Policy Number	**THE803.022**
Policy Effective Date	**11/15/2024**

Hippotherapy

Table of Contents

Related Policies (if applicable)
None

Disclaimer

Carefully check state regulations and/or the member contract.
Each benefit plan, summary plan description or contract defines which services are covered, which services are excluded, and which services are subject to dollar caps or other limitations, conditions or exclusions. Members and their providers have the responsibility for consulting the member's benefit plan, summary plan description or contract to determine if there are any exclusions or other benefit limitations applicable to this service or supply. **If there is a discrepancy between a Medical Policy and a member's benefit plan, summary plan description or contract, the benefit plan, summary plan description or contract will govern.**

Legislative Mandates

EXCEPTION: For Illinois only: Illinois Public Act 103-0458 [Insurance Code 215 ILCS 5/356z.61] (HB3809 Impaired Children) states all group or individual fully insured PPO, HMO, POS plans amended, delivered, issued, or renewed on or after January 1, 2025 shall provide coverage for therapy, diagnostic testing, and equipment necessary to increase quality of life for children who have been clinically or genetically diagnosed with any disease, syndrome, or disorder that includes low tone neuromuscular impairment, neurological impairment, or cognitive impairment.

Coverage

Hippotherapy **is considered experimental, investigational and/or unproven.**

Policy Guidelines

None.

Description

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 therapy for patients with impaired walking or balance.

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 medical policy addresses equine-assisted activities that focus on improving physical functions such as balance and gait.

Rationale

Medical policies assess the clinical evidence to determine whether the use of technology improves the net health outcome. Broadly defined, health outcomes are the 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 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 technology, 2 domains are examined: the relevance, and quality and credibility. To be relevant, studies must represent 1 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. Randomized controlled trials 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.

Cerebral Palsy

Clinical Context and Therapy Purpose

The purpose of hippotherapy in individuals with cerebral palsy is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this policy.

Populations

The relevant population of interest is individuals with cerebral palsy. Individuals 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.

Interventions

The treatment being considered is hippotherapy. Hippotherapy is conducted by a physical or occupational therapist and a horseback riding instructor in an outdoor setting.

Comparators

The following practices are currently being used to treat cerebral palsy: standard physical, occupational, and speech therapy; surgery; and/or medication.

Outcomes

The general outcomes of interest are symptoms and functional outcomes. Cerebral palsy is a lifelong disorder, and individuals may be managed from infancy through adulthood and monitored throughout their lives.

Available studies show that the duration of hippotherapy can range from a total of 8 minutes in a single session to 24 hours over several weeks. The possible benefits of hippotherapy include improving walking and equilibrium in individuals with cerebral palsy.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies;
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought; and

- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Systematic Reviews

A number of systematic reviews on hippotherapy in children with cerebral palsy have been published (Tables 1 and 2). The Agency for Healthcare Research and Quality (AHRQ) conducted a systematic review (Selph et al. 2021) summarizing the evidence for physical activity in people with multiple sclerosis, cerebral palsy, and spinal cord injury. (1) Seven RCTs, 2 nonrandomized studies, and 1 cohort study enrolled children with cerebral palsy (N=464). Evidence on functional outcomes with hippotherapy in children with cerebral palsy was based on 7 studies and provided low-strength evidence that found hippotherapy associated with improved function and balance compared to control groups. The largest trial (Kwon et al. 2015; N=92) was the only good-quality trial and demonstrated significantly higher Gross Motor Function Measure (GMFM)-66 scores after 8 weeks of hippotherapy compared with at-home exercises. The effect of hippotherapy on balance was assessed in 4 fair- and 2 poor-quality studies using the Pediatric Balance Scale. These low-strength evidence trials demonstrated improved balance scores in pooled analysis with hippotherapy compared to control measures. The inclusion of poor-quality studies in meta-analysis limited clinical interpretation.

Qin et al. (2024) published a systematic review of 17 studies (N=596) of equine therapies in children with cerebral palsy. (2) The interventions were equine-assisted therapy, horse riding simulators, and therapeutic horseback riding. Sessions ranged from 15 to 60 minutes per week, in 1 to 3 sessions per week. The outcomes of interest were related to gross motor function. In the 8 RCTs that evaluated GMFM-66 scores, there was no difference between individuals who received equine-assisted therapy and those who did not (p=.101). Similarly, there was no difference in GMFM-88 scores among those who received equine-assisted therapy and those who did not (p=.162). However, a pooled assessment of the effect on gross motor function (GMFM-66 and GMFM-88) did suggest a significant benefit of equine therapies (standard mean difference [SMD], 0.19; 95% confidence interval [Cl], 0.02 to 0.36; p=.031).

Heussen and Hausler (2022) published a meta-analysis including 24 nonrandomized or randomized studies (N=755) on equine-assisted therapy in children with cerebral palsy. (3) Fifteen of the included studies were specific to hippotherapy while others focused on therapeutic riding or use of artificial horses. Global motor function was measured with the GMFM-66 or -88, and quality of life (QOL) assessments were analyzed. Although overall improvements in motor function were found with equine-assisted therapy (n=10 studies; SMD, 0.24; 95% Cl, 0.05 to 0.43; p=.01) when using either GMFM-66 or -88 (whichever was reported by the study, with a preference for GMFM-66 when both were reported), the results specific to GMFM-66 did not show a significant benefit to equine-assisted therapy (n=8 studies; Table 3). The analysis is also limited by the heterogeneity of the study protocols, the inclusion of small nonrandomized studies, and the lack of QOL data.

A meta-analysis by Tseng et al. (2013) included 5 studies on therapeutic horseback riding and 9 studies on hippotherapy (N=277 children with spastic cerebral palsy). (4) 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 GMFM across studies; meta-analysis indicated that short-term hippotherapy (8 to 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 cerebral palsy (Gross Motor Function Classification System level <5). However, long-term hippotherapy or therapeutic riding (8 to 22 hours) did not have a statistically significant effect on GMFM in children with spastic cerebral palsy. Methodologic limitations included the use of non-validated 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 cerebral palsy. (5) Eight studies meeting inclusion criteria (quantitative study design, outcomes that included postural control or balance) were selected. The meta-analysis included 84 children with cerebral palsy in the intervention groups and 89 children in the comparison groups (39 with cerebral palsy, 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 cerebral palsy, 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 ($p<.001$), 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. Tables 1 and 2 summarize included studies and characteristics of included studies of the systematic reviews and meta-analyses. Table 3 summarizes results from the meta-analyses.

Table 1. Comparison of Trials/Studies Included in Systematic Review and Meta-analysis

Study	Zadnikar and Kastrin (2011) (5)	Tseng et al. (2013) (4)	Selph et al. (2021) (1)	Heussen and Häusler (2022) (3)	Qin et al. (2024) (2)
Bertoti (1988)	●	●			
MacKinnen et al. (1995)	●	●			
MacPhail et al. (1998)	●				
Quint and Toomy (1998)	●			●	
McGibbon et al. (1998)		●			
Haehl et al. (1999)	●				

Kuczynski and Słonka (1999)	●				
Sterba et al. (2002)		●			
Benda et al. (2003)	●	●		●	
Cherng et al. (2004)		●		●	
Casady et al. (2004)		●			
Hamill et al. (2007)		●			
Shurtleff et al. (2009)	●	●			
Davis et al. (2009)		●		●	●
McGibbon et al. (2009)		●		●	
McGee and Reese (2009)		●			
Shurtleff and Engsberg (2010)		●			
Kwon et al. (2011)		●	●	●	●
Silva and Borges (2011)			●		
Herrero et al. (2012)			●	●	●
Park et al. (2014)			●	●	●
Lee et al. (2014)			●	●	●
Kwon et al. (2015)			●	●	●
Matusiak-Wieczorek et al. (2016)			●	●	
Deutz et al. (2018)			●	●	●
Mutoh et al. (2019)			●	●	●

Matusiak-Wieczorek et al. (2020)			●		
Ahn et al. (2021)				●	
Alemdaroglu et al. (2016)				●	
Baik et al. (2014)				●	●
El Meniawy et al. (2012)				●	●
Kang et al. (2012)				●	●
Kang et al. (2013)				●	●
Lerma-Castano et al. (2017)				●	
Lucena-Anton et al. (2018)				●	●
Park et al. (2020)				●	
Silkwood-Sherer et al. (2020)				●	
Suk and Kwon (2022)				●	
Fernandes et al. (2008)				●	
Temcharoensuk et al. (2015)				●	●
Chinniah et al. (2020)					●
Bagheri et al. (2017)					●
Jung et al. (2022)					●

Table 2. Systematic Review and Meta-analysis Characteristics

Study	Dates	Trials	Participants	N (Range)	Design	Duration range
Zadnikar and	1988-2009	8	Children and adults with CP	84 (2-25)	RCTs (n=3), PED (n=1), QED (n=4)	8 mins to 26 wks

Kastrin (2011) (5)						
Tseng et al. (2013) (4)	1988-2011	14	Children with spastic CP	277 (3-71)	RCTs, observational studies	8 mins to 26 wks
Selph et al. (2021) (1)	2011-2020	10	Children with CP; none of the studies reported race or ethnicity	464 (23-335)	RCTs (n=7), nonrandomized studies (n=2), cohort study (n=1)	6 wks to 48 wks
Heussen and Häusler (2022) (3)	Through Feb 2022	26 (24 included in M-A)	Children with CP	755 (13-91)	RCTs, nonrandomized studies	1 day to 48 wks
Qin et al. (2024) (2)	2005-2023	17	Children with CP	596 (14-91)	RCTs	1 wk to 20 wks

CP: cerebral palsy; M-A: meta-analysis; min(s): minute(s); PED: pre-experimental design; QED: quasi-experimental design; RCT: randomized controlled trial; wk(s): week(s).

Table 3. Systematic Review and Meta-analysis Results

Study	**Positive effect on postural control after treatment with hippotherapy**	**GMFM-66 score increase post-therapy**	**GMFM-88 score increase post-therapy**
Zadnikar and Kastrin (2011) (5)			
Pooled effect (95% CI)	OR, 25.41 (4.35 to 148.53)	NR	NR
P value	<.001	NR	NR
I^2 (p)	60.7% (.01)	NR	NR
Tseng et al. (2013) (4)			
Total N	NA	40	50
Pooled effect (95% CI)	NA	MD, 3.47 (-2.64 to 9.57)	MD, 1.44 (-1.43 to 4.31)
P value	NA	.27	.33
I^2 (p)	NA	0% (.85)	0% (.82)
Selph et al. (2021) (1)			
Total N	149[a]	NR	NR
Pooled effect (95% CI)	MD, -3.14 (-5.28 to -1.18)	NR	NR

P value	.001	NR	NR
I^2 (p)	0% (.94)	NR	NR
Heussen and Häusler (2022) (3)		**GMFM-66 score[b]**	**GMFM-88 score[b]**
Total N	NR	NR	NR
Pooled effect (95% CI)	NR	SMD, 0.17 (-0.02 to 0.36)	SMD, 0.62 (0.15 to 1.09)
P value	NR	.07	.01
I^2 (p)	NR	6%	0%
Qin et al. (2024) (2)			
Total N	NA	330	195
Pooled effect (95% CI)	NA	SMD, 0.18 (-0.04 to 0.40)	SMD, 0.20 (-0.08 to 0.49)
P value	NA	.101	.162
I^2 (p)	NA	33.6% (.16)	0% (.789)

CI: confidence interval; GMFM: Gross Motor Function Measure; MD: mean difference; NA: not applicable; NR: not reported; OR: odds ratio; SMD: standard mean difference.

[a] Measurement of change in balance scores on the Pediatric Balance Scale from pre to post hippotherapy.

[b] From parallel-group and crossover studies (equine-based treatment vs. standard of care).

Randomized Controlled Trials

Chinniah et al. (2020) investigated the effects of a horse riding simulator (i.e., an electronic horse, working under the principles of hippotherapy) on sitting motor function in 30 children (2 to 4 years of age) with spastic cerebral palsy. (6) This study randomly assigned subjects to a horse riding simulator along with conventional physiotherapy (n=15) or conventional physiotherapy (n=15), with the therapist blinded to group allocation and time of assessment. Sitting motor function was evaluated via the GMFM-88 at baseline, 4, 8, and 12 weeks with pre- and post-intervention scores analyzed. Results revealed that the mean value of GMFM improved in both groups over the 12 weeks; however, the experimental group had significant improvement over the control group at all of the assessed weeks ($p<.01$). Limitations of the study included its small sample size, lack of long-term follow-up, specific patient population (i.e., children with spastic diplegia with mild and moderate disability levels) and focus on sitting motor function.

Kwon et al. (2015) published an RCT of hippotherapy in children (age range, 4 to 10 years) with cerebral palsy. (7) Ninety-two 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 GMFM-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.

An RCT by Davis et al. (2009) included children age 4 to 12 years with cerebral palsy who completed a 10-week session of hippotherapy with pre- and post-treatment assessments obtained from 72 families (representing 35 intervention, and 37 control subjects). (8) 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 cerebral palsy.

McGibbon et al. (2009) investigated the impact of hippotherapy on the symmetry of adductor muscle activity during walking in children with spastic cerebral palsy. (9) In phase 1 of the trial, 47 children (age range, 4 to 16 years) with spastic cerebral palsy 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 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.

Section Summary: Cerebral Palsy

The evidence for hippotherapy in cerebral palsy includes systematic reviews and small RCTs. The AHRQ systematic review found the only high-quality RCT to be that of Kwon et al. (2015) which enrolled 92 patients. Although this trial found improvements in gross motor function, the trial is limited by the unclear clinical significance of the outcomes, uncertain attributes of the control group treatment, and lack of long-term outcomes.

Multiple Sclerosis

Clinical Context and Therapy Purpose

The purpose of hippotherapy in individuals with multiple sclerosis is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this policy.

Populations

The relevant population of interest is individuals with multiple sclerosis. Individuals with multiple sclerosis frequently have impaired walking ability due to their system attacking and

damaging the myelin protecting the nerve cells, which diminishes the function of the brain and spinal cord. These abnormalities result in a lack of selective muscle control and poor equilibrium.

Interventions
The treatment being considered is hippotherapy. Hippotherapy is conducted by a physical or occupational therapist and a horseback riding instructor in an outdoor setting.

Comparators
The following practices are currently being used to treat multiple sclerosis: medications and occupational therapy.

Outcomes
The general outcomes of interest are symptoms and functional outcomes. Multiple sclerosis has no cure. Patients are managed from diagnosis through the rest of their lives.

Available studies have shown a duration of hippotherapy of up to 20 sessions over 6 months. The possible benefits of hippotherapy include improving walking ability and equilibrium in multiple sclerosis patients.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies;
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought; and
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence
Systemic Reviews
The Agency for Healthcare Research and Quality conducted a systematic review (Selph et al. 2021) summarizing evidence for physical activity in people with multiple sclerosis, cerebral palsy, and spinal cord injury. (1) Two trials of hippotherapy enrolled patients with multiple sclerosis, 1 (MS-HIPPO) with a usual care control group, and the other with a waitlist control group. Expanded Disability Status Scale scores were higher in the MS-HIPPO trial, indicating greater disability at baseline. The MS-HIPPO trial demonstrated greater improvement in quality of life based on mental (mean difference, 12.0; 95% Cl, 6.2 to 17.7) and physical health scores (mean difference, 14.4; 95% Cl, 7.5 to 21.3) compared with usual care. Balance was also significantly better with hippotherapy after 12 weeks (mean difference, 2.33; 95% Cl, 0.03 to 4.63) ; however, imputed (last observation carried forward) data was used. The other hippotherapy study in patients with multiple sclerosis (Vermohlen et al. 2018; N=33) found improved walking distance on the 6-minute walking test ($p<.001$) and improved walking speed

on the 25-foot walk test (p<.001) with hippotherapy compared with the waitlist control group. Although the data from these trials favored hippotherapy on walking, short-term QOL, and balance in adults with multiple sclerosis, no conclusions can be drawn due to only being fair-quality trials and the small included sample size.

A systematic review by Lavin-Perez et al. (2022) identified 10 studies of equine-assisted therapies in patients with multiple sclerosis (N=195). (10) A total of 104 individuals were treated with equine-assisted therapy while 91 served as controls. Four trials were RCTS, 2 were nonrandomized, and 2 used a pre-post design without control. The interventions were heterogenous with anywhere from 1 to 10 sessions/week and session durations of 20 to 50 minutes. Study durations varied from 11 to 24 weeks. When equine-assisted therapy was compared with an active control, no significant benefits were found. When compared with an inactive control, outcomes such as fatigue perception and balance were improved. Well-designed RCTs are needed to evaluate equine-assisted therapy compared to standard of care in patients with multiple sclerosis.

A systematic review by Bronson et al. (2010) evaluated 3 studies on the use of hippotherapy for patients with multiple sclerosis. (11) 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 multiple sclerosis compared with a control group of 6 patients. (12) 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 multiple sclerosis, although they acknowledged the small sample sizes, lack of randomization (especially given the variable nature of multiple sclerosis), and lack of controls in 2 studies.

Comparative Studies

A study by Munoz-Lasa et al. (2011) compared therapeutic horseback riding (with non-therapist riding instructors) with traditional physical therapy in 27 patients with multiple sclerosis. (13) 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 to hippotherapy in 18 patients with multiple sclerosis. (14) In this trial, 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.

Section Summary: Multiple Sclerosis

Current evidence on the use of hippotherapy to treat multiple sclerosis is inconclusive and the studies conducted have been flawed.

Stroke

Clinical Context and Therapy Purpose

The purpose of hippotherapy in individuals with stroke is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this policy.

Populations

The relevant population of interest is individuals with stroke. Individuals who have had a stroke frequently have impaired walking ability due to damage to the brain caused by interruption of blood supply or bleeding into the brain.

Interventions

The treatment being considered is hippotherapy. Hippotherapy is conducted by a physical or occupational therapist and a horseback riding instructor in an outdoor setting.

Comparators

The following practices are currently being used to treat symptoms following stroke: physical, occupational, and speech therapy.

Outcomes

The general outcomes of interest are symptoms and functional outcomes. A stroke can have different effects, depending on which part of the brain was damaged and the extent of the damage. As a result, the length of time a patient is under a neurologist's care varies, and the focus may become prevention of another stroke in the future.

The 1 available study showed a duration of hippotherapy of 30-minute sessions conducted 3 times per week for 8 weeks. The possible benefits of hippotherapy include improving walking and equilibrium in stroke patients.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;

- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies;
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought; and
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Randomized Trials

Lee et al. (2014) conducted a small randomized trial assessing hippotherapy for recovery of gait and balance in 30 patients poststroke. (15) 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 the 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.

Bunketorp-Kall et al. (2019) completed an evaluation of horse-riding or rhythm and music-based therapy in comparison to control in 123 subjects in the late phase after stroke (average number of days elapsed from stroke insult , 1056 days). (16) Tables 4 and 5 summarize the key characteristics and results of this study, focusing on hippotherapy in comparison to control. Post-intervention, the horse riding therapy group completed the 10 minute walk test faster at both self-selected and fast speed, with fewer steps (-2.17 [95% Cl, -3.30 to -1.04]; p=.002 and -1.40 [95% Cl, -2.36 to -0.44]; p=.020, respectively), as compared to controls. The horse riding therapy group also showed improvements in functional task performance. The gains were partly maintained at 6 months among horse riding therapy participants. The authors noted that the study population was limited to individuals with moderate impairment after stroke and that future research should be extended to other populations of stroke survivors.

Coban et al. (2023) conducted a small RCT in 30 patients with stroke that compared the effect of 15 minutes of mechanical hippotherapy to a control intervention (postural control and balance exercises), both given in addition to 45 minutes of intensive conventional rehabilitation therapy on 5 days per week for 4 weeks. (17) The primary outcome, change in Berg Balance Scale, was not different between groups (p=.14). This was likely due to a lack of statistical power, since the sample size calculation had assumed a much larger effect size than was observed in the study.

Table 4. Summary of Key Randomized Controlled Trial Characteristics

Study	Countries	Sites	Dates	Participants	Interventions	
Bunketorp-Kall et al.	Sweden	Sahlgrenska University Hospital	2010 to 2014	123 subjects in the late phase after	Active: Horse-riding therapy	Control (n=41)

(2019) (16, 18)				stroke (10 months to 5 years) – ethnicity or race of subjects not described	(n=41) or rhythm and music-based therapy (n=41)	

Table 5. Summary of Key RCT Results

Study	10-minute walk test-self-selected speed (seconds)	10-minute walk test- fast speed (seconds)	6-minute walk test (meters)	Modified Motor Assessment Scale
Bunketorp-Kall et al. (2019) (16)	Change from baseline to post-intervention (95% CI)	Change from baseline to post-intervention (95% CI)	Change from baseline to post-intervention (95% CI)	Change from baseline to post-intervention (95% CI)
Horse-riding therapy	-2.22 (-3.55 to -0.88)	-1.19 (-2.18 to -0.18)	27.06 (15.39 to 38.72)	1.13 (0.74 to 1.52)
Control	0.37 (-0.94 to 1.68)	0.88 (-0.40 to 2.16)	8.60 (-3.28 to 20.48)	0.18 (-0.20 to 0.57)
P value	0.001	0.003	0.177	0.001

CI: confidence interval; RCT: randomized control trial.

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

Clinical Context and Therapy Purpose

The purpose of hippotherapy in individuals with other gait and balance disorders not caused by cerebral palsy, multiple sclerosis, or stroke is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this policy.

Populations

The relevant population of interest is individuals with other gait and balance disorders not caused by cerebral palsy, multiple sclerosis, or stroke.

Interventions
The treatment being considered is hippotherapy. Hippotherapy is conducted by a physical or occupational therapist and a horseback riding instructor in an outdoor setting.

Comparators
The following practices are currently being used to treat other gait and balance disorders not caused by cerebral palsy, multiple sclerosis, or stroke: standard physical or occupational therapy or medication.

Outcomes
The general outcomes of interest are symptoms and functional outcomes. Gait and balance disorders may have many causes, and the length of hippotherapy would depend upon the underlying cause. The available studies showed a duration of 8 to 10 weeks of twice-weekly sessions.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies;
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought; and
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence
Systematic Reviews
The systematic review by Wood and Fields (2019) evaluated 78 studies on hippotherapy dating from 1998 to 2018, some of which are described in more detail below. (19) Seventy-seven of the 78 studies quantified results, and 59 studies were quasi-experimental designs. The most basic definition of hippotherapy in the studies was the use of equine movement by such providers as physical, occupational, and speech-language therapists. However, the definitions also varied from a therapy to improve motor function to one that treats anything by involving a horse. Among the studies, the most commonly assessed condition for hippotherapy was cerebral palsy (51%). Other conditions were multiple sclerosis, Down syndrome, autism spectrum disorder, intellectual disability, attention deficit hyperactivity disorder, traumatic brain injury, cerebral vascular accident, and others. The most often reported providers of hippotherapy were paired physical therapists and therapeutic riding instructors. Hippotherapy sessions, on average, were 38 minutes (range, 8 to 90 min; standard deviation [SD], 23.19 min), and the average number of sessions was 17.8 (range, 1 to 104; SD, 22.16). Across all studies, 517 outcomes were classified as either International Classification of Functioning, Disability and Health (ICF), body functions and structures, ICF activity/participation (ICF-AP), or other outcomes. Among the ICF-body functions outcomes, movement/gait was most reported, with 70% positive reported outcomes. Less reported, but all predominantly positive were emotional

fix (72%), muscle tone (74%), energy/drive (75%), pain (65%), and cognitive fix (100%). More or equally negative effects were reported with heart rate (53%), psychosocial fix (50%), and muscle power (58%). The ICF-AP outcomes showed mostly positive effects in daily mobility (78%) and self-care activities (67%); interpersonal interactions/relationships, recreation/leisure, play, carrying/handling objects, and other activities were all 100% positive. No benefit was seen in education and domestic life tasks. Research into integrating equine movement as a therapy tool should continue, with more efficacy trials to identify the most promising interventions for further examination.

Comparative and Noncomparative Studies

Comparative studies of hippotherapy and other treatments for outcomes other than balance and gait have been conducted in community-dwelling subjects. (20-22) Although subjects 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 prospective United States study by Homnick et al. (2013) evaluated 9 older adults (mean age, 76.4 years) with balance deficits and found improvements in balance and quality of life measured with a pretest-posttest design. (23) Without a comparison group, it is uncertain to what extent the improvements can be attributed to hippotherapy.

Kaya et al. (2023) conducted an RCT that compared hippotherapy to control in 34 children with Down syndrome. (24) All patients underwent a 30-minute home exercise program consisting of balance training exercises 3 days weekly for 6 weeks, and the hippotherapy group additionally received once-weekly 30-minute hippotherapy sessions for 6 weeks. Outcomes included the Pediatric Balance Scale, the Timed Up and Go Test, and functional Independence Measure for Children. There were significant improvements in all 3 outcomes between baseline and week 6 in the hippotherapy group (all $p<.05$). The control group also experienced improvement in the Pediatric Balance Scale at 6 weeks ($p=.001$) and the Timed Up and Go Test ($p=.041$), but not the Functional Independence Measure for Children ($p=.188$). The only between group difference at 6 weeks was in the Functional Independence Measure for Children ($p=.008$). The authors concluded that balance and mobility improved in both groups, but functional independence only improved in the hippotherapy group.

In an RCT, Abdel-Aziem et al. (2021) reported on the efficacy of hippotherapy in combination with Schroth exercises (n=27) compared to traditional physiotherapy (Schroth exercises, n=25) alone in adolescents with idiopathic scoliosis. (25) Both groups received Schroth exercises 3 days weekly for 10 weeks. The experimental group additionally received hippotherapy training and pretreatment and posttreatment outcomes were assessed. Both groups experienced improvements in all examined variables posttreatment; however, the group that additionally had hippotherapy had significant improvements in posture asymmetry and balancing ability as demonstrated in all movement outcomes (scoliotic angle, kyphotic angle, pelvic obliquity, pelvic torsion, and vertical spinal rotation) compared to the control group who received Schroth exercises alone ($p<.05$). This trial was limited by the small sample size and absence of long-term follow-up.

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. (26) The most common diagnoses were cerebral palsy (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. (27) 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 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. (28)

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 or long-term follow-up, 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 (92 children), which had blinded outcome assessment, hippotherapy had no clinically significant impact on children with cerebral palsy. There are no RCTs 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, although some benefits have been seen, it has not been shown to be more effective than other active therapies. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Practice Guidelines and Position Statements

American Academy of Neurology

In 2014, the American Academy of Neurology authored a guideline on complementary and alternative medicine for multiple sclerosis. (29) The guideline stated that there was insufficient evidence to support or refute the effectiveness of hippotherapy.

American Hippotherapy Association, Inc.

In their 2021 statement of best practices, the American Hippotherapy Association states that hippotherapy is contraindicated during acute exacerbations of multiple sclerosis and other conditions that can flare. (30)

Ongoing and Unpublished Clinical Trials

Some currently ongoing and unpublished trials that might influence this policy are listed in Table 6.

Table 6. Summary of Key Trials

NCT Number	Trial Name	Planned Enrollment	Completion Date
Ongoing			
NCT06047756	Hippotherapy Versus Swiss Ball Training to Improve Trunk Control and Balance on Spastic Daiplegic Cerebral Palsy	64	Jan 2024
NCT05846932	Preliminary Efficacy of Occupational Therapy Integrating Horses on Self-regulation in Youth With Autism Spectrum Disorder	64	May 2025
NCT05345886	The Benefit of Hippotherapy in the Therapeutic Management of Stroke Patients in Sequel Phase	50	Jan 2025
NCT04759326	Neurorehabilitation Through Hippotherapy of a Brain Stroke (HippoPostCVA)	52	Mar 2026
Unpublished			
NCT06003868	Investigation of the Effect of Hippotherapy Simulator on Balance and Walking in children With Spastic Diplegia Cerebral Palsy	50	Dec 2023
NCT04651725	Effectiveness of Hippotherapy Simulator on Balance and Knee Strength in People With Multiple Sclerosis: a Randomized Controlled Trial	40	Apr 2022

NCT: national clinical trial.

Coding

Procedure codes on Medical Policy documents are included **only** as a general reference tool for each policy. **They may not be all-inclusive.**

The presence or absence of procedure, service, supply, or device codes in a Medical Policy document has no relevance for determination of benefit coverage for members or reimbursement for providers. **Only the written coverage position in a Medical Policy should be used for such determinations.**

Benefit coverage determinations based on written Medical Policy coverage positions must include review of the member's benefit contract or Summary Plan Description (SPD) for defined coverage vs. non-coverage, benefit exclusions, and benefit limitations such as dollar or duration caps.

CPT Codes	97110, 97112
HCPCS Codes	S8940

*Current Procedural Terminology (CPT®) ©2023 American Medical Association: Chicago, IL.

References

1. Selph SS, Skelly AC, Wasson N, et al. Physical Activity and the Health of Wheelchair Users: A Systematic Review in Multiple Sclerosis, Cerebral Palsy, and Spinal Cord Injury. Number 241. Agency for Healthcare Research and Quality, US Department of Health and Human Services; 2021. Available at: <https://www.ncbi.nlm.nih.gov> (accessed January 31, 2024).
2. Qin Z, Guo Z, Wang J. Multiple Equine Therapies for the Treatment of Gross Motor Function in Children with Cerebral Palsy: A Systematic Review. J Community Health Nurs. Apr-Jun 2024; 41(2):82-95. PMID 38229243
3. Heussen N, Häusler M. Equine-Assisted Therapies for Children With Cerebral Palsy: A Meta-analysis. Pediatrics. Jul 01 2022; 150(1):e2021055229. PMID 35656779
4. Tseng SH, Chen HC, Tam KW. Systematic review and meta-analysis of the effect of equine assisted activities and therapies on gross motor outcome in children with cerebral palsy. Disabil Rehabil. Jan 2013; 35(2):89-99. PMID 22630812
5. Zadnikar M, Kastrin A. Effects of hippotherapy and therapeutic horseback riding on postural control or balance in children with cerebral palsy: a meta-analysis. Dev Med Child Neurol. Aug 2011; 53(8):684-691. PMID 21729249
6. Chinniah H, Natarajan M, Ramanathan R, et al. Effects of horse riding simulator on sitting motor function in children with spastic cerebral palsy. Physiother Res Int. Oct 2020; 25(4):e1870. PMID 32808394
7. Kwon JY, Chang HJ, Yi SH, et al. Effect of hippotherapy on gross motor function in children with cerebral palsy: a randomized controlled trial. J Altern Complement Med. Jan 2015; 21(1):15-21. PMID 25551626
8. Davis E, Davies B, Wolfe R, et al. A randomized controlled trial of the impact of therapeutic horse riding on the quality of life, health, and function of children with cerebral palsy. Dev Med Child Neurol. Feb 2009; 51(2):111-119; discussion 88. PMID 19191844
9. McGibbon NH, Benda W, Duncan BR, et al. Immediate and long-term effects of hippotherapy on symmetry of adductor muscle activity and functional ability in children with spastic cerebral palsy. Arch Phys Med Rehabil. Jun 2009; 90(6):966-974. PMID 19480872

10. Lavín-Pérez AM, Collado-Mateo D, Caña-Pino A, et al. Benefits of Equine-Assisted Therapies in People with Multiple Sclerosis: A Systematic Review. Evid Based Complement Alternat Med. 2022; 2022:9656503. PMID 35529929
11. Bronson C, Brewerton K, Ong J, et al. Does hippotherapy improve balance in persons with multiple sclerosis: a systematic review. Eur J Phys Rehabil Med. Sep 2010; 46(3):347-353. PMID 20927000
12. Silkwood-Sherer D, Warmbier H. Effects of hippotherapy on postural stability, in persons with multiple sclerosis: a pilot study. J Neurol Phys Ther. Jun 2007; 31(2):77-84. PMID 17558361
13. Munoz-Lasa S, Ferriero G, Valero R, et al. Effect of therapeutic horseback riding on balance and gait of people with multiple sclerosis. G Ital Med Lav Ergon. Oct-Dec 2011; 33(4):462-467. PMID 22452106
14. Frevel D, Maurer M. Internet-based home training is capable to improve balance in multiple sclerosis: a randomized controlled trial. Eur J Phys Rehabil Med. Feb 2015; 51(1):23-30. PMID 24755773
15. Lee CW, Kim SG, Yong MS. Effects of hippotherapy on recovery of gait and balance ability in patients with stroke. J Phys Ther Sci. Feb 2014; 26(2):309-311. PMID 24648655
16. Bunketorp-Kall L, Pekna M, Pekny M, et al. Effects of horse-riding therapy and rhythm and music-based therapy on functional mobility in late phase after stroke. NeuroRehabilitation. Dec 18 2019; 45(4):483-492. PMID 31868694
17. Coban O, Mutluay F. The effects of mechanical hippotherapy riding on postural control, balance, and quality of life (QoL) in patients with stroke. Disabil Rehabil. Jun 2024; 46(11):2338-2347. PMID 37303153
18. Bunketorp Kall L, Lundgren-Nilsson A, Blomstrand C, et al. The effects of a rhythm and music-based therapy program and therapeutic riding in late recovery phase following stroke: a study protocol for a three-armed randomized controlled trial. BMC Neurol. Nov 21 2012; 12:141. PMID 23171380
19. Wood WH, Fields BE. Hippotherapy: a systematic mapping review of peer-reviewed research, 1980 to 2018. Disabil Rehabil. May 2021; 43(10):1463-1487. PMID 31491353
20. Kim SG, Lee CW. The effects of hippotherapy on elderly persons' static balance and gait. J Phys Ther Sci. Jan 2014; 26(1):25-27. PMID 24567669
21. Araujo TB, Silva NA, Costa JN, et al. Effect of equine-assisted therapy on the postural balance of the elderly. Rev Bras Fisioter. Sep-Oct 2011; 15(5):414-419. PMID 22002189
22. de Araujo TB, de Oliveira RJ, Martins WR, et al. Effects of hippotherapy on mobility, strength and balance in elderly. Arch Gerontol Geriatr. May-Jun 2013; 56(3):478-481. PMID 23290005
23. Homnick DN, Henning KM, Swain CV, et al. Effect of therapeutic horseback riding on balance in community-dwelling older adults with balance deficits. J Altern Complement Med. Jul 2013; 19(7):622-626. PMID 23360659
24. Kaya Y, Saka S, Tuncer D. Effect of hippotherapy on balance, functional mobility, and functional independence in children with Down syndrome: randomized controlled trial. Eur J Pediatr. Jul 2023; 182(7):3147-3155. PMID 37186034
25. Abdel-Aziem AA, Abdelraouf OR, Ghally SA, et al. A 10-Week Program of Combined Hippotherapy and Scroth's Exercises Improves Balance and Postural Asymmetries in

Adolescence Idiopathic Scoliosis: A Randomized Controlled Study. Children (Basel). Dec 30 2021; 9(1):23. PMID 35053648
26. Silkwood-Sherer DJ, Killian CB, Long TM, et al. Hippotherapy--an intervention to habilitate balance deficits in children with movement disorders: a clinical trial. Phys Ther. May 2012; 92(5):707-717. PMID 22247403
27. Giagazoglou P, Arabatzi F, Dipla K, et al. Effect of a hippotherapy intervention program on static balance and strength in adolescents with intellectual disabilities. Res Dev Disabil. Nov 2012; 33(6):2265-2270. PMID 22853887
28. Lechner HE, Kakebeeke TH, Hegemann D, et al. The effect of hippotherapy on spasticity and on mental well-being of persons with spinal cord injury. Arch Phys Med Rehabil. Oct 2007; 88(10):1241-1248. PMID 17908564
29. American Academy of Neurology. Complementary and Alternative Medicine in Multiple Sclerosis. March 2014. Available at: <https://www.aan.com> (accessed January 31, 2024).
30. American Hippotherapy Association, Inc. Statements of best practice for the use of hippotherapy by occupational therapy, physical therapy, and speech-language pathology professionals. Revised February 2021. Available at: <https://www.americanhippotherapyassociation.org> (accessed January 31, 2024).

Centers for Medicare and Medicaid Services (CMS)

The information contained in this section is for informational purposes only. HCSC makes no representation as to the accuracy of this information. It is not to be used for claims adjudication for HCSC Plans.

The Centers for Medicare and Medicaid Services (CMS) does not have a national Medicare coverage position. Coverage may be subject to local carrier discretion.

A national coverage position for Medicare may have been developed since this medical policy document was written. See Medicare's National Coverage at <https://www.cms.hhs.gov>.

Policy History/Revision

Date	Description of Change
11/15/2024	Document updated with literature review. Coverage unchanged. Added references 2, 17, 24, and 29.
02/01/2024	Document updated with literature review. Coverage unchanged. References 1, 2, 9, and 22 added; others updated.
07/15/2022	Reviewed. No changes.
06/15/2021	Document updated with literature review. Coverage unchanged. References 3, 12, 14 and 22 added, others removed.
06/15/2020	Reviewed. No changes.
10/01/2019	Document updated with literature review. Coverage unchanged. No new references added.
07/15/2018	Reviewed. No changes.

07/15/2017	Document updated with literature review. Coverage unchanged.
07/15/2016	Reviewed. No changes.
02/01/2015	Document updated with literature review. Coverage unchanged.
09/01/2011	Document updated with literature review. Coverage unchanged. Rationale section was completely rewritten and the description section revised.
04/01/2009	Revised/updated document. This policy is no longer scheduled for routine literature review and update.
02/01/2007	Revised/updated document
10/15/2004	Revised/updated document
05/01/2000	New medical document