

Equine Assisted Interventions: a Bibliography
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Introduction

This bibliography updates a similar one dated 2010. The previous five bibliographies were submitted to the former Research Committee of PATH International and its partners.

Citations have been retrieved from CAB Abstracts, MEDLINE, PubMed, RehabData, and the Web of Science. Authors have referred some directly, and others were found by reviewing the lists of references in the articles themselves or by serendipity. Very few of the articles cited are not peer-reviewed. Citations to articles in the journal *Mensch & Pferd International* are the two principal articles from each issue, 2012 to early 2014.

An effort has been made not to reprint citations from previous bibliographies, but this is not a guarantee against duplication. Citations in this bibliography include a few earlier than 2010.

Outside of journal articles, no effort has been made to find contributions made only on the internet. Digital object identifiers (DOI) have been given to permit easy access to the location of the article. Perhaps 15% of the DOIs are to open access, or free, articles.

Only a selection of theses granted during this period (2009-2014) have been included.

Addresses are not given out of respect for privacy of the authors and to prevent pirating.

Individual sections A-D may include the following sections: Books, Contributions to Books, Articles, and Theses.

April 30, 2014

Horsemanship & the Horse: Journal Articles

Cook, Rebecca. (2011).

Incidents and injury within the hippotherapy milieu: four years of safety study data on risk, risk management, and occurrences. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 57-66.

Abstract: Introduction: It is becoming increasingly popular for therapists to provide treatment incorporating hippotherapy. However equine activities involve inherent risk. The aim of this study was to discover incident and injury occurrences within the hippotherapy milieu.

Method: Annual data on risks and injury was collected from hippotherapy providers in each of the years 2007 to 2010 via an internet survey.

Results: A total of 425 responses, representing 143,855 hippotherapy sessions, revealed a rate of one injury for every 14,386 hippotherapy sessions (0.007%) with no injury being permanent or disabling. This compares favorably with injury rates for recreational and sporting activities with horses. Identified risk factors included horse behavior, weather conditions, and absence of assistants.

Conclusions: Because there are inherent risks associated with hippotherapy, a sound risk management program and skilled expertise beyond traditional academic courses is essential for a safe treatment environment.

Cook, Rebecca. (2012).

Hippotherapy safety survey trends & correlation analysis. *Hippotherapy*. 2012 Summer; 18-21.

Summary: When survey data [from data for the years 2007-2010] is filtered, occupational therapists show the greatest incident/injury rate and those with HPCS credentialing, nine years or more of hippotherapy provision, and therapists who use long line equipment showed the lowest rate of incidents and injury. However, possibly due to the low numbers of incidents and injury in general with hippotherapy, no statistically significant relationship was strongly associated between incidents or injury and profession, therapist training, level of experience and equipment utilized. One area in the data where a statistically significant relationship was revealed as the more hippotherapy sessions a therapist completes, the greater the chance of completing an emergency dismount. The statistical significance of emergency dismounts highlights the importance of rehearsal and consideration of this important risk management strategy.

Cook, Rebecca. (2013).

Low injury rate in hippotherapy practice [for 2011-2012]. *Hippotherapy*. 2013 Summer: 19-20.

Fazio, Esterina; Medica, Pietro; Cravana, Cristina; Ferlazzo, Adriana. (2013).

Hypothalamic-pituitary-adrenal axis responses of horses to therapeutic riding program: effects of different riders. *Physiology & Behavior*. 2013 Jun; 118: 138-143.

<http://dx.doi.org/10.1016/j.physbeh.2013.05.009>

Abstract: In order to determine whether therapeutic riding could result in higher levels of stress than recreational riding, hypothalamic-pituitary-adrenal (HPA) axis response was evaluated in six horses by monitoring circulating beta -endorphin, ACTH and cortisol concentrations. Horses were already accustomed to be trained both for therapy and riding school activity since 2004. Intervention consisted of 60-minute therapeutic sessions, two times per week for 6 weeks with different riders: disabled and recreational riders (session A and B respectively). The therapeutic riders' group (A) consisted of six children with psychomotor disabilities; the recreational riders' group (B) consisted of six healthy children without any previous horse riding experience. Horses were asked to perform the same gaits and exercises at all sessions, both with disabled and healthy users. The statistical analysis showed that during both sessions the mean basal beta-endorphin and ACTH levels of horses did not show any significant changes, while the one way RM-ANOVA showed significant effects of sessions A on the cortisol ($F=11.50$; $P<0.01$) levels. Horses submitted to sessions A showed lower cortisol levels both at 5 min ($P<0.001$) and at 30 min ($P<0.005$) after therapeutic sessions than those after session B. Results suggest that in tested horses and for the variables settled, HPA axis was less responsive to disabled than healthy, recreational riders. Among the endocrine responses, cortisol was one of the indicators of HPA axis stress response.

Foster, Robin L. (2012).

Can screening tests predict equine job success? Assessing temperament in EAAT prospects. *Strides*. 2012 Summer; 18(3): 22-26.

Fowler, Veronica; Kennedy, Mark; Marlin, David. (2012).

A comparison of the Monty Roberts technique with a conventional UK technique for initial training of riding horses. *Anthrozoös*. 2012 Sep; 25(3): 301-321.

DOI: <http://dx.doi.org/10.2752/175303712X13403555186217>

Abstract: This study describes a comparison of the efficacy of the Monty Roberts horsemanship technique (MRT) in comparison with a UK conventional training technique (CT) for the initial training of horses. The sample consisted of 14 untrained horses, between 3 and 5 years old, sourced from a variety of non-competition yards in the UK. Horses were matched on temperament and randomly assigned to either the MRT group or the CT group. Each trainer was allowed 30 minutes per day to work with each horse for 20 days, following which the horses undertook a standardized ridden obstacle and flatwork test and a ridden freestyle test. Horses were scored for technical performance by a panel of judges who were unaware of the study or the trainers involved. During the session where the first saddle and rider were achieved, MRT-trained horses had significantly lower ($p=0.0137$) maximum heart rates (bpm \pm SD) (first saddle: 127 ± 37 , first rider: 76 ± 12) when compared with CT-trained horses (first saddle: 176 ± 24 , first rider: 147 ± 61). MRT-trained horses had similar mean heart rates to

CT-trained horses (91 ± 15 bpm, 80 ± 7 bpm, respectively) during the ridden obstacle test but received significantly higher performance scores from the judges (171 ± 4 , 133 ± 7 , respectively; $p < 0.0001$). MRT horses had similar mean heart rates to CT horses (81 ± 13 , 93 ± 5 , respectively) during the ridden flatwork test but were awarded significantly higher scores by the judges (149 ± 9 , 121 ± 11 , respectively; $p = 0.0005$). Thus, the efficacy of the MRT for initial training of riding horses is greater than that of the CT.

Gomolla, Annette. (2014).

Merkmale der Reittherapie. Ergebnisse einer qualitativen Dokumenten- und Videoanalyse reittherapeutischer Einheiten. *Mensch & Pferd International*. 2014; Heft 1: 4-12.

DOI: <http://dx.doi.org/10.2378/mup2014.art02d>

Text in German; abstract also in English.

Title in English: Features of a successful riding therapy. Qualitative documents and video analysis of horse assisted therapy units.

Abstract: In a qualitative document and video analysis therapeutic riding units were examined in terms of higher-level features. The documentation of 36 hours riding therapy of different clients and eight videos were included in the analysis. In addition to factors such as security framework and the preparation of the therapeutic setting, ten features have been filtered by a category reduction. These features can characterize riding therapy events regardless of therapeutic orientation of the individual experts and of the concrete, substantive implementation.

Hall, Carol; Kay, Rachel; Yarnell, Kelly. (2014).

Assessing ridden horse behavior: professional judgment and physiological measures. *Journal of Veterinary Behavior*. 2014; 9(1): 22-29.

DOI: <http://dx.doi.org/10.1016/j.jveb.2013.09.005>

Abstract: The assessment of ridden horse behavior by 12 equestrian professionals (riding instructors $n=4$, riders $n=4$, veterinarians $n=4$) was compared with observed behavior and physiological measures (salivary cortisol and eye temperature). Horses ($n=10$) were ridden at walk, trot, and canter in a predefined test of approximately 2-3 minutes. Video footage of the ridden test (RT) was analyzed using Observer XT 10 and duration of behavioral states/events recorded. Saliva was collected in the stable, after the warm-up (WU) and at 0, 5, 15, 30, and 60 minutes after the RT. The saliva was analyzed for cortisol (enzyme-linked immunosorbent assay) and the difference between minimum and maximum concentration (ng/mL) and associated sample times recorded. Eye temperature was measured using an infrared thermal camera (MobIR M8), static images (stable, after WU, after RT), and video footage (WU and RT) with maximum eye temperatures derived from set intervals. Mean maximum eye temperatures during ridden work were calculated. Video footage of the RT was observed by the 12 equestrian professionals who each scored the horses on 7 performance parameters derived from the Federation Equestre Internationale rules for dressage events and the training scale of the German National Equestrian Federation (relaxation, energy, compliance, suppleness, confidence, motivation, and happiness). These scores were compared

with behavioral and physiological measures and correlations investigated (Spearman's rank order correlation). Higher percentage durations of high head carriage (ranging from 0 to 50.75% of RT) and the nose carried at an angle in front of the vertical (0%-74.29% of RT) correlated with overall less favorable assessment by the equestrian professionals ($P < 0.05$) and only the instructors associated neutral head carriage (32.76%-91.92% of RT) and vertical nasal angle (0.97%-68.90% of RT) as a positive sign ($P = 0.03$ and ($P = 0.04$, respectively). Increases in salivary cortisol positively correlated with the duration of low head carriage ($P < 0.05$), suggesting that this way of going increased the demands placed on the horse. Increased eye temperature positively correlated with duration of nose carried behind the vertical when ridden ($P > = 0.02$) and negatively correlated with duration of nose carried in front of the vertical ($P = 0.01$). Some discrepancy between physiological evidence and professional assessment of ridden horse behavior was evident as were differences between groups of professionals. Further evaluation of the association between behavioral signs and physiological measures is now required to ensure that the assessment of ridden horse performance is based on valid and consistent measures.

Hausberger, Martine; Roche, H el ene; Henry, S everine; Visser, E. Kathalijne. (2008).

A review of the human-horse relationship. *Applied Animal Behaviour Science*. 2008 Jan; 109(1): 1-24.

DOI: <http://dx.doi.org/10.1016/j.applanim.2007.04.015>

Abstract: Despite a long history of human-horse relationship, horse-related incidents and accidents do occur amongst professional and non professional horse handlers. Recent studies show that their occurrence depend more on the frequency and amount of interactions with horses than on the level of competency, suggesting a strong need for specific research and training of individuals working with horses. In the present study, we review the current scientific knowledge on human-horse relationships. We distinguish here short occasional interactions with familiar or unfamiliar horses (e.g. veterinary inspection) and long-term bonds (e.g. horse-owner).

An important aspect of the horse-human relationship is to try and improve the development and maintenance of a strong positive relationship. Studies show that deficits in the management conditions (housing, feeding, possibilities for social contact, and training methods) may lead to relational problems between horses and humans. Different methods have been used to assess and improve the human-horse relation, especially at the young age. They reveal that the time and type of contact all play a role, while recent studies suggest that the use of familiarized social models might be a great help through social facilitation.

We argue that an important theoretical framework could be Hinde's [Hinde, R., 1979. *Towards Understanding Relationships*. Academic Press, Londres] definition of a relationship as an emerging bond from a series of interactions: partners have expectations on the next interaction on the basis of the previous ones. Understanding that a relationship is built up on the basis of a succession of interactions is an important step as it suggests that attention is being paid to the "positive" or "negative" valence of each interaction as a step for the next one. A better knowledge of learning rules is certainly necessary in this context not only to train the horse but also to counterbalance the unavoidable negative inputs that exist in routine

procedures and reduce their impact on the relationship.

It appears clearly that research is needed in order to assess how to better and safely approach the horse (e.g. research in position, posture, gaze, etc.), what type of approaches and timing may help in developing a positive bond, what influence human management and care have on the relationship, and how this can be adapted to have a positive influence on the relationship. Also the interaction between rider and horse, the search for the optimal match between two individuals, is an aspect of the horse-human relationship that requires attention in order to decrease the number of horse-riding accidents and reduced states of welfare. On the other hand, adequate knowledge is readily available that may improve the present situation rapidly. Developing awareness and attention to behavioural cues given by horses would certainly help decreasing accidents among professionals when interacting. Scientists therefore should play a major role in transmitting not only elements of the current knowledge of the ethology of the horse but also by helping developing observational skills.

Hübner, Marieke. (2012).

Die Koordination der Reitbewegung - eine wissenschaftliche Annäherung an die Biomechanik des Reitens. *Mensch & Pferd International*. 2012; Heft 2: 72-78.

Text in German; English title: Coordination dynamics of riding motion. A scientific approach to the biomechanics of horse-riding.

DOI: <http://dx.doi.org/2378/mup2012.art04d>

Abstract: Dieser Beitrag stellt eine Untersuchung über den Muskeleinsatz von M. biceps femoris, M. rectus abdominis, M. gluteus medius und M. erector spinae beim Reiten vor, die im Rahmen einer Bachelor-Arbeit an der Veterinärmedizinischen Universität Wien durchgeführt wurde. Die Studie ist als Grundlagenuntersuchung in Bezug auf die Biomechanik und die Muskelkoordination des Reitsitzes konzipiert worden. Neben den generierten Ergebnissen wird die Messanordnung erläutert und der themenbezogene Forschungsbedarf diskutiert. Aufgrund der Tatsache, dass sämtliche Bewegungen unseres Körpers, so auch die „Reitbewegung“, ein äußerst komplexes Zusammenspiel einer großen Vielzahl verschiedener Muskeln mit unterschiedlichen Funktionen sowie neurophysiologischer Vorgänge darstellt, können die Ergebnisse der Messungen der ausgewählten vier Muskeln natürlich nur eingeschränkt verallgemeinert werden und haben lediglich exemplarischen Charakter. Trotzdem lassen sich aus der Messung dieser ausgewählten Muskeln wertvolle Rückschlüsse über die motorischen Abläufe während des Reitens ziehen, die wiederum einen Anstoß zu weiteren wissenschaftlichen Untersuchungen geben können.

Jobling, Ruth; Creighton, Emma. (2011).

Fostering adherence to horse behavior counseling. *Journal of Veterinary Behavior*. 2011 Sep-Oct; 6(5): 276-286.

DOI: <http://dx.doi.org/10.1016/j.jveb.2011.02.009>

Abstract: Counseling services that aim to improve understanding of horse-human interactions are on the frontline of the horse welfare agenda. The aim of this research was to determine characteristics of horse owners seeking advice about their horse's behavior that

predicted their adherence to that advice. The established science of human behavioral change has largely been applied in the field of health psychology to identify predictors of behavior. A thorough review of human behavioral change literature identified 10 cognitive variables (e.g., attitude toward horse behavior counselors) that had the potential to predict adherence to the advice of a horse behavior counselor. Established self-report questionnaire methodology was adopted to survey an opportunistic sample of 52 clients of horse behavior counselors before they received the advice (initial cognitive profile), 10 days after (post-communication changes), and at 3-month follow-up (long-term changes). Data were preliminarily analyzed using correlation analyses and subsequently, multiple regression analyses were used to generate a model for adherence. Horse behavior counselors cannot influence what clients perceive when they come into the process, but are able to influence cognitive variables during the communication. The amount of post-communication change in *value of the outcome of adhering to the advice* ($\beta = 0.338, P = 0.033$) and *attribution of the horse's behavior problem to external factors* (e.g., facilities, time; $\beta = 0.309, P = 0.050$) were significant elements of a multiple regression analysis that explained 23.6% of the variance in adherence 10 days after the communication ($F_{2,35} = 6.700, P = 0.003$). At 3-month follow-up, there were no associations between adherence and the earlier cognitive profiles, but clients who showed a 3-month increase in positive attitude toward horse behavior counselors were more likely to show long-term adherence ($r = 0.389, P = 0.019$). Horse behavior counselors may benefit clients by demonstrating the effects of their advice early in the communication, so that clients value their efforts to adhere to the advice and continue to do so. Horse behavior counselors may also foster adherence to their advice by emphasizing external causes of the horse's behavior problem, which clients may find more controllable than internal causes such as their level of skill or fear. Developing the client's perception of a controllable cause of their horse's behavioral problem may build confidence in their ability to address the problem and encourage adherence.

Jones, Bidda; McGreevy, Paul D. (2010).

Ethical equitation: applying a cost-benefit approach. *Journal of Veterinary Behavior*. 2010; 5(4): 196-202.

DOI: <http://dx.doi.org/10.1016/j.jveb.2010.04.001>

Abstract: Riding and training horses is the basis of a multi-billion dollar industry, but their use in the developed world is predominantly for recreational, competitive, entertainment, or performance purposes. However, when we consider the poor welfare outcomes for the horses involved, our ultimate focus on fun seems a poor justification for using horses in this way. This article is not intended to diminish the use of horses in the ridden context, rather it foreshadows a time when horse welfare and equestrian competition are as balanced and sustainable as possible. Any use of horses is inevitably associated with a range of activities and interventions that can, collectively, compromise welfare. Laws are unlikely to adequately protect horse welfare if they assume traditional practices, including the use of the whip to accelerate horses, to be "reasonable" and "acceptable" without regard to their effect. Objective measures of the influence of training and riding methods on horse welfare are needed, along with a more sophisticated ethical framework than legislation or codes currently provide. Using a cost-benefit analysis approach is one way to test the acceptability of our impacts on horses.

This requires that welfare costs associated with an activity can be reliably estimated and balanced against the potential benefits of the activity to both humans and horses. To justify our use of horses for fun, we must have a strong moral obligation to ensure that we do everything possible to avoid jeopardizing their welfare. In other areas of animal use, particularly research, ethical models permit objective comparisons of the relative impact of different activities through “impact scales.” We propose the adaptation of such models for use in equestrian contexts to identify ways to improve ridden horse welfare. The challenge to equestrians is to maintain current levels of difficulty in competition without compromising horse welfare – for example, relying more on the skill of the trainer and rider and removing devices and training methods that negatively affect the horse.

König von Borstel, Uta; Pirsich, Wiebke; Gauly, Matthias; Bruns, Erich. (2012).

Repeatability and reliability of scores from ridden temperament tests conducted during performance tests. *Applied Animal Behaviour Science*. 2012 Jul; 139(3-4): 251-263.

DOI: <http://dx.doi.org/10.1016/j.applanim.2012.04.007>

Abstract: Current scores for equine personality traits assessed during performance tests are characterised by high means and inadequate variation, hampering genetic selection for these traits. A number of temperament and related behaviour tests have been developed in order to make assessment of equine personality more objective. However, rarely these tests have been validated for their use as a selection tool. Thus, as a first step the aim of the present study was to integrate a temperament tests into horse performance tests, in order to assess variability and repeatability of horses’ reactivity under the rider and the reliability of the judges’ assessment thereof. The temperament test was comprised of three novel stimuli, including a visual stimulus (BALL), a visual and tactile stimulus (GATE), and a visual and auditory stimulus (CANS). A total of 224 mares and stallions were subjected to the test during their participation in station performance tests for riding horses, and 133 of these horses were subjected to the test a second time either 2–3 weeks or 18 weeks after the first test. Horses were ridden in the test by professional riders, and their reactions to the stimuli were evaluated each by two judges and the rider using scores on a scale from 1 (task not concluded) to 10 (completely calm but attentive horse). Mean scores (\pm SD) ranged between 6.6 ± 2.4 (GATE) and 7.8 ± 2.1 (BALL), demonstrating lower means and considerably higher standard deviations than the same horses’ scores from present evaluation of the trait labelled temperament (8.1 ± 0.9) or related personality traits (e.g. character: 8.3 ± 0.8). Using variance components from mixed model analysis, inter-observer agreement between the two judges was for the individual stimuli very high (0.95 (BALL), 0.96 (GATE), 0.89 (CANS)), and there was likewise high agreement between the judges’ and the riders’ combined scores (0.93). Repeatabilities of horses’ scores were 0.72 (BALL), 0.75 (GATE), and 0.69 (CANS). Correlations to traits from the present evaluation of personality were low or non-existent, indicating that these traits are not a reflection of anxiety or fear reactivity as assessed by novel object tests. Horses’ improvement in judges’ combined scores from first to second test was not ($P > 0.1$) influenced by differences in time between tests, but differed between breed-types and individual riders. Also, not surprisingly, the higher horses’ scores in the first test were, the lower their improvement in the second test was (-0.45 ± 0.06 per additional score in the first test). Temperament tests using

novel stimuli presented to horses under a rider may be a practical and valid tool for improving the current assessment of equine personality traits during performance tests. Considering a combination of absolute scores and horses' improvement in scores of repeated tests, rather than measuring only absolute scores yields relevant information about horses' personality, and at the same time it may prevent owners from deliberately training their horses for low reactions to the test-stimuli.

Lindau-Bank, Detlev. (2013).

Entwicklung von Qualitätsstandards und Professionalisierung in der pferdegestützten Personalentwicklung. *Mensch & Pferd International*. 2013; Heft 2: 78-88.

DOI: <http://dx.doi.org/10.2378/mup2013.art04d>

Text in German; English translation of title: Development of standards and professionalism for therapeutic riding professionals.

Abstract: Die Professionalisierung pferdegestützter Personalentwicklung steckt noch in den Kinderschuhen. Bisher gibt es nur einen unabhängigen Verein in Deutschland der erstmalig Qualitätsstandards für pferdegestützte Trainings und Seminare aufgestellt hat. An Hand dieser Standards werden die Potentiale und Herausforderungen ungeklärter Fragen der pferdegestützten Personalentwicklung diskutiert. Unbestritten scheinen die Einmaligkeit des Erlebnisses und die eindruckliche Wirkung auf die professionelle Persönlichkeitsentwicklung des Einzelnen zu sein. Allerdings fehlen Forschungsbeiträge, die die Wirkung der pferdegestützten Interventionen erklären sowie Konzepte, die einen nachhaltigen Transfer in den Arbeitsalltag sicherstellen.

Lojek, Jacek; Lojek, Anna; Soborska, Joanna. (2013).

Effect of classic massage therapy on the heart rate of horses working in hippotherapy. Case study. *Annals of Warsaw University of Life Sciences - SGGW, Animal Science*. 2013; 52: 105-111.

Text in English; abstract also in Polish.

Available from the website <http://annals-wuls.sggw.pl/?q=node/384> (Accessed 25 Apr 2014).

Abstract: The objective of this study was determine the effect of classical massage therapy on heart rate in horses working in hippotherapy. We hypothesised that massage can be used to improve the horse's welfare, because it mentally relaxes the horse. The relationship between variables were examined to determine whether the selected factors (use or non-use of massage, the method of securing the patient on the horse, way of getting on a horse, place of treatment) influenced the heart rate of two horses working in hippotherapy. The results showed significant but very different effects on heart rate of particular horses subjected to a massage. It was also shown that heart rate of horses working in hippotherapy is highly influenced by environmental factors.

Lubbe, Beata. (2013).

Hochbegabung und Reittherapie. *Mensch & Pferd International*. 2013; Heft 2: 64-77.

DOI: <http://dx.doi.org/10.2378/mup2013.art03d>

Text in German; English translation of title: The highly gifted and therapeutic riding.

Abstract: Braucht besondere Begabung eine Therapie? Besonders intelligente Menschen, so glauben viele, sind doch besonders glücklich oder besonders privilegiert, mindestens aber besonders erfolgreich! Andererseits kämpfen hochintelligente Kinder oft auch mit besonderen Schwierigkeiten und erfahren Ablehnung durch ihre Umwelt (Fischer 2006). Enttäuschungen durch Sätze wie "Dafür bist du noch zu jung!" begünstigen Lernschwierigkeiten oder Anpassungsprobleme. In diesem Artikel wird beschrieben, wie die Reittherapie die Ressourcen dieser Kinder stärken kann, ihre Motorik verbessert und ihnen hilft, ein realistisches und belastbares Selbstbewusstsein aufzubauen.

Matsuura, A.; Sakuma, S.; Irimajiri, M.; Hodate, K. (2013).

Maximum permissible load weight of a Taishuh pony at a trot. *Journal of Animal Science*. 2013 Aug; 91(8): 3989-3996.

DOI: <http://dx.doi.org/10.2527/jas.2012-5540>

Abstract: The aim of this study was to determine the loading capacity of a trotting Taishuh pony by gait analysis using a motion analysis system. Seven Taishuh Ponies (5 mares and 2 geldings) and their rider were fitted with a marker (70 mm in diameter placed on their chest) and recorded by 2 high-resolution digital DVD cameras (at a sampling frequency of 60 Hz) as they were trotting along a straight course. Each horse performed 7 tests: 1 test with a loaded weight of 70 kg, 5 tests with random loaded weights between 80 kg and 120 kg, and a final test with a loaded weight of 70 kg again. Three-dimensional movements of each marker were analyzed using motion capture system. The time series of the vertical displacements of the marker was subjected to spectrum analysis by the maximum entropy method, and the autocorrelation coefficient was calculated. The first 2 peaks of the autocorrelation were defined as symmetry and regularity of the gait, and the sum of symmetry and regularity was defined as stability. The cross-spectrum analysis (Blackman-Tukey method) also was performed to analyze the time lag and cross-correlation coefficient between the time series of both pony and rider. Among ponies, symmetry in the 120 kg test (0.54) was significantly lower than that in the first 70 kg test (0.75, $P < 0.05$) and stabilities in the 100 kg (1.17) and 120 kg (1.17) tests were significantly less than that in the first 70 kg (1.46, $P < 0.05$). Regarding the rider, there were no significant differences in symmetry, regularity, and stability between loaded weights. The time lag between the time series of horse and rider in the 120 kg test (47.6 ms) was significantly greater than that in the first 70 kg (14.3 ms, $P < 0.05$) test. These results suggests that the maximum permissible load weight of the Taishuh pony trotting at 3.0 m/s over a short distance was less than 100 kg, which is 43% of the BW.

McGreevy, Paul Damien; Sundin, Maria; Karlsteen, Magnus; Berglin, Lena; Ternstrom, Johanna; Hawson, Lesley; Richardsson, Helena; McLean, Andrew N. (2014).

Problems at the human-horse interface and prospects for smart textile solutions. *Journal of Veterinary Behavior*. 2014; 9(1): 34-42.

DOI: <http://dx.doi.org/10.1016/j.jveb.2013.08.005>

Abstract: The significant potential for so-called "smart textiles" in the design of the next generation of devices that measure pressure, tension, moisture, and heat at the human-horse

interface is discussed in this article. Research techniques from theoretical and experimental physics laboratories, combined with wireless technology, can be readily adapted to measure and store metrics for numerous variables in equine structure and function. Activities, such as breathing, the extension and flexion of joints, limb kinematics, and cardiac function, can be logged as indicators of physiological and behavioral conditioning (training). Such metrics may also, one day, support veterinary diagnostics but also play a role in safeguarding sport-horse welfare, especially in elite contexts where the horse may be pushed to its functional limits. As such, they are likely to emerge as an area of great interest to equitation and welfare scientists. It is important to note that smart textiles sense and react to exogenous stimuli via integrated sensors. So, beyond the equitation science laboratory, the emergence of polymers and smart materials may enhance the effectiveness of, or challenge us to completely rethink, traditional items of saddlery, thus improving equitation. The integration of smart textiles in all sorts of extant and emergent equipment for everyday equestrians could, in the future, lead to equipment that responds appropriately to the demands of equitation in its various forms. Rethinking equitation through physics and the use of smart textiles seems to have merit in that it is a novel means of both investigating and addressing problems that compromise the welfare and performance of horses. The purpose of this article is to envision the use of smart textiles in research, clinical, equestrian, and horse care contexts.

McLean, Andrew N.; McGreevy, Paul D. (2010).

Ethical equitation: capping the price horses pay for human glory. *Journal of Veterinary Behavior*. 2010; 5(4): 203-209.

DOI: <http://dx.doi.org/10.1016/j.jveb.2010.04.003>

Abstract: Ethical equitation is nowadays coming into sharp focus in equestrian culture. Concerns surround the ethics of sports based on controlling an animal's locomotory responses and in using animals such as horses in sport in general. Anthropomorphically labeled misinterpretations of the responses of trained horses, such as the use of terms like "mad," "lazy," "keen," and "stubborn," may be detrimental to optimal equine welfare. Similarly, the concept of the "equine athlete" may imply an ill-informed teleological explanation of the motives of the horse in sport. Despite problems in identifying the happy horse, rewarding optimal welfare and the absence of critical stress responses in performance horses is an important step forward. Horse racing is the source of many welfare concerns because of the use of the whip and the physical dangers to horses involved in hurdle racing and steeplechasing. The use of the whip in racing is controversial and, because it does not always lead to acceleration, problematic. There is a pressing need for learning theory to be adopted in all equestrian pursuits, because such an approach would obviate the need for whips, punishment, and the use of fear in escape learning. In other disciplines, practices such as hyperflexion and soring have a significant potential to compromise the welfare of the horse in sport. The future of horse sports should involve abandoning the mandatory use of primitive control devices, such as curb bits, that have a real potential to cause harm. International governing bodies and national equestrian federations ought to proceed with removing any requirements to use curb bits and judges should reward riders who use the most humane control devices at the higher levels of competition. Finally, horse breeding should also be

scrutinized under an ethical spotlight. Selecting horses on the basis of temperament has inherent risks, including lowered motivation of riders and trainers to refine their training skill set, which may also lead to significant wastage. Pure breeding risks the health and welfare of horses owing to increases in homozygous deleterious genes expressing themselves.

Moisa, Corina Monica; Barabasi, Julia; Papuc, Ionel. (2012).

Selection methods for horses used in hippotherapy. *Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. Veterinary Medicine.* 2012; 69(1-2): 131-138.

Abstract: An almost exotic field in Romania, hippotherapy is one of the most effective treatments used to improve the position, balance, mobility and body functions, in all cases of impaired motor capacity, as a clearly defined method, programmed and inserted into a wider project of customize rehabilitation. Hippotherapy is considered as the first step in horse mediated therapy, followed by riding, pre-sportive and sportive rehabilitation, stages that show the increasing capacity of the person who undergoes therapy and its ever more active and independent role on the horse. The paper aims to identify and apply scientific methods of selection of horses to be included in a hippotherapy program as an alternative treatment, applied to institutionalized children with motor disabilities, as a recovery tool. Selection is based on the horses temperament, personality and reactivity, and a program for people with various disabilities will be customized and adapted to their requirements and resource availability. The results obtained show the importance of selecting horses for hippotherapy and the role they play in therapy for people with mental and motor disabilities by reducing negative effects and increase of confidence in their own possibilities.

Available from the website,

<http://journals.usamvcluj.ro/index.php/veterinary/article/view/849/7124> (Accessed 4 Mar 2013).

Munsters, Carolien C.B.M.; Visser, Kathelijne E.K.; van den Broek, Jan; Sloet van Oldruitenborgh-Oosterbaan, Marianne M. (2012).

The influence of challenging objects and horse-rider matching on heart rate, heart rate variability and behavioural score in riding horses. *Veterinary Journal.* 2012 Apr; 192(1): 75-80.

DOI: www.dx.doi.org/10.1016/j.tvjl.2011.04.011

Comment in *Veterinary Journal.* 2012 Apr; 192(1): 4-5.

Abstract: A good horse-rider 'match' is important in the context of equine welfare. To quantify the influence of repetition and horse-rider matching on the stress of horses encountering challenging objects, 16 Warmblood horses were ridden in a test-setting on three occasions. On each occasion the horse was ridden by a different rider and was challenged by three objects (A-C). Heart rate (HR), heart rate variability (HRV) of horse and rider, and behaviour score (BS) of the horse were obtained for each object and as a total for each test. The horse-rider interaction was evaluated with each combination and assessed as 'matching' or 'mismatching', and the horses were categorised as 'compliant', 'partly-compliant' or 'non-compliant'. Horses exhibited a decreased HR ($P = 0.015$) and a decreased BS ($P = 0.004$) within

and across different tests. 'Matching' horse-rider combinations exhibited less stress as indicated by reduced HR ('match' 69 ± 10 vs. 'mismatch' 72 ± 9 , $P=0.001$) and BS ('match' 1.9 ± 1.1 vs. 'mismatch' 3.8 ± 1.4 , $P = 0.017$) of the horse. 'Compliant' (68 ± 8 , $P < 0.001$) and 'partly-compliant' (71 ± 9 , $P = 0.002$) horses had significantly lower HR than 'non-compliant' (75 ± 9) animals. The findings of the study indicate that HR and BS measurements support a subjective 'match' diagnosis and HR measurement may be a valuable tool in assessing horse compliance.

Comment by Lesley A. Hawson titled "Compliance, cooperation, conditioning and cognition: four Cs in the assessment of the horse-rider dyad." *Veterinary Journal*. 2012 Apr; 192(1): 4-5.

DOI (comment): <http://dx.doi.org/10.1016/j.tvjl.2011.08.023>

"The study by Munsters et al. (2012) is an important step forward in using physiological measures to gain insight into a horse's internal states. HR may prove to be a valid and useful measure of psychological arousal in the horse. Nevertheless, it would be unwise to conclude that it is an indicator of horse/rider 'match' until we thoroughly understand and can control for the more fundamental stimulus/response relationships within the horse-rider dyad."

Münz, Andreas; Eckardt, Falko; Heipertz-Hengst, Christine; Peham, Christian; Witte, Kerstin. (2013).

A preliminary study of an inertial sensor-based method for the assessment of human pelvis kinematics in dressage riding. *Journal of Equine Veterinary Science*. 2013; 33(11):950-955.

DOI: <http://dx.doi.org/10.1016/j.jevs.2013.02.002>

Abstract: Kinematic studies of horse and rider often suffer from their limitation to laboratory conditions because of video-based measurement techniques. To date, there are no suitable sensor-based methods published for the assessment of the rider's pelvis. The aim of this study was to reveal the possibilities and limitations of inertial sensors to assess the motion of the rider's pelvis in walk, trot, and canter, with particular attention to repeatability. Two female riders rode the same horse in repeated trials wearing an inertial sensor attached to their pelvis. Both riders were tested in walk, sitting trot, rising trot, and canter. Gait-dependent and interindividual characteristics of pelvis rotation in dressage riding under field conditions could be demonstrated. The possibility of obtaining kinematic data of horse and rider under field conditions using inertial sensors seems to be promising not only for researchers and horsemen but also for objectifying progress in therapeutic riding.

Novak, Iona. (2012).

Evidence to Practice Commentary: the evidence alert traffic light grading system. *Physical and Occupational Therapy in Pediatrics*. 2012 Aug;32(3):256-259.

DOI: 10.3109/01942638.2012.698148

Evidence Alert Traffic Light Grading System commentaries highlight up-to-date evidence in order to provide clinically useful answers to assist decision-making and to determine next steps.

Comment on:

Physical and Occupational Therapy in Pediatrics. 2012 Aug; 32(3): 243-255 (Whalen & Case-Smith. Therapeutic effects of horseback riding therapy on gross motor function in children with cerebral palsy).

Physical and Occupational Therapy in Pediatrics. 2012 Aug; 32(3): 229-242 (Frohlich et al. Effects of neoprene wrist/hand splints on handwriting for students with joint hypermobility syndrome: a single system design study).

Pasicka, Edyta; Geringer de Oedenberg, Henryk. (2012).

Analiza indeksów pokrojowych Koników Polskich z osrodków hodowli zachowawczej oraz wykorzystywanych w hipoterapii. Analysis of exterior indices of Polish konik horses from preservation breeding centres and used in hippotherapy. *Zeszyty Naukowe Uniwersytetu Przyrodniczego we Wrocławiu - Biologia i Hodowla Zwierząt*. 2012; 67(591): 9-22.

Text in Polish, abstract also in English.

Abstract: The aim of this study was to analyse exterior indices of Polish Konik horses from preservation breeding centres as well as indices of this breed used in hippotherapy. The study was conducted in five leading preservation breeding centres with this breed in Poland. For each of 172 Polish Konik specimens, 40 conformation indices were calculated. The horses were divided into two groups based on gender. Statistical analysis showed significant differences between the sexes in a number of mean values of indices. No disproportions were found - regarding values of the analyzed indices - between the verified breeding population of Polish Konik horses and the horses of this breed used in hippotherapy centres.

Available from the website, <http://zeszyty.bihz.up.wroc.pl/archiwum/z67-2012.pdf> (Accessed 19 April 2013).

Schütte, Rebecca; Riedel, Meike. (2013).

Dressurreiten mit Handicap im Leistungssport. Grundlegende Strukturen und Entwicklungen. *Mensch & Pferd International*. 2013; Heft 4: 174-183.

DOI: <http://dx.doi.org/10.2378/mup2013.art08d>

Text in German; abstract also in English.

English title: Dressage with handicap in competitive sports. Basic structures and developments.

Abstract: At the World Equestrian Games in Kentucky 2010, for the first time Para-Equestrian – the equitation for people with disabilities worldwide – took place together with the normal athletes. Since May this year, Para-Equestrian has been acknowledged as the eighth discipline of the German Olympic Equestrian Committee.

Despite these remarkable developments and successes, the equitation for people with disabilities is being offered only in very few clubs at popular sport and/or competitive sport level.

The following article summarizes general information about the developments and structures of the National Paralympic Committee Germany and the Paralympic Games as well as the classification system of dressage for people with disabilities.

Shkedi, Anita. (2011).

The fear factor: an important issue for safe equine assisted activities & therapy (EAA/T). *Scientific and Educational Journal of Therapeutic Riding*. 2011; 67-77.

Abstract: This is an educational article about the fundamental response to fear, the “flight or fight” mechanism that is inherent in most animal species, and its relevance to therapeutic activities involving horses. By critically examining the hypothesis that the human amygdala’s response to fear blocks a person’s ability to think, focus and learn, it is then possible to consider how to prevent it from becoming a powerful detractor in an EAA/T session. Using literature to support this argument, suggestions are made as to how to improve the structure of the EAA/T session so that the challenged rider can feel safe both externally and internally. Challenged riders with various disabilities, including traumatic brain injury (TBI), post traumatic stress disorder (PTSD), and neuro-developmental dysfunctions, phobias and anxiety, are discussed.

Souza, Corey. (2011).

Hippology in anthropology: tracking horse-human ecologies from domestication to equine-assisted therapy in anthropological discourse. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 78-88.

Abstract: Research in hippology lacks a fixed location within North American academia. Crossing the boundaries of science and art, hippology has entered the discourses of archaeologists, classical historians, art historians, cognition scientists, physical and psychotherapists. This paper locates the intersections of hippology and anthropology by analyzing studies from early domestication to hippotherapy and proposes horse-human ecology as a dynamic field of inquiry for anthropological research.

Uchiyama, Hidehiko; Ohtani, Nobuyo; Ohta, Mitsuaki. (2011).

Three-dimensional analysis of horse and human gaits in therapeutic riding. *Applied Animal Behaviour Science*. 2011 Dec; 135(4): 271-276.

DOI: <http://dx.doi.org/10.1016/j.applanim.2011.10.024>

Abstract: Therapeutic horse riding or hippotherapy is used as an intervention for treating individuals with mental and physical disabilities. Equine-assisted interventions are based on the hypothesis that the movement of the horse's pelvis during horseback riding resembles human ambulation, and thus provides motor and sensory inputs similar to those received during human walking. However, this hypothesis has not been investigated quantitatively and qualitatively. This study aimed to verify the hypothesis by conducting a three-dimensional analysis of the horse's movements while walking and human ambulation. Using four sets of equipments, we analysed the acceleration patterns of walking in 50 healthy humans and 11 horses. In addition, we analysed the exercise intensity by comparing the heart rate, breathing rate and blood pressure of 127 healthy individuals before and after walking and horse riding. The acceleration data series of the stride phase of horse walking were compared with those of human walking, and the frequencies (in Hz) were analysed by Fast Fourier transform. The acceleration curves of human walking overlapped with those of horse walking, with the frequency band of human walking corresponding with that of horse

walking. Exercise intensity, as measured by the heart rate and breathing rate, was not significantly different between horse riding and human walking. The levels of diastolic blood pressure were slightly higher during horse riding than during walking, but were lower during both conditions compared with those in normal conditions ($P < 0.01$). The present study shows that, although not completely matched, the accelerations of the horse and human walking are comparable quantitatively and qualitatively. Horse riding at a walking gait could generate motor and sensory inputs similar to those produced by human walking, and thus could provide optimum benefits to persons with ambulatory difficulties.

Wolframm, Inga A.; Bosga, Jurjen; Meulenbroek, Ruud G. J. (2013).

Coordination dynamics in horse-rider dyads. *Human Movement Science*. 2013 Feb; 32(1): 157-170.

DOI: <http://dx.doi.org/10.1016/j.humov.2012.11.002>

Abstract: The sport of equestrianism is defined through close horse-rider interaction. However, no consistent baseline parameters currently exist describing the coordination dynamics of horse-rider movement across different equine gaits. The study aims to employ accelerometers to investigate and describe patterns of motor coordination between horse and rider across the equine gaits of walk, rising trot, sitting trot and canter. Eighteen female (N = 18; mean age \pm SD; 37.57 ± 13.04) Dutch horse-rider combinations were recruited to participate in the study. Horse-rider coordination was recorded using two tri-axial wireless accelerometers during a standard ridden protocol. Multiple measures of horse-rider coordination were calculated to investigate the relationship between the horse and rider, while the unpredictability of the acceleration-time series of the horse and rider during task performance were determined separately by means of approximate entropy analysis. The kinematic variables of horse-rider correlation, mean relative phase, mean standard deviation of the relative phase, approximate entropy rider, approximate entropy horse and spectral edge frequency at 95% of the power in the 0-10Hz frequency band were examined using multiple correlational analyses and multivariate analysis of variance (MANOVA). Findings showed significantly different coordination dynamics between equine gaits, with the gait of canter allowing for the highest levels of horse-rider synchronicity. It may be concluded that accelerometers are a valuable tool to map distinct coordination patterns of horse-rider combinations.

Horsemanship & the Horses: Theses

Westermann, Katharina. (2013).

Pferdegestützte Interventionen (PGI) zur Gesundheitsförderung des Menschen. Einsatzvoraussetzungen, Anforderungen, Belastungsmomente, Ausbildung und Leistungsprüfung des Pferdes. Berlin : Freie Universität Berlin, 2013. vi, 147 pp.

Text in German; abstract also in English.

English translation of title: Equine Assisted Interventions (EAI) as part of human health programmes: prerequisites, requirements, stresses and strains, training and performance tests for the horses.

Available from www.diss.fu.berlin.de/diss/receive/FUDISS_theses_00000095571 (Accessed 29 Apr 2014).

Abstract: One aim of this study was to investigate the emphasis (requirements, stresses and strains) and the actual qualifying (training guide, performance test) of horses in EAI. Another aim was to work out proposals for a standardizable quality management for those horses (development of a guideline for the utilisation and training as well as a performance test for horses in EAI, an instructor licence "EAI" for suppliers, additions to the education guidelines within the horse-related apprenticeships and opportunities for interdisciplinary cooperation). In Germany Equine Assisted Interventions (EAI), also within the meaning of "Therapeutic Riding", are increasingly being offered and used. Needed requirements and conditions are little and often insufficiently investigated. But considering the knowledge of veterinary medicine, (behaviour) biology and horse-training, differences in the requirements and stresses and strains between horses in EAT and saddle-horse could be determined, which are only inadequate incorporated into the existing additional qualifications for intervention director of EAT. In order to assess conditions and credentials of the utilization of horses in EAI, 252 German suppliers of EAI were asked about their operating structure (21 questions) and their horses (27 questions). This survey is marked by a high return (53,5%) and response rate (o 87%) and showed that the majority of the providers are small business owners (at a small number of employees (o 1-3) and a limited number of horses (o 6)). They have got a basic profession and additional hippological qualification and are equally responsible for client and horses. It is proposed to continue to develop proven horse training programs and performance tests for horses used in EAI. This is necessary in regard of safety aspects during the intervention as well as animal welfare, because of the high level of demands of the horses and the heavy burdens while they are employing in human health programs (o 2,3 caregivers and 3,7 inserts a 48,6 min with 2,5 non-competent clients each). Likewise an instructor licence "EAI" and substantial amendments in the guidelines of horse-related apprenticeships should be established. Furthermore, the majority (51%) would welcome an introduction of a performance test for horses in EAI. And 35% have the opinion, the supplier's qualification have to be tested more intensively.

Equine Assisted Interventions (Therapeutic Riding)

Equine Assisted Interventions: Books

Knapp, Shannon; Dammann, Brenda. (2012)

More than a mirror: horses, humans and therapeutic practices; foreword by Linda Parelli. [Marshall, NC] : Horse Sense of the Carolinas, ©2012.

\$US 60.00: Order via the website <http://HorseSenseBusiness.com>

Masterson, Jim (2011).

Beyond horse massage: a breakthrough interactive method for alleviating soreness, strain and tension; Jim Masterson, with Stefanie Reinhold. North Pomfret, Vt : Trafalgar Square, ©2011. xi, 205 p. : col. Illus. ; 26 cm.

Originally published by J.A. Allen with the title: Beyond horse massage: introducing the Masterson Method, a breakthrough interactive method for alleviating soreness, strain and tension.

US \$ 32.95: ISBN 9781570764721 (spiral bound); \$US 34.95 (DVD); \$US 14.99 (Kindle ed.).

Narges, Mary; Pirgit, Elaine. (2011).

The chronicles of Free S.P.I.R.I.T Riders; twenty five years of therapeutic horsemanship. Fond du Lac, WI: [M. Narges and E. Pirgit], ©2011. 207 p. : illus. (chief col.); 22 cm.

Free S.P.I.R.I.T. (Special People in Riding Therapy) Riders was founded in 1987 with a commitment to enriching the lives of children and adults with disabilities through safe therapeutic intervention with horses..." -p. [4] of cover.

\$US 22.50 incl. p&h; orders to Free S.P.I.R.I.T Riders, PO Box 1291, Fond du Lac, WI 54936-1291, USA

Shkedi, Anita. (2012).

Traumatic brain injury and therapeutic riding. Israel: A. Shkedi, ©2012. 171 p. : illus. ; 23 cm.

\$US 34.00; ISBN9789659192403; order by email at ashkedi@me.com.

Equine Assisted Interventions: Contributions to Books

**Anderson, Fraser; Annett, Michelle; Bischof, Walter F.; Boulanger, Pierre. (2010).
Virtual Equine Assisted Therapy. p.255-256.
IEEE Virtual Reality 2010 [electronic resource] : Waltham, Massachusetts, USA,
March 20-24, 2010 : proceedings, edited by Benjamin Lok, Gudrun Klinker, Ryohei Nakatsu
; sponsored by IEEE Visualization and Graphics Technical Committee. Piscataway, NJ
: IEEE, c2010. 1 online resource : illus.**

DOI: <http://dx.doi.org/10.1109/VR.2010.5444776>

Abstract: People with a wide spectrum of disabilities, ranging from spinal injuries to autism, have benefited from equine assisted therapy (EAT). Using EAT, therapy patients have improved both physically and psychologically (e.g., demonstrating increased attention, motivation, and communication skills). There are still many open questions regarding this therapy and the reasons for its success. Many of these questions have remained unanswered due in large part to the uncontrolled nature of EAT. The Virtual Equine Assisted Therapy (VEAT) Project integrates a robotic platform with virtual reality technologies to provide a safe, controlled environment through which various aspects of EAT can be isolated and studied. The system incorporates realistic equine motions with visual, auditory, olfactory, and somatosensory stimuli to provide highly immersive experiences to patients.

Beder, Joan; Sullivan-Sakaeda, Laurie; Martin, Tamar P. (2012).

Animal assisted intervention. p.239-252. IN: Beder, Joan (editor). Advances in social work practice with the military. New York : Routledge/Taylor & Francis Group, ©2012. xxx, 293 p. : illus. ; 24 cm.

ISBN: 978-0-415-89133-2 (hdbk.); 978-0-415-89134-9 (pbk.); 978-0-203-82574-7 (pdf).

Contents: The human-animal bond, Joan Beder. – Animal assistance with dogs. – Equine assisted therapy (aka equine facilitated therapy), Laurie Sullivan-Sakaeda. – Community reintegration through the healing properties of fly fishing, Tamar P. Martin.

Equine Assisted Interventions: Journal Articles

Asselin, Glennys; Ward, Constance; Penning, Julius H.; Ramanujam, Savithri; Neri, Rebecca. (2012).

Therapeutic horse back riding of a spinal cord injured veteran: a case study. *Rehabilitation Nursing*. 2012 Nov-Dec; 37(6): 270-276.

DOI: <http://dx.doi.org/10.1002/rnj.027>

Abstract: PURPOSE: To determine an incomplete spinal cord injured veteran's experience following participation in a therapeutic horseback riding program.

METHODS: Following the establishment of a nationwide therapeutic riding program for America's wounded service veterans in 2007, a Certified Rehabilitation Registered Nurse from the Michael E. DeBakey Veteran Affairs Medical Center worked with an incomplete spinal cord injured veteran who participated in the Horses for Heroes program.

RESULTS: This program resulted in many benefits for the veteran, including an increase in balance, muscle strength, and self-esteem.

DISCUSSION: A physical, psychological, and psychosocial benefit of therapeutic horseback riding is shown to have positive results for the spinal cord injured. Therapeutic riding is an emerging field where the horse is used as a tool for physical therapy, emotional growth, and learning.

CONCLUSION: Veterans returning from the Iraq/Afghanistan war with traumatic brain injuries, blast injuries, depression, traumatic amputations, and spinal cord injuries may benefit from this nurse-assisted therapy involving the horse.

Bachi, Keren. (2013).

Equine-facilitated prison-based programs within the context of prison-based animal programs: state of the science review. *Journal of Offender Rehabilitation*. 2013; 52(1): 46-74.

DOI: <http://dx.doi.org/10.1080/10509674.2012.734371>

Abstract: Equine-facilitated prison programs have become more prevalent and operate in correctional facilities in 13 states throughout the United States. However, there is a deficit of empirical knowledge to guide them. This article reviews 19 studies of prison-based animal programs and centers on patterns in the literature. It reveals how previous studies are relevant and how they can be applied to the examination of equine-facilitated prison-based interventions. Research of this field is warranted in order to study issues, such as the effectiveness of these programs, suitable participants for such programs and contraindications, and the impact of these programs on variables such as recidivism and disciplinary misconduct.

Clayton, Hilary M.; Kaiser, LeeAnn J.; de Pue, Bonnie; Kaiser, Lana. (2011).

Center-of-pressure movements during equine-assisted activities. *American Journal of Occupational Therapy*. 2011 Mar-Apr; 65(2): 211-216.

Abstract: We compared anteroposterior and mediolateral range of motion and velocity of the center of pressure (COP) on the horse's back between riders without disabilities and riders with cerebral palsy. An electronic pressure mat was used to track COP movements beneath the saddle in 4 riders without disabilities and 4 riders with cerebral palsy. Comparisons between rider groups were made using the Mann-Whitney test ($p < .05$). The two rider groups differed significantly in anteroposterior range of COP motion, mediolateral range of COP motion, and mediolateral COP velocity. Anteroposterior COP velocity did not differ between groups. The results suggest that measurements of COP range of motion and velocity are potentially useful for monitoring changes in balance as an indicator of core stability during equine-assisted activities.

Elliott, Steven; Funderburk, Janet A.; Holland, James M. (2008).

The impact of the "Stirrup Some Fun" therapeutic horseback riding program: a qualitative investigation. *American Journal of Recreation Therapy*. 2008 Spring; 7(2): 19-28.

Abstract: Therapeutic horseback riding is an intervention utilizing horses in the treatment of individuals with emotional, cognitive, and/or physical disabilities. The purpose of this study was to investigate the perceived impact of a therapeutic riding program on children with mild to moderate physical and mental disabilities. Two groups of participants including five children (with a variety of physical and cognitive disabilities) and at least one parent of each of the five children were interviewed to investigate the impact of the Stirrup Some Fun Therapeutic Riding Program (SSF TRP). Qualitative data analysis procedures were used to explore participants' views and opinions of the SSF TRP. Several themes emerged from the interviews with the participants and their parents, including (a) enjoyment, (b) the child/animal connection, (c) social relationships with volunteers, (d) perceived physical benefits, and (e) the social and mental benefits of the program.

Frank, Alana; McCloskey, Sandra; Dole, Robin L. (2011).

Effect of hippotherapy on perceived self-competence and participation in a child with cerebral palsy. *Pediatric Physical Therapy*. 2011 Fall; 23(3) 301-308.

DOI: <http://dx.doi.org/10.1097/PEP.0b013e318227caac>

Abstract: This case report highlights changes in self-competence and social acceptance, along with changes in functional skills, after an 8-week program of hippotherapy. A 6-year-old girl with mild ataxic cerebral palsy, level I Gross Motor Functional Classification System, exhibited typical impairments in body systems and functions that affected her participation in age-appropriate functional and leisure activities. The child's performance on the Gross Motor Function Measure-66, the Pediatric Outcomes Data Collection Instrument, and the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children were examined at baseline, after the 8-week intervention, and at a 2-month follow-up session. Data at 8 weeks demonstrated positive changes in all areas, with improvements continuing for 2 months after the program's completion. Hippotherapy not only may be an effective intervention to improve functional gross motor development but also may affect perceived self-competence and social acceptance, which may lead to increases in participation for children with mild cerebral palsy.

Granados, Anabel Corral; Agís, Inmaculada Fernández. (2011).

Why children with special needs feel better with hippotherapy sessions: A conceptual review. *Journal of Alternative & Complementary Medicine*, 2011 Mar; 17 (3): 191-197.

DOI: <http://dx.doi.org/10.1089/acm.2009.0229>

Abstract: Background: Hippotherapy literally means 'therapy with the help of a horse' and is derived from the Greek word hippos, meaning 'horse.' Hippocrates was the first to describe the benefits of hippotherapy for rehabilitation purposes. Although this therapy has many years of history, few scholars have defined the theoretical bases of hippotherapy and less about how psychologic, physical, social, and educational benefits can be achieved through hippotherapy in children with special needs.

Objective: This article is designed from a chronological perspective to provide mental health professionals, educators, and others with current information on how horses can be used as a main tool in an effective and holistic therapy for children with special needs. This is supported by current literature review through a conceptual framework of hippotherapy explained by dynamic system theory along with the theory of neuronal group selection and sensory integration theory.

Conclusions: Hippotherapy, by affecting multiple systems such as the sensory, muscular, skeletal, limbic, vestibular, and ocular systems simultaneously, leads to psychologic, social, and educational benefits that will be evidenced in behavioral patterns used in other environments.

Haberer, Elke; Ploppa, Melanie. (2013).

Psychomotorik mit dem Pferd. Bodenarbeit als Methode zur Förderung psychomotorischer Kompetenzen. *Mensch & Pferd International*. 2013; Heft 1: 17-27.

DOI: <http://dx.doi.org/10.2378/mup2013.art02d>

Text in German; abstract also in English.

Title in English: Horsebased psychomotricity - Groundwork as a method for the development of psychomotor competences.

Abstract: Psychomotricity have always been connected to several different job groups and areas of expertise. The present study takes a new line to those facets, analyzing the groundwork component within the concept "psychomotricity with horses" and its potential to nurture psychomotor competences in children. By means of video-based observational study, several situations in groundwork with children were analyzed and examined for possible uses in developing motoric, cognitive and social competence. Groundwork offers diverse experiences with material-related, body-related, and social situations. Provided that these experiences are made in an environment of psychomotor procedures, the methodology of groundwork is very suitable for the development of psychomotor competences.

Henrique de Sousa, Fernando; Tavella Navega, Marcelo. (2012).

Influência de atividades lúdico-desportivas na realização de Equoterpia em pacientes neurológicos – ensaio clínico controlado aleatorizado. *ConScientiae Saúde*. 2012; 11(4): 587-597.

DOI: <http://dx.doi.org/10.5585/ConsSaude.v11n4.3421>, or www.redalyc.org/articulo.oa?id=92924959009 (Accessed 23 Mar 2014).

Text in Portuguese; abstracts also in English and Spanish. Title in English: Influence of recreational and sports activities in the conduct of hippotherapy in neurological patients - randomized controlled trial.

Abstract: Introduction. Equine therapy is a therapy that uses horses to provide the practitioner in rehabilitation aspects of motor, sensory, behavioral and social.

Objective: To investigate the effect of the combination of playful activities with hippotherapy sessions on the trunk balance and range of motion.

Methods: We selected 18 practitioners diagnosed with cerebral palsy were randomly divided into two groups. The group 1 held hippotherapy sessions, and group 2 held equine therapy with recreational activities and sports. Before and after treatment, the trunk control and range of motion of the practitioners were evaluated. The data were analyzed using the Student's t-test $<p < 0.05>$.

Results: There was an improvement in range of motion and balance in both groups.

Conclusion: Equine therapy is an effective treatment for individuals with cerebral palsy, regardless of accomplishing it with or without recreational activities.

Holm, Margo B.; Baird, Joanne M.; Kim, Young Joo; Rajora, Kuwar B.; D'Silva, Delma; Podolinsky, Lin; Mazefsky, Carla; Minshew, Nancy. (2014).

Therapeutic horseback riding outcomes of parent-identified goals for children with autism spectrum disorder: An ABA multiple case design examining dosing and generalization to the home and community. *Journal of Autism and Developmental Disorders*. 2014 Apr; 44(4): 937-947.

DOI: <http://dx.doi.org/10.1007/s10803-013-1949-x>

Abstract: We examined whether different doses of therapeutic riding influenced parent-nominated target behaviors of children with autism spectrum disorder (ASD) (a) during the session (b) at home, and (c) in the community. We used a single subject multiple Baseline, multiple case design, with dosing of 1, 3, and 5 times/week. Three boys with ASD, 6-8 years of age participated, and counts of target behaviors were collected in each setting and phase of the study. Compared to Baseline, 70 % of the target behaviors were better during Intervention and improvement was retained in 63 % of the behaviors during Withdrawal. Increased doses of therapeutic riding were significant for magnitude of change, and the effect of the therapeutic riding sessions generalized to home and community.

Hübner, Marieke. (2012).

Die Koordination der Reitbewegung - eine wissenschaftliche Annäherung an die Biomechanik des Reitens. *Mensch & Pferd International*. 2012; Heft 2: 72-78.

Text in German; English title: Coordination dynamics of riding motion. A scientific approach to the biomechanics of horse-riding.

DOI: <http://dx.doi.org/2378/mup2012.art04d>

Abstract: Dieser Beitrag stellt eine Untersuchung über den Muskeleinsatz von M. biceps femoris, M. rectus abdominis, M. gluteus medius und M. erector spinae beim Reiten vor, die

im Rahmen einer Bachelor-Arbeit an der Veterinärmedizinischen Universität Wien durchgeführt wurde. Die Studie ist als Grundlagenuntersuchung in Bezug auf die Biomechanik und die Muskelkoordination des Reitsitzes konzipiert worden. Neben den generierten Ergebnissen wird die Messanordnung erläutert und der themenbezogene Forschungsbedarf diskutiert. Aufgrund der Tatsache, dass sämtliche Bewegungen unseres Körpers, so auch die „Reitbewegung“, ein äußerst komplexes Zusammenspiel einer großen Vielzahl verschiedener Muskeln mit unterschiedlichen Funktionen sowie neurophysiologischer Vorgänge darstellt, können die Ergebnisse der Messungen der ausgewählten vier Muskeln natürlich nur eingeschränkt verallgemeinert werden und haben lediglich exemplarischen Charakter. Trotzdem lassen sich aus der Messung dieser ausgewählten Muskeln wertvolle Rückschlüsse über die motorischen Abläufe während des Reitens ziehen, die wiederum einen Anstoß zu weiteren wissenschaftlichen Untersuchungen geben können.

Karlinsky, Harry. (2013).

The Horse Boy--attending to the stories our patients tell us. *Academic Psychiatry*. 2013 Jul 1; 37(4): 271-275.

DOI: <http://dx.doi.org/10.1176/appi.ap.13040048>

Abstract: In the summer of 2007, Rupert Isaacson and Kirsten Neff set off to Mongolia on an extraordinary journey to heal their 7-year old autistic son. Their story was captured on film by a small crew, and both the resulting documentary, *The Horse Boy*, and the associated book have reached a wide audience. For those involved in psychiatric education, the film represents a valuable opportunity to explore a range of relevant clinical and ethical issues with their learners, including an introduction to the world of complementary and alternative medicine and the emerging discipline of narrative medicine. Perhaps most importantly, *The Horse Boy* is an impetus for health professionals to consider their own responsibilities when determined patients in their care undertake such remarkable quests to heal themselves or their loved ones.

Klemenc-Ketiš, Zalika; Hajewska-Kosi, Jadwiga; Petrovič, Ivanka. (2006).

Hipoterapija - sdavljenje na konjskem hrbtu. Hippotherapy - treatment with the help of horseback riding. *Rehabilitacija*. 2006 Sep; 5(3-4): 154-156.

Text and abstracts in Slovenian and English.

Short introduction to classical hippotherapy.

Kreżel, Jerzy. (2012).

Hippotherapy: The mysterious art of healing or the art of rehabilitation? *Scientific and Educational Journal of Therapeutic Riding*. 2012/13; 68-80.

Abstract: Hippotherapy, according to the definition used by the Polish Hippotherapy Association, is a form of medical treatment that might improve a patient's condition in physical, mental and social domains. It is obvious that if hippotherapists want to develop and promote this treatment strategy, some effort should be made to have it accepted and approved by the medical community as a complementary treatment option. For countries like Poland,

this effort could help us promote the emergence of the profession of hippotherapist. Undoubtedly, a reasonable and professional development of this treatment strategy needs to be conducted in accordance with the philosophy of science. Unfortunately, some papers and proceedings on the topic of hippotherapy give the impression that not all therapists share that opinion. While some papers present objective results of studies as well as discussion based on scientific knowledge, others feed us with fairytale speculations decorated with modern physics terminology. This leads to an erroneous increase in the significance of pseudoscientific publications. The goal of this text is to emphasize the difference between a scientific and a pseudo-scientific approach. Several hippotherapy articles are presented as an example of science. As a counter-example, some pseudo-scientific revelations are also introduced. By means of analysis and comparison, the author attempts to show the benefits of an objective, evidence-based evaluation and promotion of hippotherapy, as well as the losses resulting from pseudo-scientific or even fictitious digressions. After clear demarcation of the two opposing approaches, the author discusses guidelines pertaining to planning and conducting evidence-based study. It is the result of these studies that may, after statistical analysis, scientifically show whether hippotherapy as a treatment approach is 1) harmless (that is, bringing no danger to the patient/client) and 2) improves the patient's functioning.

Lanning, Beth A.; Baier, Margaret E. Matyastik; Ivey-Hatz, Julie; Krenek, Nancy; Tubbs, Jack D. (2014).

Effects of equine assisted activities on autism spectrum disorder. *Journal of Autism and Developmental Disorders*. 2014. [11] p.

DOI: <http://dx.doi.org/10.1007/s10803-014-2062-5>

Abstract: Quality of life assessments were used in this study to determine the behavioral changes of children diagnosed with autism spectrum disorder (ASD) who participated in equine assisted activities. Behavioral changes of children with ASD participating in 9 weeks of equines assisted activities (EAA) ($N = 10$) were compared to behavioral changes of children who participated in a non-equine intervention ($N = 8$). Parents noted significant improvements in their child's physical, emotional and social functioning following the first 6 weeks of EAA. The children participating in the non-equine program also demonstrated improvement in behavior, but to a lesser degree. The favorable outcome of this study lends support for continuation of programs utilizing EAA in the treatment of children with ASD.

Lindskoog, Jennifer. (2009).

Carriage driving for individuals with disabilities – part 1. *Palaestra*. 2009; 24(3): 19-20, 23-24.

Available from the website, www.palaestra.com/node/25 (Accessed 18 June 2012).

Lindskoog, Jennifer. (2009).

More than a carriage ride...a lesson in therapeutic carriage driving: part 2. *Palaestra*. 2009; 24(4): 24-30.

On the thorough safety and therapeutic planning for needs-driven individual lessons in carriage driving for skills progression for individuals with moderate intellectual disabilities and two levels of autism spectrum disorder. The skills are sensory (environmental awareness, motion, balance, muscle tone, communication and motivation); developmental and physical skills (eye-hand coordination, sequencing spatial, directional & environmental awareness, self-discipline, and multi-step processing); and driving skills (physical and cognitive, sequencing, spatial analysis, competitive skills, and building of independence).

Preceded by her articles, Carriage driving for individuals with disabilities (*Palaestra*. 2009; 24(3): 19-24), and Driving safety steps (*Strides*. 2008 Spring; 14(1): 12-16).

McGibbon, Nancy H. (2013).

Hippotherapy: a story of passion, discipline and the promise of tomorrow. *Hippotherapy*. 2013 Winter; 8-11.

A short history of the profession.

Perrotta, Francesco. (2012).

Equestrian rehabilitation. "The benefits of approach with the horse in schools and in therapeutic." *Sport Science*. 2012; 5(1): 15-20.

Abstract: This review paper discusses the benefits of hippotherapy for the physical and mental development of children, particularly those with disabilities.

Available from the website

<http://www.sposci.com/PDFS/BR0501/SVEE/04%20CL%2003%20FP.pdf> (Accessed 12 Sep 2012).

Ripley, Angela D.; Miller, Samantha A. (2012).

Development and implementation of an assessment tool to evaluate hippotherapy programs. *Hippotherapy*. 2012 Winter; 15-16.

These D'Youville College physical therapy students conducted a study to create and assess the Hippotherapy Services Satisfaction Questionnaire (HSSQ), a formal evaluation of a hippotherapy program. Three blind tested pilot surveys with the HSSQ were conducted and revisions made on the basis of follow-up and feedback.

Based on the CDC Introduction to program evaluation for public health programs: a self-study guide. Centers for Disease Control and Prevention, Atlanta, GA

(www.cdc.gov/eval/evalguide.pdf).

Satiansukpong, N.; Vittayakorn, S.; Pongsaksri, M.; Sung-U, S.; Pedugsorn, M.; Phiraban, C.; Sasat, D. (2010).

The results of Thai elephant-assisted therapy program on basic sensory-motor performance and adaptive behavior in individuals with autism: a pilot study. *Journal of Thai Rehabilitation Medicine*. 2010 Jan-Apr; 20(1): 29-35.

Text in Thai; abstract also in English.

Abstract: Objectives: The objectives of this pilot study were to examine the result of the Thai Elephant-Assisted Therapy Program on (1) basic sensory-motor performance and (2) adaptive behavior in individuals with Autism.

Study design: A before and after design

Setting: Thai Elephant Conservation Center, Lampang and Occupational Therapy Clinic, Chiang Mai University.

Subjects: Four autistic individuals aged between 11-18 years whose parents gave informed consent

Methods: Sensory-motor performance, including sensory processing, balance and postural control as well as the adaptive behavior before and after providing the treatment program was evaluated. The treatment program was provided under supervision of occupational therapists four days a week continuously for three weeks. Data were analyzed by using descriptive statistics.

Results: The basic sensory-motor performance was improved. The mean sensory processing was increased 11.45 percents. The total balance scores of participants were increased 69.16 percents, while the means of postural control in supine flexion and prone extension were increased 6.85 and 12.09 percents, respectively. All four had improvement in adaptive behavior.

Conclusion: Under supervision of occupational therapists, the Thai Elephant-assisted therapy program was able to improve the basic sensory-motor performance and adaptive behavior of the four autistic individuals.

Available from the website,

<http://thailand.digitaljournals.org/index.php/JTRM/article/view/4894>

Satiansutpong, Nunatee; Pongsaksri, Methisa; Sung-U, Sasithon; Vittayakorn, Soisuda; Tipprasert, Prasop; Pedugsorn, Mayuree; Phiraban, Chitaya; Sast, Daranee. (2008).

Thai Elephant-assisted Therapy Program; the feasibility in assisting an individual with autism. *WFOT Bulletin*. 2008 Nov; 58; 17-26.

Abstract: Occupational therapy has a history of using animals as part of the therapeutic medium. Few studies have investigated animal assisted therapy for individuals with autism whose profound impairments have been seen in social interaction, communication, and restricted interests. This study explored the feasibility of using the Thai elephant in a treatment program. The purposes of the study were to (!) create a new treatment program using a Thai elephant to assist the individual with autism; and (2) examine the effect of the program and the feasibility of using it with individuals with autism. The new treatment program was created by a team of occupational therapists and elephant experts. The participants' performance was examined before and after the treatment program. The results showed that the participants improved in adaptive behaviour, sensory processing, postural control, and balance after receiving three weeks of the programme. Parents also reported satisfaction with the program results.

Schäffer, Kathrin. (2012).

HFP bei Kindern mit Komplexer Behinderung. *Mensch & Pferd International*. 2012; Heft 3: 117-123.

DOI: <http://dx.doi.org/10.2378/mup2012.art06d>

Text in German; abstract also in English.

English title: Paedagogical horseback riding for children with multiple disabilities.

Abstract: The aim of this article is to compare different treatment concepts for children with multiple disabilities and to transfer their underlying objectives onto paedagogical horseback riding. Especially in the aspects of relationship, communication, perception and movement are many intersections to be found to renowned, but also to current concepts, which justify the usage of the horse in the therapeutic riding with children of this target groups.

Smith, Caitlin. (2012).

Applying the Model of Human Occupation to hippotherapy. *Hippotherapy*. 2012 Winter: 12-14.

Discusses the doctoral fieldwork Smith completed at Blazing Stars, Inc., and explains the model, its definition, concepts, and evaluation to document improvements in occupational functioning outside of biomechanical interventions. In this case, it was the motivation of three children with autism during 16 weeks of therapy including hippotherapy. Uses the Assessment of Communication and Interaction Skills (ACIS), the Model of Human Occupation Screening Tool (MOHOST), and Short Children Occupational Profile (SCOPE) prior to and following the therapeutic interventions.

Assessments may be found at the MOHO Clearinghouse, www.uic.edu/depts/moho

Solmaz, Eva. (2012).

Ein Fall – viele Einfälle = One case, many cases. *Mensch & Pferd International*. 2012; Heft 1: 4-12.

DOI: <http://dx.doi.org/10.2378/mup2012.art02d>

Text in German; abstract also in English.

Abstract: Basic anthropological assumptions have a great influence on the pedagogical and therapeutic measures that are taken in current practice, and this is also true for therapeutic horseback-riding. But the danger here is that these basic assumptions might get applied subconsciously and effect the practice in ways that are not fully wanted. To counter this, awareness of these assumptions has to be created, ideally with the help of three examples that emphasize the impact those assumptions have on working practice.

Steinsek, Lea; Riedel, Meike. (2013).

Fördermöglichkeiten der koordinativen Fähigkeiten durch das Voltigieren im Rahmen des Grundschulsports. *Mensch und Tier International*. 2013; Heft 3: 125-137.

DOI: <http://dx.doi.org/10.2387/mup2013.art06d>

Text in German.

Abstract: Dieser Beitrag setzt sich aus sportwissenschaftlicher Sicht mit den Fördermöglichkeiten der koordinativen Fähigkeiten durch das Voltigieren im Rahmen des

Grundschulsports auseinander. Für eine erfolgreiche Altersbewältigung sowie den langfristigen Erhalt der Gesundheit, aber auch für die Aneignung sportartspezifischer Fertigkeiten sind koordinative Fähigkeiten unabdingbar. In der kindlichen Entwicklung bilden diese eine elementare Basis. Vor allem in der Phase des Schulkindalters (sechs bis ca. zwölf Jahre) ist ein positive Entwicklungszuwaches zu erkennen. Zudem gilt diese Kindheitsphase als Zeitraum der günstigen Trainierbarkeit. Aus diesem Grund is eine gezielte Förderung der koordinativen Fähigkeiten bei Kindern im Grundschulalter nicht nur sinnvoll – vielmehr sollte sie im Mittelpunkt der sportlichen Ausbildung stehen.

Vielen Studien (u. a. Bös 2003; WIAD 2008; Bös u. a. 2008) ist zu entnehmen, dass sich die koordinativen Fähigkeiten von Kindern in den letzten Jahren verschlechtert bzw, nicht in dem Ausmaß entwickelt haben, wie es im Schulkindalter eigentlich möglich ist.

Der Voltigiersport kann im Rahmen des Grundschulsports eine gute Möglichkeit für eine gezielte Förderung dieser Fähigkeiten bieten. Allerdings fehlen bislang Studien, die nicht nur die Effektivität nachweisen, sondern die ebenfalls Implementationsmöglichkeiten bzw, geeignete Konzepte für das Voltigieren in der Schule aufzeigen. Im folgenden Beitrag werden die Fördermöglichkeiten des Voltigiersports auf theoretische Basis dargestellt.

Thompson, James R.; Iacobucci, Veronica; Varney, Rachel. (2012).

Giddyup! Or whoa Nelly! Making sense of benefit claims on websites of equine programs for children with disabilities. *Journal of Developmental and Physical Disabilities*. 2012 Aug; 24(4): 373-390.

DOI: <http://dx.doi.org/10.1007/s10882-012-9276-2>

Abstract: Programs offering horseback riding or other equine related experiences for children with disabilities are commonplace throughout the United States as well as other parts of the world. However, there is a dearth of research findings demonstrating the benefits of these programs. Four Internet search engines were used to identify 115 websites associated with equine programs that people with disabilities and their family members in the United States would likely encounter if searching the Web for information. Content analysis methodology was used to review websites for information related to program characteristics and benefit claims. Findings are summarized and the importance of establishing the validity of benefit claims through means other than anecdotal and testimonial evidence is discussed.

Wysocky, Lisa. (2012).

A therapeutic riding lesson from the horse's point of view. *Strides*. 2012 Summer; 18(3): 16-19.

Equine Assisted Interventions: Theses

Treuthart, Megan K. (2011).

The impact of hippotherapy on a child with autism: A single case study. 96 pages.

Unpublished thesis (M.S.) – D'Youville College, 2011.

Abstract: This retrospective single subject design study examined the impact of hippotherapy on a 4-year-old male with Autism Spectrum Disorder (ASD). De-identified Sensory Profile (SP) scores and the treating therapist's documentation were analyzed to determine the child's ability to process, modulate and respond to sensory stimuli and to evaluate the impact it had on functional performance in his daily life. Following the intervention, the SP scores and the therapist's progress notes revealed no continuous significant improvement; however the therapist's discharge plan demonstrated progress. These results indicated that the intervention produced fluctuating degrees of improvement in the child's sensory processing abilities.

Publication Number: AAT 1493266

ISBN: 9781124635811

ProQuest document ID: 2362070921

Hippotherapy

Hippotherapy: Contributions to Books

Rodríguez Elaimé, Maciques; Meir, Lotan. (2011).

Rett syndrome: hippotherapy intervention, pages 247-277. In: Rett syndrome: therapeutic interventions. Editors: Meir Lotan and Joav Merrick. (Disability studies). New York: Nova Science Publishers, ©2011.

\$US 235.00: ISBN 978-1-61728-614-8; \$US 49.00: ISBN 978-1-61728-080-1 (pbk.).

Abstract: Most individuals with Rett syndrome (RS) present an ongoing need for therapeutic intervention. One of the therapeutic approaches suggested for this population is therapeutic horseback riding. Experience shows that this type of intervention is extremely enjoyable for the individual with RS. The current chapter presents the possible benefits of applying hippotherapy for individuals with developmental disabilities, the characteristics of RS that are compatible with this type of intervention; and three case studies describing a unique application of hippotherapy specially designed for this population. It should be emphasized that the present chapter is mostly based on the authors' clinical experience in their field of expertise with minimal support from research findings, as these are scarce. The chapter presents some case studies to illustrate the implementation of the theoretical background and reviews the literature on RS and therapeutic horseback riding. Due to the scarcity of scientific sources to support the claims presented by the authors, scientific generalization should be made cautiously.

Hippotherapy: Journal Articles

Ajzenman, Heather F.; Standeven, John W.; Shurtleff, Tim L. (2013).

Effect of hippotherapy on motor control, adaptive behaviors, and participation in children with autism spectrum disorder: a pilot study. *American Journal of Occupational Therapy*. 2013 Nov/Dec; 67(6): 653-666.

DOI: <http://dx.doi.org/10.5014/ajot.2013.008383> or <http://bit.ly/HD1cUL> (Accessed 24 Mar 2014).

Abstract: OBJECTIVE. The purpose of this investigation was to determine whether hippotherapy increased function and participation in children with autism spectrum disorder (ASD). We hypothesized improvements in motor control, which might increase adaptive behaviors and participation in daily activities.

METHOD. Six children with ASD ages 5–12 participated in 12 weekly 45-min hippotherapy sessions. Measures pre- and post-hippotherapy included the Vineland Adaptive Behavior Scales–II and the Child Activity Card Sort. Motor control was measured preintervention and postintervention using a video motion capture system and force plates.

RESULTS. Postural sway significantly decreased postintervention. Significant increases were observed in overall adaptive behaviors (receptive communication and coping) and in participation in self-care, low-demand leisure, and social interactions.

CONCLUSION. These results suggest that hippotherapy has a positive influence on children with ASD and can be a useful treatment tool for this population.

Commentary titled “Research synopsis: a pilot study,” by Heather F. Ajzenman in *Hippotherapy*. 2013 Summer; 22-23.

Aldridge, Roy; Schweighart, Farley; Easley, Megan; Wagoner, Blair. (2011).

The effects of hippotherapy on motor performance and function in an individual with bilateral developmental dysplasia of the hip (DDH). *Journal of Physical Therapy*. 2011 Jan-Mar; 2(2): 54-63.

Available at the website www.scopemed.org/fulltextpdf?mno=13265 (Accessed 23 Mar 2014).

Abstract: Study design: A-B Single-Subject Repeated Measures Design, A case report on the effects of hippotherapy on a child with ADD, DDH, and developmental delay.

Objective: To investigate if any differences are found in motor functioning with a child with Bilateral Developmental Dysplasia of the Hip, Attention Deficit Disorder, and developmental delay when adding hippotherapy to a traditional physical therapy program.

Methods: The subject included in this study was a seven year-old child. The child was medically diagnosed with Bilateral Developmental Dysplasia of the Hip. Treatment A consisted of a traditional physical therapy program for 7 weeks. Treatment B consisted of the traditional physical therapy program with the addition of hippotherapy for 7 weeks. The instrumentation used was components taken from the Bruininks-Oseretsky Test of Motor

Proficiency (BOTMP). The components from the BOTMP were standing on one leg eyes open, standing on one leg eyes closed, shuttle run, one leg hop, catching with two hands, catching with one hand, and throwing.

Results: The results of this study showed that there were significant differences found when adding hippotherapy as an adjunct therapy to a traditional physical therapy program. With all seven components used from the BOTMP, five of the seven tests showed significance.

Conclusion: The addition of hippotherapy to a traditional physical therapy program seems to improve motor functioning in a child with DDH. Further research needs to be done to investigate further the effects of hippotherapy on children with DDH.

Araújo, Thais B.; Silva, Nélida A.; Costa, Juliana N.; Pereira, Marcio M.; Safons, Mariseta P. (2011).

Effect of equine assisted therapy on the postural balance of the elderly. Efeito da equoterapia no equilíbrio postural de idosos. *Revista Brasileira da Fisioterapia = Brazilian Journal of Physical Therapy*. 2011 Sep-Oct; 15(5): 414-419.

Text in English; abstract also in Portuguese.

Abstract: *Objective:* To determine whether equine-assisted therapy (hippotherapy) produces alterations in the balance of the elderly.

Methods: The sample included 17 older adults who were divided into experimental (7 subjects) and control (10 subjects) groups. Stabilometry data were acquired with a force platform. The Timed Up and Go test (TUG) was used for clinical analysis of seated balance, transfer from a seated to a standing position, walking stability and changes in gait. Sixteen equine-assisted therapy sessions were carried out.

Results: Mann-Witney was used to compare the means between groups and no significant differences were found in the analyzed stabilometric parameters. In intragroup comparison with the Wilcoxon test, a significant increase in the variables COPy and Area ($p=0.02$) was observed. Equine-assisted therapy significantly affected ($p=0.04$) TUG test means between the experimental and control groups (Mann-Witney). Intragroup TUG test means were also significantly affected ($p=0.04$) according to the Wilcoxon test.

Conclusions: Because senescence tends to normalize stabilometric measures, the number of equine-assisted therapy sessions was insufficient to determine any differences. Nevertheless, the significant improvement in TUG test scores demonstrates that this treatment frequency was a predictor of reduced fall risk in the elderly.

Araújo, Thais Borges de; Oliveira, Ricardo Jacó de; Martins, Wagner Rodrigues; Pereira, Marcio de Moura; Copetti, Fernando; Safons, Marisete Peralta. (2013).

Effects of hippotherapy on mobility, strength and balance in elderly. *Archives of Gerontology and Geriatrics*. 2013 May-Jun; 56(3): 478-481.

DOI: <http://dx.doi.org/10.1016/j.archger.2012.12.007>

Abstract: *Objectives:* To assess the chronic effects of hippotherapy on functional mobility, muscle strength and balance in elderly.

Methods: 28 volunteers, between the age of 60 and 84, were randomly recruited and divided in experimental group (EG), with 12 individuals (8 women and 4 men) and control

group (CG), with 16 individuals (14 women and 2 men). The EG group participated in an 8-week hippotherapy program. Before and after the study period functional mobility was assessed and measured by Time Up and Go Test (TUG), muscle strength of the lower limbs was measured by 30 s Chair Stand Test (30CST) and performance in balance was measured by the Berg Balance Scale (BBS). A mixed ANOVA model (group x testing time) was applied to establish the effect of the different groups on the functional variables.

Results: The functional capacity of the EG group was increased if compared to CG group after the intervention of the BBS ($p = 0.003$) and 30CST ($p = 0.032$), but not of the TUG ($p = 0.063$).

Conclusion: The results indicated that hippotherapy improves the lower limb strength and balance in elderly.

Beinotti, Fernanda; Christofolletti, Gustavo; Correia, Nilzete; Borges, Guilherme. (2013).

Effects of horseback riding therapy on quality of life in patients post stroke. *Topics in Stroke Rehabilitation*. 2013 May-Jun; 20(3): 226-232.

DOI: <http://dx.doi.org/10.1310/tsr2003-226>

Abstract: BACKGROUND: Persons with stroke commonly have serious sequelae requiring long-term medical treatment. They often experience distress, and thus improving quality of life (QOL) has been considered a therapeutic objective in addition to prolonging the patient's life.

OBJECTIVE: The aim of this study was to analyze the impact of horseback riding therapy (HBRT) on the QOL of individuals with hemiparesis after stroke.

METHODS: In this single-blind, randomized, controlled trial, 24 poststroke patients were assigned to the experimental ($n = 12$) and control ($n = 12$) groups. The control group participated in a conventional physiotherapy program, whereas the experimental group participated in physiotherapy plus HBRT sessions for 16 weeks. The patients were evaluated by means of the Medical Outcomes Study 36-item Short-Form health survey (SF-36). Data analysis was applied through the use of descriptive and inferential statistics, with a 5% level of significance.

RESULTS: Significant improvement was observed in the total score of the SF-36 in the experimental group when compared with the control group. The combination of conventional physiotherapy and HBRT was associated with improvements in functional capacity ($P = .02$), physical aspects ($P = .001$), and mental health ($P = .04$) of the stroke patients.

CONCLUSIONS: Supplementation of conventional physiotherapy with HBRT, applied in different contexts, may yield positive QOL outcomes for people with stroke. We recommend that further studies be carried out to clarify the benefits of HBRT applied singly.

Beinotti, Fernanda; Correia, Nilzete; Christofolletti, Gustavo; Borges, Guilherme. (2010).

Use of hippotherapy in gait training for hemiparetic post-stroke. *Arquivos de Neuro-Psiquiatria*. 2010 Dec; 68(6): 908-913.

Abstract: *Objective:* To evaluate the hippotherapy influence on gait training in post-stroke hemiparetic individuals.

Method: The study was constituted of 20 individuals divided into two groups. Group A performed the conventional treatment while group B the conventional treatment along with hippotherapy during 16 weeks. The patients were evaluated by using the Functional Ambulation Category Scale, Fugl-Meyer Scale, only the lower limbs and balance sub items, Berg Balance Scale, and functional assessment of gait (cadence) in the beginning and end of the treatment.

Results: Significant improvements were observed in the experimental group including motor impairment in lower limbs ($p = 0.004$), balance, over time ($p = 0.007$) but a significant trend between groups ($p = 0.056$). The gait independence, cadence and speed were not significantly in both groups ($p = 0.93, 0.69$ and 0.44).

Conclusion: Hippotherapy associated with conventional physical therapy demonstrates a positive influence in gait training, besides bringing the patients' gait standard closer to normality than the control group.

Bongers, Bart C.; Takken, Tim. (2012).

Physiological demands of therapeutic horseback riding in children with moderate to severe motor impairments: an exploratory study. *Pediatric Physical Therapy*. 2012 Fall; 24(3): 252-257.

DOI: <http://dx.doi.org/10.1097/PEP.0b013e31825c1a7d>

Abstract: PURPOSE: To examine energy expenditure at rest and during a single therapeutic horseback riding (THR) session in children with moderate to severe motor impairments.

METHODS: Heart rate (HR), oxygen uptake (VO_2), and minute ventilation (V_E) were measured continuously during a 10-minute rest period and during a typical THR session.

RESULTS: Seven children (4 males, mean age 12.3 ± 3.5 years) completed the protocol. Significant increases from rest were seen for mean HR, VO_2 , V_E , and energy expenditure. Based on VO_2 , $43.3 \pm 24.3\%$ of the THR session consisted of sedentary, $44.4 \pm 13.4\%$ of light, and $12.3 \pm 21.8\%$ of moderate to vigorous activity intensity, with large interindividual differences.

CONCLUSIONS: The physiological demands of THR in children with moderate to severe motor impairments are moderate. However, considering the short duration of maintaining moderate to vigorous exercise activity during THR in combination with the low training frequency, group data indicate that it is unlikely that THR will improve cardiopulmonary fitness in these children.

Commentary by Kristie Bjornson and Priscilla Coyner, "Commentary on 'physiological demands of therapeutic horseback riding in children with moderate to severe motor impairments: an exploratory study.'" *Pediatric Physical Therapy*. 2012 Fall; 24(3): 258-258.

DOI (comment): <http://dx.doi.org/10.1097/PEP.0b013e31825cc9ee>

Boswell, S.; Gusowski, K.; Kaiser, A.; Flachenecker, P. (2009).

Hippotherapy in multiple sclerosis – results of a prospective, controlled, randomised and single-blind trial. *Multiple Sclerosis Journal*. 2009 Sep; 15(9) Supplement: S264-S264.

DOI: <http://dx.doi.org/10.1177/1352458509106963>

“Poster abstract P863.”

Bronson, C.; Brewerton, K.; Ong, J.; Palanca, C.; Sullivan, S. J. (2010).

Does hippotherapy improve balance in persons with multiple sclerosis: a systematic review. *European Journal of Physical and Rehabilitation Medicine*. 2010 Sep; 46(3): 347-353.

Abstract: AIM: Multiple sclerosis (MS) leads to changes in balance due to the breakdown of a number of neurological processes. Hippotherapy utilizes the movement of the horse to provide sensory feedback and has been used as a therapeutic intervention for different neurological conditions. Little is known about the effects of hippotherapy in MS. The purpose of this study is to systematically review and examine the evidence for hippotherapy as an intervention to improve balance in persons with MS.

METHODS: Major electronic databases were searched for articles relating to hippotherapy, MS and balance. Only full length articles published in peer reviewed journals that were written in English or translated into English were included. Articles were assessed using a modified quality index that was used for descriptive purposes only and did not exclude any study from the review.

RESULTS: All studies examined in this review were either case-control or case-series. Collectively all three studies reported improvements in balance. Pre-test and post-test Berg Balance Scale scores in two studies revealed that primary progressive MS demonstrated the greatest amount of change after hippotherapy compared to other subtypes of MS.

CONCLUSION: Hippotherapy has a positive effect on balance in persons with MS and has an added benefit of enhancing quality of life. The data is limited and further research will lead to a greater knowledge base and has the potential to increase accessibility for hippotherapy to be used as a rehabilitation modality.

Champagne, Danielle; Dugas, Claude. (2010).

Improving gross motor function and postural control with hippotherapy in children with Down syndrome: Case reports. *Physiotherapy: Theory and Practice*. 2010 Nov; 26(8): 564-571.

DOI: <http://dx.doi.org/10.3109/09593981003623659>

Abstract: The purpose of this case report is to describe the impact of an 11-week hippotherapy program on the gross motor functions of two children (respectively 28 and 37 months old) diagnosed with Down syndrome. Hippotherapy is a strategy that uses the horse's motion to stimulate and enhance muscle contraction and postural control. The children were assessed by the Gross Motor Function Measure (GMFM) and accelerometry. The results indicate that both children improved on many dimensions of the GMFM. Power spectral analysis of the acceleration signals showed improvement in postural control of either the head or trunk, because the children adopted two different adaptive strategies to perturbation induced by the moving horse.

Chang, Hyun Jung; Kwon, Jeong-Yi; Lee, Ji-Young; Kim, Yun-Hee. (2012).

The effects of hippotherapy on the motor function of children with spastic bilateral cerebral palsy. *Journal of Physical Therapy Science*. 2012 Dec; 24 (12): 1277-1280.

Abstract: [Purpose] The aim of this study was to investigate whether hippotherapy could improve the functional performance of preschool and school-aged children with spastic bilateral (CP). We assessed whether the therapeutic effects of hippotherapy would be different according to the functional statuses of the recipients.

[Methods] Thirty-three children, aged four years or older, with spastic bilateral CP were enrolled in this study. The children received thirty minutes of hippotherapy twice a week for eight consecutive weeks. Gross Motor Function Measure (GMFM) and Pediatric Balance Scale (PBS) values were determined during the pre-riding control period, at the onset of hippotherapy, and after hippotherapy. The subjects served as their own controls.

[Results] Total GMFM scores and PBS did not change during the pre-riding control period; however, the GMFM and PBS of children with CP improved significantly after hippotherapy. Specifically, dimensions D and E of the GMFM were significantly increased after hippotherapy compared with the pre-riding period.

[Conclusions] Hippotherapy can improve gross motor function and balance in pediatric CP patients without adverse effects. Therefore, it may be considered as an effective therapeutic method for rehabilitation of preschool- and school-aged children with spastic CP.

Czarsoleska, Patrycja. (2012).

An investigation into seated postural differences between horseback riders and sedentary non-riding individuals. *Scientific and Educational Journal of Therapeutic Riding*. 2012/13; 36-57.

Abstract: Postural problems are prevalent due to lifestyle factors. Horseback riding might have the potential to improve the postural configuration of individuals, but evidence is sparse. The aim of this study was to investigate the postural differences between horseback riders and sedentary non-riding individuals. In this small-scale study, quantitative and qualitative measurements were used to assess sagittal plane, seated posture of a group of 43 individuals (25 females, 18 males) including 23 horseback riders and 20 non-riders. There were no statistical anthropometrical, age, gender or personality differences between riders and non-riders and the confounding factors of psychosocial and socio-economic profile were eliminated. Riders showed significantly better posture in some variables, namely cranio-cervical angle, neck flexion angle, position of shoulder and pelvic tilt. Thus, there is preliminary evidence that horse riding may aid human posture.

Drnach, Mark; O'Brien, Patricia A.; Kreger, Alison. (2010).

The effects of a 5-week therapeutic horseback riding program on gross motor function in a child with cerebral palsy: a case study. *Journal of Alternative & Complementary Medicine*. 2010 Sep; 16 (9): 1003-1006.

DOI: <http://dx.doi.org/10.1089/acm.2010.0043>

Abstract: Purpose: The purpose of this study was to determine the outcome of a short-term therapeutic horseback riding intervention on the gross motor function in a child with cerebral palsy.

Design: This study employed a repeated-measures design with a pretest, a post-test, and a post post-test conducted 5 weeks apart using the Gross Motor Function Measure

(GMFM) as an outcome measure. The three sets of test scores from the GMFM were compared upon completion of the intervention.

Intervention: The subject participated in a 5-week therapeutic horseback riding program consisting of 1 hour of riding per week. Each riding session consisted of stretching, strengthening, and balance activities. The child's level of motor function was tested prior to the intervention, upon completion of the intervention, and 5 weeks postintervention. The GMFM, a criterion-referenced observational measure designed to measure change in the gross motor function in children with cerebral palsy, was chosen as the assessment tool.

Results: Upon completion of the 5-week intervention, the child was observed to have improved scores on the GMFM in two of the five dimensions measured and scored for a total of eight items. The post post-test was completed 5 weeks after the final riding session and the results demonstrated successful maintenance of the improved scores in seven of eight items.

Conclusions: The result of this case study suggest that 5 weeks of therapeutic riding are sufficient to produce positive changes in the gross motor function of a child with cerebral palsy.

Encheff, Jenna L.; Armstrong, Charles; Masterson, Michelle; Fox, C; Gribble, Phillip. (2012). Hippotherapy effects on trunk, pelvic, and hip motion during ambulation in children with neurological impairments. *Pediatric Physical Therapy*. 2012 Fall; 24(3): 242-250.

DOI: <http://dx.doi.org/10.1097/PEP.0b013e31825c1dc3>

Abstract: PURPOSE: This study investigated the effects of a 10-week hippotherapy program on trunk, pelvis, and hip joint positioning during the stance phase of gait.

METHODS: Eleven children (6 boys and 5 girls; 7.9 ± 2.7 years) with neurological disorders and impaired ambulation participated. Joint range of motion data were collected via 3-dimensional computerized gait analysis before and after the program. Paired t tests were performed on kinematic data for each joint.

RESULTS: Significant improvements ($P \leq .008$) and large effect sizes (ESs) for sagittal plane hip positions at initial contact and toe-off were found. No differences in pelvic or trunk positioning were determined, although sagittal plane pelvic positioning displayed a trend toward improvement with large ESs. Several trunk variables displayed moderate ESs with a trend toward more upright positioning.

CONCLUSIONS: Improvements in pelvic and hip joint positioning and more normalized vertical trunk position may indicate increased postural control during gait after 10 sessions of hippotherapy.

Comment by Deborah Nervick, Jennifer Parent-Nichols, "Commentary on 'Hippotherapy effects on trunk, pelvic, and hip motion during ambulation in children with neurological impairments.'" *Pediatric Physical Therapy*. 2012 Fall; 24(3): 251-251.

DOI (comment): <http://dx.doi.org/10.1097/PEP.0b013e31825d0ff4>

Espindula, Ana Paula; Simões, Mayara; Alexandre de Assis, Iramaia Salomão; Fernandes, Mariane; Abadio Ferreira, Alex; Fonseca Ferraz, Patrícia; Cardoso Cunha, Isabella; da Fonseca Ferraz, Mara Lúcia; Pascucci Sande de Souza, Luciane Aparecida; de Paula Antunes Teixeira, Vicente. (2012).

̄Análise eletromiográfica durante sessões de equoterapia em praticantes com paralisia cerebral. *ConScientiae Saúde*. 2012; 11(4): 668-676.

DOI: <http://dx.doi.org/10.5585/ConsSaude.v11n4.3276> or from www.redalyc.org/articulo.oa?id=92924959018 (Accessed 23 Mar 2014).

Text in Portuguese; abstract also in English. Title in English: Electromyographic analysis during hippotherapy sessions in practitioners with cerebral palsy.

Abstract: Introduction. Hippotherapy has emerged as a form of treatment for individuals with Cerebral Palsy (CP).

Objective: To verify the effect of the mount type in the muscular activity in patients with CP.

Methods. Three practitioners with CP were evaluated by electromyography during four hippotherapy sessions. In each session the mount condition was changed. A descriptive statistical analysis with mean and standard deviation of normalized RMS was performed.

Results. The trapezius muscle was always active in the positions initial sitting and final sitting, in all mount conditions, except in the saddle without the feet support. At the three moments evaluated during sessions, it was observed in the condition horse with blanket, that muscle activity was high in trapezius compared to the other muscles. The feet support allowed a more homogeneous activation of the trunk muscles evaluated, when compared to lack of support.

Conclusion: To use saddle on foot in the stirrup was the best option for the hippotherapy treatment of the hemiparetic individuals evaluated.

Giagazoglou, Paraskevi; Arabatzi, Fotini; Dipla, Konstantina; Liga, Maria; Kellis, Eleftherios. (2012).

Effect of a hippotherapy intervention program on static balance and strength in adolescents with intellectual disabilities. *Research in Developmental Disabilities*. 2012 Nov-Dec; 33(6): 2265-2270.

DOI: <http://dx.doi.org/10.1016/j.ridd.2012.07.004>

Abstract: The aim of this study was to assess the effects of a hippotherapy program on static balance and strength in adolescents with intellectual disability (ID). Nineteen adolescents with moderate ID were assigned either an experimental group ($n = 10$) or a control group ($n = 9$). The experimental group attended a 10-week hippotherapy program. To assess static balance, three tasks of increasing difficulty (Double-Leg Stance with opened or closed eyes, and One-Leg Stance with opened eyes) were performed while standing on an EPS pressure platform (Loran Engineering S.r.l., Bologna, Italy). The strength measurements consisted of three maximal isometric half-squats from the seating position (knee joint at 90°). The hippotherapy intervention program resulted in significant improvements in strength parameters, and on the more complex balance task (i.e. standing on one leg). In conclusion, this study provides evidence that hippotherapy can be used as an effective intervention for improving balance and strength in individuals with ID, and could thus influence functional activities and quality of life.

Giagazoglou, Paraskevi; Arabatzi, Fotini; Kellis, Eleftherios; Liga, Maria; Karra, Chrisanthi; Amiridis, Ioannis. (2013).

Muscle reaction function of individuals with intellectual disabilities may be improved through therapeutic use of a horse. *Research in Developmental Disabilities*. 2013 Sep; 34(9): 2442-2448.

DOI: <http://dx.doi.org/10.1016/j.ridd.2013.04.015>

Abstract: Reaction time and muscle activation deficits might limit the individual's autonomy in activities of daily living and in participating in recreational activities. The aim of the present study was to assess the effects of a 14-week hippotherapy exercise program on movement reaction time and muscle activation in adolescents with intellectual disability (ID). Nineteen adolescents with moderate ID were assigned either to an experimental group ($n = 10$) or a control group ($n = 9$). The experimental group attended a hippotherapy exercise program, consisting of two 30-min sessions per week for 14 weeks. Reaction time, time of maximum muscle activity and electromyographic activity (EMG) of rectus femoris and biceps femoris when standing up from a chair under three conditions: in response to audio, visual and audio with closed eyes stimuli were measured. Analysis of variance designs showed that hippotherapy intervention program resulted in significant improvements in reaction time and a reduction in time to maximum muscle activity of the intervention group comparing to the control group in all 3 three conditions that were examined ($p < 0.05$). The present findings suggest that the muscle reaction function of individuals with ID can be improved through hippotherapy training. Hippotherapy probably creates a changing environment with a variety of stimuli that enhance deep proprioception as well as other sensory inputs. In conclusion, this study provides evidence that hippotherapy can improve functional task performance by enhancing reaction time.

Gilliland, Katherine J.; Knight, Adam C. (2011).

Influence of therapeutic horseback riding on gait for a participant with Friedreich's Ataxia. *Medicine & Science in Sports & Exercise*. 2011 May; 43(5) Supplement 1: 289-290.

DOI: <http://dx.doi.org/10.1249/01.MSS.0000400795.48794.a7>

"1395: Board #131 June 1 11:00 AM - 12:30 PM."

Abstract: Friedreich's Ataxia (FA) is an autosomal recessive neurological disorder, and one crippling side effect is gait ataxia.

PURPOSE: To examine the potential benefits derived from participation in therapeutic horseback riding for an individual with FA. The male rider with FA has been participating in therapeutic horseback riding for the past 7 years. Recently it became necessary to use a walker to help with mobility, and prior to that a cane was used to help overcome balance and proprioceptive issues. He currently has problems with fatigue, loss of balance, and slowed reaction time; original issues when he was first diagnosed. He participates in therapeutic horseback riding in an attempt to retain as much independence as possible.

METHODS: The participant's walking gait was recorded with Sony(TM) Handycam digital camcorders and analyzed using Dartfish(TM) video software solutions immediately before and after each riding session for a six week program in the fall of 2009 and a five week program in the spring of 2010. The following gait characteristics were measured: stride length

and width, and ankle angle, knee angle, and hip angle in the sagittal plane at heel strike and toe-off for both legs. Each variable was analyzed with a 2 (test: pre and post) by 2 (program: 2009 and 2010) repeated measures ANOVA.

RESULTS: A significant difference in stride length ($P < .05$) was found, with a decrease for the 2010 riding session post-test compared to the 2009 riding session pre and post-tests. A significant difference in left knee angle at toe off ($P < .05$) was found, with greater knee flexion present in the 2010 post-riding assessment compared to the 2009 pre and post riding assessments. Analysis of the other variables revealed no significant differences in gait before and after each individual riding session, nor were they observed from the first day to the last day of each six week session, or intersession observations.

CONCLUSIONS: The decrease in stride length may indicate a decrement in stability as the disease progresses, but the lack of differences in joint angles may indicate that therapeutic horseback riding helped prevent some of the decrements caused by FA. This data will provide information to help understand movement issues and provide recommendations for therapeutic movement programs for individuals with FA.

Goldmann, T.; Vilimek, M. (2012).

Kinematics of human spine during hippotherapy. *Computer Methods in Biomechanics and Biomedical Engineering*. 2012 Sep; 15(S1): Supplement 1: 203-205.

DOI: <http://dx.doi.org/10.1080/10255842.2012.713619>

Abstract: Hippotherapy is a method used for relaxation and balancing of trunk muscles, especially paravertebral vertebral muscles. It is a form of physical and occupational therapy in which a therapist uses the characteristics movements of a horse to provide carefully graded sensory input. This method is usually used for children with cerebral palsy and spinal cord injury treatment. The aim of this study was to find out suitable methods that could be used for the description of biomechanical reactions of passive horse rider. – from the introduction, p.203.

Goodkind, Jessica; LaNoue, Marianna; Lee, Christopher; Freeland, Lance; Freund, Rachel. (2012).

Feasibility, acceptability, and initial findings from a community based cultural mental health intervention for American Indian youth and their families. *Journal of Community Psychology*. 2012 May; 40(4): 381-405.

DOI: <http://dx.doi.org/10.1002/jcop.20517>

Abstract: Through a CBPR partnership, university and American Indian (AI) tribal members developed and tested Our Life intervention to promote mental health of AI youth and their families by addressing root causes of violence, trauma, and substance abuse. Based on premises that well-being is built on a foundation of traditional cultural beliefs and practices, and that it requires a process of healing and understanding, the 6-month intervention had four components: 1) recognizing/healing historical trauma; 2) reconnecting to traditional culture; 3) parenting/social skill-building; and 4) strengthening family relationships through equine-assisted activities. Feasibility, acceptability, appropriateness, and

preliminary outcomes were examined in a mixed-method within-group design. Engagement and retention were challenging, suggesting that families faced numerous barriers to participation. Youth who completed the program experienced significant increases in cultural identity, self-esteem, positive coping strategies, quality of life, and social adjustment. Qualitative data supported these findings and suggested additional positive effects.

Haberer, Elke; Ploppa, Melanie. (2013).

Psychomotorik mit dem Pferd. Bodenarbeit als Methode zur Förderung psychomotorischer Kompetenzen. *Mensch & Pferd International*. 2013; Heft 1: 17-27.

DOI: <http://dx.doi.org/10.2378/mup2013.art02d>

Text in German; abstract also in English.

Title in English: Horsebased psychomotricity – Groundwork as a method for the development of psychomotor competences.

Abstract: Psychomotricity have always been connected to several different job groups and areas of expertise. The present study takes a new line to those facets, analyzing the groundwork component within the concept “psychomotricity with horses” and its potential to nurture psychomotor competences in children. By means of video-based observational study, several situations in groundwork with children were analyzed and examined for possible uses in developing motoric, cognitive and social competence. Groundwork offers diverse experiences with material-related, body-related, and social situations. Provided that these experiences are made in an environment of psychomotor procedures, the methodology of groundwork is very suitable for the development of psychomotor competences.

Han, Jun Young; Kim, Jong Moon; Kim, Shin Kyoung; Chung, Jin Sang; Lee, Hyun-Cheol; Lim, Jae Kuk; Lee, Jiwon; Park, Kawn Yong. (2012).

Therapeutic effects of mechanical horseback riding on gait and balance ability in stroke patients. *Annals of Rehabilitation Medicine*. 2012 Dec; 36(6): 762-769.

DOI: <http://dx.doi.org/10.5535/arm.2012.36.6.762> (Accessed 23 Mar 2014).

Abstract: OBJECTIVE: To investigate the therapeutic effects of mechanical horseback riding for gait and balance parameters in post-stroke patients.

METHOD: This study was a non randomized prospective positive-controlled trial over a 12 week period. From May 2011 to October 2011, 37 stroke patients were recruited from our outpatient clinic and divided into two groups. The control group received the conventional physiotherapy while the intervention group received the conventional physiotherapy along with mechanical horseback riding therapy for 12 weeks. Outcome measurements of gait included the Functional Ambulation Category (FAC) and gait part of the Performance Oriented Mobility Assessment (G-POMA) while those of balance included the Berg Balance Scale (BBS) and the balance part of the Performance Oriented Mobility Assessment (B-POMA). These measurements were taken before and after treatment.

RESULTS: There were no significant differences in the baseline characteristics and initial values between the two groups. When comparing baseline and 12 weeks post treatment in each group, the intervention group showed significant improvement on BBS ($39.9 \pm 5.7 \rightarrow 45.7 \pm 4.8$, $p=0.001$) and B-POMA ($10.4 \pm 2.6 \rightarrow 12.6 \pm 2.1$, $p=0.001$), but significant improvement

on gait parameters. When comparing the groups, the dynamic balance category of BBS in post treatment showed significant difference ($p=0.02$).

CONCLUSION: This study suggests that mechanical horseback riding therapy may be an effective treatment tool for enhancing balance in adults with stroke.

Herrero, Pablo; Asensio, Ángel; García, Elena; Marco, Álvaro; Oliván, Barbara; Ibarz, Alejandro; Gómez-Trullén, Eva M.; Casas, Roberto. (2010).

Study of the therapeutic effects of an advanced hippotherapy simulator in children with cerebral palsy: a randomised controlled trial. *BMC Musculoskeletal Disorders*. 2010 Apr 16; 11: 71. [6 pdf pages].

Available from: www.biomedcentral.com/1471-2474/11/71

Abstract: BACKGROUND: Although hippotherapy treatment has been demonstrated to have therapeutic effects on children with cerebral palsy, the samples used in research studies have been very small. In the case of hippotherapy simulators, there are no studies that either recommend or advise against their use in the treatment of children with cerebral palsy. The aim of this randomised clinical study is to analyse the therapeutic effects or the contraindications of the use of a commercial hippotherapy simulator on several important factors relating to children with cerebral palsy such as their motor development, balance control in the sitting posture, hip abduction range of motion and electromyographic activity of adductor musculature.

METHODS/DESIGN: The study is a randomised controlled trial. It will be carried out with a sample of 37 children with cerebral palsy divided into two treatment groups. Eligible participants will be randomly allocated to receive either (a) Treatment Group with hippotherapy simulator, maintaining sitting posture, with legs in abduction and rhythmic movement of the simulator or (b) Treatment Group maintaining sitting posture, with legs in abduction and without rhythmic movement of the simulator. Data collection and analysis: all measurements will be carried out by a specially trained blind assessor. To ensure standardization quality of the assessors, an inter-examiner agreement will be worked out at the start of the study. The trial is funded by the Department of Research, Innovation and Development of the Regional Government of Aragon (Official Bulletin of Aragon 23 July 2007), project number PM059/2007.

DISCUSSION: Interest in this project is due to the following factors: Clinical originality (there are no previous studies analysing the effect of simulators on the population group of children with CP, nor any studies using as many variables as this project); Clinical impact (infantile cerebral palsy is a chronic multisystemic condition that affects not only the patient but also the patient's family and their close circle of friends); Practical benefits (the development of an effective treatment is very important for introducing this element into the rehabilitation of these children).

Herrero, Pablo; Gómez-Trullén, Eva M; Asensio, Ángel; García, Elena; Casas, Roberto; Monserrat, Esther; Pandyan, Anand. (2012).

Study of the therapeutic effects of a hippotherapy simulator in children with cerebral palsy: a stratified single-blind randomized controlled trial. *Clinical Rehabilitation*. 2012 Dec; 26 (12): 1105-1113.

DOI: <http://dx.doi.org/10.1177/0269215512444633>

Abstract: *Objective:* To investigate whether hippotherapy (when applied by a simulator) improves postural control and balance in children with cerebral palsy.

Design: Stratified single-blind randomized controlled trial with an independent assessor. Stratification was made by gross motor function classification system levels, and allocation was concealed.

Subjects: Children between 4 and 18 years old with cerebral palsy.

Interventions: Participants were randomized to an intervention (simulator ON) or control (simulator OFF) group after getting informed consent. Treatment was provided once a week (15 minutes) for 10 weeks.

Main measures: Gross Motor Function Measure (dimension B for balance and the Total Score) and Sitting Assessment Scale were carried out at baseline (prior to randomization), end of intervention and 12 weeks after completing the intervention.

Results: Thirty-eight children participated. The groups were balanced at baseline. Sitting balance (measured by dimension B of the Gross Motor Function Measure) improved significantly in the treatment group (effect size = 0.36; 95% CI 0.01-0.71) and the effect size was greater in the severely disabled group (effect size = 0.80; 95% CI 0.13-1.47). The improvements in sitting balance were not maintained over the follow-up period. Changes in the total score of the Gross Motor Function Measure and the Sitting Assessment Scale were not significant.

Conclusion: Hippotherapy with a simulator can improve sitting balance in cerebral palsy children who have higher levels of disability. However, this did not lead to a change in the overall function of these children (Gross Motor Function Classification System level V).

Herrero Gallego, P.; García Antón, E.; Monserrat Cantera, M. E.; Oliván Blázquez, B.; Gómez Trullén, E. M.; Trenado Molina, J. (2012).

Efectos terapéuticos de la hipoterapia en la parálisis cerebral: una revision sistemática. *Fisioterapia*. 2012 Sep-Oct; 34 (5): 225-234.

DOI: <http://dx.doi.org/10.1016/j.ft.2012.03.008>

Text in Spanish; abstracts also in English.

Title in English: Therapeutic effects of hippotherapy in cerebral palsy: a systematic review.

Abstract: *Objective:* To review the current scientific evidence regarding hippotherapy treatment in children with cerebral palsy through the analysis of different study variables. *Methods:* A bibliographic research of Pubmed/Medline, Web of Knowledge, Cochrane, PEDro, Enfispo databases and Trip Data Base and Excelencia clínica metasearchers was carried out. The terms used in the search were: Equine-Assisted Therapy, Cerebral Palsy, Hippotherapy and Horseback riding, usually combined with the Boolean operator AND.

Results: After eliminating duplicated articles in the different databases, 25 articles were found. Seven of them were systematic reviews or meta-analysis, 7 articles were clinical trials and 11 studies were uncontrolled clinical series or descriptive studies. The quality of scientific

evidence provided by the studies used in this systematic review was level I for seven of them, level III for seven articles (scientific evidence provided good to regular) and level VIII (scientific evidence provided poor) for the remaining eleven articles.

Discussion: The main limitations found in the studies reviewed have been small sample sizes, use of non-standardized assessment tools and/or heterogeneity of the treatment protocols used.

Conclusion It is difficult to find scientific evidence regarding hippotherapy treatment in children with cerebral palsy due to different factors such as the small sample sizes used in the studies, the diversity of assessment scales and treatment protocols used.

Hokkerup, Birgitte. (2012).

Quality of movement and motor problems in patients with ADHD: implications for a therapeutic riding approach. *Scientific and Educational Journal of Therapeutic Riding*. 2012/13; 58-67.

Abstract: The main focus of this article is motor problems in patients with ADHD in two core areas: (i) inhibition problems which affect fine and gross motor adjustment and regulation of power and flow of movement; and (ii) problems with proximal stabilization of the trunk that leads to compensative activity and high muscular tone in key movement muscles to maintain alignment (Stray, 2009). Identifying how these specific motor problems may affect riding leads to the question of finding an appropriate practical approach that is helpful for the patient. The case presented here is an example of how to use the concept of Balance and Movement originated by Susanne von Dietze, in therapeutic riding practice for patients with ADHD. IT was presented in April 2012 at the IVX International Congress of Therapeutic Riding in Athens and in August 2012 as a case study for the D-course "Balance and Movement: Further Education for Physiotherapists" in Gothenburg, Sweden.

Homnick, Douglas N.; Henning, Kim M.; Swain, Charlene V.; Homnick, Tamara D. (2013).

Effect of therapeutic horseback riding on balance in community-dwelling older adults with balance deficits. *Journal of Alternative and Complementary Medicine*. 2013 Jul; 19(7): 622-626.

DOI: <http://dx.doi.org/110.1089/acm.2012.0642>

Abstract: OBJECTIVES: Falls are an important cause of morbidity in older adults. Equine-assisted activities including therapeutic riding (TR) benefit balance and neuromuscular control in patients with neurological disabilities but have not been systematically studied in older adults at greater risk for falls due to balance deficits. The effect of an 8-week TR program on measures of balance and quality of life in community-dwelling older adults with established balance deficits was evaluated.

DESIGN: This was a pretest-post-test single-group trial of a TR program on measures of balance and quality of life.

SETTING: The study was conducted at a Professional Association of Therapeutic Horsemanship (PATH) International Premier riding center.

SUBJECTS: The subjects comprised 9 adults (5 female, 4 males) with a mean age 76.4 years (range 71-83 years). Interventions: This included an 8-week observation period followed

by an 8-week TR program consisting of 1 hour per week of supervised horseback riding and an 8-week follow-up period. Subjects received balance testing at weeks 0, 8, 16, and 24 using the Fullerton Advanced Balance Scale (FABS), and quality of life was measured at weeks 8 and 16 using the Rand SF (short form) 36 quality-of-life measure.

OUTCOME MEASURES: Outcome measures were change in the FABS and Rand SF 36.

RESULTS: There was no significant difference in balance scores between the start and end of the observation period. There was a significant improvement in the balance score and perception of general health from the start to the end of the intervention period, and no significant difference between the end of the intervention and the end of study, suggesting that improvements may have been sustained.

CONCLUSIONS: TR is a safe activity for older adults with mild to moderate balance deficits and leads to both improvements in balance and quality of life. Longer and larger studies to assess the benefit of equine-assisted activities on improvements in balance and reduction in fall risk are needed.

Ihara, Masahiro; Ihara, Masayo; Doumura, Misato. (2012).

Effect of therapeutic riding on functional scoliosis as observed by roentgenography. *Pediatrics International*. 2012 Feb; 54(1): 160-162.

DOI: <http://dx.doi.org/10.1111/j.1442-200X.2011.03456.x>

Report and discussion of three case studies.

Józwiak, Marek; Harasymczuk, Piotr; Koch, Aleksander; Kotwicki, Tomasz. (2011).

Incidence and risk factors of hip joint pain in children with severe cerebral palsy. *Disability and Rehabilitation*. 2011; 33(15-16): 1367-1372.

DOI: <http://dx.doi.org/10.3109/09638288.2010.532281>

Abstract: PURPOSE: Pain is a serious complication associated with hip dislocation in cerebral palsy (CP), limiting patient independence and quality of life. This study aimed to determine the frequency of pain in severe CP patients with hip dislocation and to reveal factors associated with the hip pain.

METHODS: Seventy-three consecutive new-intervention CP patients admitted to authors' institution with spastic quadriplegia, mean age 10.8 years (range 4.0–18.0 years) were enrolled: 31 females and 42 males, totally 99 dislocated hips. All patients were assessed level IV or V according to the Gross Motor Function Classification Scale (GMFCS) and had poor communication skills. Pain severity was evaluated according to the Numeric Rating Scale (NRS-11). Data concerning previously applied physiotherapy was collected to divide the patients into subgroups: A – no abduction therapy ($n = 24$), B – abduction therapy ($n = 35$) and C – abduction therapy and horse-back riding ($n = 13$). On the pelvic antero-posterior radiographs head migration percentage was measured to reveal hip dislocation. Femoral head cartilage degenerative lesions were evaluated for size and location in 45 hips undergoing surgical treatment.

RESULTS: Overall pain prevalence was 56%. The appearance of pain was associated with the patient age ($p = 0.048$), previous abduction physiotherapy ($p < 0.00001$), previous

horse-back riding therapy ($p < 0.00001$) and anterior location of degenerative changes of the femoral head ($p = 0.03$). Pain intensity was related to the size of the degenerative cartilage lesions ($p = 0.004$) and to the degree of femoral anteversion ($p < 0.0001$).

CONCLUSIONS: Extensive abduction exercises, hippotherapy and presence of degenerative cartilage lesions on the anterior part of femoral head may be considered risk factors for hip pain appearance in the dislocated hip of a child with severe spastic CP. Other associated factors are abduction exercise intensity, age, excessive femoral anteversion and size of degenerative cartilage lesions.

Kang, Hyungkyu; Jung, Jinhwa; Yu, Jaeho. (2012).

Effects of hippotherapy on the sitting balance of children with cerebral palsy: a randomized control trial. *Journal of Physical Therapy Science*. 2012 Oct; 24(9): 833-836.

Abstract: [Purpose] This study aimed to verify the effect of hippotherapy on the sitting balance of children with severe cerebral palsy (CP) by comparing hippotherapy, physical therapy, and a control.

[Subjects] In this study, 45 children with CP were randomly divided into the hippotherapy group {HTG, $n = 15$ }, physical therapy group (PTG, $n = 15$) and control group (CON, $n = 15$).

[Methods] Two expert physical therapists provided the HTG and PTG with traditional physical therapy comprising strengthening and stretching exercises in 30-minute sessions, semi-weekly, for 8 weeks. Hippotherapy was provided semi-weekly only to the HTG for 8 weeks at 30 minutes per session. The CON group received no treatment. Before and after the 8 weeks of intervention, a sitting balance test was performed, and the results were analyzed.

[Results] Sway pathway and velocity significantly decreased in HTG compared to PTG and CON. Left/right pathway, total pathway, left/right velocity significantly decreased in HTG compared to PTG and CON. Left/right pathway, total pathway, left/right velocity, and total velocity were significantly reduced in PTG compared to that in the CON.

[Conclusion] Hippotherapy with traditional physical therapy improved the sitting balance of children with severe CP, who could not walk independently more than traditional physical therapy alone.

Kim, Hyunguen; Her, Jin Gang; Ko, Jooyeon. (2014).

Effect of horseback riding simulation machine training on trunk balance and gait of chronic stroke patients. *Journal of Physical Therapy Science*. 2014 Jan; 26(1): 29-32.

DOI: <http://dx.doi.org/10.1589/jpts.26.29> (Accessed 23 Mar 2014).

Abstract: [Purpose] The purpose of this study was to assess the effect of horseback riding simulation machine training on trunk balance and gait of patients with chronic stroke.

[Subjects and Methods] The subjects were 20 patients hospitalized for treatment after being diagnosed with stroke. Horseback riding simulation training was provided for 30 minutes, 5 times a week, for 6 weeks. Trunk balance was assessed using the Trunk Impairment Scale (TIS) and a balance measuring device (Biorescue, RM ingenierie, France), and gait ability was measured using the Functional Gait Assessment (FGA) and a gait analyzer (GAITRite, CIR system Inc., USA).

[Results] There were significant changes in movement area, distance and velocity of body sway as measured by the TIS and the balance measuring device, and in gait velocity, cadence, stride length and double limb support as measured by the FGA and gait analyzer.

[Conclusion] Horseback riding simulation training improved the trunk balance and gait of chronic stroke patients. This present study provides preliminary objective data for future research, and useful clinical information for physical therapists using horseback riding simulation machines as a treatment modality for patients with chronic stroke.

Kwon, Jeong-Yi; Chang, Hyun Jung; Lee, Ji Young; Ha, Yumi; Lee, Peter K.; Kim, Yun-Hee. (2011).

Effects of hippotherapy on gait parameters in children with bilateral spastic cerebral palsy. *Archives of Physical Medicine and Rehabilitation*. 2011 May; 92(5): 774-779.

DOI: <http://dx.doi.org/10.1016/j.apmr.2010.11.031>

Abstract: OBJECTIVES: To evaluate the effects of hippotherapy on temporospatial parameters and pelvic and hip kinematics of gait in children with bilateral spastic cerebral palsy.

DESIGN: Nonrandomized prospective controlled trial.

SETTING: Outpatient therapy center.

PARTICIPANTS: Children (N=32) with bilateral spastic cerebral palsy, Gross Motor Function Classification System level 1 or 2.

INTERVENTION: Hippotherapy (30 min twice weekly for 8 consecutive weeks).

MAIN OUTCOME MEASURES: Temporospatial parameters and pelvic and hip kinematic parameters in 3-dimensional motion analysis, Gross Motor Function Measure (GMFM)-88, and score for dimensions D (standing) and E (walking, running, jumping) of the GMFM, GMFM-66, and Pediatric Balance Scale (PBS).

RESULTS: Hippotherapy significantly improved walking speed, stride length, and pelvic kinematics (average pelvic anterior tilt, pelvic anterior tilt at initial contact, pelvic anterior tilt at terminal stance). Scores for dimension E of the GMFM, GMFM-66 and PBS also increased.

CONCLUSIONS: Hippotherapy provided by licensed health professionals using the multidimensional movement of the horse may be used in conjunction with standard physical therapy for improvement of gait and balance in children with bilateral spastic cerebral palsy.

Lee, Dong Ryul; Lee, Nam Gi; Cha, Hyun Jung; O, Yun Sung; You, Sung (Joshua) Hyun; Oh, Jin Hwan; Bang, Hyo Seong. (2011).

The effect of robo-horseback riding therapy on spinal alignment and associated muscle size in MRI for a child with neuromuscular scoliosis: An experimenter-blind study. *NeuroRehabilitation*. 2011; 29(1): 23-27.

DOI: <http://dx.doi.org/10.3233/NRE-2011-0673>

Abstract: *Purpose:* This case study was conducted to highlight the clinical and radiological features of a patient with progressive neuromuscular scoliosis before and after robo-horseback riding therapy (HBRT).

DESIGN: A clinical, laboratory, and radiological analysis of a single case.

SUBJECT: An 11-year-old child, diagnosed right thoracolumbar neuromuscular scoliosis secondary to cerebral palsy.

METHOD: The child received a 5-week course of robo-HBRT, comprising of 60-minute periods a day, five times a week. Postural alignment was determined by Cobb's method. A real-time magnetic resonance imaging (MRI) was performed to determine the robo-HBRT-induced changes in cross-sectional area (CSA) of bilateral thoracic (T2) and lumbar (L2) paraspinalis. Clinical tests including the standard Gross Motor Function Measure (GMFM) and manual muscle testing (MMT) with the Lafayette Manual Muscle Tester were used to compare the intervention-related changes in motor performance and power. The surface EMG was also used to examine therapy-induced changes in muscle activity amplitude for bilateral T2 and L2 paraspinalis and rectus abdominis muscles.

RESULTS: Clinical motor and strength scores increased after the intervention. Radiographic Cobb's angle, MRI, and electromyographic amplitude data demonstrated notably enhanced spinal alignment and muscle fiber CSA and symmetry, respectively.

CONCLUSIONS: This is the first study to provide evidence of the therapeutic efficacy of a novel form of robo-HBRT on motor function and associated structural and motor control improvements, thus suggesting a method of augmenting therapy in neuromuscular scoliosis.

Menezes, Karla Mendonça; Copetti, Fernando; Wiest, Matheus Joner; Trevisan, Cláudia Morais; Silveira, Aron Ferreira. (2013).

Effect of hippotherapy on the postural stability of patients with multiple sclerosis: a preliminary study. *Fisioterapia e Pesquisa*. 2013 Jan-Mar; 20(1): 43-49.

Text in English; titles and abstracts also in Portuguese and Spanish.

Abstract: **OBJECTIVE:** This study intended to identify the effects of hippotherapy on the postural control of multiple sclerosis (MS) patients.

METHODS: Eleven MS patients were separated into two groups: Intervention Group (IG) and Control Group (CG). Hippotherapy consisted of two 50-minute sessions each week for four months. Postural stability was evaluated before and after hippotherapy using a force plate to calculate the center of pressure (COP), when subjects stood still for 30 seconds, with eyes open and closed. Statistical analysis was performed by ANOVA and *post hoc* Tukey tests, $p < 0.05$.

RESULTS: Hippotherapy significantly reduced the amplitude of oscillation in the anteroposterior direction in IG while CG remained unaltered. In both groups postural stability was reduced after the suppression of visual information.

CONCLUSIONS: Hippotherapy induced functional adaptations that resulted in better postural stability of subjects with MS. This study corroborates literature supporting the use of hippotherapy as a possible intervention for balance disorders in patients with MS.

Moritz, Ashley. (2014).

Incorporating equine movement for the treatment of stuttering: case example.
Hippotherapy. 2014 Winter; 17-21.

Mosulishvili, T.; Loria, M. (2013).

The effectiveness of ridetherapy in children with benign joint hypermobility syndrome during articulatory changes in the knee joint. *Georgian Medical News*. 2013 Feb; (215): 76-79.

Text in English; abstracts in English, Georgian and Russian.

Abstract: Taking into account the biomechanical peculiarities of ridetherapy, the specific methodology of ridetherapy developed by us is given in this paper, also the data of treatment have been studied in the dynamics. Based on the results obtained the reliable advantage of ridetherapy method is determined as compared with therapeutic exercises. It has been established that in children with benign joint hypermobility syndrome during articulatory changes in the knee the use of ridetherapy provides an increase in muscle strength, to a certain degree their hypertrophy, the development of joint-muscular perception, the increase of proprioception, the minimizing of excessive joint movement, the antinociceptive effect and the avoidance of secondary developed complications.

Available from the website, www.geomednews.com (Accessed 11 Jan 2014)

Muñoz-Lasa, Susana; Ferriero, Giorgio; Valero, Raquel; Gomez-Muñiz, Fernando; Rabini, Alessia; Varela, Enrique. (2011).

Effect of therapeutic horseback riding on balance and gait of people with multiple sclerosis. *Giornale Italiana di Medicina Lavoro ed Ergonomia*. 2011 Oct-Dec; 33(4): 462-467.

Text in English; abstract also in Italian.

Abstract: BACKGROUND: Exercise therapy is an important part of symptomatic and supportive treatment in patients with multiple sclerosis (PwMS). According to the literature, equine-assisted therapies--such as therapeutic horseback riding (THR) and hippotherapy (HT)--are exercise therapies that can have positive physical effects on coordination, muscle tone, postural alignment, stiffness/flexibility, endurance and strength, correcting abnormal movement patterns and improving gait and balance. While HT is known to have a positive effect on balance in PwMS, data about THR are limited.

OBJECTIVE: The aim of the present work was to determine the effect of THR on the balance and gait of ambulatory PwMS.

METHODS: Twenty-seven PwMS were included in the study. Patients were divided into two groups: 12 underwent THR and 15 traditional physiotherapy (for both groups, two series of 10 weekly sessions were performed). Before and after the study period, the following outcome measures were applied: Extended Disability Status Scale (EDSS), Barthel Index, Tinetti Performance-Oriented Mobility Assessment (POMA). In addition, patients of the THR group underwent a gait analysis to assess spatiotemporal gait parameters and ground reaction forces.

RESULTS: The THR group showed a significant improvement in POMA scores ($p < 0.005$) and two gait parameters: stride time ($p < 0.04$) and ground reaction forces ($p < 0.01$). No statistically significant change was found in the control group.

CONCLUSION: The results of the study show that THR can improve balance and gait of ambulatory PwMS. Findings are preliminary, but promising and in line with the recent literature.

Pálinkas, Judit; Szabó, István András; Soha, Ferenc Rudolf; Bagi, Ágnes; Csernátony, Zoltán. (2011).

Terápiás célra használt lovak mozgásértékeinek műszeres vizsgálati lehetősége. *Magyar Állatorvosok Lapja*. 2011 Apr; 133(4): 200-206.

In Hungarian; summary also in English: Motion parameter instrumental examination possibilities of therapeutic horses.

Abstract: The knowledge of motion parameters of horses is significant not only in veterinary practice, but also in equine assisted activities. According to the presently accepted hypothesis, during therapeutic horseback riding the impulse coming from the back of the horse moves the pelvis of the rider similarly as it would move during walking, and in this way aiding the development of proper walking abilities. The basis of this effect is the so called gait-typical body training. In the present study the authors performed measurement pertaining to this: they compared and analyzed movement models based on acceleration measurements in healthy young volunteers on different sized and qualified horses. For this, they developed an acceleration measuring system. It consists of two pieces of three-axial acceleration indicators and a data collector unit. They developed their own software for the data analysis. They validated the system in a gait analyzing laboratory. In the article they present the comparison of gait parameters of 29 university students and four horses. According to the results, they were able to prove objectively that the gait of the horses and the volunteers show a great deal of similarity both qualitatively and quantitatively. With this understanding the effect of therapeutic horseback riding is closer.

Pluta, Michał. (2009).

Characteristics of the trunks of horses used for classic hippotherapy. *Annales Universitatis Mariae Curie-Skłodowska. Sectio EE. Zootechnica*. 2009; 27(3): 1-16.

DOI: <http://dx.doi.org/10.2478/v10083-009-0011-0>

Abstract: With the view of characterising trunks of horses used in hippotherapy, a zoometric analysis was conducted on 33 specimens at 9 different locations. 61% of the examined animals were geldings and 39% were mares. The following breeds were represented: the Hucul (28% of the 33 horses), the Felin pony (15%), the Malapolski horse, the Polish noble half-bred horse (9% each), the Konik, the Arab-konik, the Shetland pony (6% each), the Bilgorajski horse (3%), together with 18% horses of unknown origin. The conducted measurements made it possible to prepare a graphic visualisation of the upper line (height and length) as well as the side line (width) of the trunks. An average length of the horse's back (used in therapy) ranged between 65.8 cm and 84.8 cm. An average width of the trunk measured at shoulder was between 34.0 cm and 37.2 cm, at back – 50.0 cm to 56.0 cm, and at croup – 42.0 cm to 48.6 cm. Trunk's cross section was found to be either oval or round. Centres where several horses (4 to 6) are kept and which are characterised by varying parameters, can satisfy the needs of all admitted clients, according to the principle that a patient's disability

and weight determine the choice of a horse suitable for therapy. The various forms of the barrel make it a universal rehabilitation "tool".

Pluta, Michał. (2008).

Hipporehabilitation at the Felin Experimental Farm of the Agricultural University in 2000-2006. *Annales Universitatis Mariae Curie-Skłodowska. Sectio EE Zootechnica.* 2008; 26(2): 1-12.

DOI: <http://dx.doi.org/10.2478/v10083-008-0005-3>

Abstract: Hippotherapy was performed with four geldings (Małopolski Horse, Polish Konik and Hutzul Horse) and four mares (Felin Pony). The horses were included into the hippotherapeutic treatment program at the age of 47-124 months. and their conformation variability allowed to satisfy the patients' needs. The data of patients under the therapeutic program organized at the Felin Experimental Farm over 2000-2006 were supplied by a hippotherapist team and the Association for Movement Disabled Children and Youth. A total of 137 patients took part in the equine-assisted therapy. The average number of sessions/patient/month ranged from 14.67 in 2000 up to 29.25 in 2004. The number of patients/horse/day ranged between 2.36 in 2006 to 3.38 in 2001. The mean number of 30 min-sessions per therapist daily oscillated from 2.09 (2001) up to 4.59 (2004). The calculated values appeared to be lower than those laid out in The Canons of Polish Hippotherapy (4 h/day). Significant and highly significant statistical differences recorded between the absolute means (number of sessions and patients) and the relative ones (number of sessions/horse and / therapist) in the consecutive years gave evidence for the ongoing development of the hippotherapeutic center in Felin. Among the clients served by the center, there was a group of patients who attended the therapy sessions regularly and it is a promising predictor for the equine-assisted therapy to be used as a valid branch of rehabilitation and recognized as such by handicapped children's parents, doctors and the whole society.

Shurtleff, Tim L.; Engsberg, Jack R. (2010).

Changes in trunk and head stability in children with cerebral palsy after hippotherapy: a pilot study *Physical & Occupational Therapy in Pediatrics.* 2010 May; 30(2): 150-163.

DOI: <http://dx.doi.org/10.3109/01942630903517223>

Abstract: Hippotherapy (HPOT) is a therapy that uses horse movement. This pilot investigation objectively evaluated the efficacy of HPOT in improving head/trunk stability in children with cerebral palsy (CP). The participants were six children with spastic diplegia and six children without disability. Head and trunk stability was challenged by using a motorized barrel and measured by a video motion capture system before and after a 12-week intervention of 45 min of HPOT a week. The variables measured were anterior-posterior (AP) translation of the head, and spine at five points and average AP head angles. At pre-testing, children with CP demonstrated significant differences in AP translation and AP head rotation compared with children without disability. Following HPOT, children with CP demonstrated significant reductions in head rotation and AP translation at C7, eye, and vertex. At post-testing, translation at C7 did not differ significantly between children with CP and children

without disability. After HPOT intervention, children with CP reduced their AP head rotation and translation, suggesting that they had increased stability of the head and trunk in response to perturbations at the pelvis. The findings suggest that HPOT might improve head and trunk stability in children with CP.

Shurtleff, Tim; Engsborg, Jack. (2012).

Long-term effects of hippotherapy on one child with cerebral palsy: a research case study. *British Journal of Occupational Therapy*. 2012 Aug; 75 (8): 359-366.

DOI: <http://dx.doi.org/10.4276/030802212X13433105374279>

Abstract: Introduction: This case study followed a 6-year-old child with cerebral palsy for an additional 24 weeks after a 12-week pilot study of hippotherapy (HPOT).

Method: Pre-post measures were performed using a video motion capture system before and after 12 weeks, showing head/trunk control improvements.

Results: The third measure after 24 more weekly treatments showed no further improvement on the original variables. However, an unanticipated improvement in postural sway was found at the end of 9 months.

Conclusion: This suggests that additional investigations are needed with more children with cerebral palsy over longer periods to identify outcomes from extended interventions beyond the 6-12 weeks of most published HPOT studies. Such further work could support better treatment planning and inform discharge criteria considering diminishing returns. The information would provide better evidence-based criteria for referrals and funding. This may make HPOT more accessible for those with disabilities who can benefit in specific and predictable ways.

Şik, Berna Yildirim; Çekmece, Çiğdem; Dursun, Nigar; Dursun, Erbil; Balıkçı, Erdener; Altunkanat, Zülfikar; Gülcü, Mehmet Ali. (2012).

Hippoterapi serebral palsili çocukların rehabilitasyonunda yararlı mıdır? *Türkiye Klinikleri Journal of Medical Sciences*. 2012 Jun; 32 (3): 601-608.

DOI: <http://dx.doi.org/10.5336/medsci.2011-22465> or through www.turkiyeklinikleri.com (Accessed 23 Mar 2014).

Text in Turkish; abstract also in English. English title: Is hippotherapy beneficial for rehabilitation of children with cerebral palsy?

Abstract: Objective: The aim of this randomized controlled study was to investigate the effects of hippotherapy on gross motor functions, balance, coordination and walking in children with cerebral palsy.

Material and Methods: A total of 23 children with cerebral palsy were included in the study. Participants were randomly divided into two groups as hippotherapy and control groups. All children in both groups received 2 weeks of conventional physiotherapy with one-hour sessions every day. Hippotherapy group also received hippotherapy education for 30-45 min once a day for 10 weeks. All children in both groups were evaluated using the Gross Motor Function Measure-88 (GMFM-88) in terms of gross motor functions, the Pediatric Balance Scale (PBS) in terms of balance-coordination and computed walking analysis in terms of walking functions.

Results: Ten patients from each group completed the study. Post-treatment evaluation of both groups revealed statistically significant improvements in weltering, sitting, crawling, standing and walking-running-jumping sub-parameters and total scores of GMFM-88 ($p < 0.05$ for all parameters). The improvement in weltering, crawling, standing and total GMFM-88 scores was significantly higher in the hippotherapy group compared to the control group ($p < 0.05$ for all parameters). PBS significantly increased in both groups ($p < 0.05$ for all parameters) and the difference between the improvement rates of two groups was not significant ($p > 0.05$). While walking speed (right $p = 0.043$, left $p = 0.026$) and cadance ($p = 0.028$) significantly improved, a significant improvement was not detected in the walking parameters of the control group.

Conclusion: Hippotherapy may be considered a beneficial method that may provide additional motor gains in rehabilitation and treatment of children with cerebral palsy.

Silkwood-Sherer, Debbie J.; Killian, Clyde B.; Long, Toby M.; Martin, Kathy S. (2012).

Hippotherapy – an intervention to habilitate balance deficits in children with movement disorders: a clinical trial. *Physical Therapy*. 2012 May; 92(5): 707-717.

DOI: <http://dx.doi.org/10.2522/ptj.20110081>

Abstract: BACKGROUND: Clinical observations have suggested that hippotherapy may be an effective strategy for habilitating balance deficits in children with movement disorders. However, there is limited research to support this notion.

OBJECTIVE: The purposes of this study were to assess the effectiveness of hippotherapy for the management of postural instability in children with mild to moderate balance problems and to determine whether there is a correlation between balance and function.

DESIGN: A repeated-measures design for a cohort of children with documented balance deficits was used.

METHODS: Sixteen children (9 boys and 7 girls) who were 5 to 16 years of age and had documented balance problems participated in this study. Intervention consisted of 45-minute hippotherapy sessions twice per week for 6 weeks. Two baseline assessments and 1 postintervention assessment of balance, as measured with the Pediatric Balance Scale (PBS), and of function, as measured with the Activities Scale for Kids-Performance (ASKp), were performed.

RESULTS: With the Friedman analysis of variance, the PBS and the ASKp were found to be statistically significant across all measurements ($P < .0001$ for both measures). Post hoc analysis revealed a statistical difference between baseline and postintervention measures ($P \leq .017$). This degree of difference resulted in large effect sizes for PBS ($d = 1.59$) and ASKp ($d = 1.51$) scores after hippotherapy. A Spearman rho correlation of .700 indicated a statistical association between PBS and ASKp postintervention scores ($P = .003$). There was no correlation between the change in PBS scores and the change in ASKp scores ($r_s = .13$, $P > .05$).

LIMITATIONS: Lack of a control group and the short duration between baseline assessments are study limitations.

CONCLUSIONS: The findings suggest that hippotherapy may be a viable strategy for reducing balance deficits and improving the performance of daily life skills in children with mild to moderate balance problems.

Silva e Borges, Maria Beatriz; da Silva Werneck, Maria José; da Silva, Maria de Lourdes; Gandolfi, Lenora; Pratesi, Riccardo. (2011).

Therapeutic effects of a horse riding simulator in children with cerebral palsy. *Arquivos de Neuro-Psiquiatria*. 2011 Oct; 69(5): 799-804.

DOI: <http://dx.doi.org/10.1590/S0004-282X2011000600014>

Abstract: *Objective:* To evaluate the efficacy of horse riding simulator on the sitting postural control of children with spastic diplegia.

Method: Forty children were randomly divided in a group using the simulator (RS) and a group performing conventional physical therapy (CT). FScan/Fmat equipment was used to register maximal displacement in antero-posterior (AP) and medio-lateral (ML) directions with children in sitting position. At the pre and post intervention stage both groups were classified according to the Gross Motor Function Classification System (GMFCS) and, after intervention, by the AUQEI questionnaire (Autoquestionnaire Qualité de vie Enfant Image).

Results: Comparison between groups disclosed statistically significant pos-intervention improvement both in the AP ($p < 0.0001$) as in the ML ($p < 0.0069$) direction in the RS group.

Conclusion: The horse riding simulator produced significant improvement in the postural control of children in sitting position, additionally showing a higher motor functionality and a better acceptance of the therapeutic intervention.

Stergiou, Alexandra; Spyridon-Georgios, Soulis; Varvarousis, Dimitrios; Christodoulou, Pinio; Sakellaropoulou, Evdoxia; Kessler-Kakoulidi, Lucia. (2012).

The contribution of Psycho-Educational Vaulting (therapeutic horseback riding) on the psychomotor development of a child with cri-du-chat-syndrome: a case study. *Mensch & Pferd International*. 2012; Heft 1.

DOI: <http://dx.doi.org/10.2378/mup2012.art02e>

Abstract: To adopt a training program for a person with "cri-du-chat-syndrome" presents one with many difficulties because of the specific communication disorders, the display of behavioral problems, and the motor-functional abnormalities that characterize the above syndrome. In this particular case study, speech and intelligence of the child are not fully developed, making both communication, and the establishment of social relations, difficult for the child. It is assumed that physical education in combination with appropriate psycho-educational methods and strategies, will contribute positively to the training of these individuals, increasing the level of their mobility and communication with the environment. With respect to this aim, psycho-educational vaulting plays a particularly important role.

This English translation of the German article, "Der Beitrag der heilpädagogischen Förderung mit dem Pferd für die psychomotorische Entwicklung eines Kindes mit Cri-du-chat-Syndrom," which appears in this issue of *Mensch & Pferd International*, 2012, Heft 1, pages 13-23, is available from the publisher for € 15. – at www.reinhardt-verlag.de//5004/mensch_und_pferd_international.

Sung, Yun-Hee; Kim, Chang-Ju; Yu, Byong-Kyu; Kim, Kyeong-Mi. (2013).

A hippotherapy simulator is effective to shift weight bearing toward the affected side during gait in patients with stroke. *NeuroRehabilitation*. 2013; 33(3): 407-412.

DOI: <http://dx.doi.org/10.3233/NRE-130971>

Abstract: AIM: We investigated whether a hippotherapy simulator has influence on symmetric body weight bearing during gait in patients with stroke.

METHOD: Stroke patients were divided into a control group ($n = 10$) that received conventional rehabilitation for 60 min/day, 5 times/week for 4 weeks and an experimental group ($n = 10$) that used a hippotherapy simulator for 15 min/day, 5 times/week for 4 weeks after conventional rehabilitation for 45 min/day. Temporospatial gait assessed using OptoGait and trunk muscles (abdominis and erector spinae on affected side) activity evaluated using surface electromyography during sit-to-stand and gait. Prior to starting the experiment, pre-testing was performed. At the end of the 4-week intervention, we performed post-testing.

RESULT: Activation of the erector spinae in the experimental group was significantly increased compared to that in the control group ($p < 0.01$), whereas activation of the rectus abdominis decreased during sit-to-stand. Of the gait parameters, load response, single support, total double support, and pre-swing showed significant changes in the experimental group with a hippotherapy simulator compared to control group ($p < 0.05$). Moreover, activation of the erector spinae and rectus abdominis in gait correlate with changes of gait parameters including load response, single support, total double support, and pre-swing in experimental group.

CONCLUSION: These findings suggest that use of a hippotherapy simulator to patients with stroke can improve asymmetric weight bearing by influencing trunk muscles.

Tseng, Sung-Hui; Chen, Hung-Chou; Tam, Ka-Wai. (2013).

Systematic review and meta-analysis of the effect of equine assisted activities and therapies on gross motor outcome in children with cerebral palsy. *Disability & Rehabilitation*. 2013 Jan; 35(2): 89-99.

DOI: <http://dx.doi.org/10.3109/09638288.2012.687033>

Abstract: PURPOSE: To evaluate the literature on the efficacy of equine assisted activities and therapies (EAAT) on gross motor outcomes representing the ICF component of body functions and activity in children with cerebral palsy (CP).

METHODS: We conducted a systematic review and meta-analysis of randomized controlled trials and observational studies of hippotherapy (HPOT) and therapeutic horseback riding (TR) for children with spastic CP. Gross motor outcomes, assessed via muscle activity and muscle tone, gait, posture and Gross Motor Function Measures (GMFM) were evaluated.

RESULTS: Five TR studies and nine HPOT studies were included. Our meta-analysis indicated that short-term HPOT (total riding time 8-10 min) significantly reduced asymmetrical activity of the hip adductor muscles. HPOT could improve postural control in children with spastic CP, GMFCS level < 5 . However, the evidence did not show a statistically significant effect on GMFM after long-term HPOT or TR (total riding time, 8-22 h) in children with spastic CP.

CONCLUSIONS: This systematic review found insufficient evidence to support the claim that long-term TR or HPOT provide a significant benefit to children with spastic CP. We found no statistically significant evidence of either therapeutic effect or maintenance effects on the gross motor activity status in CP children.

Ungermann, Cathryn M.; Gras, Laura Z. (2011).

Therapeutic riding followed by rhythmic auditory stimulation to improve balance and gait in a subject with orthopedic pathologies. *Journal of Alternative and Complementary Medicine*. 2011 Dec; 17(12): 1191-1195.

DOI: <http://dx.doi.org/10.1089/acm.2009.0708>

Abstract: OBJECTIVES: The study objectives were to investigate the effect of therapeutic riding with a subject who had an orthopedic diagnosis.

DESIGN: This is a single-subject case report.

LOCATION: The study was conducted at an equestrian facility with an indoor riding arena.

SUBJECT: The subject was a 59-year-old woman with grade I spondylolisthesis at L4/L5 and multilevel lumbar spinal stenosis in central and foraminal canals. The subject had an anterior cervical fusion of C3-C7.

EVALUATION: The subject has been ambulating with a straight cane due to her history of frequent falls. Gait, agility, strength, range of motion, and balance testing were performed. The subject had impairments of bilateral lower extremities with an ataxic gait pattern and was at risk for continued falls according to the balance measures.

INTERVENTIONS: The intervention comprised therapeutic riding sessions 3 times a week for 20 minutes for 4 weeks. Each riding session was immediately followed by a 10-minute independent walking program with a metronome for rhythmic auditory stimulation.

OUTCOME MEASURES: The outcome measures were as follows: Manual muscle testing and range of motion of the lower extremities, Gait Speed Test, Dynamic Gait Index, Four-Square Step Test, Chair Stand Test, Single Leg Stance.

RESULTS: Improvements were seen in lower extremity strength and range of motion and balance. The subject improved on balance scores, placing her out of the risk for falls category.

CONCLUSIONS: Therapeutic riding followed by rhythmic auditory stimulation improved lower extremity range of motion, strength, and balance with this subject.

Wehofer, Lisa; Goodson, Nicole; Shurtleff, Tim L. (2013).

Equine assisted activities and therapies: a case study of an older adult. *Physical & Occupational Therapy in Geriatrics*. 2013; 31(1): 71-87.

DOI: <http://dx.doi.org/10.3109/02703181.2013.766916>

Abstract. Falls are the leading cause of injuries and deaths in adults over the age of 65. The purpose of this case study is to explore the use of Equine Assisted Activities and Therapies (EAAT) to improve the mechanisms of balance, postural sway, fear of falling (FOF), and participation in older adults (OA). The participant (a 76-year-old woman), completed 10 Adaptive riding (AR) sessions over a six-week period, led by a Level II therapist (COTA/L

and PATH certified riding instructor). Changes in function were assessed using the Berg Balance Scale (BBS), Activities-Specific Balance Confidence Scale (ABC), Activity Card Sort (ACS), and Video Motion Capture (VMC) system. Results indicated improved static standing balance, postural stability, and greater dynamic head and trunk control. Additionally, the participant expressed decreased FOF, decreased back pain, the ability to recover self after a fall, and an increase in activity participation as indicated in the ACS.

Abstract available from the website, www.pathintl.org/resources-education/resources/equine-welfare/equine-welfare/612-research (Accessed 19 Apr 2013).

Whalen, Cara N.; Case-Smith, Jane. (2012).

Therapeutic effects of horseback riding therapy on gross motor function in children with cerebral palsy: a systematic review. *Physical & Occupational Therapy in Pediatrics*. 2012 Aug; 32(3): 229-242.

DOI: <http://dx.doi.org/10.3109/01942638.2011.619251>

Abstract: *Purpose:* This systematic review examined the efficacy of hippotherapy or therapeutic horseback riding (THR) on motor outcomes in children with cerebral palsy (CP).

Methods: Databases were searched for clinical trials of hippotherapy or THR for children with CP. Results: Nine articles were included in this review. Although the current level of evidence is weak, our synthesis found that children with spastic CP, Gross Motor Function Classification System (GMFCS) levels I-III, aged 4 years and above are likely to have significant improvements on gross motor function as a result of hippotherapy and THR. Evidence indicates that 45-min sessions, once weekly for 8-10 weeks, result in significant effects.

Conclusions: The current literature on hippotherapy and THR is limited. Large randomized controlled trials using specified protocols are needed to more conclusively determine the effects on children with CP. From the current evidence, it appears that hippotherapy and THR have positive effects on gross motor function in children with CP.

Commentary by Iona Novak, titled "Evidence to Practice Commentary: the evidence alert traffic light grading system," *Physical and Occupational Therapy in Pediatrics*. 2012 Aug;32(3):256-259.

DOI (comment): <http://dx.doi.org/10.3109/01942638.2012.698148>

Zadnikar, Monika; Kastrin, Andrej. (2011).

Effects of hippotherapy and therapeutic horseback riding on postural control or balance in children with cerebral palsy: a meta-analysis. *Developmental Medicine & Child Neurology*. 2011 Aug; 53(8): 684-691.

DOI: <http://dx.org.org/10.1111/j.1469-8749.2011.03951.x>

Abstract: AIM: This research review and meta-analysis presents an overview of the effects of hippotherapy and therapeutic horseback riding (THR) on postural control or balance in children with cerebral palsy (CP).

METHOD: To synthesize previous research findings, a systematic review and meta-analysis were undertaken. Relevant studies were identified by systematic searches of multiple online databases from the inception of the database through to May 2010. Studies were

included if they fulfilled the following criteria: (1) quantitative study design, (2) investigation of the effect of hippotherapy or THR on postural control or balance, and (3) the study group comprised children and adults with CP. The selected articles were rated for methodological quality. The treatment effect was coded as a dichotomous outcome (positive effect or no effect) and quantified by odds ratio (OR). The pooled treatment effect was calculated using a random-effects model. Meta-regression of the effect size was performed against study covariates, including study size, publication date, and methodological quality score.

RESULTS: From 77 identified studies, 10 met the inclusion criteria. Two were excluded because they did not include a comparison group. Therapy was found to be effective in 76 out of 84 children with CP included in the intervention groups. The comparison groups comprised 89 children: 50 non-disabled and 39 with CP. A positive effect was shown in 21 of the children with CP in the comparison group regardless of the activity undertaken (i.e. physiotherapy, occupational therapy, sitting on a barrel or in an artificial saddle). The pooled effect size estimate was positive (OR 25.41, 95% CI 4.35, 148.53), demonstrating a statistically significant effectiveness of hippotherapy or THR in children with CP ($p < 0.001$). Meta-regression of study characteristics revealed no study-specific factors.

INTERPRETATION: The eight studies found that postural control and balance were improved during hippotherapy and THR. Although the generalization of our findings may be restricted by the relatively small sample size, the results clearly demonstrate that riding therapy is indicated to improve postural control and balance in children with CP.

Zadnikar, Monika; Rugelj, Darja. (2011).

Postural stability after hippotherapy in an adolescent with cerebral palsy. *Journal of Novel Physiotherapies*. 2011; 1(1). [5 pdf pages].

DOI: <http://dx.org.org/10.4172/2165-7025:10000106>

Abstract: Objectives: To investigate whether hippotherapy has short- and long-term effects on postural control in an adolescent with cerebral palsy (CP).

Design: Pre- and post-treatment follow-up with 5-week intervention. Quantitative stabilometry and a modified sensory organization test were performed to determine the subject's response after hippotherapy (HT). The total path length and the lengths of the mediolateral and anteroposterior centre of pressure (COP) movements were calculated.

Settings: Measurement system from the Health Faculty research laboratory in centre for HT.

Participant: Adolescent with CP.

Intervention: 5 weeks' hippotherapy, 3 times per week for 30 minutes.

Measures: modified sensory organization test, stabilometry and gross motor function measure.

Results: The results of measurement of the short-term effect of HT on the parameters of movement of the COP on a firm surface with eyes open show that the total path length decreased by 20.94%, the path length in the mediolateral direction decreased by 24.30%, and in the anteroposterior direction by 17.91%; the area of the stabilogram decreased by 55.54% and the individual variance index (IVI) decreased by 9.95%. After completion of HT, the total path length decreased by 33.70%, the path length in the mediolateral direction decreased by 30.48%,

in the anteroposterial direction by 35.06%; the stabilogram area decreased by 59.82% and IVI decreased by 15.10%.

Conclusion: In our case study the modified sensory organization test on the force plate was sufficiently sensitive to detect fluctuation changes in the COP; therefore it is appropriate for continued use. Similarly, HT was found to have a positive effect on postural control.

Available from the website, www.omicsgroup.org/journals/2165-7025/2165-7025-1-106.digital/2165-7025-1-106.html.

Hippotherapy: Theses

Treuthart, Megan K. (2011).

The impact of hippotherapy on a child with autism: A single case study. 2011. 96 pages.

Unpublished thesis (M.S.) – D'Youville College, 2011.

Abstract: This retrospective single subject design study examined the impact of hippotherapy on a 4-year-old male with Autism Spectrum Disorder (ASD). De-identified Sensory Profile (SP) scores and the treating therapist's documentation were analyzed to determine the child's ability to process, modulate and respond to sensory stimuli and to evaluate the impact it had on functional performance in his daily life. Following the intervention, the SP scores and the therapist's progress notes revealed no continuous significant improvement; however the therapist's discharge plan demonstrated progress. These results indicated that the intervention produced fluctuating degrees of improvement in the child's sensory processing abilities.

Abstract from Masters Abstracts International, 2011 Oct; 49(5).

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Mental Health & Learning

Mental Health & Learning: Books

Adams, C. (2013).

The Helping horse: how Equine Assisted Learning contributes to the wellbeing of First Nation youth in treatment for volatile substance misuse : [Final report. C. Adams et al.]. [Canada] : University of Calgary, University of Saskatchewan, University of Regina, White Buffalo Youth Inhalant Treatment Centre, Cartier Equine Learning Center, ©2013. [4], 75 pages (pdf).

Available at www.addictionsresearchchair.ca (The pdf file [Final-EAL-Report-June-18-2013.pdf](#) was accessed 17 Apr 2014).

Adams, C. (2013).

The Helping horse: how Equine Assisted Learning contributes to the wellbeing of First Nation youth in treatment for volatile substance misuse : [Shortened policy report. C. Adams et al.]. [Canada] : University of Calgary, University of Saskatchewan, University of Regina, White Buffalo Youth Inhalant Treatment Centre, Cartier Equine Learning Center, ©2013. [4], 25 pages (pdf).

Available at www.addictionsresearchchair.ca (The pdf file [09CDAdamsFinalReport16July2013pdf.pdf](#) was accessed 17 Apr 2014).

Hamilton, Allan J. (2011).

Zen mind, zen horse: the science and spirituality of working with horses; foreword by Monty Roberts and Robert Miller. North Adams, Mass. : Storey Pub., ©2011. vii, 311 p. : col. illus. ; 26 cm.

\$US 24.95: ISBN 9781703425650 (pbk); \$US 11.99, Kindle ed.

Shambo, Leigh. (2013).

The listening heart: the limbic path beyond office therapy; Leigh Shambo with David Young and Catherine Madera. Chehalis, Wash: Human-Equine Alliances for Learning, 2013. xiv, 139 p. : illus. ; 26 cm.

“A manual for the HEAL method of equine-facilitated psychotherapy and learning for healing social engagement, self-regulation, complex trauma, emotions, boundaries, attachment wounds.”

\$US 16.17: ISBN 9780988351400; \$US 9.99: Kindle ed.

Equine Assisted Mental Health & Learning: Journal Articles

Ansorge, Jessie; Sudres, Jean-Luc. (2011).

La médiation équine en pédopsychiatrie. *Soins Psychiatrie*. 2011 Nov-Dec; 277: 40-44.

Text in French. English translation of title: Equine-assisted therapy in child psychiatry.

Abstract: The use of a horse or pony as a therapeutic tool is often presented in the media as a recent phenomenon. A survey of 103 institutions shows that it is in fact an approach well rooted in child and adolescent psychiatry. However, professionals who use equine-assisted therapy are calling for an assessment to be carried out enabling them to hone their practices.

Bachi, Keren. (2013).

Application of attachment theory to equine-facilitated psychotherapy. *Journal of Contemporary Psychotherapy*. 2013 Sep; 43(3): 187-196.

DOI: <http://dx.doi.org/10.1007/s10879-013-9232-1>

Abstract: Equine-facilitated psychotherapy (EFP) is a form of animal-assisted therapy used to treat human psychological problems that employs horses in and around the natural surroundings of the stables. Despite the increasing number of professionals and organizations that offer this innovative therapy, EFP lacks a firm theoretical and research base. This paper aims to reveal how attachment theory can inform and enrich theory and practice of EFP. It explores the fit between central features of EFP and several of the primary concepts of attachment-based psychotherapy, such as: secure base and haven of safety through the provision of a holding environment, affect mirroring, mentalizing and reflective functioning, and non-verbal communication and body experience. This work is composed of definitions of these concepts, their application to human-horse context and EFP, and interpretation in light of potential therapeutic (transformative) processes.

Bachi, Keren; Terkel, Joseph; Teichman, Meir. (2012).

Equine-facilitated psychotherapy for at-risk adolescents: the influence on self-image, self-control and trust. *Clinical Child Psychology and Psychiatry*. 2012 Apr; 17(2): 298-312.

DOI: <http://dx.doi.org/10.1177/1359104511404177>

Abstract: This article describes the theoretical-conceptual frame of equine-facilitated psychotherapy (EFP) for adolescents at-risk, the unique components of this intervention, and its implementation in an evaluation study. The study was conducted at a residential treatment facility for adolescents at-risk. We examined the outcomes of EFP on self-image, self-control, trust and general life satisfaction. Fourteen resident adolescents comprised the treatment group, and were compared with a matched group of 15 residents who did not receive EFP (control). The treatment comprised a weekly individual EFP session over a period of seven months. The study found a trend of positive change in all four research parameters within the treatment group. Additional indications of the intervention's positive influence were also found and are discussed.

Bachi, Keren. (2012).

Equine-facilitated psychotherapy: The gap between practice and knowledge. *Society & Animals*. 2012; 20(4): 364-380.

DOI: <http://dx.doi.org/10.1163/15685306-12341242>

Abstract: Equine-Facilitated Psychotherapy (EFP) is widely used, and the uses to which it can be put are still being developed. However, existing knowledge about this field is insufficient, and most of the research suffers from methodological problems that compromise its rigor. This review will explore research into the linked fields of Animal-Assisted Therapy and Equine-Assisted Activities/Therapies (EAA/T) related to physical health. Existing knowledge of mental, emotional, and social applications of EAA/T is presented. Evaluation studies in the subfield suggest that people benefit from interventions with horses. However, these studies suffer from fundamental problems, such as small sample size and lack of control groups. Naturalistic inquiry about theoretical aspects highlights the fundamental role that human-horse relations play in EAA/T, but these studies exhibit deficiencies in theory development. A multimethod approach could promote knowledge development for EFP. Suggestions for future research concern methodological solutions to improve evaluation studies, use of grounded theory method to develop theory, as well as applying attachment theory to the human-horse context, which may offer insight about the underlying processes for change.

Banning, Nicola. (2012).

When the therapist is a horse. *Therapy Today*. 2012 Mar; 23(2): 14-18.

The author discusses her experiences while attending a two-day equine facilitated therapy (EFT) group run by equine facilitated psychotherapist Miranda Carey. The role of a therapist is played by a horse, from whom one has a lot to learn. The safety issues pertaining to EFT are also described. Horses are very sensitive and sense the behavior of humans. The amazing work that horses can do on humans and the processes followed for EFT is highlighted.

Beetz, Andrea; Grebe, Verena. (2012).

Therapeutic riding enhances quality of life and state of mind of children and juveniles with different psychiatric or medical disorders. *Mensch & Pferd International*. 2012; Heft 2.

DOI: <http://dx.doi.org/10.2378/mup2012.art03e>

Abstract: The effect of eight sessions of therapeutic riding on the quality of life and state of mind of 28 children with different psychiatric or medical disorders was investigated. Quality of life was assessed before and after the intervention, current state of mind before and after each therapy session. The reports of the children themselves as well as those of the parents showed a significant increase in the child's quality of life, and an influence of the parent's attachment status on this effect. Current state of mind was improved after each therapeutic session. The effects were independent from the child's relationship to animals.

This English translation of their article, "Therapeutisches Reiten verbessert das Befinden und die Lebensqualität von Kindern und Jugendlichen mit verschiedenen Störungsbildern," which appears in *Mensch & Pferd International*, 2012, Heft 2, pages 60-71, is available from the publisher for € 15.--. See the website www.reinhardt-verlag.de//5004/mensch_und_pferd_international.

Borioni, Nicoletta; Marinaro, Paola; Celestini, Silvia; Del Sole, Flavia; Magro, Rachele; Zoppi, Daniela; Mattei, Francesca; Dall'Armi, Valentina; Mazzarella, Federica; Cesario, Alfredo; Bonassi, Stefano. (2012).

Effect of equestrian therapy and onotherapy in physical and psycho-social performances of adults with intellectual disability: A preliminary study of evaluation tools based on the ICF classification. *Disability & Rehabilitation*. 2012; 34(4): 279-287.

DOI: <http://dx.doi.org/10.3109/09638288.2011.605919>

Abstract: Purpose: To assess the effects of equestrian rehabilitation +(ER) and onotherapy (Ono) on physical and psycho-social performances of subjects affected by intellectual disability (ID), and to develop a measurement tool based on the International Classification of Functioning Disability and Health-Children and Youth (ICF-CY).

Methods: A tool based on the ICF-CY classification was designed to evaluate subjects undergoing equine rehabilitation within a bio-psychosocial approach. A simplified version of this evaluation form was developed for the equestrian instructors. The agreement between the two tools was evaluated with the Cohen's κ coefficient. Treatment benefits were evaluated in the different areas covered by the evaluation tool.

Results: A general improvement in the autonomy and social integration of subjects with ID undergoing horse and donkey therapy was observed. ER and Ono produced maximum benefits respectively at six and 3 months in the large majority of patients, and benefits persisted over time. Although the agreement between the two tools proposed was rather slight, both evaluation groups measured similar improvements in subjects undergoing equine rehabilitation.

Conclusions: There is an improvement in autonomy and social integration for subjects with ID, undergoing horse and donkey therapy. Ono emerged as a suitable and effective alternative to equestrian therapy. The simplified measurement tool proved to be sensitive and easy to apply, even if further improvements will be necessary.

Brossard, Monika. (2012).

Heilpädagogisches Begleiten mit dem Pferd nach der Brossard-Methode. *Mensch & Pferd International*. 2012; Heft 1: 29-35.

Abstract: Das "Heilpädagogische Begleiten mit dem Pferd" (HBP) ist eine aus Erfahrung und Fachwissen entwickelte Möglichkeit, Menschen bei verschiedenen Prozessen der Entwicklung ihrer Persönlichkeit (das Annehmen-Können des Lebens als Ganzheit) zu begleiten und zu unterstützen. Die humanistische Psychologie bildet hier die theoretische Grundlage. Methoden aus der Gestalttherapie, dem neurolinguistischen Programmieren, der systemischen

Aufstellungsarbeit sowie dem Focusing erweisen sich als hilfreich, da sie Hinweise auf Veränderungen innerer Einstellungen und äußerer Gegebenheiten geben können.

Canter, Stewart. (2013).

Treating trauma through an EFP program. *Strides*. 2013 Spring; 19(2): 30-34.

“Veterans with post-traumatic stress disorder (PTSD) who engage in equine-facilitated psychotherapy learn how to regulate their nervous system to defuse their anger, lower their anxiety and stay calm and assertive.”

Cantin, Anna; Marshall-Lucette, Sylvie. (2011).

Examining the literature on the efficacy of equine assisted therapy for people with mental health and behavioural disorders. *Mental Health and Learning Disabilities: Research and Practice*. 2011; 8(1): 51-61.

Abstract: This review aims to explore the literature relating to the efficacy of Equine Assisted Therapy (EAT) during which horses are used as a tool for emotional growth and learning helping adults and children with mental health and behavioural problems, such as mood disorders, addictive behaviours and communication difficulties. EAT arose during the 1970s, when alternatives to traditional talking therapies were created. A search for relevant literature was undertaken, using electronic and manual search strategies. The data bases used included CINAHL, MEDLINE, AMED and INTERSCIENCE. It was evident that there was limited research-based literature within the UK compared with the USA. However, magazine articles, reporting opinions and case studies, originating from Canada and Northern Europe, were found useful and informative. The literature revealed promising results in the use of EAT in increasing positive and reducing negative behaviours as well as in proving beneficial for those suffering from general mental health problems. The review also indicates the needed for further research and discusses its implication for practice.

Also available from the University of Huddersfield Repository website, <http://eprints.hud.ac.uk/12527/> (Accessed 21 Nov 2012).

Carey, Andrea; Murray, Sarah; Barnfield, Anne. (2012).

The psychological effects of therapeutic riding (TR) for children. *Scientific and Educational Journal of Therapeutic Riding*. 2012/13; 11-35.

Abstract: In this paper we present two studies which investigated the psychological benefits of therapeutic riding (TR) for children, primarily those with disabilities. The studies were run during two TR programs: Study 1, TR delivered in a summer camp; and Study 2, once-weekly TR Sessions across two 10-week courses. All participants were tested at SARI Therapeutic Riding (SARI), London, Ontario, Canada. Survey methodology was employed, using standardized, validated questionnaires developed by the American Camp Association to make within-subjects comparisons. Data was collected at pre-camp/TR course, post-camp/TR course and follow-up time points; obtained from parents and child questionnaires, from researcher observation checklists, and through semi-structured interviews with the parents of children who attended summer camp. On all measures the participants of the camp demonstrated statistically significant gains between pre- and post-camp with respect to the

domains of positive identity, social skills, physical skills, and positive values (all at $p < .01$ level). For weekly riding sessions, results from parent surveys were not statistically significant. Observation checklists completed by the researcher did show positive change in behaviours; one-way analysis of variance (ANOVA) comparisons of the domains measured in pre-, mid- and post-course observations were significant, $p < .01$. There it appears that TR, delivered in a summer camp or in a 10-week course, can be beneficial to children of all ability levels.

Cerino, Stefania; Cirulli, Francesca; Chiarotti, Flavia; Seripa, Stefano. (2011).

Non conventional psychiatric rehabilitation in schizophrenia using therapeutic riding: the FISE multicentre Pindar project. *Annali dell'Istituto Superiore di Sanità*. 2011; 47(4): 409-414.

Text in English; abstract also in Italian.

DOI: http://dx.doi.org/10.4415/ANN_11_04_13

Abstract: The FISE (Federazione Italiana Sport Equestri) Pindar is a multicentre research project aimed at testing the potential effects of therapeutic riding on schizophrenic patients. Twenty-four subjects with a diagnosis of schizophrenia were enrolled for a 1 year-treatment involving therapeutic riding sessions. All subjects were tested at the beginning and at the end of treatment with a series of validated test batteries (BPRS and 8 items-PANSS). The results discussed in this paper point out an improvement in negative symptoms, a constant disease remission in both early onset and chronic disease subjects, as well as a reduced rate of hospitalization.

Chalmers, Darlene; Dell, Colleen Anne. (2011).

Equine-assisted therapy with First Nations youth in residential treatment for volatile substance misuse: building an empirical knowledge base. *Native Studies Review*. 2011; 20(1): 59-87.

Review article. Text in English; abstract also in French.

Abstract: The psychosocial impact of equine-assisted therapy (EAT) is an emerging area of study. Equine-assisted therapy is being incorporated into some programs for First Nations youth in residential treatment for volatile substance misuse (VSM). In light of this ongoing incorporation, a need for contextualised research on EAT has been identified. A scoping review of thirteen empirical EAT studies was undertaken for this paper, leading the authors to conclude that two epistemologies, or philosophical ways of knowing, guide the literature, namely post-positivism and constructivism. From this conclusion a fundamental concern is raised about the prioritizing of Western ways of knowledge building to the exclusion of Aboriginal epistemology in the developing EAT field. Two illustrations are offered: researching the experiences of First Nations youth with EAT, and appreciating the cultural significance of the horse to some First Nations. The participatory paradigm is presented as a potential alternative, holistic guide for future approaches to EAT research. Such awareness is of particular importance given the growing demand to generate empirical "evidence" for culture-based interventions in the addictions field in Canada.

Cody, Patricia¹; Holleran Steiker, Lori; Szymandera, Mary Lynn. (2011).

Equine therapy: Substance abusers' "Healing through Horses." *Journal of Social Work Practice in the Addictions*. 2011 Apr; 11(2): 198-204.

DOI: <http://dx.doi.org/10.1080/1533256X.2011.571189>

Abstract: Lori Holleran Steiker interviews Patricia Cody and Mary Lynn Szymandera about equine therapy. Holleran Steiker asks questions regarding several topics, including: the utility of equine therapy; assessing a client's ability to work with horses; and techniques for social workers who are working with substance abuse clients.

Corring, Deborah J.; Johnston, Megan E.; Rudnick, Abraham. (2010).

Effects of a supported program for horseback riding on inpatients diagnosed with schizophrenia: a qualitative exploratory study. *American Journal of Recreation Therapy*. 2010; 9(3): 41-46.

Abstract: Therapeutic horseback riding (THR) for inpatients with schizophrenia has not been examined, although it may benefit this particularly impaired population. This exploratory study aimed at studying THR for such individuals. Six inpatients with schizophrenia participated in 10 weekly sessions of THR. Validated transcriptions of semistructured interviews with these patients and with their accompanying staff as well as with the THR instructor over a few points in time were analyzed for themes. THR was found to be beneficial for this group of inpatients; in particular, they enjoyed themselves. In conclusion, THR has promise for this population, possibly as an enhancer of enjoyment, among other things, and should be further developed and studied for individuals with schizophrenia of varying severity.

Corring, Deborah; Lundberg, Erica; Rudnick, Abraham. (2013).

Therapeutic horseback riding for ACT patients with schizophrenia. *Community Mental Health Journal*. 2013 Feb; 49(1): 121-126.

DOI: <http://dx.doi.org/10.1007/s10597-011-9457-y>

Abstract: One form of psychiatric leisure rehabilitation which has only recently been explored for individuals with schizophrenia is Therapeutic Horseback Riding (THBR). This study is the first to examine THBR for Assertive Community Treatment (ACT) patients with schizophrenia. A sample of 6 ACT patients with schizophrenia or schizoaffective disorder who reside in the community and 6 mental health care staff participated in 10 weeks of weekly horseback riding sessions with an experienced THBR instructor. Participating patients, staff and the THBR instructor were qualitatively interviewed at the start, during and at the end of the THBR program and these semi-structured interviews were analyzed for recurrent themes. We found that THBR benefitted this group of patients. In spite of our study's limitations, such as its exploratory nature and the small sample size, it demonstrates that THBR has promise and should be further developed and studied for individuals with schizophrenia.

Cuypers, Koenraad; De Ridder, Karin; Strandheim, Arve. (2011).

The effect of therapeutic horseback riding on 5 children with attention deficit hyperactivity disorder: a pilot study. *Journal of Alternative and Complementary Medicine*. 2011 Oct; 17(10): 901-908.

DOI: <http://dx.doi.org/10.1089/acm.2010.0547>

Abstract: OBJECTIVES: The aim of this pilot study was to investigate the effects of therapeutic horseback riding on behavior, health-related quality of life, and motor performance in children with attention deficit hyperactivity disorder (ADHD).

DESIGN: The study employed a time series quasi-experimental design with two pretests and two post-tests conducted 8 weeks apart.

SETTING/LOCATION: The study was conducted at a riding school in Levanger, Norway.

SUBJECTS: The subjects comprised a convenience sample of 5 children aged 10-11 years with ADHD.

METHODS: Subjects received a 1-hour therapeutic horseback riding twice a week for 8 weeks as intervention. Outcome measures: Behavior and health-related quality of life was assessed using Strength and Difficulties Questionnaire (SDQ) and The KINDL^R-Health-Related Quality of Life Questionnaire, respectively. The Modified Function-Neurological Assessment and the Movement Assessment Battery for Children assessed the subject's motor performance.

RESULTS: The pre- and post-tests scores were compared with the Wilcoxon paired sample tests and the Friedman test for nonparametric multiple test samples. Positive differences ($p \leq 0.05$) between the test results at pretest 2 and post-test 1 were noted for the behavior SDQ subscore "Total difficulties" reported by children (12.8 ± 5.8), by parents (16.6 ± 8.2), and by teachers (15.0 ± 5.2). A significant difference ($p < 0.05$) for the "Total difficulties" in SDQ was found between all 4 tests. In relation to quality of life, significant differences in the "Total score" (67.2 ± 14.7) were reported by the children themselves. The motor performance improved after the intervention. The effect sizes and power were established.

CONCLUSIONS: The results of the present study indicate that therapeutic horseback riding had a positive effect on 5 children with ADHD in several domains of the social role behavior, quality of life, and motor performance. This pilot study constitutes a good scientific prospect for future studies.

Dabelko-Schoeny, Holly; Phillips, Gary; Darrough, Emily; DeAnna, Sarah; Jarden, Marie; Johnson, Denise; Lorch, Gwendolen. (2014).

Equine-assisted intervention for people with dementia. *Anthrozoös*. 2014 Mar; 27(1): 141-155.

DOI: <http://dx.doi.org/10.2752/175303714X13837396326611>

Abstract: The purpose of this exploratory study was to determine the feasibility and effectiveness of using guided interactions with horses as a nonpharmaceutical intervention to improve the physiological and behavioral states of persons with dementia. A convenience sample of persons with dementia was recruited from an adult day health center ($n = 16$). A multi-component intervention was implemented comprised of opportunities for grooming, painting, and leading horses. Using a randomized pretest-posttest crossover design, researchers compared participants receiving the equine-assisted intervention with participants receiving treatment as usual. Older persons with Alzheimer's disease and related dementias engaged positively in animal-assisted therapy with horses. A reduction in behavioral problems

was found post intervention in contrast to the comparison group. Pre-intervention measures showed that participants exhibited lower levels of disruptive behaviors compared with the control group on the days they were scheduled to work with the horses. Interestingly, cortisol levels, used as a physiological measure of coping with stress, were elevated after the intervention in participants with higher Mini Mental State Examination scores. Equine-assisted interventions are feasible and possibly beneficial for adults with Alzheimer's disease or a similar dementia disorder, such as those enrolled in adult day health programs. Future studies should utilize multiple methods of assessing impact and include process measures to delineate which specific activities seem to provide the most benefit.

Dell, Colleen Anne; Chalmers, Darlene; Bresette, Nora; Swain, Sue; Rankin, Deb; Hopkins, Carol. (2011).

A healing space: the experiences of First Nations and Inuit youth with equine-assisted learning (EAL). *Child & Youth Care Forum*. 2011. 40(1): 319-336.

DOI: <http://dx.doi.org/10.1007/s10566-011-9140-z>

Abstract: The Nimkee NupiGawagan Healing Centre (NNHC) in Muncey, ON provides residential treatment to First Nations and Inuit youth who abuse solvents. As a complement to its culture-based programming, in 2008 the centre began offering weekly equine-assisted learning (EAL) curriculum to its clients in partnership with the Keystone Equine Centre and the Lambton Equine Assisted Learning Centre. This study explores the potential benefit of the EAL program on youths' healing. We conducted 15 interviews with two intakes of male and female EAL program participants and 6 NNHC and EAL staff, reviewed EAL facilitator and NNHC staff reflections and participants' EAL journals, and observed the EAL program. It was concluded that youths' healing was aided through the availability of a culturally-relevant space ; from within an Aboriginal worldview this understanding of space is central to individual and communal well-being. This was conveyed in three key themes that emerged from the data: spiritual exchange, complementary communication, and authentic occurrence. This understanding provides insight into the dynamics of healing for Aboriginal youth who abuse solvents, and may be applicable to other programming and populations.

Dell, Colleen Anne.; Chalmers, Darlene; Dell, Debra; Sauve, Ernie; MacKinnon, Tamara. (2008).

Horse as healer: applying equine assisted learning to uncover and strengthen the spirit of First Nations youth who abuse solvents. *Pimatisiwin: a Journal of Indigenous and Aboriginal Community Health*. 2008; 6(1): 81-106.

Abstract: Canada is an international leader in providing residential treatment to First Nations youth who abuse solvents. The residential centres are linked through the national Youth Solvent Addiction Committee (YSAC), which provides theoretical direction for the treatment provided at the centres. In this article, we discuss YSAC's culture-based model of resiliency, and illustrate it through the offering of Equine Assisted Learning (EAL) at one of the residential centres – the White Buffalo Youth Inhalant Treatment Centre. YSAC has expanded the Western concept of resiliency, which focuses on the individual, to include both the individual and community. A Western worldview associates several resiliency dynamics

with an individual, including insight (which is internal) and external relationships; whereas from a First Nations worldview, YSAC identifies an individual at the same time being their inner spirit (internal) and relations with their collective community. White Buffalo's application of a culture-based model of resiliency is illustrated from the intersecting perspectives of its program, the Cartier Equine Learning Centre's EAL program, and Elders' stories. We also highlight through the EAL example how YSAC's culture-based model of resiliency and a Western health promotion approach are complementary. There is much to be learned from YSAC's holistic approach to treatment and healing for both First Nations and Western health promotion responses to substance abuse. A limitation of this article is that we discuss the theoretical intersections between a culture-based model of resiliency, EAL, and health promotion, but do not test them empirically. We conclude the article with five key research suggestions as next steps to further our understanding of EAL, and with a specific emphasis on how it relates to First Nations community health.

DeZutti, Joyce E. (2013).

Eating disorders and equine therapy: a nurse's perspective on connecting through the recovery process. *Journal of Psychosocial Nursing & Mental Health Service*. 2013 Sep; 51(9): 24-31.

DOI: <http://dx.doi.org/10.3928/02793695-20130612-01>

Abstract: Patients with eating disorders may have the most complex interdisciplinary treatment plans of any mental illness. Nurses need innovative evidence-based treatment interventions to assist their patients with eating disorders on their road to recovery. Although much has been written about equine-assisted psychotherapy (EAP) and equine-facilitated psychotherapy, the literature has not described a detailed session that can help nurses understand how this experiential treatment works and the impact it can have on the patient. A review of the literature on eating disorders and on the use of equine therapy in its treatment is presented in this article. In addition, the role of the nurse during equine therapy will be highlighted, and an individual example will provide a detailed review of an EAP session.

Duncan, C. Randy; Critchley, Steve; Marland, Jim. (2014).

Can Praxis: a model of equine assisted learning (EAL) for PTSD. *Canadian Military Journal*. 2014 Spring; 14(2): 64-69.

Available at www.journal.forces.gc.ca/vol14/no1/page64-eng.asp (Accessed 21 Apr 2014).

Abstract: The Can Praxis program, a PTSD-tailored EAL curriculum, is intended to serve as a model of appropriate operational stress injury (OSI) for: 1) veterans already on an existing treatment track for OSI and in need of behavioral modification therapy; and 2) veterans who need to recognize the value of additional help. The aim is to have the veteran couples learn new self-mediation techniques. 31 veterans and 27 spouses/partners participated in the pilot testing begun March 2013. Of the 31 veterans, one was female. All were diagnosed with PTSD, including OSI, and all were Canadian. Content review for the HOLSTER scale resulted in 35 items for pilot testing; the BELT scale for spouses/partners was adapted from the HOLSTER scale and released on the second session of pilot testing. 27 of 31

veterans reported very positive perceptions about relief from PTSD symptoms; 4 reported some reduction in PTSD symptoms. All the veterans reported very positive perceptions on the acquisition of self-mediation coping skills. 24 of 25 spouses/partners reported very positive feelings about their own EAL experience. 22 of 25 spouses/partners reported that the veterans had very positive reduction in their PTSD symptoms; 23 of 25 spouses/partners rated the veterans very positively for acquiring coping skills for their personal relationships. Subsequently, 100 percent of the veterans, and 96.0 percent of the spouses/partners reported learning new and/or enhanced communication and conflict resolution skills... The findings also support the benefits of using horses in experiential learning...

Forsling, Sven. (2011).

The Frossarbo Therapeutic Model (FTM) – an experiment within the institutional care system of juvenile delinquents in Sweden. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 25-35.

Abstract: In the 1980s a Swedish study, "444 Stockholm Youth in Crisis," identified the special institutional needs and challenges of young females aged 16-21 years. It pointed to the need for change in the prevailing high cost, staff intensive closed unit system with its poor therapeutic outcomes. In response the Frossarbo Therapeutic Model (FTM), based on a psychodynamic therapeutic approach and Milieu Therapy, was carried out and evaluated between 1987 and 1997. This model went against existing practice and focused on the strength of the juveniles instead of on their distress diagnoses. Over the 10 year period 47 girls (6 at a time) came to Frossarbo Stables for an alternative therapy which involved learning about, caring for and training trotting horses in preparation for racing. FTM was evaluated against standard variables established by The General Board of Compulsory Treatment, Stockholm Metropolitan Council. It received top ratings in all variables.

Gabriels, Robin L.; Agnew, John A.; Holt, Katherine D.; Shoffner, Amy; Zhaoxing, Pan; Ruzzano, Selga; Clayton, Gerald H.; Mesibov, Gary. (2012).

Pilot study measuring the effects of therapeutic horseback riding on school-age children and adolescents with autism spectrum disorders. *Research in Autism Spectrum Disorders*. 2012 Apr-Jun; 6(2): 578-588.

DOI: <http://dx.doi.org/10.1016/j.rasd.2011.09.007>

Abstract: This preliminary study examined the effects of 10 weekly lessons of therapeutic horseback riding (THR) on 42 participants diagnosed with an autism spectrum disorder (ages 6–16 years) compared to a subset ($n = 16$) of the total study population who were first evaluated before and after a 10-week waitlist control condition. All participants received baseline and post-condition assessments in the areas of self-regulation (Irritability, Lethargy, Stereotypic Behavior, and Hyperactivity), adaptive living skills, and motor skills. Participants who completed 10 weeks of THR demonstrated significant improvements on measures of Irritability, Lethargy, Stereotypic Behavior, Hyperactivity, expressive language skills, motor skills, and verbal praxis/motor planning skills. When compared to the pre- and post-assessments of participants from the waitlist control condition, the THR group still showed significant improvements in self-regulation behaviors. The THR-specific change from

the baseline to post-assessments suggests that the improvements are related to the THR treatment.

Glazer, Hilda R.; Clark, Myra D.; Stein, David S. (2004).

The impact of hippotherapy on grieving children. *Journal of Hospice & Palliative Nursing*. 2004 Jul-Sep; 6(3): 171-175.

Abstract: This article looks at the use of therapeutic riding, or hippotherapy, with children who are mourning the death of a family member. Therapeutic riding is the summer program that is part of the Evergreen support group for grieving school-age children and their families. A qualitative study of the impact of the riding program is presented. The research question was whether the children, parents, and adult volunteer would view the program as encouraging the processing of grief and person development. The following themes in perceived outcomes of the program were identified: confidence, trust, and communication skills. The parents and guardians all described the therapeutic riding as a positive experience. They noted an increase in overall communication, including talk about the deceased, as well as an increase in the child's self-confidence and self-esteem. Success with the horses appeared to be important to these children, who expressed pride and joy in their accomplishments.

Goodkind, Jessica; LaNoue, Marianna; Lee, Christopher; Freeland, Lance; Freund, Rachel. (2012).

Feasibility, acceptability, and initial findings from a community-based cultural mental health intervention for American Indian youth and their families. *Journal of Community Psychology*. 2012 May; 40(4): 381-405.

DOI: <http://dx.doi.org/10.1002/jcop.20517>

Abstract: Through a CBPR partnership, university and American Indian (AI) tribal members developed and tested Our Life intervention to promote mental health of AI youth and their families by addressing root causes of violence, trauma, and substance abuse. Based on premises that well-being is built on a foundation of traditional cultural beliefs and practices, and that it requires a process of healing and understanding, the 6-month intervention had four components: 1) recognizing/healing historical trauma; 2) reconnecting to traditional culture; 3) parenting/social skill-building; and 4) strengthening family relationships through equine-assisted activities. Feasibility, acceptability, appropriateness, and preliminary outcomes were examined in a mixed-method within-group design. Engagement and retention were challenging, suggesting that families faced numerous barriers to participation. Youth who completed the program experienced significant increases in cultural identity, self-esteem, positive coping strategies, quality of life, and social adjustment. Qualitative data supported these findings and suggested additional positive effects.

Grant, Susan E. (2012).

Therapeutic driving builds car driving skills. *Strides*. 2012 Spring; 18(2): 38-42.

On driver rehabilitation and instruction in car driving skills, such as self-direction, autonomy and independence, to those with acquired or developmental disabilities, through therapeutic horse or dressage driving.

Hallberg, M. Leif. (2011).

The role and method of PATH Intl. in sound equine-facilitated psychotherapy practice. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 47-56.

Abstract: The work of a PATH Intl. task force offers a unique view on the practice of equine-facilitated psychotherapy. The context for this orientation lies embedded within the broader and long-standing approach of PATH Intl. to equine-assisted activities and therapies and to the organization's general approach to therapeutic work with horses and other equines. This paper outlines the evolution of PATH Intl.'s approach to equine-facilitated psychotherapy and summarizes the key elements and requirements of that approach, namely use of practice guidelines, standards, certification and accreditation.

Attachment: PATH International. Revised equine facilitated psychotherapy definitions and new EFP guidelines, p.54-56.

Hameury, Laurence; Delavous, Patrice; Leroy, Cathy. (2011).

L'équithérapie dans le project de soins en pédopsychiatrie. *Soins Pédiatrie-Puériculture*. 2011 Jan-Feb; (258): 37-40.

English translation of title: Hippotherapy in the paedopsychiatric care project.

Text in French; abstract also in English.

Abstract: Hippotherapy uses relationships with horses as a mediation method. The care treatment aims to act on the psychological functioning of children affected by relational disorders, especially in order to help the development of communication and emotions. A partnership has been established between the paedopsychiatric university centre at the CHRU in Tours and a horse-riding centre.

Haseman, Susanne; Bartlett, Lasell; Tassel, Abby. (2012).

Experiential education: EFP for sexual and domestic violence survivors. *Strides*. 2012 Fall; 18(4): 38-42.

On the program Getting Wise, an equine facilitated psychotherapy support group for victims of domestic and sexual trauma, and High Horses Therapeutic Riding Program.

Hauge, Hilde; Kvalem, Ingela L.; Berget, Bente; Enders-Slegers, Marie-José; Braastad, Bjarne O. (2013).

Equine-assisted activities and the impact on perceived social support, self-esteem and self-efficacy among adolescents - an intervention study. *International Journal of Adolescence and Youth*. 2013. [21 p.].

DOI: <http://dx.doi.org/10.1080/02673843.2013.779587> (Open access article accessed 23 Dec 2013).

Advanced online publication, 13 Apr 2013.

Abstract: In this project, we examined the effect of a 4-month intervention with horses on perceived social support, self-esteem and general self-efficacy among Norwegian adolescents aged 12-15 years. The intervention took place at farm-based stables and included work with the horses and riding. A waiting-list crossover design was used and the participants

answered questionnaires at three time periods. Study I ($N = 49$) examined the effect of the intervention compared with the control group. Study II ($N = 41$) examined the relationship between the same psychological variables and change in mastering skills with horse. The intervention group reported a significant increase in perceived social support compared with the control group. There were no differences in self-esteem and general self-efficacy between the groups. The results from study II showed that a lower level of perceived social support prior to the intervention predicted an increase in mastering skills with the horse during the intervention.

Hauge, Hilde; Kvaem, Ingela L.; Pedersen, Ingeborg; Braastad, Bjarne O. (2013).

Equine-Assisted Activities for Adolescents: Ethogram-based behavioral analysis of persistence during horse-related tasks and communication patterns with the horse. *Human-Animal Interaction Bulletin*. 2013; 1(2): 34-56.

Available from the website www.apa-hai.org/human-animal-interaction/haib (Accessed 6 March 2013).

Abstract: Earlier studies have indicated that learning to handle a horse through tasks and activities can lead to a feeling of mastery which may have an impact on self-efficacy. The aim of this study was to examine how adolescents conducted horse-related tasks presented to them in an intervention in a farm environment, and whether there was a change during the intervention in persistence on tasks with the horse. Furthermore, we wanted to examine the behavior of the adolescents towards the horse and the response from the horse. Each participant was given an intervention once a week for approximately 16 weeks consisting of tasks with the horse, riding, grooming, and stable work. The sample presented in this study consisted of 29 participants who were successfully video-recorded in the beginning and at the end of the intervention. Petting the horse was the most frequent way of initiating contact with the horse, and the distributions of contact behaviors were the same at both time spots. The response of the horse was mainly neutral or positive. When participants did not succeed at their first attempt when trying to solve a horse-related task or an exercise during riding, their subsequent behavior was recorded as either trying again or not trying again. Early in the intervention, these two options were chosen with about the same frequency, while at the end of the intervention trying again was chosen significantly more often than not trying again. This was operationalized as an increase in persistence when having difficulties in solving tasks with the horse. The increased persistence late in the intervention in retrying tasks may indicate that the adolescents developed a feeling of mastery, which is an important factor in development of self-efficacy.

Holmes, Christian M. P.; Goodwin, Deborah; Redhead, Edward S.; Goymour, Katy L. (2012).

The benefits of equine-assisted activities: An exploratory study. *Child & Adolescent Social Work Journal*. 2012 Apr; 29(2): 111-122.

DOI: <http://dx.doi.org/10.1007/s10560-011-0251-z>

Abstract: This study explores the benefits of equine-assisted-activities (EAA) to adolescents with emotional, behavioural or learning difficulties, expanding on previous

anecdotal evidence by employing quantitative measures and a control activity. Ten adolescent males and one adolescent female attended a racehorse rehabilitation centre, interacting with both live and model horses. Interaction frequency, self-report anxiety and self-esteem were measured. A significant reduction in trait anxiety was found over the course of the programme, however, no changes in self-esteem were reported. Such programmes could reduce anxiety in at risk populations. Further research could deconstruct the study and elucidate the relationships between EAA and psychological well-being.

Jarrell, Nancy. (2009).

A healing triangle: clients learn much about themselves through equine-assisted therapy. *Addiction Professional*. 2009 Jan-Feb; 7(1): 15-20.

Available from the website www.addictionpro.com/article/healing-triangle (Accessed 28 Mar 2012).

Johnson, Margaret P. (2012).

In the midst of multiplicity: How to stay in the saddle. *Psychological Perspectives: a Quarterly Journal of Jungian Thought*. 2012 Jan; 55(1): 11-26.

DOI: <http://dx.doi.org/10.1080/00332925.2012.649200>

Abstract: The author asks the question, how is the human psyche impacted by the current rapid cultural change, globalization, etc., that is presently occurring in our world. She describes the relationship between the horse and the rider as an amplification of the relationship between the psyche and the ego in coping with change. How does one build a good relationship? In times of confusion and rapid change, the horse will likely panic and throw the rider if there is a poor relationship between them. She describes some of the clients in therapeutic riding centers, particularly the more vulnerable teenage clients, as being "unhorsed" – disconnected from their positive instincts – and how this form of therapy is particularly helpful because it reconnects them with their "inner horse." She describes how she learned to develop a bonded relationship with her own horse and how that kind of relationship can operate within a context of the cutting horse competition.

Josten, Katharina; Volmer, Jan. (2012).

Pferde und Dissoziation. Stabilisierungsarbeit mit traumatisierten Menschen im Rahmen pferdegestützter Therapie. *Mensch & Pferd International*. 2012; Heft 3: 108-116.

DOI: <http://dx.doi.org/10.2378/mup2012.art05d>

Text in German; abstract also in English.

English title: Horses and dissociation; Stabilization work in traumatized people in horse assisted therapy.

Abstract: The development of dissociative identity disorders (lat.: dissociare = "separate," "divorce") is a quite common coping strategy for unbearable life situations, but it has nevertheless a great impact on the way of life of such traumatized people. Those affected are often hampered by a sense of paralysis and loss of control, as well as restricted in their ability to relate to other people. This article describes how such dissociative disorders can be detected and treated with horse-assisted therapy.

Kakacek, Sandra L.; Ottens, Allen J. (2008).

An arena for success: exploring equine-assisted psychotherapy. *Michigan Journal of Counseling: Research, Theory and Practice*. 2008; 35(1): 14-23.

Abstract: Equine-Assisted Psychotherapy (EAP) is a relatively new experientially-based therapy that has been applied to individuals, couples, families, and groups. There is a small but growing literature base that speaks to EAP's potential for working with very challenging clients. Adjudicated juveniles diagnosed with Oppositional Defiant Disorder (ODD) are one such group. This paper contains a brief presentation of a case study that illustrates how EAP can be implemented, a description of the evolution of EAP, and a discussion of the hypothesized mechanisms that account for its effectiveness.

Kern, Janet K.; Fletcher, Charles L.; Garver, Carolyn R.; Mehta, Jyutika A.; Grannemann, Bruce D.; Knox, Kandice R.; Richardson, Theresia A.; Trivedi, Madhukar H. (2011).

Prospective trial of equine-assisted activities in autism spectrum disorder. *Alternative Therapies in Health and Medicine*. 2011 May-Jun; 17(3): 14-20.

Comment, "Lost in a lost world," by William Bend, in *Alternative Therapies in Health and Medicine*. 2011 May-Jun; 17(3): 8-9.

Abstract: BACKGROUND: Anecdotal reports and some studies suggest that equine-assisted activities may be beneficial in autism spectrum disorders (ASD).

OBJECTIVE: To examine the effects of equine-assisted activities on overall severity of autism symptoms using the Childhood Autism Rating Scale (CARS) and the quality of parent-child interactions using the Timberlawn Parent-Child Interaction Scale. In addition, this study examined changes in sensory processing, quality of life, and parental treatment satisfaction.

DESIGN AND PARTICIPANTS: Children with ASD were evaluated at four time points: (1) before beginning a 3-to-6 month waiting period, (2) before starting the riding treatment, and (3) after 3 months and (4) 6 months of riding. Twenty-four participants completed the waiting list period and began the riding program, and 20 participants completed the entire 6 months of riding. Pretreatment was compared to posttreatment with each child acting as his or her own control.

RESULTS: A reduction in the severity of autism symptoms occurred with the therapeutic riding treatment. There was no change in CARS scores during the pretreatment baseline period; however, there was a significant decrease after treatment at 3 months and 6 months of riding. The Timberlawn Parent-Child Interaction Scale showed a significant improvement in Mood and Tone at 3 months and 6 months of riding and a marginal improvement in the reduction of Negative Regard at 6 months of riding. The parent-rated quality of life measure showed improvement, including the pretreatment waiting period. All of the ratings in the Treatment Satisfaction Survey were between good and very good.

CONCLUSION: These results suggest that children with ASD benefit from equine-assisted activities.

Lepthien, Maren; Friedrich, Sibylle; Feistritzer, Martins. (2013).

Pferdecoaching zur therapeutischen Unterstützung traumatisierter und psychisch beeinträchtigter junger Menschen. *Mensch & Pferd International*. 2013; Heft 4: 164-173.

DOI: <http://dx.doi.org/10.2378/mup2013.art07d>

Text in German; abstract also in English.

Title in English: Equine-facilitated coaching of traumatized adolescents.

Abstract: This article asks whether equine-facilitated coaching could support the therapy of traumatised adolescents. It is based on a one-year study at the University of Hamburg (July 2009-July 2010), in that six traumatised adolescents, all involved in the child and youth welfare system, participated. The evaluation is based on a mixed method approach.

Lindau-Bank, Detlev. (2012).

Pferdegestützte Personalentwicklung. Einmalig und nachhaltig. *Mensch & Pferd International*. 2012; Heft 4: 153-163.

DOI: <http://dx.doi.org/10.2378/mup2012.art08d>

Text in German; abstract also in English..

Abstract: Der Beitrag setzt sich kritisch mit den grundlegenden Aspekten von pferdegestützten Personalentwicklungsmaßnahmen auseinander. Der Autor führt seit fünf Jahren im Rahmen seiner Dozententätigkeit an der Universität Vechta Lehrforschungsprojekte durch, die den gegenwärtigen Stand der pferdegestützten Angebote im Bereich der Personalentwicklung zum Untersuchungsgegenstand haben. Vor dem Hintergrund dieser Datensammlung werden zunächst die Möglichkeiten der pferdegestützten Personalentwicklung dargestellt, um anschließend Standards und Maßnahmen für die Qualitätssicherung und Personalentwicklung sowie Forschungsdesiderata aufzuzeigen.

English abstract: This article critically engages the topic of horseassisted human resource development. Using a data collection from a variety of training research projects from the University of Vechta, firstly the prospects of horse-assisted human research development will be presented, followed by a depiction of standards and measures of quality insurance and for the development of quality criteria, as well as an illustration of research desiderata.

Lindau-Bank, Detlev. (2013).

Entwicklung von Qualitätsstandards und Professionalisierung in der pferdegestützten Personalentwicklung. *Mensch & Pferd International*. 2013; Heft 2: 78-88.

DOI: <http://dx.doi.org/10.2378/mup2013.art04d>

Text in German; translation of title: Development of standards and professionalism in health personnel involved in therapeutic riding.

Abstract: Die professionalisierung pferdegestützter Personalentwicklung steckt noch in den Kinderschuhen. Bisher gibt es nur einen unabhängigen Verein in Deutschland der erstmalig Qualitätsstandards für pferdegestützte Trainings und Seminare aufgestellt hat. An Hand dieser Standards werden die Potentiale und Herausforderungen ungeklärter Fragen der pferdegestützten Personalentwicklung diskutiert. Unbestritten scheinen die Einmaligkeit des Erlebnisses und die eindruckliche Wirkung auf die professionelle Persönlichkeitsentwicklung des Einzelnen zu sein. Allerdings fehlen Forschungsbeiträge, die die Wirkung der

pferdegestützten Interventionen erklären sowie Konzepte, die einen nachhaltigen Transfer in den Arbeitsalltag sicherstellen.

Luderschmid, Elisabeth; Plümäkers, Andrea. (2014).

Elemente der Montessori-Pädagogik in der Heilpädagogischen Förderung mit dem Pferd. Möglichkeiten der Planung und Umsetzung. *Mensch & Pferd International*. 2014; Heft 1: 13-22.

DOI: <http://dx.doi.org/10.2378/mup2014.art03d>

Text in English; abstract also in English. English title: Elements of Montessori education in horse assisted therapy. Ways of planning and realization.

Abstract: "Help me, to do it myself!" Most of us probably know this famous sentence of the Italian reform educationist Maria Montessori. The Montessori-Education is still relevant today in spite of its long history.

'The child learns through action and experience that it wins by the actions. Therefore, the child needs a special environment and a number of different culture-independent services' (Anderik 1996). Many pedagogical concepts have to create artificial offers and environments. A large part of methodical/didactical and philosophical aspects are covered by working with horses and in nature. There are various similarities to the basic attitudes of horse assisted theory with the theoretical discussion of Montessori education.

Malkin, Marjorie J.; Lloyd, Leslie Freels; Gerstenberger, Deirdre. (2011).

Benefits of the therapeutic horseback riding for an adolescent female with traumatic brain injury. *American Journal of Recreation Therapy*. 2011; 10(2): 17-28.

Abstract: After completion of a recreational therapy assessment, a treatment plan based on a one-year therapeutic horseback riding program was designed and implemented to address the needs of a 13-year-old adolescent female who had sustained a traumatic brain injury. The purpose of this study was to determine if therapeutic horseback riding could improve selected deficits in the adolescent female. Benefits were observed in the areas of increased attention and memory, following directions, sequencing, and horseback riding skills. All gains cannot be solely attributed to the therapeutic horseback riding program but may be part of the cumulative effect of concurrent treatment modalities.

Maujean, Annick; Kendell, Elizabeth; Roquet, Lillan; Sharp, Tony; Pringle, Graham. (2013).

Connecting for health: Playing with horses as a therapeutic tool. *Journal of Community Psychology*. 2013 May; 41(4): 515-522.

DOI: <http://dx.doi.org/10.1002/jcop.21547>

Abstract: This pilot study examined a brief psychological intervention using horses as a therapeutic tool to improve levels of self-esteem, self-efficacy, and facilitate the development of life skills in a group of disengaged youths (n = 16). Participants and their case managers were interviewed after completion of the program to explore their responses to the intervention. Interview transcripts were coded to identify participants' experiences and outcomes. Five themes emerged from these interviews, namely, (a) enjoyment, (b) psychological and social benefits, (c) engagement, (d) transferrable skills, and (e) mechanisms

of change. The findings of this study indicate that this type of intervention may provide a viable option for youths who are disengaged from school and/or the community and who have not responded to traditional interventions.

Memishevikj, Haris; Hodzhikj, Saudin. (2010).

The effects of equine-assisted therapy in improving the psychosocial functioning with children with autism. *Journal of Special Education and Rehabilitation*. 2010; 11(3-4): 57-67.

Text in both Macedonian and English.

Abstract:AIM: To examine the effects of equine-assisted therapy (EAT) on psycho-social functioning of four children with autism spectrum disorders (ASD) and intellectual disability (ID).

PARTICIPANTS: Four children, aged 8-10 years, two boys, two girls, with mild to severe ID and mild to severe symptoms of ASD.

METHODS: The Autism Treatment Evaluation Checklist was used to evaluate effectiveness of methods of treatment for autistic children and adults. EAT took place once a week for ten weeks, each session about 30 minutes. The protocol included horsemanship activities, riding, exercises and EAT tasks. Parents of the children rated them by using the ATEC prior to and at completion of the sessions.

RESULTS: Case 1, an 8 year old girl with a diagnosis of autism and mild ID. Comparing prior and completion ATEC scores, she improved in all four areas, from 20% in Sensory/Cognitive Awareness (SCA) to 25% in Speech/Language/Communication (SLC) domain. Case 2, a 10 year old boy with severe symptoms of autism and of ID; comparing the ATEC scores he made slight progress (3%) in SCA and slight progress (5%) in Health/Behavior. Case 3, a 9 year old girl with autism and mild ID. Comparing her ATEC scores, she improved significantly in all the domains assessed, from 11% in HB to 30% in Socialization. Case 4, a 10 year old boy with severe symptoms of autism and of ID: After seven sessions, he was so aggressive toward the horse, the therapy had to be discontinued for safety reasons.

DISCUSSION: Baseline scores played an important role as predictors of success: two children with favorable initial scores had less space for improvement, and the other two had minimal changes. All children had symptoms of both ID and autism, making the prognosis of autism poor. The two children who had severe ID symptoms did not improve significantly. It is likely the severity of the symptoms and the child's preferences may serve as a predictor of the success of EAT. The case design did not allow statistical tests to be performed. In single-case research participants serve as their own control, and a group design there is usually greater variability between participants. To validate these results it would be necessary to follow-up to see how long-lasting the effects of EAT are.

CONCLUSION: Not all children with ASD will benefit from EAT. As in any other therapy, it is important to assess the children and individualize their therapy to help each child grow with the assistance of the horses.

Available from the website <http://jser.fzf.ukim.mk> (Accessed 7 Jan 2013).

Nevins, Robert; Finch, Sharon; Hickling, Edward J.; Barnett, Scott D. (2013).

The Saratoga WarHorse project: a case study of the treatment of psychological distress in a veteran of Operation Iraqi Freedom. *Advances in Mind-Body Medicine*. 2013 Fall; 27(4): 22-25.

Abstract: OBJECTIVE: We theorized that ability to direct and control a horse will lead to a sense of empowerment, facilitate a relationship between horse and veteran, lead to a decrease in anxiety, and improve physical and social functioning.

METHODS: This case study utilizes the Connection methodology: nonverbal language of the horse in a predictable, sequential, and repeatable method. Psychological testing occurred immediately pre- and post-Connection with follow-up occurring at 2, 4, 6, and 12 wks post-Connection.

PARTICIPANT: Twice-deployed combat medic who served in Operation Iraqi Freedom (OIF).

SETTING: Saratoga Springs, New York.

PRIMARY OUTCOME MEASURES: Beck Depression Inventory-II (BDI-II); Posttraumatic Stress Disorder Checklist (PCL-C); the Response to Stressful Experiences Scale (RSES); the Quality of Life Inventory (QOLI); and the Modified Social Support Survey (MSSS).

RESULTS: The participant demonstrated significant improvement in measures of psychological functioning (eg, over 12 wks); both PCL-C and RSES scores decreased 58% and 44%, respectively. Participant further reported an increase in sleep quality.

CONCLUSION: The results of this case study strongly support the potential for the intervention and indicate the need for a controlled, randomized study that might more stringently investigate the impact of the intervention.

Pendry, Patricia. (2013).

EFL improves children's social competence. *Strides*. 2013 Winter; 19(1): 36-40.

Presents the first year results of the study at the Palouse Area Therapeutic Horsemanship center (Pendry & Roeter 2013), Pullman, Washington. ...[Participants] displayed greater self-awareness and self-management. ...[R]esults demonstrated that children gradually increased the number and strength of positive behaviors and decreased negative behaviors over the 11-week session. ...[C]hanges were most strongly associated with attendance... [C]hildren with greater behavioral challenges at the start of the session appeared to benefit slightly more from program participation than those children fewer challenges and higher baseline levels of positive adaptive behavior... [S]uggests that [the program] may be especially suitable for children considered at high-risk for adjustment problems.

Pendry, Patricia; Roeter, Stephanie. (2012).

Experimental trial demonstrates positive effects of equine facilitated learning on child social competence *Human-Animal Interaction Bulletin*. 2012; 1(1): 1-19.

Available from the website www.apa-hai.org/human-animal-interaction/haib (Accessed 6 Mar 2013).

Abstract: Although equine facilitated programs have gained in popularity over the last decade, virtually nothing is known about the causal effects of equine facilitated interventions

on human development and wellbeing. To address this gap in the literature, researchers conducted a randomized controlled trial to determine if an 11-week equine facilitated learning program enhanced 5th-8th grade children's social competence. Children were recruited for program participation through referral by school counselors and recruitment in schools and community agencies. Researchers then randomly assigned 64 physically and mentally able children to an experimental group or waitlisted control group. Children in the experimental group participated in an 11-week equine facilitated learning program designed to increase social competence through a series of once-weekly, 90-minute sessions of individual, team, and group-focused equine facilitated activities, whereas children in the control group did not until 16 weeks later. Parents of children in both groups provided ratings of child social competence at the beginning and again at the end of the 11-week program. Results indicated significant group differences in mean levels of child social competence at posttest ($p = .020$), suggesting a moderate positive effect of program participation ($d = .61$). Waitlisted children in the control group who completed the program at a later date demonstrated significantly higher posttest levels of social competence after program completion ($p = .000$), compared to their own pretest scores. Using a lagged dependent variable approach, program effects were robust ($p = .026$) when simultaneously considering children's pretest levels of social competence, age, gender, and referral status.

Pendry, Patricia; Smith, Annelise N.; Roeter, Stephanie M. (2013).

Randomized trial examines effects of equine facilitated learning on adolescents' basal cortisol levels. *Human-Animal Interactions Bulletin*. 2014 Mar; 2(1): 80-95.

Available from the website, www.apa-hai.org/human-animal-interaction/category/haib/2014/volume-2-no-1/ (Accessed 22 Apr 2014).

Abstract: Although equine facilitated programs have gained in popularity over the last decade, virtually nothing is known about the causal effects of equine facilitated interventions on human development and well-being. Researchers conducted a randomized trial to determine the effects of an 11-week equine facilitated learning program on the activity of the Hypothalamic Pituitary Adrenal (HPA) axis of fifth through eighth graders through salivary cortisol levels. Children ($N = 131$) referred by school counselors and recruited from the community were randomly assigned to either an experimental ($N = 53$) or waitlisted condition ($N = 60$). Six samples of salivary cortisol were collected in participants' own home over two consecutive days at pretest, and another set of six samples were collected at posttest in both groups of children. Children in the experimental group who participated in a series of once-weekly, 90-minute sessions of equine facilitated activities and lower afternoon cortisol levels ($F(1, 112) = 8.56, p = .017; d = .48$) and lower total cortisol concentration per waking hour ($F(1, 112) = 11.12, p = .017; d = .46$) at posttest, compared to waitlisted children. Multivariate regression analyses showed that program effects were independent from baseline levels of child cortisol, child gender, age, and referral status.

Schäffer, Kathrin; Demory, Pauline. (2012).

Die Basispassprüfung "Pferdekunde" für Menschen mit geistiger/psychischer Behinderung. *Mensch & Pferd International*. 2012; Heft 1: 24-28.

Abstract: Warum sollte eine Basispassprüfung mit Teilnehmern dieser Zielgruppe durchgeführt werden? Bedenkt man die Anstrengung und den Stress, den solch eine Prüfung bedeutet, und zieht man zudem in Betracht, dass für die meisten Menschen Reiten eine Freizeitaktivität ist, die Spaß machen soll, so scheint diese Frage berechtigt. Tatsächlich hat das Projekt unseren Teilnehmern einiges an Lernen, Konzentration und Durchhaltevermögen abverlangt. Gewiss gab es auch einige schlaflose Nächte und ziemlich viel "Bammel" vor dem Tag X. Dennoch sind wir uns alle einig, Teilnehmer und Leiterinnen, dass dieses Ereignis mitsamt seinen Vorbereitungen unbedingt lohnend und nachahmenswert ist. Warum sollte eine Basispassprüfung mit Teilnehmern dieser Zielgruppe durchgeführt werden? Bedenkt man die Anstrengung und den Stress, den solch eine Prüfung bedeutet, und zieht man zudem in Betracht, dass für die meisten Menschen Reiten eine Freizeitaktivität ist, die Spaß machen soll, so scheint diese Frage berechtigt. Tatsächlich hat das Projekt unseren Teilnehmern einiges an Lernen, Konzentration und Durchhaltevermögen abverlangt. Gewiss gab es auch einige schlaflose Nächte und ziemlich viel "Bammel" vor dem Tag X. Dennoch sind wir uns alle einig, Teilnehmer und Leiterinnen, dass dieses Ereignis mitsamt seinen Vorbereitungen unbedingt lohnend und nachahmenswert ist.

Schäffer, Kathrin; Struck, Henrike. (2013).

Unterstützte Kommunikation (UK) in der Heilpädagogischen Förderung mit dem Pferd. *Mensch und Tier International*. 2013; Heft 3: 116-124.

DOI: <http://dx.doi.org/10.2387/mup2013.05d>

Abstract: In der heilpädagogischen Förderung mit dem Pferd (HFP) wird konzeptionell stark über den Bewegungsdialog und die damit implizierte Verbesserung im Beziehungsaufbau und auch in der Kommunikation gearbeitet. Darüber hinaus gibt es im Bewegungsdialog mit dem Pferd vielfältige Fördersituationen, die eine Kommunikationsanbahnung und -erweiterung ermöglichen, wenn sie entsprechend methodisch unterstützt werden. Hier sind die besonderen Einsatzfelder der Unterstützten Kommunikation in der HFP zu sehen. Zur HFP kommen Kinder und Jugendliche, aber zunehmend auch Erwachsene, die bereits über Vorerfahrungen im Bereich der UK verfügen und diese Kenntnisse auch in der Förderung mit dem Pferd angemessen zur Kommunikation nutzen wollen. Der folgende Artikel gibt einen kurzen Einblick in die drei grundlegenden Bereiche der Unterstützten Kommunikation und zeigt die Vor- und Nachteile der einzelnen Verfahren für die HFP. Im nächsten Heft werden dann im Praxistipp weitere Ideen für Materialien vorgestellt.

Schmidt, Julia; Gomolla, Annette. (2012).

Auswirkungen der Reittherapie auf die psychische Befindlichkeit von Patienten mit neurologischen Erkrankungen. *Mensch & Pferd International*. 2012; Heft 4: 148-152.

DOI: <http://dx.doi.org/10.2378/mup2012.art07d>

Text in German; abstract also in English.

English title: Impact of therapeutic riding on the mental wellbeing of patients with neurological illnesses.

Abstract: The psychological well-being of patients in neurological rehabilitation is a significant variable in relation to the success of the treatment. The research question here is whether horse assisted therapy as a complementary technique can improve the condition of neurological patients in rehabilitation. 22 patients from the neurological rehabilitation program were interviewed using the mood scale of Zerssen prior to and after horse assisted therapy. The patients showed a significant improvement in their mental state after the horse assisted intervention, thus it can be a useful complementary therapy in neurological rehabilitation for stabilizing the mental wellbeing of patients.

Selby, Alison. (2011).

A historical perspective of psychotherapy involving equines. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 5-19.

Review article; references, p.13-19.

Abstract: Equine-facilitated psychotherapy is explored in a historical context to enhance understanding of the treatment approach and as a basis for the continued construction of a theoretical framework. An overview of the European and North American history of horsemanship as therapy is presented, and the preeminent professional organizations are identified. Hippotherapy, therapeutic horsemanship, therapeutic riding, and other activities with horses are described as they relate to therapeutic techniques involving equines in a mental health setting. The importance of standardized terminology is emphasized to ensure proper usage, and to promote comprehension and agreement across settings. Some relevant theoretical constructs are suggested, which include animal-assisted therapy, biophilia, myth and metaphor, as well as theories of attachment, neurodevelopment, the therapeutic relationship and exercise; they are identified as important foundational elements of the evolving theoretical underpinnings of this unique form of treatment.

Selby, Alison; Smith-Osborne, Alexa. (2012).

A systematic review of effectiveness of complementary and adjunct therapies and interventions involving equines. *Health Psychology*. 2013 Apr; 32(4): 418-432.

DOI: <http://dx.doi.org/10.1037/a0029188>

Abstract: OBJECTIVE: This systematic review examines the empirical literature in an emerging body of evidence for the effectiveness of biopsychosocial interventions involving equines across populations with chronic illness or health challenges.

METHODS: Selected quantitative studies published in peer-reviewed journals were reviewed for inclusion; the gray literature and white papers were also explored. Population, Intervention, Comparison, and Outcome (PICO) criteria and Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) were applied to all studies. Fourteen full reports meeting a priori inclusion criteria were extracted from 103 studies accessed through 16 electronic databases and a hand search. Data were synthesized in relation to three research questions informing evidence-based practice.

RESULTS: No randomized clinical trials were located. Two studies provided a moderate level of evidence for effectiveness. Nine studies demonstrated statistically significant

positive effects. Three studies did not find significant psychosocial effects for the target group, although one found significant positive effects for the comparison group.

CONCLUSION: In the aggregate, the evidence is promising in support of the effectiveness of complementary and adjunct interventions employing equines in the treatment of health challenges. Future studies are needed that utilize rigorous and creative designs, especially longitudinal studies and comparisons with established effective treatments.

Shambo, Leigh. (2011).

The HEAL model of Equine-Facilitated Psychotherapy and Learning. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 36-46.

Abstract: The HEAL model of Equine-Facilitated Psychotherapy and Learning (EFP/L) focuses on bonding with the horse as treatment of Post-Traumatic Stress Disorder (PTSD) and other clinical disorders. The author draws on literature from the fields of neuroscience, attachment and trauma psychology, and animal science to explain the horse-human bond, and how the bond helps clients resolve troubled emotional history. Methods are explained including the clinical framework of treatment planning, the facilitator's focus and responsibilities, and the typical progression of clients through beginning, middle and final stages of therapy. A case vignette and excerpts from qualitative data gathered from clients treated with this model are presented. These support the author's hypothesis that the bond with the horse enables the client to form new neural pathways in the limbic (i.e. emotional-social) part of the brain.

Siporin, Sheldon. (2012).

Talking horses: equine psychotherapy and intersubjectivity. *Psychodynamic Practice*. 2012 Nov; 18(4): 457-464.

DOI: <http://dx.doi.org/10.1080/14753634.2012.719744>

Abstract: Drawing on the play *Equus*, this article discusses equine psychotherapy and intersubjectivity. In the play a teenage boy displays a pathological fascination with horses. A psychiatrist is consulted, and discovers that the horse embodies powerful religious and sexual signification for the boy, along with possible therapeutic effect. Even the psychiatrist has strong emotional responses towards the animal. While the treatment outcome in *Equus* is unclear, what is clear is that horses are potent psychological symbols. Gestural and body language, implicit in therapist-client relations, is explicit in human-horse communication. This urges the expansion of client awareness and may evoke early parent-infant interaction patterns. Thus, with the human therapist's careful guidance and interpretation, equine-assisted psychotherapy (EAP) may promote emotional healing and empathic growth.

Smith-Osborne, Alexa; Selby, Alison. (2010).

Implications of the literature on equine-assisted activities for use as a complementary intervention in social work practice with children and adolescents. *Child & Adolescent Social Work Journal*. 2010 Aug; 27(4): 291-307.

DOI: <http://dx.doi.org/10.1007/s10560-010-0201-1>

Abstract: This article reviews the literature investigating psychosocial benefits of equine-assisted activities (EAA) for children and adolescents with physical, mental, and family challenges. It further analyzes implications for clinical social work practice in the use of EAA as complementary or adjunct interventions with these populations, thus addressing a gap in the literature on population-specific outcomes of EAA. As a contribution to methodology in future research, the conceptual analysis suggests that concurrent examination of complementary interventions across categories of special needs could add to the knowledge base concerning these children's psychosocial status. Cross-domain investigations could also assess the contribution of each challenge to the status of children with multiple conditions.

Stefanon, Andra Bryan. (2013).

Wounded Warriors partner with horses. *Strides*. 2013 Spring; 19(2): 36-39.

John Brummet, an Iraq war veteran and PATH Intl. Certified Registered Instructor at Magic Moments Riding Therapy, a PATH Intl. Premier Accredited Center in Diamond, MO, plans to work with veterans through PATH Intl.'s partnership with the Wounded Warrior Project.

Thomas, Lynn. (2011).

The EAGALA model of equine assisted psychotherapy and learning. *Scientific and Educational Journal of Therapeutic Riding*. 2011; 20-24.

Abstract: The Equine Assisted Growth and Learning Association (EAGALA), established twelve years ago has a unique approach to equine assisted psychotherapy and learning, which is based firmly on sound professional principles in horsemanship, psychotherapy and pedagogy. This paper outlines the development and basis of the EAGALA model, and also provides practical examples of its application in practice.

Walsh, Kathleen M.; Blakeney, Barbara A. (2013).

Nurse presence enhanced through Equus. *Journal of Holistic Nursing*. 2013 Jun; 31(2): 121-128.

DOI: <http://dx.doi.org/10.1177/0898010112474721>

Abstract: PURPOSE: The purpose of this study was for nurses to experience equine-assisted learning and for them to describe their being in the moment with their horse. The aims of the study were to assist clinicians in recognizing their ability and skill at being present--that is, calm and centered--as they engage with horses and to determine if interaction with horses is a valid representation in recognizing presence in the participants.

DESIGN: Descriptive phenomenology was used to explore this lived experience.

FINDINGS: Five themes emerged: The Experienced Novice, Present in the Moment, Discovery of Self, Team Building, and Leadership.

CONCLUSIONS: Equine-assisted learning can be a meaningful venue for nurses to self-discover their ability to be present.

Ward, Sandra C.; Whalon, Kelly; Rusnak, Katrina; Wendell, Kimberly; Paschall, Nancy. (2013).

The Association between therapeutic horseback riding and the social communication and sensory reactions of children with autism. *Journal of Autism and Developmental Disorders*. 2013 Sep; 43(9): 2190-2198.

DOI: <http://dx.doi.org/10.1007/s10803-013-1773-3>

Abstract: This study investigated the association between therapeutic riding (TR) and the social communication and sensory processing skills of 21 elementary students with autism attending TR as part of a school group. An interrupted treatment design was employed to determine whether children were able to maintain treatment effects following the removal of TR. Teacher ratings indicated that participating children with autism significantly increased their social interaction, improved their sensory processing, and decreased the severity of symptoms associated with autism spectrum disorders following TR. Gains were not maintained consistently after two 6-week breaks from TR, but were recovered once TR was reinstated. Potential explanations regarding the benefits of TR are discussed, and suggestions for future research provided.

Wendell, Kim; Rusnak, Kat. (2013).

Teaching techniques for children with autism spectrum disorder. *Strides*. 2013 Winter; 19(1): 30-34.

On research into the positive impact of therapeutic riding for children with ASD and to quantify the improvements held at the Cori Sikich Therapeutic Riding Center, Williamsburg, Virginia, in collaboration with Sandra Ward and Kelly Whalon at the College of William & Mary School of Education.

Side bar, p.34: Study results, by Dr. Sandra Ward.

Winkler, Nora; Beelmann, Andreas. (2013).

Der Einfluss pferdegestützter Therapie auf psychische Parameter. Eine quantitative Zusammenfassung des Forschungsstands. *Mensch und Tier International*. 2013; Heft 1: 4-16.

DOI: <http://dx.doi.org/10.2378/mup2013.art01d>

Text in German; abstract also in English.

English title: Effects of equine-assisted activities and therapies on psychological functions in children and adolescents: a meta-analysis.

Abstract: The effectiveness of equine-assisted activities and therapies (EAAT) on children and adolescents in terms of psychological benefits has ever been investigated in one US-American meta-analysis by Graves (2011). A meta-analysis involving EAAT studies from the German and English-speaking worlds has not yet been undertaken. Apart from the overall effect size, a number of factors were examined to identify beneficial components of EAAT as well as the methodological quality of the studies. Overall, EAAT was found to have a moderate to large effect on psychological domains with Cohen's $d = .64$, generated from 19 studies. Furthermore, the analysis revealed a significant increase in effectiveness the longer the duration of the treatment carried out, as well as the tendency that therapies held in a group setting produce higher effect sizes compared to individual settings. With regard to methodological factors, it was found that studies with a poor quality design had significantly higher mean effect sizes than those of high quality. In addition, the analysis indicated objective

research instruments such as standardized tests and physiological measures as most suitable for assessing the effectiveness of EAAT. The present study illustrates quality research is still needed in this field of research, but previous results are promising.

Wössner, Gaby; Mori, Alexandra. (2013).

Ergotherapie und Logopädie mit dem Medium Pferd. *Mensch & Pferd International*. 2013; Heft 4: 184-188.

Abstract: Die ergotherapeutische und logopädische Behandlung mit dem Pferd ist eine medizinisch-therapeutische Maßnahme, bei welcher das Pferd gezielt als Medium eingesetzt wird. Kinder, Jugendliche und Erwachsene empfinden es als etwas ganz Besonderes, auf dem Pferderücken zu sitzen und die Wärme, die Rhythmik der Bewegungen und das Gefühl des Getragenwerdens zu spüren. Auf dem Pferd werden das Gleichgewicht und die Muskulatur gestärkt und Körper- und Sinneswahrnehmungen auf der emotionalen Ebene angesprochen. Der Kontakt zum Pferd hat positive Auswirkungen auf soziale Kompetenzen wie Einfühlungsvermögen, Selbstständigkeit und Verantwortungsbewusstsein. Auch die Konzentration und Aufmerksamkeit werden gefördert und verbessert.

Die Therapie mit dem Medium Pferd bietet die Möglichkeit der Förderung ohne Therapiecharakter. Die Ganzheitlichkeit einer therapeutischen Einheit kann so optimal genutzt werden.

Yorke, Jan; Nugent, William; Strand Elizabeth; Bolen, Rebecca; New, John; Davis, Cindy. (2012).

Equine-assisted therapy and its impact on cortisol levels of children and horses: a pilot study and meta-analysis. *Early Child Development and Care*. 2013 Jul; 183(7): 874-894.

DOI: <http://dx.doi.org/10.1080/03004430.2012.693486>

Abstract: Childhood trauma, abuse or neglect impacts the function and structure of the brain of affected children. Attunement with other beings as well as an enriched environment can contribute to normal brain development. The enriched environment of a barn and attunement with an animal may contribute to reductions in stress for traumatised children. A pilot study, using a multiple base line, single case design included four children with post-traumatic stress syndrome (aged eight to ten years) and four therapy riding horses. This study hypothesised that cortisol would correlate between each child-horse pair, using a 12-day intervention that included six consecutive days of riding and grooming. A meta-analysis was completed of correlation levels of four child-horse pairs. The weighted mean cross-correlation, controlling for autocorrelation, was 0.23, $Z = 3.03$, approximate 95% confidence interval $0.23 \pm (1.96 \times 0.076)$ or 0.08 to 0.38. The data suggest a need for further research.

Mental Health & Learning : Theses

Frederick, Karen. (2013).

Understanding the impact of Equine-Assisted Learning on levels of hope in at-risk adolescents. 2013.

Unpublished thesis – Baylor University, 2013.

Abstract: In this study, the researcher uses an experimental design to investigate the impact of five-week intervention of group Equine-Assisted Learning (EAL) on levels of hope, self-efficacy, and depression in at-risk adolescents. A randomized, longitudinal, repeated measures method is utilized with a treatment group and a control group. Participants in the experimental group participated in a five-week equine-assisted intervention entitled Leading Adolescents to Successful School Outcomes (LASSO) in addition to receiving the regularly provided services of their school. Participants in the control group received only the regularly provided services of their school counselors. Analysis of variance was used to analyze the main effects of the treatment on measurements of hope, self-efficacy, and depression utilizing the Adolescent Domain-Specific Hope Scale (Frederick, 2011), the New Generalized Self-Efficacy Scale (Chen et al. , 2001), and the Major Depression Inventory (Bech, 1998; Bech et al., 2001). Data was collected pre- and post-intervention, as well as weekly during the intervention.

Abstract from *Dissertation Abstracts International Section A: Humanities and Social Sciences*. 2013 Jul; 74(1-A):

Dissertation number: AAI3524352

PsycINFO Accession number: 2013-99130-584

ProQuest document ID: 1417863412

Sakai, Janine. (2012).

Attachment theory and the therapeutic relationship: Implications for Equine Facilitated Psychotherapy (EFP) and the human-animal bond. 2012. [196] leaves.

Unpublished thesis (M.A.) – Counseling Psychology, Adler School of Professional Psychology, 2012.

Abstract: Research has identified several physical, emotional, and psychological benefits associated with the human-animal bond. Animals have been used in a variety of different therapies including physical therapy and more recently psychotherapy. The use of equines in psychotherapy is an innovative approach that might be used as a viable form of therapy regardless of theoretical orientation and may be implemented as an adjunct to many types of therapy approaches. Equine-Facilitated Psychotherapy (EFP) focuses on psychotherapeutic benefits for individuals with mental health difficulty using horses that can be utilized in a variety of psychotherapy settings. Efforts toward professionalizing equine-facilitated mental health practices are in their infancy and there is a general lack of consensus around a theoretical proposal of how or why the human-equine relationship might benefit

people's psychological health contributing to psychosocial well-being. This paper involves a theoretical exploration of these benefits by applying a theoretical lens to this relationship and the purpose is to propose a theoretical model to better understand Equine-Facilitated Psychotherapy. The paper focuses on applying principles of Attachment Theory to the human-equine relationship for psychotherapeutic purposes. The writer concludes that EFP can be understood through attachment theory/therapy principles and that through an attachment relationship between client and equine therapeutic change is possible. Attunement, internal working models, and the corrective emotional experience were found to be key mechanisms of change in the equine-client therapeutic relationship.

Abstract from *Masters Abstracts International*. 2014 May; 52(4).

ISBN: 9781303600333

Dissertation/thesis number: 1549013

ProQuest document ID: 1475203082

Stebbins, Tira. (2012).

Effects of an Equine Assisted Activities program on youth with emotional disturbance: A pilot study. 2012. [139] leaves.

Unpublished thesis – Cleveland State University, 2012.

Abstract: This study evaluated the effects of a 10-week Equine Assisted Activities (EAA) program on special education students (aged 9 to 15) identified as Emotionally Disturbed (ED) who were enrolled in an alternative school. A control group of special education students receiving treatment-as-usual was included. The Behavior Assessment Scale for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004) measured change in emotional, behavioral, and school functioning, and adaptive skills. The Self-Report of Personality (SRP), Teacher Report Scale (TRS) and Parent Report Scale (PRS) forms of the BASC-2 (Reynolds & Kamphaus, 2004) were used to triangulate outcome data reported by the students, teachers, and parents. Two central hypotheses were tested. First, the treatment group would evidence significant reductions in emotional, behavior, and school problems and significant increases in adaptive skills as compared to the control group at post-test; these improvements, in turn, would be maintained at a three-month follow-up. Second, the treatment group would evidence significantly fewer missed school days, higher GPAs, and higher behavioral point percentages at post-test in comparison to the control group; these improvements, in turn, would be maintained at a three-month follow-up. Results indicated that, according to teachers' ratings, participants who participated in 10 weeks of EAA intervention had statistically significant reductions in Externalizing Problems scores and marginally significant reductions in Behavior Symptoms Index BASC composite scores. Results were not significant for all other variables; however, students tended to under-report symptoms and over-report adaptive skills. Although there are over 40,000 individuals with disabilities receiving services from EAA programs every year, there is scant experimentally designed research which has tested the effects of such programs. The present study, therefore, makes an important contribution to the field of EAA research. Future directions for research and clinical practice were explored.

Abstract from *Dissertation Abstracts International: Section B: The Sciences and Engineering*. 2013 Aug; 74(3-B):

ISBN: 9781267674838

Dissertation number: AAI3529848

ProQuest document ID: 1411060510

Toukonen, Margaret Cuffari. (2011)

The relationship between adolescent girls and horses: Implications for equine-assisted therapies. ©2011. ix, 129 leaves.

Unpublished thesis (Ph.D.) – Kent State University, 2011.

Abstract: Most mental health disorders begin in adolescence. Because earlier interventions result in better outcomes, the search for effective therapies for at-risk adolescents has intensified. There is anecdotal evidence that equine-assisted mental health therapy programs improve coping and build skills in adolescent girls with mental health problems. The value of working with horses in a therapeutic modality is presumed to be based on the adolescent girl-horse relationship, yet the nature of this relationship has not been described or explained. The purpose of this research was to describe the essence of the relationship between adolescent girls and horses in order to obtain a greater understanding of the potential benefits of equine-assisted therapies for adolescent girls.

An interpretive qualitative approach, based on Heideggerian philosophy, was used to examine the nature of the relationship from the perspective of the adolescent girls. To provide a broad understanding of the relationship, two groups of adolescent girls were purposefully sampled (N = 19). One group consisted of girls who had a variety of behavioral and emotional problems and were participating in an equine-assisted therapy program (n = 9). The second group included girls from local riding stables who were naturally attracted to horses and rode for pleasure (n = 10). Using open-ended questions, the girls were asked to describe their relationships with horses. The interviews were audio taped and transcribed. The data were analyzed in a disciplined and systematic manner according to procedures outlined by Diekelmann and Allen (1989). The themes identified were *sharing physical affection, being there for each other, being connected, dealing with stress, being good at something, and being a better person.*

The findings illustrate that adolescent girls derive important benefits from their relationships with horses. The experiences of girls with their horses during equine-assisted therapy can provide a context and focus for psychotherapy and counseling, suggesting that the two types of therapy should be integrated. This study offers promising information into understanding the relationship between adolescent girls and horses and a foundation for future research in this area.

Abstract from *Dissertation Abstracts International, Section B*. 2012 Jun; 72(12-B).

Publication Number: AAT 3475855

Wekenman, Jayna.

Becoming More Equine-Centered: A Curriculum to Enrich Experiential Learning Programs and the Equines They Employ. 2011. [92] leaves.

Unpublished thesis (M.A.) – Prescott College, Arizona, 2011.

Abstract: This thesis is a proposed curriculum for organizations to explore how their organizational procedures, personnel, and programming may affect their equines' physical,

mental, and emotional health; why this may affect program outcomes; and what organizations and personnel can do to become more equine-centered. Topics covered include: learned helplessness, equine consciousness, authenticity, domestic equine behavior, wild equine behavior, experiential learning, and flow theory. Also, the concepts of enrichment and Jaime Jackson's (2006) Paddock Paradise are introduced. This curriculum is formatted to be facilitated as multiple individual workshops or as a single multi-day workshop for one organization, multiple organizations, and/or individuals. This curriculum in its entirety has not been tested.

Abstract is taken from *Masters Abstracts International*. 2011 Oct; 49(5).

ISBN: 9781124652252

Dissertation number: 1492744

ProQuest document ID: 871217673

Whitely, Ruth. (2009).

Therapeutic benefits of equine assisted psychotherapy for at-risk adolescents. 2009. [150] leaves.

Unpublished thesis (Ph.D.) – Texas A&M University, Commerce, 2009.

Abstract: The purpose of this study is to investigate and explore the therapeutic benefits of equine assisted psychotherapy/equine facilitated psychotherapy (EAP/EFP) in the treatment of at-risk adolescents, utilizing a mixed methods design. The research question of interest is, what are the therapeutic benefits of utilizing EAP/EFP with at-risk adolescents as measured by The Youth Outcome Questionnaire-Self Report (Y-OQ-2.0 SR; Wells, Burlingame, Rose, & Lambert, 2005) and The Youth Outcome Questionnaire parent/guardian version (Y-OQ-2.0; Burlingame et al., 1996) and as perceived by the participant's themselves? The Y-OQ-2.0 SR and the Y-OQ-2.0 measures are used as a pretest/posttest measures along with along with structured interviews, behavioral observation, and session notes, the researcher explores the participant's perceptions of the therapeutic benefits of EAP/EFP. Statistical significance differences were evident in the Y-OQ-2.0 guardian measure, $t(10) = p .002$. Qualitative data analysis revealed seven major themes: (a) relationship skills, (b) emotional awareness, (c) responsibility, (d) self-control, (e) self-awareness, (f) self-concept, and (g) empathy. This study indicates that participation in EAP/EFP led to reduction in maladaptive behaviors and emotional symptoms, as perceived by the Y-OQ measures, and individual interviews conducted with participants.

Abstract from *Dissertation Abstracts International, Section B*. 2010 Oct; 71(4).

ISBN: 9781109720273

Dissertation number: 3405795

ProQuest document ID: 251078813