

Pilates and riding

III. Hip and shoulder joints

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Drawn figures by Sandy Johnson

In the first two articles of this series “Pilates and Riding” I emphasized the importance of rider focus and centering through the use of breath, and connecting to the muscles of the torso to promote balance. These skills are absolutely necessary for graceful and effective riding. It is only from quiet concentration and efficient balance that harmonious and efficient aids can be produced. If these skills are not present, the arms and legs become involved with balancing the rider and communication between horse and rider is compromised. This article will discuss the relevant anatomy of the leg and shoulder, and consider problems related to function that challenge riders.

The leg

The thigh bone, or femur, is connected to the pelvis and trunk by several strong muscles including the iliopsoas, gluteals, quadriceps, hamstrings, and the adductors. From Figures 1, 2, and 3 you can see that these muscles of the leg have considerable bulk compared to the muscles of the torso.

One muscle deserves particular comment, the iliopsoas. This muscle originates deep in the body along side either side of the vertebral column (Figure 3) at about the level of the ribcage. It dives into either side of the pelvis and emerges attached to the top of the femur, or thigh bone. Its action is to either flex, or bend the hip joint (when the spine is stable) or move the spine (if the femur is stable). It is unique, because it is the only muscle of the body that attaches the leg directly to the center of the body. As such, it provides the rider with powerful control of the nature of movement at the hip joint while riding. However, it can only act as this modulator when the spine is stabilized by the muscles of the torso, and the other muscles of the hip are not gripping. It can be hard to access, as it is deep in the body. I'll present an exercise to help feel this muscle's effects.

The other muscles of the hip joint all connect the femur directly to the pelvis. These muscles work to move the femur in many directions including flexing forward, extending the leg back, external, or outward rotation, internal, or inward, rotation, pulling the legs apart in abduction, and bringing the legs together in adduction.

However, these strong muscles are often a rider's first tool to stay in the saddle. In particular the adductors are often overused. The rider pinches the knees together to grip the saddle like a clothes pin on a clothes line. While effective in the short term, this balance strategy has significant adverse effects. First, these gripping muscles prevent the rider from sitting deeply in the saddle. Second, the gripping limits movement at the hip joint. With the hip joint locked, the thigh bone is both unable to move with the horse's back and the rider will struggle to move the leg to give a clear leg aid. Further, the

locked hip joint forces excessive and unhealthy movement in the low back. Seeking balance from the trunk muscles to carry the rider forward with the horse reduces the need to grip, improves suppleness and freedom of the thigh muscles and hip joint, and improves precision of the leg aids.

The knee joint is, for the most part, a hinge joint. So, unlike the hip joint, it cannot move in many directions, but the majority of its movement occurs in just two planes – flexion and extension, or bending and straightening. This has significant implications for the application of a leg aid. If a leg aid is applied by trying to pull the lower leg directly in towards the horse's barrel, since the knee joint can't move the lower leg in that direction (adduction) very much, the thigh will rotate outwards to accomplish this goal. As a result, the knee will be pulled away from the saddle. The most effective way to apply a lower leg aid is with the whole leg (from the hip joint down) very slightly rotated out. In this position, one can take advantage of the powerful hamstring muscles to pull the lower leg against the horse by pulling the hip into slight extension, and pulling the knee into slight flexion (bending). These two actions pull the lower leg against the horse's barrel. The amount that the leg should be outwardly rotated is very slight, and similar to how the leg is externally rotated when we naturally stand. With this leg position the upper thigh rests against the saddle and the calf can hang against the horse's barrel.

Pilates exercises can help the rider become much more aware of correct leg muscle function. There are many exercises that help the rider differentiate movement at the hip joint with movement in the spine. The exercises require stability of the torso (limited spine movement) while moving the legs in circles or other figures. Not only is balance from the center of the body challenged, but also the leg muscles must work cooperatively. The exercises help the rider switch the focus of balance and support away from the leg to the muscles of the torso, leaving the muscles of the hip joint with "less to do." As well, correct and healthy knee alignment is reinforced to limit wear and tear on this important joint.

The shoulder

The arm hangs off of the upper body at the shoulder joint. This joint, like the hip joint, has a large range of motion. Via a complex system of muscles shown in Figures 4 and 5, the arm can be moved out in front, to the back, out to the side, across the body, and in rotation internally and externally.

Important muscles of the shoulder girdle for riding awareness include the pectoralis major (pulls the shoulder forward) and the trapezius (can pull the shoulder up into a shrug or back and down). The latissimus dorsi muscle connects the shoulder girdle to the whole of the back, connecting it to the center of the body. When balanced with appropriate abdominal muscle support to prevent spine extension, this gives the rider great stability of the upper body. From this comes a non-pulling and elastic contact, even if the horse tends to pull.

The muscle mass of the shoulder girdle is less than the hip joint, but the shoulder can have a tremendous influence on posture (Figure 6), as the relatively strong muscles of the shoulder girdle can pull the vertebrae out of alignment. For example, a rider that works in front of a computer all day may tend to slouch with the shoulders pulled forward (tight pectoralis major muscles) (Figure 6A). This shoulder position favors a rounded or flexed spine that is apparent when they sit in the saddle. This rider needs both stretching of the pectoralis major muscle plus support from the deep muscles of the back to keep neutral alignment (Figure 6C). On the other hand, too many cues to “put your shoulders back” can lead to spine extension or an arched back (Figure 6B). For a rider, this means the shoulder and back muscles are overworking to keep a given position. This rider needs more utilization of the deep abdominal muscles to pull the rib cage closer to the pelvis in front and bring the spine into neutral alignment (Figure 6C). Riders with this issue usually feel that they are leaning forward after this correction. But soon they appreciate improved efficiency of balance as they learn to support their position with all the muscles of the torso.

Our intent use of the eyes and hands in daily life can lead to us only being aware of our upper body and shoulders and forgetting about the rest of the body. As a result, movement tends to be initiated from the muscles of the neck or shoulder girdle, rather than the center of the body. The shoulder muscles, rather than the muscles of the torso, then become an important source of balance. This is problematic, as the shoulder muscles are not designed to be in charge of balance and can become stiff and sore as a result. In riding, this focus on the upper body can lead to assessing and correcting what is happening in the horse mostly with sight and the reins, rather than with feel using the whole body. Connecting with the center of the body helps the rider obtain an assessment of what the whole horse is doing and facilitates the rider using his/her whole body (not just the hands) to guide and correct the horse. If the rider relies on the shoulders and arms for balance, staying on the horse may come from tightening the muscles of the shoulder girdle and hanging on the reins. Using the deep postural muscles of the torso for support helps relieve the shoulder muscles of balancing duty and allows the shoulder and arm to stay supple achieving an elastic contact and controlled rein aids.

Pilates arm exercises improve proper function of the entire shoulder girdle, making it strong and balanced in its work. Arm exercises teach fluid movement at the shoulder, without disruption of postural alignment. Like a ballerina, the resulting movement is efficient and appears fluid and easy, but in fact it requires physical work and focus. Exercises develop a strong connection of the arm and shoulder girdle to the torso, allowing the arm to get support and stability from the entire body. As a result, the function of the arm becomes supple and elastic rather than stiff and grabbing.

Exercises

1. Accessing the iliopsoas muscle – knee folds

Lay on the floor, knees bent, feet flat on the floor in alignment with your seatbones. Take an inhale breath and then exhale and scoop in your lower abdomen to stabilize the spine (don't flatten the back). Lift one knee towards the chest, and set the leg back down. Repeat on the other leg. Do 6-8 leg lifts per side.

Exercise #1 Iliopsoas muscle awareness
Knee Folds



Your trunk muscles must be engaged to prevent the pelvis from rocking and your weight shifting while lifting your leg.

To access the iliopsoas muscle, imagine that the movement comes from deep within the center of the body. Since this muscle is deep within the body and you can't really feel it, you only know if you are using it correctly if other muscles work less. You can tell when you access the iliopsoas if the tendon of a more superficial muscle (the rectus femoris) at the front of the hip joint barely tightens during this movement. Check for this by placing your thumbs over the front of the hip joint. You are accessing the iliopsoas muscle to move your leg when this tendon barely pops up. Also, using the iliopsoas muscle for this exercise confers a very stable feeling to your body and the leg feels like it weighs less.

This exercise is made more challenging by lifting one knee, and then alternating leg positions.

This exercise is useful for riders as it teaches a deep and efficient connection of the thigh to the center of the body. Accessing the iliopsoas muscle while riding provides a means to fine tune the stability and mobility of the hip joint.

2. Gluteal and hamstring awareness and strengthening – bridging

Lay on the floor in neutral spine alignment, knees bent, feet flat on the floor, arms by your sides.

Keeping neutral alignment, on an exhale breath, lift the pelvis and torso off the floor until your body forms a plank from the knees to the shoulders, and then while inhaling return the pelvis and torso to the mat, back to start position. Repeat 6-8 times.

This exercise strengthens the hamstrings and gluteal muscles as well as the stabilizing muscles of the trunk.

Check that you push off from both feet equally; that one leg is not doing more work than the other. Don't let your back arch at the top of the movement; keep the abdominal and trunk muscles engaged. Don't let the knees fall apart – keep the distance between them the same (placing a small ball or towel between the knees helps).

Be sure that the power for this exercise comes from the gluteal and hamstring muscles of the back of the leg. These muscles lift your body off the floor, not the muscles of the back or your arms.

This exercise is made more challenging by reaching up to the ceiling with your arms (increases the balance challenge) or by lifting from one leg.

Exercise #2 Bridging
Trunk muscle, hamstring,
and gluteal strengthening



This exercise is useful for riders for two reasons. First, it in some ways mimics the posting trot. What is different is that the horse provides much of the lift of your body, rather than your legs. Further, in posting trot, your entire body moves forward and out of

the saddle as a unit – there is no bending of the spine at the neck as there is with this exercise. By imagining this exercise as you ride the posting trot, you will get a better connection to the power of the horse's hindlegs lifting you up, and will gain skill at maintaining your balance and alignment throughout the phases of the posting trot.

The second benefit for riders is feeling the hamstring muscles work. The hamstrings are important muscles for applying leg aids.

3. Hip joint suppleness, torso stability – single knee or leg circles

Knee circles:

Lay on the floor, knees bent, feet flat on the floor in alignment with your seat bones. On an exhale breath, lift one knee towards the chest. Place your hand on top of the knee, and move the knee in a small circle one direction and then the other. Use your trunk muscles to keep the pelvis stable, unaffected by the movement of the leg. Do not allow your torso to rock side to side as the leg moves. Gradually let go of the knee with your hand and do the circles without the help of your hand. Repeat on the other side. Do 5-6 circles per direction per side.

Leg circles:

Do the same exercise, but straighten the legs (the straighter the leg, the more difficult the exercise). Move the leg in 5-6 circles one direction, then the other. Repeat the exercise with the opposite leg. Keep the circles mostly across the body, not far out to the side. Keep the pelvis stable with minimal side to side rocking as the leg moves in a circle.

Exercise #3
Knee or leg circles
Hip joint suppleness, torso stability



Knee Circles



Leg Circles

This exercise is fantastic for riders to teach what it means to have a stable torso and a mobile and supple hip joint.

4. Balanced leg lifts – leg lifts on the ball

Sit on an exercise ball or a chair in neutral spine alignment, feet flat on the floor, seatbone distance apart. Take an easy inhale breath. On the exhale breath, support the torso, and lift the right leg off the floor, with the knee bent, then set it back down. Repeat with the left leg. Lift each leg 5 times.

Work to keep the body and pelvis stable on the ball or chair as you lift one leg up. This requires tremendous stability of the torso to remain still while you lift one leg. Feel the cross body balance that happens – as you lift the left leg, feel the muscles of the right torso activate to stabilize the body, and vice versa with the right leg.

This exercise teaches you how to stay stable in the saddle while giving leg aids. It assures that you can move your leg without disrupting your posture, alignment and balance in the saddle.

5. Leg stretches

Healthy muscles are both strong and supple. Stretching muscles after exercise can enhance the range of motion at joints. The strong muscles of the leg are prone to becoming tight. This can lead to hip joint and back soreness.

A. Hamstring muscle stretch:

Lay on your back in neutral spine alignment. Place a towel or elastic band around one foot and reach the foot to the ceiling, keeping the knee straight. Try not to let the back flatten to the floor. Flex the foot for more stretch. Hold for 45-60 seconds, repeat other side.

B. Deep hip rotators stretch:

Lay on your back, knees bent, feet flat on the floor, in neutral spine alignment. Put the side of the foot of one leg on the front of the thigh of the other leg. Pull the leg on the floor toward your chest. You will feel the stretch deep in outside of the hip of the crossed leg. Hold for 45-60 seconds, repeat other side.

Exercise 5A. Hamstring stretch



Exercise 5B. Deep hip rotators stretch



C. Adductor muscles stretch:

Lay on the floor by a wall. Slide your hips up to the wall, place your feet on the wall, let the feet fall apart to stretch the muscles of the inner thigh. Hold for 45-60 seconds.

D. Quadriceps muscle stretch:

Stand up straight in neutral alignment. Bend the leg at the knee and grab the foot. Gently pull the knee back (without arching the spine). Hold for 45-60 seconds, repeat other side.

Exercise 5C. Adductor muscle stretch



Exercise 5D. Quadriceps muscle stretch



6. Shoulder suppleness, torso stability – hug a tree

Sit upright on an exercise ball or chair. Use free weights (the weight should be challenging but not a struggle – I use 2lb weights in my classes). Raise your arms just below shoulder height in front of you, with the elbows slightly bent, as if “hugging a tree.” Open your arms out to the side and bring them back in front. Repeat 6-8 times. Keep elbows lifted, and avoid shrugging your shoulders. Do not let the movement of the arms alter your posture.

Exercise #6. Arm exercise – Hug a Tree



This exercise teaches that the arms can be mobile about the trunk without disrupting posture, position, or balance. Thus it enhances the development of independent arm/rein aids.

7. Shoulder suppleness, torso stability – chest expansion

Sit upright on an exercise ball or chair. Holding onto free weights, let your arms hang down by your side, palms facing backward. Reach back with your arms by pulling the shoulder blades together. Do not shrug the shoulders or push the chest out. Do not let the motion of the arms disrupt posture.

Exercise #7: Arm exercise – Chest expansion



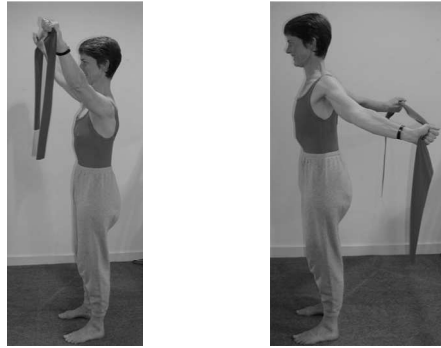
This exercise develops a correct “shoulders back” position with a stable and supported shoulder girdle without arching the spine or upper back.

8. Shoulder stretch

Pectoralis major stretch

Grasp an elastic band or towel with both hands shoulder width apart, or greater. Reach over and behind your head with the band taut to stretch the shoulders back. You should feel the stretch in the muscle of the front of the armpit, or the pectoralis major muscle. Adjust the tension on the stretchy band or towel so that it is not uncomfortable to lift your arms over your head behind your back.

Exercise #8: Shoulder stretch



The pectoralis major muscle is often tight in folks whose lives involve a great deal of desk or computer work. This stretch promotes a correct shoulder position and posture on and off the horse.