Computerized Dynamic Posturography

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Instructions for Use

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Commercial Policy
• Computerized Dynamic Posturography

Application

This Medical Policy does not apply to the states listed below; refer to the state-specific policy/guideline, if noted:

State	Policy/Guideline
Indiana	Computerized Dynamic Posturography (for Indiana Only)
Kentucky	Computerized Dynamic Posturography (for Kentucky Only)
Louisiana	Computerized Dynamic Posturography (for Louisiana Only)
Mississippi	Computerized Dynamic Posturography (for Mississippi Only)
Nebraska	Computerized Dynamic Posturography (for Nebraska Only)
New Jersey	Computerized Dynamic Posturography (for New Jersey Only)
North Carolina	Computerized Dynamic Posturography (for North Carolina Only)
Pennsylvania	Computerized Dynamic Posturography (for Pennsylvania Only)
Tennessee	Computerized Dynamic Posturography (for Tennessee Only)

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 policy 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 federal, state, or contractual requirements 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)

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.

Kamieniarz et al. (2021) conducted a cohort study to quantify balance changes in early and moderate stage Parkinson's Disease (PD) and compare the values to healthy controls (HC) using clinical assessments of balance and posturography. Study participants included 15 adults with early PD, 15 moderate PD and 15 age matched controls. PD patients were tested during the "ON period" of their usual antiparkinsonian medication (at least one hour after they took their medication) and none of the patients exhibited any dyskinesia or dystonia signs during testing. A clinical assessment was done, as well as clinical tests of balance on a force platform. The authors quantified the spatiotemporal parameters of the center of pressure (COP), the sample entropy and power spectral density (PSD) of the COP. The results showed the PSD of the COP differentiated PD-II from HC from 0-0.5 Hz and PD-II from PD-III from 0.5-1 Hz. Specifically, PD-II and PD-III manifested greater power than HC from 0-0.5 Hz, whereas PD-III exhibited greater power than PD-II and HC from 0.5-1.0 Hz ($p<0.05$). However, there were no significant differences between PD-II and HC in all clinical tests and in spatiotemporal parameters of the COP ($p>0.05$). Although the sample entropy was significantly lower in the PD groups ($p<0.05$), entropy failed to differentiate PD-II from PD-III. The authors concluded that the low-frequency modulation of the COP in this small cohort differentiated early PD from HC and from moderate PD, and show that there are early balance deficits in PD. This study is limited by a small number of particpants and a lack of randomization.

A 2020 Hayes Evolving Evidence Review focused specifically on the evidence that addresses the clinical validity (in terms of diagnostic performance) and clinical utility (in terms of impact on diagnostic decision-making) of computerized dynamic posturography (CPD) for diagnosing vestibular disorders in adults compared with standard otoneurologic tests. There were no clinical studies that met the review criteria. There was one systematic review that did not indicate evidence of any potential benefit or advantage to the patient. This was due to the low sensitivity and specificity reported and the absence of information on clinical utility. There were no professional guidelines identified (Hayes, 2020).

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.

Clinical Practice Guidelines

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:

- Computerized static platform posturography
- Computerized dynamic platform posturography
- Dynamic (or moving) platform posturography
- Static 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 website for more information: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPCD/classification.cfm. (Accessed March 17, 2021)

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Policy History/Revision Information

Date	Summary of Changes
08/01/2021	Application • Added language to indicate this policy does not apply to the states of Mississippi, North Carolina, and Pennsylvania; refer to the state-specific policy version
05/01/2021	Template Update • Replaced content sub-heading titled "Professional Societies" with "Clinical Practice Guidelines" in *Clinical Evidence* section • Removed *CMS* section • Replaced reference to "MCG™ Care Guidelines" with "InterQual® criteria" in *Instructions for Use* Application • Added language to indicate this policy does not apply to the states of Indiana and New Jersey; refer to the state-specific policy version Supporting Information • Updated *Clinical Evidence* and *References* sections to reflect the most current information • Archived previous policy version CS023.K

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the federal, state or contractual requirements for benefit plan coverage must be referenced as the terms of the federal, state or contractual requirements for benefit plan coverage may differ from the standard benefit plan. In the event of a conflict, the federal, state or contractual requirements for benefit plan coverage govern. Before using this policy, please check the federal, state or contractual requirements for benefit plan coverage. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

UnitedHealthcare may also use tools developed by third parties, such as the InterQual® criteria, to assist us in administering health benefits. The UnitedHealthcare Medical Policies 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.