Side Dominance of the Musculo-skeletal System & Hoof Form

by Ute Miethe LMT/LAMT ©2008

As a human and equine massage therapist, I specialize in horse and rider imbalances. Becoming a natural performance barefoot trimmer was simply an inevitable progression for me as a massage therapist, and it helped me to connect many of the dots, so to speak.

Horses are side dominant, just like humans. It puzzles me somewhat that this is still a rather little known fact among horse owners and horse professionals, yet many are aware of the main symptoms:

- Difficulty turning into one direction
- Horse prefers one canter lead over the other
- Horse is stronger on one side, weaker on the other
- Horse braces more on one side versus the other

Unfortunately, riders and trainer often label such symptoms as resistance, and assume the horse is willfully being difficult. In reality, it can be very hard for a horse to perform certain movements, depending on which side is dominant, and how uneven the horse's muscle development is side to side. Asking an owner to write 10 times "I love my horse" with their non-dominant hand—and nicely too, please—usually puts these unrealistic (and unfair) expectations into perspective for most humans. However, frequent reminders are often needed.

Even a very simple thing, like a Western rider always holding the reins in one hand, makes switching to the other side challenging. It is not painful, but the body simply fights against it, as it is being pulled out of its comfort zone. Horses are no different, plus they generally will not analyze what their body tells them, like we can. They just follow with what is more comfortable. Interestingly, most horses seem to be right side dominant, just like humans. The rest are left-sided or somewhere in the middle. It is also interesting to note, from what I have seen, that most Arabs have a tendency to be left-sided.

In humans, it is believed that the side dominance is related to how the human baby is bent in the womb and how this affects the fascial development (*The Endless Web: Fascial Anatomy and Physical Reality*). Fascia is essentially the "biological plastic wrap" that wraps everything in the body. It separates specialized tissue, so the tissue can optimally function next to each other. It is the ultimate support system of the whole body—without it, everything would fall apart. It is conceivable that equines may be similarly affected during their development in the womb.

My findings are based on continual observations while working with clients'

UNO ALLA VOLTA — ONE AT A TIME

horses. When I see something unusual, I start looking for trends. This helps me to determine possible root causes. I believe a lot of discoveries could be made, and quicker solutions to common problems be found, simply through thorough observations and looking for common threads, rather than waiting for extensive research data that may never come.

In addition, humans often do not know what to look for or chose to ignore warning signs or attribute them to something else. As said by a well-known Canadian actor, we are generally taught what to think, but not how to think. We continuously need to apply critical thinking to what we were taught, because some things turn out to be simply wrong, while others can be much improved upon. Never just rely on doing things a certain way because it's been traditionally done this way. This approach can cause considerable harm to humans and animals.

All photos above: Right-sided TB with very pronounced front hoof size difference. This is a shod horse, but a good example because it is so obvious. She was quite overdue for shoeing, too. The side dominance is also clearly visible from the front and side. Note the much larger developed shoulder on the right side.

Side Dominance and Front Hoof Shape

The horse's side dominance is generally easily visible in the horse's front hooves. The dominant front hoof is usually flatter and wider—with a tendency to run forward—because it tends to take more load, while the hoof on the non-dominant leg tends to grow more upright. It is therefore often mislabeled as a "club," or "clubby" looking hoof. In reality, the non-dominant hoof is usually the more normal looking hoof, with good heel height and a shorter toe, although this can quickly turn into a problem if the heels and toes are left too long on such a hoof, which seems to be a common trimming problem.

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In comparison, we see this in humans, too—the dominant hand for example, tends to be slightly bigger than the non-dominant hand. To verify the horse's side dominance, I also check the muscle development over the shoulders. There's typically more muscle development over the dominant shoulder, again, because the horse tends to use that shoulder more. Right-sided horses prefer the left lead canter where they can use the stronger right hind for strike off, and because they naturally bend more towards the left. Predictably, left-sided horses generally prefer the right lead canter for the same reasons.

A recent Irish study says it has linked facial whorls with side dominance. It states that the whorls of right-sided horses go clockwise, and counter clockwise on left-sided horses. I have not found this consistently to be true. So far the accuracy is at about 50: 50%. I get better accuracy relying on front hoof shape, shoulder muscle development and the horse's canter lead preference.

I generally find that the more significant the size difference is in front hooves, the more unbalanced a horse is side to side, or, in other words, the more the stronger side dominates the weaker side. I do not believe side dominance is merely a symptom of being ridden, because I also see this in horses who have never carried a rider. I recently observed the side dominance in the front hooves of a one week-old paint foal. Most likely, this horse will be right-sided, too.

Above: Right sided Saddlebred, before and after de-shoeing. Note how the heels run slightly more forward on the dominant right front hoof. The barefoot photo is after the second trim. This gelding wore reverse shoes for several years and was very, very uncomfortable in those shoes. He kept shifting weight and pointing, especially the left front. The left front was his most unhealthy and unbalanced hoof, and also has a sheared heel and, of course, heel contraction.

Hoof Form & Musculo-skeletal Imbalances

As already mentioned, the front hooves generally tell me how balanced (or not) a horse is side to side. The more uneven the shape of the hooves is (not from trimming), the more unbalanced a horse typically is. The more even the front hooves are in shape, the more balanced a horse usually is. I have also observed that hooves of more balanced horses tend to maintain themselves better and wear more evenly overall.

If I consistently see uneven wear patterns or flaring in hooves, despite cor-

rect trimming, I start to look higher up into the body, even if the conformation does not seem to have any obvious flaws.

It is very common for the pectoral (chest— between front legs) and adductor (between hind legs) muscles, to overpower the lateral antagonist muscles of the horse. This is probably due to the fact that a quadruped needs extra muscle security to minimize the risk of doing a split. However, this also affects how hooves are loaded and worn.

It is common for the hind legs to be slightly toed out (from the hip down), most likely to allow the stifle to clear the belly when moving the leg forward. This causes the medial side of the hind hooves to be loaded first, slightly before the lateral edge makes ground contact and is the reason why many hind hooves tend to flare more to the lateral side (to varying degrees).

I have a client who has mini's. Three of her mares are rather bow-legged behind. They show the exact opposite problem in the hind hooves—a tendency to flare excessively to the inside and collapse the lateral edge of the hooves. It is also common for the dominant hind leg to swing more inward towards the midline during the suspension phase, which also affects hoof wear pattern. The front hooves on the other hand commonly tend to flare more on the inside, which indicates to me that the lateral edge takes the initial impact before the medial edge is loaded. How much depends on the horse.

Photos above show a miniature pony who is standing base wide behind—note how this causes more wear and impact on the lateral sides of the hooves and excessive flaring to the medial sides. If not regularly controlled with correct trimming, those hooves quickly become very unbalanced and will start to collapse on the lateral sides. Hoof shots are the right hind.

My own horse has correct front-end conformation at rest, has a medium wide chest, and tends to move base

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narrow. That causes the front hooves to wear more on the lateral side and flare more to the medial side. His hooves are well-balanced and they do stay fairly balanced overall between trims. I recently watched him in his pasture for about 30 minutes. Most of the time, he perfectly rolls from lateral to medial in front when he moves, and it does not seem to cause any problems at all. After all, he's done this for about 13 years now.

Again, this appears to be typical for most horses, as I see this trend in many horses to varying degrees. Some flaring is so minor, it is hardly visible, but a slight deviation is usually there and can be seen in the growth angle of the collateral grooves, as well (the collateral groove angle on the flared side tends to be more shallow). I believe that this is also caused primarily by the stronger pectoral muscles and not so much just the chest size.

The chest size simply determines how much medial flaring may be seen. I would expect a reduction in medial flaring once a horse has a more even muscle balance between the pectoral and the lateral antagonist muscles. The non-dominant front leg also has a tendency to be pulled in more towards the midline, which again affects hoof wear patterns. In Dressage, this is referred to as a horse wanting to move like a tricycle.

This is commonly seen in young, untrained horses. It is another postural habit that developed while the horse grew and is yet another sign of side dominance compensation. This particular habit can potentially exacerbate the medial flaring of the non-dominant hoof.

The dominant legs also have a tendency to step shorter. I suspect this is due to balance security. The horse relies more on the dominant leg for support, much like a human does when putting on a pair of pants. We feel much more secure standing on one leg and tend to speed up the process on the other, because the weaker muscled leg will start to protest, if we stand on it too long.

Horses react very similarly. I have also experienced that horses tend to fidget more when the dominant leg is held up for trimming (this assumes otherwise healthy hooves!). It does not matter whether it is a front or a hind, although they tend to fidget more with the fronts.

As a side note, I believe another factor for fidgeting during trimming is the surface they stand on when being trimmed. As Pete Ramey, Dr. Bowker, Dr. Strasser, Jaime Jackson, etc. all point out, bare hooves adapt to the environment they live in. I often see horses that dislike standing on certain surfaces, because it becomes too uncomfortable for their hooves' tolerance levels. For example, in my case (the wetter Pacific Northwest), concrete and rocks are not tolerated as well as grass, or other soft surfaces, usually are.

If the lateral flares follow a different pattern, I either suspect medio-lateral trim imbalances, conformational issues or other muscle imbalances in the body. In such cases, the muscle imbalances are generally more trauma or

illness related and not part of the postural habits that are created through side dominance.

Training Implications

Above: This left sided paint horse toes out in front, and therefore tends to flare slightly more to the lateral sides. Also note how little difference there is in size between those two front hooves. It is much harder to tell in this case which side is dominant by just looking down at the hooves. This is where shoulder muscle development and a closer look at the front hooves usually helps to determine which side is actually dominant. Note how the lateral hoof wall on the left front hoof ever so slightly flares more to the lateral side.

As a Dressage rider I know that the goal in Dressage is to develop a well-balanced horse. It means creating a horse that is equally strong (as much as possible) and flexible on both sides, and should actually be the goal of any rider for any horse, for obvious reasons. Anything that affects the horse's musculo-skeletal system, like training approach, tack fit, etc., can affect hoof health and shape. Sometimes the cause is obvious, like conformation issues or joint problems, but more often it is musculo-skeletal imbalances that were created through postural habits thanks to side dominance. Musculo-skeletal imbalances should be addressed by a skilled body worker/ massage therapist and with proper muscle training/conditioning, as needed. This also includes the rider. Human postural habits and musculo-skeletal imbalances due to side dominance are also very common and predictable. A horse can only be as good as its rider. A rider with an unbalanced seat causes the horse to compensate with his own muscles accordingly, potentially creating further musculo-skeletal imbalances.

The implications of musculo-skeletal imbalances and postural habits in horses (and humans) are still largely unrecognized among horse professionals. I feel it is important to build more awareness of the existence of such musculo -skeletal imbalances among riders, owners, trainers, veterinarians, farriers and trimmers, so horses will get the right help, right from the start.

So far, I have not found a hoof that is perfectly shaped and even side to side, yet most horses are sound, regardless of hoof form variations (as long as they are trimmed correctly and balanced per their individual needs). Normal varies greatly from individual to individual. We need to listen closely to each horse's needs and trim and support the hoof as best as possible, to create a happy and healthy barefooted horse. Happy trails!

About the author: Ute is a natural performance barefoot trimmer and a human & animal massage therapist who specializes in fascial release techniques. For more info, visit her website at www.BalancedStep.com

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