The Benefits of Therapeutic Horseback Riding for Cerebral Palsy Children

Information brochure for health professionals, care givers and families of CP children
Therapeutic Horseback Riding

Horses have always been appreciated by humans for their strength, beauty, and gentle manner. However, horses can play a very different role in the lives of children and adults with disabilities. Therapeutic horseback riding is a physical and occupational therapy that uses the movement of the horse as a treatment tool. Therapeutic riding addresses impairments, functional limitations, and disabilities in clients with neuromusculoskeletal dysfunction, such as cerebral palsy. It is used as part of an integrated treatment program to achieve functional outcomes, and engages the client in activities on the horse that are enjoyable and challenging. Therapists modify the horse's movement and carefully grade sensory input, establishing a foundation for improved neurological 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.

Therapeutic riding, in the literal sense, has existed for many years. In 1952, Madam Liz Hartel of Denmark, who had poliomyelitis, brought recognition to the field by winning the silver medal for Grand Prix Dressage at the Helsinki Olympics after she had rehabilitated herself by riding. After this event, international attention began focusing on the therapeutic use of horse riding. Therapeutic riding began to spread across Europe and the United States. The North American Riding for the Handicapped Association (NARHA) was formed in the 1960’s and is up to now one of the leading organizations in the world, serving 42,000 individuals with disabilities, in more than 700 NARHA centers across the United States and Canada.

Any riding program using horse related activities for clients with physical, mental, cognitive, social or behavioral problems is a therapeutic riding program. However, Therapeutic riding is a broad term used to describe several methods of providing treatment to people with disabilities. Hippotherapy (hippo in Greek means 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 positioned on the horse. Therapeutic riding also includes riding and vaulting in special education, riding as a sport for people with a disability, and for the last ten years or so, the use of horses in psychology and psychiatry.
What are the benefits?

Evidence suggests that Therapeutic riding and Hippotherapy are efficacious, and medically indicated as therapy for gross motor rehabilitation in children with CP. The sensation of smooth, rhythmical movement made by the horse improves co-contraction, joint stability and weight shift, as well as postural and equilibrium reactions. The list of beneficial effects expands further and is presented as following;

**Improved balance and postural control**

As part of the postural control mechanism which develops during riding, the balance develops as well. This can be attributed to the three dimensional movement of the horse which moves its center of gravity in three directions; forward – backward, upward – downward, and to the sides (left – right). This movement transfers to the rider's body and causes balance disturbance with every single step the horse performs. In order to remain in balance while riding, equilibrium reactions develop and are generated through every step of the horse. The changes in the horse's pace as it progresses from walk to trot and trot to canter, or the lengthening of the horse's strides assist in improving the rider's balance. The use of stirrups assists in the development of balance as the sensory intake of weight bearing increases.

**Improved coordination**

Horseback riding improves coordination and hasten reflexes activity. These develop subsequently to the improvement of postural control mechanism and equilibrium reactions. The rider must learn how to coordinate his various body parts in order to influence the horse.

**Regulation of muscle tone**

During riding, the rider's body follows the rhythm of the horse. The rider alternately contracts and releases different muscle groups. This action relaxes both body and mind. Apart from the mobility benefit, the position required while sitting on the horse and holding the reins assists in eliminating components of pathological patterns. In addition the horse's body temperature appears to have influence as well. The warmth of the horse's body along with its slow rhythmical movement assists in spasm reduction.
Increased joints range of motion
When spasticity is reduced, range of motion (ROM) increases. Riding and its accompanied activities enhances mobility and as a result, ROM may increase; Stepping on the horse, the actual sitting position on the horse's back and stepping down from the horses' back encourage extension in the thoracic spine and flexion in the lumbar spine. In this way these actions enhance increased ROM. Petting and hugging the horse encourage increased ROM in the upper limbs and assist in the reduction of spasm due to the protraction position in the scapula and the extension position of the elbow and wrist.

Improved muscle symmetry
Studies evaluated the effect of hippotherapy on muscle activity in children with spastic cerebral palsy and demonstrated significant improvement in symmetry of muscle activity, especially in muscle groups displaying the highest asymmetry prior to hippotherapy. The improvement in symmetry was typically achieved through a reduction in activity of the overactive muscle group and a corresponding increase in muscle activity on the contralateral side adjusting to maintain balance.

Improved weight bearing & weight shifting capabilities
When the rider is sitting properly and places an equal pressure on the stirrups in dorsi flexion position at the ankle, he gains feeling of weight bearing and weight shifting in each leg alternately, which occur in response to the movements of the horse's legs. This feeling closely resembles the feeling established during normal walking.
Increased sensory input

The sensory stimulation transfers from the horse to the receptors in the human body. In this way we can utilize the sensory integration created by the moving horse, in order to help people to improve body equilibration, balance, coordination, speech, bodily awareness, memory, self esteem and more. Touch stimulation, vestibular stimulations and orientation stimulation are dominant factors in the motorical development of a child. Riding horses is an easy method to create these stimulations. During riding the rider feels the mobile surface under his body; the muscles and joints receive these sensory inputs through the many proprioceptors and adjust the reactions accordingly. When sitting on the horse, the rider has a higher point of view. For some children this is the first time in a long while that they are able to look at the world around them from a high and entirely different point of view; this amplifies the visual and vestibular systems.

The new perceived information allows the rider to rediscover his own body capabilities and reveal the degree of control one has on his own body.

Vestibular stimulation;

Individuals with limited mobility lack vestibular stimulations so that the disorder not only persists but deteriorates with time. During horseback riding, the child may comprehend and perceive the three dimensional rhythmical movements, which serve as a unique and efficient method for vestibular stimulation for patients with impaired and limited mobility.

Proprioceptive stimulation;

The proprioceptive sense is believed to be composed of information from sensory neurons located in the inner ear (motion and orientation) and in the stretch receptors located in the muscles and the joint-supporting ligaments. During horseback riding, the rider receives a lot of information from his muscles and joints, and needs to process the continuous information throughout the quick movements and rhythm changes. Rhythm changes contribute to increase senses activity. The rider gradually learns to move in harmony with the horse's movement and to be aware of his body centre position in relation to the horse.
**Improved walking abilities**

The three-dimensional, reciprocal movement of the walking horse produces normalized pelvic movement in the rider; this may be the result of a distinct similarity in pelvic displacements found between the horse and the human. The movement angle of the horses’ pelvic at walk is very similar to that of a human pelvis during walking. The aspects of walking ability investigated in research includes parameters such as weight transfer from one leg to the other, ability to stand without support, ability to walk without using a walking aid, and ability to stop and turn successfully. Functional improvement was gained during hippotherapy and maintained several months later.

**Improved gross muscle function**

Many studies about the benefits of Therapeutic riding use the GMFM (Gross Muscle Function Measure) as their measurement tool. The GMFM was developed for use with children with CP to evaluate the effect of treatment over time on gross motor function without regard to the quality of the performance. GMFM is composed of 88 test items and is categorized into 5 developmental dimensions by test position: Dimension A (lie/roll), Dimension B (sit), Dimension C (crawl/kneel), Dimension D (stand), and Dimension E (walk/run/jump). Therapeutic riding programs demonstrated improved GMFM total score, Dimension E score in particular.

**Psychological benefits**

Not only physical, but also psychological benefits are attributed to horse riding. Testimonies of parents, therapists and patients bear witness to psychosocial benefits that include increased motivation, higher self-esteem, better concentration and academic performance. Although the physical effects of hippotherapy tend to be of most interest to physiotherapists and doctors, there is a substantial and growing body of evidence of the psychological and emotional benefits of horse-human interaction in therapeutic riding in general.
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