
Silkwood-Sherer D, Warmbier H (2007) J Neurol Phys Ther. Jun;31(2):77-84. PURPOSE: The purpose of this pilot study was to examine the effectiveness of hippotherapy as an intervention for the treatment of postural instability in individuals with multiple sclerosis (MS). SUBJECTS: A sample of convenience of 15 individuals with MS (24-72 years) were recruited from support groups and assessed for balance deficits. METHODS: This study was a nonequivalent pretest-posttest comparison group design. Nine individuals (4 males, 5 females) received weekly hippotherapy intervention for 14 weeks. The other 6 individuals (2 males, 4 females) served as a comparison group. All participants were assessed with the Berg Balance Scale (BBS) and Tinetti Performance Oriented Mobility Assessment (POMA) at 0, 7, and 14 weeks. RESULTS: The group receiving hippotherapy showed statistically significant improvement from pretest (0 week) to posttest (14 week) on the BBS (mean increase 9.15 points ($x (2) = 8.82, p = 0.012$)) and POMA scores (mean increase 5.13 ($x (2) = 10.38, p = 0.006$)). The comparison group had no significant changes on the BBS (mean increase 0.73 ($x (2) = 0.40, p = 0.819$)) or POMA (mean decrease 0.13 ($x (2) = 1.41, p = 0.494$)). A statistically significant difference was also found between the groups' final BBS scores (treatment group median = 55.0, comparison group median 41.0), $U = 7, r = -0.49$. DISCUSSION: Hippotherapy shows promise for the treatment of balance disorders in persons with MS. Further research is needed to refine protocols and selection criteria.

An exploration of German and British physiotherapists’ views on the effects of hippotherapy and their measurement.

Debuse D, Chandler C, Gibb C. (2005) Physiother Theory Pract. Oct-Dec;21(4):219-42. Hippotherapy (Greek hippos = horse) is a specialized physiotherapy treatment that makes use of the horses’ unique three-dimensional movement impulses at a walk to facilitate movement responses in patients sitting on the horse’s back (Strauss, 2000). Despite a substantial body of anecdotal and clinical evidence for its benefits, research evidence for hippotherapy is sparse. This questionnaire survey was the first study in a series of investigations exploring the views of physiotherapists and people with cerebral palsy who use hippotherapy. These investigations, in turn, form the basis from which the authors will recommend outcome measures for individuals with cerebral palsy in a hippotherapy environment. This study aimed to: (a) establish the pattern of hippotherapy practice in Germany and the U.K.; (b) examine the perceived main effects of hippotherapy on people with cerebral palsy in Germany and
the U.K.; and (c) investigate how these effects are being measured in both countries. The results highlighted considerable differences in how hippotherapy is practiced in the U.K. compared with in Germany. In spite of this, the study revealed agreement among respondents on the overall perceived effects of hippotherapy on individuals with cerebral palsy, namely, the regulation of muscle tone, improvement of postural control and psychological benefits. The results also indicate scant use of outcome measures to evaluate these effects. The impact of these findings is discussed in the light of published research, and suggestions for further research are made.


Hammer A, Nilsagård Y, Forsberg A, Pepa H, Skargren E, Oberg B. (2005) Physiother Theory Pract. Jan-Mar;21(1):51-77. The aim of this study was to investigate whether therapeutic riding (TR, Sweden) hippotherapy (HT, United States) may affect balance, gait, spasticity, functional strength, coordination, pain, self-rated level of muscle tension (SRLMT), activities of daily living (ADL), and health-related quality of life. Eleven patients with multiple sclerosis (MS) were studied in a single-subject experimental design (SSSD) study, type A-B-A. The intervention comprised ten weekly TR/HT sessions of 30 minutes each. The subjects were measured a maximum of 13 times. Physical tests were: the Berg balance scale, talking a figure of eight, the timed up and go test, 10 m walking, the modified Ashworth scale, the Index of Muscle Function, the Birgitta Lindmark motor assessment, part B, and individual measurements. Self-rated measures were: the Visual Analog Scale for pain, a scale for SRLMT, the Patient-Specific Functional Scale for ADL, and the SF-36. Data were analyzed visually, semi-statistically and considering clinical significance. Results showed improvement for ten subjects in one or more of the variables, particularly balance, and some improvements were also seen in pain, muscle tension, and ADL. Changes in SF-36 were mostly positive, with an improvement in Role-Emotional seen in eight patients. Conclusively, balance and Role-Emotional were the variables most often improved, but TR/HT appeared to benefit the subjects differently.

The effect of hippotherapy on ten children with cerebral palsy.

Casady RL, Nichols-Larsen DS. (2004) Pediatr Phys Ther. Fall;16(3):165-72. PURPOSE: The purpose of this study was to determine whether hippotherapy has an effect on the general functional development of children with cerebral palsy. METHODS: The study employed a repeated-measures design with two pre-tests and two post-tests conducted 10 weeks apart using the Pediatric Evaluation of Disability Inventory (PEDI) and the Gross Motor Function Measure (GMFM) as outcome measures. A convenience sample of 10 children with cerebral palsy participated whose ages were 2.3 to 6.8
years at baseline (mean +/- 4.1 +/- 1.7 sd). Subjects received hippotherapy once weekly for 10 weeks between pre-test 2 and post-test 1. Test scores on the GMFM and PEDI were compared before and after hippotherapy. RESULTS: One-way analysis of variance of group mean scores with repeated measures was significant (p < 0.05) for all PEDI subscales and all GMFM dimensions except lying/rolling. Post hoc analyses with the Tukey test for honest significant differences on the PEDI and GMFM total measures as well as GMFM crawling/kneeling and PEDI social skills subtests were statistically significant between pre-test 2 and post-test 1. CONCLUSIONS: The results of this study suggest that hippotherapy has a positive effect on the functional motor performance of children with cerebral palsy. Hippotherapy appears to be a viable treatment strategy for therapists with experience and training in this form of treatment and a means of improving functional outcomes in children with cerebral palsy.

Hippotherapy.
Meregillano G. (2004) Phys Med Rehabil Clin N Am. Nov;15(4):843-54, vii. Hippotherapy refers to the use of the movement of the horse as a treatment strategy by physical therapists, occupational therapists, and speech-language therapists to address impairments, functional limitations, and disabilities in clients with neuromusculoskeletal dysfunction, such as cerebral palsy. Hippotherapy is used as part of an integrated treatment program to achieve functional outcomes. Hippotherapy engages the client in activities on the horse that are enjoyable and challenging. In the controlled hippotherapy environment, the therapist modifies the horse’s movement and carefully grades sensory input, establishing a foundation for improved neurologic function and sensory processing. This foundation can be generalized to a wide range of daily activities, making the horse a valuable therapeutic tool for rehabilitation.

Improvements in muscle symmetry in children with cerebral palsy after equine-assisted therapy (hippotherapy).
Benda W, McGibbon NH, Grant KL. (2003) J Altern Complement Med. Dec;9(6):817-25. OBJECTIVE: To evaluate the effect of hippotherapy on muscle activity in children with spastic cerebral palsy. DESIGN: Pretest/post-test control group. SETTING/LOCATION: Therapeutic Riding of Tucson (TROT), Tucson, AZ. SUBJECTS: Fifteen (15) children ranging from 4 to 12 years of age diagnosed with spastic cerebral palsy. INTERVENTIONS: Children meeting inclusion criteria were randomized to either 8 minutes of hippotherapy or 8 minutes astride a stationary barrel. OUTCOME MEASURES: Remote surface electromyography (EMG) was used to measure muscle activity of the trunk and
upper legs during sitting, standing, and walking tasks before and after each intervention. RESULTS: After hippotherapy, significant improvement in symmetry of muscle activity was noted in those muscle groups displaying the highest asymmetry prior to hippotherapy. No significant change was noted after sitting astride a barrel. CONCLUSIONS: Eight minutes of hippotherapy, but not stationary sitting astride a barrel, resulted in improved symmetry in muscle activity in children with spastic cerebral palsy. These results suggest that the movement of the horse rather than passive stretching accounts for the measured improvements.

The short-term effect of hippotherapy on spasticity in patients with spinal cord injury.

Lechner HE, Feldhaus S, Gudmundsen L, Hegemann D, Michel D, Zäch GA, Knecht H. (2003) Spinal Cord. Sep;41(9):502-5. STUDY DESIGN: Assessment of spasticity before and after hippotherapy treatment. OBJECTIVE: To evaluate the short-term effect of hippotherapy on spasticity of spinal cord injured patients (SCIs). SETTING: Swiss Paraplegic Centre, Nottwil. METHODS: 32 patients with spinal cord injury with various degrees of spasticity had repeated sessions (mean 11) of Hippotherapy-K. Spasticity of the lower extremities was scored according to the Ashworth Scale. RESULTS: In primary rehabilitation patients Ashworth values after hippotherapy were significantly lower than before (Wilcoxon’s signed-rank test: P<0.001). Highest improvements were observed in SCIs with very high spasticity. No significant difference between short-term effect in paraplegic and short-term effect in tetraplegic subjects was found. CONCLUSIONS: Hippotherapy significantly reduces spasticity of lower extremities in SCIs.

Effect of an equine-movement therapy program on gait, energy expenditure, and motor function in children with spastic cerebral palsy: a pilot study.

McGibbon NH, Andrade CK, Widener G, Cintas HL. (1998) Dev Med Child Neurol. Nov;40(11):754-62. The purpose of this study was to evaluate the effects of an 8-week program of hippotherapy on energy expenditure during walking; on the gait dimensions of stride length, velocity, and cadence; and on performance on the Gross Motor Function Measure (GMFM) in five children with spastic cerebral palsy (CP). A repeated-measures within-subjects design was used consisting of two baseline measurements taken 8 weeks apart, followed by an 8-week intervention period, then a posttest. After hippotherapy, all five children showed a significant decrease (X2(r)=7.6, P<0.05) in energy expenditure during walking and a significant increase (X2(r)=7.6, P<0.05) in scores on Dimension E (Walking, Running, and Jumping) of the GMFM. A trend toward increased stride length and decreased cadence was observed. This study suggests that hippotherapy may improve energy expenditure during walking and gross motor function in children with CP.
Influence of Hippotherapy on the Kinematics and Functional Performance of Two Children with Cerebral Palsy.

Haehl V, Giuliani C, Lewis C. (1999) Pediatric Physical Therapy 11:99-101. Therapists use hippotherapy to improve postural control in children with neuromotor dysfunction. Understanding the influence of the horse’s movement on the child may clarify mechanisms, which influence posture during hippotherapy. This study was conducted in two phases. First measures of the kinematic relationship between the rider and the horse were developed. A kinematic analysis of the rider’s trunk and the horse’s back was used to describe postural orientation, postural stability, and temporal phase relations of a novice and an experienced rider. Both riders exhibited biphasic movement patterns in response to the horse’s movement. The experienced rider had a more vertical orientation of the trunk and delayed postural response to the movement of the horse. Next we examined the influence of 12 weekly hippotherapy sessions on the postural control, coordination, and function of two children with cerebral palsy. Both children with cerebral palsy approximated the biphasic movement patterns exhibited by the two children developing typically. Both also demonstrated improved coordination between the upper and lower trunk, and between the lower trunk and the back of the horse. One child’s functional mobility improved.

Hippotherapy as a method for complex rehabilitation of patients with late residual stage of infantile cerebral palsy.

Sokolov PL, Dremova GV, Samsonova SV. (2002) Zh Nevrol Psikhiatr Im S S Korsakova.;102(10):42-5. Influence and therapeutic efficacy of horseback riding (hippotherapy) as a method for complex rehabilitation of patients with late residual stage of infantile cerebral palsy were studied. Significant increase of a range of active and passive movements in large joints of lower extremities, higher, indices of hand dynamometry on the left, of vital lung capacity as well as a relief of relief of reactive and personality anxiety and depression, higher motivation for rehabilitation treatment, etc., were registered. Neurophysiological study revealed significant changes of afferentation at stem and thalamus cortical levels and of spectral components of cortical rhythmics. The data obtained allow us to consider hippotherapy as an effective method of complex rehabilitation of patients with late residual stage of infantile cerebral palsy. A combination of sensory stimulation and motor rehabilitation components may be a key mechanism of positive effect.