IN LINE EQUINE BODY WORK

Find the why. Restore equilibrium.

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CLIENT RESOURCE

Stifle & Strengthening

Compiled by Mary Day of In Line Equine Bodywork for client use.

What are some indicators of Stifle Lameness?

- Shortened Stride Length
- Reluctance to work or rough canter
- Dragging the toe
- Clumsy, or frequent stumble/trip
- Legs get stuck out behind
- Have a hind limb that gives out or collapses
- Difficulty backing up
- Issues going up and down hill
- Drifting to one side over fences
- Problems transitioning from trot to canter and vice versa
- Sore back or croup often accompanies stifle lameness (sensitivity to grooming and or saddling)
- Intermittent upward fixation of the patella (frequently in young horses)
  - Sticky stifles or catchy stifles
  - Some pony breeds this is an inherited condition
  - This is when the stifle locking mechanism is keeping the leg in a locked position
  - Many cases exercise and strengthening of the muscle and ligament can help reduce or eliminate this

Causes of Stifle Lameness

The stifle is a complex joint and there are many different causes that can lead to stifle lameness. The most common include:

- Bone cysts beneath cartilage: Large cysts may develop in the stifle – as well as the fetlock – although the cause is not always clear. Trauma may play a role, as may osteochondrosis dissecans or another disorder of the bone or cartilage.
- Meniscal tears: Among the most common causes of stifle lameness, a meniscal tear can range from low-grade lameness to a severe situation if the tear is severe.[3]
- Osteochondrosis: These cystic lesions of the bone underlying the joint cartilage most often develop in the foal's first six months. Signs of lameness may not become apparent until the animal begins work.[4]

- Stifle trauma: While horses used for certain disciplines or with various conformation issues are at greater risk for stifle lameness, any horse can step in a hole, get kicked, or slip in the mud.

Anatomy of the Equine Stifle

- The stifle is a complex joint in the horse's body with a similar function to the human knee. Stifle injuries can result from repetitive stress, trauma, excessive use, changes in direction and rapid deceleration. Horses engaged in jumping and barrel racing are most at risk of these injuries. Any discipline where the horse makes sudden stops, changes of directions quickly, higher levels of dressage where the horse has upper body rotation and bending, or travels at speed can increase the odds of stifle lameness.
- Horses with straight hind limbs, as well as low heels and long toes are more susceptible to stifle lameness.
- The stifle is one of the most complicated parts of the equine body. The stifle is designed for flexion and extension of the hind leg.
- The stifle is the largest joint in the horse's body and the site where the femur meets the tibia in the hind end. The former is the long bone between the hip joint and the stifle, while the latter is the bone running between the stifle and hock.
- Also involved in the stifle joint is the patella, or kneecap, situated on the femur's lower end. This small, flat, round bone is attached to the thigh's quadriceps muscle.
- The patella sits in the trochlear groove on the femur. From this groove, it slides up and down as the rear leg moves. The patella's movement lets the joint move like a hinge. The leg is able to extend and flex, but it cannot move sideways.
- Three shock-absorbing joints are involved with these bones:
  - Medial femorotibial joint
  - Lateral femorotibial joint
  - Femoropatellar joint
- On the outside edges of the joint, the short, thick, medial and lateral collateral ligaments join the femur and tibia bones. Deep within the cleft area are the anterior and posterior cruciate ligaments (ACL and PCL). These ligaments aid in joint stabilization.
- In total, 14 ligaments hold the joints together. There are also the two menisci, discs cushioning the femur and tibia.
- The major soft-tissue structures of the equine stifle are the medial collateral ligament (MCL), the lateral collateral ligament (LCL), the anterior and posterior cruciate ligaments (ACL and PCL) and the medial and lateral menisci. The most common injury to the human and canine knee is rupture of the anterior or cranial cruciate ligament. But this injury is very uncommon in the horse.
- “Part of the reason is a difference in anatomy,” Trumble explains. “In humans and dogs, there is one joint and one patella ligament with the cruciate ligaments located within the joint capsule. Horses have three joints, three patellar ligaments, and the cruciate ligaments are extra capsular making the equine stifle inherently more stable.”

- Consequently, horses simply can tolerate more forceful stress to their stifles. But significant trauma to the front or cranial surface of the stifle still can cause ACL rupture.
- Dyson says she often sees this type of injury associated with patella fractures and cautions practitioners to obtain a “skyline” radiograph (tangentially taken of the slightly flexed stifle) to carefully evaluate for this complication. Damage to the ACL is also believed to occur from quick changes in direction, rapid deceleration (this stresses the stifle as the horse “sits back” on its hind end and slows itself) and from the pressure created as a horse lands a jump.

What Happens Next?

- Call the vet:
  - Acute will have swelling with in normally.
  - Vet will check for swelling and perform a flexion test
  - Vet may block the three joints
  - Xray and or ultrasound
- Stifle injuries, especially documented ligamentous problems, should be handled like tendon or ligament injuries in other areas of the horse. Ultrasound should be used to monitor healing and to help determine the exercise/rehabilitation program. All too often in the past, a horse was suspected of having a stifle injury and might or might not have had much swelling. A period of rest resolved the swelling, and the horse appeared to be “sound” again. However, putting that horse back into work often resulted in a re-injury that was often worse than the original problem. The curvilinear probe allows the clinician to monitor the degree and quality of the healing process, and it determines exactly how and when to reintroduce that horse to exercise.
- “Meniscal injuries heal even slower than regular tendon or ligament injuries because the fibrocartilage has very little blood supply,” Morton explains.
- Keep in mind in severe cases tissue healing can take up to a year and occurs in three phases. The first is the inflammatory phase (3-5 days post injury). Then the reparative stage begins lasting 2-6 weeks where the tissue is healing. Last is the remodeling phase that starts around 2-3 weeks post injury and lasts about a year. Here the collagen fibers develop cross link, and collagen fibers reorientate.

Preventing Stifle Lameness

- Plenty of turnout, with rolling hills and companions to move even better.
- Strengthening exercises (see below) in hand or under saddle
- Promote a strong core, topline, solid muscling in hind end
- Keep horse at a healthy weight, overweight horses lack conditioning are among the most vulnerable to stifle injuries
- Support their joint health through proper diet and reduce inflammation within the body

Stifle Strengthening Exercises

> Always consult your veterinarian when engaging in a rehabilitation plan and choose appropriate activities for the horse's condition. Have veterinarian monitor horse before increases and moving up in rehab plan.

- Gradual progression, start with gentle exercises and gradually increase intensity and duration as the horse improves.
- Variety is key!
- Introduce joint loading gradually, beginning with hand walking (starting at 5 min twice daily and building up to 40 minutes).
- Good start point is 1-2 weeks of static, or isometric exercises for the hind quarters (see below). This will require the horse to stabilize and use muscles around the stifle without actually moving the stifle. The idea is to activate the motor units without loading the joint with sloppy movements. This is especially useful when muscles have atrophied to some point. General rule use 6-10 seconds each time. Studies have shown diminishing returns longer than 10 seconds.
- Slowly introduce long reining, ponying and ground poles.
- Avoid mechanical horse walkers initially, since they require repetitive circles.
- While you can walk the horse on GENTLE slopes, avoid steep hills, tight turns, and deep footing, which can destabilize the joint.
- Before introducing ridden work be sure you have worked up to 40 minutes of daily hand walking on a firm surface.
- At the start of tack walking reduce your sessions to 20 minutes and build back up gradually
- Ideally introduce trot and canter work before moving under saddle.
  - Avoid tight turns
  - Perform trot work while ground driving, on a dry treadmill, or while ponying alongside another horse
    - Start with short 5-minute trot sessions, and gradually build up to 20 minutes
  - then incorporate canter work
    - as with walk and trot work increase your amounts gradually and slowly.
    - During week 1 of canter, one to two laps around the arena in each direction is sufficient, still avoiding tight turns if possible.
    - Increase to 5 minutes of canter with intermittent trot and walk breaks
- Introducing ground poles to a rehabilitating horse:
  - When setting up poles for a rehabilitating horse to walk over, set them at related distances that encourage range of motion in flexion and extension. Over time, increase the number of poles and add height (up to 12 inches).
- Generally, you can introduce sport-specific training, such as jumping, six to eight months into rehab, depending on the rate of healing and severity of case. Small paddock turnout can begin once the horse is

cantering soundly.

Ideas for Strengthening Exercises

- Isometric exercises: most effective when performed 3-4 times daily
  - Start with tail pulls and balance.
    - Have someone hold your horse while you stand by his hip and gently pull on his tail. Keep pulling it toward you until you feel the horse pull back. Hold for 6-10 seconds.
    - Gently pull tail to each side (lateral tail pull) engaging the stifle on each side. Hold the pull for 10 seconds before releasing as the horse braces against the pull, in the process tightening his back, abdominal, and quadriceps muscles. Repeat 10 times per session on each side
    - Holding the horse in a position where they need to actively brace against pressure for a short period, like standing on one leg. Aim to conduct the balance for 6-10 seconds per side for 2-3 times per leg, alternating legs each time. Do not let the horse rest on you, they must be strengthening the leg they are standing on.
  - Prolonged pelvis tucks *butt tucking* 3-5 seconds' hold
  - Asking horse to flex and rest hind hoof on block
  - After about a week you should see an improvement in ability to hold these exercises, then you should be able to move on to more dynamic, in hand exercises.
- Hand-walking with impulsion: Encourage the horse to step forward with purpose while walking in hand and hind feet should track up into where front feet have been. THEN you can progress to back up.
- Use this metric with assessing back up stride to help evaluate stifle progression:
  - The steps of each limb should be similar in length;
  - The horse should be able to pick the leg and hoof up off the ground and place it behind them (they should not drag their toes in this activity);
  - The horse should be able to stay in straight line and not curve in towards the more affected limb side; and
  - The strides should be fast and even, and should clear the ground.
  - If the horse is not performing well, return to increases in isotonic exercises (above)
- Backing up: Asking the horse to back up in hand to actively engage the stifle muscles, start with in hand.
- If horse is progressing well after 2 weeks, beginning walk to trot and trot to walk transitions in hand.
- Later exercises include turning on forehand. Backing up and down hills, completing long line work, navigating ground poles, and performing exercises on a hill. Hold off ridden exercises until around week 8 and only if horse is progressing favorable.
  - 8-10 (3 x week) minutes at a time perform serpentines, zig zags, and halt/walk/halt transitions keeping the variety in your routine in warm up
  - A progressive program of ground poles will also strengthen a horse's stifles. By progressive, one that moves from easy to harder in a stepwise manner over a period of 3+ weeks. As a general guideline, I recommend walking ground pole exercises three to five times weekly and trotting ground pole

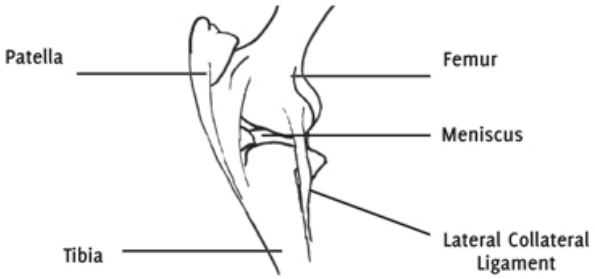
exercise 1 day weekly. For a review on how to space or set up your poles, read my blog post Getting Started with Ground Poles. (from Jec Ballou) (see source link below for full article and access to her amazing videos.)

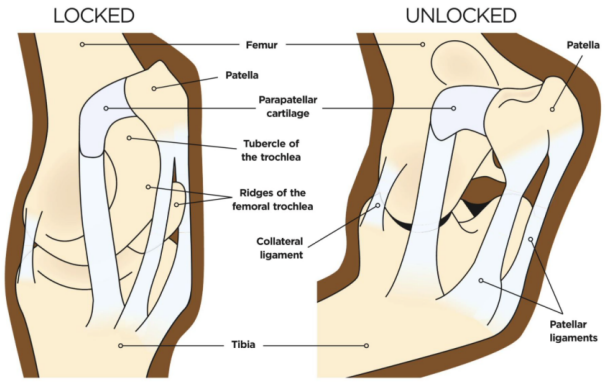
- Progressive using 3+ weeks easy to hard
- Walking poles 3-5 times a week
- Trot poles 1 x week

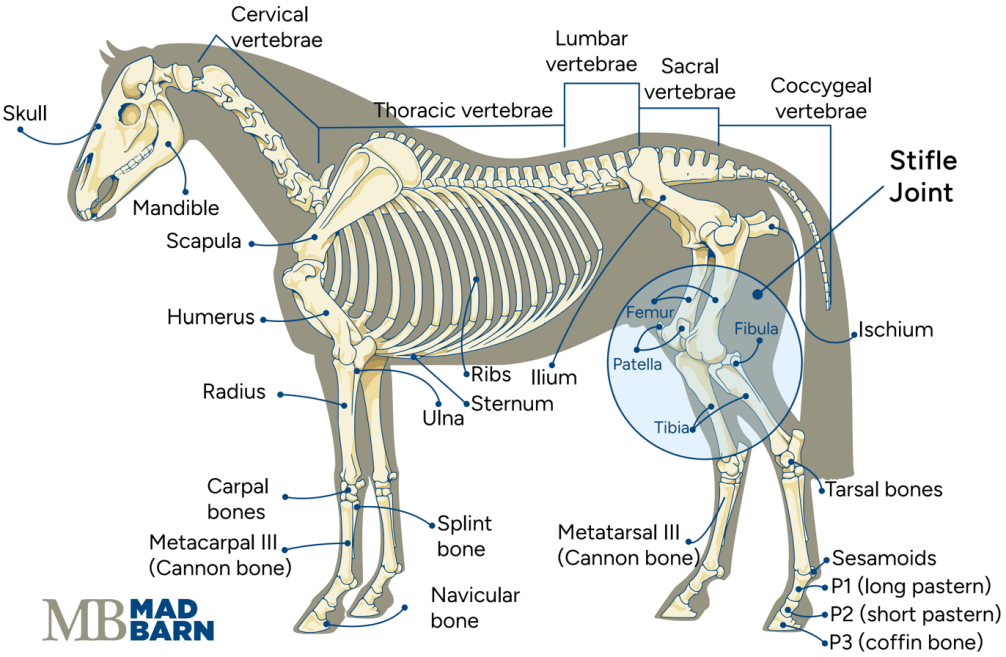
- Assuming your horse has been regularly receiving 4+ days per week of light exercise to this point and has baseline body tone, it is helpful to add 10 to 15 minutes once per week of walking and easy jogging in deep sand footing measuring approximately 4 inches. This increases the work of the hind legs and builds quadricep strength.
- Exercise on slopes or hills proves effective in most horses with stifle dysfunction. However, many students mistakenly think they must march up and down a very steep hillside. Steeper is NOT better, especially if your goal is to create rhythmic, smooth, and balanced stifle activity that sets your horse up with good posture and mechanics for the long term. Find a gentle slope, even a very gradual one will work. Most of us have access to a driveway or a place in the pasture that serves well.
- Regular hill work at walk and trot can strengthen the muscles supporting the stifles and pelvis. Make sure the horse remains straight and does not move the haunches in either direction. Use gentle inclines.
- On a gentle slope, spend 8-10 minutes three times per week using the terrain creatively: make figure 8's across the slope face, ride zig zags, make tons of halt-walk-halt transitions while traversing up and down.
- Walk and trot straight lines (in hand or under saddle)
- When riding in fields, perform serpentines, so the horse uses his quadriceps another inside and outside leg muscles during bending.
- Cavaletti training: Setting up low Cavaletti poles to improve coordination and muscle activation in the hind legs.
- Lunging: Lunging with transitions between gaits to encourage hind leg engagement.

- Stretching:
  - High flexion: Bring the limb up passively into a fully flexed hip and stifle position and hold for 10-30 seconds.
  - Protraction: Bring the limb forward under the horse's belly straight, for hamstrings
  - Retraction: Stretch the limb backward past the tail holding the hock at 90 degrees
  - Adduction: Stretch the hind limb toward the midline under the horse's belly, aiming for in front of the other hind foot
- Balance pads: allow horse to stand on which ever firmness of pad they like for however long they like. Can use Surefoot brand name pads or order stability pads from amazon

Stifle Anatomy Diagrams







Skeletal diagram: Mad Barn.

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