Unbridling the Magic
Exploring the Physical, Cognitive, and Behavioral Benefits of Therapeutic Horsemanship

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Authors: Melinda Mordarski, Dana Magee and Julie M. Fagan, Ph.D.

Summary

Does therapeutic riding provide a real benefit for individuals with a broad range of disabilities? Discussed is how therapeutic horsemanship differs from both hippotherapy and traditional riding lessons. To begin to examine the potential physical, cognitive, and behavioral benefits of therapeutic riding lessons, we conducted a survey of the parents/guardians of a group of handicapped students participating in a therapeutic horsemanship program. Our results indicate that these students showed increased self-esteem and independence, an improvement in coordination, fine motor skills and flexibility, an improvement in behavior and cognitive abilities and a general increase in their quality of life.

Video Link:
https://www.youtube.com/watch?v=eSzuVt2Enu8&list=UUts4_1WyqXMmVDfu9ZfisfA

Ways in Which Therapeutic Horsemanship Can Increase the Quality of Life for Individuals with Disabilities

Introduction (MM)

Current statistics show that 56.7 million people or 19% of the population have a disability; this equates to nearly 1 out of every 5 people in the United States (1). Due to the large percentage of the population that is affected by a disability, it is important to make sure that these individuals as well as their guardians are able to maintain a good quality of life despite the potential difficulties caused by these diagnoses. Therapeutic horsemanship is an equine assisted activity (EAA) taught by certified instructors who are not therapists; the main goal is to increase the participant’s quality of life through teaching horsemanship skills. This activity provides immense physical, behavioral, and cognitive benefits and it is important to make individuals with disabilities as well as their parents or guardians aware of equine assisted activities as an option that is available to them.

Defining Therapeutic Horsemanship (MM)

Therapeutic horsemanship is a form of equine assisted activity (EAA) that focuses on teaching riding and horse handling skills to students with disabilities. A therapeutic horsemanship lesson is conducted by a Professional Association of Therapeutic Horsemanship International (PATH Intl.) certified instructor and the primary goal is to
improve the horsemanship skills of the student; all “therapeutic” benefits come as a result of learning how to ride and handle the horse. This is where therapeutic horsemanship is different from hippotherapy, an equine assisted therapy (EAT). In an EAT setting, the sessions are conducted by a licensed occupational, physical, or speech therapist and the primary goal is to use the motion of the horse as a therapeutic tool rather than to teach horsemanship skills (2).

Because the primary goal of therapeutic horsemanship is to teach horsemanship skills, it might initially seem similar to traditional riding facilities however; it differs drastically from these traditional facilities in several important ways. Due to the fact that in a therapeutic horsemanship facility, the instructors are dealing with a more vulnerable population, there is a stronger emphasis on safety and attempting to minimize both the number and severity of falls.

One of the primary differences is that all lessons at a therapeutic riding facility must be taught by a PATH International certified instructor. In order to become certified, all instructors must first demonstrate a basic knowledge of the different disabilities and the ability to safely conduct a group lesson for disabled riders (3). Instructors are also required to attend 20 hours of continuing education annually and maintain current CPR and first aid certifications (3). During the certification testing, many of the oversights that compromise the safety of the lesson such as forgetting to adequately check the girth or leaving an arena door open result in an automatic failure (3).

The other key differences between therapeutic horsemanship facilities and normal riding facilities are the care with which horses are selected, the use of volunteers in the form of leaders and sidewalkers, the use of adaptive equipment, and the use of different mounting and dismounting techniques suited for disabled students. Each of these topics will be discussed in depth in the following sections.

**Horse Selection (MM)**

One of the most essential components of a therapeutic horsemanship facility is the horse. The horses chosen for therapeutic horsemanship programs must have a calm, quiet personality that allows them to cope with challenges that are unique to a therapeutic horsemanship program. They must be able to deal with volunteers around them, unbalanced and sometimes loud students, confusing aids, the use of toys and games, as well as the use of unusual mounting and dismounting techniques. It is important to know the limits of each horse in the program and carefully consider their tolerance levels in order to match them with an appropriate student.

In addition to selecting for a very specific personality, the gait of the horse is a crucial consideration when selecting a horse for a lesson (4). The horse must be sound and have a balanced, symmetrical way of going. Balanced movement from the horse is necessary for the rider to achieve balanced movement of their own trunk and pelvis (4). In addition, each horse has a different type of movement that may be better suited to different groups of students. Some horses have a lot of movement that might be difficult for certain riders
to deal with while for other riders, a horse with very little movement might not provide enough sensory input.

Due to the nature of these lessons, matching both the horse’s gait and personality carefully to the needs of each student is critical in order to make learning horsemanship skills a safe and attainable goal for individuals with disabilities.

**Adaptive equipment (MM)**

Another hallmark of a therapeutic horsemanship facility is the use of adaptive equipment (2). Adaptive equipment is any piece of equipment that has been altered specifically for the purpose of making horsemanship skills safer and easier for disabled riders to perform. Adaptive equipment can be anything from the type of saddle or pad used to the types of reins used to a safety belt worn by the student. The ways in which equipment can be designed or adapted to cater to the needs of disabled students are countless and limited only by the creativity of the staff.

One key piece of adaptive equipment that is always used in therapeutic horsemanship facilities is safety stirrups. These are stirrups that are specially designed to prevent the rider’s foot from getting stuck in the stirrup in the event of a fall. One unifying theme among most pieces of adaptive equipment used is there is a huge emphasis on the safety and security of the rider (2). Examples of adaptive equipment can be seen in appendix B.

**Use of Volunteers (MM)**

While the need for appropriate horses and equipment may appear obvious, there is another component of a therapeutic horsemanship facility that is less obvious but no less important; volunteers. Volunteers are the glue that holds a therapeutic horsemanship center together and makes safe, fun, and effective lessons possible. Therapeutic riding centers use volunteers to varying degrees depending on the needs of the specific student (5).

One of the ways in which a volunteer can help in a therapeutic horsemanship facility is to be a leader or horse handler. Therapeutic horsemanship facilities serve a very broad spectrum of students of varying ages and abilities which means that the leader’s exact job and involvement in the lesson is variable depending on the student. For students who are not able to control the horse independently for any number of reasons, a leader may be asked to be an “active leader” in which case they are completely responsible for controlling the horse (5). For more independent students the leader may be asked to act as either a “passive leader” or a “safety line”. In this situation the student is responsible for controlling the horse while the leader is just present as an added safety to intervene should an unsafe situation arise. Finally, for the most advanced students, the leader can act as a “spotter” in which case they are not attached to the horse at all.

In addition, a rider may have as many as 2 side walkers next to them during a lesson. The job of the side walker is to help keep the student balanced and on the horse (5).
Depending on the needs of the student different holds can be used such as a belt hold, an arm over thigh hold, or an ankle hold. Each type of hold serves a different purpose and the type of hold and number of side walkers used is subject to change as the student progresses and their balance improves. Eventually, a lot of the students are able to progress to a point where a side walker might not be needed at all.

The varied use of both leaders and side walkers during lessons is what allows lessons to be tailored to each specific student in a way that creates a safe, fun, but still challenging environment.

**Different methods for mounting and dismounting (MM)**

Next, due to the nature of some disabilities, some students at a therapeutic horsemanship facility may be unable to use traditional mounting and dismounting techniques. Because of this, another advantage of a therapeutic horsemanship facility is that the techniques for mounting and dismounting at a can be adjusted in ways that increase the safety and comfort of the students (5).

First, rather than a traditional 3 step mounting block, therapeutic riding facilities utilize a mounting block that is much higher and much larger. The added height allows for students to get on without reaching too far for the stirrup and the larger size allows for the instructor to stand on the mounting block with the student to assist as necessary. The mounting block is configured like a chute to assist with getting the horse to stand close enough for the student to get on easily and the platform on the offside provides a place for the side walker to stand so they are also available to assist the student when necessary. These mounting blocks also usually have stairs on one end and a ramp on the other so that they are easily accessible to students with wheelchairs or walkers.

In addition to the design of the mounting block, the actual methods for getting on and off the horse can be altered to accommodate the needs of different riders. For example, if a student has tight muscles and low flexibility, a crest mount may be used. In this instance rather than swinging their leg over the horse’s rump, the rider backs up to the horse, sits on the horse sideways so they are facing the instructor, the instructor then assists the student in rotating to face forward, and finally the student can swing their leg over the horse’s neck. This can be done because the neck is much narrower than the rump and therefore requires less of a stretch from the rider in order to get on or off the horse. Students are also able to dismount either to the ground when possible or to the mounting block if the drop from the horse’s back down to the ground is too far for that individual. Finally, a wheelchair lift can also be used for students who are wheelchair bound and cannot walk or mount the horse independently (5). Examples of the mounting blocks used in a therapeutic horsemanship facility can be seen in appendix B.

**Physical, Cognitive, and Behavioral Benefits from Therapeutic Riding (DM)**

Children diagnosed with autism or other disabilities are faced with a wide range of impairments that can affect them physically, cognitively and behaviorally. Many battle
muscle issues, cognitive abnormalities, learning disabilities, and sensory impairments. Therapeutic riding frees the restrictions that autism or other disabilities holds on the individual. Riding gives the individuals a sense of independence, creates relationships between the horse and the instructors, can create an increase in focus and attention from the rider (6).

Children within the wide spectrum of Autism are often faced with some degree of physical impairment. Riding a horse is a very physical task that is demanding on the body. Some issues faced with the individuals are hypertonia and hypotonia. Hypertonia is a condition which causes an increase in muscle tone, usually present in the limbs. Hypertonia is seen mostly in people who have cerebral palsy, multiple sclerosis, or have suffered from a stroke or other types of spinal cord or brain injuries. The gait and movement of a horse is said to naturally mirror the motions of a human walking. When the rider is with a narrowly-built horse, they seem to have an increase in control over their limbs. The actual act of riding helps the rider’s muscles to relax, can increase balance and flexibility. The other condition dealing with muscles is called Hypotonia. Hypotonia is a condition in which there is a decrease in muscle tone, especially around the trunk of the body. Hypotonia is usually present in ataxic or hypotonic cerebral palsy, Down syndrome, multiple sclerosis or traumatic brain injuries. These riders would be paired with a wider horse with a bigger gait to stimulate more muscle movement. Due to their weak muscles, these riders may need support when starting to ride, but after continued lessons, they can support themselves and improve muscle strength (6).

Cognitive impairments can be seen across the whole spectrum of autism and other disabilities. These impairments can be any abnormal development or impairment in the social or mental processes involved in interaction, communication, and other areas. Riding helps increase balance and well as body awareness. Communication is also improved because the students are working with the horse, along with instructors and other riders. It helps the rider focus on the lessons taught during the ride, and helps them learn from past rides as well (6).

Learning disabilities are quite common among individuals affected in the range of autism. Children or people affected with a learning disability have difficulties in understanding or using language, it also affects the ability for some to speak, listen, read, and think. Some diagnoses include attention deficit disorder, attention deficit hyperactive disorder, or dyslexia. The structure of the riding lesson allows the rider to concentrate on specific tasks and communication skills such as listening and speaking (6).

Sensory impairments are also present across a wide range of disabilities. These impairments include issues with vision and hearing and the integration of the senses. These impairments effects which horses are chosen to be paired with the students. Riders who have visual disabilities would benefit from a horse that has an even and consistent gait to help the rider have a sense of where they are and how they are moving. Riders who have overactive or a hyperactive sense of touch would benefit from a horse with smooth, easy gaits and with the addition of a fleece pad on the saddle, can comfort the rider and allow them to relax and concentrate better (6).
The following sections discuss current studies showing that EAA and EAT can have a positive influence on individuals with disabilities. The physical, cognitive, and behavioral benefits of therapeutic horsemanship have been studied in a variety of disabilities with the current research showing a strong focus on autism, multiple sclerosis, and cerebral palsy. Each of disability mentioned will be discussed in depth in the sections below.

**Autism Spectrum Disorders**

There has been a significant amount of work done evaluating the effectiveness of hippotherapy (EAT) on improving both the sociability and cognitive awareness in children with autism spectrum disorders. Autism spectrum disorders are characterized by abnormal social behavior, inhibited communication abilities, and stereotypical or repetitive behavior however; autism is a spectrum disorder meaning there is a large range in the amount and severity of the symptoms present in different individuals (7). This makes it almost impossible to apply one blanket definition to all individuals who are on the autism spectrum.

68 students participated in a study conducted at a facility in Texas used the child autism rating scale (CARS) and the autism treatment evaluation checklist (ATEC) survey to evaluate the severity of the disorder and how the symptoms compared before and after a set amount of equine assisted therapy sessions (8). The results of this study showed that after 10 weeks of EAT, the severity of the autism spectrum disorder as measured by the CARS and ATEC rating scale had decreased however; the effect was largest for students who had milder symptoms prior to starting the program. In this study, cognitive awareness and sociability were the areas that were most affected by EAT (8).

A second study focused on the effects of hippotherapy on children with autism spectrum disorders. Two boys and two girls from ages 8-10 participated in the study and were subjected to EAT sessions once weekly for a 10 week period (9). The parents of each child were asked to fill out an ATEC survey both before therapy began and after the 10 weeks of therapy was complete. In this study, 2 students responded positively within the 10 week time period while 2 students exhibited minimal changes as a result of the 10 weeks of EAT (9). Like in the study conducted by Van den Hout and Bragonje, the students who exhibited maximum improvement had better ATEC scores and less severe symptoms at the start (9). The results from this small study suggested that EAT might only be beneficial to students with mild symptoms at the outset (9).

While the above studies focused on EAT rather than EAA, the results still show that the act of sitting on a horse and the movement provided are beneficial to at least some degree for children on the autism spectrum. In addition, both studies used a 10 week time period after which the results were measured by the ATEC survey; and they both came to the same conclusion that EAT is more beneficial to students with milder symptoms. Despite both studies reaching the same conclusion, it can also be argued that because they both used the same time frame it might not have been long enough to see an improvement in
the children with more severe symptoms. Perhaps in the future, more research can be
done to see if children with more severe symptoms can show the same improvements if
they attend therapy for a longer period of time. It can also be argued that the second study
would be more statistically significant if a larger sample size was used.

**Cerebral Palsy**

Cerebral Palsy (CP) is a disorder that results from improper development of the central
nervous system which leads to disorders of posture and movement control (10). CP exists
in many different forms such as spastic CP which is characterized by hypertonia and
ataxic CP which is characterized by hypotonia. (11).

The first study that will be discussed in this section is a case study conducted by O’Brien,
Kreger, and Drnach that looked into the effectiveness of 5 weeks of therapeutic riding
lessons on children with CP. Children were given a gross motor function measure
(GMFM) test prior to starting the program, after 5 weeks of therapeutic riding sessions,
and again 5 weeks after ending the therapeutic riding sessions (12). The results of this
study showed not only that the children demonstrated increased motor function after the 5
weeks of EAA but also that the increased motor function was maintained for at least 5
weeks after EAA sessions were stopped (12). This study shows that not only does EAA
improve the gross motor control of CP patients, but it also results in a long term increase
in motor function that lasts even after the EAA sessions end. Due to the fact that the
benefits for CP patients have been shown to be sustained at least for a while after sessions
have ended, therapeutic horsemanship might be a good option even for individuals who
cannot afford long term participation in the program.

The next study that will be discussed is a meta-analysis of current literature regarding the
effects of hippotherapy (EAT) and therapeutic horsemanship (EAA) on children with
cerebral palsy (Kastrin and Zadnikar, 2011). 8 studies were analyzed in this paper and
these 8 studies included 84 children with CP, 76 of which experienced positive effects
(10). This study concluded that both hippotherapy and therapeutic horsemanship have
positive effects on both balance and postural control of children with CP (10). Some
criticisms of this study are that the children in the studies used had CP with differing
degrees of CP and adult patients were not included in the study. Despite the criticisms,
this study shows that both EAA and EAT can improve postural control and core strength
in these patients as well as other gross motor skills.

**Multiple Sclerosis**

Multiple sclerosis (MS) is a condition in which the myelin of the central nervous system
gets damaged (13). Some symptoms of MS include spasticity, weakness and fatigue,
depression, walking difficulties, and cognitive changes (13).

One recent study was conducted in 2011 that looked into how therapeutic riding could
improve the balance and gait of patients with MS (14). 27 patients with MS were put into
2 groups with 12 patients undergoing 2 series of 10 weekly sessions of therapeutic riding
sessions (EAA) and 15 patients undergoing 2 series of 10 weekly sessions of traditional physiotherapy (14). A Tinetti Performance-Oriented Mobility Assessment (POMA) was used to assess the patients’ progress and a gait analysis was done on the group of patients that underwent EAA sessions (14). The results showed that there was a significant improvement in the group that underwent the EAA sessions in their POMA scores as well as gait parameters such as stride time and ground reaction force while there was no statistically significant change in the control group (14).

This study shows that EAA has the potential to significantly increase the core strength of patients with MS as well as help them develop a more normalized gait or manner of walking. It is likely that the improvements in postural control and gait seen in these patients were largely due to the unique, 3-dimensional movement provided by the horse.

**How Can Therapeutic Horsemanship Benefit Individuals with Disabilities? (MM)**

As discussed in the previous sections, it has been shown through the studies discussed previously that therapeutic horsemanship offers a wide range of physical, cognitive, and behavioral benefits for individuals with a broad range of disabilities. While after analyzing these studies it is apparent that EAA and EAT both have a strong impact on individuals with disabilities, what is less clear is why exactly therapeutic horsemanship has the effects it does on these patients. There are three main parts of therapeutic horsemanship programs that work together to provide the maximum benefit for the participants; the movement of the horse, learning horsemanship skills, and the ability to interact with the volunteers and other students at the facility.

**The Movement of the Horse (MM)**

One of the most basic parts of therapeutic horsemanship that can provide immense benefits is the motion of the horse. Just through sitting on the horse, the rider’s balance is constantly being challenged which encourages them to engage their core muscles in order to stay centered. The movement of a horse is a 3-dimensional, rhythmic motion that moves the rider’s pelvis in a way that is mimics the normal walking motion of the human pelvis (15). This ability to simulate a normal walking motion in addition to engaging the core muscles is invaluable to students that may normally be restricted to a wheelchair such as stroke victims, TBI patients, or patients with cerebral palsy or multiple sclerosis. In some instances, this motion can even “re-teach” the human body how to walk again following a stroke or TBI. This walking motion is also accompanied by a movement that causes rotational motion of the client’s trunk which has been shown to inhibit spasticity in patients with cerebral palsy (15).

In addition, the motion of the horse provides a valuable tool for reaching an appropriate level of arousal or alertness of the participant (16). Too much motion from the horse can cause a sensory overload while not enough motion can impede the rider’s ability to focus and lead to an ineffective lesson. However, when an optimal level of movement is achieved, it can greatly enhance the rider’s ability to focus and perform specific tasks.
Through this mechanism, the motion of a horse can provide huge benefits for individuals who are extremely hyperactive such as people with ADHD. Children with hyperactivity use motor skills as a mechanism to stimulate themselves and as a result increase their brain activity (16). In an therapeutic horsemanship setting, the motion of the horse can provide the necessary stimulation which allows the rider to calm their own body enough to focus on the task at hand (16). Similar effects can be observed on the effect of the horse’s motion on self-stimming behavior in riders with autism spectrum disorders.

Another way in which the movement of the horse can benefit riders with TBI or stroke victims is through the intense stimulation provided by the movement. It has been hypothesized that because neurons in the brain are plastic, the neural stimulation provided can result in new connections being formed between neurons (17). The formation of new connections between neurons is partially what allows the body to compensate for parts of the brain that have been damaged; these new connections can almost replace the damaged ones and aid these riders in re-learning how to walk or use limbs that might have previously had limited function (17).

Furthermore, transitions between gaits such as walk-halt or walk-trot transitions can aid in increasing the flexibility and strength of the participants in a therapeutic horsemanship program. Upward transitions such as a walk-trot transition stimulate a flexor response that involves bending the trunk while downward transitions on the other hand simulate extensor responses that involve straightening the trunk (4). These types of movements influence the rider’s anterior-posterior pelvic tilt and aid in developing core strength and postural control. (4).

A second type of trunk motion that can be influenced by the motion of the horse is lateral trunk control. When the horse moves through a pattern like a serpentine or a circle that involves bending, the horse’s pelvis rotates which in turn causes the rider to shift weight in a way that promotes lateral flexion of the torso (4). These types of patterns require the student to engage their core in a way that both strengthens their core and increases flexibility. Patterns like these are often performed evenly in both directions to stretch and strengthen each side of the rider’s body equally.

**Horsemanship Skills (MM)**

Horsemanship skills taught in a therapeutic horsemanship lesson can be split into two categories; mounted activities and unmounted activities. Mounted activities encompass all activities that take place on the horse while unmounted activities encompass all activities done from the ground such as leading, untacking, and grooming the horse.

**Mounted Activities (MM)**

Mounted activities involve teaching riding skills that may include asking the horse to change gait, halt, or bend around a turn. Activities such as steering and asking the horse to bend require the independent use of each arm and independent use of each leg. The
aids for asking a horse to bend around a turn are supposed to be gentle and subtle in order to avoid excessive rein pressure on the horse’s mouth and excessive use of leg pressure on the horse’s sides (5). As the rider progresses during lessons they develop fine motor skills needed to grasp the reins and the body control necessary to use each arm and leg both gently and independently to give the horse appropriate aids (5). In addition, body control and impulse control are learned through attempting to use correct aids required to effectively guide and control the horse. In a therapeutic horsemanship facility, riders are rewarded immediately when they give gentle but effective aids and use proper body control by the horse responding in the way that they want. This allows riders to make a connection between their own movements and the horse’s response that teaches them about controlling their own body movements.

During a therapeutic horsemanship lesson, riders will also learn how to ask the horse to stop and to perform both upward and downward transitions between different gaits such as a walk, trot, or even a canter for the most advanced riders. Performing these transitions requires appropriate use of leg and rein aids. Like with steering in order to get good upward and downward transitions, the rider must learn to coordinate their seat, leg, and rein aids as well as develop both impulse and body control (5).

In addition to challenging riders physically, the mounted activities challenge the cognitive ability of the rider as well. Controlling the horse requires an ability to remember a sequence, tell left from right, and the ability to follow directions as well as the ability to work as a team (18). Through designing obstacle courses of increasing complexity and asking students to navigate an arena while keeping a safe distance away from the other horses, therapeutic horsemanship lessons can lead to an increase in the rider’s cognitive ability to focus as well as increase their motor planning abilities. These riding skills not only challenge the rider both physically and cognitively but also allow the rider to feel a sense of accomplishment and independence when they can successfully perform these riding skills. Through accomplishing new challenges and becoming better at performing these skills, the riders have a concrete way to measure improvement that often leads to an increase in self-esteem (19).

Furthermore, while teaching horsemanship skills therapeutic horsemanship facilities often use games such as bean bag tosses and retrieving rings from a stand. In addition to requiring the rider to use rein and leg aids to steer to the bean bags or stop the horse at a spot close enough for them to reach the ring, these activities also challenge the rider’s hand eye coordination and sometimes require the rider to cross the midline. Exercises that involve crossing the midline have been shown to increase stimulation of the corpus callosum (17). Through increasing stimulation of the corpus callosum, communication between the two hemispheres of the brain is increased; studies have shown that this can be particularly beneficial for patients suffering from PTSD (17).

**Unmounted Activities (MM)**

After the riding portion of the lesson has ended, instructors spend a slightly shorter amount of time working with students on unmounted horsemanship skills. During the
unmounted portion of the lesson, students are taught include how to lead, untack, and groom the horse once the lesson is over. Like with the riding skills, the unmounted activities provide both physical and cognitive challenges for the students. The first part of the unmounted portion of the lesson is usually leading the horse back to the proper spot in the barn. Like with riding, this helps the rider develop the ability to plan ahead and focus to make sure they both stay a safe distance away from other horses and people and wind up back at the correct spot. Also, like with the riding part, the extent to which volunteers help the student with this task can be varied depending on the needs of the individual student to maintain a safe lesson environment.

After the horse is back in the correct location in the barn, students are asked to help untack the horse. This requires the use of fine motor skills to perform tasks such as unclipping the reins as well as the use of gross motor skills for removing the girth and saddle; in addition, students are also asked to help carry the tack back to the tack room. With English saddles weighing approximately 15 lb, this provides a great exercise for increasing upper body strength. In addition to providing opportunities to increase motor function, untacking the horse also provides a cognitive challenge by requiring that the rider remembers the correct order in which to remove everything from the horse from week to week.

In the final part of the unmounted portion of the lesson, the rider is asked to help groom the horse. Grooming the horse requires control of the arm and shoulder muscles to brush up high as well as the ability to lean or stretch down to brush the horse’s legs (20). Performing these tasks can lead to both an increase in hand and upper body strength as well as an increase in flexibility for the participant. In addition, grooming the horse can also provide tactile stimulation through the feel of the horse’s hair and the different textures of the brushes used to groom the horse which can be beneficial for students on the autism spectrum.

Unmounted activities such as leading and grooming the horse also provide an opportunity for the rider to bond with the horse and develop a relationship with the horse. Interactions with animals have been shown to be beneficial for children in multiple ways such as decreased anxiety (21), and decreased blood pressure (22). Studies have shown that animal therapy can increase levels of oxytocin, beta-endorphin, prolactin, and dopamine; hormones that are involved with bonding and positive interactions; animal interactions also decreased the participants levels of cortisol, a hormone associated with stress (23). The effects were intensified when participants interacted with a familiar animal (23). Despite the fact that this study was conducted with dogs, it is possible that interactions with other animals such as a horse can provide similar results. Furthermore, the fact that results were intensified through interaction with a familiar animal supports the idea that long term participation in a therapeutic horsemanship can provide an outlet for positive interaction, bonding, and positively impact the mental health of the participants. In addition, further studies have indicated that animals can increase positive social interaction, decrease aggressive behavior, and increase empathy (24). Studies showed that the presence of an animal led to improved social integration among first grade students; people were also more likely to view a therapist as trustworthy when an animal
was present (24). Again, even though this study was conducted using dogs, it can be hypothesized that another animal such as a horse can provide similar results. In these studies, the students not only showed positive interaction with the animal, but also showed improved interaction with other people due to the presence of an animal. The benefits of these positive interactions with other people are discussed in the following section.

Riders are also able to work together with each other and the volunteers to make sure the horse gets taken care of properly following the lesson. The benefits of these interactions are discussed in the paragraphs below.

**Interactions with the Volunteers and Other Students (MM)**

One last invaluable aspect of therapeutic horsemanship is the opportunity to interact and form relationships with the instructor and volunteers as well as other students if the rider is in a group lesson. Through forming these relationships students can practice normal social interactions in a safe environment.

One of the challenges often experienced by individuals with disabilities is the stereotypes others may have about their abilities that makes interactions embarrassing or ineffective. In a therapeutic horsemanship setting, volunteers are instructed in how to respectfully and positively interact with students with a wide range of disabilities (5). In addition to assisting with keeping the rider balanced the volunteers acting as side walkers can interact with the rider by assisting with games or even just chatting with the participant at appropriate times designated by the instructor. Through something as simple as chatting with the student, both volunteers and instructors have an opportunity to model appropriate social behavior that the participant can then apply to their interactions outside of the riding facility. Praise given by the instructor as well as the volunteer can give the rider a sense of accomplishment and help in increasing the rider’s self esteem (19). For some students the increase in self-esteem and ability to form relationships with others is one of the most important benefits experienced as a result of therapeutic horsemanship (19).

In addition to the opportunity to interact with the program volunteers, many therapeutic horsemanship programs offer group lessons that allow students to interact with other individuals in the program. Group lessons can be very beneficial as members of the group can each model tasks for each other to aid in the understanding of others in the group. This can make learning a skill easier as well as increase the confidence of the riders asked to demonstrate (25). In addition group lessons provide students with opportunities to interact positively with each other and develop better social skills through practice and modeling the behavior of other students. These skills are developed at but can translate to their social interactions outside of the barn and provide an increase in the quality of the participant’s everyday life (25).

**Community Action: Surveying Parents/Guardians of Disabled Students to Evaluate the Benefits of Therapeutic Riding**
**The Survey (DM)**

We conducted a survey to analyze what effects therapeutic riding had on individuals with a wide range of disabilities. We created our own survey (Appendix C), and geared our questions towards specific benefits that therapeutic riding has been reported to offer. The survey was filled out by the parents or guardians of the riders at Celtic Charms Therapeutic Horsemanship in Howell, NJ. This facility does hands on instructional riding with the individuals and creates meaningful relationships with the students as well as their parents or guardians. The survey was also to be conducted at the HRH Horse Show at the Horse Park of New Jersey. This horse show is specifically for therapeutic riding centers around the state. The horse show is through the Special Olympics and gives the riders and guests an opportunity to take part in and observe a real horse show. We hoped to get responses from the spectators and see how therapeutic riding has benefited their child or relative. However, we decided to focus solely on just the Celtic Charms location for our research project. This allowed us to remove any variables from the project due to the many differences in environment.

**Methods (MM)**

This study was conducted at Celtic Charms Therapeutic Horsemanship in Howell, New Jersey. Celtic Charms has a population of about 106 students. The population consisted of 56.2% male students and 43.8% female students. 54.72% of the population was diagnosed with autism spectrum disorders, 10.5% with Down's syndrome, 8.9 % with Cerebral Palsy, 0.95% with multiple sclerosis and 25.47% was diagnosed with disabilities classified as “other”. Diagnoses of Asperger’s syndrome, pervasive developmental disorders, ADHD, and sensory processing disorders fell under the category of autism spectrum disorders.

The study involved the distribution of surveys to the guardians of the students participating in the EAA program at Celtic Charms Therapeutic Horsemanship. The survey was designed with questions asking parents about the physical, cognitive, and behavioral changes they have seen in their child since starting the program as well as what their initial expectations were for the program. The surveys was divided into 3 parts; a section asking for general information about the student, an open ended section, and a section in which they were asked to fill out a chart. The survey and instructions can be seen in Appendix C.

The first section of the survey was used to determine what disabilities were represented among the sample population and to determine what percentage of the sample population was also involved in occupational therapy. The disability categories recorded were autism spectrum disorders, Down’s syndrome, cerebral palsy, and other. Pervasive developmental disorder, sensory processing disorder, ADHD, and Asperger’s syndrome were all included in autism spectrum disorders as was consistent with the way in which the disabilities were classified by the facility in student files.
The second section of the survey included various open ended questions regarding the parent’s expectations and what changes they have observed in their child. The expectations were grouped based on the types of benefits the parents expected to see. The categories used were; no physical, cognitive, or behavioral benefits, only physical benefits, only cognitive and behavioral benefits, and only cognitive and physical benefits. Questions regarding student interactions with the horse, the instructor, the volunteer, and other students were scored as positive, neutral or negative. The responses to the open ended questions regarding changes in physical abilities, cognitive function, or behavior were scored as either ‘showed improvement’ or ‘no change’. Due to noncompliance by some parents on certain questions, each individual question was scored separately and surveys with no response to certain questions were omitted from the analysis of that specific question. The sample size, and percentage of the two response categories was calculated for each open ended question. Questions that were asked in both the open ended section and the chart were omitted from analysis of the open ended section and only the chart response was analyzed. Comments from the open ended section were also chosen at random to be included in Appendix A.

The last section of the survey was composed of a chart asking parents to check strongly agree, agree, neutral, disagree, or strongly disagree with regards to specific statements about the program and changes seen in their child. Numerical values of 4, 3, 2, 1, and 0 were assigned to each category respectively. Each chart question was scored separately and the percentage of responses in each category as well as the numerical average of the responses was calculated for each question.

Results (MM)

Table 1: Percent Participation in Occupational Therapy and Therapeutic Horsemanship

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic Horsemanship Only</td>
<td>22</td>
<td>64.71%</td>
</tr>
<tr>
<td>Occupational Therapy and Therapeutic Horsemanship</td>
<td>12</td>
<td>35.29%</td>
</tr>
</tbody>
</table>

Data was obtained through a multiple choice question on our survey (Appendix C). This question had 100% compliance.

Table 2: Expectations of the Benefits of Therapeutic Riding

<table>
<thead>
<tr>
<th>Prior Expectation Categories</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>no physical or cognitive benefits</td>
<td>13</td>
</tr>
<tr>
<td>physical benefits</td>
<td>6</td>
</tr>
<tr>
<td>Cognitive, behavioral benefits</td>
<td>2</td>
</tr>
<tr>
<td>both cognitive and physical</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 3: Survey Population Disability Statistics

<table>
<thead>
<tr>
<th>Disability</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>------------</td>
</tr>
<tr>
<td>Autism Spectrum Disorder</td>
<td>22</td>
<td>64.71%</td>
</tr>
<tr>
<td>Down’s Syndrome</td>
<td>3</td>
<td>8.82%</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>2</td>
<td>5.88%</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>14.71%</td>
</tr>
<tr>
<td>No Answer</td>
<td>2</td>
<td>5.88%</td>
</tr>
</tbody>
</table>

Data was obtained through an open ended question on our survey (Appendix C).

### Table 4: Perception of the Nature of the Interaction with the Horses, Instructors, and Volunteers

<table>
<thead>
<tr>
<th>Interaction with</th>
<th>Positive</th>
<th>Neutral</th>
<th>Negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interaction with the Horse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>31</td>
<td>1</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>Percentage</td>
<td>93.93%</td>
<td>3.03%</td>
<td>3.03%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Interaction with the volunteers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>30</td>
<td>3</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>Percentage</td>
<td>90.91%</td>
<td>9.09%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Interaction with the instructor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>31</td>
<td>2</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>Percentage</td>
<td>91.93%</td>
<td>6.06%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Interaction with the other students</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>14</td>
<td>5</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Percentage</td>
<td>73.68%</td>
<td>36.32%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Data was obtained through open ended questions on our survey (Appendix C). Each question had a different number of responses due to varying levels of compliance for the individual questions on the survey. The length of time students had been participating in the program ranged from 4 months-3 years, with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

### Table 5: Effect of EAA on Fine Motor Skills and Flexibility

<table>
<thead>
<tr>
<th>Skill</th>
<th>Showed Improvement</th>
<th>No Change Observed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fine motor skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>16</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>Percentage</td>
<td>76.19%</td>
<td>23.81%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Flexibility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>11</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Percentage</td>
<td>68.75%</td>
<td>31.25%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Data was obtained through open ended questions on our survey (Appendix C). Each question had a different number of responses due to varying levels of compliance for the
individual questions on the survey. The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 6: EAA Improved the Behavior of Most Disabled Students

<table>
<thead>
<tr>
<th></th>
<th>Showed Improvement</th>
<th>No Change Observed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Responses</td>
<td>24</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>Percentage</td>
<td>85.71%</td>
<td>14.29%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Data was obtained through open ended questions on our survey (Appendix C). Each question has a different number of responses due to varying levels of compliance for the individual questions on the survey. The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 7: EAA Improved Cognitive Function in All Participants

<table>
<thead>
<tr>
<th></th>
<th>Showed Improvement</th>
<th>No Change Observed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Responses</td>
<td>23</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Percentage</td>
<td>100%</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>

Data was obtained through open ended questions on our survey (Appendix C). Each question has a different number of responses due to varying levels of compliance for the individual questions on the survey. The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 8: Parents Agree that EAA Improved the Core Strength and Coordination of Participants

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (4)</th>
<th>Agree (3)</th>
<th>Neutral (2)</th>
<th>Disagree (1)</th>
<th>Strongly Disagree (0)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child has shown increased core strength</td>
<td>22</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>64.71%</td>
<td>32.35%</td>
<td>2.94%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>3.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statement</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>My child has shown increased coordination</td>
<td>15</td>
<td>17</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>44.12%</td>
<td>50%</td>
<td>5.88%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>3.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parents were asked to check strongly agree, agree, neutral, disagree, or strongly disagree in response to each survey (Appendix C) statement. The chart questions all had 100% compliance. The length of time students had been participating in the program ranged...
from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 9: Parents Agree that EAA Improved Cognitive Parameters Such as Focus and Independence

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (4)</th>
<th>Agree (3)</th>
<th>Neutral (2)</th>
<th>Disagree (1)</th>
<th>Strongly Disagree (0)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child has shown increased focus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>15</td>
<td>13</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>44.12%</td>
<td>38.24%</td>
<td>17.65%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>3.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child has shown increased independence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>17</td>
<td>10</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>50%</td>
<td>29.41%</td>
<td>20.59%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>3.29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parents were asked to check strongly agree, agree, neutral, disagree, or strongly disagree in response to each statement on the survey (Appendix C). The chart questions all had 100% compliance. The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 10: Parents Agree that their Children Benefited from EAA

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (4)</th>
<th>Agree (3)</th>
<th>Neutral (2)</th>
<th>Disagree (1)</th>
<th>Strongly Disagree (0)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic riding has met my expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>30</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>88.24%</td>
<td>8.82%</td>
<td>2.94%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>3.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child has benefited from therapeutic riding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Responses</td>
<td>30</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Percentage</td>
<td>88.24%</td>
<td>11.76%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Average</td>
<td>3.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parents were asked to check strongly agree, agree, neutral, disagree, or strongly disagree in response to each statement on the survey (Appendix C). The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 11: Parents Agree that their Children Enjoy EAA and Have Shown Increased Self-Esteem
Parents were asked to check strongly agree, agree, neutral, disagree, or strongly disagree in response to each statement on the survey (Appendix C). The chart questions all had 100% compliance. The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Table 12: EAA Improved the Behavioral Parameter of Adaptability to Change

<table>
<thead>
<tr>
<th>Strongly Agree (4)</th>
<th>Agree (3)</th>
<th>Neutral (2)</th>
<th>Disagree (1)</th>
<th>Strongly Disagree (0)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Responses</td>
<td>14</td>
<td>10</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Percentage</td>
<td>41.18%</td>
<td>29.41%</td>
<td>23.53%</td>
<td>5.88%</td>
<td>0%</td>
</tr>
<tr>
<td>Average</td>
<td>3.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parents were asked to check strongly agree, agree, neutral, disagree, or strongly disagree in response to each statement on the survey. The chart questions all had 100% compliance. The length of time students had been participating in the program ranged from 4 months-3 years with the average being 2.25 years. The average age of the survey sample was 13 years old with a range of 5-41 years old.

Discussion

The purpose of this study was to explore the physical, cognitive, and behavioral benefits of therapeutic horsemanship. Surveys were distributed with both open ended questions and chart questions in the form of a likert scale asking about each of the 3 categories. As can be seen in Table 3, the percentage of students within each disability classification was similar to that of the entire sample. The percentage of students with autism spectrum disorders was a little higher and the other categories were correspondingly a little lower however; the relative percentages were the same for the most part. Students categorized as having MS were not represented in the survey population; likely because the percentage of students with MS in the population surveyed was so low (less than 1%). The results for the open ended and chart questions regarding physical benefits can be seen in Tables 5 and 8 respectively. The open ended questions regarding changes in
physical abilities asked about fine motor skills and flexibility. 76.19% of the survey population reported that their children had shown improvements in fine motor skills since beginning therapeutic horsemanship. 68.78% of the survey population answered that their children showed improvements in flexibility since starting therapeutic horsemanship. The question regarding flexibility had the lowest percentage that answered that improvement was seen as well as the lowest compliance of all the open ended questions. It is possible that parents were unsure as to what was meant by flexibility; some parents answered the question with responses that indicated improvements in mental flexibility and these types of responses were not used for this question. It is also possible that flexibility is a parameter that is more difficult to measure in everyday life than motor skills or strength. The chart questions regarding physical parameters asked about core strength and coordination; these questions had a much higher compliance rate than the open ended questions which makes these results more statistically significant. In the chart section, 64.7% checked that they strongly agreed that their child has shown increased core strength; 32.35% checked that they agree. This equates to 97.06% of the survey population checking a box indicating that their child has shown increased core strength since starting therapeutic horsemanship; almost the entire population. The remanding 2.94% checked that they were neutral with no one checking either the “disagree” or “strongly disagree boxes”.

The chart question regarding increased coordination received positive responses as well with 44.21% indicating that they strongly agree that their child has shown increased coordination and 50% checking that they agree. Over 90% of the population checked a box that indicated that they felt their child has shown increased coordination since starting the therapeutic horsemanship program. The remanding 5.88% of the population was neutral with no one checking the boxes indicating “disagree” or “strongly disagree”. Both the open ended and chart questions regarding physical parameters received largely positive responses indicating that a majority of the parents noticed that their child has benefited physically from therapeutic horsemanship in the forms of improved fine motor skills, improved flexibility, increased core strength, and increased flexibility. This data strongly supports the idea that therapeutic horsemanship can provide physical benefits to participants with a range of disabilities.

The open ended question regarding the cognitive benefits of therapeutic horsemanship simply asked parents to note what changes in cognitive function they had noticed in their child since starting the program rather than asking about specific parameters. 100% of the parents who answered this question indicated that their child has shown improved cognitive function since participating in the therapeutic horsemanship program. The chart questions asked about specific parameters relating to cognitive function including focus and independence. 44.12% checked the box indicating “strongly agree” and 38.24% checked the box indicating “agree” regarding the statement “my child has shown increased focus”; 82.34% of the survey population checked a box indicating that they felt their child has shown increased focus since starting therapeutic horsemanship. The remaining 17.65% was neutral with no one checking the boxes indicating “disagree” or “strongly disagree”.

The
When asked about increased independence, 50% of the survey population checked the box indicating “strongly agree” and 29.41% indicated that they agree. 79.41% of the survey population indicated that they felt their child has shown more independence since starting EAA. The remaining 20.59% was neutral, no one indicated “disagree”, or “strongly disagree” regarding the statement “my child has shown increased independence”.

The results from this section indicate that parents have noticed significant changes in the cognitive ability of their children. The fact that 100% of the open ended responses regarding cognitive function indicated that their children have shown improvement and that over 75% of the population indicated that their child’s independence increased supports the fact that therapeutic horsemanship has a huge potential to improve the quality of life for these individuals.

The open ended question about behavioral changes simply asked what overall changes in behavior the parents have seen in their children rather than asking about specific parameters. 85.71% of the parents answered this question in a way that indicated that their child had shown behavioral improvements. The chart question asked about the specific behavioral parameter of adaptability to change. 41.18% indicated they strongly agreed that their child showed an improved ability to adapt to change or transitions; 29.41% indicated that they agreed. This shows that 70.59% of the survey population filled out the chart in a way that indicated that they saw an improvement in their child’s adaptability to change. 23.53% indicated they were neutral while 5.88% indicated they disagreed. No one indicated that they strongly disagreed. This was the only chart question where “disagree” was indicated as a response.

Other questions asked about whether the parents felt the students enjoyed the lesson, how they interacted with the animals, staff, and volunteers, and how the parents felt their child’s self-esteem was influenced by therapeutic horsemanship. As can be seen in Table 4, the majority of parents answered the questions in a way that they felt their child interacted positively with the horse, volunteers, instructor, and other students. 93.93% answered that their child interacted positively with the horse, 3.03% answered neutrally and 3.03% indicated a negative reaction. Overall, interactions with the horse were rated as overwhelmingly positive by the parents. When asked about interactions with the volunteers, 90.91% indicated that they felt their child interacted positively with the volunteers and the remaining 9.09% answered neutrally. No one answered this question in a way that would indicate a negative interaction. Similarly, over 90% of the population answered that their child interacted positively with the instructor and no one indicated a negative interaction in response to this question. When asked about interaction with other students, 73.68% indicated positive social interactions while the remaining 36.32% answered neutrally. This question had a lower percentage answer in a way that indicated positive interactions as well as a lower total number of responses than the other questions regarding interactions. This is likely because not all students participate in a group lesson and as a result this question was not applicable to the entire survey population. As shown in Table 11, when asked to respond to the chart questions regarding whether or not their child enjoys lessons and whether or not they feel their child has shown increased self-
esteem, the results were overwhelmingly positive. In response to the statement “my child enjoys the lesson” 79.41% answered “strongly agree” and 20.59% answered “agree”. This means that 100% of the population answered this question in a way that indicates they feel their child enjoys therapeutic horsemanship. Similarly, when asked to respond to the statement “my child has shown increased self-esteem”, 82.35% of the population responded in a way that indicated they feel that their child has shown better self-esteem since starting therapeutic horsemanship. The remaining 17.65% was neutral with no one indicating that they disagreed or strongly disagreed with that statement. Furthermore, as shown in Table 10, 100% of the survey population responded to the statement “my child has benefited from therapeutic riding” in a way that indicated that they felt their child has benefited from this experience in some way. 88.24% of the population marked “strongly agree” while 11.76% of the population indicated “agree”. In addition to the positive responses to questions regarding the physical, cognitive, and behavioral benefits of therapeutic horsemanship, the responses to these questions clearly show that the parents feel that the therapeutic horsemanship facility is a very positive environment for their children and that their child both enjoy and benefit from the experience. It is clear from these responses that the parents feel that therapeutic horsemanship has a positive impact on the quality of life of their child.

Furthermore, as shown in Table 1, over half of the survey population indicated that their child participates in therapeutic horsemanship only. This indicates that therapeutic horsemanship offers its own set of benefits for individuals with disabilities separate from those seen as a result of occupational therapy. In addition as can be seen in Table 2, half of the survey population did not expect to see any physical, cognitive, or behavioral benefits as a result of this program, only 24% expected to see any kind of cognitive benefits, and only 8% expected to see any behavioral benefits as a result of this program. This makes it unlikely that there was any sort of placebo effect in which the parents merely were seeing benefits that they were already expecting to see; particularly since the open ended question regarding improvements in cognitive function received the most overwhelmingly positive response. In addition, the parents surveyed on average marked that their children have been participating in the program for over 2 years with the mode being 3 years. If the parents did not see this as a positive experience for their children it is unlikely that they would have stayed with the program for so long.

Current research discussed earlier in the literature review concluded that for children on the autism spectrum, therapeutic horsemanship was only beneficial for students with milder symptoms at the start however; the survey distributed at Celtic Charms did not discriminate based on the type or severity of the disability and 100% of the population surveyed felt that the program was beneficial for their children. The two studies that reached this conclusion used a time frame of only 10 weeks which differs drastically from the average time frame of 2.25 years that was indicated by the survey population. It seems likely that therapeutic horsemanship can benefit children with more severe disabilities at the outset however; the benefits will be seen in a more long term time frame rather than in just 10 sessions. Over all, the hypothesis that therapeutic horsemanship can provide physical, cognitive, and behavioral benefits for disabled riders
and increase the quality of life of these individuals was largely supported by the survey responses.

References

Appendix A: Parent Comments from the Surveys
1. “I am tremendously pleased with all the new skills he has developed”
2. “The most beneficial aspect of this program has been he calmer, improved posture, and ability to follow directions”
3. “Learned how to listen and is starting to do better at home in listening”
4. “Looks forward to every week”
5. “My child is more engaged in his environment”
6. “My child loves coming here. He still wants to come back even when he has had a bad lesson”
7. “When my child began, he was deathly afraid of all animals other than a cat. Now he rides smoothly in synch with the horse”
8. “He has grown a ton since beginning here”
9. “The most beneficial aspect of this program is the horses, students, and teachers. For a small child to trust such a large animal is beautiful”
10. “Since we’ve been coming here my expectations have changed. I have much higher expectations for him because Celtic Charms has high expectations for him. For me as a parent I really appreciate the belief system at Celtic Charms that they have expectations of my son”
11. “My child has shown better motor planning, coordination, confidence”
12. “Improvements in communication, working in a social setting, adhering to and following instructions”
13. “The instructor has become part of our family. She is always able to keep him focused and happy”
14. “He has developed a strong relationship with his horse and all the people”
15. “Loves to pet and groom the horse after the lesson”
16. “Improved ability to retain lessons learned”
17. “I was hoping it would improve her focus. She has improved with interacting with other children and adults. Her confidence has increased dramatically”
18. “She looks forward to an activity. She never had enjoyment in outdoor activities”
19. “His perceptions in everyday life are definitely keener”
20. “Expected a hobby, something of a challenge for him. My child has flourished and now it’s a consistent outlet for learning”
21. “He has found a way to learn. He is able to follow styles and accomplish a bigger goal”
22. “Riding provides great deal of strength to his core”
23. “She loves the horse! She is the best!”
24. “The most beneficial aspect of this program has been over all progress”
25. “A lot more language, spontaneous!!”
26. “She is now trying to string multiple words together”
27. “My expectations were met and exceeded. His focus and core strength have greatly improved.”
28. “The one thing he never gives me a hard time about is going to ride at Celtic Charms”
29. “He has come so far. He listens, makes a plan, and follows them”
30. “Better listening, planning, memory skills. Thinks 1st instead of just doing”
31. “It helps her slow down so her brain slows down so she can think and articulate ideas better”
32. “Calmer and better impulse control since starting”
33. “I wasn’t sure what to expect or how it could help her. I just knew she loved animals and hopes it would bring her joy. I feel this place is God sent, my child has her confidence, smile, and autonomy back”
34. “She is now happy and secure to speak to adults and peers without being timid”
35. “She’s happy again”
36. “Loves every minute”
Appendix B: Some Examples of Tack and Adaptive Equipment

Different types of pads can be used instead of a saddle. This allows the student to feel more of the horse’s movement. This provides increased sensory input and allows the rider to have a better feel of whether or not they are balanced. Other types of bareback pads and suede pads can also be used instead of a saddle. In addition, a suede pad provides a softer seat for riders who may not tolerate sitting on a leather saddle.

Supracor Pad

Suede pad

Bareback pad
Safety stirrups are used to ensure that in the event of a fall, the rider falls free of the horse instead of getting their foot caught in the stirrups. Peacock stirrups have a rubber band instead of metal on the outside of the stirrup; the rubber band will fall off if the rider’s foot hits it during a fall allowing them to fall completely free of the horse. Devonshire boots and dapps have a leather or plastic cap respectively on the front of the stirrup. This cap stops the rider’s foot from falling through the stirrup if they are wearing sneakers instead of boots with a heel.

Peacock Stirrups

Dapps
Different types of reins may also be used for different students. Rainbow reins have different colors going down the reins and provide an easy visual cue to let students know...
where to hold the reins. Cotton reins, leather reins, rainbow reins, rope reins among many others can provide different textures for different students. Furthermore, western reins can be used instead of english reins which allows students to use one hand as opposed to two to steer the horse. This is a good alternative to students who may have limited use of one hand or arm.

Examples of various types of reins

In addition to using different rein styles, different saddles may be used. Students can ride in either an english saddle or a western saddle. Western saddles are heavier, wider, and have a horn which can be useful for students requiring a little extra security and a wider seat.
To ensure the safety of the students, not only are helmets required to be worn by all students, but students who require extra support to stay in the saddle can wear a safety belt. The instructor and side-walkers can hold handles on the belt to keep the rider safely on the horse.
Therapeutic horsemanship facilities use a different type of mounting block to make the process of getting on the horse as safe as possible.

Outdoor mounting block with a wheelchair accessible ramp
Indoor mounting block with a ramp and wheelchair lift

A horse standing in the mounting block as they would prior to a lesson
In addition to different tack, adaptive equipment, and styles of getting on the horse, teaching methods can are also adapted at a therapeutic riding facility. Games used to teach horsemanship skills such as steering, walking on, or halting are also designed to help hand-eye coordination and involve crossing the midline. Games can be used in an arena or on a sensory trail that provides the added stimulation of an outdoor, wooded environment.

A beanbag toss game requires the use of riding skills as well as hand-eye coordination to get the beanbag in the hole.

A ring game involves the use of riding skills as well as stretching and sometimes crossing the midline in order to reach the rings.
Some examples of games on a sensory trail

Appendix C: Survey

Benefits of Therapeutic Horsemanship

Please do not write your name anywhere on the survey!

General information

1. What is your child’s age and disability?
2. My child is involved in:
   a. therapeutic riding
   b. occupational therapy
   c. both
   d. neither
3. How long has your child been involved in therapeutic horseback riding? How often do they ride?
4. Does your child ride in a group lesson or a private lesson? If they ride in a group, how many students are in the group?

Please answer the following open ended questions to the best of your ability

5. How does your child interact with:
   a. The horse
   b. The instructor
   c. The volunteers
   d. The other students (if they ride in a group)

6. Does your child enjoy:
   a. The riding lesson
   b. Horsemanship skills (leading, grooming, untacking, etc.)

7. What did you expect when your child first started riding? Were your expectations met? How have they changed?
8. What has been the most beneficial aspect of this program?

9. What physical changes have you observed as a result of therapeutic riding regarding:
   a. Gross motor skills
   b. Core strength
   c. Fine motor skills
   d. Coordination
   e. Flexibility

10. What changes in your child’s behavior have you seen due to therapeutic riding?
11. What changes have you seen in cognitive abilities as a result of therapeutic riding?

12. Has your child’s self-esteem been influenced by therapeutic riding? In what way?

Please check box under the most applicable answer choice

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<th>Neutral</th>
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<td>My child has shown increased self-esteem</td>
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<td>My child has shown increased coordination</td>
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<td>My child is more able to adapt to change or deal with transitions</td>
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THANK YOU FOR YOUR TIME!
Submitted to ABILITY Magazine

To whom it may concern,

It has been said by Winston Churchill that “there is something about the outside of a horse that is good for the inside of a man”. This quote not only applies to the companionship and bond competitive riders and backyard owners form with their horses, but also to the special way in which horses can help individuals with special needs. As an animal science major and certified therapeutic riding instructor, I see the connections that are possible between humans and animals every day. Current research shows that therapeutic horsemanship can benefit individuals with many disabilities including autism, cerebral palsy, multiple sclerosis, and many more. The impact therapeutic horsemanship can have on the quality of life for individuals with disabilities is nothing short of amazing and it is something that I believe a lot of people are missing out on due to a lack of knowledge.

Because this is a topic that I am passionate about, I have decided to conduct a research project on the benefits of therapeutic horsemanship on students at a therapeutic riding facility in Howell, New Jersey along with a partner. We have distributed surveys to the parents and guardians of the students participating in the program asking them about changes they have seen in their children since the start of therapeutic horsemanship sessions. In addition, we will analyze the first 6 months of progress notes of students participating in the program for 6 months or longer in order to assess the changes that the riders have demonstrated in the course of their lessons.

The preliminary results from the first set of surveys were overwhelmingly positive with responses indicating increases in core strength, motor planning, focus, and calmer behavior among other parameters. Most of the parents have agreed that this has been highly enjoyable and beneficial for both their children and themselves and has increased the quality of life of the program participants. I am excited to see what future survey responses and the analysis of progress notes tells us about the benefits of therapeutic horsemanship and the results will be made public. I believe that continued studies that make parents and guardians aware of therapeutic horsemanship as a response are crucial to improve the quality of life for individuals with disabilities as well as their guardians. Please feel free to contact me with questions or comments. Thank you for your time

Sincerely,
Melinda Mordarski

Dana Magee- Letter to the Editor of Daily Targum

Dear Online Editor of the Daily Targum,

Please consider my post below for publication in your online newsletter. If you have any questions, please feel free to contact me at xxx Thank you, Dana Magee.
My name is Dana Magee and I am currently a senior in SEBS studying animal science and focusing specifically in equine science. Throughout my time at Rutgers, I have learned so much about horses and how they are more than just a farm animal. Many people, including myself, know or care for someone deemed “disable”. This term is so broad and can include a multitude of situations, such as autism, learning disabilities, physical disabilities (cerebral palsy), or disability from traumatic events. Today there are many different forms of therapy used to help these individuals. One that was particularly interesting to me was equine assisted therapy. To further explore this interest, Dr. Fagan, an Associate Professor of Animal Science at Rutgers University, and I, along with another group member, are researching the benefits of equine assisted therapy in children and young adults suffering from disabilities.

My partner and I created a survey to find out more information from the parents and guardians on one particular therapy farm, Celtic Charms, in Howell, New Jersey. The survey was handed out during the lessons, and from the result we have received, many of the parents and guardians not only see the benefits in their children’s communication, cognitive and physical abilities, and behavior, but are advocates for the program. I personally went to the HRH Horse Show hosted by the Special Olympics earlier this month. This show was only for riders with special needs. It was amazing to see how confident and happy these children and young adults were when they were working with their horses. Our research will be published in the near future, and if there are any questions or interests please feel free to contact me.

Dana Magee
Rutgers University, Animal Science.