Equine Lameness Exam

A lame horse loses much of its usefulness. Determining the source of lameness will help you to treat it and to prevent it from recurring. To determine the source of lameness one needs to localize the source of pain to a specific joint, tendon, ligament, bone, or structure. It is said that 90 % of lameness is in the foot.

The cause of lameness is usually inflammation in response to injury or to abnormal development. Examining the horse for lameness is therefore a search for inflammation. The horse increases blood supply to the affected region for healing, and the pain helps the horse to protect the site from further injury.

The cardinal signs of inflammation are heat, pain, swelling and redness (calor, dolor, tumor, rubor). However, in the horse we generally can't see redness due to the horse's coat, so we focus on the other three signs. This is done through visual examination and palpation of the limb, including flexion and extension of key joints.

A key part of lameness is examination of all limbs, especially the opposite (contralateral) limb. This is generally used as a convenient "normal" benchmark to detect inflammation.

Upper front leg

The withers represent the region where doral spinous processes of vertebrae and the scapula are close and move relative to each other. This a region where saddle pressure can cause lameness. A well fitted saddle should not contact the spine at any point.

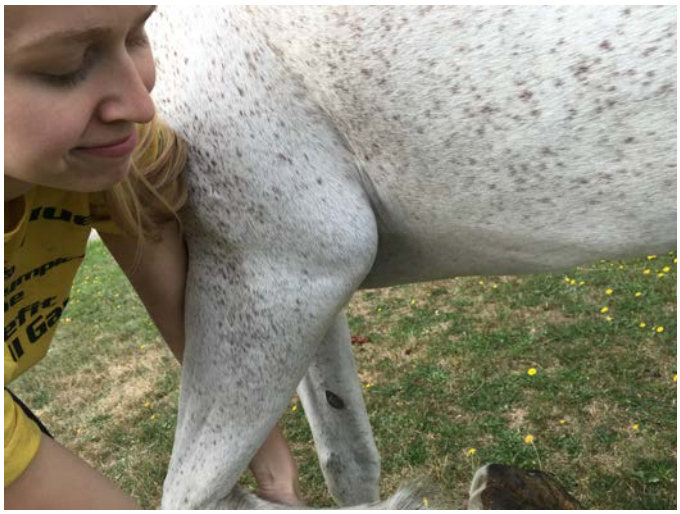
The point of the shoulder represents the location of the scapulo – humeral or shoulder joint. Lameness here is not common but it does occur.

This shows the location of the elbow, also known as the cubital joint. The elbow is a combination of the humero-radial and humero-ulnar joints.

Flexions and extensions

The shoulder may be isolated during extension by pulling the elbow forward, making sure not to overly flex or extend other joints.

The elbow may be isolated in extension by pushing the forearm backwards. Again, make sure other joints are not forcibly flexed or extended.



The knee may be flexed by lifting the cannon bone up against the forearm, without putting pressure on other joints. Note that we are not lifting by the hoof, pastern or fetlock

Fetlock Joint

The fetlock joint is a common site of lameness, especially in ex-racehorses.
To isolate the fetlock in flexion one must brace the knee (e.g. against one's own thigh) so it is not overly flexed, support the cannon bone, and raise the pastern, while letting the hoof hang relatively loose.

Pastern Joint

The pastern joint (proximal interphalangeal joint), is mostly immobile and therefore not usually used for flexion tests. However it can be a site of osteoarthritis (high ringbone).

Coffin Joint

The coffin joint is an important site of lameness, and involves the coffin and navicular bone.
To flex it one must support the pastern and raise the hoof.

Hind leg

The hind leg is a potential source of lameness. It is mostly responsible for propelling the horse, and supports 40 % of the horses weight.

The wing of the ilium (so-called "point of the hip") is not a joint, but part of the pelvic bone. It anchors tendons of muscles which support the abdomen. One of the widest points of the horse, this frequently hits stall doors and is prone to injury.

The croup is where wings of the first sacral vertebrae lie in front of the wings of the ilium, forming the sacroiliac joint. This joint can become inflamed (hunter's bump) and can subluxate, creating asymmetry of the pelvis

The true hip (coxo - femoral joint) is where the femur joins the pelvis. The head of the femur can be palpated deep under the gluteal muscles

The stifle (femoro - tibial joint) is the homolog of the human knee. The medial patella ligament can hook over the distal femur, locking the knee when standing.

Hoof testers

Hoof testers are a useful way to assess pain in the hoof. The horse should not exhibit pain when squeezing the hoof sole to the opposite wall. Work around testing the whole sole. Be sure not to put hoof testers above the coronary band. Hold the front hoof between your knees.

One can squeeze across the frog to the opposite wall. It should be done to both sides of the hoof. This may be a way to elicit a response associated with navicular disease, the coffin joint, or pain in the heel.

The back foot can also be examined with hoof testers. You will need to rest the hind leg on your thigh. Hoof testers can be useful in diagnosing foot abscesses, a common cause of severe lameness, in front and back feet.

Lower leg tendons and ligaments

When you lift the horses leg you will feel these 3 tendons or ligaments become loose.

The **suspensory ligament** extends from the back of the cannon bone to the sesamoid bones. Distal sesamoid ligaments to pastern complete this system of fetlock support.

The **deep digital flexor** tendon is just behind the suspensory ligament. It extend all the way to the coffin bone and flexes the coffin joint.

The **superficial digital flexor** tendon inserts on the pastern, and tend to flex the fetlock while causing extension of the coffin joint if the horse is standing.

Other important structures

The splint bones are long thin bones about the size of a pencil, gradually tapering down from the carpus to a final pea size bump at their distal end, a little above the fetlock. They lie on either side at the back of the cannon bone, and are metacarpals II and IV (or metatarsals II and IV of the back leg). The cannon bone is metacarpal (or metatarsal) III.

The extensor tendon can be strummed on the front of the cannon bone. Why is it so loose in the standing horse while the flexor tendons are so tight?

Reciprocal Apparatus

The reciprocal apparatus of the hind leg causes the hock and stifle always to flex together. This effect is created by the superficial digital flexor tendon and the peroneus tertius extending to fixed points spanning above and below the stifle and hock joints. Flexion of the hock for an extended period (two minutes) followed by watching the horse's gait is an example of a "flexion test" for lameness. In the case of the hock it is called a "spavin test", spavin being a general term for hock lameness. By flexion alone it is difficult to distinguish between hock or stifle lameness

Working with a PVC model of the hind leg it became clear to me that one effect of the reciprocal apparatus is to transmit small but powerful movements of the massive gluteal muscles to large movements of the foot. This greatly augments the range of motion achievable by the hind legs, helping horses to run fast and kick hard. A little movement of the hip joint translates to massive movement at the toe. It is appears to create a sort of biological "fifth gear".