

Computerized Dynamic Posturography

Guideline Number: MMG025.K
 Effective Date: May 1, 2020

[Instructions for Use](#)

Table of Contents	Page
Coverage Rationale	1
Applicable Codes	1
Description of Services	1
Clinical Evidence	2
U.S. Food and Drug Administration	3
References	4
Guideline History/Revision Information	4
Instructions for Use	4

Related Policies
None

Coverage Rationale

Computerized dynamic posturography (CDP) testing, also called balance board testing or equilibrium platform testing (EPT) is unproven and not medically necessary for evaluating any condition including but not limited to balance disorders due to insufficient evidence of efficacy.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
92548	Computerized dynamic posturography sensory organization test (CDP-SOT), 6 conditions (i.e., eyes open, eyes closed, visual sway, platform sway, eyes closed platform sway, platform and visual sway), including interpretation and report
92549	Computerized dynamic posturography sensory organization test (CDP-SOT), 6 conditions (i.e., eyes open, eyes closed, visual sway, platform sway, eyes closed platform sway, platform and visual sway), including interpretation and report; with motor control test (MCT) and adaptation test (ADT)

CPT® is a registered trademark of the American Medical Association

Description of Services

Computerized dynamic posturography (CDP), also known as moving platform posturography or dynamic posturography, uses a platform device for evaluating a patient's ability to maintain balance. CDP has been used to measure a patient's ability to maintain balance under varying conditions when the usual cues that one relies upon to remain upright, vision, proprioception, and vestibular function, are manipulated. The goal of testing is to isolate vestibular symptoms to a specific cause that can often be treated.

Standard diagnostic tests include electronystagmography and rotational chair tests, which evaluate eye movements in response to a number of different stimuli including the position and rotation of the head.

Clinical Evidence

Overall, there is weak evidence in the peer-reviewed literature regarding the efficacy of CDP for evaluating vestibular and other disorders. There is a lack of well-designed, randomized controlled trials (RCTs) with blinded assessments to demonstrate the diagnostic utility of CDP compared with standard tests. Furthermore, there is insufficient evidence demonstrating consistent and beneficial effects of CDP testing on patient-relevant outcomes.

Mallinson et al. (2019) analyzed 180 patients referred for chronic vestibular disease (persistent symptoms for more than one year) who received a full battery of vestibular assessments. The vestibular evoked myogenic potential (VEMP) results were correlated with computerized dynamic posturography (CDP). CDP results were “normal” in 102 patients (57%), “nonspecifically abnormal” in 53 patients (29%) and showed a “vestibular abnormality pattern” in 25 patients (14%). The rate of VEMP abnormalities was the same in patients with normal CDP and those with abnormal CDP. In some patients, all assessments were abnormal, but in some patients only one assessment was abnormal, suggesting that these modalities measure different things. The authors concluded that the results show that CVEMP and OVEMP abnormalities do not correlate with CDP findings; as variables in chronically dizzy patients, they are independent of each other.

Ahmed et al. (2017) performed a study to evaluate the relation between gait parameters and postural stability in early and late stages of Parkinson's disease (PD). Forty-one PD patients were divided into two groups. Group A (n=20) were considered early stage PD and group B (n=21) were considered late stage ambulant PD. A control group (n = 18) consisted of eighteen healthy elderly subjects. The individuals were evaluated for postural stability by computerized dynamic posturography (CDP) device and gait analysis using an 8 m-camera Vicon 612 data capturing system set. The study results found postural instability in early PD and late PD groups with a significant decline of composite equilibrium score and Unified Parkinson Disease Rating Scale motor part score in early PD and late PD groups as compared with control group. The authors concluded that this suggests that particularly highly mobile PD patients benefit from visual feedback-based balance training in early PD and that computerizing dynamic posturography assists in the analysis of the functional aspects of the body imbalance, treatment and prognosis of PD. There was insufficient data for the long follow-up effect of visual feedback-based balance training for PD.

Hebert and Manago (2017) performed a study to determine the reliability and discriminant validity of the computerized dynamic posturography sensory organization test (CDP-SOT) in people with multiple sclerosis (MS). The CDP-SOT was performed on 30 participants with MS. A 2-week-interval, repeated-measures design was implemented to investigate test-retest reliability of the CDP-SOT and the ability of the CDP-SOT to discriminate between participants with lower versus higher disability. The CDP-SOT had excellent reliability for composite scores. Composite scores were significantly greater in the lower-disability group versus the higher-disability group at session 1 (70.89 vs. 48.60) and session 2 (74.82 vs. 48.85). The authors concluded that the CDP-SOT is a reliable measure of balance and accurately differentiates disability status in people with MS. A study limitation identified was the recognition that smaller sample sizes can lead to large variances in measures, prohibiting valid minimal detectable change analyses. Larger longitudinal studies investigating clinically meaningful changes in CDP-SOT scores due to the natural course of MS and in response to treatment need to be conducted.

A single center, retrospective review was conducted by Morisod et al. (2018) to look for a specific posturographic pattern among patients diagnosed with chronic subjective dizziness (CSD) and to visualize improvement after vestibular rehabilitation. The study included 114 patients who underwent computerized dynamic posturography (CDP). Sixty-two percent of the assessment posturographies were abnormal. The most affected sub-items were limit of stability and composite score of sensory organization tests. In the 42 patients who had vestibular rehabilitation and a post rehabilitation posturography, the proportion of abnormal posturography significantly dropped from 79% to 33%. The authors concluded that patients with CSD have a high rate of abnormal posturography, but without a specific pattern. The findings of this study need to be validated by well-designed studies.

A study was conducted by Buster et al. (2016) which compared Computerized Dynamic Posturography (CDP) scores from individuals with traumatic brain injuries (TBI) to controls to determine if CDP could differentiate between the two groups and determine if there was a learning effect associated with testing that could be used to guide evaluation of baseline balance. Ten ambulatory individuals with a history of severe TBI and 10 individuals without participated in three CDP sessions (24-72 hours

apart). Participants performed the Berg Balance Test, Dynamic Gait Index and three trials of a standardized balance assessment during each session. Dynamic Movement Analysis (DMA) scores were recorded for each test. Individuals with TBI scored 93% higher (i.e. reflecting poorer balance) than the control group. The group with TBI exhibited 6.6-times more variability compared to the control group. A learning effect was detected in the group with TBI on the first day of testing. The authors concluded that the CDP system detected balance differences between individuals with TBI and controls and given the documented learning effect, the best of three trials should be used to accurately assess baseline scores. The significance of this study is limited by small sample size and short follow-up period.

Smoot et al (2015) conducted a feasibility study with ten children; five with autism spectrum disorder (ASD) and five with typical development (TD) using posturography to monitor changes following vestibular input. Each child participated in a 10 min vestibular swing activity with pre- and post-intervention evaluations under four different sensory testing conditions. Sway ranges, mean sway velocity, sway root mean square (RMS), and sample entropy were calculated from center of pressure (COP) data. All five children with ASD demonstrated decreased mean sway velocity in the eyes open/flat plate condition post-intervention. Four of the five children with ASD demonstrated an increase in RMS and a decrease in anterior/posterior sample entropy post-intervention in the eyes closed, foam pad condition and eyes open, flat plate condition respectively. The authors concluded that using posturography with sensory integration warrants further investigation. This is an uncontrolled study with a small sample size. Due to limited studies, small sample sizes, and weak study designs, there is insufficient evidence to conclude that CDP is useful for evaluating any condition. Further clinical trials demonstrating the clinical usefulness of CDP are needed.

Palm et al. (2014) performed a study where twenty subjects performed tests on the Biodex Stability System at all 13 stability levels. Overall stability index, medial-lateral stability index, and anterior-posterior stability index scores were calculated, and data were analyzed using analysis of variance and linear regression analysis. A decrease in platform stability from the static level to the second least stable level was associated with a linear decrease in postural control. The overall stability index scores were 1.5 ± 0.8 degrees (static), 2.2 ± 0.9 degrees (level 8), and 3.6 ± 1.7 degrees (level 2). The slope of the regression lines was 0.17 for the men and 0.10 for the women. The authors concluded that a linear correlation was demonstrated between platform stability and postural control. Limitations include non-randomization and small sample size.

Professional Societies

American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS)

In a 2014 position statement, AAO-HNS recognizes that the following tests or treatments are medically indicated and appropriate in the evaluation or treatment of persons with suspected balance or dizziness disorders:

- Static platform posturography
- Computerized static platform posturography
- Computerized dynamic platform posturography
- Dynamic (or moving) platform posturography

A 2017 clinical practice guideline for benign paroxysmal positional vertigo lists computerized posturography as one of the potential tools to consider for diagnosing this condition (Bhattacharyya, 2017).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Devices for testing vestibular dysfunction are captured in the FDA 510(k) database under Product Code LXV (Vestibular Analysis Apparatus), IKN (Electromyograph, Diagnostic) and/or Product Code KHX (Force-Measuring Platforms). Note that devices in product categories LXV and KHX are Class I, 510(k) exempt devices. Devices in product category IKN are class II devices which are also 510(k) exempt. Although many manufacturers have voluntarily submitted product information via the 510(k) process, it is not a requirement. All manufacturers are, however, required to register their establishment and submit a "Device Listing" form; these records can be viewed in the Device Listing Database. See the following Web sites for more information:

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPCD/classification.cfm> (Accessed January 6, 2019)

References

- Ahmed M, Mosalem D, Alfeeli A, et al. Relationship between gait parameters and postural stability in early and late Parkinson's disease and visual feedback-based balance training effects. *Open Access Maced J Med Sci*. 2017 Apr 15; 5(2):207-214.
- American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) [Internet]; Posturography position statement; Revised September 20, 2014.
- Bhattacharyya N, Baugh RF, Orvidas L, et al. Clinical Practice Guideline: Benign paroxysmal positional vertigo (Update). *Otolaryngology Head and Neck Surgery* 2017, Vol. 156(3S) S1-S47.
- Buster TW, Chernyavskiy P, Harms NR, et al. Computerized dynamic posturography detects balance deficits in individuals with a history of chronic severe traumatic brain injury. *Brain Inj*. 2016;30(10):1249-55.
- Hayes, Inc. Hayes Search and Summary. Computerized dynamic posturography (CDP) for diagnosis of vestibular disorders. Lansdale, PA: Hayes, Inc.; September 2018. Archived October 17, 2019.
- Hebert JR, Manago MM. Reliability and validity of the computerized dynamic posturography sensory organization test in people with multiple sclerosis. *Int J MS Care*. 2017 May-Jun;19(3):151-157.
- Mallinson A, Kuijpers A, Van Zwieten, G et al. Computerized dynamic posturography does not detect measured CVEMP and OVEMP abnormalities. *Gait & Posture* 67 (2019) 248–250.
- Morisod B, Mermod M, Maire R. Posturographic pattern of patients with chronic subjective dizziness before and after vestibular rehabilitation. *J Vestib Res*. 2018;27(5-6):305-311.
- National Institute on Deafness and Other Communication Disorders (NIDCD) [Internet]; Balance disorders; January 2000; Updated April 2014.
- Palm HG, Lang P, Strobel J, et al; Computerized dynamic posturography: the influence of platform stability on postural control; *Am J Phys Med Rehabil*; 2014 Jan; 93 (1): 49-55.
- Smoot Reinert S , Jackson K, et al. Using posturography to examine the immediate effects of vestibular therapy for children with autism spectrum disorders: A feasibility study. *Phys Occup Ther Pediatr*. 2015;35(4):365-80.

Guideline History/Revision Information

Date	Summary of Changes
01/01/2021	Template Update <ul style="list-style-type: none">Reformatted policy; transferred content to new template
05/01/2020	Supporting Information <ul style="list-style-type: none">Updated <i>Clinical Evidence</i> and <i>References</i> sections to reflect the most current informationArchived previous policy version MMG025.J

Instructions for Use

This Medical Management Guideline provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Management Guideline is provided for informational purposes. It does not constitute medical advice.

UnitedHealthcare may also use tools developed by third parties, such as the MCG™ Care Guidelines, to assist us in administering health benefits. UnitedHealthcare West Medical Management Guidelines are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice.

Member benefit coverage and limitations may vary based on the member's benefit plan Health Plan coverage provided by or through UnitedHealthcare of California, UnitedHealthcare Benefits Plan of California, UnitedHealthcare of Oklahoma, Inc., UnitedHealthcare of Oregon, Inc., UnitedHealthcare Benefits of Texas, Inc., or UnitedHealthcare of Washington, Inc.