Hippotherapy

Policy # 00066
Original Effective Date: 08/25/2003
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Services Are Considered Investigational
Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers hippotherapy to be **investigational.***

Background/Overview

AMBULATION AND BALANCE DISORDERS
Patients with spastic cerebral palsy frequently have impaired walking ability due to hyperactive tendon reflexes, muscle hypertonia, and increased resistance to increasing velocity of muscle stretch. These abnormalities result in a lack of selective muscle control and poor equilibrium responses.

Hippotherapy
Hippotherapy has been proposed as a technique to decrease the energy requirements and improve walking in patients with cerebral palsy. It is thought that the natural swaying motion of the horse induces a pelvic movement in the rider that simulates human ambulation. Also, variations in the horse's movements can prompt natural equilibrium movements in the rider.

Hippotherapy is also being evaluated in patients with multiple sclerosis and other causes of gait disorders, such as strokes.

As a therapeutic intervention, hippotherapy is typically conducted by a physical or occupational therapist and is aimed at improving impaired body function. Therapeutic horseback riding is typically conducted by riding instructors and is more frequently intended as social therapy. It is hoped that the multisensory environment may benefit children with profound social and communication deficits, such as autism spectrum disorder and schizophrenia. When considered together, hippotherapy and therapeutic riding are described as equine-assisted activities and therapies.

This evidence review addresses equine-assisted activities that focus on improving physical functions such as balance and gait.

FDA or Other Governmental Regulatory Approval

U.S. Food and Drug Administration (FDA)
Not applicable.

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Centers for Medicare and Medicaid Services (CMS)
There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

Rationale/Source

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function—including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice. The following is a summary of the key literature to date.

CEREBRAL PALSY
Systematic Reviews
A number of systematic reviews on hippotherapy in children with cerebral palsy (CP) have been published. A 2013 meta-analysis included 5 studies on therapeutic horseback riding and 9 studies on hippotherapy (total N=277 children with spastic CP). Included in the analysis were RCTs and observational studies that compared pre- with post riding results; 10 of the 14 studies provided level 4 evidence. Reviewers evaluated Gross Motor Function Measures (GMFM) across studies; meta-analysis indicated that short-term hippotherapy (8-10 minutes of total riding time) significantly reduced the asymmetrical activity of the hip adductor muscles and could improve postural control in cases of spastic CP (Gross Motor Function Classification System level <5). However, long-term hippotherapy or therapeutic riding (8-22 hours) did not have a statistically significant effect on GMFM in children with spastic CP. Methodologic limitations included the use of nonvalidated outcome measures, lack of clinically meaningful differences between groups, and in the meta-analysis specifically the inclusion of observational studies (pre-post comparisons) without control groups.

Zadnikar and Kastrin (2011) published a meta-analysis of hippotherapy and therapeutic horseback riding in children with CP. Eight studies meeting inclusion criteria (quantitative study design, outcomes that included postural control or balance) were selected. The meta-analysis included 84 children with CP in the intervention groups and 89 children in the comparison groups (39 with CP, 50 with a disability). The treatment effect on postural control or balance showed a positive effect in 76 (90%) of the 84 children in the intervention groups. In the comparison group of 39 children with CP, 21 (54%) experienced positive effects from the comparison treatment, which consisted of a continuation of their weekly physical therapy and/or occupational therapy, or sitting on a barrel or in an artificial saddle. Although this difference was statistically significant ($p<0.001$), the clinical significance of the effect cannot be determined from this analysis. Also, the analysis found heterogeneity among the studies, which typically would preclude meta-analysis, and a funnel plot showed asymmetry, indicating possible publication bias. Finally, the inclusion of poor-quality studies in the meta-analysis further limited clinical interpretation.

Randomized Controlled Trials

A 2009 RCT included children ages 4 to 12 years with CP who completed a 10-week session of hippotherapy with pre- and posttreatment assessments obtained from 72 families (representing 35 intervention, and 37 control subjects). Randomization to hippotherapy or a waiting-list control with usual therapy was stratified by age and level of gross motor function. The physical therapist assessor was blinded to randomization, and participants were asked not to mention if they had completed the intervention at the time of the assessment. No differences between the hippotherapy and control groups were found for functional status (therapist-assessed) or child-reported quality of life. Minor differences were found in the parent-reported quality of life and child health scores in the domain of family cohesion. Overall, hippotherapy did not have a clinically significant impact on children with CP.

McGibbon et al (2009) investigated the impact of hippotherapy on the symmetry of adductor muscle activity during walking in children with spastic CP. In phase 1 of the trial, 47 children (age range, 4-16 years) with spastic CP were randomized to a single 10-minute session of hippotherapy or barrel sitting. Adductor muscle symmetry was measured before and after the session. The hippotherapy group demonstrated a statistically significant difference in adductor symmetry after this single intervention. Six children went on to participate in a phase 2, 36-week study (12 weeks without hippotherapy [baseline], 12 weeks of weekly hippotherapy, 12 weeks without intervention). Four of 6 subjects showed improved symmetry during walking after 12 weeks of hippotherapy; this improvement was maintained for an additional 12 weeks posttreatment. All 6 children improved on the 66-item Gross Motor Function Measure (GMFM-66), and 1 child began walking without a walker after 4 weeks of hippotherapy. Five children improved in at least 1 area of the Self-Perception Profile. The authors noted that the trial had a small sample size in phase 2, spasticity was diversely distributed among subjects, and inclusion criteria led to a sample with mixed characteristics.

Benda et al (2003) used remote surface electromyography to assess outcomes in 15 children (age range, 4-12 years) with CP who were randomized to 8 minutes of hippotherapy or sitting stationary astride a barrel.

The authors reported that the hippotherapy group showed greater symmetry of muscle activity. The clinical significance of this outcome is uncertain.

Kwon et al (2015) published an RCT of hippotherapy in children (age range, 4-10 years) with CP. Ninety-one subjects were randomized to hippotherapy (30 minutes twice weekly) or home-based aerobic exercise, both for 8 consecutive weeks. Significant differences in composite measures of gross motor function improvement using the GMFM-88 and -66 were observed between groups. Trial limitations included the unclear clinical significance of the outcomes, uncertain attributes of the control group treatment, and lack of long-term outcomes.

Case Series
Sterba et al (2002) reported on the results of an 18-week horseback riding intervention in 17 subjects with CP. GMFM was assessed before and after a once weekly horseback riding program; after 18 weeks, GMFM total score improved by 7.6% and returned to baseline 6 weeks after the program ended.

Section Summary: Cerebral Palsy
We identified 4 RCTs comparing hippotherapy with a control, only one of which involved usual physical therapy and blinded outcomes assessment. The trial with blinded outcome assessment showed no difference between groups in functional status at follow-up, while other trials reported significant between-group differences, which suggests that observed differences might have been due to bias.

MULTIPLE SCLEROSIS
The use of hippotherapy for patients with multiple sclerosis (MS) was addressed in a 2010 systematic review of 3 studies. Included in the review was a comparative study by Silkwood-Sherer and Warmbier (2007), which found that 14 weekly sessions of hippotherapy significantly improved balance in 9 patients with MS compared with a control group of 6 patients. Each of the other 2 studies in the review, both case series, included 11 subjects; these series also reported improvements in balance with hippotherapy. Reviewers concluded that these studies provided emerging evidence that hippotherapy could improve balance in persons with MS, although they acknowledged the small sample sizes, lack of randomization (especially given the variable nature of MS), and lack of controls in 2 studies.

A 2011 study compared therapeutic horseback riding (with nontherapist riding instructors) with traditional physical therapy in 27 patients who had MS. The therapeutic horseback riding focused on progressively challenging the rider's motor skills and the individualized physical therapy consisted of aerobic, balance, strengthening, and flexibility exercise sessions. The interventions were self-selected and were provided in 20 sessions over 6 months. The therapeutic horseback riding group showed a significant improvement on the balance subscale of the Tinetti Performance Oriented Mobility Assessment and 2 gait parameters (stride time, ground reaction forces). Five (42%) of 12 horseback riders showed a clinically significant improvement. Gait speed and cadence and scores on the Extended Disability Status Scale and the Barthel Index did not improve. No significant change was found in the control group. It was not reported whether the

changes found after therapeutic horseback riding were significantly greater than those of the physical therapy control group.

In an RCT, Frevel and Maurer (2015) compared an Internet-based home training program with hippotherapy in 18 patients who had MS. In this trial, hippotherapy was considered the control intervention and the home training program the experimental intervention. Although both intervention groups showed significant improvements in static and dynamic balance capacity, no significant differences were found between groups. The trial had weak statistical power to detect a difference between treatments. It cannot be determined from this trial whether hippotherapy is more effective than standard physical therapy.

Section Summary: Multiple Sclerosis
Current evidence on the use of hippotherapy to treat MS is inconclusive and the studies conducted have been flawed.

STROKE
Lee et al (2014) conducted a small randomized trial assessing hippotherapy for recovery of gait and balance in 30 patients poststroke. Patients were selected if they could walk independently or with a walking aid, had spasticity in a paretic lower extremity as graded by a score of less than 2 on the Ashworth Scale, and could train for more than 30 minutes. Patients were randomized to hippotherapy or treadmill for 30 minutes, 3 days a week, for 8 weeks. At the end of training, gait speed and step length asymmetry ratio were assessed, and balance was measured with the Berg Balance Scale. The hippotherapy group showed significant improvements in balance, gait speed, and step length asymmetry, while the treadmill training group improved only in step length asymmetry. Improvements in gait speed and step length asymmetry were significantly greater for the hippotherapy group than for the treadmill group.

Section Summary: Stroke
The current evidence base on the use of hippotherapy to treat stroke is not sufficiently robust to draw conclusions about efficacy.

OTHER GAIT AND BALANCE DISORDERS
Comparative studies of hippotherapy and treatments for the outcomes other than balance and gait have been conducted in community-dwelling subjects. Although they showed some improved outcomes, the study subjects did not have any balance or gait disorders, and so the clinical importance of the findings is unclear. A 2013 prospective U.S. study of 9 older adults (mean age, 76.4 years) with balance deficits found improvements in balance and quality of life measured with a pretest-posttest design. Without a comparison group, it is uncertain to what extent the improvements can be attributed to hippotherapy.

Silkwood-Sherer et al (2012) reported on the efficacy of hippotherapy in a convenience sample of 16 children with mild-to-moderate balance deficits secondary to a variety of disorders. The most common diagnoses were CP (n=5), Down syndrome (n=3), developmental coordination disorder (n=2), and autism

(n=2). Baseline and posttreatment Pediatric Balance Scale tests were videotaped and sent in random order to 3 pediatric physical therapists for scoring. The Activities Scale for Kids–Performance questionnaires were completed by the children or their parents. Hippotherapy sessions, conducted twice weekly for 6 weeks, yielded significant improvements on the Pediatric Balance Scale (from a median of 49.0 to 53.0) and the Activities Scale for Kids–Performance (from a median of 81.7 to 92.1). This trial lacked a control group.

Giagazoglou et al (2012) reported on the effect of hippotherapy on balance and strength in a controlled trial of 19 adolescents with intellectual disability. Balance and strength were assessed using a pressure platform before and after 10 weeks of both hippotherapy (n=10) and the nonintervention control (n=9). There were no significant differences between groups in double leg stance or left leg stance; however, there were significant group-by-time interactions in balance with the right leg stance. Measures of strength were improved following hippotherapy, with significant group-by-time interactions. This study is lacked an active therapy control group.

In another small study (2007) of 12 patients with spastic spinal cord injury, hippotherapy resulted in short-term improvements in spasticity and well-being.

Section Summary: Other Gait and Balance Disorders
Current evidence has suggested potential benefit in the treatment of other gait and balance disorders with hippotherapy, but the relevant studies lack control groups, which limits the conclusions that can be drawn.

SUMMARY OF EVIDENCE
For individuals who have cerebral palsy, multiple sclerosis, stroke, or gait and balance disorders other than cerebral palsy, multiple sclerosis, and stroke who receive hippotherapy, the evidence includes systematic reviews, randomized trials, and case series. Relevant outcomes include symptoms and functional outcomes. Studies in cerebral palsy, multiple sclerosis, stroke, and other indications have had variable findings. The randomized trials are generally small and have significant methodologic problems. In the largest randomized trial conducted to date (72 children), which had blinding outcome assessment, hippotherapy had no clinically significant impact on children with cerebral palsy. There are no randomized controlled trials showing that hippotherapy is superior to alternative treatments for patients with multiple sclerosis. Hippotherapy for other indications has been compared primarily with no intervention and has not been shown to be more effective than other active therapies. The evidence is insufficient to determine the effects of the technology on health outcomes.

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Policy History

Original Effective Date:	08/25/2003
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08/03/2005	Medical Director review
08/16/2005	Medical Policy Committee review. Format revision. Rationale/Source added. Coverage eligibility unchanged.
08/24/2005	Managed Care Advisory Council approval

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07/07/2006	Format revision, including addition of FDA and or other governmental regulatory approval and rationale/source. Coverage eligibility unchanged.
09/05/2007	Medical Director review
09/19/2007	Medical Policy Committee approval. No change to coverage eligibility.
09/03/2009	Medical Policy Committee approval
09/16/2009	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
09/09/2010	Medical Policy Committee review
09/15/2010	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
09/01/2011	Medical Policy Committee review
09/14/2011	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
09/06/2012	Medical Policy Committee review
09/19/2012	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
09/05/2013	Medical Policy Committee review
09/18/2013	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
09/04/2014	Medical Policy Committee review
09/17/2014	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
08/03/2015	Coding update:ICD10 Diagnosis code section added; ICD9 Procedure code section removed.
10/08/2015	Medical Policy Committee review
10/21/2015	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
10/06/2016	Medical Policy Committee review
10/19/2016	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
01/01/2017	Coding update: Removing ICD-9 Diagnosis Codes
10/05/2017	Medical Policy Committee review
10/18/2017	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
10/04/2018	Medical Policy Committee review
10/17/2018	Medical Policy Implementation Committee approval. Coverage eligibility unchanged.

Next Scheduled Review Date: 10/2019

Coding

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Codes used to identify services associated with this policy may include (but may not be limited to) the following:

Code Type	Code
CPT	No codes
HCPCS	S8940
ICD-10 Diagnosis	G80.0 G80.1 G80.2 G80.4 G80.8 G80.9

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A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. FDA and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or
B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:
    1. Consultation with the Blue Cross and Blue Shield Association technology assessment program (TEC) or other nonaffiliated technology evaluation center(s);
    2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
    3. Reference to federal regulations.

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