bone

Successful hoof management always comes back to a horse's owner. Whether the horse is shod or barefoot, discipline is needed and its hooves should be attended to regularly.

A quick touch up trim every couple of weeks is the best model by far and is becoming a popular option, whether a horse owner is totally taking over the hoof trimming themselves, or just giving the hooves a touch up between visits from the professional (that is why the author conducts hoof management workshops around the country).

If shod, shoes should be reset in no more than 6 weeks and would be better revisited every 4 weeks.

How should hooves be balanced?

Instead of chasing cosmetic symmetry, hooves should be balanced according to the boney column within. This can be achieved objectively by using the outer rim of the sole plane as a guide and then trimming the hoof wall to the same height above sole plane on both sides of a hoof. The sole plane is an extremely valuable guide because it is an accurate extrapolation of the solar surface of the pedal bone (see photo 8).

This cross section of a cadaver shows a perfect correlation between sole plane and pedal bone. It doesn't get more objective than this!

A couple of situations to avoid...

Horse owners should avoid making unjustified demands on a farrier to forego sole plane balance for cosmetic balance.

Furthermore, when 'corrective' shoes are being applied to create the appearance of symmetry, it is vital not to 'crank' a hoof straight because that will only damage the joints. Hopefully a horse's loss of performance will become a red flag before permanent damage is done.

Sometimes with continual corrective trimming or shoeing, that is chasing elusive symmetry, the 'real' hoof gets lost somewhere inside a deformed hoof capsule.

Even though most subtle imbalances can be seen by a trained eye, especially by looking at the shape and orientation of the hairline, if there is doubt about exactly where the boney column is positioned, a totally objective observation can be made by employing a vet with a digital radiograph ('x-ray') machine (see below)

These before and after rads show joint-destroying imbalance that was well hidden inside a deformed hoof capsule.

It is simply not an option to cut a straight hoof onto a bent leg.

Most cases of hoof deformity can be solved by removing the hoof wall from the weightbearing equation (even if only for a few months) and balancing to the sole plane.

Hoof management should aim for long term soundness. In this regard, success can be judged simply by the concept of dynamic equilibrium - when the 'plastic' hoof holds its balance between farrier visits.

Photo 9: Before and after rads show joint-destroying imbalance that was well hidden inside a deformed hoof capsule.