Hippotherapy

Policy Number: 8.03.12  Last Review: 7/2017
Origination: 7/2008  Next Review: 1/2018

Policy
Blue Cross and Blue Shield of Kansas City (Blue KC) will not provide coverage for Hippotherapy. This is considered investigational.

When Policy Topic is covered
Not Applicable

When Policy Topic is not covered
Hippotherapy is considered investigative.

Description of Procedure or Service

<table>
<thead>
<tr>
<th>Populations</th>
<th>Interventions</th>
<th>Comparators</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals: With cerebral palsy</td>
<td>Interventions of interest are: Hippotherapy</td>
<td>Comparators of interest are: Standard clinical management</td>
<td>Relevant outcomes include: Symptoms, Functional outcomes</td>
</tr>
<tr>
<td>Individuals: With multiple sclerosis</td>
<td>Interventions of interest are: Hippotherapy</td>
<td>Comparators of interest are: Standard clinical management</td>
<td>Relevant outcomes include: Symptoms, Functional outcomes</td>
</tr>
<tr>
<td>Individuals: With stroke</td>
<td>Interventions of interest are: Hippotherapy</td>
<td>Comparators of interest are: Standard clinical management</td>
<td>Relevant outcomes include: Symptoms, Functional outcomes</td>
</tr>
<tr>
<td>Individuals: With gait and balance disorders other than cerebral palsy, multiple sclerosis, and stroke</td>
<td>Interventions of interest are: Hippotherapy</td>
<td>Comparators of interest are: Standard clinical management</td>
<td>Relevant outcomes include: Symptoms, Functional outcomes</td>
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Hippotherapy, also referred to as equine-assisted therapy, describes a treatment strategy that uses equine movement to engage sensory, neuromotor, and cognitive systems to achieve functional outcomes. Hippotherapy has been proposed as a type of therapy for patients with impaired walking or balance.

For individuals who have cerebral palsy, multiple sclerosis, stroke, or other gait and balance disorders who receive hippotherapy, the evidence includes 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 treatment 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.

Background
Patients with spastic cerebral palsy frequently have impaired walking ability due to hyperactive tendon reflexes, muscle hypertonias, and increased resistance to increasing velocity of muscle stretch. These abnormalities result in a lack of selective muscle control and poor equilibrium responses. 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. In addition, variations in the horse’s movements can also prompt natural equilibrium movements in the rider. Hippotherapy is also being evaluated in patients with multiple sclerosis and developmental disorders such as Down syndrome.

Hippotherapy is a therapeutic intervention that 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 multi-sensory environment may be beneficial to 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 policy addresses equine-assisted activities that focus on improving physical functions such as balance and gait.

Simulated hippotherapy using a new device has been studied in European centers. Therapeutic interventions using such a device would be conducted in the physical/occupational therapy setting and are outside the scope of this policy.

Rationale
This evidence review was originally created in July 1999 and has been updated regularly with searches of the MEDLINE database. The most recent literature review was conducted through January 25, 2017. Following is a summary of key studies 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 with a total of 277 children with spastic CP.1 Included in the analysis were randomized controlled trials (RCTs) and observational studies that compared pre- and postriding results; 10 of the 14 studies provided level 4 evidence. Methodologic limitations included use of nonvalidated outcome measures and lack of clinically meaningful differences between groups. 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 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. A limitation of this meta-analysis is the inclusion of observational studies (pre-post comparisons) without a control group.

In 2011, Zadnikar and Kastrin published a meta-analysis of hippotherapy and therapeutic horseback riding in children with CP.2 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 nondisabled). 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 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. In addition, the analysis found heterogeneity among the studies, which typically would preclude meta-analysis, and a funnel plot showed asymmetry, indicating a 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 completed by 72 families (representing 35 intervention and 37 control subjects).3 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 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 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 GMFM (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.

In a 2003 study, Benda et al 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.

In 2015, Kwon et al 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 to 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**

In 2002, Sterba et al 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 1 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 may 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 studies 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) and traditional physical therapy in 27 patients with 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.

A 2015 RCT by Frevel and Maurer compared an Internet-based home training program to hippotherapy in 18 patients with MS. In this study, hippotherapy was considered the control intervention and the home training program the experimental intervention. Although both intervention groups showed significant improvement 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.

**Stroke**

Lee et al (2014) conducted a small randomized trial of hippotherapy for recovery of gait and balance in 30 patients poststroke. Patients were selected for the study if they could walk independently or with a walking aid, had spasticity in a paretic lower extremity 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.
Other Gait and Balance Disorders

Comparative studies of hippotherapy and other treatments for the outcomes of balance and gait have been conducted in community-dwelling subjects.\textsuperscript{13-15} Although they showed some improved outcomes, the study subjects included 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.\textsuperscript{16} 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.\textsuperscript{17} 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 randomized 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 study 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.\textsuperscript{18} Balance and strength were assessed with 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.\textsuperscript{19}

Summary of Evidence

For individuals who have cerebral palsy, multiple sclerosis, stroke, or other gait and balance disorders who receive hippotherapy, the evidence includes 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 treatment 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.

Supplemental Information

Practice Guidelines and Position Statements
No guidelines or statements were identified.

U.S. Preventive Services Task Force Recommendations
Not applicable.

Medicare National Coverage
There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials
Some currently unpublished trials that might influence this review are listed in Table 1.

Table 1. Summary of Key Trials

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT01372059</td>
<td>The Effects of a Rhythm and Music-based Therapy Program and Therapeutic Riding in Late Recovery Phase Following Stroke&lt;sup&gt;20&lt;/sup&gt;</td>
<td>123</td>
<td>Dec 2016 (ongoing)</td>
</tr>
</tbody>
</table>

NCT: national clinical trial.

References

Billing Coding/Physician Documentation Information

S8940 Equestrian/Hippotherapy, per session

ICD10 Codes
G80.0- G80.9 Cerebral palsy code range

Additional Policy Key Words
N/A

Policy Implementation/Update Information
7/1/08 New policy; considered investigational.
1/1/09 No policy statement changes.
7/1/09 No policy statement changes.
1/1/10 No policy statement changes.
7/1/10 No policy statement changes.
1/1/11 No policy statement changes.
7/1/11 No policy statement changes.
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