Stroke or TIA (within 6 months)

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Other Notices:

Guideline Information:

Disease Area: Cardiology
Care Path Group: General Cardiology
Care Path Name: Stroke
Type: [**X**] Adult (18+ yo) | [_] Pediatric (0-17yo)

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Care Path Clinical Discussion

Stroke is defined as a neurological deficit due to an acute focal injury of the central nervous system (CNS) by a vascular cause, including cerebral infarction, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH).[1] Stroke is a significant cause of morbidity and the fifth-leading cause of death in the United States.[2] The American Heart Association (AHA) and the American Stroke Association (ASA) define a transient ischemic attack (TIA) as a transient episode of neurologic dysfunction caused by focal brain, spinal cord, or retinal ischemia without acute infarction.[3] Ischemic stroke and TIA share many factors, including pathophysiological mechanism, preventative approach, and diagnostic approach.[4] Stroke is a chronic condition, which may start with a hospital stay, followed by formal rehabilitation. After a stroke, many patients experience fatigue, depression, and apathy.[5] Care should also include attempts to prevent another stroke or TIA.

The acute hospital stay is focused on stabilizing the patient, the delivery of acute stroke treatments, assessment of rehabilitation needs, and the initiation of prophylactic and preventive measures.[5] Upon discharge from the hospital, patients may go to an inpatient rehabilitation facility, skilled nursing facility (SNF), long-term acute care hospital, home with home healthcare, or home with outpatient therapy. Physical and occupational therapy are important for stroke patients to maximize recovery.[6] For patients with speech or swallowing deficits, early intensive speech therapy improves outcomes.[6]

For patients with a stroke or TIA, optimal medical therapy includes antiplatelet therapy, statin therapy and risk factor reduction.[4] Treatment of hypertension and hyperlipidemia is crucial.[4] Patients with stroke should be screened for diabetes, and patients with diabetes should be treated based on guidelines.[4] Patients with an ischemic stroke or TIA may benefit from a sleep study and treatment with CPAP when appropriate.[4] Tobacco cessation is recommended for patients with CVA or TIA.[4] Patients with ischemic stroke, TIA, or hemorrhagic stroke who are heavy drinkers should eliminate or decrease alcohol consumption.[4] Procedures, such as carotid endarterectomy and carotid stenting, may reduce the risk of recurrent stroke in patients with moderate to severe extracranial cerebrovascular disease

ischemic stroke is a major potential complication of atrial fibrillation. For patients with atrial fibrillation, the risk of stroke can be estimated by an instrument such as $CHADS_2$ or CHA_2DS_2–VASc. If anticoagulation is initiated,

the selection of an antithrombotic agent should be individualized based on risk factors, cost, tolerability, the potential for drug interactions, and other clinical characteristics.[4]

The stroke patient's care may include prevention and treatment of falls, loss of bone mineral density, skin breakdown, contractures, urinary and fecal incontinence, deep venous thrombosis, and pulmonary embolism.[5] Depression and anxiety are common after stroke, and the physician should screen for these and treat them when appropriate.[5] Other concerns for patients recovering from a stroke may include returning to work, driving, and sexual function. The caregiver and family are critical to the post-stroke treatment plan, and referral to local community resources can help to support their needs.[5]

The information contained herein gives a general overview of the pathway of this specific diagnosis, beginning with the initial presentation, recommended assessments, and treatment options as supported by the medical literature and existing guidelines. It should be noted that the care of patients can be complex. The information below is meant to support clinical decision-making in adult patients. It is not necessarily applicable to every case, as the entire clinical picture (including comorbidities, history, etc.) should be considered.

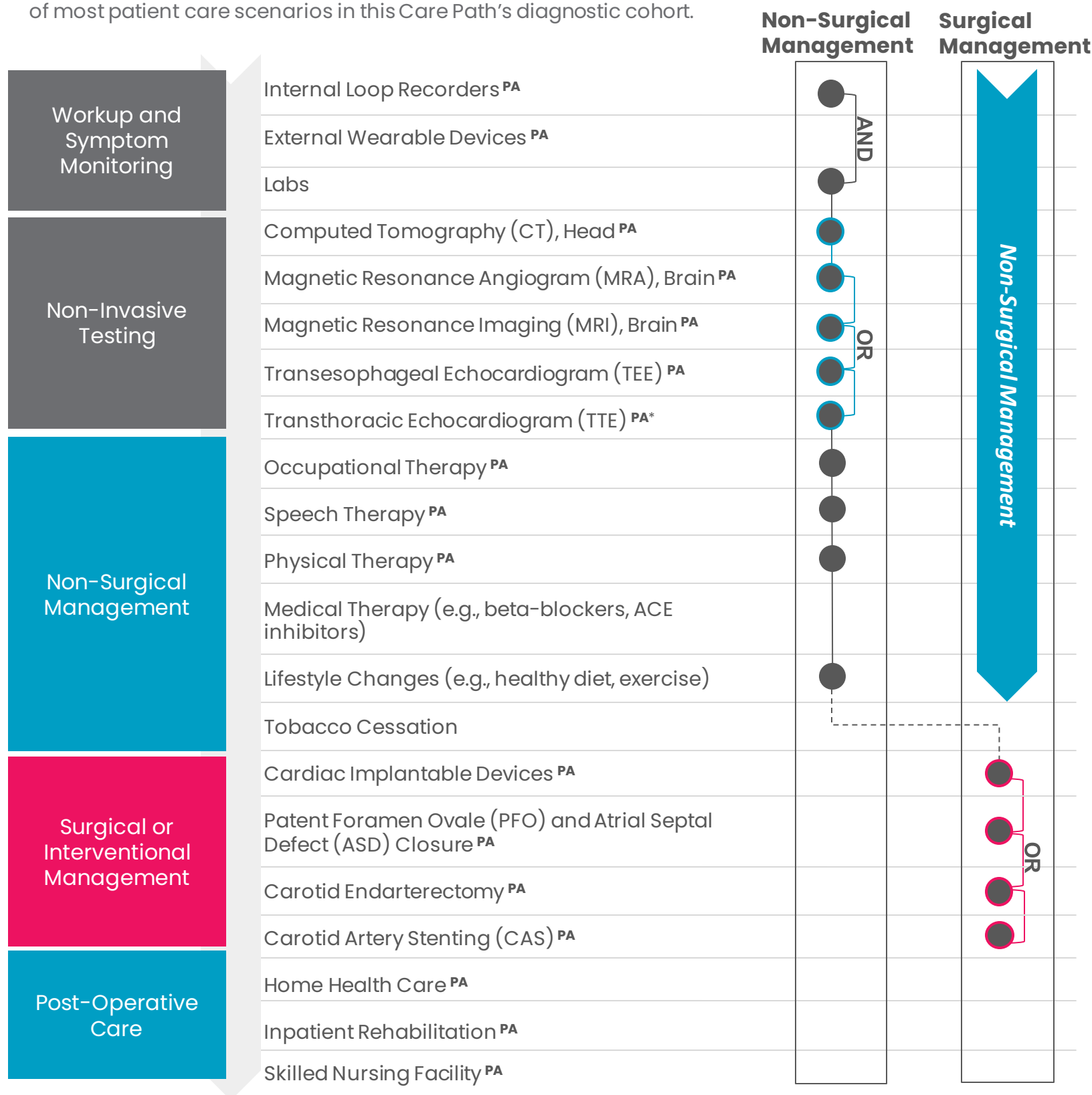
Key Information

- The patient with stroke or TIA often presents to the emergency department but may also present to the primary care or specialist office.
- Stroke affects nearly 800,000 individuals, with many survivors experiencing persistent difficulty with daily tasks as a direct consequence. More than two-thirds of stroke survivors receive rehabilitation services after hospitalization.[5]
- Physical, occupational, and speech therapy can be beneficial for stroke patients to maximize recovery.[6]
- Imaging studies, such as magnetic resonance angiography, carotid artery ultrasonography, and echocardiography, may help determine the cause of the stroke.[6]
- Carotid revascularization may be beneficial for symptomatic patients with a greater than 50% stenosis of the ipsilateral extracranial carotid circulation .

Stroke

What is a "Cohere Care Path"?

These Care Paths organize the services typically considered most clinically optimal and likely to be automatically approved. These service recommendations also include the suggested sequencing and quantity or frequency determined clinically appropriate and medically necessary for the management of most patient care scenarios in this Care Path's diagnostic cohort.



Key

PA = Service may require prior authorization
★ = Denotes preferred service
AND = Services completed concurrently
OR = Services generally mutually exclusive

= Non-surgical management prior authorization group of services
= Surgical management prior authorization group of services
= Subsequent service
= Management path moves to a different management path

Care Path Diagnostic Criteria

Disease Classification

Stroke or transient ischemic attack (TIA), including cerebral infarction, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH).

ICD-10 Codes Associated with Classification

ICD-10 Code	Code Description/Definition
F01.51	Vascular dementia with behavioral disturbance
G08	Intracranial and intraspinal phlebitis and thrombophlebitis
G45.0	Vertebro-basilar artery syndrome
G45.8	Other transient cerebral ischemic attacks and related syndromes
G45.9	Transient cerebral ischemic attack, unspecified
G46.0	Middle cerebral artery syndrome
G46.4	Cerebellar stroke syndrome
G46.8	Other vascular syndromes of brain in cerebrovascular diseases
G81.91	Hemiplegia, unspecified affecting right dominant side
G81.92	Hemiplegia, unspecified affecting left dominant side
G81.94	Hemiplegia, unspecified affecting left nondominant side
G83.14	Monoplegia of lower limb affecting left nondominant side
H34.8311	Tributary (branch) retinal vein occlusion, right eye, with retinal neovascularization
H34.9	Unspecified retinal vascular occlusion
I51.3	Intracardiac thrombosis, not elsewhere classified
I60	Nontraumatic subarachnoid hemorrhage
I60.0	Nontraumatic subarachnoid hemorrhage from carotid siphon and bifurcation
I60.00	Nontraumatic subarachnoid hemorrhage from unspecified

	carotid siphon and bifurcation
I60.01	Nontraumatic subarachnoid hemorrhage from right carotid siphon and bifurcation
I60.02	Nontraumatic subarachnoid hemorrhage from left carotid siphon and bifurcation
I60.1	Nontraumatic subarachnoid hemorrhage from middle cerebral artery
I60.10	Nontraumatic subarachnoid hemorrhage from unspecified middle cerebral artery
I60.11	Nontraumatic subarachnoid hemorrhage from right middle cerebral artery
I60.12	Nontraumatic subarachnoid hemorrhage from left middle cerebral artery
I60.2	Nontraumatic subarachnoid hemorrhage from anterior communicating artery
I60.3	Nontraumatic subarachnoid hemorrhage from posterior communicating artery
I60.30	Nontraumatic subarachnoid hemorrhage from unspecified posterior communicating artery
I60.31	Nontraumatic subarachnoid hemorrhage from right posterior communicating artery
I60.32	Nontraumatic subarachnoid hemorrhage from left posterior communicating artery
I60.4	Nontraumatic subarachnoid hemorrhage from basilar artery
I60.5	Nontraumatic subarachnoid hemorrhage from vertebral artery
I60.50	Nontraumatic subarachnoid hemorrhage from unspecified vertebral artery
I60.51	Nontraumatic subarachnoid hemorrhage from right vertebral artery
I60.52	Nontraumatic subarachnoid hemorrhage from left vertebral artery

I60.6	Nontraumatic subarachnoid hemorrhage from other intracranial arteries
I60.7	Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery
I60.8	Other nontraumatic subarachnoid hemorrhage
I60.9	Nontraumatic subarachnoid hemorrhage, unspecified
I602	Nontraumatic subarachnoid hemorrhage from anterior communicating artery
I61	Nontraumatic intracerebral hemorrhage
I61.0	Nontraumatic intracerebral hemorrhage in hemisphere, subcortical
I61.1	Nontraumatic intracerebral hemorrhage in hemisphere, cortical
I61.2	Nontraumatic intracerebral hemorrhage in hemisphere, unspecified
I61.3	Nontraumatic intracerebral hemorrhage in brain stem
I61.4	Nontraumatic intracerebral hemorrhage in cerebellum
I61.5	Nontraumatic intracerebral hemorrhage, intraventricular
I61.6	Nontraumatic intracerebral hemorrhage, multiple localized
I61.8	Other nontraumatic intracerebral hemorrhage
I61.9	Nontraumatic intracerebral hemorrhage, unspecified
I62	Other and unspecified nontraumatic intracranial hemorrhage
I62.0	Nontraumatic subdural hemorrhage
I62.00	Nontraumatic subdural hemorrhage, unspecified
I62.01	Nontraumatic acute subdural hemorrhage
I62.02	Nontraumatic subacute subdural hemorrhage
I62.03	Nontraumatic chronic subdural hemorrhage
I62.1	Nontraumatic extradural hemorrhage
I62.9	Nontraumatic intracranial hemorrhage, unspecified

I63	Cerebral infarction
I63.0	Cerebral infarction due to thrombosis of precerebral arteries
I63.00	Cerebral infarction due to thrombosis of unspecified precerebral artery
I63.01	Cerebral infarction due to thrombosis of vertebral artery
I63.011	Cerebral infarction due to thrombosis of right vertebral artery
I63.012	Cerebral infarction due to thrombosis of left vertebral artery
I63.013	Cerebral infarction due to thrombosis of bilateral vertebral arteries
I63.019	Cerebral infarction due to thrombosis of unspecified vertebral artery
I63.02	Cerebral infarction due to thrombosis of basilar artery
I63.03	Cerebral infarction due to thrombosis of carotid artery
I63.031	Cerebral infarction due to thrombosis of right carotid artery
I63.032	Cerebral infarction due to thrombosis of left carotid artery
I63.033	Cerebral infarction due to thrombosis of bilateral carotid arteries
I63.039	Cerebral infarction due to thrombosis of unspecified carotid artery
I63.09	Cerebral infarction due to thrombosis of other precerebral artery
I63.1	Cerebral infarction due to embolism of precerebral arteries
I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
I63.11	Cerebral infarction due to embolism of vertebral artery
I63.111	Cerebral infarction due to embolism of right vertebral artery
I63.112	Cerebral infarction due to embolism of left vertebral artery

I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries
I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
I63.12	Cerebral infarction due to embolism of basilar artery
I63.13	Cerebral infarction due to embolism of carotid artery
I63.131	Cerebral infarction due to embolism of right carotid artery
I63.132	Cerebral infarction due to embolism of left carotid artery
I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
I63.139	Cerebral infarction due to embolism of unspecified carotid artery
I63.19	Cerebral infarction due to embolism of other precerebral artery
I63.2	Cerebral infarction due to unspecified occlusion or stenosis of precerebral arteries
I63.20	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
I63.21	Cerebral infarction due to unspecified occlusion or stenosis of vertebral arteries
I63.211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral artery
I63.212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral artery
I63.213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
I63.219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral artery
I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar artery
I63.23	Cerebral infarction due to unspecified occlusion or stenosis of carotid arteries

I63.231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
I63.232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
I63.233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
I63.239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid artery
I63.29	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries
I63.3	Cerebral infarction due to thrombosis of cerebral arteries
I63.30	Cerebral infarction due to thrombosis of unspecified cerebral artery
I63.31	Cerebral infarction due to thrombosis of middle cerebral artery
I63.311	Cerebral infarction due to thrombosis of right middle cerebral artery
I63.312	Cerebral infarction due to thrombosis of left middle cerebral artery
I63.313	Cerebral infarction due to thrombosis of bilateral middle cerebral arteries
I63.319	Cerebral infarction due to thrombosis of unspecified middle cerebral artery
I63.32	Cerebral infarction due to thrombosis of anterior cerebral artery
I63.321	Cerebral infarction due to thrombosis of right anterior cerebral artery
I63.322	Cerebral infarction due to thrombosis of left anterior cerebral artery
I63.323	Cerebral infarction due to thrombosis of bilateral anterior cerebral arteries
I63.329	Cerebral infarction due to thrombosis of unspecified anterior cerebral artery

I63.33	Cerebral infarction due to thrombosis of posterior cerebral artery
I63.331	Cerebral infarction due to thrombosis of right posterior cerebral artery
I63.332	Cerebral infarction due to thrombosis of left posterior cerebral artery
I63.333	Cerebral infarction due to thrombosis of bilateral posterior cerebral arteries
I63.339	Cerebral infarction due to thrombosis of unspecified posterior cerebral artery
I63.34	Cerebral infarction due to thrombosis of cerebellar artery
I63.341	Cerebral infarction due to thrombosis of right cerebellar artery
I63.342	Cerebral infarction due to thrombosis of left cerebellar artery
I63.343	Cerebral infarction due to thrombosis of bilateral cerebellar arteries
I63.349	Cerebral infarction due to thrombosis of unspecified cerebellar artery
I63.39	Cerebral infarction due to thrombosis of other cerebral artery
I63.4	Cerebral infarction due to embolism of cerebral arteries
I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
I63.41	Cerebral infarction due to embolism of middle cerebral artery
I63.411	Cerebral infarction due to embolism of right middle cerebral artery
I63.412	Cerebral infarction due to embolism of left middle cerebral artery
I63.413	Cerebral infarction due to embolism of bilateral middle cerebral arteries

I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
I63.42	Cerebral infarction due to embolism of anterior cerebral artery
I63.421	Cerebral infarction due to embolism of right anterior cerebral artery
I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral arteries
I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
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I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
I63.432	Cerebral infarction due to embolism of left posterior cerebral artery
I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral arteries
I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
I63.44	Cerebral infarction due to embolism of cerebellar artery
I63.441	Cerebral infarction due to embolism of right cerebellar artery
I63.442	Cerebral infarction due to embolism of left cerebellar artery
I63.443	Cerebral infarction due to embolism of bilateral cerebellar arteries
I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery
I63.49	Cerebral infarction due to embolism of other cerebral artery

I63.5	Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries
I63.50	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery
I63.51	Cerebral infarction due to unspecified occlusion or stenosis of middle cerebral artery
I63.511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
I63.512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery
I63.513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle cerebral arteries
I63.519	Cerebral infarction due to unspecified occlusion or stenosis of unspecified middle cerebral artery
I63.52	Cerebral infarction due to unspecified occlusion or stenosis of anterior cerebral artery
I63.521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
I63.522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
I63.523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior cerebral arteries
I63.529	Cerebral infarction due to unspecified occlusion or stenosis of unspecified anterior cerebral artery
I63.53	Cerebral infarction due to unspecified occlusion or stenosis of posterior cerebral artery
I63.531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
I63.532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
I63.533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior cerebral arteries
I63.539	Cerebral infarction due to unspecified occlusion or stenosis

	of unspecified posterior cerebral artery
I63.54	Cerebral infarction due to unspecified occlusion or stenosis of cerebellar artery
I63.541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
I63.542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
I63.543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar arteries
I63.549	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebellar artery
I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I63.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
I63.8	Other cerebral infarction
I63.81	Other cerebral infarction due to occlusion or stenosis of small artery
I63.89	Other cerebral infarction
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I65.21	Occlusion and stenosis of right carotid artery
I65.22	Occlusion and stenosis of left carotid artery
I65.23	Occlusion and stenosis of bilateral carotid arteries
I65.29	Occlusion and stenosis of unspecified carotid artery
I65.8	Occlusion and stenosis of other precerebral arteries
I65.9	Occlusion and stenosis of unspecified precerebral artery
I66.01	Occlusion and stenosis of right middle cerebral artery
I66.02	Occlusion and stenosis of left middle cerebral artery
I66.21	Occlusion and stenosis of right posterior cerebral artery

I66.22	Occlusion and stenosis of left posterior cerebral artery
I66.23	Occlusion and stenosis of bilateral posterior cerebral arteries
I66.29	Occlusion and stenosis of unspecified posterior cerebral artery
I66.8	Occlusion and stenosis of other cerebral arteries
I66.9	Occlusion and stenosis of unspecified cerebral artery
I67.0	Dissection of cerebral arteries, nonruptured
I67.1	Cerebral aneurysm, nonruptured
I67.2	Cerebral atherosclerosis
I67.81	Acute cerebrovascular insufficiency
I67.82	Cerebral ischemia
I67.841	Reversible cerebrovascular vasoconstriction syndrome
I67.848	Other cerebrovascular vasospasm and vasoconstriction
I67.85	Hereditary cerebrovascular diseases
I67.89	Other cerebrovascular disease
I67.9	Cerebrovascular disease, unspecified
I69	Sequelae of cerebrovascular disease
I69.0	Sequelae of nontraumatic subarachnoid hemorrhage
I69.00	Unspecified sequelae of nontraumatic subarachnoid hemorrhage
I69.01	Cognitive deficits following nontraumatic subarachnoid hemorrhage
I69.010	Attention and concentration deficit following nontraumatic subarachnoid hemorrhage
I69.011	Memory deficit following nontraumatic subarachnoid hemorrhage
I69.012	Visuospatial deficit and spatial neglect following nontraumatic subarachnoid hemorrhage
I69.013	Psychomotor deficit following nontraumatic subarachnoid hemorrhage

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I69.021	Dysphasia following nontraumatic subarachnoid hemorrhage
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I69.031	Monoplegia of upper limb following nontraumatic subarachnoid hemorrhage affecting right dominant side
I69.032	Monoplegia of upper limb following nontraumatic subarachnoid hemorrhage affecting left dominant side
I69.033	Monoplegia of upper limb following nontraumatic subarachnoid hemorrhage affecting right non-dominant side
I69.034	Monoplegia of upper limb following nontraumatic subarachnoid hemorrhage affecting left non-dominant side

I69.039	Monoplegia of upper limb following nontraumatic subarachnoid hemorrhage affecting unspecified side
I69.04	Monoplegia of lower limb following nontraumatic subarachnoid hemorrhage
I69.041	Monoplegia of lower limb following nontraumatic subarachnoid hemorrhage affecting right dominant side
I69.042	Monoplegia of lower limb following nontraumatic subarachnoid hemorrhage affecting left dominant side
I69.043	Monoplegia of lower limb following nontraumatic subarachnoid hemorrhage affecting right non-dominant side
I69.044	Monoplegia of lower limb following nontraumatic subarachnoid hemorrhage affecting left non-dominant side
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I69.118	Other symptoms and signs involving cognitive functions following nontraumatic intracerebral hemorrhage
I69.119	Unspecified symptoms and signs involving cognitive functions following nontraumatic intracerebral hemorrhage
I69.12	Speech and language deficits following nontraumatic intracerebral hemorrhage
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I69.121	Dysphasia following nontraumatic intracerebral hemorrhage
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I69.132	Monoplegia of upper limb following nontraumatic intracerebral hemorrhage affecting left dominant side
I69.133	Monoplegia of upper limb following nontraumatic intracerebral hemorrhage affecting right non-dominant side

I69.134	Monoplegia of upper limb following nontraumatic intracerebral hemorrhage affecting left non-dominant side
I69.139	Monoplegia of upper limb following nontraumatic intracerebral hemorrhage affecting unspecified side
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I69.141	Monoplegia of lower limb following nontraumatic intracerebral hemorrhage affecting right dominant side
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I69.23	Monoplegia of upper limb following other nontraumatic intracranial hemorrhage
I69.231	Monoplegia of upper limb following other nontraumatic intracranial hemorrhage affecting right dominant side
I69.232	Monoplegia of upper limb following other nontraumatic intracranial hemorrhage affecting left dominant side
I69.233	Monoplegia of upper limb following other nontraumatic intracranial hemorrhage affecting right non-dominant side
I69.234	Monoplegia of upper limb following other nontraumatic intracranial hemorrhage affecting left non-dominant side
I69.239	Monoplegia of upper limb following other nontraumatic

	intracranial hemorrhage affecting unspecified side
I69.24	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage
I69.241	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage affecting right dominant side
I69.242	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage affecting left dominant side
I69.243	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage affecting right non-dominant side
I69.244	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage affecting left non-dominant side
I69.249	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage affecting unspecified side
I69.25	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage
I69.251	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage affecting right dominant side
I69.252	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage affecting left dominant side
I69.253	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage affecting right non-dominant side
I69.254	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage affecting left non-dominant side
I69.259	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage affecting unspecified side
I69.26	Other paralytic syndrome following other nontraumatic intracranial hemorrhage
I69.261	Other paralytic syndrome following other nontraumatic intracranial hemorrhage affecting right dominant side
I69.262	Other paralytic syndrome following other nontraumatic intracranial hemorrhage affecting left dominant side
I69.263	Other paralytic syndrome following other nontraumatic intracranial hemorrhage affecting right non-dominant side

I69.264	Other paralytic syndrome following other nontraumatic intracranial hemorrhage affecting left non-dominant side
I69.265	Other paralytic syndrome following other nontraumatic intracranial hemorrhage, bilateral
I69.269	Other paralytic syndrome following other nontraumatic intracranial hemorrhage affecting unspecified side
I69.29	Other sequelae of other nontraumatic intracranial hemorrhage
I69.290	Apraxia following other nontraumatic intracranial hemorrhage
I69.291	Dysphagia following other nontraumatic intracranial hemorrhage
I69.292	Facial weakness following other nontraumatic intracranial hemorrhage
I69.293	Ataxia following other nontraumatic intracranial hemorrhage
I69.298	Other sequelae of other nontraumatic intracranial hemorrhage
I69.3	Sequelae of cerebral infarction
I69.30	Unspecified sequelae of cerebral infarction
I69.31	Cognitive deficits following cerebral infarction
I69.310	Attention and concentration deficit following cerebral infarction
I69.311	Memory deficit following cerebral infarction
I69.312	Visuospatial deficit and spatial neglect following cerebral infarction
I69.313	Psychomotor deficit following cerebral infarction
I69.314	Frontal lobe and executive function deficit following cerebral infarction
I69.315	Cognitive social or emotional deficit following cerebral infarction
I69.318	Other symptoms and signs involving cognitive functions

	following cerebral infarction
I69.319	Unspecified symptoms and signs involving cognitive functions following cerebral infarction
I69.32	Speech and language deficits following cerebral infarction
I69.320	Aphasia following cerebral infarction
I69.321	Dysphasia following cerebral infarction
I69.322	Dysarthria following cerebral infarction
I69.323	Fluency disorder following cerebral infarction
I69.328	Other speech and language deficits following cerebral infarction
I69.33	Monoplegia of upper limb following cerebral infarction
I69.331	Monoplegia of upper limb following cerebral infarction affecting right dominant side
I69.332	Monoplegia of upper limb following cerebral infarction affecting left dominant side
I69.333	Monoplegia of upper limb following cerebral infarction affecting right non-dominant side
I69.334	Monoplegia of upper limb following cerebral infarction affecting left non-dominant side
I69.339	Monoplegia of upper limb following cerebral infarction affecting unspecified side
I69.34	Monoplegia of lower limb following cerebral infarction
I69.341	Monoplegia of lower limb following cerebral infarction affecting right dominant side
I69.342	Monoplegia of lower limb following cerebral infarction affecting left dominant side
I69.343	Monoplegia of lower limb following cerebral infarction affecting right non-dominant side
I69.344	Monoplegia of lower limb following cerebral infarction affecting left non-dominant side
I69.349	Monoplegia of lower limb following cerebral infarction affecting unspecified side

I69.35	Hemiplegia and hemiparesis following cerebral infarction
I69.351	Hemiplegia and hemiparesis following cerebral infarction affecting right dominant side
I69.352	Hemiplegia and hemiparesis following cerebral infarction affecting left dominant side
I69.353	Hemiplegia and hemiparesis following cerebral infarction affecting right non-dominant side
I69.354	Hemiplegia and hemiparesis following cerebral infarction affecting left non-dominant side
I69.359	Hemiplegia and hemiparesis following cerebral infarction affecting unspecified side
I69.36	Other paralytic syndrome following cerebral infarction
I69.361	Other paralytic syndrome following cerebral infarction affecting right dominant side
I69.362	Other paralytic syndrome following cerebral infarction affecting left dominant side
I69.363	Other paralytic syndrome following cerebral infarction affecting right non-dominant side
I69.364	Other paralytic syndrome following cerebral infarction affecting left non-dominant side
I69.365	Other paralytic syndrome following cerebral infarction, bilateral
I69.369	Other paralytic syndrome following cerebral infarction affecting unspecified side
I69.39	Other sequelae of cerebral infarction
I69.390	Apraxia following cerebral infarction
I69.391	Dysphagia following cerebral infarction
I69.392	Facial weakness following cerebral infarction
I69.393	Ataxia following cerebral infarction
I69.398	Other sequelae of cerebral infarction
I69.8	Sequelae of other cerebrovascular diseases

I69.80	Unspecified sequelae of other cerebrovascular disease
I69.81	Cognitive deficits following other cerebrovascular disease
I69.810	Attention and concentration deficit following other cerebrovascular disease
I69.811	Memory deficit following other cerebrovascular disease
I69.812	Visuospatial deficit and spatial neglect following other cerebrovascular disease
I69.813	Psychomotor deficit following other cerebrovascular disease
I69.814	Frontal lobe and executive function deficit following other cerebrovascular disease
I69.815	Cognitive social or emotional deficit following other cerebrovascular disease
I69.818	Other symptoms and signs involving cognitive functions following other cerebrovascular disease
I69.819	Unspecified symptoms and signs involving cognitive functions following other cerebrovascular disease
I69.82	Speech and language deficits following other cerebrovascular disease
I69.820	Aphasia following other cerebrovascular disease
I69.821	Dysphasia following other cerebrovascular disease
I69.822	Dysarthria following other cerebrovascular disease
I69.823	Fluency disorder following other cerebrovascular disease
I69.828	Other speech and language deficits following other cerebrovascular disease
I69.83	Monoplegia of upper limb following other cerebrovascular disease
I69.831	Monoplegia of upper limb following other cerebrovascular disease affecting right dominant side
I69.832	Monoplegia of upper limb following other cerebrovascular disease affecting left dominant side
I69.833	Monoplegia of upper limb following other cerebrovascular

	disease affecting right non-dominant side
I69.834	Monoplegia of upper limb following other cerebrovascular disease affecting left non-dominant side
I69.839	Monoplegia of upper limb following other cerebrovascular disease affecting unspecified side
I69.84	Monoplegia of lower limb following other cerebrovascular disease
I69.841	Monoplegia of lower limb following other cerebrovascular disease affecting right dominant side
I69.842	Monoplegia of lower limb following other cerebrovascular disease affecting left dominant side
I69.843	Monoplegia of lower limb following other cerebrovascular disease affecting right non-dominant side
I69.844	Monoplegia of lower limb following other cerebrovascular disease affecting left non-dominant side
I69.849	Monoplegia of lower limb following other cerebrovascular disease affecting unspecified side
I69.85	Hemiplegia and hemiparesis following other cerebrovascular disease
I69.851	Hemiplegia and hemiparesis following other cerebrovascular disease affecting right dominant side
I69.852	Hemiplegia and hemiparesis following other cerebrovascular disease affecting left dominant side
I69.853	Hemiplegia and hemiparesis following other cerebrovascular disease affecting right non-dominant side
I69.854	Hemiplegia and hemiparesis following other cerebrovascular disease affecting left non-dominant side
I69.859	Hemiplegia and hemiparesis following other cerebrovascular disease affecting unspecified side
I69.86	Other paralytic syndrome following other cerebrovascular disease
I69.861	Other paralytic syndrome following other cerebrovascular disease affecting right dominant side

I69.862	Other paralytic syndrome following other cerebrovascular disease affecting left dominant side
I69.863	Other paralytic syndrome following other cerebrovascular disease affecting right non-dominant side
I69.864	Other paralytic syndrome following other cerebrovascular disease affecting left non-dominant side
I69.865	Other paralytic syndrome following other cerebrovascular disease, bilateral
I69.869	Other paralytic syndrome following other cerebrovascular disease affecting unspecified side
I69.89	Other sequelae of other cerebrovascular disease
I69.890	Apraxia following other cerebrovascular disease
I69.891	Dysphagia following other cerebrovascular disease
I69.892	Facial weakness following other cerebrovascular disease
I69.893	Ataxia following other cerebrovascular disease
I69.898	Other sequelae of other cerebrovascular disease
I69.9	Sequelae of unspecified cerebrovascular diseases
I69.90	Unspecified sequelae of unspecified cerebrovascular disease
I69.91	Cognitive deficits following unspecified cerebrovascular disease
I69.910	Attention and concentration deficit following unspecified cerebrovascular disease
I69.911	Memory deficit following unspecified cerebrovascular disease
I69.912	Visuospatial deficit and spatial neglect following unspecified cerebrovascular disease
I69.913	Psychomotor deficit following unspecified cerebrovascular disease
I69.914	Frontal lobe and executive function deficit following unspecified cerebrovascular disease
I69.915	Cognitive social or emotional deficit following unspecified

	cerebrovascular disease
I69.918	Other symptoms and signs involving cognitive functions following unspecified cerebrovascular disease
I69.919	Unspecified symptoms and signs involving cognitive functions following unspecified cerebrovascular disease
I69.92	Speech and language deficits following unspecified cerebrovascular disease
I69.920	Aphasia following unspecified cerebrovascular disease
I69.921	Dysphasia following unspecified cerebrovascular disease
I69.922	Dysarthria following unspecified cerebrovascular disease
I69.923	Fluency disorder following unspecified cerebrovascular disease
I69.928	Other speech and language deficits following unspecified cerebrovascular disease
I69.93	Monoplegia of upper limb following unspecified cerebrovascular disease
I69.931	Monoplegia of upper limb following unspecified cerebrovascular disease affecting right dominant side
I69.932	Monoplegia of upper limb following unspecified cerebrovascular disease affecting left dominant side
I69.933	Monoplegia of upper limb following unspecified cerebrovascular disease affecting right non-dominant side
I69.934	Monoplegia of upper limb following unspecified cerebrovascular disease affecting left non-dominant side
I69.939	Monoplegia of upper limb following unspecified cerebrovascular disease affecting unspecified side
I69.94	Monoplegia of lower limb following unspecified cerebrovascular disease
I69.941	Monoplegia of lower limb following unspecified cerebrovascular disease affecting right dominant side
I69.942	Monoplegia of lower limb following unspecified cerebrovascular disease affecting left dominant side

I69.943	Monoplegia of lower limb following unspecified cerebrovascular disease affecting right non-dominant side
I69.944	Monoplegia of lower limb following unspecified cerebrovascular disease affecting left non-dominant side
I69.949	Monoplegia of lower limb following unspecified cerebrovascular disease affecting unspecified side
I69.95	Hemiplegia and hemiparesis following unspecified cerebrovascular disease
I69.951	Hemiplegia and hemiparesis following unspecified cerebrovascular disease affecting right dominant side
I69.952	Hemiplegia and hemiparesis following unspecified cerebrovascular disease affecting left dominant side
I69.953	Hemiplegia and hemiparesis following unspecified cerebrovascular disease affecting right non-dominant side
I69.954	Hemiplegia and hemiparesis following unspecified cerebrovascular disease affecting left non-dominant side
I69.959	Hemiplegia and hemiparesis following unspecified cerebrovascular disease affecting unspecified side
I69.96	Other paralytic syndrome following unspecified cerebrovascular disease
I69.961	Other paralytic syndrome following unspecified cerebrovascular disease affecting right dominant side
I69.962	Other paralytic syndrome following unspecified cerebrovascular disease affecting left dominant side
I69.963	Other paralytic syndrome following unspecified cerebrovascular disease affecting right non-dominant side
I69.964	Other paralytic syndrome following unspecified cerebrovascular disease affecting left non-dominant side
I69.965	Other paralytic syndrome following unspecified cerebrovascular disease, bilateral
I69.969	Other paralytic syndrome following unspecified cerebrovascular disease affecting unspecified side
I69.99	Other sequelae of unspecified cerebrovascular disease

I69.990	Apraxia following unspecified cerebrovascular disease
I69.991	Dysphagia following unspecified cerebrovascular disease
I69.992	Facial weakness following unspecified cerebrovascular disease
I69.993	Ataxia following unspecified cerebrovascular disease
I69.998	Other sequelae following unspecified cerebrovascular disease
I72.0	Aneurysm of carotid artery
I77.71	Dissection of carotid artery
I77.74	Dissection of vertebral artery
I77.75	Dissection of other precerebral arteries
I82.210	Acute embolism and thrombosis of superior vena cava
Q27.30	Arteriovenous malformation, site unspecified
Q27.39	Arteriovenous malformation, other site
Q28.2	Arteriovenous malformation of cerebral vessels
Q28.3	Other malformations of cerebral vessels
R13.10	Dysphagia, unspecified
R13.12	Dysphagia, oropharyngeal phase
R26.0	Ataxic gait
R26.89	Other abnormalities of gait and mobility
R27.0	Ataxia, unspecified
R29.810	Facial weakness
R40.4	Transient alteration of awareness
R47.01	Aphasia
R47.02	Dysphasia
R47.1	Dysarthria and anarthria
R47.81	Slurred speech
R53.1	Weakness
S06.340A	Traumatic hemorrhage of right cerebrum without loss of

	consciousness, initial encounter
Z82.3	Family history of stroke
Z86.73	Personal history of transient ischemic attack (TIA), and cerebral infarction without residual deficits

Presentation and Etiology

Causes and Risk Factors[3,6]

- Hypertension
- Hyperlipidemia
- Diabetes mellitus
- Sleep apnea
- Obesity
- Tobacco and alcohol use
- Arrhythmia including atrial fibrillation
- Bacterial endocarditis
- Dilated cardiomyopathy
- Patent foramen ovale

Typical History

- Activity at the onset of the stroke
- Timing and progression of the focal symptoms
- Associated symptoms such as headache, vomiting, and decreased level of consciousness.
- Personal and family illnesses, especially risk factors for stroke: hypertension, atrial fibrillation, diabetes, hyperlipidemia, tobacco use, or a strong family history of stroke
- Medications and recreational drugs
- Presence and nature of past strokes or TIA's
- Which hand is dominant
- Caregiver and family support
- Risk factors for falls

Typical Physical Exam Findings

A thorough physical exam can distinguish stroke from stroke mimics, identify the cause of the stroke, and identify comorbidities. Key components of the physical exam are:

- Assessment of airway, breathing, and circulation to determine if urgent intervention is needed.
- Elevated blood pressure.
- A head and neck examination should identify any signs of trauma, infection, and meningeal irritation.
- A fundoscopic exam for retinopathy, hemorrhage, or retinal infarction.
- Auscultation of the neck may reveal a bruit, suggesting carotid disease as the cause of the stroke.
- Pulses.
- Auscultation for murmurs, gallops, and rhythm. An irregular rhythm suggests atrial fibrillation, which can lead to stroke.
- Mental status and level of consciousness.
- Language (expressive and receptive capabilities).
- Cranial nerves.
- Motor function.
- Sensory function.
- Cerebellar function.
- Gait.

Typical Evaluation

- Magnetic resonance imaging (MRI), brain
- Magnetic resonance angiography (MRA), brain
- Computed tomography (CT), head
- Carotid artery ultrasonography
- Echocardiography

All stroke patients should have brain imaging with computed tomography or magnetic resonance imaging (MRI) to distinguish between ischemic and hemorrhagic events. Computed tomography (CT) can usually exclude stroke mimics such as brain tumors and subdural hematomas and determine ischemia or hemorrhage.[6,7] Cerebral infarction is not always seen on initial CT. Diffusion-weighted magnetic resonance imaging of the brain can confirm the presence of ischemic stroke. Diffusion-weighted magnetic resonance imaging is the most sensitive and specific test for early detection of acute cerebral infarction.[6]

Evaluation of acute stroke patients should also include oxygen saturation, ECG, electrolytes, glucose, renal function, complete blood count, cardiac enzymes, international normalized ratio INR/prothrombin time, and activated partial thromboplastin time. Depending on the clinical presentation, a

toxicology screen, blood alcohol level, pregnancy test, arterial blood gas, chest x-ray, lumbar puncture, or electroencephalogram may be indicated.

Imaging studies, such as magnetic resonance angiography, carotid artery ultrasonography, and echocardiography, may help determine the cause of the stroke.[6] Magnetic resonance angiography is useful for the characterization of vascular disease. Magnetic resonance angiography is significantly more expensive than ultrasonography, and its use is limited in patients who have metallic implants, pacemakers, or claustrophobia.[6] Carotid artery ultrasonography is a lower-cost test to identify carotid stenosis. Patients with greater than 50% percent carotid stenosis on the side of the neurologic deficit may benefit from carotid revascularization..[6]

Cardioembolic stroke may be caused by atrial fibrillation, ventricular thrombus, valvular heart disease, cardiac tumors, and structural heart defects. Echocardiography (both transthoracic and transesophageal) can identify the source of embolism and guide therapy.

Care Path Services & Medical Necessity Criteria

Workup and Symptom Monitoring

Service: Internal Loop Recorders

General Guidelines

- **Units, Frequency, & Duration:** When medical necessity criteria are met in the absence of exclusionary criteria, referral to a cardiac electrophysiologist or trained cardiologist for the implant of an internal loop recorder (ILR) can be indicated. A single outpatient procedure is anticipated. The duration of an implant can be up to 4 years, depending on the device's battery life. Periodic recordings are actively or passively transmitted for interpretation by a physician.
- **Criteria for Subsequent Requests:** Subsequent requests are only accepted with documentation of device malfunction, an infection that requires removing the initial device, or incorrect placement resulting in poor R-wave sensing.
- **Recommended Clinical Approach:** Non-invasive ambulatory EKG monitoring is recommended in patients with stroke and concern for atrial fibrillation. Poor diagnostic yield of noninvasive monitoring in the setting of continued symptoms may lead a physician to recommend an ILR for their patient.[8] A cardiac electrophysiologist or trained cardiologist performs this procedure, and referral to a center that supports this service is required.
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Internal loop recorders** are considered appropriate if **ALL** of the following are **TRUE**:

- ◆ Acute ischemic stroke or TIA within the past six months.[4]
- ◆ No diagnostic conclusions have been achieved with non-invasive monitoring methods, such as an external loop recorder or mobile cardiac telemetry[8-9]
- ◆ The patient has no other implantable cardiac devices which can detect, record, and transmit data to a physician/cardiologist.

- The patient has no active systemic infection or non-reversible bleeding disorder, which would create a safety contraindication.[9]

Non-Indications

➔ **Internal loop recorders** are **not** considered appropriate if **ANY** of the following is **TRUE**[9]:

- The patient has a culprit arrhythmic diagnosis identified on non-invasive monitoring.
- The patient has an active infection or an irreversible bleeding disorder.

Site of Service Criteria

Outpatient surgical center with invasive cardiac electrophysiology services.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
33285	Insertion and programming of subcutaneous cardiac rhythm monitor
33286	Removal of subcutaneous cardiac rhythm monitor

Service: External Wearable Devices

General Guidelines

- **Units, Frequency, & Duration:** When medical necessity is met based on described clinical criteria and exclusionary criteria, noninvasive external cardiac monitoring may be conducted using external wearable devices for 24 hours to 30 days, depending on symptom frequency.[10]
- **Criteria for Subsequent Requests:** Subsequent requests may be considered for device malfunction, high burden of poor quality data/artifact, or inability to capture a recording of patient symptoms. The latter would be pertinent if the initial monitor chosen was of shorter duration or solely dependent on patient-activated data.
- **Recommended Clinical Approach:** For patients with cryptogenic stroke or TIA, cardiac monitoring may detect atrial fibrillation and lead to anticoagulant initiation, decreasing the risk of recurrent stroke.[10-11]
- **Exclusions:** 2 types of monitors cannot be ordered simultaneously.

Medical Necessity Criteria

Indications

➔ **External wearable devices** are considered appropriate if **ALL** of the following are **TRUE**:

- ◆ The patient had an acute ischemic stroke or TIA within the past six months of unknown etiology.[4,11]
- ◆ The patient does not have superseding symptoms of a more urgent cardiac condition that ambulatory cardiac monitoring would delay.
- ◆ The patient does not have an implantable cardiac device that would acquire similar clinical information regarding the patient's symptoms.
- ◆ If the patient has had 3 or more external wearable devices in the last six months, consider an internal loop recorder.

Non-Indications

➔ **External wearable devices** are not considered appropriate if **ANY** of the following is **TRUE**:

- ◆ The patient has an implantable cardiac device capable of acquiring clinical data of an equivalent quality to an external cardiac monitor.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93228	Other qualified health care professional review and interpretation with report of external mobile cardiovascular telemetry with electrocardiographic recording, concurrent computerized real time data analysis, and greater than 24 hours of accessible electrocardiogram (ECG) data storage (retrievable with query) with ECG triggered and patient selected events transmitted to a remote attended surveillance center for up to 30 days
93229	Technical support for connection and patient instructions for use, attended surveillance for uo 30 days, analysis and other qualified health care professional prescribed transmission of daily and emergent data reports of external mobile cardiovascular telemetry with electrocardiographic recording, concurrent computerized real time data analysis, and greater than 24 hours of accessible electrocardiogram (ECG) data storage (retrievable with query) with ECG triggered and patient selected events transmitted to a remote attended surveillance center
93745	Initial set-up and programming by other qualified health care professional of wearable cardioverter-defibrillator with initial programming of system, establishing baseline electronic electrocardiogram (ECG), transmission of data to data repository, patient instruction in wearing system, and patient reporting of problems or events

Non-Invasive Testing

Service: Carotid Duplex Ultrasound (Carotid Doppler)

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** Subsequent requests may be appropriate if there is a change in clinical status.
- **Recommended Clinical Approach:** Carotid duplex ultrasonography is a non-invasive method of imaging the extracranial carotid and vertebral arteries. The test involves combining 2-dimensional real-time imaging with Doppler flow analysis to evaluate vessels of interest and measure blood flow velocity. Computed tomographic angiography (CTA) and magnetic resonance angiogram (MRA) are options when a carotid duplex scan is not readily available or when results are equivocal[12]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Carotid Duplex Ultrasound** is considered appropriate if **ANY** of the following are **TRUE**[12,13]:

- ◆ Patients with clinical signs or symptoms of extracranial cerebrovascular disease
- ◆ Patients with a history of a prior carotid revascularization procedure (e.g. carotid stent, carotid endarterectomy or carotid bypass)
- ◆ Patients with a diminished or absent carotid pulse, a carotid bruit or a carotid thrill on physical examination
- ◆ The patient has neurologic symptoms that may be due to cerebral ischemia.
- ◆ Follow-up after a carotid revascularization procedure. (Noninvasive imaging of the extracranial carotid arteries is reasonable 1-3 months, 6 months, and/or annually after carotid revascularization to assess patency and exclude the development of new, recurrent or contralateral lesions. Once stability has been established over an extended period, surveillance at longer intervals may be appropriate).

Non-Indications

- ➔ **Carotid Duplex Ultrasound** is not considered appropriate if **ANY** of the following is **TRUE**:
  - ◆ Another non-invasive or invasive procedure (cerebral angiogram) has been performed for the same event.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93880	Extracranial arteries; complete bilateral study
93882	Extracranial arteries; unilateral or limited study

Service: Computed Tomography (CT), Head

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** A non-contrast computed tomography (CT) is the primary imaging test for the initial evaluation of patients with suspected stroke. A non-contrast head CT may identify the early signs of stroke and exclude tumor or intracerebral hemorrhage.[14]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Head CT** is considered appropriate if **ANY** of the following is **TRUE**:
- ◆ The patient has acute neurologic deficits, including cranial nerve dysfunction and ataxia.[14-18, 20]
- ◆ Suspected stroke.[14,19]
- ◆ Suspected acute intracranial hemorrhage.[19-22]
- ◆ As a follow-up for known intracranial hemorrhages.
- ◆ Mental status change.[14,23-26]

Non-Indications

➔ **Head CT** may not be appropriate if **ANY** of the following is **TRUE**:
- ◆ In pregnant patients.
- ◆ If angiographic contrast is requested and **ANY** of the following are **TRUE**[27]:
  - The patient has contrast dye hypersensitivity.
  - The patient has impaired renal function.
  - The patient uses metformin.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
70450	Computed tomography (CT) of brain without contrast material
70460	Computed tomography (CT) of brain with contrast material
70470	Computed tomography (CT) of brain without contrast material, followed by contrast material and further sections

Service: Magnetic Resonance Imaging (MRI), Brain

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** MRI is more expensive and time-consuming than CT but has significantly higher sensitivity and specificity in diagnosing acute ischemic infarction, especially in the first few hours after onset. MRI can help identify the severity of some types of stroke and diagnose other medical conditions with similar symptoms.[14]
- **Exclusions:** Exclusions include contraindications of MRI (e.g., retained metal, incompatible width to bore size, claustrophobia), incompatibility with following directions (i.e., breath-hold), and renal insufficiency (eGFR less than 30 mL/min per 1.73 m^2) if gadolinium contrast is requested.

Medical Necessity Criteria

Indications

➔ **Brain MRI** is considered appropriate if **ANY** of the following is **TRUE**[28]:

- ◆ Acute ischemia and infarction.[14,29]
- ◆ Evaluation of headaches with associated neurological findings or suspected brain structural abnormality.
- ◆ Intracranial hemorrhage, including:
  - Determining the age of hemorrhage.[30]
  - Detection of microhemorrhages.[14]
  - Detection of hemorrhagic transformation in the rapid evaluation of acute ischemic stroke.[31]

Non-Indications

➔ **Brain MRI** may not be considered appropriate if **ANY** of the following is **TRUE**[28]:

- ◆ Non-compatible implanted devices.
- ◆ Metallic intraocular foreign bodies.
- ◆ There is a potential for adverse reactions to contrast media.
- ◆ The patient has significant claustrophobia.
- ◆ If the patient has renal insufficiency (eGFR less than 30 mL/min per 1.73 m^2) and if gadolinium contrast is requested, an MRI/MRA may not be considered appropriate.

Site of Service Criteria

Inpatient, outpatient, or observation status.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
70551	Magnetic resonance imaging (MRI) of brain including brain stem, without contrast material
70552	Magnetic resonance imaging (MRI) of brain including brain stem, with contrast material
70553	Magnetic resonance imaging (MRI) of brain including brain stem, without contrast material, followed by contrast material and further sections

Service: CTA Head and Neck

General Guidelines

- **Units, Frequency, & Duration:** Cervical computed tomography angiography (CTA) is a noninvasive imaging technology that can be used to evaluate and image vessels in the head and neck.
- **Criteria for Subsequent Requests:** CTA may be indicated for the diagnosis of symptomatic extracranial cerebrovascular disease. Subsequent orders can be placed before, during, or after treatment.
- **Recommended Clinical Approach:** CTA may be used as the primary modality for detecting symptomatic cerebrovascular disease or as an adjunctive tool for characterizing known diseases or assessing changes over time.
- **Exclusions:** This document only includes criteria for CTA of the head/neck. CTA of the head, body, and extremities are excluded and discussed separately.

Medical Necessity Criteria

Indications

➔ **CTA Head/Neck** is considered appropriate if **ANY** of the following are **TRUE**[8]:

- ◆ Carotid duplex scanning is inadequate (or unavailable) for diagnosis and/or follow-up
- ◆ Suspected intracranial cerebrovascular disease
- ◆ Patient requires the evaluation of **ANY** of the following:
  - Routine follow-up
  - Post-procedure follow-up (percutaneous and surgical)[54-66]

Non-Indications

➔ **CTA Head/Neck** may not be considered appropriate if **ANY** of the following is **TRUE**:

- ◆ Chronic kidney disease or acute kidney injury (glomerular filtration rate less than 30 mL/min/1.73m2 (or 0.5 mL/sec/1.73m2))
- ◆ Personal/family history of allergic reaction to iodinated contrast media (e.g., anaphylaxis)
- ◆ Current Pregnancy

Service: Magnetic Resonance Angiogram (MRA), Head

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Magnetic resonance angiography (MRA) is a noninvasive imaging technology used to evaluate and image vessels in the head and neck. MRA can be performed with or without gadolinium contrast, for instance, in individuals who have a history of contrast allergy and who are at high-risk of kidney failure.
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Head MRA** is considered appropriate if **ANY** of the following is **TRUE**[32]:
- ◆ The patient had a stroke or transient ischemic attack (TIA).[30]
- ◆ The patient has focal or lateralizing neurological deficits.
- ◆ An MRA is needed to evaluate for vascular disease.[30]
- ◆ An MRA is needed to evaluate an intracranial hemorrhage.

Non-Indications

➔ **Head MRA** may not be considered appropriate if **ANY** of the following is **TRUE**[32]:
- ◆ Non-compatible implanted devices.
- ◆ Metallic intraocular foreign bodies.
- ◆ There is a potential for adverse reactions to contrast media.
- ◆ The patient has significant claustrophobia.
- ◆ If the patient has renal insufficiency (eGFR less than 30 mL/min per 1.73 m^2) and if gadolinium contrast is requested, an MRI/MRA may not be considered appropriate.

Site of Service Criteria

Inpatient, outpatient, or observation status.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
70544	Magnetic resonance angiography (MRA) of head without contrast material

70545	Magnetic resonance angiography (MRA) of head with contrast material
70546	Magnetic resonance angiography (MRA) of head without contrast material, followed by contrast material and further sequences

Service: Transesophageal Echocardiogram (TEE)

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Transesophageal echocardiography (TEE) can identify the cause of stroke by detecting potential intrathoracic sources of embolism. TEE is more expensive, more invasive, and takes longer to perform than TTE, but it is more sensitive, especially for patent foramen ovale and left atrial appendage.
- **Exclusions:** A TEE is usually not needed in the setting of a short duration of atrial fibrillation that is reliably defined as less than 48 hours duration in a patient with CHA_2DS_2-VASc score of less than 0 in males, 1 in females.[33-34]

Medical Necessity Criteria

Indications

➔ **TEE** is considered appropriate if **ANY** of the following conditions is **TRUE**:
- ◆ The patient has known or suspected cardiovascular source of embolus with no identified noncardiac source.[7,35]
- ◆ As an initial test for evaluation to facilitate clinical decision making with regard to anticoagulation, cardioversion,/or radiofrequency ablation.[7]
- ◆ In a patient presenting with atrial fibrillation and any history of left atrial appendage thrombus, regardless of anticoagulation status.
- ◆ As a follow-up procedure if initial imaging yielded an intracardiac thrombus or evidence of left atrial stasis and the patient has had a minimum of 3-4 weeks of therapeutic anticoagulant therapy and a change in therapy is anticipated.[36]
- ◆ If a patient has any risk factor for embolic stroke and no pertinent abnormality is detected on transthoracic echocardiography.[6]

Non-Indications

➔ **TEE** may not be considered appropriate if **ANY** of the following is **TRUE**:
- ◆ The patient has a history of undiagnosed dysphagia.
- ◆ The patient has a history of esophageal stricture, malignancy, recent surgery of the esophagus, active GI bleeding, esophageal varices (relative), or prior surgery (relative).

Site of Service Criteria

Inpatient, outpatient, or observation status.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93312	Real time transesophageal echocardiography with 2-dimensional (2D) image documentation, M-mode recording, probe placement, image acquisition, interpretation, and report
93313	Real time transesophageal echocardiography with 2-dimensional (2D) image documentation and placement of transesophageal probe only
93314	Interpretation and report only of real time transesophageal echocardiography with 2-dimensional (2D) image documentation and image acquisition
93315	Transesophageal echocardiography (TEE) with probe placement, image acquisition, interpretation, and report
93316	Transesophageal echocardiography (TEE) for placement of transesophageal probe only
93317	Interpretation and report only of transesophageal echocardiography (TEE) with image acquisition
93318	Real time transesophageal echocardiography (TEE) with probe placement, 2-dimensional (2D) image acquisition and interpretation
93355	Transesophageal echocardiography (TEE) for guidance of transcatheter closure of left atrial appendage, with quantitative measurements, probe manipulation, interpretation and report
C8925	2d tee w or w/o fol w/con,in
C8926	Tee w or w/o fol w/cont,cong
C8927	Tee w or w/o fol w/cont, mon

Service: Transthoracic Echocardiogram (TTE)

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Transthoracic echocardiography (TTE) is the usual initial test in patients with suspected embolic stroke. TTE could be recommended for patients experiencing symptomatic HF, valvular heart disease, or arrhythmias. TTE could also be recommended to confirm other findings that have not previously been evaluated (e.g., heart murmur, abnormal ECG).[36]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **TTE** is considered appropriate if **ANY** of the following is **TRUE**[36]:
- ◆ There is a suspected cardiovascular source of embolus.[7]
- ◆ The patient has symptoms or conditions potentially related to cardiac etiology, including but not limited to stroke or TIA.[7]

Non-Indications

➔ **TTE** is not considered appropriate if **ANY** of the following is **TRUE**:
- ◆ Echocardiography has no contraindications. Echocardiography may have limited benefit in patients at the extremes of adult body weight, because a thick chest wall (in markedly obese patients) or overcrowded ribs (in severely underweight patients) may limit the penetration of ultrasound waves.[36,37]

Site of Service Criteria

Inpatient, outpatient, or observation status.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93303	Complete transthoracic echocardiography for congenital cardiac anomalies
93304	Follow-up transthoracic echocardiography for congenital cardiac anomalies
93306	Real time transthoracic echocardiography with

	2-dimensional (2D) image documentation, M-mode recording with spectral Doppler echocardiography, and color flow Doppler echocardiography
93307	Complete real time transthoracic echocardiography with 2-dimensional (2D) image documentation
93308	Follow-up real time transthoracic echocardiography with 2-dimensional (2D) image documentation
C8921	Tte w or w/o fol w/cont, com
C8922	Tte w or w/o fol w/cont, f/u
C8923	2d tte w or w/o fol w/con,co
C8924	2d tte w or w/o fol w/con,fu
C8929	Tte w or wo fol wcon,doppler

Non-Surgical Management

Service: Occupational Therapy (OT)

General Guidelines

- **Units, Frequency, & Duration:** Insufficient evidence is available to support specific recommendations regarding timing, duration, and frequency of conservative treatment.
- **Criteria for Subsequent Requests:** The patient should be making progress towards goals in the occupational therapy plan without fully obtaining all goals.
- **Recommended Clinical Approach:** Occupational therapy can improve a patient's ability to perform activities of daily living and instrumental activities of daily living. All outpatient OT services must be certified by a physician responsible for establishing a planned set of therapy services.[38,5]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **OT** is considered appropriate IF **ANY** of the following is **TRUE**[38]**:**
- ◆ The patient is experiencing pain, weakness, or limited motion in **ANY** of the following areas due to/secondary to stroke:
  - Neck
  - Back
  - Shoulder
  - Elbow
  - Hand
  - Hip
  - Knee
- ◆ Vertigo, gait difficulty, poor balance, or falls
- ◆ Incontinence
- ◆ Inability to perform activities of daily living or instrumental activities of daily living with a significant chance of improvement with occupational therapy

Non-Indications

➔ **OT** may not be appropriate if **ANY** of the following is **TRUE**[38]:

- There is concern that a patient may worsen due to OT.
- The patient is unwilling or unable to participate in treatment sessions actively.
- Occupational therapy is unlikely to improve the patient's condition.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
97010	Application of hot or cold packs
97012	Application of mechanical traction
97014	Application of electrical stimulation to 1 or more areas, unattended by physical therapist
97016	Application of vasopneumatic devices
97018	Application of paraffin bath
97022	Application of whirlpool
97024	Application of diathermy
97026	Application of infrared modality
97028	Application of ultraviolet modality
97032	Application of manual electrical stimulation, attended
97033	Application of iontophoresis
97034	Application of contrast baths
97035	Application of ultrasound modality
97036	Application of Hubbard tank
97039	Modality service
97110*	Therapeutic exercises to develop strength and endurance, range of motion and flexibility

97112	Neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and proprioception for sitting and standing activities
97113	Aquatic therapy with therapeutic exercises
97116	Gait training including stair climbing
97124	Massage including effleurage and petrissage; Massage including effleurage and tapotement; Massage including effleurage, petrissage and tapotement; Massage including petrissage and tapotement
97139	Therapeutic procedure
97140	Manual therapy techniques
97150	Group therapeutic procedures
97164	Physical therapy re-evaluation of established plan of care, high complexity, typical time with patient 20 minutes; Physical therapy re-evaluation of established plan of care, high complexity, typical time with patient and family 20 minutes; Physical therapy re-evaluation of established plan of care, high complexity, typical time with patient's family 20 minutes
97530	Direct therapeutic activities with use of dynamic activities to improve functional performance, each 15 minutes
97535	Home management training, direct one-on-one contact, each 15 minutes; Self-care management training, direct one-on-one contact, each 15 minutes
97537	Community reintegration training, direct one-on-one contact, each 15 minutes; Work reintegration training, direct one-on-one contact, each 15 minutes
97542	Wheelchair management, each 15 minutes
97545	Work conditioning, initial 2 hours; Work hardening, initial 2 hours

97546	Work conditioning, each additional hour; Work hardening, each additional hour
97750	Physical performance measurement with written report, each 15 minutes; Physical performance test with written report, each 15 minutes
97755	Assistive technology assessment with written report, direct one-on-one contact, each 15 minutes
97760	Initial orthotic management and training with assessment and fitting of lower extremities and trunk, each 15 minutes; Initial orthotic management and training with assessment and fitting of lower extremities, each 15 minutes; Initial orthotic management and training with assessment and fitting of lower extremity and trunk, each 15 minutes; Initial orthotic management and training with assessment and fitting of lower extremity, each 15 minutes; Initial orthotic management and training with assessment and fitting of trunk, each 15 minutes; Initial orthotic management and training with assessment and fitting of upper and lower extremities and trunk, each 15 minutes
97761	Initial prosthetic training of lower extremities, each 15 minutes; Initial prosthetic training of lower extremity, each 15 minutes Initial prosthetic training of upper and lower extremities, each 15 minutes; Initial prosthetic training of upper extremities, each 15 minutes; Initial prosthetic training of upper extremity, each 15 minutes
97763	Subsequent orthotic management and training of lower extremities and trunk, each 15 minutes Subsequent orthotic management and training of lower extremity and trunk, each 15 minutes Subsequent orthotic management and training of lower extremity, each 15 minutes Subsequent orthotic management and training of upper and lower extremities and trunk, each 15 minutes

	Subsequent orthotic management and training of upper extremities and trunk, each 15 minutes Subsequent orthotic management and training of upper extremities, each 15 minutes Subsequent orthotic management and training of upper extremity and trunk, each 15 minutes Subsequent orthotic management and training of upper extremity, each 15 minutes Subsequent orthotic management of lower extremities and trunk, each 15 minutes Subsequent orthotic management of lower extremity and trunk, each 15 minutes Subsequent orthotic management of lower extremity, each 15 minutes Subsequent orthotic management of upper and lower extremities and trunk, each 15 minutes Subsequent orthotic management of upper extremities and trunk, each 15 minutes Subsequent orthotic management of upper extremities, each 15 minutes Subsequent orthotic management of upper extremity and trunk, each 15 minutes Subsequent orthotic management of upper extremity, each 15 minutes Subsequent orthotic training of lower extremity, each 15 minutes Subsequent orthotic training of upper and lower extremities and trunk, each 15 minutes Subsequent orthotic training of upper extremities and trunk, each 15 minutes Subsequent orthotic training of upper extremities, each 15 minutes Subsequent orthotic training of upper extremity and trunk, each 15 minutes Subsequent orthotic training of upper extremity, each 15 minutes Subsequent prosthetic management and training of lower extremities and trunk, each 15 minutes

	Subsequent prosthetic management and training of lower extremity and trunk, each 15 minutes Subsequent prosthetic management and training of lower extremity, each 15 minutes Subsequent prosthetic management and training of upper and lower extremities and trunk, each 15 minutes Subsequent prosthetic management and training of upper extremities and trunk, each 15 minutes Subsequent prosthetic management and training of upper extremities, each 15 minutes Subsequent prosthetic management and training of upper extremity and trunk, each 15 minutes Subsequent prosthetic management and training of upper extremity, each 15 minutes Subsequent prosthetic management of lower extremities and trunk, each 15 minutes Subsequent prosthetic management of lower extremity and trunk, each 15 minutes Subsequent prosthetic management of lower extremity, each 15 minutes Subsequent prosthetic management of upper and lower extremities and trunk, each 15 minutes Subsequent prosthetic management of upper extremities and trunk, each 15 minutes Subsequent prosthetic management of upper extremities, each 15 minutes Subsequent prosthetic management of upper extremity and trunk, each 15 minutes Subsequent prosthetic management of upper extremity, each 15 minutes Subsequent prosthetic training of lower extremity, each 15 minutes Subsequent prosthetic training of upper and lower extremities and trunk, each 15 minutes Subsequent prosthetic training of upper extremities and trunk, each 15 minutes Subsequent prosthetic training of upper extremities, each 15 minutes

	Subsequent prosthetic training of upper extremity and trunk, each 15 minutes Subsequent prosthetic training of upper extremity, each 15 minutes Subsequent orthotic management and training of lower extremities, each 15 minutes Subsequent orthotic management of lower extremities, each 15 minutes Subsequent orthotic training of lower extremities and trunk, each 15 minutes Subsequent orthotic training of lower extremities, each 15 minutes Subsequent orthotic training of lower extremity and trunk, each 15 minutes Subsequent prosthetic management and training of lower extremities, each 15 minutes Subsequent prosthetic management of lower extremities, each 15 minutes Subsequent prosthetic training of lower extremities and trunk, each 15 minutes Subsequent prosthetic training of lower extremities, each 15 minutes Subsequent prosthetic training of lower extremity and trunk, each 15 minutes
97799	Unlisted physical medicine/rehabilitation service or procedure
00420	Physical Therapy
00421	Physical Therapy: Visit Charge
00422	Physical Therapy: Hourly Charge
00423	Physical Therapy: Group Rate
00424	Physical Therapy: Evaluation/Re-evaluation
00429	Physical Therapy: Other Physical Therapy
97163	Evaluation of physical therapy, typically 45 minutes
97161	Evaluation of physical therapy, typically 20 minutes

97162	Evaluation of physical therapy, typically 30 minutes
97168	Re-evaluation of occupational therapy established plan of care, typically 30 minutes
97165	Evaluation of occupational therapy, typically 30 minutes
97166	Evaluation of occupational therapy, typically 45 minutes
97167	Evaluation of occupational therapy established plan of care, typically 60 minutes
G0151	Hhcp-serv of pt,ea 15 min

Service: Speech Therapy

General Guidelines

- **Units, Frequency, & Duration:** Insufficient evidence is available to support specific recommendations regarding timing, duration, and frequency of conservative treatment.
- **Criteria for Subsequent Requests:** The patient should be making progress towards goals in the speech therapy plan without fully obtaining all goals.
- **Recommended Clinical Approach:** Speech therapy can improve a stroke patient's ability to speak and swallow. All outpatient speech services must be certified by a physician responsible for establishing a planned set of therapy services.[5,38]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Speech therapy** is considered appropriate if **ANY** of the following is **TRUE**[38]:

- ◆ The patient has a speech problem related to a stroke.
- ◆ The patient has dysphagia related to a stroke.

Non-Indications

➔ **Speech therapy** may not be appropriate if **ANY** of the following is **TRUE**[38]:

- ◆ The patient is unwilling or unable to participate in treatment sessions actively.
- ◆ Speech therapy is unlikely to improve the patient's condition.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
92507	Treatment of speech, language, voice, communication, and/or hearing processing disorder
92508	Group treatment of speech, language, voice,

	communication, and/or hearing processing disorder
92520	Functional assessment of the voice box
92526	Treatment of swallowing and/or oral feeding function
92606	Therapeutic services for use of non-speech-generating device with programming
92609	Therapeutic services for use of speech-generating device with programming
92630	Hearing training and therapy for hearing loss prior to learning to speak
92633	Hearing training and therapy for hearing loss after speech
G0283	Elec stim other than wound
S9152	Speech therapy, re-eval
V5362	Speech screening
V5363	Language screening
V5364	Dysphagia screening
97039	Physical medicine service or procedure
97129	Therapeutic interventions that focus on cognitive function (eg, attention, memory, reasoning, executive function, problem solving, and/or pragmatic functioning) and compensatory strategies to manage the performance of an activity (eg, managing time or schedules, initiating, organizing, and sequencing tasks), direct (one-on-one) patient contact; initial 15 minutes
97130	Therapeutic interventions that focus on cognitive function (eg, attention, memory, reasoning, executive function, problem solving, and/or pragmatic functioning) and compensatory strategies to manage the performance of an activity (eg, managing time or schedules, initiating, organizing, and sequencing tasks), direct (one-on-one) patient contact; each additional 15 minutes
97139	Therapeutic procedure

97150	Therapeutic procedures in a group setting
97535	Self-care or home management training, each 15 minutes
97537	Community or work reintegration training, each 15 minutes

Service: Physical Therapy (PT)

General Guidelines

- **Units, Frequency, & Duration:** Insufficient evidence is available to support specific recommendations regarding the timing, duration, and frequency of conservative treatment.
- **Criteria for Subsequent Requests:** The patient should be making progress towards goals in the physical therapy plan without fully obtaining all goals.
- **Recommended Clinical Approach:** The therapy should focus on the affected anatomic area and encompass the following as indicated: Active and passive range of motion, strengthening, ultrasound, modalities, desensitization as well as nerve/tendon gliding exercises. The patient should be provided with a home exercise program as well. All outpatient PT services must be certified by a physician responsible for establishing a planned set of therapy services.[5, 38]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **PT** is considered appropriate if **ANY** of the following is **TRUE**[38]:
- ◆ The patient is experiencing pain, weakness, or limited motion in **ANY** of the following areas due to/secondary to stroke:
  - Neck
  - Back
  - Shoulder
  - Elbow
  - Hand
  - Hip
  - Knee
- ◆ Vertigo, gait difficulty, poor balance, or falls
- ◆ Incontinence

Non-Indications

➔ **PT** is considered appropriate if **ANY** of the following is **TRUE**[38]:
- ◆ There is a concern that a patient's symptoms may worsen with PT.
- ◆ The patient did not respond to prior conservative treatment with therapy.

- The patient is unwilling or unable to participate in PT actively.

Site of Service Criteria

Outpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
97010	Application of hot or cold packs
97012	Application of mechanical traction
97014	Application of electrical stimulation to 1 or more areas, unattended by physical therapist
97016	Application of vasopneumatic devices
97018	Application of paraffin bath
97022	Application of whirlpool
97024	Application of diathermy
97026	Application of infrared modality
97028	Application of ultraviolet modality
97032	Application of manual electrical stimulation, attended
97033	Application of iontophoresis
97034	Application of contrast baths
97035	Application of ultrasound modality
97036	Application of Hubbard tank
97039	Modality service
97110*	Therapeutic exercises to develop strength and endurance, range of motion and flexibility
97112	Neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and proprioception for sitting and standing activities

97113	Aquatic therapy with therapeutic exercises
97116	Gait training including stair climbing
97124	Massage including effleurage and petrissage; Massage including effleurage and tapotement; Massage including effleurage, petrissage and tapotement; Massage including petrissage and tapotement
97139	Therapeutic procedure
97140	Manual therapy techniques
97150	Group therapeutic procedures
97164	Physical therapy re-evaluation of established plan of care, high complexity, typical time with patient 20 minutes; Physical therapy re-evaluation of established plan of care, high complexity, typical time with patient and family 20 minutes; Physical therapy re-evaluation of established plan of care, high complexity, typical time with patient's family 20 minutes
97530	Direct therapeutic activities with use of dynamic activities to improve functional performance, each 15 minutes
97535	Home management training, direct one-on-one contact, each 15 minutes; Self-care management training, direct one-on-one contact, each 15 minutes
97537	Community reintegration training, direct one-on-one contact, each 15 minutes; Work reintegration training, direct one-on-one contact, each 15 minutes
97542	Wheelchair management, each 15 minutes
97545	Work conditioning, initial 2 hours; Work hardening, initial 2 hours
97546	Work conditioning, each additional hour; Work hardening, each additional hour
97750	Physical performance measurement with written report,

	each 15 minutes; Physical performance test with written report, each 15 minutes
97755	Assistive technology assessment with written report, direct one-on-one contact, each 15 minutes
97760	Initial orthotic management and training with assessment and fitting of lower extremities and trunk, each 15 minutes; Initial orthotic management and training with assessment and fitting of lower extremities, each 15 minutes; Initial orthotic management and training with assessment and fitting of lower extremity and trunk, each 15 minutes; Initial orthotic management and training with assessment and fitting of lower extremity, each 15 minutes; Initial orthotic management and training with assessment and fitting of trunk, each 15 minutes; Initial orthotic management and training with assessment and fitting of upper and lower extremities and trunk, each 15 minutes
97761	Initial prosthetic training of lower extremities, each 15 minutes; Initial prosthetic training of lower extremity, each 15 minutes Initial prosthetic training of upper and lower extremities, each 15 minutes; Initial prosthetic training of upper extremities, each 15 minutes; Initial prosthetic training of upper extremity, each 15 minutes
97763	Subsequent orthotic management and training of lower extremities and trunk, each 15 minutes Subsequent orthotic management and training of lower extremity and trunk, each 15 minutes Subsequent orthotic management and training of lower extremity, each 15 minutes Subsequent orthotic management and training of upper and lower extremities and trunk, each 15 minutes Subsequent orthotic management and training of upper extremities and trunk, each 15 minutes Subsequent orthotic management and training of upper

	extremities, each 15 minutes Subsequent orthotic management and training of upper extremity and trunk, each 15 minutes Subsequent orthotic management and training of upper extremity, each 15 minutes Subsequent orthotic management of lower extremities and trunk, each 15 minutes Subsequent orthotic management of lower extremity and trunk, each 15 minutes Subsequent orthotic management of lower extremity, each 15 minutes Subsequent orthotic management of upper and lower extremities and trunk, each 15 minutes Subsequent orthotic management of upper extremities and trunk, each 15 minutes Subsequent orthotic management of upper extremities, each 15 minutes Subsequent orthotic management of upper extremity and trunk, each 15 minutes Subsequent orthotic management of upper extremity, each 15 minutes Subsequent orthotic training of lower extremity, each 15 minutes Subsequent orthotic training of upper and lower extremities and trunk, each 15 minutes Subsequent orthotic training of upper extremities and trunk, each 15 minutes Subsequent orthotic training of upper extremities, each 15 minutes Subsequent orthotic training of upper extremity and trunk, each 15 minutes Subsequent orthotic training of upper extremity, each 15 minutes Subsequent prosthetic management and training of lower extremities and trunk, each 15 minutes Subsequent prosthetic management and training of lower extremity and trunk, each 15 minutes Subsequent prosthetic management and training of lower

	extremity, each 15 minutes Subsequent prosthetic management and training of upper and lower extremities and trunk, each 15 minutes Subsequent prosthetic management and training of upper extremities and trunk, each 15 minutes Subsequent prosthetic management and training of upper extremities, each 15 minutes Subsequent prosthetic management and training of upper extremity and trunk, each 15 minutes Subsequent prosthetic management and training of upper extremity, each 15 minutes Subsequent prosthetic management of lower extremities and trunk, each 15 minutes Subsequent prosthetic management of lower extremity and trunk, each 15 minutes Subsequent prosthetic management of lower extremity, each 15 minutes Subsequent prosthetic management of upper and lower extremities and trunk, each 15 minutes Subsequent prosthetic management of upper extremities and trunk, each 15 minutes Subsequent prosthetic management of upper extremities, each 15 minutes Subsequent prosthetic management of upper extremity and trunk, each 15 minutes Subsequent prosthetic management of upper extremity, each 15 minutes Subsequent prosthetic training of lower extremity, each 15 minutes Subsequent prosthetic training of upper and lower extremities and trunk, each 15 minutes Subsequent prosthetic training of upper extremities and trunk, each 15 minutes Subsequent prosthetic training of upper extremities, each 15 minutes Subsequent prosthetic training of upper extremity and trunk, each 15 minutes Subsequent prosthetic training of upper extremity, each 15

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97799	Unlisted physical medicine/rehabilitation service or procedure
420	Physical Therapy
421	Physical Therapy: Visit Charge
422	Physical Therapy: Hourly Charge
423	Physical Therapy: Group Rate
424	Physical Therapy: Evaluation/Re-evaluation
429	Physical Therapy: Other Physical Therapy
97163	Evaluation of physical therapy, typically 45 minutes
97161	Evaluation of physical therapy, typically 20 minutes
97162	Evaluation of physical therapy, typically 30 minutes
97168	Re-evaluation of occupational therapy established plan of care, typically 30 minutes

97165	Evaluation of occupational therapy, typically 30 minutes
97166	Evaluation of occupational therapy, typically 45 minutes
97167	Evaluation of occupational therapy established plan of care, typically 60 minutes
G0151	Hhcp-serv of pt,ea 15 min

Surgical or Interventional Management

Service: Patent Foramen Ovale (PFO) and Atrial Septal Defect (ASD) Closure

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Patent foramen ovale (PFO) refers to the nonclosure between septum primum and secundum located at the superior and inferior margin of the foramen ovale. Closure can prevent stroke in appropriate patients.[39] Patients with reduced functional capacity caused by hemodynamically important secundum ASD benefit from surgical or transcatheter closure of the secundum ASD. Patients who do not undergo ASD closure may experience atrial arrhythmias, reduced functional capacity, and greater degrees of pulmonary hypertension.[40] While secundum ASDs can be closed percutaneously, anatomy permitting, the primum, sinus venosus, and coronary sinus ASDs require surgical treatment.
- **Exclusions:** Exclusions to percutaneous device closure may include the presence of an inferior vena cava filter, elevated bleeding risk or coagulopathy, and vascular, cardiac, or PFO anatomy that is unsuitable for device placement.

Medical Necessity Criteria

Indications

➔ **PFO closure** is considered appropriate if **ANY** of the following are **TRUE**[4,39,41-42]:
- ◆ The PFO patient is 18-60 years old with a right-to-left shunt, a non lacunar embolic-appearing ischemic stroke, and no other evident source of stroke despite a comprehensive evaluation.
- ◆ The patient with orthodeoxia/platypnea syndrome.

➔ **ASD closure** is considered appropriate if **ANY** of the following are **TRUE**[4,39,41]:
- ◆ ASD (any type) causing impaired functional capacity with ALL of the following:
  - Hemodynamically significant net left-to-right shunt (pulmonary to systemic blood flow ratio of 1.5 to 1 or greater).
  - No significant pulmonary hypertension.

- Documented or verified paradoxical embolization events.
- Orthodeoxia/platypnea syndrome.

Non-Indications

➔ **PFO closure** is not considered appropriate if **ANY** of the following is **TRUE**:
- The patient has severe pulmonary hypertension as indicated by **ANY** of the following[40]:
  - PA systolic pressure greater than two-thirds systemic.
  - Pulmonary vascular resistance greater than two-thirds systemic.
  - Net right-to-left shunt.
- PFO was discovered incidentally without associated symptoms.

➔ **ASD closure** is not considered appropriate if **ANY** of the following is **TRUE**:
- The patient has severe pulmonary hypertension as indicated by **ANY** of the following[40]:
  - PA systolic pressure greater than two-thirds systemic.
  - Pulmonary vascular resistance greater than two-thirds systemic.
  - Net right-to-left shunt.

Site of Service Criteria

Inpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
93580	Percutaneous transcatheter closure of congenital interatrial communication with implant

Service: Carotid Endarterectomy

General Guidelines

- **Units, Frequency, & Duration:** none.
- **Criteria for Subsequent Requests:** Patients who present with symptomatic recurrent extracranial carotid artery occlusive disease AFTER a prior CEA may be candidates for redo CEA, transfemoral carotid stenting (CAS) or trans-carotid artery revascularization (TCAR)
- **Recommended Clinical Approach:** Patients with symptomatic extracranial carotid artery occlusive disease may be candidates for CEA to reduce the risk of recurrent stroke.
- **Exclusions:** Except in extraordinary circumstances, carotid revascularization by either CEA or CAS is not recommended when atherosclerosis narrows the lumen by less than 50%. Carotid revascularization is not recommended for patients with chronic total occlusion of the ipsilateral internal carotid artery. Patients with symptomatic external carotid artery (ECA) stenosis (in the setting of an ipsilateral internal carotid artery occlusion) may benefit from ECA revascularization. Carotid revascularization is not recommended for patients with severe disability caused by cerebral infarction that precludes preservation of useful function.[43]

Medical Necessity Criteria

Indications

➔ **CEA** is considered appropriate if **ANY** of the following is **TRUE**[4,42]:
- ◆ Patients with recent TIA or ischemic stroke (within the past 6 months) and **ALL** of the following:
  - Ipsilateral moderate (50%–69%) to severe (70-99%) extracranial internal carotid artery stenosis as documented by **ANY** of the following[44]:
    - Catheter-based imaging or noninvasive imaging (carotid duplex scan, magnetic resonance angiogram (MRA), or CT angiogram (CTA)
  - Perioperative morbidity and mortality risk is estimated to be less than 6%

Non-Indications

➔ **CEA** is not considered appropriate if **ANY** of the following is **TRUE**:
- ◆ The surgical risk is greater than or equal to 6%

- Severe disability caused by cerebral infarction that precludes preservation of useful function.[43]
- The degree of stenosis is less than 50%.[4,44]

Applicable CMS Medicare NCDs & LCDs

None.

Site of Service Criteria

Inpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
35301	Carotid thromboendarterectomy by neck incision

Service: Carotid Artery Stenting (CAS) and Transcarotid revascularization (TCAR)

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** CAS or TCAR can be an appropriate treatment option for patients with symptomatic extracranial carotid artery occlusive disease..[43]
- **Recommended Clinical Approach:** For stroke patients with symptomatic extracranial carotid artery occlusive disease, treatment can lower the risk of subsequent stroke.[43] CAS and/or TCAR areless invasive procedures compared to CEA.[43] CAS and/or TCAR may be superior to CEA in patients with previous neck surgery or radiation injury.[43]
- **Exclusions:** Visible thrombus within the lesion detected on preoperative or intraoperative imaging (eg, ultrasound, angiography), inability to gain vascular access, or active infection.[44]

Medical Necessity Criteria

Indications

➔ **CAS and TCAR** may be considered appropriate if **ANY** of the following are **TRUE**[4,42]**:**
- ◆ For patients with a TIA or ischemic stroke and **ALL** of the following are **TRUE**:
  - when the diameter of the lumen of the ICA is reduced by **ANY** of the following[44]:
    - greater than or equal to 50% by noninvasive imaging
    - greater than 50% by catheter-based imaging
  - Anticipated rate of periprocedural stroke or death is <6 %
  - Patient has significant comorbidities predisposing them to an increased risk of complications with carotid endarterectomy

Non-Indications

➔ **CAS and TCAR** is not considered appropriate if **ANY** of the following is **TRUE**:
- ◆ Peri-procedural risk is >/= 6%
- ◆ Severe disability caused by cerebral infarction that precludes preservation of useful function.[43]
- ◆ Carotid stenosis less than 50%[44]

Site of Service Criteria

Inpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
37215	Open transcatheter placement of intravascular stent in cervical carotid artery with distal embolic protection
37216	Percutaneous transcatheter placement of intravascular stent in cervical carotid artery
37217	Transcatheter placement of intravascular stent in innominate artery by retrograde treatment with open exposure of ipsilateral cervical carotid artery
37218	Transcatheter insertion of stent of intrathoracic common carotid artery by open antegrade approach with angioplasty, and radiological supervision and interpretation

Post-Operative Care

Service: Home Health Care

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Home health care may be recommended if outpatient treatment is not appropriate.
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Home health care** may be appropriate if **ALL** of the following are **TRUE**:
- The patient lives with those that are unable to care for the patient.
- The patient must be confined to the home, or the condition is such that leaving home for required services would require considerable effort or expose the individual to undesirable risk.

Non-Indications

None.

Site of Service Criteria

Home.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
99509	Home visit for assistance with activities of daily living and personal care
99600	Unlisted home visit procedure; Unlisted home visit service
99334	Level 1 rest home visit for evaluation and management of established patient with minor and/or self-limited problem, including problem-focused interval history and physical examination, and straightforward medical decision-making, typical time with patient, family, and/or caregiver 15 minutes
G0129	Partial hosp prog service

G0283	Elec stim other than wound

Service: Inpatient Rehabilitation

General Guidelines

- **Units, Frequency, & Duration:** No guidelines available for a specific duration, timing, frequency of rehabilitation.
- **Criteria for Subsequent Requests:** none.
- **Recommended Clinical Approach:** Inpatient rehabilitation facility provides hospital-level care to stroke survivors who need intensive, 24-hour-a-day, interdisciplinary rehabilitation care provided under the direct supervision of a physician.[5]
- **Exclusions:** None.

Medical Necessity Criteria

Indications

➔ **Post-acute inpatient rehabilitation** is considered appropriate if **ANY** of the following is **TRUE**[5]:

- ◆ The patient has a stroke deficit, significant improvement is expected within a reasonable length of time, and the patient is likely to return to a community setting.
- ◆ There are both intensive (3 hours a day for 5 days a week) and complex rehabilitation issues (e.g., orthotics, spasticity, and bowel/bladder).
- ◆ The patient is able to actively participate in therapy.
- ◆ There is a need for an interdisciplinary team care (Physician, nursing, therapy (PT, OT. Speech), and case management/social services).

Non-Indications

None.

Site of Service Criteria

Inpatient.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
97014	Application of electrical stimulation to 1 or more areas, unattended by physical therapist

97110*	Therapeutic exercises to develop strength and endurance, range of motion and flexibility
97112	Neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and proprioception for sitting and standing activities
97116	Gait training including stair climbing
97140	Manual therapy techniques
97164	Physical therapy re-evaluation, high complexity, typical time with patient and/or family 20 minutes
97530	Therapeutic activities with use of dynamic activities to improve functional performance
97016	Application of blood vessel compression or decompression device to 1 or more areas
97161	Evaluation of physical therapy, typically 20 minutes
97162	Evaluation of physical therapy, typically 30 minutes
97163	Evaluation of physical therapy, typically 45 minutes

*Default codes for suggested services

Service: Skilled Nursing Facility (SNF)

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Skilled nursing facilities provide stroke survivors with daily skilled nursing or rehabilitation services.[46]
  Exclusions: None.

Medical Necessity Criteria

Indications

➔ **SNFs** may be considered appropriate if **ANY** of the following is **TRUE**[5]:

- The patient requires maximum assistance for mobility[46]
- The patient does not have others to take care of them at home if "Practical Matter" criteria are also met.[47]
- Skilled nursing services are required to maintain or prevent the deterioration of the patient.
- There is bowel and bladder impairment requiring skilled nursing care.
- There is skin breakdown or a high-risk for skin breakdown requiring skilled nursing care.
- The patient has impaired mobility.[46]
- The patient is dependent for activities of daily living (ADLs).
- The patient is unable to manage their medications if "Practical Matter" criteria are also met.[47]
- The patient is at a high-risk for nutritional deficits.

Non-Indications

None.

Site of Service Criteria

Skilled nursing facility.

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
99304	Level 1 initial nursing facility care for evaluation and management of patient with problem of low severity, including comprehensive history and physical

	examination, and medical decision-making of low complexity, typical time 25 minutes; Level 1 initial nursing facility care for evaluation and management of patient with problem of low severity, including detailed history and physical examination, and straightforward medical decision-making, typical time 25 minutes
99305	Level 2 initial nursing facility care for evaluation and management of patient with problem of moderate severity, including comprehensive history and physical examination, and medical decision-making of moderate complexity, typical time 35 minutes
99306	Level 3 initial nursing facility care for evaluation and management of patient with problem of high severity, including comprehensive history and physical examination, and medical decision-making of high complexity, typical time 45 minutes
99307	Level 1 subsequent nursing facility care for evaluation and management of patient, including problem-focused interval history and physical examination, and straightforward medical decision-making, typical time 10 minutes; Level 1 subsequent nursing facility care for evaluation and management of patient, including problem-focused interval history and physical examination, typical time 10 minutes; Level 1 subsequent nursing facility care for evaluation and management of patient, including problem-focused interval history and straightforward medical decision-making, typical time 10 minutes; Level 1 subsequent nursing facility care for evaluation and management of patient, including problem-focused physical examination and straightforward medical decision-making, typical time 10 minutes
99308	Level 2 subsequent nursing facility care for evaluation and management of patient, including expanded problem-focused interval history and medical decision-making of low complexity, typical time 15 minutes; Level 2 subsequent nursing facility care for evaluation and management of patient, including expanded problem-focused interval history and physical examination, and medical decision-making of low

	complexity, typical time 15 minutes; Level 2 subsequent nursing facility care for evaluation and management of patient, including expanded problem-focused interval history and physical examination, typical time 15 minutes; Level 2 subsequent nursing facility care for evaluation and management of patient, including expanded problem-focused physical examination and medical decision-making of low complexity, typical time 15 minutes
99309	Level 3 subsequent nursing facility care for evaluation and management of patient, including detailed interval history and medical decision-making of moderate complexity, typical time 25 minutes; Level 3 subsequent nursing facility care for evaluation and management of patient, including detailed interval history and physical examination, and medical decision-making of moderate complexity. typical time 25 minutes; Level 3 subsequent nursing facility care for evaluation and management of patient, including detailed interval history and physical examination, typical time 25 minutes; Level 3 subsequent nursing facility care for evaluation and management of patient, including detailed physical examination and medical decision-making of moderate complexity, typical time 25 minutes
99310	Level 4 subsequent nursing facility care for evaluation and management of patient, including comprehensive interval history and medical decision-making of high complexity, typical time 35 minutes; Level 4 subsequent nursing facility care for evaluation and management of patient, including comprehensive interval history and physical examination, and medical decision-making of high complexity, typical time 35 minutes; Level 4 subsequent nursing facility care for evaluation and management of patient, including comprehensive interval history and physical examination, typical time 35 minutes; Level 4 subsequent nursing facility care for evaluation and management of patient, including comprehensive physical examination and medical decision-making of high complexity, typical time 35 minutes
99315	Nursing facility discharge day management, 30 minutes or less

99316	Nursing facility day management, more than 30 minutes
G0128	Corf skilled nursing service

Surgical Risk Factors

Patient Medical Risk Stratification

Patient Risk Score	Patient Characteristic	Min Range	Max Range	Guidance
1- Very Low Risk	No known medical problems			
2- Low Risk	Hypertension		180/110 mm Hg	
2- Low Risk	Asthma	peak flow >80% of predicted or personal best value		
2- Low Risk	Prior history of alcohol abuse			Screen for liver disease and malnutrition
2- Low Risk	Prior history of tobacco use			
3- Intermediate Risk	Asthma	peak flow <80% of predicted or personal best value		
3- Intermediate Risk	Active alcohol abuse			
3- Intermediate Risk	Age	65	75	
3- Intermediate Risk	History of treated, stable coronary artery disease (CAD)			
3- Intermediate Risk	Stable atrial fibrillation			
3- Intermediate Risk	Diabetes mellitus	HbA1C >7%		
3- Intermediate Risk	Morbid obesity	BMI 30	BMI 40	
3- Intermediate Risk	Anemia	hemoglobin <11 (females), <12 (males)		Workup to identify etiology
3- Intermediate Risk	HIV	CD4 <200 cells/mm3		Get clearance from HIV specialist
3- Intermediate Risk	Rheumatologic disease			Preoperative consultation with rheumatologist re: perioperative medication management
3- Intermediate Risk	Peripheral vascular disease or history of peripheral vascular bypass	ankle-brachial pressure index (ABPI)		Preoperative consultation with vascular surgeon

		<0.9		
3- Intermediate Risk	History of venous thromboembolism (VTE)			
3- Intermediate Risk	Well-controlled obstructive sleep apnea			
3- Intermediate Risk	Malnutrition	transferrin <200 mg/dL albumin <3.5 g/dL prealbumin <22.5 mg/dL total lymphocyte count <1200-1500 cell/mm3 BMI <18		Preoperative consultation with nutritionist
3- Intermediate Risk	Active tobacco Use			Enroll patient in smoking cessation program
3- Intermediate Risk	Known allergy or hypersensitivity to medication needed for procedure			
4- High Risk	Advanced Renal Disease (Creatinine > 2)			
4- High Risk	Diabetes mellitus with complications	HbA1c >8%		
4- High Risk	Age	76	85	
4- High Risk	Oxygen dependent pulmonary disease			
4- High Risk	Sickle cell anemia			
4- High Risk	Obesity	BMI 40		
4- High Risk	Cirrhosis, history of hepatic decompensation or variceal bleeding			
4- High Risk	Impaired cognition; dementia			
4- High Risk	Compensated CHF			
4- High Risk	Cerebrovascular disease			
4- High Risk	Uncontrolled or suspected obstructive sleep apnea (OSA)			
4- High Risk	Renal insufficiency	serum creatinine >1.5 mg/dL or creatinine clearance		

		<100 mL/min		
4- High Risk	Opioid dependence			
5- Very High Risk	Percutaneous Coronary Intervention (PCI) within 1 month			
5- Very High Risk	Cardiovascular: unstable angina, recent myocardial infarction (60 days), uncontrolled atrial fibrillation or other high-grade abnormal rhythm, severe valvular disease, decompensated heart failure			
5- Very High Risk	Primary pulmonary hypertension			Preoperative consultation with pulmonologist warranted
5- Very High Risk	Cirrhosis or severe liver disease, history of hepatic decompensation or variceal bleeding			
5- Very High Risk	Severe frailty, dependence for ADLs, or history of 3 or more falls in last 6 mos			
5- Very High Risk	Obesity		BMI >50	
5- Very High Risk	Age		>85	
5- Very High Risk	History of VTE with CI to anticoagulation, failure of anticoagulation, cessation of anticoagulation therapy secondary to bleeding			Preoperative consultation with hematologist or internist
5- Very High Risk	Renal failure requiring dialysis			
5- Very High Risk	Immunosuppression			
5- Very High Risk	Chronic Pain			

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