Introduction

No-one wants to be an imposition to their horse. A good, effective riding position is especially important for endurance riders. Not because we are worried about striking a pose and looking fabulous. But because we want to minimize our riding burden and allow our horses to travel cleanly and efficiently, with the senses and reflexes of both horse and rider intimately connected. This is what a good riding position allows.

To improve our riding, it is not enough to just try harder, no matter how determined we are. Instead we should try and understand some of the physical and biological forces at work, and learn to harness these forces to our advantage. So, let's consider the rising trot; why we do it, how we do it, and what we can do to make the trot work to our advantage in training and in competition.

The Trot

The trot is a diagonal gait in two-time: The left hind and right fore (the right diagonal) move forward together, then the right hind and left fore (the left diagonal) move forward together. Between the passing of each diagonal there is a moment of suspension where all four feet are off the ground.

Actually, the trot is not always strictly in two-time. Superior performance horses display what is called 'positive dissociation', where the movement of the hind-leg precedes slightly the movement of the diagonal foreleg. This is difficult to see with the naked eye but is often apparent in photos and slow motion video.

We rise in the trot to cope with the strong vertical forces produced during the moment of suspension. For example, on the right diagonal we rise as the right diagonal leaves the ground. We are at the top of the rise and coming down as 

the left diagonal leaves the ground. We sit briefly as the right diagonal hits the ground and begin to rise again as it leaves the ground.

The Rider's Position

An effective and healthful position when riding is a hybrid position between standing and sitting. There should be an approximately straight line running through the rider's ear, shoulder, hip and heel. But the leg should not be straight. The stirrup should be short enough to provide for adequate angles at the hip, knee and ankle. These angles enable the legs to function as shock absorbers and save the rider from ruined knees and contracted hip flexor muscles. Most shock absorption occurs at the ankle joint, less at the knee and still less in the hip.

The Lower Leg

An effective lower leg will have the shape of a right-angle triangle. A line drawn from the rider's knee to their toe should be on the vertical, at a right angle to the foot (see Figure 1). The rider's foot will rest gently in the stirrup and the heel will be down.

Sometimes riders misunderstand the instruction: 'heels down'. It is not correct to simply push the heel down. This merely sends the lower leg forward, making the rider's leg straight (the traditional stockman's position) - all shock absorbing properties are lost. Instead, riders should think of their heels stretching back and down toward their horses hocks. In practice, the heel will appear level with, or only slightly below, the rest of the foot. In its role as a shock absorber, the heel will, of course, move up and down slightly with the motion of the trot.

When the heels are raised, other joints have to take on increased shock absorption duties, giving rise to all those sore knees and dodgy hips. A raised heel also indicates contraction in the muscles of the rider's leg, which is an unnecessary waste of energy.

The stirrup is the most important piece of tack. Humans are most comfortable and relaxed with both feet planted firmly on the ground. Our bodies associate having our feet off the ground with falling (potentially or actually), which automatically sets off a number of defensive reactions. When riding, the stirrups act as a surrogate ground surface, giving our sense receptors the message that we are still 'grounded' and all is well.

The Seat and Upper Leg

To achieve a biomechanically correct rising trot, it can be helpful to think of your knee as the centre of a circle and your thigh as the radius of the circle. As you rise, the bony knobble at the top of your thigh, the greater trochanter, describes a part of the circumference of that circle (see Figure 2).

In the rising part of the motion your pelvis sweeps on a forward and upward arc. The emphasis should be on forward, not on upward; it is as if you were going to rise on over the front of the pommel. The larger and longer the forward sweep of your pelvis, the longer your horse's stride will become. As you rise, the angle of the hip opens up, almost to 180 degrees. Your kneecap will rotate slightly downward and the lower leg will remain still, with next to no change of pressure in the stirrup. It is as if you could continue to rise to the trot with no difficulty if someone amputated your legs just below the knee.

Figure 3 demonstrates a good test of your ability to rise correctly. While kneeling on the floor, rise forward and up, while keeping your upper body on, or even a little behind, the vertical. You should be able to achieve a fully extended rise without having to lean forward at all. This exercise does require significant effort. Of course, it is much easier when riding your horse due to the vertical forces that arise from the motion of the trot.

If you do need to lean forward in front of the vertical to rise up in this exercise, then it is most likely you are pushing off your stirrups when actually riding your horse. By raising your heels, you have lost the primary means of shock absorption and, as a result, your hip flexor muscles have become contracted as they try to compensate.

Rhythm and Tempo

One of the reasons we riders feel safer when riding at trot, when compared to riding at canter, is due to our neurological wiring. Humans evolved with a two-beat locomotory

pattern, either walking or running. Our horses are much more complex with two, three and four-beat locomotory patterns. It is the two beat rhythm of the trot that meshes most easily with our own evolved locomotory patterns. We also find it easiest to establish rhythm in two-beat patterns.

Rhythm is the evenness of beats. Rhythm requires balance, while a lack of balance, in horse or rider, suggests falling. For example, think of the traditional stockman's position with a long, straight leg and heels pushed out in front: the rider's seat and upper body, without any support from the legs below, fall back in the saddle every stride and the trot becomes irregular.

Tempo is the interval between beats. You will find particular tempos feel harmonious and your body will relax and participate easily in the motion of trotting. If the tempo is faster or slower than this resonant tempo you need more energy to keep rising effectively, your body becomes tense and discordant, and rhythm is lost.

Your horse is the same. He works in an efficient, ground covering trot at one tempo but looses efficiency at faster and slower tempos. Tight structures resonate faster than loose ones. To accommodate a fast tempo (or a non-rhythmic rider) your horse will have to stiffen his muscles – clearly this is not desirable.

It is obvious by now that balanced riding is the best way to develop a rhythmic trot and allows us to take control of our horse. To slow our horse's trot we need not pull on the reins, nor adjust the 'rings' very short. Instead, we slow him by adopting a relentless rhythm with a tempo slower than that which our horse offers. How we slow the tempo is important. If we simply try and slow our rising down, we will emphasise the down beat in the up/down action of rising trot, with detrimental effects on our horse's stride. Instead, what we should do is, after our pelvis sweeps forward and up, pause for a moment, at the top of the rise, before coming back down.

Diagonals

Endurance competition is mostly straight lines with the occasional turn. The lateral demands on our horses are small. It does not really matter which diagonal we rise on at any given moment, so long as we alternate diagonals for roughly equal periods of time.

However, when we school our horses in the arena, or practice a little lateral work, or even if we simply wish to rise on the 'correct' diagonal while riding through bends on the trail, then we rise as the hind-leg on the inside of the bend moves forward. For example, if the trail turns right, we rise as the left diagonal (right hind, left fore) moves forward.

This sounds a bit complicated in theory but is easy in practice. As our horse moves from one diagonal to the next, his stomach swings from one side to the other. As the hind-leg on one side moves forward, his stomach swings away to the opposite side which relieves the hind-leg of weight and allows it to move forward under the body. We feel this as our seat-bone and thigh on that side sinking down and our calf swinging across with his belly. It is that simple.

So knowing which diagonal is moving forward is easy. As our horse's right diagonal leaves the ground, the left hind steps forward, the belly swings from left to right: our left seat bone and thigh drop down, and our left calf swings to the right. As our horse's left diagonal leaves the ground, the right hind steps forward, the belly swings from right to left: our right seat bone and thigh drop down, and our right calf swings to the left.

Trotting Hills

Trotting hills significantly increases the strain on your horse, particularly his hind end. The increased range of motion combined with the effects of gravity mean that there is increased potential for injury. This is especially true of the trot where the hind legs are widely separated during some parts of the stride, with one hind leg stretching forward and the other stretching back. This puts strain on the hocks, hips and particularly the sacroiliac joints. For these reasons it is better to slow the tempo of the trot up hills, compared to the tempo on the flat. When riding up very steep hills you should either walk (a stable gait which requires much less effort) or, on a fit horse, canter (where the hind legs move very close together, so reducing sacroiliac strain).

Don't be afraid to ride your horse in a low, round frame when riding up hill, both in training and competition. Thanks to the increased range of motion of the joints and the increase carrying effort due to gravity, having him very round in front provides an excellent stretch of all the muscles and ligaments along your horse's topline (see Figure 4).

Contrary to popular opinion, trotting down hill on a balanced horse does not put any additional strain on the fore legs. Ride your horse in a slower tempo to allow time for the increased flexion of the hind leg joints imposed by the grade of the hill. Balanced and steady, he can tuck his hindquarters underneath his body, carrying his weight, and lightly pass over the forehand with each stride. There are incredible time and energy savings to be made by trotting down hill in a biomechanically correct manner during competition. Always practice down hill work in training before competition to condition your horse's muscles appropriately.

There are many complicated theories about the rider's position when riding in hills. Keep it simple. If you ignore the hill and instead keep your upper body vertical, as though perpendicular to flat (i.e. horizontal) ground, then you will always be in a balanced and effective position.

Conclusion

In summary, what we are trying to achieve is a hybrid position between sitting and standing. With our heels stretching lightly back and down, our feet rest on the stirrups as if we are still standing on the ground rather than perched on our horse. This satisfies our neurological need for mental groundedness (as the ground is much more reliable in its behaviour than our horse) and allows our body to remain balanced and coordinated. This in turn enables us to control our horse, containing him with our seat by adjusting his rhythm and tempo.

Figures

Figure 1: A straight line dropped from knee to toe should combine with the rider calf and foot to make a right angle triangle. This provides you with a good base of support.

Figure 2a: The thigh is the radius of a circle with the knee at the circle's centre point.

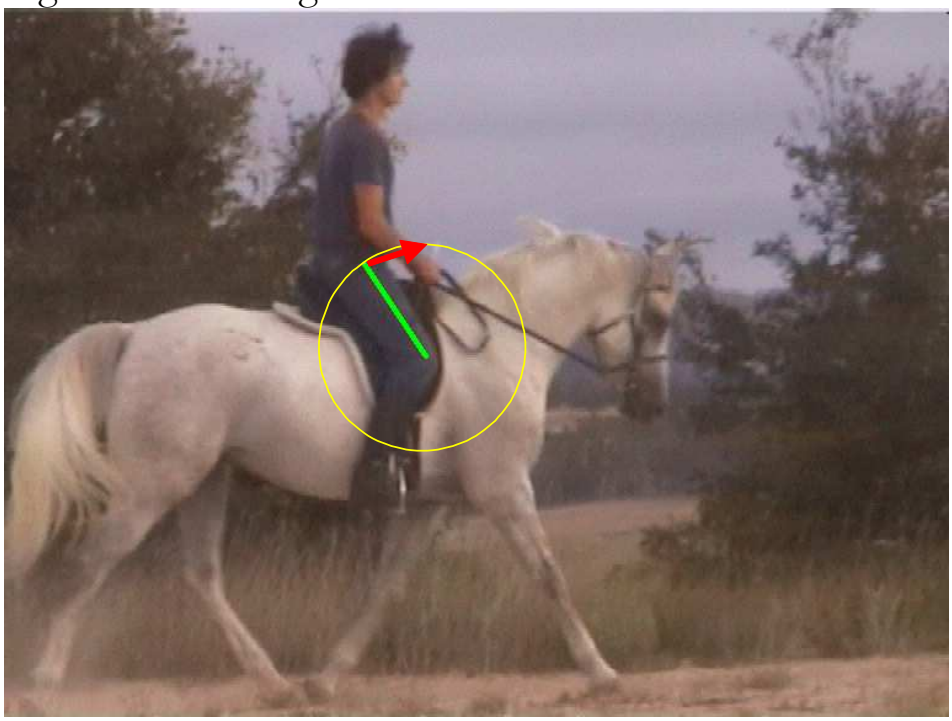

Figure 2b: During the rise, your pelvis sweeps forward and up along the circumference of the circle until your thigh is nearly vertical.

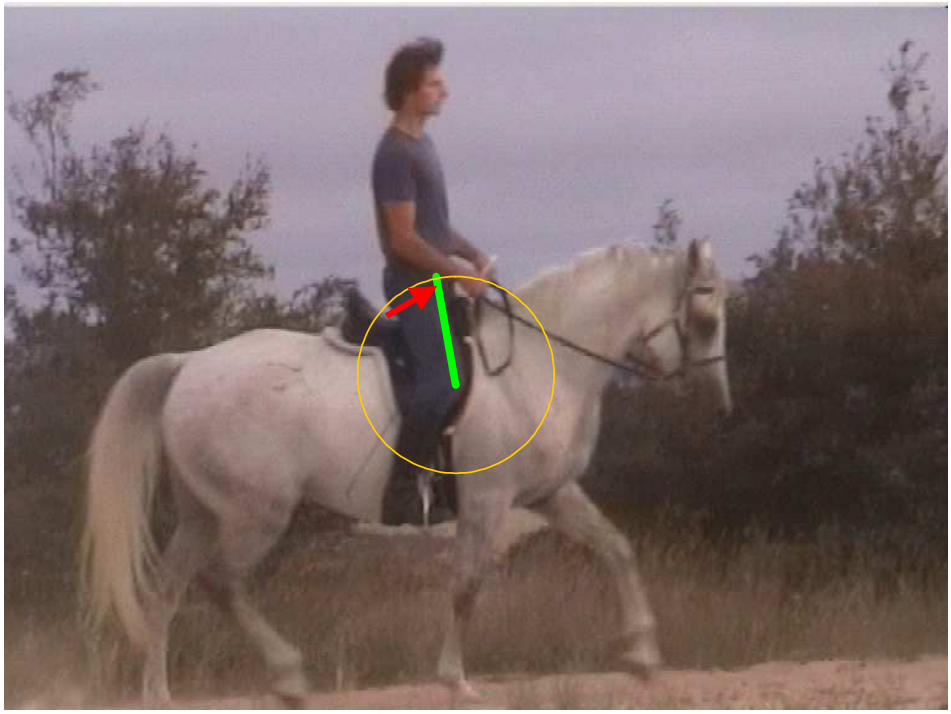

Figure 3: When testing for correct muscular function in the rising trot, you should not collapse forward during the rise.

Figure 4: When trotting up hill, it is good to ask your horse for a rounded frame to stretch the muscles and ligaments along his topline.