

DEVELOPMENT OF A STRUCTURED HORSEBACK RIDING THERAPEUTIC  
PROGRAM FOR YOUNG ADULTS WITH CEREBRAL PALSY

HONORS THESIS

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DEVELOPMENT OF A STRUCTURED HORSEBACK RIDING THERAPEUTIC  
PROGRAM FOR YOUNG ADULTS WITH CEREBRAL PALSY

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## **Abstract**

This research concentrates on the development of a therapeutic horseback riding program for young adults with Cerebral Palsy enrolled in the non-profit program, Always Wanted a Riding Experience (A.W.A.R.E) in San Marcos, Texas. This project involves a 21- year-old female with severe spastic quadriplegia Cerebral Palsy. The structured program will target the physiological benefits for her body as well as incorporate social and cognitive goals using behavioral and learning models. These models will help analyze the patient's self-perception in her group and individual therapy. The main component explored in this research targets hippotherapy effects in building trunk and postural stability. This project explores how therapeutic horse riding sessions can relate to her specific goals in her future career. In return, this work will add for potential modifications to future cerebral palsy clients' programs offered at A.W.A.R.E. and make contributions to the use of hippotherapy treatment and therapeutic horseback riding for the Cerebral Palsy population.

## **Acknowledgements**

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## **List of Abbreviations**

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CP	Cerebral Palsy
A.W.A.R.E.	Always Wanted A Riding Experience
TBI	Traumatic Brain Injury
UMNL	Upper Motor Neuron Lesion
AHA	American Hippotherapy Association
PT	Physical Therapist
OT	Occupational Therapist
SLP	Speech Language Pathologist
HPOT	Hippotherapy
HBRT	Horseback Riding Therapy
AFT	Animal-Facilitated Therapy
NARHA	North American Riding for the Handicapped Association
BABS	Brunel Active Balance Saddle
COP	Centre-of Pressure
FRD	Feed Related Displacement
EMG	Electromyogram
SPSS	Statistical Package for the Social Sciences
QOL	Quality of Life
DARS	Department of Assisted Rehabilitative Services
BMIS	Brief Mood Introspective Scale
ICF	International Classification of Functioning, Disability and Health
WHO	World Health Organization
WPW	Whole Part Whole Model
LHD	Left Hand Dominant
RHD	Right Hand Dominant
LHDE	Left Hand Dominant Error
RHDE	Right Hand Dominant Error

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## **Chapter I: Introduction**

### *Cerebral Palsy*

Cerebral Palsy (CP) is defined as the following by the International Workshop on Definition and Classification of Cerebral Palsy as, “a group of disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain.”<sup>1</sup> The onset of CP can either be congenital, a result from a difficult labor, acquired from a traumatic injury to the brain (Traumatic Brain Injury, or TBI), ischemia, anoxia, or an infection.<sup>2,3</sup> When a pregnant mother has Rubella or Chickenpox, the child is put at risk for CP and at risk for brain damage.<sup>3</sup> Jaundice, low birth weight, a premature birth, or infections such as bacterial meningitis can put a child at risk for CP.<sup>3</sup> CP is seen at the age of two years old or earlier.<sup>2</sup>

There are many different forms of CP. Spastic CP is the main focus of this thesis and discussed later on. Athetoid CP affects the entire body with uncontrolled, slow physical movements.<sup>3</sup> Ataxic CP affects balance and coordination, yet is the least common form of CP. CP affects different regions of the body and is diagnostically labeled as to how many extremities are affected. Diplegia individuals have more navigational control of the lower extremities than the upper extremity.<sup>2</sup> A hemiplegic person is unilaterally affected by CP and primarily has an injury in one hemisphere of their brain, affecting normal functioning.<sup>2</sup> A quadriplegia or tetraplegia person has all extremities deformed, including deformation to the neck and trunk.<sup>2</sup> Double hemiplegia has all of the extremities affected, yet each side shows a noticeable amount of asymmetry in functioning compared to the other.<sup>2</sup> It is uncommon to see a paraplegia patient affected by the disorder in the lower extremities exclusively. A monoplegia shows that only one

extremity is affected and is a rare phenomena.<sup>2</sup> A CP diagnosis should be concluded only after progressive neurological disorder, idiopathic toe-walking, and Pelizaeus-Merzbacher disease (slowly gradual X-linked genetic disorder) have been ruled out.

The client I observed is diagnosed with spastic quadriplegia CP. Spastic CP is the most common form and causes muscles to become rigid with limited mobility.<sup>3</sup> Spasticity is allied with an upper motoneuron lesion (UMNL) that is “a sensorimotor disorder resulting in an intermittent or continuous involuntary activation of muscles.”<sup>4</sup> Seventy to eight percent of CP populations are born predisposed to experience lifetime complications with spasticity.<sup>2</sup> Spasticity causes asymmetrical posture.<sup>5</sup> Asymmetry causes the body to naturally fall into compensatory postures, therefore advancing the imbalance in muscle activity between homologous muscles.<sup>5</sup> Uneven bone growth, degeneration, and weakness in the hips cause both upper and lower extremities to misalign.<sup>5</sup> Hyperactive hip adductor muscles cause a deformed kinetic chain leading to the lower extremities such as the knee and ankle, resulting in uneven weight bearing posture and deformity.<sup>5</sup>

Despite the different variations of CP, the CP population shows abnormal postural statures that result from a “nonprogressive or static lesion of the developing brain.”<sup>2</sup> The only kind of CP that is immediately affiliated with short hypoxic events during childbirth (anoxia) are spastic quadriplegia individuals who exhibit jerky movements, asymmetrical statures, persistent and repetitive movements.<sup>2</sup>

For over 25 years, horse riding therapy has been used on the spastic CP population and is the main topic for investigation in this research project.<sup>5</sup> Horse treatment was first used after Lis Hartl, a Denmark Olympian won a silver medal for

dressage in 1952. Hartl had previously suffered from poliomyelitis (spinal paralysis and muscle weakness) in the 1940's and worked hard to win an Olympic medal. After gaining recognition from the public of her huge accomplishment, Hartl directed international attention to horseback riding and its therapeutic effects for the future.<sup>6</sup>

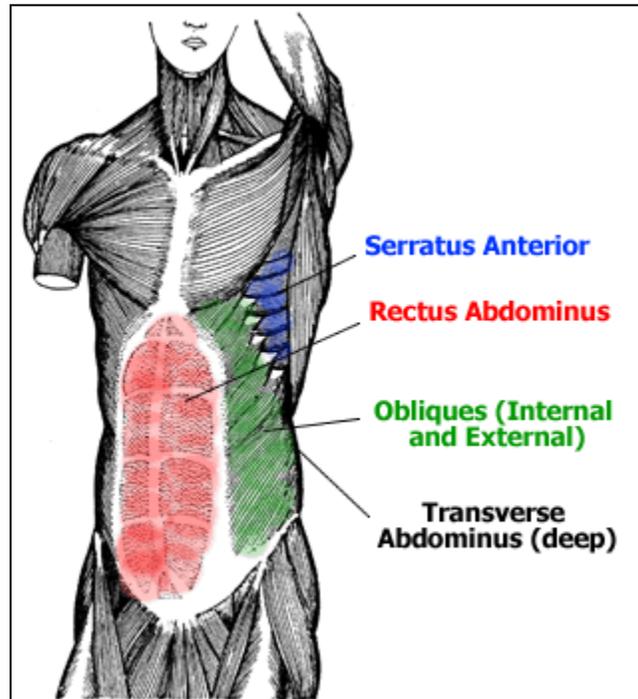
### *Hippotherapy*

Hippotherapy (HPOT) is derived from the Greek name for horse, Hippos. According to the American Hippotherapy Association (AHA), hippotherapy is “a physical (PT), occupational (OT), or speech/ language (SLP) therapy treatment strategy incorporating the movement of the horse.”<sup>7</sup> HPOT treatment occurs in sessions instructed by a licensed equine professional. The licensed equine professional is familiar with how horses maneuver and relate their therapeutic effects to an individual seeking their services.<sup>7</sup> A typical lesson is 30 minutes or longer and has a five to ten minute walking period to start off the lesson. This initial period passively relaxes the rider's muscles while mimicking the horse's movements.<sup>5</sup> Position changes and exercises follow the brief warm up in efforts to improve the rider's muscular strength and postural stability.<sup>5</sup> The horse's movements are the main instrument used in the patient's therapeutic treatment.<sup>1</sup> HPOT lessons include speech therapy because the rider talks to their horse and verbalizes navigational commands as well as gives answers to games the horse instructor creates. HPOT utilizes equine movement to treat individuals seeking rehabilitative effects on their physical composition as well as learn new functional skills while meeting the desired goals for that individual's needs.<sup>7</sup> The three dimensional patterns provide a challenge for the patient's muscles as well as mind to make their own body move in accordance with the horses, thus delivering a psychosomatic response. The outcomes for physiological

and psychological responses from the rider show progression in their treatment. In North America, only 10% of children with disabilities participate in HPOT, while the other 90% engage in horseback riding therapy (HBRT).<sup>1</sup> This statistical difference could be due to differences in the following: insurance coverage, location, personal preference, cost, interest, or facility availability.

### *Rehabilitative Goals*

Equestrian riding creates a three dimensional movement and differs from a human's bipedal gait pattern. A horse's sinusoidal movement targets various parts of the rider's body: core muscles, hips, postural muscles such as the abdominals and back muscle, legs, feet, and even in the upper extremities, where the rider is actively engaged in leading the horse with reigns. HPOT is sometimes used to compensate for the rider's neuromuscular deficits<sup>7, 1</sup>. Neuromuscular responses in the individual's body are retrained by adjusting to the horse's movements.<sup>7, 1</sup> As an example, if the HPOT treatment is aimed to increase the individual's weak main core muscles, such as the transverse abdominis, erector spinae, and external/internal obliques, then the coordinator would start the horse at a slow walking pace in order to accommodate the individual's weak physiological state (see Figure 1).<sup>7</sup>



**Figure 1.** The trunk muscles used while targeting core stability.  
 Illustration from: [[http://www.fitstep.com/Advanced/Anatomy/Graphics/abdominals\\_anatomy.gif](http://www.fitstep.com/Advanced/Anatomy/Graphics/abdominals_anatomy.gif)]

Whether the lesson is instructed by a licensed horse instructor, PT, OT, or SLP, all professionals seek to help a patient walk on their own, achieve independence in their everyday living, and most commonly, build their trunk stability.<sup>7</sup> Once the core's stability progresses and becomes stronger, then the coordinator can instruct the horse to walk faster (trot) in order to engage the individual's trunk stability.<sup>7</sup> Each HPOT lesson typically lasts anywhere from 1-1.5 hours. Each HPOT lesson is designed to gradually relax the individual in an effort to become more comfortable with changing the pace of the horse's stride.<sup>7</sup> When an individual struggles with a unilateral impairment such as weakness on one side, the direction of the horse influences different muscles to be targeted, therefore strengthening the affected side. Strengthening unilateral weakness is targeted when the rider turns corners in their trail pattern.<sup>7</sup>

Stretching is a common part of a typical HPOT session. A rider may reach along the horse's neck to place clips in the horse's mane or rings in the back of the horse's ears.<sup>8</sup> Riders may lean forward to one side in order to touch their feet in the stirrups or pat the backside of the horse's hind to thank the horse for good behavior.<sup>8</sup> These movements encourage the rider to communicate with their horse as well as have the opportunity to stretch the various muscles groups in their body. Cognitive games are played while riding the horse to improve memory recall, recognition, or just for fun.<sup>8</sup> Playing games is a good way to distract the rider if they are apprehensive about the riding lesson and are incorporated in group therapy with fellow riders. HPOT is believed to improve an individual's functional and cognitive skills.<sup>8</sup> HPOT is categorized under animal-facilitated therapy (AFT) and based on the theory that the transfer between human and horse is therapeutic.<sup>9</sup>

In HPOT, a constant proprioceptive input between the horse and individual is communicated with each step the horse takes that sends messages to the rider as to where his/her own body should relocate for security and for stability.<sup>7</sup> Riders use vestibular input from the horse when determining spatial perceptions and decisions of oncoming riders in the arena. HPOT sessions occur in a fenced corral, otherwise known as an arena.<sup>7</sup> Both vestibular and proprioception simultaneously stimulate the rider's level of arousal to concentrate on the task set before them.<sup>7</sup>

### *Psychological Effects*

Individuals who want to build their independence and want to engage in social interaction may seek HPOT treatment to build their self-esteem. A sense of personal accomplishment develops through active engagement in controlling a horse's movements

among other oncoming riders. Typically in HPOT treatment, a rider's session is mixed with individual and group therapy interactions with other riders. This may increase motivation, better self-esteem, and increased performance on tasks such as academic excellence or other personal goals.<sup>6</sup>

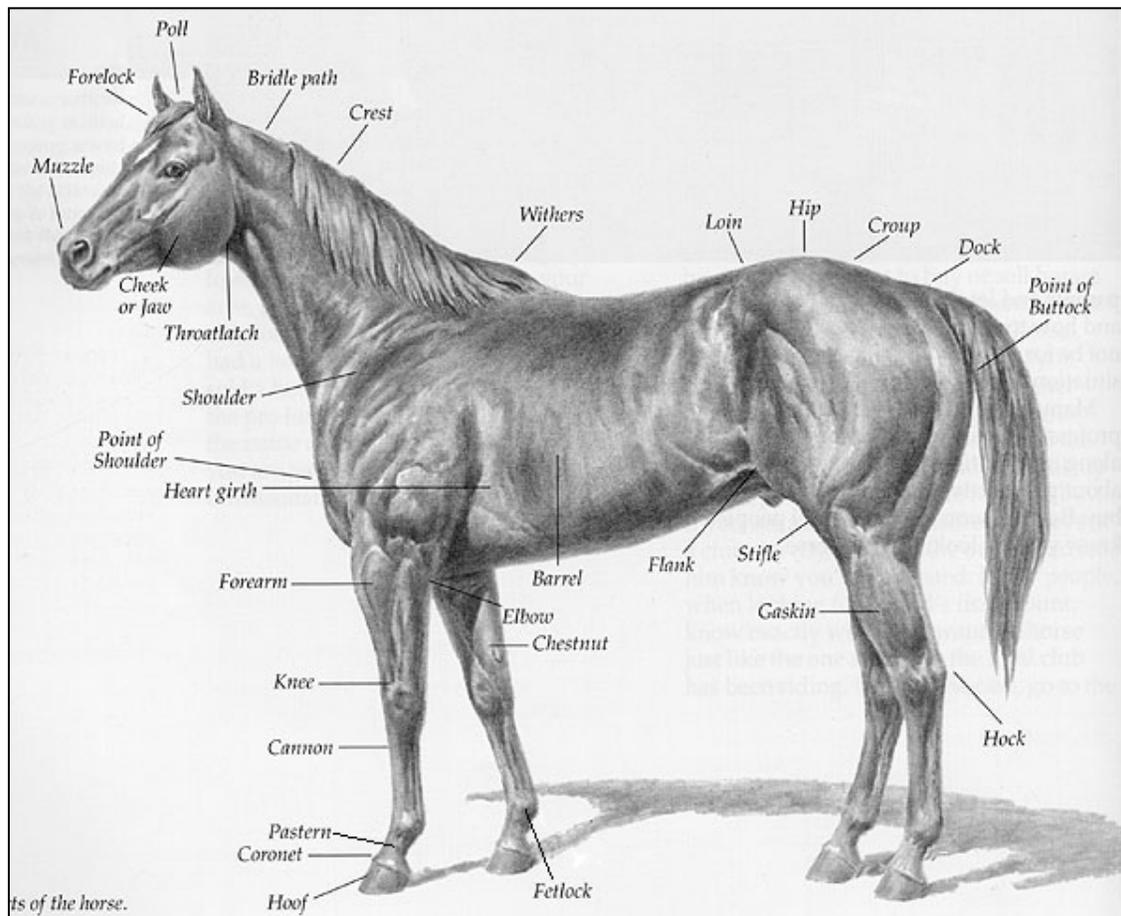
One study conducted showed there was a positive outcome for a ten year old development after being severely socially isolated prior to their introduction with horseback riding. After learning to ride, the boy was able to become more social and developed relationships with his therapist and other riders in his group treatment.<sup>6</sup>

### *Horseback Riding Therapy*

Horseback riding therapy (HBRT) is similar to the method of HPOT because both techniques use horse assisted therapy, but HBRT slightly differs in procedures. Instead of a licensed physical therapist professional, certified horse instructors familiar with the rider's disabilities instruct a HBRT lesson.<sup>1</sup> Riders are referred to as "clients" and not as "patients" because of the non-clinical atmosphere and lack of medicinal credentials the HBRT facility has. One to two side walkers closely monitor the riders and offer assistance alongside the rider's legs.<sup>1</sup> A lead-walker uses a lead-line that is attached to the horse's halter and guides the horse in the direction that the rider commands using his/her reigns and takes over when the rider is doing exercises without reigns. (This thesis is based off of the HBRT facility that A.W.A.R.E. provides under the direction of licensed horseback riding instructors.)

If an outsider was to observe a rider's HBRT lesson, they may see activities such as physical interactions with the horse by stroking their mane, shoulders, or hips (see Figure 2.) When riders come into contact with a large animal, research shows that this

relationship can increase the rider's self-esteem because of the trust developed between a horse and its rider.<sup>4</sup> Riders follow trail patterns that coincide with different objects placed around the arena. Individual toys promote balance and stability, improved dexterity and coordination. Objects seen at different distances challenge the rider to reach further from the midline of their body creating counterbalance that is used to build the rider's strength.<sup>1</sup> Joint mobility, muscle elasticity, and strength are all subjected to improvement in HBRT.<sup>6</sup> A rider can lay prone, supine, or upright on their horse depending on comfort and capability. Often, no measurements or statistical data are obtained from a riding lesson. However, in HPOT, a physical therapist's medical documentation for differences in range of motion and manual muscle testing are used.<sup>1</sup> Since both methods of horse therapy have similar physiological responses, both backgrounds for previous discoveries are discussed to add versatility in the results found in the research collected from the modified riding program.



**Figure 2.** Horse Anatomy.

Illustration from: [http://www.google.com/imgres?imgurl=http://www.hawaiihorse  
rescue.com/images/]

### *Contraindications in Equine Riding for Cerebral Palsy*

For people with disabilities, equestrian lessons should be conducted by hippo-therapists or hippo-instructors that have a sufficient certification required in their field's standard of care.<sup>2</sup> The North American Riding for the Handicapped Association (NARHA) is an organization that sets standards for proper licensure. All clients must wear proper fitting headwear to ensure the proper safety measures are addressed in case of an accident.<sup>2</sup> Instructors must follow safety protocol when using the large animals before lessons begin and deem them safe according to procedural standards.<sup>2</sup> Individuals

who are equinophobic, fractured, allergic to horses, are diagnosed with seizures, have tethered cord syndrome or atlantoaxial instability should not participate in this treatment.<sup>2</sup>

*Always Wanted a Riding Experience (A.W.A.R.E.)*

A.W.A.R.E. was created in San Marcos, Texas in 1984 by a special education teacher named Cathy Hovey.<sup>10</sup> Hovey had five horses and five riders when she launched the non-profit organization in 1994. Two San Marcos families donated twenty acres of land and the facility.<sup>10</sup> A.W.A.R.E.'s personal goal for people seeking their services is "to improve their quality of life by offering an opportunity for therapy, exercise, and recreation."<sup>10</sup>

I will be working with a licensed instructor, Mrs. Kimberly Jones, who earned her certification from NARHA. She originally volunteered at A.W.A.R.E. as an adolescent where she first became interested in becoming an instructor. Kimberly has had many years of experience with distributing therapeutic horse riding services to disabled children and young adults in addition to taking care of her own horses her entire life.

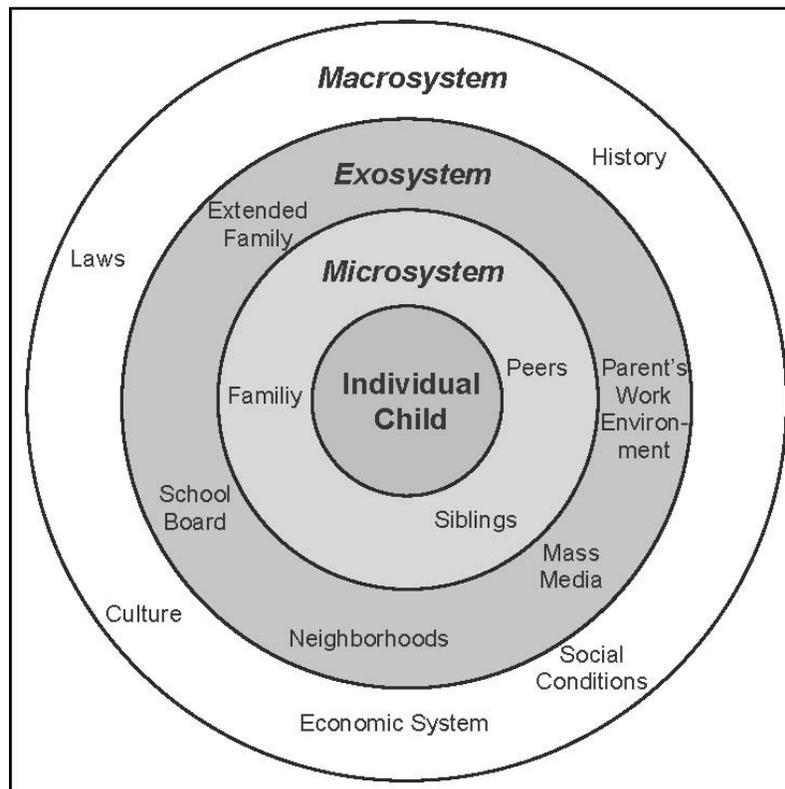
Relevant to the services A.W.A.R.E. offers, one research study investigated whether younger CP populations of different ages, genders, or gross motor function capabilities showed a significant differences in community or social participation as opposed to their lifestyle at home.<sup>11</sup> Social participation was defined as engaging in activities with friends as opposed to community participation which was places other than the home (school or neighborhood).<sup>11</sup> Results were taken by charting the subjects' willingness to participate in either formal or informal activities (required effort or little effort to plan and often seen as self-initiated).<sup>11</sup> The young CP population showed that the social and community participation was not influenced necessarily by gender, but more

on gross motor function capabilities and their age.<sup>11</sup> The young CP population studied showed that the more social participation they were included in, the more opportunities there were to make mature relationships as a part of their lifespan development.<sup>11</sup> This study is relevant to the impaired Cerebral Palsy adult populations that are enrolled in HBRT at facilities such as A.W.A.R.E., because of the social interaction that is available to them in the learning environment. A.W.A.R.E. gives riders an opportunity to build their self-esteem and make lasting relationships. These are the things that should be targeted in facilities to optimize a rider's full potential.

#### *Transition into Adulthood with a Disability*

As a 21-year-old with CP transitions into adulthood, many new opportunities are available. Job training for the impaired plays a significant effect on one's lifestyle and becomes an important focus in one's life for financial support. The opportunity to learn new things and take on more responsibility is presented to the individual. One study assessed components such as individual, family, and community variables that build psychosocial maturity for adolescents transitioning into adulthood.<sup>12</sup> Seventy four participants with CP or Spina Bifida were used in addition to the 72 participants without motor disabilities.<sup>12</sup> The average age was 25 years old and ranged from 20-30 years old. Psychosocial maturity was defined by the 18-20 years old CP population as leading a life of success: "being happy, self-efficacious, and have intimate relationships with others."<sup>12</sup> Urie Bronfenbrenner's ecological perspective model was used to analyze this investigation by associating the three different components individual, family, and community with the effects on building psychosocial maturity (see Figure 3.)<sup>12</sup> Bronfenbrenner's microsystem involves people that are directly involved with the

individual everyday.<sup>12</sup> The exosystem is made up of less involved people in relation with the individual like the community.<sup>12</sup> The macrosystem is the biggest picture of what distant connections there are with the individual. Both the microsystem and exosystem influences any individual every day and was used as a fundamental model in this research.



**Figure 3.** Bronfenbrenner's Ecological Perspective Model. Illustration from: [<http://www.biomedcentral.com/content/figures/1471-2458-9-94-1-1.jpg>]

The individual variables that were assessed were gross motor functioning levels, age, gender, IQ, education, task coping, and depression levels.<sup>12</sup> The Microsystem and its family components assessed family functioning, the father fostering autonomy, and then the mother encouraging autonomy from the young adult.<sup>12</sup> The Exosystem and Macrosystem and its community variables assessed transportation independence for each participant and the transition services available to them.<sup>12</sup> The outcome of this

investigation showed no concrete evidence of difference among the two impaired and able populations in achieving psychosocial maturity. However, this conclusion is heartening because the disability group did not show lower potential to reach psychosocial maturity compared to that of the non-disabled group.<sup>12</sup> The roles of the father and mother both encouraging autonomy for the individual showed advances in maturity and possibly provided an increased sense of identity and self-efficacy for the individual.<sup>12</sup> Levels of depression from the impaired participant showed lack of energy to willingly participate in simple activities and furthermore, have great difficulty when dealing with transitioning to adult lifestyle.<sup>12</sup> The community component showed little significance in the project. This research investigation is one of the very few conducted on the lifestyles of CP individuals transitioning into adulthood and the hardships that come along with the conversion.

## **Chapter II: Genesis: The Researcher's Intention**

As an experienced volunteer involved in the A.W.A.R.E. program, I found myself enthusiastic about developing a structured program for the client I see each week. She is a young adult suffering from quadriplegia Cerebral Palsy. Aspiring to find out how HBRT could benefit her physically and/or elicit different psychological responses to her current lifestyle struck me as an enticing challenge. As a pre-physical therapy undergraduate researcher interested in rehabilitative services, I am familiar with how important it is for the individual seeking therapeutic services to know the proper technique of the exercises they are supposed to do and what purpose they serve in their everyday life. My initial impression upon working with this client was that she wasn't fully conscious as to why she engaged in the specific activities that she does while receiving HBRT. The reasons for specific exercises and how they provide her with any relevance to her everyday life outside of the stables was unclear. This is when I realized that I would not be comfortable spending my time with someone with a vulnerable health condition who had not had the opportunity to be formally educated about why she participates in the riding lesson's activities. The volunteers and coordinators are there to help the clients engage in the HBRT in order to improve the quality of life for the handicapped individual and it is only fair that the client understands how to reach her full potential. After all, "if learners don't value the new content that is being taught, there is little transfer for retention or transfer to the workplace."<sup>18</sup> The aim for this thesis is to devise a structured horseback therapeutic riding program for young adults with Cerebral Palsy that enables this population to concentrate on their personal goals that are relevant to their vocational job program. This main focus led me to come up with two investigative questions relevant to this topic:

**Q1:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy create a better quality of life for herself by strengthening her postural stability and motor control?

**Q2:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy improve her self confidence to participate as an employee in the workforce?

### **Chapter III: Literature Review on HPOT and HBRT**

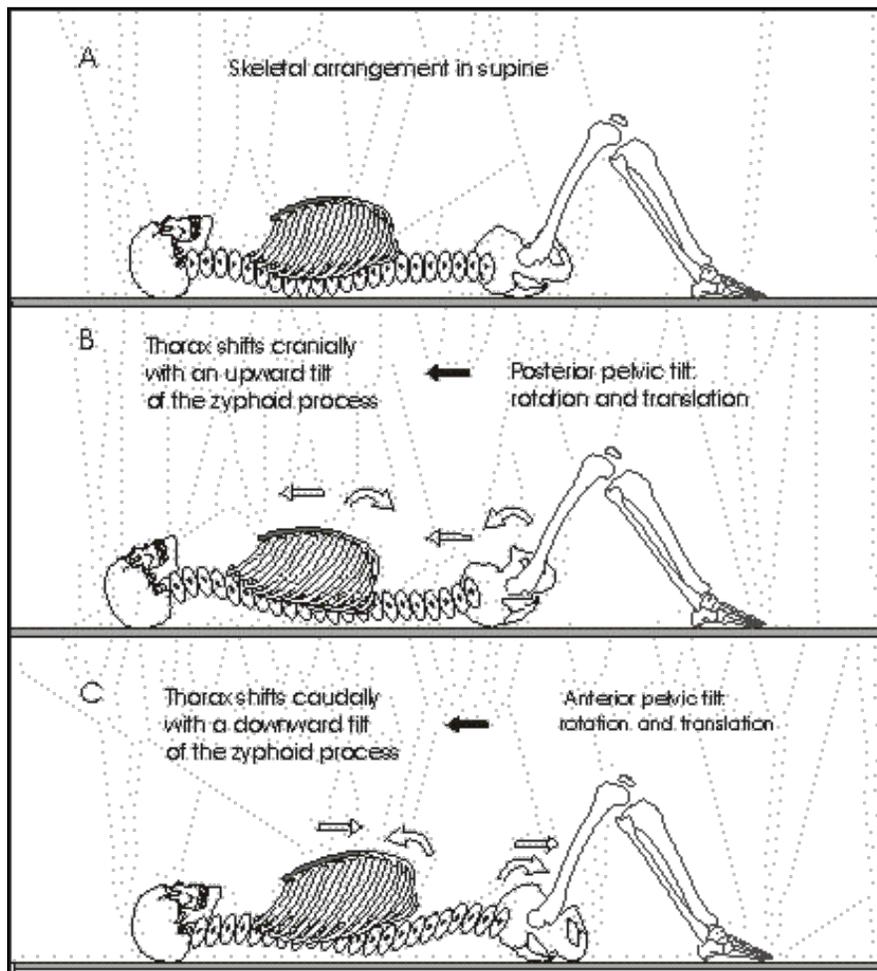
#### *Past Researchers' Results*

There is significantly more research available on the younger CP population than the older CP population. I believe that the imbalance in research among the two cohorts shows more investigations on younger children, because they are still growing and sometimes more willing to work harder to improve their strength than the results shown when documenting older CP generations. Most CP individuals are exposed to HPOT or HBRT earlier on and therefore researchers see more versatility in the younger populations. Many previous research studies have used the Gross Motor Function Measure (GMFM) scale to rate the effectiveness of HPOT or HBRT, yet this is only applicable to the younger CP population and will not be used in this research investigation.

There is limiting research available on articles that compared both HBRT and HPOT in the same study, yet, there is a lot of a research on the therapies independent from one another. Nonetheless, there is little difference between the two professions, except that the lessons are administered by different licensed professionals. The aid of a horse is still the same in both treatments, so similar outcomes are expected. The sinusoidal movement of the horse creates a challenging obstacle for the rider to mimic and causes their riders to activate trunk displacement as well as experience the pelvic rhythm in relation to the horse's walking patterns. This has been found to automatically create postural responses in the rider and trigger the rider's muscles. In one study comparing diplegia and quadriplegia individuals, diplegic CP riders improved their equilibrium reactions in their torso compared with riders more so than the quadriplegic

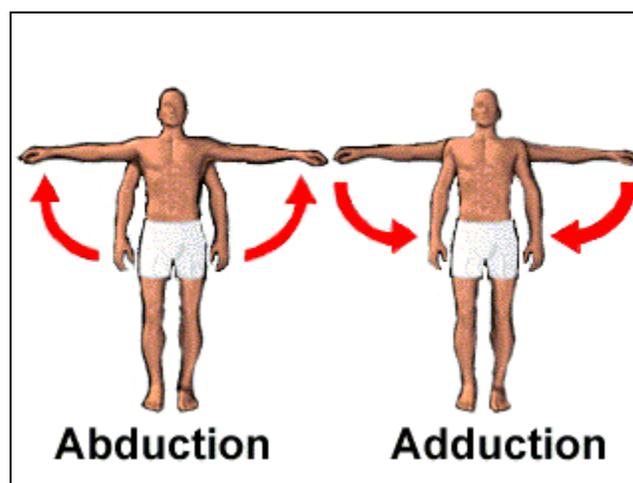
group.<sup>1</sup> The researchers concluded that HBRT achieved a successful outcome for reaching torso equilibrium and that HBRT had better affects in children with diplegia than quadriplegia children.<sup>1</sup>

Researchers have mimicked the movement of a horse by designing their own horse: The Brunel Active Balance Saddle (BABS). BABS was designed to measure the gait analysis of a horse and its therapeutic effects of pelvic mobility, lumbar spine, hip joints, trunk and head posture, and improving muscle tone.<sup>13</sup> This machine mimics the rider's pelvis with a horse's consistent and steady movements.<sup>13</sup> The BABS machine is convenient because it requires less assistance to run than arena HRBT, yet is not as visually or socially stimulating for the rider.<sup>13</sup> The passive range of motion for antero-posterior pelvic tilts was a variable used to evaluate if the BABS machine could produce measurable variables in comparison to a static saddle (see Figure 4). The participants were placed in hip abduction (pulled away from the midline of the body) and assessed (see Figure 5).<sup>13</sup> BABS is made with a speed ranging from 0-100 and mimics a horse's 40-45 strides per minute.<sup>13</sup> The outcome of this investigation showed that the CP participants sitting on the BABS had better sensory input in comparison to the static stool results and therefore better exposed to partial weight bearing exercises, accompanied by various pelvic directions.<sup>13</sup> Postural tone was shown to be psychologically rooted.<sup>13</sup> Fear and excitement in one participant showed differences in the passive range of motion in pelvic mobility.<sup>13</sup> The BABS outcomes with CP participants demonstrated that conventional HBRT is a beneficial treatment of the CP population.<sup>13</sup>



**Figure 4.** Antero-lateral Stability.

Illustration from: [[http://www.efeld.com/images/phd/pelvic\\_tilt.gif](http://www.efeld.com/images/phd/pelvic_tilt.gif)]



**Figure 5.** Difference in Abduction and Adduction. Illustration from: [<http://www.medtrng.com/abductionadduction.gif>]

Another research group investigated the therapeutic effects of artificial saddle riding using a custom-made force plate with the BABS machine to measure the centre of pressure (COP) in addition to assessing postural balance in the CP population.<sup>14</sup> Recordings of feet related displacement (FRD) measured how much the neuromuscular system was used while maintaining the rider's balance.<sup>14</sup> The post treatment evaluation indicated that 70% of the evaluators (parents of the children) noticed satisfactory progress in their children as a result of the BABS intervention.

Another researcher concluded that children with spastic CP improved their postural strength during a period of 10 weeks in HPOT. Measurements of posture using head, neck, shoulder, scapula, trunk, spine, and pelvis all showed improvements in HPOT treatment.<sup>1</sup> In a similar study done by the same researchers above, the researchers concluded that HPOT did efficiently target symmetry, assist weight bearing activities, and help hemiplegic children with weight transitions over a period of six weeks, seen one hour per week.<sup>1</sup>

The immediate effects of HPOT were investigated after a ten minute session and compared to that of a ten minute session of barrel-sitting on a 55 gallon drum (approximately the girth of a horse and similar to the BABS look) on the effects of adductor muscle activity (thigh muscles that pull legs toward the midline of the body, hence the “*addition*” to the body) during walking.<sup>5</sup> Only the first ten minutes of the treatment for the CP participant was recorded in order to measure adduction activity using electrodes and an electromyogram machine (EMG).<sup>5</sup> Higher scores between left and right adduction indicated a higher asymmetry score and analyzed using SPSS 15.0.<sup>5</sup> Results showed that HPOT improved the adductor muscle asymmetry score by

decreasing the average score of adductor muscle asymmetry.<sup>5</sup> However, the barrel-sitting group did not show a significant improvement in adduction and therefore HPOT was concluded as an efficient therapeutic treatment for the CP population.<sup>5</sup> The 12 weeks of HPOT treatment showed adductor symmetry improvements up until 12 weeks post treatment.<sup>5</sup>

The second part of the experiment focused on movement in circles, lengthening the horse's stride, speeding up and slowing down the horse's gait. The inclusions of visual and auditory environmental cues were used to assess dynamic postural control, motor planning and core stability.<sup>5</sup> As the rider gains greater postural strength, the therapist will change the horse's speed from an average pace of 90-110 steps a minute to 2700-3300 stepping repetitions in the same time period.<sup>5</sup> The results showed that the participants successfully developed an interrelationship among the exercise activities, physical functions, and social participation to develop self-competence.<sup>5</sup> Overall, the power a horse generates with its muscular legs provides "strong vestibular and proprioceptive stimulation" for a rider to improve their postural balance, tactile skills, and help lead a better quality of life (QOL) in their relationships with friends and family.<sup>5</sup> QOL is defined as "an overall assessment of well-being across various domains, such as home, school, family, friends, and health."<sup>15</sup>

#### *Past Researchers' Problems*

One researcher reported after reviewing nineteen spastic cerebral palsy both ambulatory (walking or moving) and not ambulatory to have an inconclusive research study on the therapeutic effects of HBRT once a week for 26 weeks. No significant changes were observed on both body types and the limitations consisted of a small

sample size as well as large age differentiations between the riders.<sup>1</sup> Another investigation also showed no significant changes when assessing the QOL and health for CP participants using HBRT, despite a large sample size and control group used in the study.<sup>15</sup> The main difficulty was comparing the variables assessed in each individual to measure a standard QOL outcome. The HBRT program may not have had specific and sensitive enough designs to accommodate the various participants' QOL needs and therefore the research needs further clarification for its investigation.<sup>15</sup>

Suggestions for this field of research are to acquire larger sample sizes, targeting all types of CP in order to fully investigate the used in order to surface more knowledge on this topic. Careful consideration and documentation should be made for conflicting therapies that are ongoing with the patient or client during an investigation so that the outcomes do not become confused with another treatment's benefits. Differences in genders, age, and domestic lifestyles also play a significant role and should be included in the research.

In conclusion, most of the literature reviewed for this topic suggests small samples, blind assessments, control groups, and non-riding controls as previous limitations for interested researchers.<sup>1</sup> Psychological assessment and longer sessions in accordance with HPOT and HBRT are also suggested by other literature reviewers.<sup>16</sup>

## **Chapter IV: Methods**

### *Baseline Data*

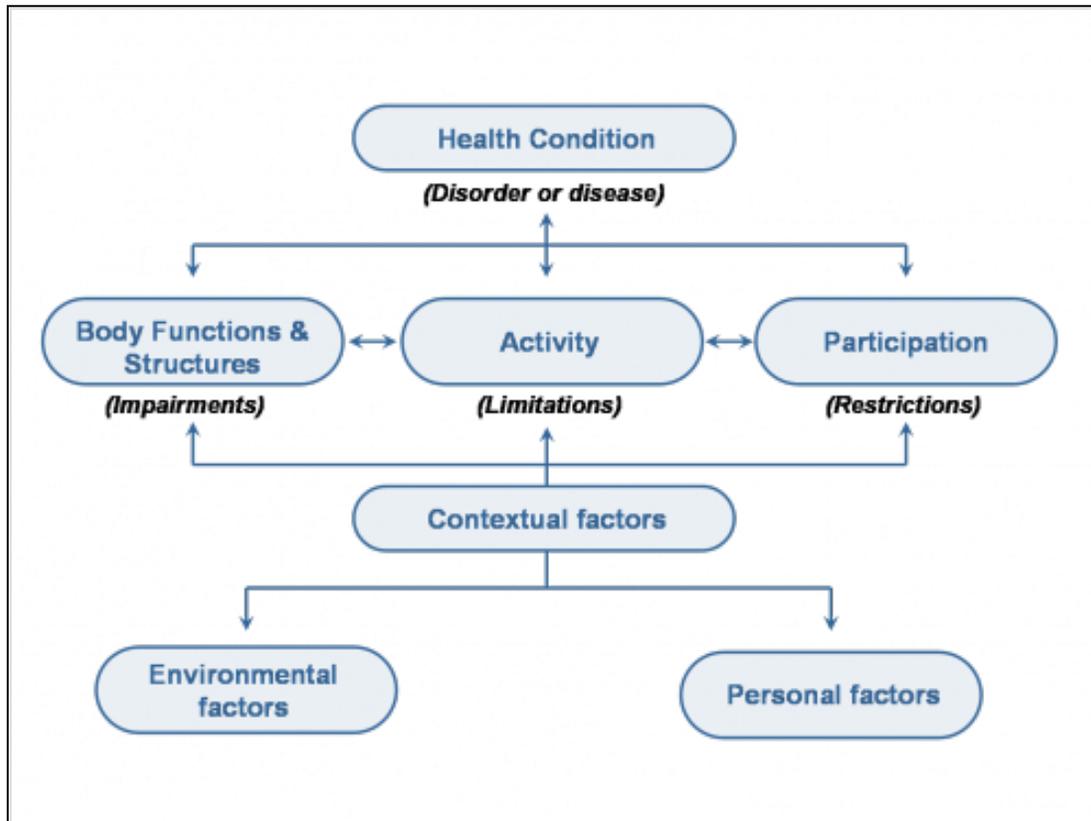
A young woman with Cerebral Palsy who currently attends A.W.A.R.E. was chosen for this research project. In my efforts to develop a structured program that is modified from the generic program my client currently undergoes at A.W.A.R.E., I devised lesson plans to relate to her personal goals in her HPOT program. A consent form was approved by IRB for the facility and client's consent. (See appendix A,B, and C.) I arranged for two personal question and answer sessions to find out what was going on in the participant's life that could be relevant to activities facilitated through the HPOT program. The client is enrolled in a vocational job training program that was placed at a H-E-B non-paid trainee in Spring 2010 and a Kohl's paid employee in Fall 2010. (H-E-B is a grocery store and Kohl's is a department store.)

The client is a part of a vocational training program provided by the Department of Assisted Rehabilitative Services (DARS) and was offered a paid position at Kohl's after completing her job training as an H-E-B door greeter. She goes to Kohl's once a week and still volunteers at H-E-B as a door greeter. (See Appendix D for a suggested generic A.W.A.R.E. client for a vocational job training goals questionnaire.)

### *Participant's Capabilities*

I chose to utilize this biopsychosocial model to organize what the participant could and couldn't do in the research project for modifying her current HBRT. The International Classification of Function (ICF) that was created by the World Health Organization (WHO) uses this model to measure and organize outcomes (see Figure 6).<sup>11</sup> This chart "is based on the premise that disability involves an interaction between

features of the person and features of the environment.”<sup>11</sup>This ICF model helps categorize adult social roles that pertain to the individual. This will attempt to improve a rider’s QOL, because in modifying a HBRT program to meet their needs for education, employment, autonomy, social life, or for leisure, this model acknowledges their level of impairment and limitations with activities.<sup>17</sup>



**Figure 6.** The International Classification of Function Model.

Illustration from: [[http://cirrie.buffalo.edu/encyclopedia/images/ptstroke\\_figure2.png](http://cirrie.buffalo.edu/encyclopedia/images/ptstroke_figure2.png)]

This model led me to devise how I will go about organizing and documenting each lesson to optimize the rider's HBRT lesson.

<b>Client's Demographics</b>
Health Condition: <ul style="list-style-type: none"> <li>• Quadriplegia Cerebral Palsy</li> </ul>
Body Functions & Structures: <ul style="list-style-type: none"> <li>• Spasticity</li> <li>• Left hand dominant/uninvolved</li> <li>• Right hand non-dominant/involved</li> <li>• Uses a motor and manual wheel chair</li> </ul>
Activity: <ul style="list-style-type: none"> <li>• Needs help getting on and off the horse</li> <li>• Need reminders about activities and trail patterns</li> </ul>
Participation: <ul style="list-style-type: none"> <li>• Must wear safety gear</li> <li>• Must follow A.W.A.R.E. riding rules at all times</li> </ul>
Contextual Factors: <ul style="list-style-type: none"> <li>• Receives botox injections</li> <li>• Experienced horseback rider at A.W.A.R.E for ten years</li> </ul>
Environmental Factors: <ul style="list-style-type: none"> <li>• Attends riding lessons once a week after working a Kohl's shift the same day</li> </ul>
Personal Factors: <ul style="list-style-type: none"> <li>• Kohl's employee</li> <li>• H-E-B volunteer greeter</li> <li>• Worked with same horse leader and side walker for three years now</li> <li>• Eager to participate in new HRBT lessons for this thesis</li> </ul>

**Table 1.** Client's Demographics Table. This table portrays how the client's demographics break down into certain section of the ICF model. This was used in creating lesson plans that were pertinent to the client's capabilities.

#### *Reiteration of the Client's Information*

The personal goals for the participant emphasize building personal postural stability, working on fine motor coordination using their hands to put on and off clothing tags and becoming more social in the HBRT lesson. Postural stability is a physiological component that will target improving her physical strength throughout the day. Before each session, the participant answered a scale pertaining to their feelings on the Brief Mood Introspection Scale (BMIS) to assess the participant's current emotional state. The

BMIS shown on the next page provides a clear depiction to an outsider of what factors may predict as to how the lesson will go and how the client feels prior to their personal riding lesson. The participant's feelings prior to the lesson are important to know beforehand, because the potential for change if an individual has had a bad day as opposed to a good day may rely influence their motivation and how prepared the participant feels for the lesson.<sup>18</sup> (See Appendix E.)

The BMIS rating for each lesson was analyzed by separating the “bad versus good feelings” for each lesson. Overall, this analysis would contribute to a mood, comfort and performance ratings taken in each lesson. The good feelings are as follows out of eight options: lively, happy, peppy, caring, calm, content, loving, and active. The bad feelings are as follows out of eight options: drowsy, grouchy, sad, tired, nervous, gloomy, fed up, and jittery. There are 16 options available in each BMIS survey and were filled out by the client prior to each lesson to get an idea as to what kind of day the client had gone through and what she was feeling before each lesson. The rating “definitely did not feel” was scored as 0 points, “do not feel” was scored as 1 point, “slightly feel” was scored as 2 points, and “definitely feel” was scored as 3 points. The total number of points possible for each category was 24 points (3 points maximum for each answer x 8 options.) (See appendix E.)

### *Entering the Business World*

The main adult social role every person experiences as a part of growing up is entering the field of competitive employment and establishing their independence. Rates among young adults with developmental disabilities are significantly behind the general population: 46% vs. 59%.<sup>17</sup> Getting into a vocational training program after high school

is ideal for young adults in order to advance their future career employment opportunities.<sup>17</sup> There are less women with disabilities employed or attending these programs than men.<sup>17</sup> This main social role that young adult life entails is what encouraged this research project to begin. One study showed that successful employment of the Cerebral Palsied advocate the following factors for employment:

- Independent travel
- Ability to write legibly
- Ability to speak intelligibly
- Manual dexterity
- Appropriate vocational adjustment<sup>19</sup>

As a part of the client's riding program, I chose to incorporate activities that stress manual dexterity and postural stability into the revised HRBT program. I found this to be the two main focuses that would benefit the client while working at Kohl's since the client will be using her hands a lot to fold and put tags on clothes. (Examples of these exercises will be mentioned later on in this research project.)

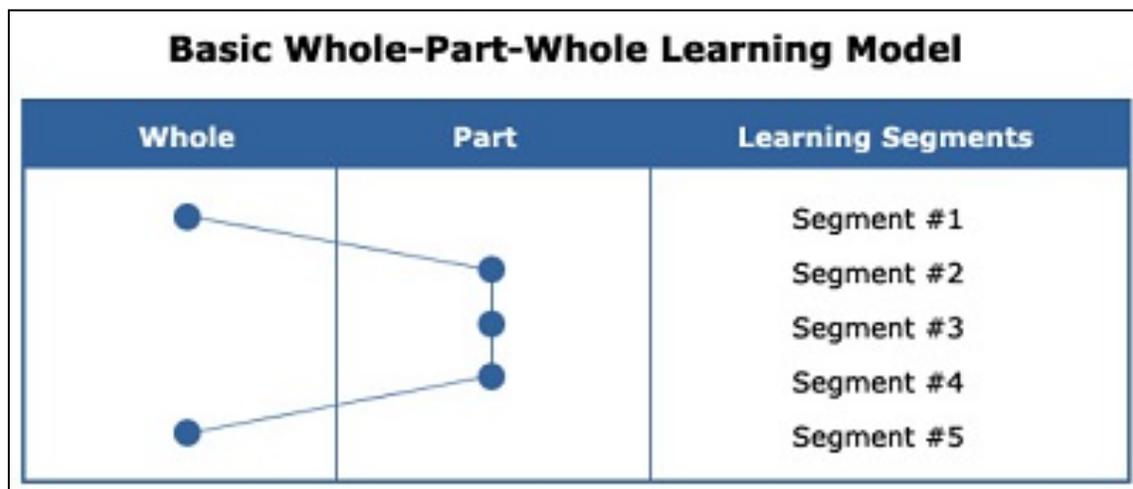
#### *Whole-Part-Whole Model*

In an effort to devise a strategy to go about exposing my client to a new HBRT program, I chose to use the basic Whole-Part-Whole Learning Model (WPW) as an organizational device to modify the participant's current riding program. The WPW leads an individual to cohesively understand the framework needed to efficiently learn the concepts set forth in the model. The first whole is comprised of the new material the rider is going to experience and make a connection with. Again, my two questions for this thesis are the following:

**Q1:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy create a better quality of life for herself by strengthening her postural stability and motor control?

**Q2:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy improve her self confidence to participate as an employee in the workforce?

The First Whole plays vital role in preparing and motivating the learner for what is to come. The segments are components of the program and bring about a Second Whole comprehension for the conclusion of the program (refer to Figure 7).<sup>18</sup> The WPW roots from gestalt psychology (a cognitive focus) as well as behaviorism (a connective approach). The WPW targets learning that makes knowledge advance from “simplified wholes to more complex wholes [and not] meaningless parts to meaningful wholes.”<sup>18</sup> Memory retrieval and retention are a vital aspect of the WPW course. The Second Whole ties the relationship between all of the segments to completely understand the content. Therefore, each segment must be presented in the correct order for an optimal learning environment to master the Second Whole concept.



**Figure 7.** Basic Whole-Part-Whole Learning Model

This model influenced me to devise a similar template for the HBRT for CP client. It is described as the following:

<b>Researcher's Template for CP HBRT WPW Program</b>
<b>Segment #1: Acceptance of Group/ Individual Therapy Change</b>
<ul style="list-style-type: none"> <li>Participants accepts HBRT Group &amp; Individual Therapy lessons will be modified to meet rider's specific goals (Potential goals are addressed for riding program such as: improving trunk stability and fine motor coordination using hands)</li> </ul>
<b>Segment # 2: Weaknesses Targeted</b>
<ul style="list-style-type: none"> <li>Weaknesses Targeted (exercises developed and scheduled appropriately to target physical aspects for each weakness)</li> </ul>
<b>Segment #3: Troubleshooting</b>
<ul style="list-style-type: none"> <li>Troubleshooting (identify progression or digression in the activities with the participant and getting her personal feedback)</li> </ul>
<b>Segment #4: Commitment to exercises</b>
<ul style="list-style-type: none"> <li>Commitment to exercises (measurements and modifications made to seek improvement)</li> </ul>
<b>Segment #5: Strengths recognized and future plan recorded</b>
<ul style="list-style-type: none"> <li>Strengths recognized (analyze data collected for continuing an effective riding program): Postural strength developed &amp; improved hand strength for participant with future plan recorded</li> </ul>

**Table 2. Researcher's Template for CP HBRT WPW Program.** This table was used to break down the WPW model into five segments for creating the structured riding program. Segment #1 is the initiation to the structured program and Segment #5 is the concluding portion of the program. Segment #2, #3, and #4 are the middle portions that tie Segment #1 and Segment #5 as a whole, together.

The “whole” parts of this behavioral model are segment #1 and #5 that are the overall indicator that the new structured HBRT will benefit the rider to meet a better quality of life and help her physical endurance and strength. Segment #2-#4 indicate the “part” portion in how the rider's lessons will modify throughout the course of developing the new riding program.

An example for a modified activity is the following:

Trunk balance could be assessed if the client is off center as a result of a seat check on the saddle while riding the horse. If the client is favoring one side (right), then the modified program would focus on reaching to the left at different distances according to client's trunk balance and strength capabilities.

Progression in the task would be displayed by the client actively reaching at farther distances to grab a toy or item with less assistance from side walkers.

### *The Exercises for Individual Therapy*

From using the WPW model, I came up with these exercises to make connections as to how certain exercises could improve her quality of life. The arena at A.W.A.R.E. is shown in Figure 8. (See a bird's eye view of the arena in Appendix F.)



**Figure 8.** A.W.A.R.E. arena

Handkerchiefs, shoe lacing, toys, puzzles, balls, and other toys are kept on top of the starting row of four barrels for the clients to use when instructed. The cavelletes (long rectangular stepping blocks that lay on the ground) and box sometimes move to different locations depending on the trail pattern used for the lesson (see Appendix F, H-L. The various games played are explained in Appendix G.)



**Figure 9.** Various cavallette arrangements in the arena.

Different objectives were used for each lesson and determined by the main focus of each game or activity (see Appendix N). Diagrams were used to plan and navigate trail patterns around the arena for teaching the rider navigational commands to their horse.

### *Riding Lessons*

The following records below are the riding lesson plans that the client completed once a week that led to devising a structured therapeutic riding program for young adults with Cerebral Palsy. (See Appendix F-N for trail patterns, pictures and game explanations.)

Riding Lesson 1 (1 hour session)  
 Number of Side Walkers: 1  
 Horse Leader: 1

**Exercises:**

Beginning Status:

- Client commented that she was “happy” to be there; some discomfort with getting onto horse because client had not been riding all summer

10 min Warm Up (See Appendix H):

- 2 laps around outside of the poles to the left
- 2 laps around the outside of the poles to the right
- Client is introduced to a new client using sign language to communicate

Trail Pattern 1:

- Straight down outside of poles, weave in and out of poles two completes times and finish following down on the same side of poles and then
- Reminded to sit up straight (seat and saddle check)
- Side walker switched sides of the patient walking because one side walker and one leader was used

Trail Pattern 2 (See Appendix I):

- Ring game putting on rings while weaving between 6 poles, followed by going over the bridge (3/5 difficulty with 5 being the easiest) displayed a little apprehension, stop in box, weave the opposite poles
- Formal introduction to another new rider

Game 1:

- Stoplight: client performed a sloppy form on trot= purple light signal
- Seat check and saddle adjustment

Game 2:

- Animal trivia two lengths of the arena
- Weave and receive handkerchiefs off of poles and walk back on other side

Ending status:

- “Good”

Goal: Left side of body more dominant (especially left hand) and need to gain more strength in right arm

i.e. ADL: holding plate at home with right hand to prevent spasticity

Objective: I, III, V

Proposal for next lesson: Concentrate on bilateral coordination using opposite sides of the body to improve muscle strength and less spasticity response in right hand; lead using reigns left and right hands for equal amount of times during the lesson; document right and left hand dominant errors, and document trunk stability errors to improve lesson

---

Riding Lesson 2 (1 hour session)  
 Number of Side Walkers: 2  
 Horse Leader: 1

**Exercises:**

Beginning Status:

- Client commented that she was “excited/joyful” yet tired and sore because of previous Botox injection

10 min Warm Up:

- Left hand dominant (LHD) 2 laps around outside of the poles to the left: 2 cutoff mistakes
- Right hand dominant (RHD) 2 laps around the outside of the poles to the right: 4 cutoff mistakes

Trail Pattern 1 (See Appendix J):

- Figure eight around barrels, over two cavallettes, weave in and out of poles two completes times over bridge (3/5 bridge difficulty) with RHD

Game 1:

- Handkerchiefs: 2 hesitations to complete task with RHD involuntary spasticity

Game 2:

- Margarita game: While weaving the poles, client pours a ball into two cups. One cup is given to each side walker and the client reaches contralaterally to dump the ball into the side walker’s cup. Each side walker has a cup and makes the client reach stabilizing core muscles while reins are not used; LHD easy no errors and RHD very hard with 4 mistakes

Game 3:

- Shoe Lacing: While weaving the poles, client laces up a cardboard horse; RHD 3 mistakes; LHD no mistakes; client became very frustrated and changed moods, client requested less frustrating tasks because was first encountering RHD and LHD riding lesson

Trail Pattern 2:

- Straight down poles using LHD, weave coming back using RHD, weave again LHD, and straight down RHD while placing seamonkeys that have hooks onto each end of the poles

Ending status:

- “Tired”

Goal: Left side of body more dominant (especially left hand) and need to gain more strength in right arm, build postural stability

Objective: I, II,IV,V

Proposal for next lesson: Concentrate on contralateral coordination using opposite sides of the body to improve hand strength, lead using reins left and right hands an equal amount of times during the lesson, build postural stability using trunk stabilizing activities by incorporating more stretches into lesson plan

---

Riding Lesson 3 (Canceled session due to bad weather)

---

Riding Lesson 4 (1 hour session)

Number of Side Walkers: 2

Horse Leader: 1

**Exercises:**

Beginning Status:

- Client commented that she was “slightly under the weather, tired and exhausted,” because she had been scheduled a four hour shift at work and that was the first time to have an additional two hour shift at her jobsite

10 min Warm Up:

- Right hand dominant (RHD) 2 laps around the outside of the poles to the right: 4 errors
- Left hand dominant (LHD) 2 laps around outside of the poles to the left: 1 error  
Horse stopped randomly and client reminded the horse to walk on

Game 1:

- Margarita game: LHD easy no errors and RHD 1 error

Game 2:

- Beading necklace for horse: RHD holding wooden bead harder than LHD holding bead
- Seat check
- Rider holds beads for client while the horse is moving, RHD 3 errors, LHD 3 errors
- Seat check

Game 3:

- Animal trivia: Client had trouble with scapular depression and retraction while acting out a chicken and could not mimic the movement at all

8 minute Stretch:

- Client stretched reaching for each stirrup left and then right
- Touched horse’s mane behind and in front
- Reached up with both hands high

Trail Pattern 1:

- RHD weave poles, LHD weave poles, RHD straight down poles, LHD down poles; LHD no errors and RHD no errors

Ending status:

- “Tired”

Goal: Left side of body more dominant (especially left hand) and need to gain more strength in right arm, postural stability

Objective: I, III, V

Proposal for next lesson: Concentrate on bilateral coordination using opposite sides of the body to improve hand strength; lead using reins left and right hands an equal amount of times during the lesson

---

Lesson #5 Canceled due to client's illness

---

Lesson #6 (1 hour session)  
 Number of Side Walkers: 2  
 Horse Leader: 1

**Exercises:**

Beginning Status:

- Client physically responsive to getting onto the horse, flexibility significantly improved by client's ease getting onto the horse
- Client is excited for riding lessons, but exhausted from work
- Substitute horse instructor teaches for today's lesson, mentions horse used is very slow and tired today

10 min Warm Up:

- LHD 1 lap around the outside of the poles to the left: no errors
- RHD 1 lap around outside of the poles to the right: no errors  
 Horse stopped randomly and client reminded the horse to walk on with three voluntary kicks on left leg, no kicks seen on right side

Game 1:

- Margarita game: LHD 2 errors and RHD 2 errors

Stretch:

- Client stretched reaching for each stirrup L and then R; 2 sets
- Touched horse's mane behind and in front; 2 sets
- Touched horse's mane behind and in front with passive assistive stretch trunk twists; 2 sets
- 5 curl ups with side walker's hand support on back and arms reaching over thighs to prevent bruising of the patient (never touch the thigh directly to prevent bruising)
- Seat Check

Game 2:

- Puzzle pieces: no errors
- Seat Check

Game 3:

- Ring Connecting People: no errors
- Straight walk back on outer side of poles to dismount

Goal: Left side of body more dominant (especially left hand) and need to gain more strength in right arm, postural strength, stretching, vocal commands for navigational control

Objective: I, II, III, IV, V

Proposal for next lesson: Concentrate on bilateral coordination using opposite sides of the body to improve hand strength; lead using reins left and right hands an equal amount of times during the lesson

---

Lesson #7 (Canceled due to client's illness)

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Lesson #8 (1 hour lesson)  
 Number of Side Walkers: 1  
 Horse Leader: 1

**Exercises:**

Beginning Status:

- Client feels tired today after a long day at work

10 min Warm Up:

- LHD 1 lap around the outside of the poles to the right while placing her right hand on her right thigh to control spasticity response: no mistakes
- Client has trouble placing right hand on thigh and recoils hand to saddle

Game 1:

- Beading: RHD no mistakes

Game 2:

- Stop Light: RHD no mistakes, LHD no mistakes

Game 3: Pull tubes: LHD 2 mistakes, RHD no mistakes, 1 seat check

Game 4:

- Food Trivia

Stretch: trust twists side to side 5 times each side

Ending status: exhausted

Goal: Left side of body more dominant (especially left hand) and need to gain more strength in right arm, postural strength, stretching, vocal commands for navigational control

Objective: I,II,III,IV, V

Proposal for next lesson: Client participates in scavenger hunt to increase cognitive skills and social experience with other riders, work on flattening right hand on right thigh while LHD steering

---

Lesson #9 (1 hour lesson)  
 Number of Side Walkers: 2  
 Horse Leader: 1

**Exercises:**

Beginning Status:

- Client physically worn out and overly tired. Rider feels worn out from work

Warm Up:

- LHD: 1 mistake
- Seat check
- RHD: no mistakes

Game 1:

- Halloween Scavenger Hunt: LHD 2 mistakes, seat check, RHD 1 mistake, seat check
- Severe difficulty with sitting up straight due to being tired

Game 2:

- Bear Soup Game

Game 3: Pull tubes with the rider naming 3 things that are the color of the pull tube obtained: no mistakes

Ending status: exhausted

Goal: Left side of body more dominant (especially left hand) and need to gain more strength in right arm, postural strength, stretching, vocal commands for navigational control

Objectives: I,II, IV, V

Proposal for next lesson: Continue to work on Bear Soup Game for fine motor skills and intrinsic (hands) strength

---

Lesson #10 (45 minute lesson)  
 Number of Side Walkers: 1  
 Horse Leader: 1

**Exercises:**

Beginning Status:

- Client physically worn out and overly tired. Rider feels worn out from work
- Client preparation takes longer than usual to get onto the horse

Warm Up:

- RHD: 1 mistake
- LHD: no mistakes, seat check

Game 1:

- Scavenger Hunt: RHD 1 mistake, LHD 1 mistake

Game 2:

- Bear Soup: RHD 12 mistakes, LHD 3 mistakes

Ending status: exhausted, rider takes a slower procedure off of the horse than usual

Goal: Left side of body more dominant (especially left hand) and need to gain more control in right hand while actively resting hand on right thigh while riding. postural strength,

Objectives: I,IV,V

Proposal for next lesson: possible pasture walk if weather and light outside permitting, flatten right hand on thigh to resist spasticity while LHD steering, use legs in adduction and abduction and vocal commands in next lesson to navigate, bridge activity recorded with rating, hand warm up

---

Lesson #11 (1 hour lesson)

Number of Side Walkers: 2

Horse Leader: 1

**Exercises:**Beginning Status:

- Client physically tired, but “ready for horseback”

Warm Up:

- LHD outside of poles: 1 error
- RHD outside of poles: 2 errors

Stretch

- Hand stretch: client pulls gently on fingers for 7 seconds on each finger on each hand. Flexion and extension wrist and forearm stretches

Trail Pattern 1 (See Appendix K):

- Straight down the middle of the arena while swimming hand motions, go through the cavaliettes, make a U turn, stop in the box, proceed over the bridge, go to the right side of the poles, weave ½ poles back: bridge difficulty 2/5: no errors

Game 1:

- Pull tubes with an advanced stretch combined for each tube

Stretch

- Hand stretch, seat check

Trail Pattern 2 (See Appendix L)

- Weave the poles, bridge, figure 8, then weave ½ of the poles coming back (3 poles): bridge 1/5, no errors

Objectives: I,II,III,IV, V

Proposal for next lesson: flatten right hand on thigh to resist spasticity while LHD steering, use legs in adduction and abduction and vocal commands in next lesson to

navigate, bridge activity recorded with rating, hand warm up

---

Lesson #12 (1 hour lesson)

Number of Side Walkers: 2

Horse Leader: 1

**Exercises:** Beginning Status:

- Client did not have work today and feels “energetic and happy” for today’s lesson

Warm Up:

- RHD outside of poles: 2 errors
- LHD outside of poles: no errors

Game 1

- Thanksgiving Treasure Hunt around the arena
- Seat check
- Horse becomes spooked by something in the corner of the arena. Rider recovers quickly from the situation and laughs about it, proceeding on with the lesson shortly after

Trail Pattern 1 (See Appendix M):

- LHD weave the poles, stop in box (2/5), go over the bridge, over 3 cavallettes with RHD, LHD shoot 3 baskets, RHD trot for four poles: no errors

Stretch

- Hand stretch
- Lean forward to touch foot twice on each side, touch horse’s flank twice on each side, touch horse’s mane twice using both hands
- Seat check

Game 1

- Margarita Game: RHD 1 error, LHD 1 error

Client requests to ride one more lap around the poles before getting off the horse

Objectives: I,II,III,IV, V

Proposal for next lesson: flatten right hand on thigh to resist spasticity while LHD steering, use legs in adduction and abduction and vocal commands in next lesson to navigate, progress hand warm up

---

## **Chapter V: The Results**

### *Results for Question 1*

The following question was investigated using the BMIS and errors made in each lesson:

**Q1:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy create a better quality of life for herself by strengthening her postural stability and motor control?

The following tables display the recorded information from each riding lesson.

Before each lesson, the client filled out a BMIS in order to assess the client's emotional state, used as a tool to measure her quality of life. In Table 1, nine lessons were recorded using the BMIS scoring. (Refer to BMIS *Reiteration of the Client's Information* section to review how the BMIS data was ranked.) The client began with low "good feelings" as she came into the lesson, yet steadily maintained a positive emotional state throughout the development of the program. As the "good feelings" fluctuated throughout the course of the semester's riding lessons, the "bad feelings" increased from zero bad feelings, to a moderately low number of bad feelings. Her overall feeling rating fluctuated throughout the lessons and showed no significant correlation in relation to the "good" and "bad feeling results.

**Table of BMIS Results Prior to Riding Lesson**

<b>Lesson Number</b>	<b>Good Feelings Rating</b>	<b>Bad Feelings Rating</b>	<b>Numeric Rating Overall Feeling</b>
1	3/24	0/24	8
2	20/24	5/24	5
3*	No data collected	No data collected	No data collected
4	14/24	9/24	-4
5**	No data collected	No data collected	No data collected
6	20/24	6/24	8
7*	No data collected	No data collected	No data collected
8	19/24	5/24	2
9	20/24	6/24	8
10	21/24	10/24	0
11	21/24	6/24	3
12	18/24	7/24	7

\*Canceled due to bad weather

\*\*Canceled lesson due to client's illness

Good feelings: lively, happy, peppy, caring, calm, content, loving, and active

Bad feelings: drowsy, grouchy, sad, tired, nervous, gloomy, fed up, and jittery

**Table 3.** Brief Mood Introspective Scale. The BMIS Scale was used to measure the client's emotional state prior to each lesson.

In Table 2, the number of errors was recorded during each lesson. The client is predominantly left handed, and has more spasticity in her right hand. (Her right hand could be considered the involved side when trying to initiate exercises that incorporate more right hand involvement to improve her strength bilaterally.) Initially, the first lesson did not record the number of errors, because RHD and LHD had not been a part of the client's structured program before. Recognizing the need to utilize right and left hand dominance in the exercises was established as a result of the first lesson. Eight lessons were recorded for errors in RHD activities and errors in LHD activities. Nine lessons were recorded for seat checks and bridge difficulty overall.

There were more RHD mistakes made overall in each lesson than LHD mistakes, with the exception of lesson 6 and lesson and lesson 8. The number of postural seat

checks decreased toward the conclusion of the structured program. Bridge difficulty became easier for the client and was performed twice during lesson 9. However, going over the bridge was not a part of the client's lesson plans for lesson 4,6,8,9, and 10 when riding lessons were held.

**Errors in Lesson**

<b>Lesson</b>	<b>Right Hand Dominant</b>	<b>Left Hand Dominant</b>	<b>Postural Check for Trunk Stability (Seat Check)</b>	<b>Bridge Difficulty 1 through 5</b>
1	Not documented	Not documented	2	3/5
2	13	2	0	3/5
3*	Not documented	Not documented	Not documented	Not documented
4	8	4	3	0/5
5**	Not documented	Not documented	Not documented	Not documented
6	2	2	3	0/5
7*	Not documented	Not documented	No documented	Not documented
8	0	2	1	0/5
9	3	1	3	0/5
10	14	4	2	0/5
11	2	1	1	2/5, 1/5
12	2	1	1	2/5

\*Canceled due to bad weather

\*\*Canceled lesson due to client's illness

Bridge Activity Ratings: 5=Extremely hard, 4=Hard, 3=Somewhat hard, 2=Somewhat Easy, 1=easy, 0= Not performed

**Table 4.** Errors in Lessons. This error chart shows a record of the number of errors the client made during each lesson. Errors made in the lesson could be: a vocal reminder from side walkers or horse instructor to correct rider's posture, missing an obstacle while directing the horse, cutting off a side walker on a trail pattern, and dropping a toy during an activity.

### *Results for Question 2*

The following question was analyzed using personal questionnaires:

**Q2:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy improve her self confidence to participate as an employee in the workforce?

Personal question and answers interviews once in the spring and once in the fall between the client and myself in order to understand her personal goals and what was currently going on in her life at the time. A generic questionnaire was made for future Cerebral Palsy clients seeking A.W.A.R.E.'s services to assess a future CP client's self confidence (see appendix D).

<b>Spring 2010 Personal Interview Questionnaire:</b>
Client: 21-year-old female diagnosed with quadriplegia Cerebral Palsy
1. What is a main goal in your life right now?
A: I want to become an H.E.B. greeter.
2. Are you undergoing training now?
A: Yes, I am in training now.
3. When do you graduate from training?
A: In a year. [1.5 years training from January 2010-May 2011]
4. What are the expectations for an H.E.B. greeter?
A: To greet people as they come into the store, check their receipts for groceries (mainly for ice purchases), and warn the store managers as to any issues with the customers, answer questions regarding where they can find products on what aisles, and where coupons are located throughout the store
5. What is the hardest challenge for you as an H.E.B. greeter?
A: Memorizing what is located on what aisle. It is really hard.
6. Who is in charge of your training?
A: My job training coach.
7. Will there be more jobs after you graduate from this one?
A: I have probably two more jobs in my training before I graduate that are assigned to me later on.
8. Where does your job training coach stand during your training?
A: Right beside me.
9. What are the physical expectations for you to do while you're on the clock?
A: Sit up straight in my wheelchair with the wheels locked and look at the customers to greet them.

10. If there were to be an emergency where someone took something without purchasing it, what action would you take?
A: I'd put the staff member's cell phone numbers in my phone and call them for assistance.
11. How do you think a horse riding program can help you with being a future H.E.B. greeter?
A: I can work on holding up my head and keeping my back straight.
12. Would using memory recall activities in the horse riding program help you target memorization with products on certain aisles help you?
A: Yes

**Table 5.** These questions and answers for the spring semester led the researcher to know more about the client's QOL and personal goals as an unpaid H-E-B employee in training and was used to assess the client's self confidence throughout the development of their structured therapeutic riding program.

<b>Fall 2010 Personal Quality of Life Questionnaire</b>
1. Please identify your current main goal in life now?
I want to keep busy and make a lot more friends besides the ones that I have. I want to be more social.
2. Are you undergoing any job training now?
No, my job is paid as a Kohl's employee.
3. When are you expected to graduate from job training?
I am still training for the Kohl's job, but getting paid as I train. As soon as the manager feels as if I can be on my own during the job, my job coach will no longer be there with me. I graduate in the program May 2011, but hope to continue working at Kohl's after.
4. What will be expected of you at your specific employee job?
I will be putting security tags on all clothes, stocking items, folding t-shirts and putting them back into their bag in the back.
5. What will be the hardest challenge for you as a worker for your employer?
Folding t-shirts on my lap will be hard because they don't have a table to do it. My friend works there and she has to hold t-shirts on her lap too.
6. Who will be in charge of supervising you?
The Job Finders Program with the Department of Assisted Rehabilitative Services (DARS). A job coach supervises me with the program until my manager decides I am ready to be out there in the store on my own.
7. Where will your job training be located?

Kohl's is my paid job that I want to maintain as an on-going job. Kohl's officially starts 9/13/10 for me.
8. What are some of the expected physical duties for you while you are on the clock?
I will be using my manual wheelchair and my job coach will help me. I will start out wheeling myself and then when I get tired, my job coach will help me out. I will be using my hands a lot.
9. What are you expected to do if there is an emergency?
My job coach is going to stay with me so they will be there for me.
10. How will you use the restroom?
I will go to the customer service desk and ask politely to please open the restroom door for me and then check on me in five minutes. That is what I do when I am at school. I am capable of getting on and off the toilet and just need help opening and closing the door.
11. How do you think a horseback riding program might help you qualify for a job with a future employer?
What I want to work on is hand strength because the security tag on clothes is hard. You have to put the pin through the clothes and send the pin through a tiny hole and then fasten the tag.
12. What kind of activities would you like to see as a part of your horse riding program to help you become a better worker on a job? (i.e. practice with memory recall, strengthening activities, attitude, etc)
More shoe lacing and hand work as well as balance a ball on a spoon while riding.
13. How long is a typical shift?
A typical shift is 2-4 hours. When I get comfortable with the job, it will be 4 hours long. At the old H-E-B training, it was two hours.

**Tables 6.** This questionnaire for the fall semester led the researcher to compare the client's self confidence as a paid Kohl's employee in training versus an H-E-B door greeter throughout the development of their structured therapeutic riding program.

The questions that are most similar between the two semesters' questionnaires are shown in a Table 7 below and were used to compare how the client's self confidence in her two job experiences differ as a result of a change in her QOL

## QOL Questionnaire Comparison

<b>Spring 2010 (H-E-B Unpaid Employee/Trainee)</b>	<b>Fall 2010 (Kohl's Paid Employee)</b>
1	1
4	4
5	5
9	8
11	11

**Table 7.** QOL Questionnaire Comparison for the spring as an H-E-B trainee versus a Kohl's employee in training.

## Chapter VI: Discussion and Conclusion

The aim of this research project was to develop a standardized horseback therapeutic riding program for persons with Cerebral Palsy and then document the client's response. Two primary outcomes were tracked including postural stability, motor control and the client's participation in the work force. Two research questions were addressed.

### *Discussion for Question 1*

Discussion for Question 1 was addressed using the Brief Mood Introspective Scale (BMIS) and the number of errors made in each lesson to determine whether or not the following question was addressed in the new riding program:

**Q1:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy create a better quality of life (QOL) for herself by strengthening her postural stability and motor control?

The client's main goals were to build her postural stability as well as focus on building her hand strength and socializing skills to work as an H-E-B greeter or a Kohl's paid employee. Muscular endurance in her hands and strengthening her postural stability were integrated into a structured horseback therapeutic riding program in an effort to create a better QOL for herself in her new career.

The BMIS showed that the client's feelings remained more positive than negative during the duration of developing the structured program when comparing the "good" feelings from the "bad feelings." (See Table 4 and refer to BMIS *Reiteration of the Client's Information* section to review how the BMIS data was ranked.) However, the bad feelings increased in general after starting the new paid position as a Kohl's employee. This trend might have been because the expectations and responsibilities for

the new client greatly increased compared to her previous job as an H-E-B door greeter in training. The amount of stress in the new life change might have influenced the number of bad feelings that were experienced throughout the development of the program because her riding classes were scheduled on the same days that she worked for a four hour shift. Client feelings of fatigue after her laborious shift and her emotional rankings are proof of this according to the BMIS results. There was no apparent relationship found using the overall numeric rating scale, yet it does show low numbers for overall pleasant feelings before the start of a lesson due to a strenuous day at work.

Observations of the first lesson were used to document a typical lesson before reconstructing the previous riding program to meet the client's needs. One modification included the addition of recordings for Right Hand Dominant (RHD) and Left Hand Dominant (LHD) errors during the riding class so that a program could be constructed to build muscular endurance in the client's hands. This emphasis on improving her fine motor skills and manual dexterity was used to help her fold clothes and put on security tags in her new job position. Since the client is predominantly left handed with spasticity and weakness in her right hand, there were a greater number of errors in her RHD activities during the lesson. The spasticity in the client's right hand is involuntary and very difficult to control, yet as a result of this structured riding program, her right hand was given more therapeutic challenges than in previous lesson activities before this project began. It can be seen that over the course of time, RHD errors started to decrease which suggests that she was improving in her right hand function.

Postural stability was recorded by the number of seat checks the side walkers and instructors saw when the client would lean away from the center of the horse, therefore

jeopardizing the client's postural stability and kinesthetic proprioception for their exercises. As the number of seat checks decreased from lessons 10-12, the client's bridge difficulty ratings decreased from a 3 in the beginning to a 2 and 1 as seen in Table 4. One can conclude that as postural stability was worked on throughout the course of the riding program, the difficulty of going over the bridge also decreased which might indicate improvements in trunk muscles and overall balance.

### *Discussion for Question 2*

Discussion for Question 2 was addressed using personal questionnaires for each semester to determine whether or not the following question was addressed in the new riding program:

**Q2:** Will the structured horseback riding therapeutic program for a young woman with Cerebral Palsy improve her self confidence to participate as an employee in the workforce?

The structured horseback riding therapeutic program for my Cerebral Palsy client did improve her self confidence as an employee in the workforce and was assessed using Table 7: QOL Questionnaire Comparison. The questionnaire given in the spring of 2010 was taken at the time the client was involved in an unpaid job opportunity to introduce her to a job training program. As a H-E-B door greeter, the client trained during the spring to become a possible H-E-B part time paid employee in the future. In the fall, the client received a job offer by Kohl's to be a part-time paid employee. The client's structured horseback riding program was created around this new life change.

In the Spring 2010 questionnaire, the client's main goal was to become an H-E-B greeter and when asked in the Fall 2010 interview pertaining to her Kohl's career, her goal was to make more friends and to become more social. The QOL response changes

between the two jobs shows how the client advanced from a job focused on communicating effectively (H-E-B door greeter) to more of an advanced career with cognitive and physical challenges (Kohl's employee.) Question 1 for both of the interviews showed a progressive response from being introduced to the workforce in the spring, to branching out and socializing as a part of the workforce in the fall semester. The client's desire to become more social increases throughout the development of the program by her mentioning of making more friends at Kohl's, more so than when she stood only with her job coach at H-E-B. This social desire shows an increase in self confidence after getting her "feet wet" in the work force as an H-E-B door greeter in the spring. Question 4 focuses on verbal expectations for the client as an H-E-B greeter in comparison to question 4 indicating Kohl's expectations as an employee completing fine motor tasks that challenge her physical capabilities more so than as an H-E-B greeter. Question 5 as an H-E-B greeter states that the client's cognitive skills for memorization were her biggest challenge as opposed to question 5 as a Kohl's employee with demands of physical endurance and strength to perform more complex duties such as folding clothes. The physical expectations for the H-E-B greeter position in question 9 were less physically draining than the physical expectations for the Kohl's employee position because of required postural stability and hand strength to successfully put on security tags on clothes. In questions 11 for both questionnaires, the response for how a horseback riding program can help benefit the client as a door greeter was to build postural strength while the client responded building hand strength in addition to building postural stability as a Kohl's employee in the fall questionnaire,. The spring questionnaire shows a progression from one goal to several goals in the fall. In the last recorded lesson, the

client requested to walk another lap around the poles after the time was up in the lesson. The client had never requested to ride another lesson and was unaware that this was the last lesson recorded for the program. This shows that the client enjoys her riding lessons and is confident to ask for more riding time at the end of the lessons. Targeting these two goals were evident in exercises and progressions made in the structured horseback therapeutic riding program, therefore it may be concluded that the structured program did target goals to help the rider's self confidence as an employee in the business world.

### *Limitations*

This research project was limited by having a small sample size of recording one client's physical and cognitive feedback while developing a structured horseback therapeutic riding program. Another limitation to this research project was that as the researcher, I was also a side walker for the client and could not solely observe as a researcher everything noted in the lesson. Although, being alongside the client is important for explaining the exercises and completing them with her, having an additional side walker to replace myself could have been more beneficial in more thorough results. Also, the researcher and client were not blinded as to her participation in this horse riding program.

### *Conclusion*

In conclusion, this research on a person with Cerebral Palsy shows positive results in mood, postural stability, motor skills, and self confidence that provide benefits for an individual participating in the workforce. A standardized tracking method for the program was devised as a tool in tracking the progression and digression of a client's horseback therapeutic riding program. (See Appendix N). It can be concluded that

developing a structured therapeutic program for young adults with Cerebral Palsy does deserve ongoing consideration for extensive research in an effort to adding more knowledge about therapeutic riding programs and their physical and cognitive benefits for the Cerebral Palsy population.

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Appendices

Appendix A: Texas State University Institutional Review Board (IRB) approval.

Texas State University's IRB granted approval for this undergraduate thesis.



**Institutional Review Board Application**

**Certificate of Approval**

**Applicant: Taylor Clark**

**Application Number : 2**

**010I4654**

**Project Title: Development of a Structured Hippotherapy Program for Young Adults with Cerebral Palsy**

**Date of Approval: 07/26/10 12:20:56**

**Expiration Date: 07/26/11**

## Appendix B: Client Consent Form

This client consent form was devised to meet Texas State's IRB standards for this undergraduate research.

### Development of a Structured Horseback Riding Therapeutic Program for Young Adults With Cerebral Palsy Consent Form

#### **Researcher's Information**

My name is Taylor Clark and I am an undergraduate student at Texas State University-San Marcos. I would like to investigate way your mind and body works during therapeutic horseback riding program as a part of my research project for an undergraduate thesis in the Texas State's Honor Program. The data collected will be used to further advocate the effectiveness of a horseback riding program for young adults diagnosed with Cerebral Palsy. You have been chosen as the only participant in this research project because you are affected by Cerebral Palsy and are currently a client at the therapeutic horseback riding clinic, Always Wanted A Riding Experience (A.W.A.R.E.) located in San Marcos, Texas. If at any time you want to conclude your participation in this research project or have any questions about participating in this research project, I can be contacted at the following:

(email and cell number provided)

The Texas State University Institutional Review Board (IRB) can be contacted at the following if you have any questions about the research, your rights as a participant, and/or relevant research-related injuries at:

Dr. Jon Lasser, IRB Chair 512.245.3413 [lasser@txstate.edu](mailto:lasser@txstate.edu)

Ms. Becky Northcut, Compliance Specialist 512.245.2102

#### **What is the purpose of this study?**

I want to develop a structured therapeutic horseback riding program to help young adults with Cerebral Palsy. The purpose of this study is to observe your riding lesson at A.W.A.R.E. to assess how your body works and your personal goals improve during each riding lesson using behavioral and learning models. With these models, I will analyze your perception of yourself in your individual and group therapy. The modifications in your current riding lesson will target building trunk and postural strength as well as improvements in your memory recall. My personal goal in this research project is to bring attentiveness to you as a client associated with A.W.A.R.E.'s program as to why you engage in the activities during the lesson and how they should help you. In return, I hope that my research will benefit future Cerebral Palsy clients' programs and add to research regarding the use of therapeutic horseback riding for the Cerebral Palsy population.

#### **What will I be asked to do?**

As a participant, you are expected to fill out a quick Brief Mood Introspection Scale questionnaire at the beginning of each riding lesson regarding your current emotional state which should take 5 minutes to complete. Two example questions for the beginning questionnaire may be:

- Rate how your overall mood today on a scale of -10 to +10 (-10 feeling Very Unpleasant and +10 feeling Very Pleasant) Describe to me how you feel today in a one word answer
- What have you done earlier today, before coming to A.W.A.R.E. that you found challenging?

You will also have to fill out a quick survey that will differ lesson to lesson regarding the various activities you participated in at the end of each riding lesson which should take 5-10 minutes to complete. The survey will ask your thoughts on the activities you participated in. An example question may be:

- Did you find any part of today's lesson challenging and if so, what activity/activities?
- What do you like or dislike about the activities you did participated in today?
- How do you feel after your lesson today?

The questionnaires and surveys will be collected as data and be in easy, understandable terms and language. I will be available to record your responses.

The riding lesson will be conducted in the same manner as before, but there will be more emphasis on my observations and modifications to your games and activities to support your specific desired goals that will be clearly defined at the beginning of this research project. Measurements of your body may be taken in order to track your progress during your lessons. Examples of these measurements include:

- How straight you can hold your trunk while riding the horse
- How much help you need to keep your balance on the horse
- How often you hold your breath when going over the bridge

#### **If you do not choose to participate?**

If you do not want to participate in this research project, you will still remain an active client in the A.W.A.R.E. program. Your participation in this study is completely voluntary and you may withdraw from the study at anytime. At anytime, you can offer to not answer or give information asked on questionnaires and surveys without jeopardizing your relationship with Texas State University or the A.W.A.R.E. program. All data collected will be available to you at any time at your own discretion by contacting me at any time.

#### **What are the benefits?**

Participation in the proposed structured program will help you become more conscious about yourself and why you do things in certain ways. This may also help increase your quality of life and others who have mental and physical challenges. There are no immediate medical complications from engaging in this research study.

#### **Are there any risks involved?**

You are riding a large and unpredictable animal in every lesson. Although you have been riding the same horse for many years, you are always at a risk for spooking a horse in the arena. You will wear protective headwear (securely fastened helmet) at all times when you are in the arena and must follow all of the licensed instructor's rules at all times. You will also have specially trained assistants to closely monitor you on the horse. You must agree to A.W.A.R.E.'s current consent form in accordance to this consent form.

#### **Will my personal information be protected?**

Procedures will be used to ensure your privacy during participation in this project. The information collected will be stored on a password protected computer. The stored

collected data will only be accessible to me and my supervising advisor, Dr. Denise Gobert, PT, Ph.D., my pre-thesis advisor, Mrs. Dianne McCabe, and thesis coordinator, Dr. Heather Galloway. The data found in my research will be unidentifiable to the public as to who you are. No name will be used in the research documented. Only your gender, age, diagnosis, lesson date, and data collected will be identifiable in addition to the survey and questionnaire data. All records will be kept behind a locked door. Publicizing your picture as well as video or audio recordings in the research project will be used only with your approval. The specific time of your lessons will not be identifiable. Your data will be stored for three years after the study is concluded. This research study will be ongoing until December 2010.

**Will I get paid to participate?**

As a participant, you will not receive any financial compensation for your participation.

**Consent Statement**

I \_\_\_\_\_ (printed name), agree to participate in this research study and understand the purpose of this study conducted is to observe me in multiple therapeutic horseback riding lessons conducted at A.W.A.R.E. in San Marcos, Texas. I have read through this entire consent form and agree to its terms.

**Participant's Signature** \_\_\_\_\_

**Date:** \_\_\_/\_\_\_/\_\_\_

**Researcher's Signature** \_\_\_\_\_

**Date:** \_\_\_/\_\_\_/\_\_\_

**Video Consent**

I understand that with my signature below, I am approving to have video footage or audio recordings used and published.

Approval to use video/audio recordings: **Signature** \_\_\_\_\_ **Date:** \_\_\_/\_\_\_/\_\_\_

I do not want video recording/ audio recordings to be publicized:

**Signature** \_\_\_\_\_ **Date:** \_\_\_/\_\_\_/\_\_\_

**Picture Consent**

I understand that with my signature below, I am approving to have my pictures published.

Approval to use pictures: **Signature** \_\_\_\_\_ **Date:** \_\_\_/\_\_\_/\_\_\_

I do not want my picture to be publicized: **Signature** \_\_\_\_\_ **Date:** \_\_\_/\_\_\_/\_\_\_

With my signature below, I am stating that I have clearly read through this entire consent form and consent to be a participant according to all of the terms above. My questions have been answered to my satisfaction and will obtain a copy of this consent form to keep for my own records.

**Participant's Signature** \_\_\_\_\_

**Date:** \_\_\_/\_\_\_/\_\_\_

With my signature below, I am stating that I have clearly explained this entire consent form and answered the participant's questions according to the IRB's standards.

**Researcher's Signature** \_\_\_\_\_

**Date:** \_\_\_/\_\_\_/\_\_\_

With my signature below, I am stating that I have clearly read through this entire consent form and consent to be a witness that I observed the participant and researcher discuss all of the terms above.

**Witness's Signature** \_\_\_\_\_

**Date:** \_\_\_/\_\_\_/\_\_\_

Appendix C: A.W.A.R.E. Facility Consent Form

This consent form was used as a part of meeting Texas State's IRB standards for undergraduate research.

A.W.A.R.E. Facility Consent Form

A.W.A.R.E. approves of Taylor Clark's undergraduate thesis on the Development of a Structured Horseback Riding Therapeutic Program for Young Adults with Cerebral Palsy and understands her thesis will fully comply with A.W.A.R.E.'s rules at all times.

**Signature:** \_\_\_\_\_

**Date:** \_\_/\_\_/\_\_

## Appendix D: Proposed Questionnaire for Young CP Adults Entering the Workforce

This is a suggested questionnaire for young adults with Cerebral Palsy entering the workforce that will help guide more information about the client and their quality of life.

<b><u>Personal Quality of Life Questionnaire and Answer</u></b>
<b>The following questions will help develop a structured horseback riding program to help you reach your goals in life.</b>
1. Please identify your current main goal in life now?
2. Are you undergoing any job training now?
3. When are you expected to graduate from job training?
4. What will be expected of you at your specific employee job?
5. What will be the hardest challenge for you as a worker for your employer?
6. Who will be in charge of your job training?
7. Where will your job training be located?
8. What are some of the expected physical duties for you while you are on the clock?
9. What are you expected to do if there is an emergency?
10. How do you think a horseback riding program might help you qualify for a job with a future employer?
11. What kind of activities would you like to see as a part of your horse riding program to help you become a better worker on a job? (i.e. practice with memory recall, strengthening activities, attitude, etc)

## Appendix E. Brief Mood Introspective Scale

This BMIS scale was used to assess the client's emotion before attending each lesson.

**Brief Mood Introspection Scale (BMIS)**

By John D. Mayer

**INSTRUCTIONS:**

Circle the response on the scale below that indicates how well each adjective or phrase describes your present mood.

**RATINGS:**

definitely do not feel= XX      do not feel = X      slightly feel= V      definitely feel = VV

---

Lively	XX	X	V	VV
Drowsy	XX	X	V	VV
Happy	XX	X	V	VV
Grouchy	XX	X	V	VV
Sad	XX	X	V	VV
Peppy	XX	X	V	VV
Tired	XX	X	V	VV
Nervous	XX	X	V	VV
Caring	XX	X	V	VV
Calm	XX	X	V	VV
Content	XX	X	V	VV
Loving	XX	X	V	VV
Gloomy	XX	X	V	VV
Fed up	XX	X	V	VV
Jittery	XX	X	V	VV
Active	XX	X	V	VV

---

Overall, my mood is: \_\_\_\_\_

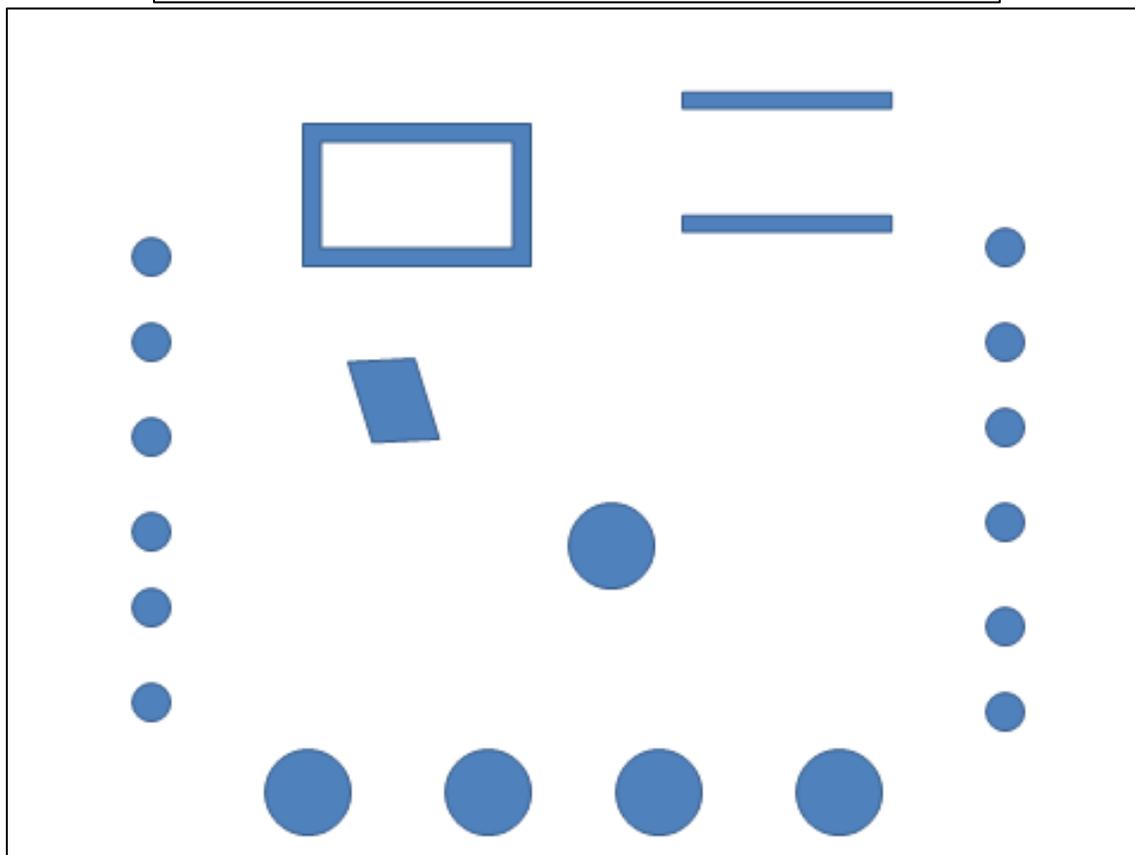
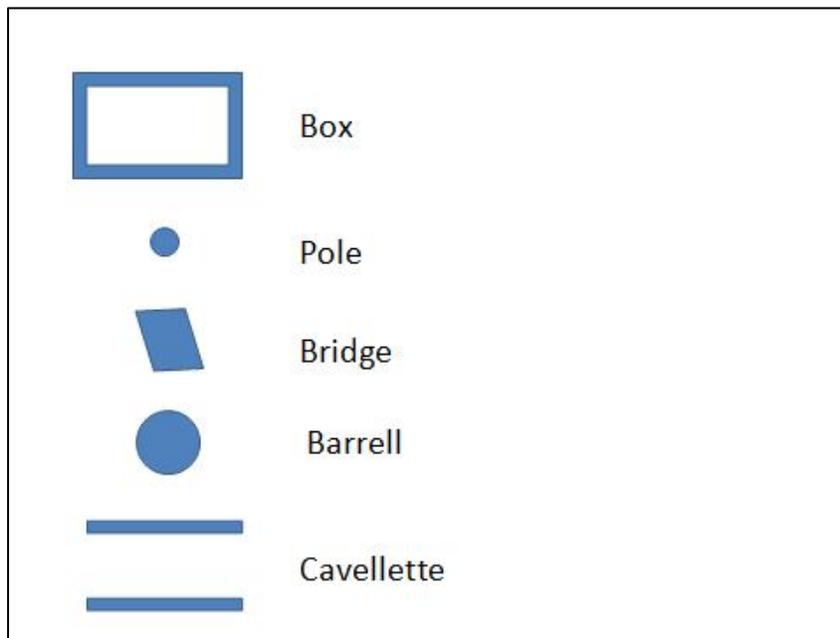
Very Unpleasant	Neutral	Very Pleasant
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10		

Source:

Mayer J.D., & Gaschke, Y.N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology*, 55, 102-111.

## Appendix F: A.W.A.R.E.'s Arena

This diagram is an illustration of A.W.A.R.E.'s arena and is used to describe the trail patterns that are created in each lesson. Directly below is key of all of the objects seen in the arena for a typical riding lesson.



## Appendix G: Lesson Games

The following games were made for riding lessons and utilize cognitive, physical, and social skills to complete each task set before the rider. (All trail patterns in the lesson are placed in the Objective Category V: Instrumental Navigational Motor Coordination.)

**Rings:** Rider puts reaches for plastic rings across their body from side walkers and places the rings on the poles while weaving through the poles. Pull tubes were also often used as a substitute for rings.

Objective III



**Figure 10.** Pull Tubes. Pull tubes connect, disconnect, and scrunch together, making the client work hard to manipulate while balancing on the horse.

**Stop Light:** Red light signal (stop the horse), green light signal (walk on to the horse)  
purple light signal (trot), blue light signal (back up)

Objective V

**Handkerchiefs:** This is incorporated more in trail patterns than a game. Rider rides alternating poles while putting handkerchiefs in each hollow pole top. Client reaches across their body while sidewalk makes the rider reach to put each handkerchiefs into a pole's hole

Objective I, II, V



**Figure 11.** Hankerchief Game. Hankerchiefs are used as a target to improve the client's hand strength, navigational control, and postural stability while balancing on the horse.

**Margarita:** While weaving the poles, client pours a ball into two cups. One cup is given to each side walker and the client reaches contralaterally to dump the ball into the side walker's cup. Each side walker has a cup and makes the client reach stabilizing core muscles while reigns are not used, yet passive assistive therapy used because the rider uses the saddle to grip and maintain balance while reaching contralaterally for the ball from the sidewalker

Objective I



**Figure 12.** The Margarita Game. Dumping a ball back and forth into two cups causes the rider to use their arms in horizontal flexion, internal rotation, and extension while using their core and back muscles for postural stability.

**Animal Trivia:** One rider, horse leader, horse instructor, or side walker chooses an animal and the group must figure out what animal they have chosen. After the animal is guessed, the horse walks on while the rider acts out the animal

Objective I

**Food Trivia:** Similar to animal trivia, but focuses more on cognitive ability. A sidewalker or rider chooses a food to describe and another person in the arena answers the clues as to what the food is as they control the horses walking pattern.

Objective V

**Shoe Lacing:** While weaving the poles, client laces up a cardboard horse

Objective IV



**Figure 13.** Shoe Lacing. Shoe lacing a wooden figure emphasizes fine motor skills that are crucial for the client to improve her hand strength and is useful when putting tags on clothing at her vocational job training site.

**Beading:** Without the horse moving, client laces up a wooden beads on a thick string switching hands; RHD holding wooden bead harder than LHD holding bead

Objective IV

**Scavenger Hunt:** Plastic toys, objects, or papers are hidden around the arena while the clues are distributed to the rider by a sidewalker. Once the rider finds the clue in the arena, the rider must reach in different directions to obtain the next clue.

Objective V

**Puzzle Pieces:** While horse is moving, the client reaches across their bodies to the opposite side (contralateral) to receive the puzzle piece from a side walker after pointing

to what puzzle piece they would like to put into the puzzle. Then the client reaches for the puzzle piece from the side walker and then puts it into the puzzle themselves while the two side walkers hold the puzzle board. The client switches sides alternating different sides.

Objective IV

**Ring Connecting People:** The rider reaches for a plastic ring that has plastic human figurines connect to from their appendages. After the rider reaches for the ring from one side walker contralaterally, they reach for the man from the other side walker and proceed to put the person on the ring themselves. The people sit on top of each pole and as the client walks by and instructors their horse to stop, the side walker tilts the pole in a direction where the client must reach farther to obtain the person on the pole.

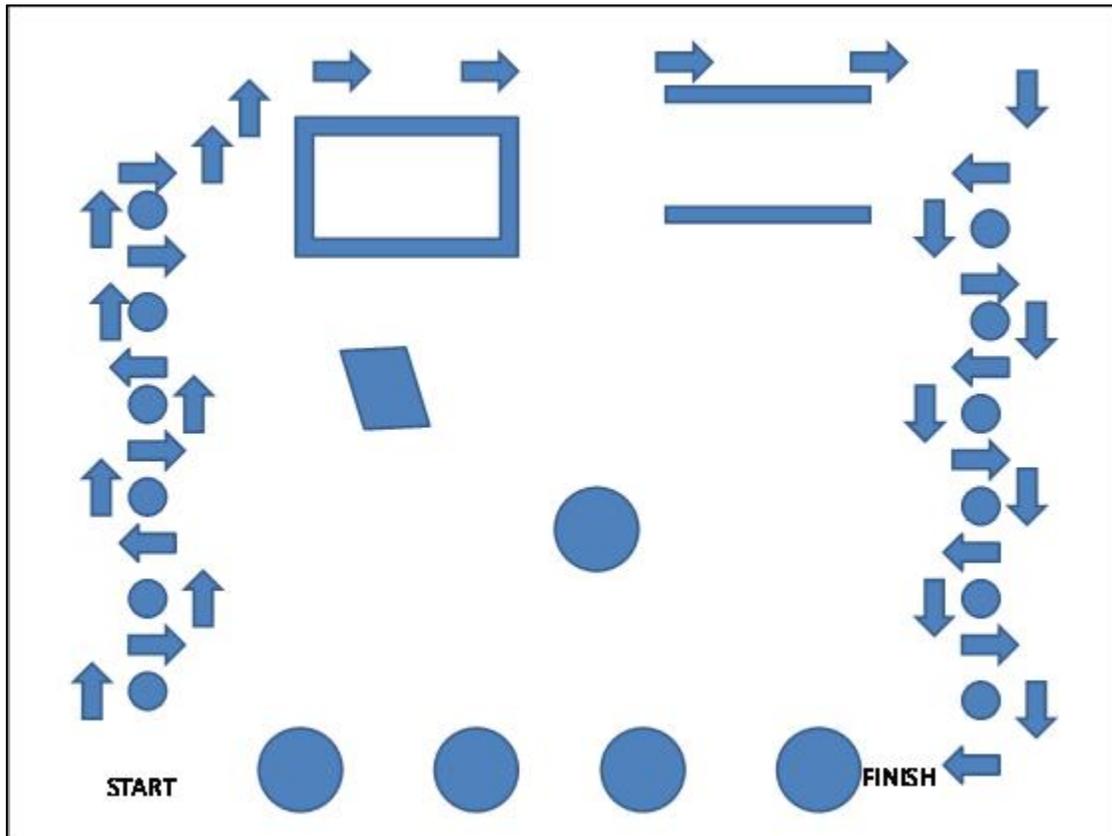
Objective IV, V

**Bear Soup:** The sidewalkers hold individual cups as the client rides the horse around the arena with a spoon, fishing for miniature bear figurines using the spoon to get the bear out of the sidewalkers cup. One sidewalker's cup is empty, while the other is full with bears. The rider transfers each bear one by one from cup to cup while reaching at different levels to get one bear at a time with the spoon. The game goes on until all of the bears have been transferred.

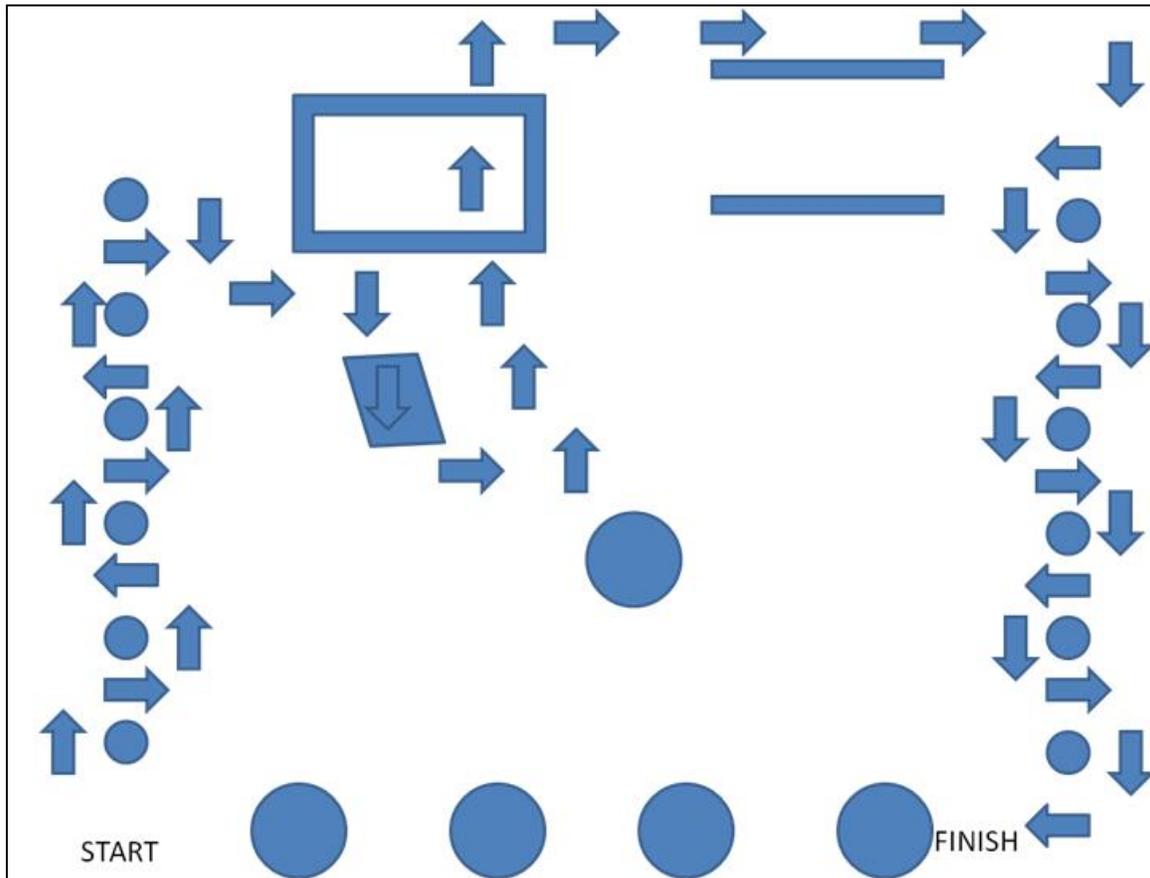
Objective: II,IV

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Appendix H: 10 Minute Warm Up Trail Pattern for Lesson #1



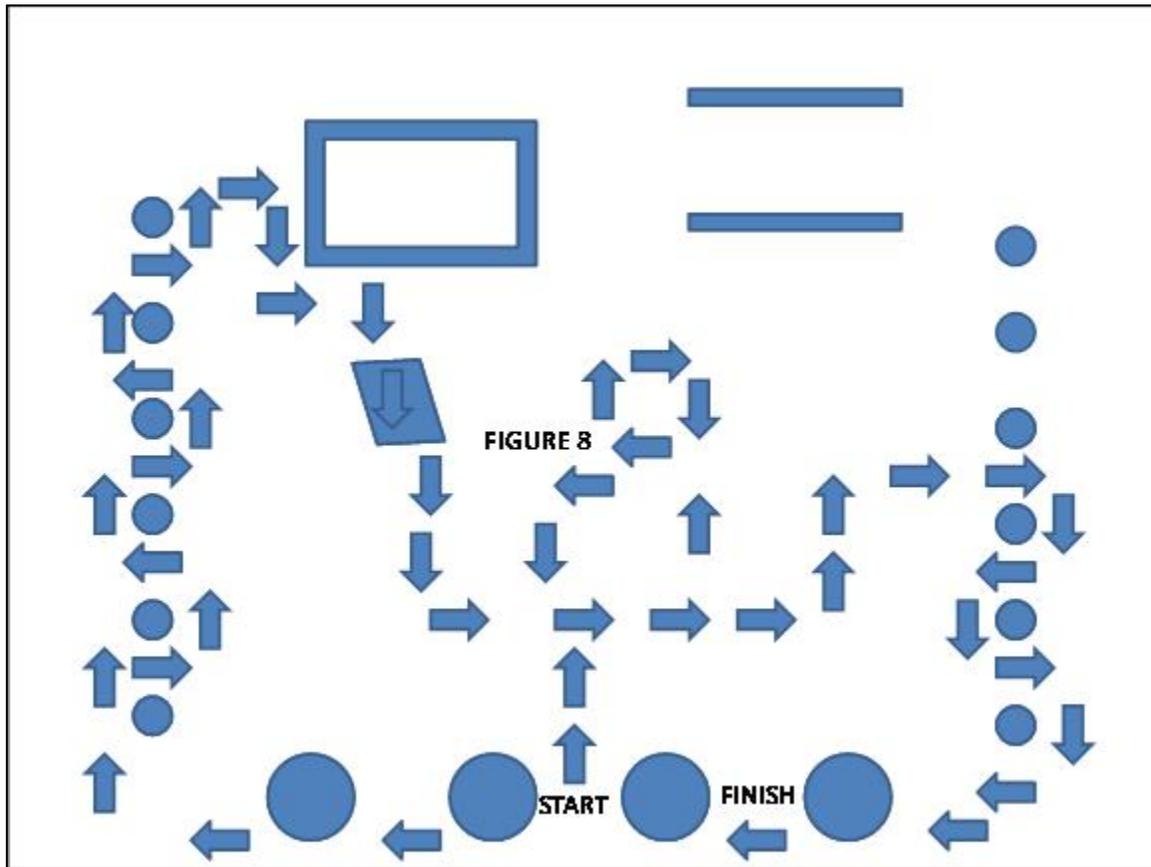
Appendix I: Trail Pattern #2 for Lesson #1



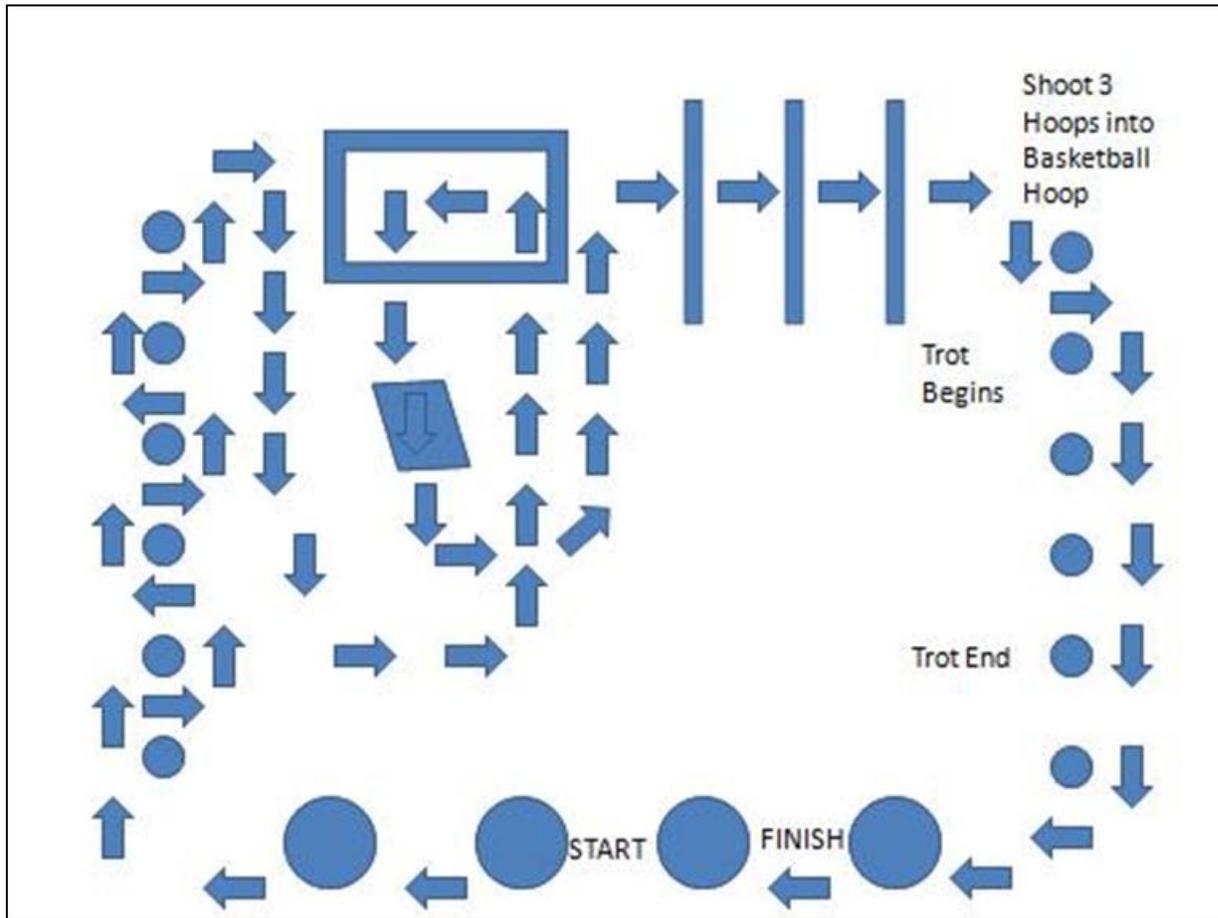




Appendix L: Trail Pattern 2 for Lesson #11



Appendix M: Trail Pattern 1 for Lesson 12



## Appendix N

**A.W.A.R.E. Lesson Form for Cerebral Palsy Client**

Name: \_\_\_\_\_

Date: \_\_/\_\_/\_\_

Dx: \_\_\_\_\_

Goal:

Trunk Control

Objective I. Anterior/ Posterior Alignment

Objective II. Medial/ Lateral Alignment

Motor Skills

Objective III. Functional Flexibility

Objective IV. Bilateral Fine Motor Skills

Objective V. Instrumental/ Navigational Motor Coordination

Next Lesson Plan Note: