A Method of Prototype Evaluation for Assistive Mobility in Animals: Intervention for a Congenitally Malformed Dog – A Case Study

Background: There are several studies report successful fittings of tripedal quadruped animals with prosthetic devices, but very few report fittings of bipedal quadrupeds. None of these studies report how the animals were trained to use their assistive devices or how the device was developed.

Research Focus: To develop a method to train animals to use assistive devices and measure their mobility in order to determine the success or failure of prototype design.

Methods: The overall goal of the assistive device(s) for the bilateral front limb deficient dog was to increase the animal’s mobility. Increased mobility can be divided into two distinct design goals: 1) design a usable device(s); 2) verify increased mobility. The first design goal is broken up into 3 steps: a) the owner must be able to don & doff the device(s); b) the dog must tolerate the devices; and c) the dog must be able to ambulate 5 feet in the device(s). The second goal was achieved via an adaptation of the Timed Up & Go test (see diagram to right). A successful trial was determined to begin when dog decided to leave the 10" square box and ended when dog crossed the line 5 feet later. A failed trial was determined to be when the dog refused or was unable to finish, or the dog required assistance.

Results & Discussion: After eight prototype designs over the course of 10 weeks, a design suitable for a timed up and go test was achieved. The test revealed an increase in mobility so the device was delivered to the owner. A decision tree was developed for prototype design and can be generalized to any animal requiring an assistive device.
References for Presentation


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• Information on Faith the biped dog provided by http://www.gizmag.com/go/5715/

• Cart systems information, pictures and pricing provided by HandicappedPets.com, K9carts.com, and eddieswheels.com

• Pictures for dog rang of motion provided by http://cal.vet.upenn.edu/saortho/appendix_b/appb.htm#shoulder