

Horses and Humans Research Foundation

Grant award summary

2006 *Improvement in Trunk/Head Stability and Upper Extremity Control after HPOT*

Washington University of Medicine, Program in Occupational Therapy St. Louis, MO- Principal Investigators: Tim Shurtleff, Dr. Jack Engsberg, Dr. John Standeven

The study investigated changes in control of head, trunk and upper extremity movement following hippotherapy treatment (use of the rhythmic movement of a horse to effect therapeutic gains) in children with spastic diplegia cerebral palsy. They rode a motorized barrel in the motion laboratory for several 15 second tests while video cameras measure their ability to control body movements and measure their performance on multiple simple reaching tasks. Participants then completed a session in hippotherapy before being re-tested in the motion lab. After another three months (no hippotherapy), participants were tested again.

Results: HPOT appears to improve basic movement skills that are maintained after the intervention ceases. The persistence of these positive changes when no longer receiving HPOT treatment suggests that the motor control improvements learned on a horse may become available as a foundation upon which to build improved functional skills in other aspects of life.

Publications: "Changes in Dynamic Trunk/Head Stability and Functional Reach after Hippotherapy" was published in the Archives of Physical Medicine and Rehabilitation, 2009 Jul;90(7):1185-95.

2008 *The Effect of Equine Assisted Activities on the Social Functioning in Children with Autism*

Good Hope Equestrian Training Center Miami, FL- Principal Investigator: Dr. Margaret Bass

The study evaluated the effects of therapeutic horseback riding lessons (TR) on the social function and attention of children, ages 7 -12, who are diagnosed with autism. The experimental group received therapeutic riding lessons once a week for 12 weeks. The control group did not have any exposure to riding lessons during the study period. Outcome measures were taken before and after the 12 week study period. The subjects' parents and teachers completed the Social Responsiveness Scale and Sensory Profile. The two groups were compared between pretest and posttest. The experimental group was tested again after 8 weeks of no TR.

Results: An observed increase in social functioning was found in the experimental group, as well as improvement in sensory seeking, emotional reactive, inattention/distractibility and sensory sensitivity. Although, following the initial posttest for the experimental group it was found that some of these effects had subsided. The results do indicate that EAA services are a beneficial intervention for this population.

Publications: Pilot study results published in the *Journal for Autism & Developmental Disorders*)

2008 *Hippotherapy to Improve Postural Control in Children with Cerebral Palsy*

Faculté de médecine et Des Sciences de la santé, Université de Sherbrooke Québec, Canada

Université du Québec a Trois-Rivières, Département des sciences de l'activité physique Trois-Rivières,

Canada-Principal Investigators: Dr. Helene Corriveau, Dr. Claude Dugas, Danielle Champagne

The study measured the effect of a ten week Hippotherapy [HPT] intervention on the control of head and trunk movement for children with cerebral palsy. The research design incorporated appropriate baseline and outcome laboratory measures, but was unique in using novel instrumentation to chart the subject's progress in therapy, while simultaneously controlling the movement of the horse. Subjects, and their therapeutic mounts, were fitted with portable, telemetry recording, accelerometers. These devices recorded the speed and magnitude of the subjects' upper body and head displacement, as they were actually mounted and engaged in HPT. The accelerometry data allowed the investigators to demonstrate specific pre and post treatment effects, and the evolution during treatment of greater head and trunk, postural

control. Ten weeks after the end of treatment the subjects were evaluated the same way to determine if the observed changes were maintained by the subjects.

Results: The investigators concluded that hippotherapy provided by trained therapists who apply a graded intensive treatment plan can improve different aspects of function and strength. It was also determined that these improvements were maintained in follow up.

Publication: Submitted

2010 Basic neurobiological and psychological mechanisms underlying therapeutic effects of Equine Assisted Activities (EAA/T)

University of Rostock, Germany-Principal Investigators: Dr. Andrea Beetz, Dr. Henri Julius, Dr. Kurt Kotrschal, and Dr. Kerstin Uvnas-Moberg

The study tested the theoretical basis for the effects of equine assisted activities on youth with social and emotional disorders. In the first of two controlled trials, the research team investigated whether human-horse interactions have a positive effect on difficult mother-child relationships. The hypothesis was that children in the EAA group would show more improvement in the mother-child relationship and interaction due to the activation of the oxytocin system by the interaction with the horse, than the control group without animal support. In the second controlled trial, the research team explored if human-horse interactions facilitated the development of a trustful relationship between an insecurely attached child and his or her therapist which would allow the child to open up and talk about emotionally stressful situations.

Results: All data pointed to advantages of EAA for communication and interaction of the mother-child dyad. In the first study mothers of boys improved more with regard to their compulsive caregiving than in the control group as the mothers learned boys need space and the difference between controlling versus caregiving. The majority of the results of study 2 supported the investigators assumption that EAA promotes more relaxation, more (nonverbal) communication with the therapist, and more openness to talk about relevant topics. Findings further support the assumption that positive effects are connected to the activation of the oxytocin system via interaction with the animals and/or via a triadic effect of subject-animal-therapist.

Publications: Submitted

2010 Effects of Hippotherapy on Balance and Gait in Ambulatory Children with Spastic Cerebral Palsy

Central Michigan University-Principal Investigators: Debbie Silkwood-Sherer and Nancy McGibbon

The study determined if the addition of 12 weekly hippotherapy sessions to a child's usual therapy program would improve balance and gait. Thirty children with spastic cerebral palsy, ages 3 – 6 years, were recruited. Balance and gait measures were the pediatric balance scale, the standardized walking obstacle course, and the 1-minute walk test. The Activities Scale for Kids (5-6 yr) and the Children's Assessment of Participation and Enjoyment-preschool version (3-4 yr) measured activities and participation. The Beery Test of Motor Integration measured visual-motor integration, and the PedsQL-CP was used to measure health-related quality of life. Statistical analysis of the data determined if the children who received hippotherapy made greater gains on the tests than those who did not receive hippotherapy and if there are correlations between the specific measures.

Results: The findings suggest that hippotherapy may be a viable strategy for reducing balance deficits and improving the performance of daily life skills in children with mild to moderate balance problems.

Publication: Pilot study for this project was published in *Physical Therapy, Journal of the American Physical Therapy Association* May, 2012

2011 Effects of Hippotherapy on Children with Autism Spectrum Disorders

Washington University of Medicine, Program in Occupational Therapy St. Louis, MO- Principal Investigators: Tim Shurtleff

The team is measuring outcomes from Occupational and Physical Therapy using horse movement (Hippotherapy) for children with Autism Spectrum Disorder (ASD). The project is following fifteen children with Autism Spectrum Disorder as they participate in 12 weeks of weekly hippotherapy sessions using

objective quantitative data collection in addition to qualitative standardized clinical scales that are typically used for such studies. Age and gender-matched children without disabilities will provide a neurotypical comparison in the motor skill aspects of the study. Assessments will be taken 12 weeks before, immediately before and 12 weeks after the hippotherapy interventions. The team will explore relationships between physical skill changes and sensory processing improvements that many have observed after hippotherapy treatment with this population and how those changes are related to social responsiveness. It is hypothesized that these changes together affect their lifelong ability to participate in age-appropriate activities.

Publications: **Pilot study results published in American Journal of Occupational Therapy, Nov/Dec 2013**

2012 *Effects of Equine-Assisted Activities on PTSD Symptoms, Coping Self-Efficacy, Emotion Regulation, and Social Engagement in Military Veterans*

Research Center for Human-Animal Interaction, University of Missouri, College of Veterinary Medicine Columbia, MO- Principal Investigator: Dr. Rebecca Johnson

The team is examining the effects of 6 weeks of human-horse interaction and systematic therapeutic horseback riding on 40 U.S. military veterans with Post Traumatic Stress Disorder and/or Traumatic Brain Injury. The intervention's impact on participants' experience of PTSD symptoms as well as on their coping skills, emotional regulation and social engagement will be assessed. Participants will be randomly assigned to an experimental group or to a control group. The experimental or Riding Group will spend one hour per week interacting with and riding the same horse at one of three accredited riding centers under the supervision of an Occupational Therapist. Participants will be evaluated when they enter the study and after 3 and 6 weeks of participation. The control group will be assessed at the same intervals, then again on the same basis during their participation.

2013 *Effects of Equine Facilitated Psychotherapy on Post-Traumatic Stress Symptoms in Male Youth*

Tufts University Cummings School of Veterinary Medicine New Grafton, MA-Principal Investigator: Dr. Megan Mueller

The team is investigating changes in levels of PTSD symptomatology as measured by the Children's Revised Impact of Event Scale (CRIES-13) and levels of the human-animal bond as measured by the Human-Animal Bond Scale (HABS) in male children and adolescents ages 10-18 over the course of a 10-week Equine Facilitated Psychotherapy (EFP) intervention. Members of the treatment group will participate in 10, two hour sessions of EFP over the course of 12 weeks. Control participants will not receive any EFP, but will continue to receive their already existing therapeutic services provided by their treatment facility. Both groups will complete a survey prior to beginning the program, at 5 weeks after the start of the program, and at the completion of the 10 week program. The surveys will include measures of PTSD symptomatology. Multivariate Repeated Measures Analysis of Variance (MANOVAs) will be used to compare both within group and between group (treatment and control) change in the CRIES-13 and HABS between the baseline, week 5 and week 10.

Additional information: www.Horsesandhumans.org

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