



Objective assessment of spinal ataxia

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The two main cues we are looking for when assessing the gait of a horse is a) whether it is lame or not and b) whether the horse is ataxic or not. Objectively measuring changes in coordination is important a) because subtle changes in gait for both lameness and ataxia is difficult to appreciate especially when the signs are mild and b) because horses may be euthanased or retired if they are neurologically abnormal and considered unsafe to ride.

The nervous components responsible for walking and transitioning between gaits is a complex system consisting of forebrain, thalamus, brainstem, cerebellum and vestibular system. Diseases in different parts of the nervous system results in changes in gait.

There are three main tools that can be used to measure changes in gait: 1) measure the forces of the hoof as the foot hits the ground using force plates, 2) measure how the legs and joints move with millimetre accuracy using reflective markers and motion capture cameras and 3) movement of upper body and leg segments using inertial sensors.

Force plates and motion capture have the advantage of very precise and detailed measurements and the disadvantage of being very expensive and only able to measure few strides at the time. Inertial sensors are portable and cost-effective and are able to measure many strides for immediate analysis and results.

In recent years different research groups have shown that force plates and motion capture are able to pick up the differences between normal and ataxic horses and we have recently shown that putting a blindfold on the horse whilst measuring gait worsens the signs and makes it easier to measure the differences. It is likely that inertial sensors can be utilised to help us differentiate ataxia from normal gait.