

Temporal-Spatial Gait Analysis of Healthy Labrador Retrievers with a Portable Walkway System



Victoria Light and Dr. Janet Steiss, Dept of Anatomy, Physiology and Pharmacology
College of Veterinary Medicine, Auburn University AL 36849



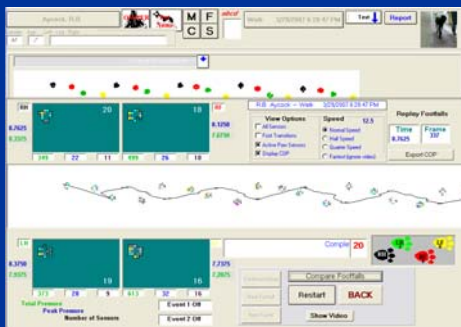
Introduction: Analysis of gait uses a variety of equipment and techniques. These include force plates, 2D kinematics and walkway systems. GAITFour (Platinum © 2006 MAPCIR GAITRite Havertown, PA) is one of the current walkway systems. One of the advantages of using this portable walkway is the ability to capture sequential steps to measure multiple gait cycles with one pass or walk. Some of the parameters that are measured include: center of pressure, stance time, stance % of the gait cycle, stride length, stride time and velocity. Ratios are calculated for a quick glance at symmetry. Other advantages of this gait analysis system are (1) its portability, allowing the researcher to go into the field to collect data, (2) the ability to have walkway systems up to 16 feet or more, (3) automatic foot identification, and (4) simultaneous videotaping.

Materials and Methods: In this preliminary study three healthy Labrador retrievers were used. They ranged in age from 2-4 years with an average weight of 69.23(±2.15)lbs. The walkway system attached to a dedicated laptop was used to collect temporal and spatial parameters at a walk. The velocity of the walk was within the range of 84cm/sec to 199 cm/sec. The dogs walked on a loose leash and a constant velocity without turning their head to the side. Ten walks per day were collected for three consecutive days.

Results: The results indicated that healthy Labrador Retrievers at a walk have an average stride length of 89 cm, a average stride time of 0.75 sec, an average stance % of the gait cycle of 60% in the front and 56% in the hind, and an average stance time of 0.46 sec in the front and 0.42 sec in the hind.

	Stride length (cm)	Stride Time (s)	Stance % of gait cycle	Stance time (s)	Mean Pressure	# of Sensors
Left Front	89.16(±5.88)	0.75(±0.07)	59.86(±0.73)	0.45(±0.06)	2.25(±0.33)	17.46(±2.69)
Right Front	89.10(±5.49)	0.75(±0.07)	60.69(±0.67)	0.45(±0.06)	2.28(±0.32)	17.41(±2.67)
Left Hind	89.41(±5.59)	0.75(±0.07)	55.44(±1.18)	0.42(±0.06)	2.09(±0.34)	13.10(±2.47)
Right Hind	89.26(±6.18)	0.75(±0.07)	56.35(±0.60)	0.42(±0.06)	2.07(±0.32)	13.09(±2.83)

Table 1. Preliminary data showing the mean and standard deviation from three healthy Labrador retrievers at a walk measured by the GaitFour system.



Summary and Future Plans: More dogs will be added to complete this study. In addition, possible correlation between body height, body length and stride length will be determined.

The walkway is being adapted for application for cats and other smaller animals weighing under 15 pounds. The walkway system offers a novel method for obtaining objective measurements of gait in small animals such as cats and laboratory rats when studying treatments for spinal cord regeneration, etc.