Neurologic Rehabilitation

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Link to Codes

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Ambulatory Care
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Clinical Indications

- Neurologic rehabilitation may be indicated for **1 or more** of the following:
  - Initial therapy, when **ALL** of the following are present:
    - Neurologic dysfunction, when **1 or more** of the following is present:
      - Central vestibular disorder, when **ALL** of the following are present(1)(2)(3)(4):N
        - Diagnosis of central nervous system cause for symptoms[A] and **1 or more** of the following:
          - Recent diagnosis
          - Recent functional decline or acute symptom exacerbation
        - Symptoms (dizziness or vertigo) not resolved with specific treatment for diagnosis
      - Child born at 37 weeks' gestation or less, and younger than 12 months post term at beginning of therapy(5)(6)N
      - Lower or upper extremity weakness, abnormal tone, gait unsteadiness, or movement disorder, when **ALL** of the following are present(7)(8):N
        - Diagnosis of neurologic condition, with upper or lower extremity neurologic dysfunction or movement disorder, as indicated by **1 or more** of the following(13)(49):
          - Abnormal tone of upper or lower extremity or trunk (eg, spasticity)(14)(25)(53)(54)(55)
          - ADL deficit related to upper or lower extremity weakness, abnormal tone, or movement disorder (eg, Huntington disease)(14)(56)(57)(58)
          - Apraxial[B] of upper or lower extremity(60)
          - Developmental coordination disorder(61)(62)(63)
          - IADL deficit related to upper or lower extremity weakness, abnormal tone, or movement disorder(14)
          - Movement disorder (eg, Parkinson disease)(17)(18)(40)(64)
          - Spinal cord injury(65)(66)
          - Traumatic brain injury(52)(67)(68)(69)(70)

        - Weakness of upper or lower extremity or trunk(71)
      - Recent change in condition, as indicated by **1 or more** of the following:
        - Recent diagnosis (eg, stroke)(14)(15)(72)
        - Recent functional decline or acute impairment exacerbation
        - Recent functional decline related to comorbid medical condition (eg, hospitalization for pneumonia)
        - Recent surgery
        - Recurrent falls(73)(74)
    - Peripheral vestibular disorders (eg, benign paroxysmal positional vertigo, peripheral vestibular hypofunction), when **ALL** of the following are present(1)(2)(75)(76)(77):
      - Clinician-diagnosed peripheral vestibular disorder
      - Recent change in vertigo status, as indicated by **1 or more** of the following:
        - Recent diagnosis
        - Recent functional decline or acute symptom exacerbation
  - Patient is expected to be able to adequately participate in and respond as planned to proposed treatment.
- Extended therapy, when **ALL** of the following are present(15)(80)(81)(82):
  - Functional progress has been made during initial therapy, or patient requires maintenance therapy plan[C] to prevent further deterioration or preserve existing function.
  - Goals of therapy are not yet met.
  - Patient is actively participating in treatment sessions.
  - Patient is adherent to plan of care.

Treatment Plan

- Treatment plan includes:
  - Goals of therapy:
    - For central vestibular disorder(2)(3)(4):
      - Decreased dizziness or vertigo
      - Improved ability to perform ADL and IADL
      - Improved self-reported quality of life
      - Increased understanding of disease management
    - For child born at 37 weeks' gestation or less(6)(83):
      - Enhanced parent-child relationship
      - Improved cognitive outcomes
      - Improved social behavior
      - Improved speech development
      - Increased strength and coordination
      - Meeting developmental milestones
    - For lower or upper extremity weakness, abnormal tone, gait unsteadiness, apraxia, or movement disorder(13)(14)(15)(46)(84):
      - Improved ability to perform ADL and IADL(53)(68)(85)
      - Improved self-reported quality of life(18)(86)
      - Increased balance to reduce risk of falls(39)(73)(87)(88)(89)
      - Increased exercise tolerance and endurance(90)
      - Increased functional independence with mobility-related tasks(29)(68)
      - Increased independence with energy-conservation techniques and proper body mechanics
      - Increased strength and range of motion(25)
      - Increased understanding of self-management of health and disease process
      - Reduced neuropsychiatric complications (eg, poststroke depression)(13)(91)(92)(93)
    - For peripheral vestibular disorder(2)(75)(77):
      - Decreased dizziness or vertigo
      - Improved ability to perform ADL and IADL
      - Improved self-reported quality of life
      - Increased understanding of disease management

- Planned interventions:
  - For central vestibular disorder(1):
    - Patient education:
      - Disease process
      - Self-management
    - Therapeutic modalities(3):
      - Functional retraining
      - Vertigo habituation
      - Virtual reality training(2)
  - For child born at 37 weeks' gestation or less(6):
    - Patient, family, and caregiver education(94)(95):
      - Developmental milestones(96)
      - Home exercise program
      - Infant response patterns(5)
    - Therapeutic modalities:
      - Functional movement pattern training(83)
      - Play therapy
      - Positioning(5)
      - Postural support and facilitation techniques
      - Stretching exercises(5)
  - For lower or upper extremity weakness, abnormal tone, gait unsteadiness, or movement disorder(15):
    - Patient, family, and caregiver education(13)(46)(97):
      - Disease process
      - Fall prevention(73)(88)(98)
      - Home exercise program(24)
      - Self-management(99)
    - Therapeutic modalities(50):
      - ADL with or without adaptive, assistive, or durable medical equipment
      - Balance activities to reduce risk for falls[D](9)(39)(73)(101)(102)
      - Bilateral or unilateral arm training(24)(48)(57)
      - Casting for plantar flexion contractures(103)
      - Constraint-induced movement therapy for chronic stroke[E](14)(26)(48)(104)(105)
      - Endurance training(33)(46)(62)(106)
      - Functional muscle retraining(48)
      - Functional task practice(62)(107)(108)
      - Gait training(27)(28)(42)(109)(110)(111)
      - IADL training with or without adaptive, assistive, or durable medical equipment
      - Mental practice(48)(112)
      - Mirror and virtual reality therapies(48)(113)(114)(115)(116)(117)
      - Resistance exercises(20)(43)(118)
      - Strengthening exercises[F](119)(120)(121)
      - Transfer training(122)
  - For peripheral vestibular disorders(78):
    - Patient education(2):
      - Disease process
      - Importance of home exercises and self-positioning to maintain improvement(123)
      - Self-management
    - Therapeutic modalities(75):
      - Functional retraining

- Positional maneuvers(2)(3)(124)
- Relaxation training

Visits per Episode

ICD-10-CM Code	Diagnosis Description	One Visit Episode %	Mean *	25th %ile *	50th %ile (Median) *	75th %ile *	Episode > 1 Year % *
E11.40	Type 2 diabetes mellitus with diabetic neuropathy, unspecified	40.78%	8.5	2	6	11	3.28%
E11.42	Type 2 diabetes mellitus with diabetic polyneuropathy	60.09%	9.4	2	5	13	3.53%
F07.81	Postconcussional syndrome	15.75%	10.2	3	7	13	2.58%
F84.0	Autistic disorder	9.88%	28.8	9	24	39	35%
G24.3	Spasmodic torticollis	19.43%	9.5	3	6	12	4.12%
G25.89	Other specified extrapyramidal and movement disorders	17.84%	8.4	4	6	10	1.36%
G44.86	Cervicogenic headache	17.45%	10.0	4	7	13	3.3%
G51.0	Bell's palsy	23.58%	10.0	4	6	12	1.49%
G54.0	Brachial plexus disorders	18.59%	11.4	4	7	14	4.53%
G56.00	Carpal tunnel syndrome, unspecified upper limb	18.25%	8.3	3	6	11	0%
G56.01	Carpal tunnel syndrome, right upper limb	30.08%	8.5	3	6	11	1.1%
G56.02	Carpal tunnel syndrome, left upper limb	32.65%	8.0	3	5	10	0.65%
G56.03	Carpal tunnel syndrome, bilateral upper limbs	30.4%	8.0	3	5	10	1.02%
G56.20	Lesion of ulnar nerve, unspecified upper limb	20.73%	9.3	3	7	10	1.54%

G56.21	Lesion of ulnar nerve, right upper limb	22.75%	9.6	4	6	12	0.67%
G56.22	Lesion of ulnar nerve, left upper limb	29.01%	7.6	3	5	10	0.2%
G56.23	Lesion of ulnar nerve, bilateral upper limbs	27.89%	10.5	4	7	12	3.77%
G56.31	Lesion of radial nerve, right upper limb	17.96%	8.8	3	6	11	2.19%
G56.32	Lesion of radial nerve, left upper limb	33.03%	8.4	3	7	10	0%
G57.11	Meralgia paresthetica, right lower limb	18.39%	8.2	3	6	12	0%
G57.12	Meralgia paresthetica, left lower limb	14.67%	9.1	4	6	11	1.56%
G57.51	Tarsal tunnel syndrome, right lower limb	26.74%	11.6	4	9	16	0.79%
G57.52	Tarsal tunnel syndrome, left lower limb	26.06%	10.6	4	8	15	1.64%
G57.61	Lesion of plantar nerve, right lower limb	60.82%	8.4	2	4	10	2.45%
G57.62	Lesion of plantar nerve, left lower limb	59.74%	7.0	2	5	9	0%
G60.0	Hereditary motor and sensory neuropathy	23.91%	12.0	4	8	15	4.29%
G60.3	Idiopathic progressive neuropathy	25%	12.1	4	9	15	1.28%
G60.9	Hereditary and idiopathic neuropathy, unspecified	27.66%	12.0	4	9	16	1.47%
G61.0	Guillain-Barre syndrome	8.44%	15.2	5	12	22	0.71%
G62.0	Drug-induced polyneuropathy	16.13%	9.6	3	6	13	6.41%

G62.9	Polyneuropathy, unspecified	15.25%	10.7	3	7	13	3.67%
G80.0	Spastic quadriplegic cerebral palsy	25.38%	20.9	7	14	28	14.97%
G80.1	Spastic diplegic cerebral palsy	19.59%	20.3	7	15	30	13.46%
G80.2	Spastic hemiplegic cerebral palsy	25.71%	16.0	6	11	23	17.95%
G80.8	Other cerebral palsy	17.39%	18.8	6	12	28	16.54%
G80.9	Cerebral palsy, unspecified	14.2%	20.6	6	15	30	14.9%
G81.91	Hemiplegia, unspecified affecting right dominant side	13%	16.4	6	11	23	5.75%
G81.94	Hemiplegia, unspecified affecting left nondominant side	13.73%	12.9	3	8	17	4.55%
G90.522	Complex regional pain syndrome I of left lower limb	7.5%	11.7	4	9	13	2.7%
G90.9	Disorder of the autonomic nervous system, unspecified	25.93%	16.9	5	11	28	21.25%
G95.9	Disease of spinal cord, unspecified	10.57%	13.3	5	10	15	5.45%
G96.9	Disorder of central nervous system, unspecified	7.98%	20.4	7	16	31	20.5%
G98.8	Other disorders of nervous system	6.87%	20.5	8	15	31	21.26%
H81.10	Benign paroxysmal vertigo, unspecified ear	46.44%	5.0	2	3	5	0.83%
H81.11	Benign paroxysmal vertigo, right ear	56.86%	4.3	2	3	5	0.37%

H81.12	Benign paroxysmal vertigo, left ear	56.22%	4.6	2	3	5	0.3%
H81.13	Benign paroxysmal vertigo, bilateral	44.83%	5.8	2	3	6	0.56%
H81.20	Vestibular neuronitis, unspecified ear	28.74%	7.8	3	6	11	1.61%
H81.21	Vestibular neuronitis, right ear	39.81%	7.8	3	6	10	0%
H81.4	Vertigo of central origin	34.29%	9.4	3	5	10	0.98%
H83.2X9	Labyrinthine dysfunction, unspecified ear	40.31%	6.0	2	3	6	2.6%
I63.9	Cerebral infarction, unspecified	17.78%	14.6	4	9	18	3.72%
I69.351	Hemiplegia and hemiparesis following cerebral infarction affecting right dominant side	11.76%	15.9	5	10	21	2.22%
I69.354	Hemiplegia and hemiparesis following cerebral infarction affecting left non-dominant side	5.91%	17.4	4	10	23	1.71%
I69.398	Other sequelae of cerebral infarction	10.47%	12.9	3	6	13	3.9%
M62.50	Muscle wasting and atrophy, not elsewhere classified, unspecified site	20.42%	9.3	4	6	10	4.42%
M62.511	Muscle wasting and atrophy, not elsewhere classified, right shoulder	9.57%	13.3	6	9	19	0.96%
M62.512	Muscle wasting and atrophy, not elsewhere classified, left shoulder	6.06%	13.4	5	10	17	0%
M62.551	Muscle wasting and atrophy, not elsewhere classified, right thigh	10.71%	13.3	5	9	17	2.5%

M62.552	Muscle wasting and atrophy, not elsewhere classified, left thigh	9.22%	15.4	5	11	20	3.21%
M62.58	Muscle wasting and atrophy, not elsewhere classified, other site	28.23%	8.3	3	5	10	3.33%
M62.59	Muscle wasting and atrophy, not elsewhere classified, multiple sites	12.8%	14.7	5	10	18	2.72%
M62.81	Muscle weakness (generalized)	13%	12.1	4	8	15	3.46%
M62.831	Muscle spasm of calf	15.24%	8.1	4	6	11	2.25%
M62.838	Other muscle spasm	21.98%	8.0	3	5	10	4.66%
R25.1	Tremor, unspecified	35.58%	10.3	3	6	15	2.99%
R25.2	Cramp and spasm	23.87%	9.2	3	6	11	6.51%
R26.0	Ataxic gait	14.94%	15.3	5	11	18	3.41%
R26.2	Difficulty in walking, not elsewhere classified	12.19%	14.0	5	10	18	2.35%
R26.81	Unsteadiness on feet	22.68%	12.7	4	8	16	2.67%
R26.89	Other abnormalities of gait and mobility	16.16%	13.0	4	9	17	4.2%
R26.9	Unspecified abnormalities of gait and mobility	15.66%	12.6	4	8	17	4.01%
R27.0	Ataxia, unspecified	17.9%	13.4	4	9	18	5.21%
R27.8	Other lack of coordination	14.87%	18.0	5	12	27	16.26%
R27.9	Unspecified lack of coordination	12.15%	19.1	6	14	30	16.61%
R29.2	Abnormal reflex	10.27%	20.8	9	19	27	19.28%
R29.3	Abnormal posture	18.02%	10.2	4	7	12	3.02%
R29.6	Repeated falls	12.84%	14.5	5	10	20	2.11%

R29.818	Other symptoms and signs involving the nervous system	13.09%	18.2	6	13	27	18.95%
R29.898	Other symptoms and signs involving the musculoskeletal system	16.6%	9.6	3	6	12	2.17%
R29.90	Unspecified symptoms and signs involving the nervous system	15.68%	19.2	6	14	31	21.79%
R42	Dizziness and giddiness	39%	6.7	2	4	8	1.15%
R48.2	Apraxia	12.77%	19.1	6	14	25	14.63%
R48.8	Other symbolic dysfunctions	21.24%	21.3	6	15	32	19.74%
S06.0X0A	Concussion without loss of consciousness, initial encounter	41.27%	7.6	3	5	9	1.02%
S06.0X0D	Concussion without loss of consciousness, subsequent encounter	18.88%	8.0	3	5	10	1.35%
S06.0X0S	Concussion without loss of consciousness, sequela	18.75%	9.2	4	7	10	0%
S06.0X1D	Concussion with loss of consciousness of 30 minutes or less, subsequent encounter	21.19%	8.7	3	6	10	1.08%
S06.0X9D	Concussion with loss of consciousness of unspecified duration, subsequent encounter	14.07%	9.2	4	6	10	0.86%
S06.0XAA	Concussion with loss of consciousness status unknown, initial encounter	39.82%	6.6	3	4	9	4.41%
S14.3XXD	Injury of brachial plexus, subsequent encounter	8.89%	12.9	5	9	15	4.88%
Z86.73	Personal history of transient ischemic attack (TIA), and	20.8%	11.2	4	7	13	2.02%

	cerebral infarction without residual deficits						
Z91.81	History of falling	44%	12.7	4	8	17	4.29%

* Visit Summary for Episodes with 2 or more Visits

Evidence Summary

Criteria

The evidence for the clinical indications found in this guideline includes 48 published peer reviewed articles, 9 specialty society or other evidence-based guidelines, 9 Cochrane systematic reviews, and 9 book sections.

For a central vestibular disorder, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** A systematic review of 12 studies (421 patients) evaluating the efficacy of vestibular rehabilitation in patients with neurologic disorders found that patients who received vestibular rehabilitation combined with other neurologic rehabilitation programs had improved balance compared with patients who did not receive vestibular rehabilitation. Heterogeneity among the included studies limited the results; further studies were recommended.(4) **(EG 1)** Adults with a central vestibular disorder benefit from vestibular rehabilitation programs that include virtual reality training or habituation training combined with a home program.(1)(2)(3) **(EG 2)** Habituation training involves repeated exposure to a provoking stimulus or movement so that the response to the stimulus is reduced.(1)(3) **(EG 2)**

For a child born at 37 weeks' gestation or less, and younger than 12 months post term at the beginning of therapy, evidence demonstrates a net benefit, but of less than moderate certainty, and may consist of a consensus opinion of experts, case studies, and common standard care. **(RG A2)** A systematic review of 25 randomized or quasi-randomized controlled trials (3615 patients) evaluating early (beginning at less than 12 months post-term age) developmental intervention programs for infants born at less than 37 weeks' gestational age found that intervention was associated with improvements in cognitive outcomes in infancy and preschool and with small improvements in motor scale scores in infancy. However, there were no effects on cognitive outcomes at school age or on risk of cerebral palsy. The findings were limited by variable study quality, heterogeneity in the interventions studied, and lack of long-term follow-up; the authors recommended additional high-quality studies to further evaluate specific interventions for premature infants.(6) **(EG 1)** A randomized controlled trial of 153 infants born at 32 weeks' postmenstrual age or less evaluating a physical therapist-led, family-delivered physical therapy intervention reported significant improvements in motor performance (measured by the Test of Infant Motor Performance) with the intervention at 37 weeks' postmenstrual age. The effect on longer-term outcomes is unknown.(5) **(EG 1)**

For upper or lower extremity weakness, abnormal tone, gait unsteadiness, or movement disorder, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** Therapy interventions may be indicated for patients with neurologic diseases involving weakness, abnormal tone, or movement disorders of the upper or lower extremities. Common indications for neurologic rehabilitation interventions include patients with traumatic brain injury,(9)(10)(11) stroke,(12)(13)(14)(15) Parkinson disease,(16)(17)(18) multiple sclerosis,(19)(20)(21)(22) cerebral palsy,(23)(24)(25)(26)(27) spinal cord injury,(28)(29) diabetic neuropathy,(30)(31) and postpolio syndrome.(32)(33) **(EG 2)** For cerebral palsy, a systematic review of 41 studies (11 randomized controlled trials; total 619 patients) evaluating gait training for children and young adults (age 5 to 25 years) with cerebral palsy reported that gait training was associated with significant improvements in walking speed.(27) **(EG 1)** A systematic review of 29 studies (629 patients) found low-quality to very low-quality evidence that aerobic exercise may result in a small improvement in gross motor function, though it does not improve gait speed. The authors concluded that exercise appears to be safe for people with cerebral palsy, but large, high-quality, randomized controlled trials that assess the effectiveness of exercise are needed.(34) **(EG 1)** For diabetic neuropathy, a randomized controlled trial of 38 patients with diabetic neuropathy concluded that, after 8 weeks of a balance exercise program, static balance, dynamic balance, and trunk proprioception significantly improved.(30) **(EG 1)** For Huntington disease, a clinical practice guideline recommends aerobic exercise alone or in combination with resistance training as well as supervised gait training.(35) **(EG 2)** For multiple sclerosis, a systematic review of 15 Cochrane reviews evaluating a variety of rehabilitation interventions for multiple sclerosis (168 clinical trials; 10,396 subjects) found moderate-quality evidence that inpatient or outpatient multidisciplinary rehabilitation was associated with improvements in functional activities and bladder-related activities and that physical therapeutic modalities were associated with improvements in functional outcomes and patient-reported fatigue. There was lower-quality evidence suggesting that other interventions, including neuropsychological interventions, symptom-management programs, whole body vibration, and telerehabilitation, were associated with improvements for some outcomes.(36) **(EG 1)** A systematic review and meta-analysis identified 43 studies (1070 patients with multiple sclerosis) evaluating the efficacy of rehabilitation with aerobic exercise training and found that aerobic training was associated with improved balance, gait speed, and walking endurance compared with rehabilitation without aerobic training; no difference in aerobic performance or fatigue perception was seen between groups.(37) **(EG 1)** A systematic review of 19 studies of multiple sclerosis patients with severe mobility disability found limited evidence that exercise training significantly improves physical function and participatory outcomes (eg, fatigue and quality of life).(38) **(EG 1)** For Parkinson disease, a meta-analysis of 25 randomized controlled trials evaluating the effects of exercise in Parkinson disease patients found that exercise training was associated with improved balance and gait as well as reduced fall rates.(39) **(EG 1)** A systematic review that included 154 randomized trials involving 7837 participants noted that physiotherapy improved motor signs and quality of life for patients with Parkinson disease; however, there was insufficient evidence to support the use of any single physiotherapy intervention over another.(40) **(EG 1)** A systematic review and meta-analysis of resistance training, endurance training, and other intensive training modalities for patients with Parkinson disease included 15 randomized controlled trials and found strong evidence that resistance training can improve muscle strength and

moderate evidence that endurance training can improve cardiorespiratory fitness.(41) **(EG 1)** A systematic review concluded that treadmill training improves gait speed and stride length, but not walking distance or cadence, in patients with Parkinson disease.(42) **(EG 1)** A systematic review and meta-analysis of 7 randomized controlled trials (401 patients) evaluating resistance training in Parkinson disease patients found that training was associated with improved muscle strength, balance, and motor symptoms, but not with improved gait, balance confidence, or quality of life.(43) **(EG 1)** A clinical practice guideline recommends balance, gait, resistance, and task-specific training along with aerobic exercise, behavior-change approaches, and integrated care (eg, physical therapist, occupational therapist, speech-language pathologist, neurologist, physiatrist, nurse, and social worker) for rehabilitation management of patients with Parkinson disease.(18) **(EG 2)** A working group guideline recommends consideration of Parkinson disease-specific physiotherapy in patients in the early stages of Parkinson disease experiencing balance or motor function problems.(44) **(EG 2)** For spinal cord injury, a study of 134 patients evaluating the effects of a multidisciplinary outpatient rehabilitation program (including occupational and physical therapy, education, and home nursing) found, after 6 months, that the program was associated with improvement on the Spinal Cord Independence Measure III scale.(45) **(EG 2)** For stroke, there is substantial evidence that positive rehabilitation outcomes are associated with well-functioning multidisciplinary team care and high patient and family motivation and engagement.(7)(13)(14)(46) **(EG 2)** The principle that increased intensive training is helpful for stroke rehabilitation is widely accepted and supported by moderate-quality evidence.(7)(14)(46)(47)(48) **(EG 1)** A synthesis of 40 systematic reviews that contained 503 studies (18,078 participants) found moderate-quality evidence for improvement in upper limb function after stroke by using therapies that included constraint-induced movement therapy, mental practice, mirror therapy, virtual reality therapy, interventions for sensory impairment, a relatively high dose of repetitive task practice, and unilateral arm training over bilateral arm training.(48) **(EG 1)** A systematic review evaluating the effectiveness of physical rehabilitation for patients with stroke included 267 studies (21,838 patients) and found that, compared with no physical rehabilitation, physical rehabilitation may improve independence in activities of daily living and motor function.(49) **(EG 1)** Clinical guidelines recommend both therapy-based rehabilitation services at home within 1 year of stroke and outpatient rehabilitation services to help improve ability to perform ADL.(7)(14) **(EG 2)** A national specialty society guideline emphasizes coordination between the patient, family, and interprofessional team to provide a comprehensive rehabilitation program for adults recovering from stroke, including facility-based and outpatient or home-based programs, at an intensity commensurate with anticipated benefit and patient tolerance.(15) **(EG 2)** A national expert consensus guideline on stroke rehabilitation recommends that rehabilitation therapy start as soon as acute stroke patients are medically stable and able to actively participate; those patients with ongoing therapy goals after discharge are recommended to have outpatient and/or in-home rehabilitation provided by a specialized interdisciplinary team beginning within 48 hours to 72 hours of hospital or inpatient rehabilitation discharge.(50) **(EG 2)** For traumatic brain injury, a literature review that included 16 articles (6 randomized controlled trials) found moderate evidence that supported various exercise programs to improve motor functioning after traumatic brain injury; evidence to support multidisciplinary rehabilitation programs and computer-based interventions was limited.(11) **(EG 2)** Another literature review of 19 articles (including 4 systematic reviews) found moderate evidence that various multidisciplinary and interdisciplinary rehabilitation approaches and community-based rehabilitation programs are effective in improving occupational performance and social participation after moderate to severe traumatic brain injury; no single approach or setting was clearly better than others. Conclusions were limited by small low-quality studies and by study heterogeneity.(51) **(EG 2)** A joint consensus guideline on mild traumatic brain injury recommends targeted interventions to address autonomic/exertional, cervical musculoskeletal, motor function, or vestibulo-oculomotor impairments in this population.(52) **(EG 2)**

For peripheral vestibular disorders, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** Patients with benign paroxysmal positional vertigo benefit from postural/positional maneuvers.(2)(76) **(EG 2)** A systematic review that included 39 randomized controlled trials with 2441 participants concluded that there is moderate to strong evidence to support vestibular rehabilitation as a safe and effective treatment for unilateral peripheral vestibular disorders, including benign paroxysmal positional vertigo, especially in the medium term and long term when combined with specific physical repositioning maneuvers. However, specific physical repositioning maneuvers may be more effective in the short term for benign paroxysmal positional vertigo than exercise-based vestibular rehabilitation alone.(75) **(EG 1)** A practice guideline states that vestibular rehabilitation should be offered to patients with unilateral or bilateral vestibular dysfunction with impairments and functional limitation related to the vestibular deficit.(77) **(EG 2)** A clinical practice guideline recommends that clinicians offer self-administered or clinician-supervised vestibular rehabilitation as an option for treatment of benign positional vertigo.(78) **(EG 2)** A clinical practice guideline recommends vestibular rehabilitation for patients with chronic vertigo due to Meniere disease, but not for those with acute vertigo.(79) **(EG 2)**

Rationale

Use of this MCG care guideline helps the clinician determine if a particular treatment, medication, or service might be appropriate for a specific patient, taking into account their unique health complexities.

Use of these evidence-based clinical criteria to support decision making benefits the patient by identifying patient-specific complex clinical factors and conditions, promoting personalized treatment. Utilizing evidence-based clinical criteria promotes patient safety by helping ensure that potential patient benefits outweigh the risks. In addition, the use of evidence-based guidelines can increase consistency in treatment thresholds, leading to less variation in care and promoting equitable treatment among patients.

Related CMS Coverage Guidance

This guideline supplements but does not replace, modify, or supersede existing Medicare regulations or applicable National Coverage Determinations (NCDs) or Local Coverage Determinations (LCDs).

Code of Federal Regulations (CFR): 42 CFR 419.22(125); 42 CFR 422.101(126)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 14 - Medical Devices(127); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(80); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 16 - General Exclusions from Coverage(128)

Medicare Coverage Determinations: Medicare Coverage Database(129)

References

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Footnotes

[A] Diagnosis of a central vestibular disorder may be based on neurodiagnostic studies, imaging, or pathology. [A in Context Link 1]

[B] Apraxia is an inability to perform the purposeful execution of learned activities that is not secondary to a primary motor or sensory impairment, or due to the inability to comprehend or remember.(59) Either an action plan cannot be retrieved from memory or a patient is unable to implement a plan of action correctly or at all.(59) [B in Context Link 1]

[C] According to the Centers for Medicare and Medicaid Services (CMS), a maintenance therapy program helps to maintain the patient's current condition or to prevent or slow further deterioration. CMS specifies that skilled therapy services are necessary for the performance of a safe and effective maintenance program only when (a) the particular patient's special medical complications require the skills of a qualified therapist to perform a therapy service that would otherwise be considered nonskilled, or (b) the needed therapy procedures are of such complexity that the skills of a qualified therapist are required to perform the procedure.(80) [C in Context Link 1]

[D] A systematic review that included 159 trials concluded that fall-prevention exercise programs, usually including muscle strengthening and balance retraining, were associated with lower fall rates in community-dwelling older people.(87)(100) An international guideline recommends strength and balance training for older people living in the community with a history of recurrent falls with or without balance and gait deficit.(73) A specialty society guideline recommends that every older adult be screened for fall risk annually and that structured physical therapy, including education about fall risk, possible home hazard evaluation, and footwear modification, be offered to those at increased risk.(88) [D in Context Link 1]

[E] Constraint-induced movement therapy involves constraining the unaffected arm while having the patient perform repetitive movements directed toward specific tasks.(57)(104) A practice guideline concluded that modified constraint-induced movement and robot-assisted training are beneficial for arm and upper limb impairment and motor function.(7) [E in Context Link 1]

[F] A meta-analysis of randomized controlled trials studying patients with chronic stroke concluded that strength training can improve upper extremity strength and function.(119) A systematic review concluded that moderate exercise programs can be safely adapted for patients with amyotrophic lateral sclerosis without adverse effects.(120) [F in Context Link 1]

Codes

ICD-10 Diagnosis: A69.22, B91, D57.213, D57.413, D57.433, E08.40, E08.41, E08.42, E08.43, E08.44, E08.49, E08.610, E09.40, E09.41, E09.42, E09.43, E09.44, E09.49, E09.610, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.610, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.610, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.610, E75.244, F07.81, F78.A1, F84.0, F84.8, G04.1, G04.82, G10, G11.10, G11.11, G11.19, G11.2, G11.4, G11.5, G11.6, G11.8, G11.9, G12.0, G12.1, G12.20, G12.21, G12.22, G12.23, G12.24, G12.25, G12.29, G13.8, G14, G20.A1, G20.A2, G20.B1, G20.B2, G20.C, G21.11, G21.19, G21.2, G21.3, G21.4, G21.8, G21.9, G23.1, G23.3, G24.01, G24.3, G24.4, G24.8, G24.9, G25.0, G25.1, G25.2, G25.81, G25.89, G25.9, G31.80, G31.89, G31.9, G32.81, G35.A, G35.B0, G35.B1, G35.B2, G35.C0, G35.C1, G35.C2, G35.D, G37.3, G37.81, G37.89, G37.9, G40.42, G40.833, G40.834, G40.841, G40.842, G40.843, G40.844, G43.409, G44.86, G47.62, G51.0, G54.0, G54.5, G54.8, G55, G56.00, G56.01, G56.02, 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