

Lameness Locator™ is an inertial sensor-based motion analysis system designed at the University of Missouri as an aid to practicing equine veterinarians for evaluation of lameness in horses. The system consists of 3 small inertial sensors that are attached in a few minutes to the horse's body with tape or Velcro. Each sensor weighs less than 40 grams and is a self-contained unit with a sensing element (accelerometer or gyroscope), radio transmitter and receiver, antennae, microcomputer, battery and other circuitry. Each sensor is about 1.5 by 1.25 by 0.75 inches in dimension. Data from the sensors is transmitted wirelessly up to ¼ mile to a hand-held tablet computer in real time. The data is then analyzed by algorithms developed over the last 15 years that detect lameness and then identify which forelimb and/or hindlimbs are contributing most to the lameness. Other algorithms estimate the timing of lameness to the stride cycle, in other words, "is the pain from lameness occurring at impact, pushoff or during the swing phase of the stride?". This information can be useful to equine veterinarians trying to localize the foci of lameness within the affected limb or limbs. Data processing is fast and conducted in the field while the horse is being evaluated. Lameness Locator™ is designed to be used by equine veterinarians as an ancillary aid to their normal lameness evaluation procedures. It is an objective means to evaluate soundness and lameness in horses before or after blocks or between treatments. It has been tested in over 1500 horses and found to be a reliable method of motion analysis in the horse. It has been tested against and found to be as accurate as the stationary force plate and other camera and marker-based kinematic systems at detecting lameness in the horse, but much more easy to use. The University of Missouri and Equinosis™, the company holding the intellectual property rights for Lameness Locator development, has secured NSF (National Science Foundation) support to further test Lameness Locator™, in more rigid experimental conditions and in 6 field sites around the United States; the University of Missouri Veterinary Teaching Hospital (Columbia, Missouri), Virginia Equine Imaging (Middleburg, Virginia), North Carolina State Veterinary Teaching Hospital (Raleigh, North Carolina), Hagyard Equine Medical Institute (Lexington, Kentucky), Texas A& M Veterinary Teaching Hospital (College Station, Texas) and Pioneer Hospital (Oakdale, California) .