

Medical Coverage Policy

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Autonomic Nerve Function Testing

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<u>Electrodiagnostic Testing (EMG/NCV)</u> Tilt Table Testing

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 quidance 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

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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 autonomic nerve function testing, including sudomotor, cardiovagal, and adrenergic tests.

Coverage Policy

Autonomic nerve function testing is considered medically necessary to evaluate autonomic nerve function and aid in the diagnosis of ANY of the following conditions:

- Distal small fiber neuropathy
- Postural tachycardia syndrome
- Reflex sympathetic dystrophy (e.g., sympathetically maintained pain, causalgia)
- · Recurrent, unexplained syncope
- Any of the following progressive autonomic neuropathies:
 - Diabetic autonomic neuropathy
 - Amyloid neuropathy
 - > Sjogren's syndrome
 - Idiopathic neuropathy
 - Pure autonomic failure
 - Multiple system atrophy (Shy-Drager syndrome)

Autonomic nerve function testing to aid in the diagnosis of ANY other condition is not covered or reimbursable.

Autonomic nerve function testing using a portable, automated device (e.g., ANX 3.0™ [Autonomic Nervous System and Respiration (ANSAR)]; VitalScan ANS) for any indication is considered experimental, investigational or unproven.

Health Equity Considerations

Health equity is the highest level of health for all people; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which people are born, grow, live, work, and age.

Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include safe housing, transportation, and neighborhoods; racism, discrimination and violence; education, job opportunities and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

General Background

The autonomic nervous system controls the internal organs of the body regulating and maintaining physiologic processes such as blood pressure, heart rate, body temperature,

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metabolism, sweating, urination, and fluid and electrolyte balance. The autonomic nervous system is controlled by two nerve systems, the parasympathetic nervous system and sympathetic nervous system. Stimulus to the sympathetic nervous system activates what is commonly referred to as the "fight or flight response", involving redistribution of blood flow from the internal organs to skeletal muscle, increasing cardiac function, sweating, and pupillary dilatation. Stimulation of the parasympathetic nervous system is associated with maintenance of function and conserving energy. Most of the body organs are innervated by both systems, although some organs are innervated by only one. When innervated by both systems the two systems work together allowing the body to respond appropriately to various stimuli.

Disorders of the autonomic nervous system can affect any body system. They can be classed as either structural or functional disorders. Structural disorders (i.e., autonomic failure), such as multiple system atrophy (MSA) or diabetic autonomic neuropathy, exert a direct effect on autonomic nerve function whereas functional disorders do not. Functional disorders are less specific in cause and effect and are generally defined by the symptoms that an individual displays as part of a "syndrome", such as postural tachycardia syndrome (POTS) or complex regional pain syndrome.

Clinical symptoms that are associated with autonomic impairment typically include lightheadedness resulting from position changes, dry mouth, dry eyes, impotence, gastroparesis, bowel or urinary incontinence, and neuropathies, to name a few. When symptoms suggest autonomic nerve dysfunction, autonomic nerve function testing may be recommended to aid with the diagnosis of a condition. Treatment is then aimed at correction of the underlying disease and/or management of the specific symptoms.

Sudomotor testing (i.e., sweat testing) is used to test nerve fibers associated with sweating and aids in the assessment of neuropathy. Cardiovagal and adrenergic testing, which are both noninvasive, use blood pressure and heart rate to obtain waveforms and measurements and are performed to evaluate conditions such as tachycardia and orthostatic hypotension. Comprehensive testing is typically performed in a dedicated autonomic testing laboratory by an autonomic disorders specialist. An evaluation typically involves an electrocardiogram (ECG), respiratory and blood pressure monitoring, and may include tilt table testing.

Autonomic Sudomotor Function Tests (Sweat Testing) (CPT® code 95923)

Tests that are established and commonly used to assess sudomotor function include the thermoregulatory sweat test, quantitative sudomotor axon reflex test, silastic sweat imprint test, and sympathetic skin response test. The aim of sudomotor testing is to evaluate the functional integrity of sudomotor nerves. A standardized stimulus is administered under controlled conditions, and the patient's response is measured (Cheshire, et al., 2021).

Quantitative sudomotor axon reflex test (QSART): The QSART involves stimulation of the sympathetic nerve fibers using iontophoresis of acetylcholine (ACh) and then measuring an evoked sweat response. The QSART specifically evaluates the functional status of the postganglionic sympathetic axons. The sweat response is recorded from four distinct body areas to assess for deficits, one on the forearm, and three located on the lower extremities. An absent response indicates a lesion of the postganglionic axon.

Thermoregulatory sweat test (TST): The TST assesses the sympathetic nerves that supply the skin and evaluates both pre- and postganglionic pathways. A color indicator in the form of powder is applied to the skin. A heat cabinet is used to raise the patient's temperature, the elevated temperature induces sweating, and the presence of sweating causes a change in the indicator. Digital photography is used to document sweat distribution. The test can be used to diagnose

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neuropathy, ganglionopathy, or generalized autonomic failure. This test has also been helpful in assessing the status of dysautonomias over time.

Sympathetic skin response test (SSR): The SSR test measures a change in skin resistance following a random electrical stimulation and provides an index of sweat production. Sympathetic peripheral autonomic potentials are evoked by electrical stimulation producing sweat, with recordings taken over the palms and soles. The SSR is recorded as being present or absent in the hand and in the foot.

Silastic sweat imprint test: Sweat imprints are formed by the secretion of active sweat glands into a plastic/silastic imprint. This test is used to determine sweat gland density, sweat droplet size and sweat volume per area.

Quantitative direct and indirect reflex test (QDIRT): The QDIRT combines some of the advantages of silicone impressions and QSART by providing data on droplet number, droplet topographic distribution, and temporal resolution in direct and axon reflex-mediated regions. Sweat glands are stimulated by acetylcholine iontophoresis and sweat is displayed via an activator dye followed by digital photographs over time. QDIRT has been associated with some limitations which include the ability to control the room temperature and humidity when and where testing is conducted. Temperature and humidity control prevents cool, dry air from causing evaporation of sweat production, which could affect the validity of test results.

Quantitative pilomotor axon reflex test (QPART): The piloerector muscles generally react to mechanical, thermal, electrical, or pharmacological stimuli by way of an axon reflex (Siepmann, et al., 2012). While sudomotor axon tests and vasomotor axon tests are commonly used to evaluate small nerve fiber function, the QPART is under investigation as a method to evaluate pilomotor nerve and muscle function, which in theory can be used to complement the axon mediated tests (Siepmann, et al., 2012). Published scientific evidence supporting the clinical utility of QPART however is still being gathered.

Cardiovagal Innervation (CPT code 95921)

Cardiovagal testing provides a standardized quantitative assessment of vagal innervation to the heart and evaluates heart rate response to deep breathing, a Valsalva ratio, and/or heart rate response to standing. Changes in heart rate response are recorded and interpreted; when the autonomic nervous system is intact variation of heart rate occurs with the specific maneuver. These tests have high sensitivity and specificity, and are standardized established tests of autonomic function (Cheshire, et al., 2021). Impairment may be seen as a result of diabetic neuropathy, multiple system atrophy (formerly called Shy-Drager syndrome), idiopathic hypotension, or other neuropathies affecting the autonomic nerves.

Vasomotor Adrenergic Innervation (CPT code 95922)

Vasomotor adrenergic testing evaluates a beat-to-beat blood pressure response to tilt-testing, a Valsalva maneuver, or standing (e.g., Valsalva maneuver analysis). Tilt-testing results in a shift of blood to dependent body areas causing reflex responses while Valsalva maneuvers result in increased intrathoracic pressure, decreasing venous return and causing changes to blood pressure and reflex vasoconstriction. When performed these tests enhance the sensitivity and specificity of adrenergic function and are considered established methods of testing. Similar to cardiovagal testing, impairment may be seen with conditions such as multiple system atrophy, idiopathic orthostatic hypotension, and diabetic or other neuropathies affecting autonomic nerves.

Combined Parasympathetic and Sympathetic Testing with Tilt Table (CPT code 95924) Combined testing of autonomic function may also be performed, and may be appropriate when there is a need to differentiate sympathetic from parasympathetic cardiovascular function. One

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method that is well established involves testing parasympathetic function and vasomotor adrenergic function using at least a 5-minute tilt with a passive tilt table.

Portable, Automated Autonomic Nerve Function Testing

Devices have also been developed that allow for combined testing without the use of beat-to-beat recordings or tilt table. These devices are referred to as "automated autonomic nerve function testing" and represent a simplified method of ANS testing which has not been validated in the scientific literature, therefore results may be erroneous. These devices have been marketed as quick, office-based tests, often for use by non-ANS specialist practitioners.

There are numerous commercially-available automated technologies promoted as "autonomic nervous system testing", including:

- ANS Sudopath Complex; Plus
- ANX 3.0
- EZSCAN
- Finapres[®] NOVA
- neuropad[®]
- Pulse 4 Pulse
- Sudoscan[®]
- TM-Flow System
- VitalScan ANS; Combo Pro; SudoCheck
- ZYTO Hand Cradle

Automated ANS tests typically do not involve physician interpretation, or control for medications, respirations, expiratory pressures, or beat-to-beat blood pressure measurements. In the absence of expiratory pressure and blood pressure measurements in response to a Valsalva maneuver, interpretation of heart rate cannot be validated (American Academy of Neurology [AAN], 2014). Commercial tests which record moisture or skin conductance due to spontaneous sweating (e.g., Sudoscan®, EZSCAN) have been proposed as fast, non-invasive tests of sudomotor or sensory nerve fiber function. However, inconsistencies with technique and normative values, and concerns regarding sensitivity and specificity have been raised in the literature (Zhao, et al., 2022; Cheshire, et al., 2021; Rajan, et al., 2019).

A 2021 joint professional society publication recommended ANS testing be performed in the clinical autonomic laboratory setting by healthcare professionals with comprehensive knowledge of the neuroanatomy, physiology, and pathological profiles of autonomic disorders. The statement further noted "autonomic testing by automated devices without physician interpretation has not been validated, lacks a sound physiological basis, is potentially misleading, and should be interpreted with caution." Regarding electrochemical skin conductance-type tests, the authors stated since such tests "do not evaluate the integrity of sudomotor axons, they are not truly tests of autonomic function" (Cheshire, et al., 2021).

U.S. Food and Drug Administration (FDA)

Various monitoring devices have been FDA-cleared for autonomic nerve function testing. Some of these devices are able to assess both branches of the nervous system, some employ automation of results, and others require physician review and interpretation. Examples of automated testing devices include but are not limited to the ANX 3.0^{TM} (Autonomic Nervous System and Respiration [ANSAR]) (Ansar Medical Technology, Philadelphia, PA; 1995) and the VitalScan ANS (Medeia Inc., Santa Barbara, CA; 2020).

Literature Review

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The results of clinical trials evaluating the clinical utility of autonomic nerve testing in the peer-reviewed published scientific literature are mixed, and consist of retrospective and prospective case series, observational studies and few randomized controlled trials. Some studies demonstrate that autonomic nervous system testing impacts treatment strategies and clinical outcomes while some studies show no impact (Rajan, et al., 2019; Jones and Gibbons, 2014; Iodice, et al., 2012; Kimpinski, et al., 2012; Keet, et al., 2011; Gibbons, et al., 2010; Peltier, et al., 2010; Illigens and Gibbons, 2009; Lipp, et al., 2009; Chen, et al., 2008; Wang, et al., 2008; Hoitsma, et al., 2004; Huang, et al., 2004; Low, et al., 2004; Chelimsky, et al., 1995). However, autonomic nerve function tests have been used extensively, are considered established tests that are safe and effective, and have shown clinical utility for a specific subset of conditions (Cheshire, et al., 2021).

Professional Societies/Organizations

American Autonomic Society (AAS)/American Academy of Neurology (AAN)/International Federation of Clinical Neurophysiology (IFCN): In 2021, these societies published a consensus statement regarding the electrodiagnostic assessment of the autonomic nervous system. The recommendations included the following (Cheshire, et al., 2021):

- "Testing of the autonomic nervous system in the clinical autonomic laboratory should be performed by healthcare professionals with comprehensive knowledge of the neuroanatomy, physiology, and pathological profiles of autonomic disorders.
- Interpretation of autonomic test results should be based also on a medical history and physical examination, from which autonomic testing assists in confirming or eliminating potential conditions in a differential diagnosis.
- A combination of autonomic tests in a screening battery provides a more accurate measure
 of autonomic function, as a single test alone cannot distinguish the type or severity of
 autonomic failure.
- Ideally, assessment of autonomic function should include tests of cardiovascular adrenergic, cardiovagal, and sudomotor function.
- In resource-limited settings the knowledge and expertise of the person interpreting
 autonomic tests is no less important. Before the results are interpreted as normal or
 abnormal, consideration should be given to potentially confounding factors, such as
 medications, equipment settings, room conditions, or patient factors that might have
 altered the findings."

For assessment of sympathetic cardiovascular adrenergic function, the authors recommended measurement of continuous beat-to-beat heart rate and blood pressure responses to the Valsalva maneuver. Parasympathetic cardiovagal testing should include measuring continuous beat-to-beat heart rate and blood pressure responses to postural change on a tilt table; continuous beat-to-beat heart rate responses to sinusoidal deep breathing; and/or the Valsalva ratio. Assessment of sympathetic sudomotor cholinergic function should include the quantitative sudomotor axon reflex test (QSART) and/or thermoregulatory sweat test (TST).

Appropriate indications for testing included:

- autonomic failure, including familial dysautonomia
- peripheral polyneuropathy, including diabetic, amyloid, and paraneoplastic autonomic neuropathies; distal small fiber neuropathy
- ganglionopathy
- orthostatic hypotension
- orthostatic intolerance, including postural tachycardia syndrome (POTS)
- syncope, including recurrent or unexplained syncope
- neurodegenerative disorders, including autonomic failure in multiple system atrophy,
 Parkinson disease, and Lewy body dementia; pure autonomic failure

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- hyperadrenergic states
- heat intolerance
- regional autonomic failure

The statement commented on the unproven validity of commercial tests which record moisture or skin conductance due to spontaneous sweating (e.g., Sudoscan). These tests assess sweat gland function in areas that have large sweating output, and which are highly responsive to emotional activation (e.g., palms and soles). Further, the statement noted that since such tests "do not evaluate the integrity of sudomotor axons, they are not truly tests of autonomic function."

The statement further noted that "autonomic testing by automated devices without physician interpretation has not been validated, lacks a sound physiological basis, is potentially misleading, and should be interpreted with caution" (Cheshire, et al., 2021).

American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM): The AANEM updated its recommended policy for electrodiagnostic medicine in 2023. Within this policy, the AANEM states autonomic nervous system function testing is employed to determine the presence of autonomic dysfunction, to determine the site of autonomic function and to identify various autonomic systems which may be disordered. The recommended policy includes testing of cardiovagal innervation, vasomotor adrenergic innervation, and evaluation of sudomotor function (specifically, the quantitative sudomotor axon reflex test [QSART]; silastic sweat imprint; thermoregulatory sweat test; and sympathetic skin response [SSR]). Conditions for which testing may be appropriate included as multiple system atrophy, idiopathic orthostatic hypotension, diabetic neuropathy, and other neuropathies affecting autonomic nerves.

In 2021, the AANEM published a revised position statement on the proper performance of autonomic function testing. The statement outlined the qualifications and training of the provider performing such studies, specifically that the provider "must be a physician with special training in the diagnosis and treatment of disorders of the autonomic nervous system and in the application of particular neurophysiological techniques to study these disorders."

The AANEM statement recommended the following tests as reliable and reproducible:

- Evaluation of sudomotor function:
 - quantitative sudomotor axon reflex testing
 - thermoregulatory sweat testing
 - o induced silastic skin imprints
 - sympathetic skin response
- Evaluation of cardiovagal function:
 - heart rate response to deep breathing
 - Valsalva ratio
 - o postural change
- Evaluation of vasomotor adrenergic function:
 - continuous beat-to-beat heart rate and blood pressure response to a Valsalva maneuver
 - tilt table test
 - active standing

Pharmacologic testing to induce changes in blood pressure was not recommended. The AANEM further stated the physician should consider other factors that may cause abnormal test results (e.g., beat-to-beat blood pressure setting; room temperature and humidity; tobacco, caffeine or medication use; patient participation). Finally, the statement noted the physician "should directly

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supervise and interpret the data on-site and in real time collected in various autonomic procedures including those performed by a technician" (AANEM, 2021).

National Institute for Health and Care Excellence (NICE): The 2022 NICE guidance on the use of Neuropad for detecting preclinical diabetic peripheral neuropathy indicated there was insufficient evidence to support the use of Neuropad in persons for whom standard (10 g monofilament) testing is not possible.

Medicare Coverage Determinations

	Contractor	Determination Name/Number	Revision Effective Date
NCD	National	No Determination found	
LCD	First Coast Service Options, Inc.	Autonomic Function Tests (L33609)	1/7/2021
LCD	National Government Services, Inc.	Autonomic Function Testing (L36236)	9/12/2019
LCD	Novitas Solutions, Inc.	Autonomic Function Tests (L35395)	11/14/2019
LCD	Wisconsin Physicians Service Insurance Corporation	Autonomic Function Testing (L35124)	10/26/2023

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 since the American Medical Association (AMA) and Centers for Medicare & Medicaid Services (CMS) code updates may occur more frequently than policy updates.
- 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:

CPT®*	Description
Codes	
95921†	Testing of autonomic nervous system function; cardiovagal innervation (parasympathetic function), including 2 or more of the following: heart rate response to deep breathing with recorded R-R interval, Valsalva ratio, and 30:15 ratio
95922 [†]	Testing of autonomic nervous system function; vasomotor adrenergic innervation (sympathetic adrenergic function), including beat-to-beat blood pressure and R-R interval changes during Valsalva maneuver and at least 5 minutes of passive tilt

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CPT®* Codes	Description
95923 [†]	Testing of autonomic nervous system function; sudomotor, including 1 or more of the following: quantitative sudomotor axon reflex test (QSART), silastic sweat imprint, thermoregulatory sweat test, and changes in sympathetic skin potential
95924 [†]	Testing of autonomic nervous system function; combined parasympathetic and sympathetic adrenergic function testing with at least 5 minutes of passive tilt

$^{\rm t}\underline{\text{Note}}\text{:}$ Considered Experimental/Investigational/Unproven when used to report testing using portable, automated devices.

ICD-10-CM Diagnosis Codes	Description	
A50.43	Late congenital syphilitic polyneuropathy	
A52.15	Late syphilitic neuropathy	
E09.40	Drug or chemical induced diabetes mellitus with neurological complications with diabetic neuropathy, unspecified	
E09.41	Drug or chemical induced diabetes mellitus with neurological complications with diabetic mononeuropathy	
E09.42	Drug or chemical induced diabetes mellitus with neurological complications with diabetic polyneuropathy	
E09.43	Drug or chemical induced diabetes mellitus with neurological complications with diabetic autonomic (poly)neuropathy	
E09.49	Drug or chemical induced diabetes mellitus with neurological complications with other diabetic neurological complication	
E10.40	Type 1 diabetes mellitus with diabetic neuropathy, unspecified	
E10.41	Type 1 diabetes mellitus with diabetic mononeuropathy	
E10.42	Type 1 diabetes mellitus with diabetic polyneuropathy	
E10.43	Type 1 diabetes mellitus with diabetic autonomic (poly)neuropathy	
E10.49	Type 1 diabetes mellitus with other diabetic neurological complication	
E11.40	Type 2 diabetes mellitus with diabetic neuropathy, unspecified	
E11.41	Type 2 diabetes mellitus with diabetic mononeuropathy	
E11.42	Type 2 diabetes mellitus with diabetic polyneuropathy	
E11.43	Type 2 diabetes mellitus with diabetic autonomic (poly)neuropathy	
E11.49	Type 2 diabetes mellitus with other diabetic neurological complication	
E13.40	Other specified diabetes mellitus with diabetic neuropathy, unspecified	
E13.41	Other specified diabetes mellitus with diabetic mononeuropathy	
E13.42	Other specified diabetes mellitus with diabetic polyneuropathy	
E13.43	Other specified diabetes mellitus with diabetic autonomic (poly)neuropathy	
E13.49	Other specified diabetes mellitus with other diabetic neurological complication	
E85.0	Non-neuropathic heredofamilial amyloidosis	
E85.1	Neuropathic heredofamilial amyloidosis	
E85.2	Heredofamilial amyloidosis, unspecified	
E85.3	Secondary systemic amyloidosis	
E85.4	Organ-limited amyloidosis	
E85.81	Light chain (AL) amyloidosis	
E85.82	Wild-type transthyretin-related (ATTR) amyloidosis	
E85.89	Other amyloidosis	
E85.9	Amyloidosis, unspecified	
G23.0	Hallervorden-Spatz disease	

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ICD-10-CM Diagnosis	Description	
Codes		
G23.1	Progressive supranuclear ophthalmoplegia [Steele-Richardson-Olszewski]	
G23.2	Striatonigral degeneration	
G23.3	Hypomyelination with atrophy of the basal ganglia and cerebellum	
G23.8	Other specified degenerative diseases of basal ganglia	
G23.9	Degenerative disease of basal ganglia, unspecified	
G58.8	Other specified mononeuropathies	
G58.9	Mononeuropathy, unspecified	
G60.3	Idiopathic progressive neuropathy	
G60.8	Other hereditary and idiopathic neuropathies	
G60.9	Hereditary and idiopathic neuropathy, unspecified	
G61.0	Guillain-Barre syndrome	
G90.09	Other idiopathic peripheral autonomic neuropathy	
G90.2	Horner's syndrome	
G90.3	Multi-system degeneration of the autonomic nervous system	
G90.50	Complex regional pain syndrome I, unspecified	
G90.511	Complex regional pain syndrome I of right upper limb	
G90.512	Complex regional pain syndrome I of left upper limb	
G90.513	Complex regional pain syndrome I of upper limb, bilateral	
G90.521	Complex regional pain syndrome I of right lower limb	
G90.522	Complex regional pain syndrome I of left lower limb	
G90.523	Complex regional pain syndrome I of lower limb, bilateral	
G90.59	Complex regional pain syndrome I of other specified site	
G90.8	Other disorders of autonomic nervous system (Code invalid 09/30/2024)	
G90.81	Serotonin syndrome	
G90.89	Other disorders of autonomic nervous system	
G90.9	Disorder of the autonomic nervous system, unspecified	
G90.A	Postural orthostatic tachycardia syndrome [POTS]	
G90.B	LMNB1-related autosomal dominant leukodystrophy	
I49.8	Other specified cardiac arrhythmias	
M34.83	Systemic sclerosis with polyneuropathy	
M35.00	Sjögren syndrome, unspecified	
M35.01	Sjögren syndrome with keratoconjunctivitis	
M35.02	Sjögren syndrome with lung involvement	
M35.03	Sjögren syndrome with myopathy	
M35.04	Sjögren syndrome with tubulo-interstitial nephropathy	
M35.05	Sjögren syndrome with inflammatory arthritis	
M35.06	Sjögren syndrome with peripheral nervous system involvement	
M35.07	Sjögren syndrome with central nervous system involvement	
M35.08	Sjögren syndrome with gastrointestinal involvement	
M35.09	Sjögren syndrome with other organ involvement	
M35.0A	Sjögren syndrome with glomerular disease	
M35.0B	Sjögren syndrome with vasculitis	
M35.0C	Sjögren syndrome with dental involvement	
R55	Syncope and collapse	

Not Covered or Reimbursable:

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ICD-10-CM Diagnosis Codes	Description
	All other codes

^{*}Current Procedural Terminology (CPT®) ©2024 American Medical Association: Chicago, IL.

References

- American Academy of Neurology (AAN); Gibbons CH, Cheshire WP, Fife TD. Autonomic Testing. Model Coverage Policy. Oct 2014. Accessed Dec 17, 2024. Available at URL address: https://www.aan.com/siteassets/home-page/tools-and-resources/practicing-neurologist--administrators/billing-and-coding/model-coverage-policies/14autonomicmodel_tr.pdf
- 2. American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM). Position Statement: Proper Performance of Autonomic Function Testing. Aug 2016, May 2017. Revised and reapproved Dec 2021. Accessed Dec 17, 2024. Available at URL address: https://www.aanem.org/clinical-practice-resources/position-statements
- 3. American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM). Recommended Policy for Electrodiagnostic Medicine. Sep 1997. Updated Jan 2023. Accessed Dec 17, 2024. Available at URL address: https://www.aanem.org/clinical-practice-resources/position-statements
- 4. American Diabetes Association Professional Practice Committee. 12. Retinopathy, Neuropathy, and Foot Care: Standards of Care in Diabetes-2025. Diabetes Care. 2025 Jan 1;48(Supplement 1):S252-S265.
- 5. Assessment: Clinical autonomic testing report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. Neurology. 1996 Mar;46(3):873-80.
- Blitshteyn S, Whiteson JH, Abramoff B, Azola A, Bartels MN, Bhavaraju-Sanka R, Chung T, Fleming TK, Henning E, Miglis MG, Sampsel S, Silver JK, Tosto J, Verduzco-Gutierrez M, Putrino D. Multi-disciplinary collaborative consensus guidance statement on the assessment and treatment of autonomic dysfunction in patients with post-acute sequelae of SARS-CoV-2 infection (PASC). PM R. 2022 Oct;14(10):1270-1291.
- 7. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determinations (LCDs) alphabetical index. Accessed Dec 17, 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/reports/local-coverage-final-lcds-alphabetical-report.aspx?lcdStatus=all
- 8. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determinations (LCD) Autonomic Function Testing (L35124). Oct 26, 2023. Accessed Dec 17, 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=35124
- 9. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determinations (LCD) Autonomic Function Testing (L36236). Sep 12, 2019. Accessed Dec 17, 2024. Available at

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- URL address: https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=36236
- 10. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determinations (LCD) Autonomic Function Tests (L35395). Nov 14, 2019. Accessed Dec 17, 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=35395
- 11. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determinations (LCD) Autonomic Function Tests (L33609). Jan 7, 2021. Accessed Dec 17, 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=33609
- 12. Centers for Medicare and Medicaid Services (CMS). National Coverage Determinations (NCDs) alphabetical index. Accessed Dec 17, 2024. Available at URL address: https://www.cms.gov/medicare-coverage-database/reports/national-coverage-ncd-report.aspx?chapter=all&sortBy=title
- 13. Chelimsky T, Chelimsky G. Disorders of the autonomic nervous system. In: Jankovic J, Mazziotta JC, Pomeroy SL, Newman NJ. Bradley and Daroff's Neurology in Clinical Practice, 8th ed. Elsevier, Inc.; 2022. 1930-1957.e4
- 14. Chen HT, Lin HD, Won JG, Lee CH, Wu SC, Lin JD, et al. Cardiovascular autonomic neuropathy, autonomic symptoms and diabetic complications in 674 type 2 diabetes. Diabetes Res Clin Pract. 2008 Nov;82(2):282-90.
- 15. Cheshire WP, Freeman R, Gibbons CH, Cortelli P, Wenning GK, Hilz MJ, Spies JM, Lipp A, Sandroni P, Wada N, Mano A, Ah Kim H, Kimpinski K, Iodice V, Idiáquez J, Thaisetthawatkul P, Coon EA, Low PA, Singer W. Electrodiagnostic assessment of the autonomic nervous system: A consensus statement endorsed by the American Autonomic Society, American Academy of Neurology, and the International Federation of Clinical Neurophysiology. Clin Neurophysiol. 2021 Feb;132(2):666-682.
- 16. England JD, Gronseth GS, Franklin G, Carter GT, Kinsella LJ, Cohen JA, et al.; American Academy of Neurology; American Association of Neuromuscular and Electrodiagnostic Medicine; American Academy of Physical Medicine and Rehabilitation. Practice parameter: the evaluation of distal symmetric polyneuropathy: the role of autonomic testing, nerve biopsy, and skin biopsy (an evidence-based review). Report of the American Academy of Neurology, the American Association of Neuromuscular and Electrodiagnostic Medicine, and the American Academy of Physical Medicine and Rehabilitation. PM R. 2009 Jan;1(1):14-22.
- 17. Gibbons CH, Illigens BM, Centi J, Freeman R. QDIRT: quantitative direct and indirect test of sudomotor function. Neurology. 2008 Jun 10;70(24):2299-304.
- 18. Gibbons CH, Illigens BM, Wang N, Freeman R. Quantification of sudomotor innervation: a comparison of three methods. Muscle Nerve. 2010 Jul;42(1):112-9.
- 19. Gibbons CH, Illigens BM, Wang N, Freeman R. Quantification of sweat gland innervation: a clinical-pathologic correlation. Neurology. 2009 Apr 28;72(17):1479-86.

- 20. Gilman S, Wenning GK, Low PA, Brooks DJ, Mathias CJ, Trojanowski JQ, et al. Second consensus statement on the diagnosis of multiple system atrophy. Neurology. 2008 Aug 26;71(9):670-6.
- 21. Hoitsma E, Reulen JP, de Baets M, Drent M, Spaans F, Faber CG. Small fiber neuropathy: a common and important clinical disorder. J Neurol Sci. 2004 Dec 15;227(1):119-30.
- 22. Huang YN, Jia ZR, Shi X, Sun XR. Value of sympathetic skin response test in the early diagnosis of diabetic neuropathy. Chin Med J. 2004 Sep;117(9):1317-20.
- 23. Illigens BM, Gibbons CH. Sweat testing to evaluate autonomic function. Clin Auton Res. 2009 Apr;19(2):79-87.
- 24. Iodice V, Lipp A, Ahlskog JE, Sandroni P, Fealey RD, Parisi JE, et al. Autopsy confirmed multiple system atrophy cases: Mayo experience and role of autonomic function tests. J Neurol Neurosurg Psychiatry. 2012 Apr;83(4):453-9.
- 25. Jones PK, Gibbons CH. The role of autonomic testing in syncope. Auton Neurosci. 2014 May 24. pii: S1566-0702(14)00071-X.
- 26. Kang PB, McMillan HJ, Kuntz NL, Lehky TJ, Alter KE, Fitzpatrick KF, El Kosseifi C, Quijano-Roy S; Professional Practice Committee of the American Association of Neuromuscular & Electrodiagnostic Medicine. Utility and practice of electrodiagnostic testing in the pediatric population: An AANEM consensus statement. Muscle Nerve. 2020 Feb;61(2):143-155.
- 27. Keet SW, Bulte CS, Boer C, Bouwman RA. Reproducibility of non-standardised autonomic function testing in the pre-operative assessment screening clinic. Anaesthesia. 2011 Jan;66(1):10-4.
- 28. Kimpinski K, Iodice V, Burton DD, Camilleri M, Mullan BP, Lipp A, et al. The role of autonomic testing in the differentiation of Parkinson's disease from multiple system atrophy. J Neurol Sci. 2012 Jun 15;317(1-2):92-6.
- 29. Lipp A, Sandroni P, Ahlskog JE, Fealey RD, Kimpinski K, Iodice V, et al., Prospective differentiation of multiple system atrophy from Parkinson disease, with and without autonomic failure. Arch Neurol. 2009 Jun;66(6):742-50.
- 30. López JR, Ahn-Ewing J, Emerson R, Ford C, Gale C, Gertsch JH, Hewitt L, Husain A, Kelly L, Kincaid J, Kise M, Kornegay A, Moreira JJ, Nuwer M, Schneider A, Stecker M, Sullivan LR, Toleikis JR, Wall L, Herman S. Guidelines for Qualifications of Neurodiagnostic Personnel: A Joint Position Statement of the American Clinical Neurophysiology Society, the American Association of Neuromuscular & Electrodiagnostic Medicine, the American Society of Neurophysiological Monitoring, and ASET-The Neurodiagnostic Society. J Clin Neurophysiol. 2023 May 1;40(4):271-285.
- 31. Low PA, Benrud-Larson LM, Sletten DM, Opfer-Gehrking TL, Weigand SD, O'Brien PC, et al. Autonomic symptoms and diabetic neuropathy: a population-based study. Diabetes Care. 2004 Dec;27(12):2942-7.
- 32. Maguire AM, Craig ME, Craighead A, Chan AK, Cusumano JM, Hing SJ. Autonomic nerve testing predicts the development of complications: a 12-year follow-up study. Diabetes Care. 2007 Jan;30(1):77-82.

- 33. Mazzeo A, Stancanelli C, Di Leo R, Vita G. Autonomic involvement in subacute and chronic immune-mediated neuropathies. Autoimmune Dis. 2013;2013:549465.
- 34. National Institute for Health and Care Excellence (NICE). Neuropad for detecting preclinical diabetic peripheral neuropathy. MTG38. Published Sep 10, 2018. Updated Sep 21, 2022. Accessed Dec 17, 2024. Available at URL address: https://www.nice.org.uk/guidance/mtg38
- 35. Peltier AC, Garland E, Raj SR, Sato K, Black B, Song Y, et al. Distal sudomotor findings in postural tachycardia syndrome. Clin Auton Res. 2010 Apr;20(2):93-9.
- 36. Rajan S, Campagnolo M, Callaghan B, Gibbons CH. Sudomotor function testing by electrochemical skin conductance: does it really measure sudomotor function? Clin Auton Res. 2019 Feb;29(1):31-39.
- 37. Shen WK, Sheldon RS, Benditt DG, Cohen MI, Forman DE, Goldberger ZD, Grubb BP, Hamdan MH, Krahn AD, Link MS, Olshansky B, Raj SR, Sandhu RK, Sorajja D, Sun BC, Yancy CW. 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Circulation. 2017 Aug 1;136(5):e60-e122. Erratum in: Circulation. 2017 Oct 17;136(16):e271-e272.
- 38. Siepmann T, Gibbons CH, Illigens BM, Lafo JA, Brown CM, Freeman R. Quantitative Pilomotor Axon-Reflex Test A Novel Test of Pilomotor Function. Arch Neurol. 2012 November; 69(11):1488–1492.
- 39. Suchowersky O, Reich S, Perlmutter J, Zesiewicz T, Gronseth G, Weiner WJ; Quality Standards Subcommittee of the American Academy of Neurology. Practice Parameter: diagnosis and prognosis of new onset Parkinson disease (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2006 Apr 11;66(7):968-75.
- 40. Thijs RD, Brignole M, Falup-Pecurariu C, Fanciulli A, Freeman R, Guaraldi P, Jordan J, Habek M, Hilz M, Traon AP, Stankovic I, Struhal W, Sutton R, Wenning G, Van Dijk JG. Recommendations for tilt table testing and other provocative cardiovascular autonomic tests in conditions that may cause transient loss of consciousness: Consensus statement of the European Federation of Autonomic Societies (EFAS) endorsed by the American Autonomic Society (AAS) and the European Academy of Neurology (EAN). Clin Auton Res. 2021 Jun;31(3):369-384.
- 41. U.S. Food and Drug Administration (FDA). Center for Devices and Radiological Health (CDRH). 510(k) premarket notification database. Accessed Dec 19, 2023. Available at URL address: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm
- 42. Vernino S, Bourne KM, Stiles LE, Grubb BP, Fedorowski A, Stewart JM, Arnold AC, Pace LA, Axelsson J, Boris JR, Moak JP, Goodman BP, Chémali KR, Chung TH, Goldstein DS, Diedrich A, Miglis MG, Cortez MM, Miller AJ, Freeman R, Biaggioni I, Rowe PC, Sheldon RS, Shibao CA, Systrom DM, Cook GA, Doherty TA, Abdallah HI, Darbari A, Raj SR. Postural orthostatic tachycardia syndrome (POTS): State of the science and clinical care from a 2019 National Institutes of Health Expert Consensus Meeting Part 1. Auton Neurosci. 2021 Nov;235:102828.

- 43. Wang AK, Fealey RD, Gehrking TL, Low PA. Patterns of neuropathy and autonomic failure in patients with amyloidosis. Mayo Clin Proc. 2008 Nov;83(11):1226-30.
- 44. Wenning GK, Stankovic I, Vignatelli L, Fanciulli A, Calandra-Buonaura G, Seppi K, Palma JA, Meissner WG, Krismer F, Berg D, Cortelli P, Freeman R, Halliday G, Höglinger G, Lang A, Ling H, Litvan I, Low P, Miki Y, Panicker J, Pellecchia MT, Quinn N, Sakakibara R, Stamelou M, Tolosa E, Tsuji S, Warner T, Poewe W, Kaufmann H. The Movement Disorder Society Criteria for the Diagnosis of Multiple System Atrophy. Mov Disord. 2022 Jun;37(6):1131-1148.
- 45. Writing Committee; Kittleson MM, Ruberg FL, Ambardekar AV, Brannagan TH, Cheng RK, Clarke JO, Dember LM, Frantz JG, Hershberger RE, Maurer MS, Nativi-Nicolau J, Sanchorawala V, Sheikh FH. 2023 ACC Expert Consensus Decision Pathway on Comprehensive Multidisciplinary Care for the Patient With Cardiac Amyloidosis: A Report of the American College of Cardiology Solution Set Oversight Committee. J Am Coll Cardiol. 2023 Mar 21;81(11):1076-1126. Erratum in: J Am Coll Cardiol. 2023 Mar 21;81(11):1135.
- 46. Zhao Y, Bao JJ, Ye LF, Zhou L. Consistency Analysis Between SUDOSCAN Examinations and Electromyography Results in Patients with Diabetes. Diabetes Metab Syndr Obes. 2022 Nov 1;15:3397-3402.
- 47. Ziemssen T, Siepmann T. The Investigation of the Cardiovascular and Sudomotor Autonomic Nervous System-A Review. Front Neurol. 2019 Feb 12;10:53.

Revision Details

Type of Revision	Summary of Changes	Date
Annual Review	No clinical policy statement changes.	2/15/2025
Annual Review	Revised noncoverage policy statement.	2/15/2024

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