

## Changes in Dynamic Trunk/Head Stability and Functional Reach after Hippotherapy

**Source:** Shurtleff, T., Standeven, J., Engsborg, J., (2009). Changes in dynamic trunk/head stability and functional reach after hippotherapy. *Archives of Physical Medicine and Rehabilitation*. 90(7), 1185-1195.

### **Purpose:**

Does hippotherapy change head/trunk stability in children with spastic diplegia cerebral palsy (SDCP), also, whether their reaching speed/efficiency has been changed?

### **Design/Methods:**

This study investigated whether both head/trunk control and reaching/targeting could be improved due to hippotherapy. There were 11 children between the ages 5-17, average age was 8, with SDCP who participated in this study. They had to be able to sit upright without any help, able to communicate, follow directions, abduct hips, and be available for 26 weeks. After the intervention group was recruited, 8 without disability children were recruited to match the ages of the intervention group. The children receiving hippotherapy were on the horse for 45 minutes, 1 time/week for 12 weeks. Either a licensed occupational, or occupational assistant, or physical therapist delivered the therapy. An experienced leader led the horses, and the horse could walk or trot during therapy. While on the horse the child would perform UE activities, stretches, cognitive games, and exercises. The kids with SDCP were measured before the intervention, within 2 weeks of receiving hippotherapy, after receiving hippotherapy for 12 weeks and then again at a follow-up session. They compared the kids' performance on head/trunk stability tests and a hand reaching test to the kids they matched in age without a disability, the "control group." The researchers used a video motion capture using surface markers on a mechanical barrel to measure trunk/head stability, and functional reaching on a static surface.

### **Results:**

Children with SDCP showed a significant change in head control pre vs post and also into the follow-up. Significant changes in range of motion and minimum head angle were kept from pre to follow-up, but there was no significant change between post-follow-up. There was a reduction in movement for all participants. There was significant reduction in horizontal translation at C7 and Vertex from pre all the way to the follow-up. The reach path ratio, elapsed time decreased from pre through follow-up significantly.

### **Conclusion:**

With only 12 sessions of hippotherapy, children with SDCP can greatly improve range of head, trunk, and upper extremity control.

### **Strengths:**

The strengths of this study included the use of objective measurement tools in VMC and a motorized barrel when assessing for head and trunk control changes and the consistency of treatment session length.

### **Limitations:**

The SDCP group was also receiving OT and PT therapy along with hippotherapy, which could contribute to their performance improvement. The hand-reaching test was designed for persons who had a stroke, not kids with SDCP. Also, the sample size was small, the effects of dosage (going for a longer intervention period), different levels of intensity during therapy, the authors discuss they did not have 2 pre-intervention baseline assessments.

### **Practical Application:**

This study adds significant results to the literature and investigates the affect hippotherapy can have on children with SDCP, the impact it can have on trunk/head stability, and if kids can improve on the reach tasks and all of its implications. This particular study touched on areas that had not been previously explored in research, thus resulting on a contribution to the area of hippotherapy.