Autonomic Testing

Disclaimer

Clinical guidelines are developed and adopted to establish evidence-based clinical criteria for utilization management decisions. Clinical guidelines are applicable according to policy and plan type. The Plan may delegate utilization management decisions of certain services to third parties who may develop and adopt their own clinical criteria.

Coverage of services is subject to the terms, conditions, and limitations of a member's policy, as well as applicable state and federal law. Clinical guidelines are also subject to in-force criteria such as the Centers for Medicare & Medicaid Services (CMS) national coverage determination (NCD) or local coverage determination (LCD) for Medicare Advantage plans. Please refer to the member's policy documents (e.g., Certificate/Evidence of Coverage, Schedule of Benefits, Plan Formulary) or contact the Plan to confirm coverage.

Summary

The autonomic nervous system (ANS) regulates parts of the body that are not consciously controlled. such as blood pressure, heart rate, body temperature, and many others. It includes sympathetic nerves (e.g., the "fight-or-flight" system) and parasympathetic nerves (e.g., the "rest-and-digest" system). Certain diseases, injuries, and medications can impair the ANS, resulting in "autonomic dysfunction". Because the autonomic nervous system is widespread throughout the body, clinical manifestations can vary depending on the underlying process. Some signs of dysfunction include impaired blood pressure and heart autoregulation, abnormal sweat production, heat or cold intolerance, digestive problems, erectile dysfunction, or problems with urination and bowel movements. There are a number of tests to evaluate the autonomic nervous system. These are generally performed by applying a stimulus to the affected organ system and measuring for the appropriate autonomic response (or lack thereof). This guideline outlines the clinical criteria and exclusions for autonomic testing.

This guideline does not describe the clinical criteria, exclusions, or benefit details for testing of the somatosensory nervous system, which is also part of the peripheral nervous system, but is responsible for sensory feedback, balance, and position.

Definitions

"Autonomic Nervous System (ANS)" is a division of the peripheral nervous system (i.e., nerves and ganglia outside of the brain and spinal cord). It controls involuntary actions such as, but not limited to,

blood pressure, urination/defecation, sexual function, digestion, pupillary light reflex, and glandular secretion (sweat, saliva, tears, etc.).

"Dysautonomia," or autonomic dysfunction, occurs when the ANS is damaged or impaired by some disease, injury, or medication.

1. Signs of dysautonomia include, but are not limited to:
    - Orthostatic hypotension or other blood pressure fluctuations
    - Urinary incontinence or retention
    - Bradycardia, tachycardia, or other fluctuations in heart rate/rhythm
    - Changes in vision
    - Dizziness
    - Syncope
    - Digestive issues
2. Dysautonomia can be seen in the diseases or conditions that may include, but are not limited to:
    - Parkinson's disease and associated parkinsonian syndromes
    - Diabetes mellitus and other neuropathies
    - Surgical or iatrogenic injury
    - Autoimmune diseases such as SLE or Sjogren's disease
    - HIV and AIDS
    - Multiple sclerosis
    - Toxicity from medications and drugs
    - Amyloidosis
3. The diagnosis of dysautonomia relies on four autonomic functions:
    - Cardiovagal, which is the parasympathetic response in heart rate to breathing and valsalva maneuvers (e.g., holding your breath and bearing down);
    - Vasomotor or adrenergic, which refers to the sympathetic-mediated constriction of blood vessels to increase blood pressure;
    - Sudomotor, which is sweat production in response to sympathetic stimuli
    - Pupillary constriction to light, which is a parasympathetic function

"Somatosensory Nervous System" is also a division of the peripheral nervous system. It controls sensory input and reflexes. Testing of the somatosensory nervous system differs from the ANS and is usually performed through various nerve conduction studies. It also differs from testing of the central nervous system and associated nerves, which is often performed through evoked potential or evoked response testing.

"Sympathetic" nerves are a part of the ANS responsible for the "fight-or-flight" response, which diverts blood away from nonessential organs, increases heart rate and contractility, and dilates the pupils, among other functions. It is counteracted by the parasympathetic system.

"Parasympathetic" nerves are part of the ANS responsible for the "rest-and-digest" response, which activates digestion and peristalsis while decreasing cardiac and respiratory rates, among other functions.

"Sudomotor" refers to a branch of the sympathetic nervous system that controls sweat glands. The sudomotor system is a frequent surrogate for testing for evidence of autonomic dysfunction as it is easily stimulated and accessible for measurement of response (i.e., sweat production). Various tests for sudomotor function are defined below.

"QSART (Quantitative Sudomotor Axon Reflex Test)" is a test used to diagnose autonomic dysfunction by evaluating the postganglionic sudomotor nerves. To perform this test, an electric current is used to draw acetylcholine (which stimulates sweat excretion) to the sweat glands, and the sweat response is recorded.

"QDIRT (Quantitative Direct and Indirect Testing of Sudomotor Function)" is similar to QSART, but also adds temporal and volumetric data on the sweat production. QDIRT is more variable than QSART and normative values have yet to be clearly established.

"QPART" (Quantitative Pilomotor Axon Reflex Test) is a test of piloerection (e.g., "goose bumps"), which is an alternative expression of autonomic function. The clinical role of QPART has not yet been established in the literature.

"TST" (Thermoregulatory Sweat Test) tests sudomotor function from the pre- and postganglionic nerves. The test is conducted by applying an indicator dye over the skin surface, and then placing the patient in a heated enclosure to increase the core body temperature. The indicator will change color in areas where sweat is produced and remain unchanged in areas of autonomic dysfunction.

"Silastic Sweat Imprinting" is a technique like QSART, however the sweat drops are recorded as imprints in a silastic material to quantify the response.

"SSR" (Sympathetic Skin Response) is a test to measure changes in skin electrical potential in response to an arousing stimulus. SSR is difficult to reproduce accurately and may lack the sensitivity and specificity for broad clinical application.

"Tilt-Table Test" is used to assess adrenergic sympathetic activity (e.g., the vasomotor response). Patients are positioned supine on a table and allowed to acclimate. The table is then tilted to an upright position to mimic standing for 20-45 minutes. Blood pressure, heart rate, and sometimes EKG tracings are recorded for each position at set time points. In a normal physiologic response, the blood vessels should constrict to maintain cerebral perfusion. In autonomic dysfunction, there is a failure of the body's response to adjust for blood pressure and heart rate, resulting in multiple symptoms including but not limited to dizziness and potential syncope.

"Syncope" is the temporary loss of consciousness and muscle tone due to inadequate brain perfusion. It is typically self-limited and resolves quickly without significant intervention, depending on the underlying cause.

Clinical Indications

Tilt-Table Testing

Tilt-table testing, alone or with provocative agents (e.g., isoproterenol), is considered medically necessary when ALL of the following criteria are met:

1. The patient has a history of syncope or recurrent syncopal episodes, with further testing indicated for at least ONE of the following:
    a. Suspected carotid sinus hypersensitivity; *or*
    b. Evaluation is needed for a patient returning to high-risk work (i.e., commercial driving, operating machinery, etc.) or a leisure activity that may place the patient at risk; *or*
    c. Neurally mediated syncope is suspected, including:
        i. Vasovagal syncope, *except when this is the first episode of suspected vasovagal syncope*; *or*
        ii. Carotid sinus dysfunction; *or*
        iii. Situational syncope.
    d. Postural orthostatic tachycardia syndrome (POTS); *or*
    e. For other conditions where the results of the tilt-table test would change medical management (i.e., medications or further workup would be indicated).
2. Cardiac causes of syncope have been excluded via the appropriate non-invasive tests and workup (e.g., history and physical exam, EKG, stress test, and/or cardiac echocardiogram); *and*
3. Comorbid conditions that may have contributed have been diagnosed, adequately treated, and/or ruled out (e.g., hypovolemia, bleeding, shock, seizures, infections, anemia, etc); *and*
4. Medications that may contribute to autonomic dysfunction and/or syncopal episodes have been adjusted or discontinued; *and*
5. There are NOT contraindications to tilt-table testing, including but not limited to:
    a. Critical aortic and/or mitral valvular stenosis
    b. Left ventricular outflow tract obstruction
    c. Severe proximal cerebral artery stenosis or coronary artery disease
6. Testing is ordered ONCE when used to exclude specific autonomic diseases, or no more than once annually for patients who have already been diagnosed with autonomic dysfunction in whom repeat testing is indicated for new or worsening symptoms meeting the above criteria.

Sudomotor Testing

Sudomotor testing is considered medically necessary when ALL of the following criteria are met:

1. Testing is ordered for QSART, silastic sweat imprint, or TST; *and*
2. The testing is conducted by physicians with the appropriate expertise and training to perform and interpret the tests results; *and*

3. Testing is ordered ONCE when used to exclude specific autonomic diseases, or no more than once annually for patients who have already been diagnosed with autonomic dysfunction in whom repeat testing is indicated for new or worsening symptoms meeting the above criteria; *and*
4. Testing is ordered for one of the following:
    a. To diagnose an appropriate condition, specified as any one or more of the following:
        i. Peripheral neuropathies:
            - Amyloid neuropathy; *or*
            - Diabetic autonomic neuropathy; *or*
            - Distal small fiber neuropathy; *or*
            - Idiopathic neuropathy.
        ii. Multiple systems atrophy; *or*
        iii. Sjogren's disease; *or*
        iv. Pure autonomic failure; *or*
        v. Postural orthostatic hypotension or postural orthostatic tachycardia syndrome (POTS); *or*
        vi. Reflex sympathetic dystrophy or causalgia; *or*
        vii. Recurrent syncope without a known cause despite appropriate workup.
    b. To evaluate any one or more of the following:
        i. The severity and/or distribution of a previous diagnosed autonomic neuropathy that is progressing; *or*
        ii. The change in severity, distribution, or type of autonomic dysfunction in a patient who has previously exhibited signs of autonomic failure but does not yet have a diagnosis; *or*
        iii. The response to treatment in a patient with autonomic dysfunction who had recent changes in symptoms and clinical exam findings; *or*
        iv. To evaluate inadequate response to beta blocker therapy in vasodepressor syncope.

Experimental or Investigational / Not Medically Necessary

Tilt-Table Testing

Tilt-table testing is considered investigational and/or experimental, and thus NOT medically necessary, in the following situations:

1. Any indication not meeting the above Tilt-Table Testing criteria in the *Clinical Indications* section; *or*
2. Solely for following the effectiveness or response to treatment for syncope; *or*
3. To evaluate dizziness, near syncope, or vertigo; *or*
4. To evaluate post-concussive syndrome; *or*
5. To evaluate chronic fatigue syndrome; *or*

6. Suspected vasovagal syncope with a single episode or when the diagnosis of vasovagal syncope has already been established through history and physical exam; *or*
7. To differentiate convulsive syncope from epilepsy in a patient with recurrent loss of consciousness associated with tonic-clonic movements; *or*
8. To evaluate for unexplained recurrent falls when there is no sign of cardiovagal instability; *or*
9. To evaluate patients with recurrent transient ischemic attacks (TIAs).

Sudomotor Testing

Sudomotor testing is considered investigational and/or experimental, and thus NOT medically necessary, in the following situations:

1. Any condition or test not meeting the Sudomotor Testing criteria in the *Clinical Indications* section, such as chronic fatigue syndrome, myalgia, encephalomyelitis, Raynaud phenomenon, traumatic brain injury or predicting foot ulcers; *or*
2. Screening for patients without signs or symptoms of autonomic dysfunction, regardless of their current diagnoses; *or*
3. Testing solely performed to monitor disease intensity or treatment efficacy, unless otherwise specified above; *or*
4. Testing when the results will not impact clinical management; *or*
5. Clearly diagnosed somatosensory neuropathies that have not changed in severity and/or distribution of symptoms, including but not limited to the demyelinating neuropathies (e.g., Guillain-Barre, CIDP, etc.); *or*
6. The following sudomotor testing methods are NOT indicated for any condition as there is insufficient evidence to support clinical effectiveness in the existing literature:
    a. SSR; *or*
    b. QDIRT; *or*
    c. QPART; *or*
    d. Any ambulatory and/or automatic measuring device for autonomic function, including but not limited to:
        i. Sudoscan; *or*
        ii. ANSAR and Medeia QANS/QHRV System; *or*
        iii. Zephyr Bioharness or Biopatch.

Applicable Billing Codes

Autonomic Testing	
CPT/HCPCS Codes considered medically necessary if criteria are met:	
Code	*Description*
95921	Testing of autonomic nervous system function; cardiovagal innervation (parasympathetic function), including two or more of the following: heart rate

	response to deep breathing with recorded R-R interval, Valsalva ratio, and 30:15 ratio
95922	Vasomotor adrenergic innervation (sympathetic adrenergic function), including beat-to beat blood pressure and R-R interval changes during Valsalva maneuver and at least five minutes of passive tilt
95923	Sudomotor, including one 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
ICD-10 codes considered medically necessary if criteria are met:	
Code	*Description*
E08.42; E09.42	Polyneuropathy in diabetes
E10.40 - E10.49; E11.40 - E11.49; E13.40 - E13.49	Diabetes with neurological manifestations
E85.1	Amyloid heredofamilial amyloidosis [amyloid polyneuropathy]
G56.40 - G56.43	Causalgia of upper limb
G57.70 - G57.73	Causalgia of lower limb
G60.3	Idiopathic progressive neuropathy
G60.8	Other hereditary and idiopathic neuropathies [distal small fiber neuropathy]
G63	Polyneuropathy in diseases classified elsewhere [when coded with E85.1]
G90.0 - G90.09	Idiopathic peripheral autonomic neuropathy
G90.3	Multi-system degeneration of the autonomic nervous system
G90.50 - G90.59	Complex regional pain syndrome I (CRPS I) [Reflex sympathetic dystrophy]
G90.8	Other disorders of autonomic nervous system [when used for pure autonomic failure]
G90.A	Postural orthostatic tachycardia syndrome [POTS]

~~G90.9~~	~~Disorder of the autonomic nervous system, unspecified~~
G99.0	Autonomic neuropathy in diseases classified elsewhere [when coded with E85.0 - E85.9]
M35.00 - M35.09	Sjögren syndrome
~~R00.0~~	~~Tachycardia, unspecified [postural tachycardia syndrome]~~
R55	Syncope and collapse
ICD-10 codes considered experimental, investigational, or *not* medically necessary:	
Code	*Description*
A8	Unspecified viral encephalitis
F07.81	Postconcussional syndrome
G04.00 - G04.02	Acute disseminated encephalitis and encephalomyelitis (ADEM)
G04.81; G04.90	Other and unspecified encephalitis and encephalomyelitis
G05.3	Encephalitis and encephalomyelitis in diseases classified elsewhere
G45.8 - G45.9	Transient cerebral ischemic attacks and related syndromes
I73.00 - I73.01	Raynaud's syndrome
M79.10 - M79.18	Myalgia
R53.82	Chronic fatigue, unspecified
S06.2x0A - S06.309S	Diffuse traumatic brain injury

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