

The Anatomy of Saddle-Fit
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Articles on saddle-fitting are somewhat frequently published in horse magazines, both in print, or online. The articles are usually combined with a bulleted checklist (9-points, 11-points, and so on) to see if your saddle fits. However, the most important ingredient to a successful riding recipe is that the rider understands WHY the saddle should fit that way, and what often happens if it doesn't fit correctly. Many of our horse's behavioral and performance problems are merely the horse's way of telling us that he's in pain!

I was recently at a tack shop and overheard the ladies next to me trying to find a new saddle. The first gal sat in quite a few expensive models until she found one that was comfortable for her, and the friend helping her looked it over and proclaimed that the tree should fit the horse just fine, "after all, it's a medium-wide." No longer able to contain myself, I asked what kind of horse they were trying to fit, and had they thought about at least doing basic tracings to bring to the store before making such an expensive purchase. These were kind people that only wanted the best for their horse in their new riding adventure, but buying a saddle before fitting it properly to the horse is like buying a bikini for your friend without taking her to the store to try it on!



Figure 1: Computerized tracing of scapula (shoulder-blade). White fill denotes cartilage cap.



Understanding some basic equine anatomy goes a LONG way in understanding why the saddle must fit correctly for your horse to perform pain free and maximally. We need to be able to identify the 4 borders that denote our saddle-bearing area. This is important because pressure outside this region can do significant harm to our horse's back and result in behavioral and performance problems.

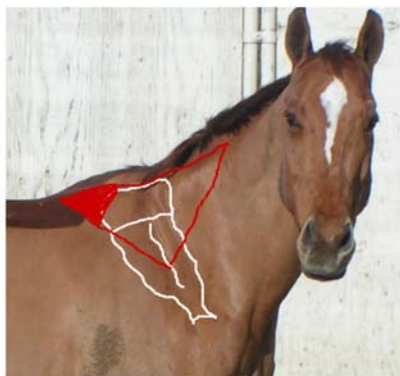
First, we need to be very familiar with our horse's shoulders. Did you know that most horses are actually left-handed? This means that the muscles on the left side of the withers are typically bigger than the right, though about 20% of horses are right-handed. Why does this matter? Saddles are made on EVEN trees – so consider what happens when we put an EVEN tree on an UNEVEN horse – things shift, slide, slip, and pinch! Are you constantly having to stand in one stirrup to shift yourself back to the middle? Does your horse prefer one lead over the other? Or worse, does he buck going one direction? The horse in the photo has a considerably larger right shoulder muscle.

The horse's shoulder must be allowed a complete range of motion to extend the trot, cut cows, or jump fences. The scapula, or shoulder blade, is actually topped with cartilage. Why is this important? A saddle that pinches in this area can actually shear off the delicate cartilage that allows the shoulder blade to glide beneath the muscles that overlay it. The effects of pinching saddles are now documented with advanced imaging, such as MRI and CT scan. A saddle that fits parallel to the shoulders doesn't allow passage of the shoulder blade once girthed up. There should be some space at the top of the panel to allow for proper range of motion of the scapula.

Pictures denote scapula tracing. Red line shows back of shoulder at weight-bearing, green line shows back of shoulder at early extension. Note the range of motion.



When you have identified the shoulder borders then the next important structure to recognize is the trapezius muscle which originates on the shoulder blade. The function of this muscle is to elevate the scapula and hold it to the body wall. Horses that are trying to pull their shoulders down and away from a pinching saddle may often have atrophy in this area. Look around, and you will see horses that have a visible dip in front of their withers.



Next, there is a nerve that exits directly from this trapezius muscle behind the withers (see the red triangle at left). This nerve is cranial nerve 11, also called the Accessory Nerve. Poke or squeeze your horse in the shaded area a few times and witness his reaction. His head comes up, his back dips, his tail swishes, his muscle twitches, and he may even turn to bite you. Now imagine you have a saddle that crushes this area

every time you ride. Does your horse pin his ears or get upset when you approach him in the crossties with your saddle? He's trying to tell you that he hurts. Some horses with chronic shoulder pinch will also develop a more obvious line across the shoulder. This

line is where the cutaneous trunci muscle will flicker if a fly lands on your horse. When you pinched behind the shoulder, did you notice the muscle flicker? With constant stimulation, a distinct line or groove may become visible.



In the photo on the left, the horse has a dip in front of his withers, and also has a groove across his shoulder. The photo on the right highlights this groove on a different horse.

A common error is to place your saddle too far forward! Place the saddle on your horse's withers, then gently slide it back into position until it "locks into place." Look to see if there is enough room at the top of the saddle to allow the shoulder-blade to rotate backwards without bumping into the tree. Note: if the billets are too far back when your saddle is placed behind your horse's shoulders, your saddle does NOT fit! Scooting the saddle on top of the shoulder blade so that the girth is where you want it does irreparable damage to the horse's shoulders and withers, and the angle cannot be corrected by adding a riser pad so that you don't feel tipped! And remember, a saddle that fits only needs a thin wither-relief/contoured pad. Saddle pads for saddles that don't fit are only a band-aid. They merely change the pressure points temporarily, until new areas become sore. Remember, if your shoes are too tight, wearing thicker socks won't fix the blisters!

Your saddle should not extend past the 18th rib. Horse's have 18 thoracic vertebrae which means they also have 18 ribs. The rib heads form the lower border of where your saddle should sit. If the saddle extends beyond the last rib your horse will feel painful pressure over his lumbar spine. You can feel for the last rib with your fingers (a ridge in front of your horse's flank), or look to where the hairlines come together at the flank. Draw a line straight upwards and you are at the last rib.



So you have the front, rear, and lower boundary of your saddle's area, now we need the top border. The channel width of your saddle should be determined by the anatomy of your horse, not by the saddle maker. The channel MUST clear the paraspinal ligaments to prevent rubbing and fluid buildup within this area. Most horses require at least 3 fingers' width in the channel from front to back, though with today's larger

warmbloods dominating the show rings, a minimum of 5 fingers' width is often necessary. The saddle in the photo above has only a one-inch clearance, which will do significant harm to your horse's back, and is unfortunately a common finding on many of the older traditional close contact saddles.



Compare the different channels on these two saddles. Which one looks more comfortable? The saddle on the right has adequate clearance of the horse's paraspinal area, while the saddle on the left caused damaging pain to the horse's back.

In addition to understanding your horse's anatomy, you should also be familiar with the anatomy of your saddle. The saddle tree is designed to provide a frame for the saddle itself, but also to provide support for the curvatures of the rider's spine, and a platform of communication with the horse through the rider's seat and weight. Store-stocked saddles are often marked with different tree widths (narrow, medium, wide, extra wide, combinations of these) but did you know that saddle trees also have an angle? The angle of the tree corresponds to the angles of the shoulders, and the width of the tree correlates to the width of the shoulder muscle. Two saddles may be labeled as "wide tree" but have two completely different angles! You may have a horse with high withers who needs a narrow angle to clear the top of the withers, but a very wide tree to clear the width of the shoulder blades and muscles. Differences in individual anatomy are why fitting a saddle to the horse is so important! One size does not fit all, but we have been taught this way, and manufacturers are able to mass produce their saddles under these categories.



The horse in this photo seems to have a very long back, but actually has a small saddle-bearing area as denoted in red.

Some signs that your horse may have saddle-fit problems, and secondary back pain:

- ❖ **White hairs under saddle area**
- ❖ **Bites or acts out when saddled or girthed**
- ❖ **Anxious when mounted, won't stand still**
- ❖ **Bucks/kicks under saddle**
- ❖ **Bolts**
- ❖ **Chips or rushes jumps**
- ❖ **Trouble with leads/lead changes**
- ❖ **Improper muscle development – no topline**
- ❖ **Stiff to warm up/cold-backed**
- ❖ **Trouble with collection or lateral work**
- ❖ **Won't enter the arena**
- ❖ **Much more...**

Finally, there's no better way to ensure proper saddle fit than to have your horse with you when trying saddles, and to enlist the help of a certified professional to help you. Ensure that the individual is a veterinarian or a certified saddle fitter, and not just a sales representative from a company. If you cannot take your horse with you, making simple tracings are worth the effort. Some tack stores will also allow saddles to be taken on trial for a deposit. Horses bodies' change over time, just as ours do. You don't wear the same



pair of jeans you wore as a 6 year-old, so don't expect that an unadjustable wood or plastic treed saddle will fit you and your horse the rest of your lives. Advances are being made in adjustable gullets and adaptable trees, but both the angle and the tree width must be taken into account. Treeless saddles are also finding popularity, but have their own issues. Be patient! Armed with education and determination you can find something comfortable for you and pain-free for your horse, and have enjoyment for years to come!

Figure 8: Be sure to ask for help from a professional such as a veterinarian or a certified saddle fitter when looking for that perfect saddle!

Dr. Robson is a veterinarian and owner of Inspiritus Equine Inc. She provides veterinary acupuncture, veterinary chiropractic, and saddle-fitting services and education. She welcomes comments and questions and can be reached via her website at www.InspiritusEquine.com. For more information or articles on saddle fitting, visit the above web address, or www.schleese.com, and www.sustainabledressage.net.