Medical Coverage Policy

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Tilt Table Testing and Computerized Dynamic Posturography

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INSTRUCTIONS FOR USE

The following Coverage Policy applies to health benefit plans administered by Cigna Companies. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make coverage determinations. References to standard benefit plan language and coverage determinations do not apply to those clients. Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer's particular benefit plan document [Group Service Agreement, Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Each coverage request should be reviewed on its own merits. Medical directors are expected to exercise clinical judgment where appropriate and have discretion in making individual coverage determinations. Where coverage for care or services does not depend on specific circumstances, reimbursement will only be provided if a requested service(s) is submitted in accordance with the relevant criteria outlined in the applicable Coverage Policy, including covered diagnosis and/or procedure code(s). Reimbursement is not allowed for services when billed for conditions or diagnoses that are not covered under this Coverage Policy (see "Coding Information" below). When billing, providers must use the most appropriate codes as of the effective date of the submission. Claims submitted

for services that are not accompanied by covered code(s) under the applicable Coverage Policy will be denied as not covered. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations.

Overview

This Coverage Policy addresses tilt table testing for the diagnosis and evaluation of select patients with syncope and computerized dynamic posturography (CDP) for evaluation and treatment planning for balance disorders.

Coverage Policy

Tilt table testing with or without the administration of provocative agents (e.g., isoproterenol) is considered medically necessary for the evaluation of syncope for ANY of the following indications:

- individual with or without structural heart disease, when the cause of syncope has not been established following a complete history and physical examination and appropriate diagnostic testing, including a twelve-lead electrocardiogram (ECG), echocardiogram, and formal exercise tolerance testing
- individual in whom the suspected cause of syncope, such as asystole or high-degree atrioventricular (AV) block, has already been established, but results of tilt table testing are needed to determine the treatment plan
- differentiation of convulsive syncope from epilepsy

Tilt table testing is not covered or reimbursable for ANY other indication including the following:

- single syncopal episode, when clinical features support a diagnosis of vasovagal syncope
- syncope in which a specific alternate cause has been established and in which the potential demonstration of neurally mediated syncope would not alter treatment plan
- evaluation of an individual with unexplained recurrent falls, without a history of symptoms associated with vasovagal syncope
- recurrent near syncope or dizziness presumed to be neurally mediated in origin
- evaluation of unexplained syncope, when neuropathies or dysautonomias may contribute to symptomatic hypotension
- follow-up evaluation of therapy to prevent syncope recurrences
- chronic fatigue syndrome
- recurrent vertigo
- recurrent transient ischemic attacks

The use of computerized dynamic posturography (CDP) is considered experimental, investigational or unproven for ANY indication.

General Background

Tilt Table Testing

Syncope is a syndrome in which a transient loss of consciousness (TLOC) is triggered by a period of inadequate oxygen delivery to the brain, most frequently caused by a period of systemic hypotension. The differential diagnosis of syncope most often involves vascular and cardiac causes. Vascular causes of syncope, particularly reflex-mediated syncope and orthostatic hypotension are the most common causes and account for at least one third of all syncopal episodes. Causes of reflex-mediated syncope include carotid sinus hypersensitivity, neurally mediated syncope (common faint, vasodepressor, neurocardiogenic, vasovagal), glossopharyngeal syncope and situational (acute hemorrhage, cough, defecation, laugh, micturition, sneeze) syncope. Syncope due to orthostatic hypotension can be associated with primary autonomic failure, secondary autonomic failure (diabetes, amyloidosis, uremia, spinal cord injuries), drug-induced orthostatic hypotension or volume depletion (Benditt, 2022; Calkins and Zipes, 2019; Benditt and Adkisson, 2013).

Syncope can peak in late adolescence to early adulthood with a second peak later in older age and a sharp rise after age 70 years. The increased risk of syncope in older adult patients appears to be due to age- and disease-related abnormalities that impair the ability to respond to physiologic stresses that would ordinarily not cause syncope. Syncope/collapse appears to be slightly more common among females depending upon the population studied. Males are more likely than females to have a cardiac cause of syncope, possibly due to the increased risk of cardiovascular disease in males (Benditt, 2022).

Cardiac causes of syncope, particularly tachyarrhythmias and bradyarrhythmias, are the second most common causes of syncope and account for 10% to 20% of all syncopal episodes. Anatomic causes of syncope include obstruction to blood flow, such as massive pulmonary embolism, atrial myxoma, or aortic stenosis (Benditt, 2022; Calkins and Zipes, 2019).

The evaluation of syncope begins with a careful history, physical examination, supine and upright blood pressure, and a 12-lead electrocardiogram (ECG). Additional testing may be needed in select patients, which can include carotid sinus massage, echocardiography, ECG monitoring, and tilt-table testing. The cause of syncope may be accurately determined in a majority of patients by a detailed history and physical exam. In some patients, the hemodynamic response to standing may be sufficient to identify postural orthostatic tachycardia syndrome or orthostatic hypotension, which may be treated without further testing. An ECG provides important information about the heart rhythm and atrioventricular (AV) conduction. An echocardiogram may be helpful if a diagnosis is not provided by history, physical examination and ECG, or if underlying heart disease is suspected. Exercise-tolerance testing, Holter monitoring, electrophysiological testing and loop-event monitoring may also be used. A diagnosis of reflex (neurally mediated) syncope is considered when there is no structural heart disease and the ECG is normal. Although syncope is not associated with excess mortality in the absence of underlying heart disease, physical harm may occur with recurrent syncope. Determining the origin of syncope can be challenging. The clinician must consider and exclude conditions that mimic syncope but are not true syncope. The most common of these conditions are seizures, sleep disturbances, accidental falls, and some psychiatric conditions (e.g., psychogenic nonepileptic seizures and pseudoseizures). Tilt table testing may be considered for a select subset of individuals when the diagnosis remains uncertain (Benditt, 2022; Calkins and Zipes, 2019; Brignole, et al., 2018; Strickberger, et al., 2006).

Postural orthostatic tachycardia syndrome (POTS) is a multisystem disorder of the autonomic nervous system, defined as the presence of symptoms of orthostatic intolerance for more than six

months, accompanied by a heart rate increase of more than 30 beats per minute within ten minutes of standing upright, in the absence of orthostatic hypotension. The syndrome must occur in the absence of prolonged bed rest, medications that impair autonomic regulation (e.g., diuretics, vasodilators, sympatholytics or certain antidepressants) or other conditions that may cause tachycardia (e.g., dehydration, anemia, or hyperthyroidism). The etiology of POTS is not clear; and may be heterogeneous. Symptoms of orthostatic intolerance are brought on by standing and relieved by sitting down. Symptoms can include lightheadedness, palpitations, fading vision, presyncope, difficulty concentrating, shortness of breath, tremulousness, chest discomfort, headache, mental clouding and nausea. The diagnosis of POTS is established from patient history and which demonstrates a heart rate increase of > 30 beats per minute (bpm) over baseline or > 120 bpm when assuming the upright posture (Cheshire, 2023; Calkins and Zipes, 2019; Shen, et al., 2017).

Tilt table testing is performed by using a tilting table with a footboard. The patient rests in the supine position for 20–45 minutes before beginning the test. At least three ECG leads record simultaneously during the study, and continuous blood pressure readings are recorded. The table rapidly moves to an upright position (60–90°). A tilt test response is considered positive for vasovagal syncope if sudden drops in heart rate, blood pressure or both are induced during the test in association with syncope or near syncope. Provocative agents are intravenous medications that can cause venous pooling or increase adrenergic stimulation, such as isoproterenol, may be used to induce a positive test result if syncope is not produced by tilt table testing alone (Cheshire, 2023; Benditt, 2022).

Literature Review – Tilt Table Testing
Evidence evaluating tilt table testing is primarily in the form of prospective case series, observational studies, retrospective reviews and review articles (Joo, et al., 2018; Furukawa, 2017; Saal, et al., 2016). The pretest probability of reflex (neurally mediated) syncope is high in a patient without evidence of ischemia or structural heart disease, and even if the test is negative, reflex syncope remains the most likely diagnosis. The sensitivity of tilt table testing can be increased, along with an associated fall in specificity, by the use of longer tilt durations, steeper tilt angles, and provocative agents such as isoproterenol or nitroglycerin (Calkins and Zipes, 2019; Strickberger, et al., 2006).

Despite the lack of strong evidence, tilt table testing has become an established procedure in the clinical evaluation of patients with syncope. Tilt table testing is used when the cause of syncope cannot be established based on a detailed history, physical examination and routine diagnostic testing. It is also used to discriminate between suspected reflex syncope and orthostatic hypotension syncope, to evaluate for postural tachycardia syndrome, to differentiate between convulsive syncope and epilepsy, or to establish a diagnosis of psychogenic nonepileptic seizures. The procedure may also be used when the cause of syncope has been established but the results of tilt table testing will contribute to establishing appropriate treatment. Numerous other applications for tilt table testing have emerged, including evaluation of near syncope, frequent falls, evaluation of therapy to prevent syncope recurrence, and evaluation of syncope related to neuropathies or dysautonomias.

Other emerging conditions for which tilt table testing has been proposed include evaluation of chronic fatigue syndrome to determine if neurally mediated hypotension and bradycardia are contributing factors, and evaluation of recurrent vertigo and recurrent transient ischemic attacks. The use of tilt table testing for these indications has not gained widespread acceptance, and the diagnostic utility of tilt table testing to evaluate these conditions has not been demonstrated in the published medical literature (Nelson, et al., 2019).

Professional Societies/Organizations – Tilt Table Testing
American College of Cardiology (ACC)/American Heart Association (AHA)/Heart Rhythm Society (HRS): In 2017, the ACC/AHA/HRS issued guidelines for evaluating and managing patients with syncope. These guidelines included the following recommendations for the use of tilt table testing (Shen, et al., 2017):

- If the diagnosis is unclear after initial evaluation, tilt-table testing can be useful for patients with suspected vasovagal syncope (VVS).
- Tilt-table testing can be useful for patients with syncope and suspected delayed orthostatic hypotension (OH) when initial evaluation is not diagnostic.
- Tilt-table testing is reasonable to distinguish convulsive syncope from epilepsy in selected patients.
- Tilt-table testing is reasonable to establish a diagnosis of pseudosyncope.
- Tilt-table testing is not recommended to predict a response to medical treatments for VVS.

The guidelines also stated that exercise stress testing can be useful to establish the cause of syncope in select patients who experience syncope or presyncope during exertion (Shen, et al., 2017).

Computerized Dynamic Posturography (CDP)
Computerized dynamic posturography (CDP) testing is a technique used to assess underlying sensory and motor control impairments associated with balance disorders. It does not identify the site of pathology, but rather documents the impairments that are functional manifestations of the pathology. Neurological evaluation, brain imaging, electronystagmography (ENG), vestibular evoked myogenic potentials (VEMP), vestibular ocular reflex (VOR), video head impulse testing (vHIT), subjective visual vertical (SVV) and in some instances magnetic resonance imaging (MRI) or computed tomography (CT) scans, are typically used to diagnose and plan treatment for balance disorders (Furman and Barton, 2022). CDP testing has been proposed as a complement to clinical tests that localize and categorize the pathology of balance disorders. During CDP testing, the patient stands on a movable, enclosed platform. A computer controls the platform's orientation and can move it in a horizontal plane or rotate it out of a horizontal plane. The computer also assesses and records the patient's postural stability and motor reactions during platform tilting.

The protocol for CDP testing includes sensory organization, motor control and adaptation testing. During sensory organization testing (SOT), visual, vestibular and proprioceptive information is manipulated to evaluate the effect on standing balance. This protocol creates conditions of conflicting sensory impressions to isolate vestibular balance control and stress the adaptive responses of the central nervous system (CNS). The motor control test (MCT) evaluates the patient's recovery from unexpected platform movements. Adaptation testing (ADT) assesses the patient's ability to modify motor reactions when the platform moves unexpectedly in a "toes up" or "toes down" direction. This adaptive test simulates daily life conditions, such as irregular support surfaces.

The role of CDP testing in the evaluation of and treatment planning for balance disorders is controversial. It has been proposed that patients in the following categories may be candidates for testing with CDP (Monsell, et al., 1997):

- Patients who are undergoing balance rehabilitation
- Patients who have symptoms of disequilibrium for whom conventional tests of vestibular function have not detected an abnormality
- Patients who are being evaluated for balance impairment after trauma

- Disability and return-to-work assessment for patients with vestibular and neurological disorders
- Patients who are receiving potentially vestibulotoxic medications or are in environments that alter inner ear function or where the vestibular structures of the inner ear may be damaged
- Patients with a history of falls and aging patients with disequilibrium
- Patients who may have a nonorganic sensation of imbalance (e.g., malingerers)

Varying sensitivity and specificity rates have been reported in the literature for CDP used to evaluate a variety of balance disorders. A sensitivity range of 57–89% and specificity range of 88–100% has been reported for differentiating malingerers from both patients with a genuine balance disorder and healthy controls. Sensitivity and specificity rates of 77% and 71% respectively have been reported for differentiating between simulated vertigo and acute vertigo due to vestibular neuritis. The clinical utility of CDP has not been established. CDP reportedly provides additional information to conventional testing for balance disorders. However, the impact of this information on diagnosing, treatment planning, and monitoring has not been clearly defined. CDP does not localize the site of a lesion. Currently, vestibular disorders are typically diagnosed using established testing methods such as electronystagmography and rotational chair testing combined with imaging studies.

U.S. Food and Drug Administration (FDA) - Computerized Dynamic Posturography (CDP): The EquiTest™ system, introduced by NeuroCom® International (Clackamas, OR) in 1985, is approved by the FDA for computerized posturography testing.

Literature Review - Computerized dynamic posturography (CDP)
The evidence in the published peer-reviewed medical literature examining the safety and effectiveness of CDP includes older studies, some poorly designed, with varying results (Morgan, et al., 2002; El-Kashlan, et al., 1998; Di Fabio, 1996; Di Fabio, 1995). A systematic review by Piirtola and Era (2006) evaluated prospective studies (n=9) and reported that measures related to dynamic posturography (i.e., moving platforms) were not found to be predictive of falls among elderly populations. It was found that while certain aspects of force platform data may have predictive value for subsequent falls, the small number of available studies made it difficult to draw conclusions.

Additional evidence evaluating the use of CDP is primarily in the form of prospective and retrospective case series and validation studies with patient populations ranging from 26–216 (Kamieniarz, et al., 2021; Mallinson, et al., 2019; Ahmed, et al., 2017; Hebert and Manago, 2017; Morisod, et al., 2017; Rossi-Izquierdo, et al., 2014; Ebersbach, et al., 2011; Mockford, et al., 2010; Gouveris, et al., 2007; Mbongo, et al., 2005; Sataloff, et al., 2005; Soto, et al., 2004). Studies have included patients with a various disorders including vertigo, vestibular schwannoma, Parkinson's disease and Ménière's disease. Overall, small sample sizes and poor study design have limited the generalizability of these study results. The data have not reliably demonstrated any beneficial effects of CDP evaluation on patient outcomes.

Professional Societies/Organizations - Computerized Dynamic Posturography (CDP)
The American Academy of Otolaryngology—Head and Neck Surgery (AAO-HNS): The AAO-HNS stated in a position statement on posturography that computerized dynamic platform posturography testing is medically indicated and appropriate in the evaluation of individuals with suspected balance or dizziness disorders (AAO-HNS, 2007; 2014).

In 2017, an AAO-HNS clinical position on benign paroxysmal positional vertigo listed computerized posturography as a diagnostic tool to consider when diagnosing benign paroxysmal positional vertigo. No additional information was provided (Bhattacharyya, et al., 2017).

Medicare Coverage Determinations

	Contractor	Determination Name/Number	Revision Effective Date
NCD		No Determination found	
LCD	Palmetto GBA	Outpatient Occupational Therapy (L34427)	4/13/2023
LCD	Palmetto GBA	Outpatient Physical Therapy (L34428)	5/18/2023

Note: Please review the current Medicare Policy for the most up-to-date information.
(NCD = National Coverage Determination; LCD = Local Coverage Determination)

Coding Information

Notes:

1. This list of codes may not be all-inclusive.
2. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

Note: Code 93660 should not be billed to describe autonomic nerve testing

CPT®* Codes	Description
93660	Evaluation of cardiovascular function with tilt table evaluation, with continuous ECG monitoring and intermittent blood pressure monitoring, with or without pharmacological intervention

ICD-10-CM Diagnosis Codes	Description
R55	Syncope and collapse

Not Covered or Reimbursable:

ICD-10-CM Diagnosis Codes	Description
	All other codes

Considered Experimental/Investigational/Unproven for any indication:

CPT®* Codes	Description
92548	Computerized dynamic posturography sensory organization test (CDP-SOT), 6 conditions (ie, 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 (ie, 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)

***Current Procedural Terminology (CPT®) ©2022 American Medical Association: Chicago, IL.**

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Revision Details

Type of Revision	Summary of Changes	Date
Annual Review	• Title changed.	12/15/2023