

AmeriHealth Caritas Louisiana

National Imaging Associates, Inc.*	
Clinical guidelines NECK MRA/MRV	Original Date: September 1997
CPT Codes: 70547, 70548, 70549	Last Revised Date: April 2021
Guideline Number: NIA_CG_012-2	Implementation Date: January 2022

INDICATIONS FOR NECK MRA

For evaluation of known or suspected extracranial vascular disease

Cerebrovascular Disease

- Recent ischemic stroke or transient ischemic attack ([Robertson, 2020](#); [SalmelaACR, 2017](#); ~~2019~~; [Sanelli, 2014](#)).
- **Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech** ([Yang, 2005](#); [Lima-Neto, 2017](#); [Searls, 2012](#); [Yang, 2005](#)).
- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis \geq 70%, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) ([Brott, 2011](#); [DaCosta, 2019](#); [Marquardt, 2010](#)).
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis \geq 50%, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) ([BAAN, 2010](#); [Brott, 2011](#); [Chaturvedi, 2005](#); [Rerkasem, 2011](#)).

Aneurysm screening

- **Screening for aneurysm in Loeyz-Dietz syndrome**, fibromuscular dysplasia or spontaneous coronary arteries dissection (SCAD)** ([Hayes, 2018](#); [Hitchcock, 2014](#); [Macaya, 2019](#); [MacCarrick, 2014](#)).
- **** For Loeyz-Dietz imaging should be repeated at least every two years**
- ~~Screening for aneurysm in fibromuscular dysplasia or spontaneous coronary arteries dissection (SCAD)~~ ([Hayes, 2018](#); [Hitchcock, 2014](#); [Macaya, 2019](#)).

Tumor/pulsatile mass

- Pulsatile mass on exam ~~after Ultrasound (US)~~ — ([Aulino, 2019](#))

* National Imaging Associates, Inc. (NIA) is a subsidiary of Magellan Healthcare, Inc.

- Known ~~C~~carotid body tumors, or other masses such as a paraganglioma, arteriovenous fistula, pseudoaneurysm, atypical lymphovascular malformation ([Nguyen, 2011](#); [Al-Rawaq, 2018](#); [Nguyen, 2011](#)).

Note: Ultrasound (US) may be used to identify a mass overlying or next to an artery in initial work up of a pulsatile mass.

Other extracranial vascular disease

- Takayasu arteritis based on findings in other blood vessels on previous imaging (Zhu, 2012)
- Giant cell arteritis **with suspected extracranial involvement** ([Abdel Razek, 2014](#); [Halbach, 2018](#); [Khan, 2015](#); [Koster, 2018](#)); ~~([Khan, 2015](#); [Halbach, 2018](#))~~
- Subclavian steal syndrome when ultrasound is positive or indeterminate ~~or~~ **OR** for planning **an** interventions (Potter, 2014)
- Suspected carotid or vertebral artery dissection; due to trauma or spontaneous due to weakness of vessel wall ~~leading to dissection~~ (Franz, 2012; Shakir, 2016)
- Horner's syndrome (miosis, ptosis, and anhidrosis) (Kim, 2012)
- **For evaluation of pulsatile tinnitus (subjective or objective) for vascular etiology (Pegge, 2017)**
- Known extracranial vascular disease that needs follow-up or further evaluation

Pre-operative/procedural evaluation

- ~~**Pre-operative evaluation for a planned surgery or procedure if the imaging provides diagnostic information that is not available on prior studies (provider should be referred to the health plan for nondiagnostic surgical planning studies).**~~

Post-operative/procedural evaluation (e.g., carotid endarterectomy)

- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.

INDICATIONS FOR COMBINATION STUDIES

Neck MRA/Brain MRA

- Recent ischemic stroke or transient ischemic attack (TIA) ([Robertson, 2020](#); [Salmela, 2017](#); [ACR, 2017, 2019](#); Wintermark, 2013)
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, ~~and~~ weakness in both sides of the body, or abnormal speech (Lima-Neto, 2017; Searls, 2012).
- Suspected carotid or vertebral artery dissection; due to trauma or spontaneous due to weakness of vessel wall ~~leading to dissection~~ (Franz, 2012; Shakir, 2016).
- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis > 70%, technically limited study, aberrant direction of flow in

the carotid or vertebral arteries) and patient is surgery or angioplasty candidate (Brott, 2011; DaCosta, 2019; Marquardt, 2010)

- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 50\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate (Brott, 2011; DaCosta, 2019; Rerkasem, 2011)
- For evaluation of pulsatile tinnitus (subjective or objective) for vascular etiology (Pegge, 2017)

Neck MRA/**Brain MRA**/Brain MRI

- Recent ischemic stroke or transient ischemic attack
- Suspected carotid or vertebral artery dissection with focal or lateralizing neurological deficits
- Approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent vascular and intracranial pathology (Lawson, 2000).

BACKGROUND

For vascular disease, in general, MRA and CTA are comparable. ~~There is no~~No current literature ~~comparing~~compares the efficacy of contrast enhanced CT to CTA or MRI and MRA for evaluation of pulsatile neck mass, so any are approvable. MRA may be complementary to MRI in the following settings: evaluation of a pulsatile neck mass to assess vascular detail when needed; assessment of relevant vascular anatomy for pre-procedural evaluation; vascular supply to tumors and vessel encasement and narrowing by tumors; extent of disease in vasculitis; and to help determine the nature and extent of congenital or acquired vascular anomalies (~~ACR, 2015~~Ansari, 2020~~6~~).

MRA and Carotid Body Tumor – Carotid body tumors are found in the upper neck at the branching of the carotid artery. Although most of them are benign, they may be locally aggressive with a small malignant potential. MRA may be used to identify a carotid body tumor due to its ability to define the extension of the tumor in relation to the carotid arteries, involvement of the base of the skull and bilateral tumors.

MRA and dissection - Craniocervical dissections can be spontaneous or traumatic. Patients with blunt head or neck trauma who meet Denver Screening criteria should be assessed for cerebrovascular injury (although about 20% will not meet criteria). The criteria include: focal or lateralizing neurological deficits (not explained by head CT), infarct on head CT, face, basilar skull, or cervical spine fractures, cervical hematomas that are not expanding, glasgow coma score less than 8 without CT findings, massive epistaxis, cervical bruit or thrill (Franz, 2012; Liang, 2013; Munding, 2013; Simon, 2019). Spontaneous dissection presents with headache, neck pain with neurological signs or symptoms.

There is often minor trauma or precipitating factor (ie e.g., exercise, neck manipulation). Dissection is thought to occur due to weakness of the vessel wall, and there may be an underlying connective tissue disorder. Dissection of the extracranial vessels can extend intracranially and/or lead to thrombus, which can migrate into the intracranial circulation causing ischemia. Therefore, MRA of the head and neck is warranted (Nash, 2019; Shakir, 2016).

Post-operative evaluation of carotid endarterectomy – Carotid endarterectomy is a vascular surgical procedure that removes plaque from the carotid artery. MRA with multiprojection volume reconstruction is a non-invasive imaging modality that is an alternative to postoperative angiography following carotid endarterectomy. It allows the surgeon to get informative and comparative data.

MRA and recent stroke or transient ischemic attack (TIA) - A stroke or central nervous system infarction is defined as “brain, spinal cord, or retinal cell death attributable to ischemia, based on neuropathological, neuroimaging, and/or clinical evidence of permanent injury. ... Ischemic stroke specifically refers to central nervous system infarction accompanied by overt symptoms, whereas silent infarction causes no known symptoms” (Sacco, 2013).” If imaging or pathology is not available, a clinical stroke is diagnosed by symptoms persisting for more than 24 hours. Ischemic stroke can be further classified by the type and location of ischemia and the presumed etiology of the brain injury. These include large-artery atherosclerotic occlusion (extracranial or intracranial), cardiac embolism, small-vessel disease and less commonly dissection, hypercoagulable states, sickle cell disease and undetermined causes (Kernan, 2014). TIAs in contrast, “are a brief episode of neurological dysfunction caused by focal brain or retinal ischemia, with clinical symptoms typically lasting less than one hour, and without evidence of acute infarction on imaging” (Easton, 2009).” On average, the annual risk of future ischemic stroke after a TIA or initial ischemic stroke is 3–4%, with an incidence as high as 11% over the next 7 days and 24–29% over the following 5 years. This has significantly decreased in the last half century due to advances in secondary prevention (Hong, 2011).

When revascularization therapy is not indicated or available in patients with an ischemic stroke or TIA, the focus of the work-up is on secondary prevention. This includes noninvasive vascular imaging to identify the underlying etiology, assess immediate complications and risk of future stroke. The majority of stroke evaluations take place in the inpatient setting. Admitting TIA patients is reasonable if they present within 72 hours and have an ABCD(2) score ≥ 3 , indicating high risk of early recurrence, or the evaluation cannot be rapidly completed on an outpatient basis (Easton, 2009). Minimally, both stroke and TIA should have an evaluation for high-risk modifiable factors, such as carotid stenosis atrial fibrillation, as the cause of ischemic symptoms (Kernan, 2014). Diagnostic recommendations include neuroimaging evaluation as soon as possible, preferably with magnetic resonance imaging, including DWI; noninvasive imaging of the extracranial vessels should be performed, and noninvasive imaging of intracranial vessels is reasonable (Wintermark, 2013).

Patients with a history of stroke and recent work-work-up with new signs or symptoms indicating progression or complications of the initial CVA should have repeat brain imaging as an initial study. Patients with remote or silent strokes discovered on imaging should be evaluated for high-risk modifiable risk factors based on the location and type of the presumed etiology of the brain injury.

POLICY HISTORY

Date	Summary
<p>April <u>May</u> 2021</p>	<p>Updated references</p> <p>Added</p> <ul style="list-style-type: none"> — <u>Loeys-Dietz syndrome to aneurysm screening section</u> • <u>Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia and weakness in both sides of the body, or abnormal speech – which was before only in the combo section</u> • <u>Note: Ultrasound (US) may be used to identify a mass overlying or next to an artery in initial work up of a pulsatile mass.</u> • <u>For evaluation of pulsatile tinnitus (subjective or objective) for vascular etiology - which was before only in the combo section</u> • <u>Pre-operative evaluation for a planned surgery or procedure if the imaging provides diagnostic information that is not available on prior studies (provider should be referred to the health plan for nondiagnostic surgical planning studies).</u> • <u>Approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent vascular and intracranial pathology (Lawson, 2000).</u> <p>Clarified</p> <ul style="list-style-type: none"> • <u>Giant cell arteritis with suspected extracranial involvement</u> <p>Deleted:</p> <ul style="list-style-type: none"> • <u>After US (for pulsatile neck mass)</u>
<p><u>May 2020</u></p>	<p>Clarified:</p> <ul style="list-style-type: none"> • <u>Recent ischemic stroke or transient ischemic attack (also in combo section)</u> • <u>Pulsatile mass on exam after ultrasound (US)</u> • <u>Takayasu arteritis based on findings in other blood vessels on previous imaging</u> • <u>Giant cell arteritis</u> • <u>Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia,</u>

	<p><u>blindness, vomiting, ataxia and weakness in both sides of the body, or abnormal speech</u></p> <ul style="list-style-type: none"> • <u>Suspected carotid or vertebral artery dissection; due to trauma or spontaneous due to weakness of vessel wall leading to dissection (combo section)</u> <p><u>Deleted:</u></p> <ul style="list-style-type: none"> • <u>Ehlers-Danlos syndrome and neurofibromatosis in screening for aneurysm</u> <p><u>Added:</u></p> <ul style="list-style-type: none"> • <u>Spontaneous coronary arteries dissection (SCAD) in screening for aneurysm</u> • <u>Suspected carotid or vertebral artery dissection; due to trauma or spontaneous due to weakness of vessel wall leading to dissection</u> • <u>Horner’s syndrome (miosis, ptosis, and anhidrosis)</u> • <u>Known extracranial vascular disease that needs follow-up or further evaluation</u>
<p><u>April 2019</u></p>	<ul style="list-style-type: none"> • <u>Suspected or known disease: Added “Giant cell arteritis” and “Subclavian steal syndrome when ultrasound is positive or indeterminate or for planning interventions</u> • <u>“Known or suspected tumor/<i>pulsatile</i> mass”: Added ‘pulsatile’;</u> • <u>Neck MRA/Brain MRA: Added Denver screening criteria to assess for cerebrovascular injury</u> • <u>Added background information describing MRA and CTA as complimentary information to MRI or CT</u>

April 2019

- ~~Suspected or known disease: Added “Giant cell arteritis” and “Subclavian steal syndrome when ultrasound is positive or indeterminate or for planning interventions~~
- ~~“Known or suspected tumor/pulsatile mass”: Added ‘pulsatile’;~~
- ~~Neck MRA/Brain MRA: Added Denver screening criteria to assess for cerebrovascular injury~~
- ~~Added background information describing MRA and CTA as complimentary information to MRI or CT~~

May 2020

Clarified:

- ~~Recent **ischemic** stroke or transient ischemic attack (also in combo section)~~
- ~~Pulsatile mass on exam after ultrasound (US)~~
- ~~Takayasu arteritis based on findings in other blood vessels on previous imaging~~
- ~~Giant cell arteritis~~
- ~~Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia and weakness in both sides of the body, or abnormal speech~~
- ~~Suspected carotid or vertebral artery dissection; due to trauma or spontaneous due to weakness of vessel wall leading to dissection (combo section)~~

~~Deleted:~~

- ~~Ehlers Danlos syndrome and neurofibromatosis in screening for aneurysm~~

Added:

- ~~Spontaneous coronary arteries dissection (SCAD) in screening for aneurysm~~
- ~~Suspected carotid or vertebral artery dissection; due to trauma or spontaneous due to weakness of vessel wall leading to dissection~~
- ~~Horner’s syndrome (miosis, ptosis, and anhidrosis)~~
- ~~Known extracranial vascular disease that needs follow up or further evaluation~~

REFERENCES

Abdel Razek AA, Alvarez H, Bagg S, et al. Imaging spectrum of CNS vasculitis. *Radiographics*. 2014 Jul-Aug; 34(4):873-94).

Al-Rawaq KJ, Al-Naqqash MA, Al-Saad RK, et al. Carotid body tumor: A review of the literature and two cases reports in Baghdad radiation oncology center, Medical City, Baghdad, Iraq. *J Tumor*. 2018 May; 6(1):516-19.

~~[American Academy of Neurology \(AAN\). Carotid Endarterectomy—An evidence-based review. 2010.](#)~~

~~[Ansari S, Carmody T, Erickson K, et al. ACR-ASNR-SNIS-SPR Practice Parameter for the performance of cervicocerebral magnetic resonance angiography \(MRA\). American College of Radiology Practice Parameters and Technical Standards. Revised 2020. Accessed June 25, 2021. <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/CervicoCerebralMRA.pdf>](#)~~
~~ACR-ASNR-SNIS-SPR Practice Parameter for the performance of cervicocerebral magnetic resonance angiography (MRA). Revised 2015.~~

~~[American College of Radiology \(ACR\). ACR Appropriateness Criteria®—Cerebrovascular Disease. 2017.](#)~~

~~[American College of Radiology \(ACR\). ACR Appropriateness Criteria®—Cerebrovascular Disease—Child. 2019.](#)~~

~~[Aulino JM, Kirsch CFE, Burns J, et al. ACR Appropriateness Criteria® Neck Mass-Adenopathy. *Journal of the American College of Radiology*. 2019;16\(5\):S150-S160. doi:10.1016/j.jacr.2019.02.025](#)~~

Brott TG, Halperin JL, Abbara S, et al. ASA / ACCF / AHA / AANN / AANS / ACR / ASNR / CNS / SAIP / SCAI / SIR / SNIS / SVM / SVS guideline on the management of patients with extracranial carotid and vertebral artery disease: Executive summary. *Circulation*. 2011; 124:489-532. <http://www.ncbi.nlm.nih.gov/pubmed/21282493>.

~~[Chaturvedi S, Bruno A, Feasby T, et al. Carotid endarterectomy--an evidence-based review: Report of the therapeutics and technology assessment subcommittee of the American Academy of Neurology. *Neurology*. 2005;65\(6\):794-801. doi:10.1212/01.wnl.0000176036.07558.82](#)~~

DaCosta M, Surowiec SM. Carotid Endarterectomy. *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2019.

[DeMarco JK, Willinek WA, Finn JP, et al. Current state of the art 1.5 T and 3 T extracranial carotid contrast enhanced magnetic resonance angiography. *Neuroimaging Clin N Am.* 2012; 22\(2\):235-257. doi: 10.1016/j.nic.2012.02.007.](#)

Easton JD, Saver JL, Albers GW, et al. Definition and evaluation of transient ischemic attack: A scientific statement for healthcare professionals from the American Heart Association/American Stroke Association Stroke Council; Council on Cardiovascular Surgery and Anesthesia; Council on Cardiovascular Radiology and Intervention; Council on Cardiovascular Nursing; and the Interdisciplinary Council on Peripheral Vascular Disease. *Stroke.* 2009; 40:2276–2293.

Franz RW, Willette PA, Wood MJ, et al. A systematic review and meta-analysis of diagnostic screening criteria for blunt cerebrovascular injuries. *J Am Coll Surg.* March 2012; 214(3):313-27.

Guneyli S, Ceylan N, Bayraktaroglu S, et al. Imaging findings of vascular lesions in the head and neck. *Diagn Interv Radiol.* 2014 Sep-Oct; 20(5):432-7.

[Halbach C, McClelland CM, Chen J, et al. Use of noninvasive imaging in giant cell arteritis. *Asia Pac J Ophthalmol \(Phila\).* 2018;7\(4\):260-264. doi:10.22608/APO.2018133](#)

Hayes SN, Kim ESH, Saw J, et al. Spontaneous coronary artery dissection: Current state of the science: A scientific statement from the American Heart Association. *Circulation.* 2018 May 8; 137(19):e523-e557. doi:10.1161/CIR.0000000000000564. ~~Epub 2018 Feb 22.~~

Hitchcock E, Gibson WT. A review of the genetics of intracranial berry aneurysms and implications for genetic counseling. *J Genet Couns.* 2017;26(1):21–31. doi:10.1007/s10897-016-0029-8.

Hong KS, Yegiaian S, Lee M, et al. Declining stroke and vascular event recurrence rates in secondary prevention trials over the past 50 years and consequences for current trial design. *Circulation.* 2011 May 17; 123(19):2111-9. doi: 10.1161/CIRCULATIONAHA.109.934786. ~~Epub 2011 May 2.~~

Jadhav AP, Jovin TG. (2012). Vascular imaging of the head and neck. *Semin Neurol.* 2012; 32(04):401-410. doi: 10.1055/s-0032-1331811.

Kernan WN, Ovbiagele B, Black HR, et al. Guidelines for the prevention of stroke in patients with stroke and transient ischemic attack: A guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke.* 2014 Jul; 45(7):2160-236. doi: 10.1161/STR.0000000000000024. ~~Epub 2014 May.~~

[Khan A, Dasgupta B. Imaging in giant cell arteritis. *Curr Rheumatol Rep.* 2015;17\(8\):52. doi:10.1007/s11926-015-0527-y](#)

Kim JD, Hashemi N, Gelman R, et al. Neuroimaging in ophthalmology. *Saudi J Ophthalmol*. 2012; 26(4):401–407. doi:10.1016/j.sjopt.2012.07.001.

Koster MJ, Matteson EL, Warrington KJ. Large-vessel giant cell arteritis: Diagnosis, monitoring, and management. *Rheumatol*. 2018; 57(suppl2):l132-42.

[Lawson GR. Controversy: Sedation of children for magnetic resonance imaging. *Arch Dis Child*. 2000;82\(2\):150-153. doi:10.1136/adc.82.2.150](#)

Liang T, Tso DK, Chiu RY, et al. Imaging of blunt vascular neck injuries: A review of screening and imaging modalities. *AJR Am J Roentgenol*. 2013 Oct; 201(4):884-92.

Lima-Neto AC, Bittar R, Gattas GS, et al. Pathophysiology and diagnosis of vertebrobasilar insufficiency: A review of the literature. *Int Arch Otorhinolaryngol*. 2017 July; 21(3):302-07.

Macaya F, Moreu M, Ruiz-Pizarro V, et al. Screening of extra-coronary arteriopathy with magnetic resonance angiography in patients with spontaneous coronary artery dissection: A single-centre experience. *Cardiovasc Diagn Ther*. 2019 Jun; 9(3):229-238. doi:10.21037/cdt.2019.04.09.

[MacCarrick G, Black JH, Bowdin S, et al. Loeys–Dietz syndrome: A primer for diagnosis and management. *Genet Med*. 2014;16\(8\):576-587. doi:10.1038/gim.2014.11](#)

Marquardt L, Geraghty OC, Mehta Z, et al. Low risk of ipsilateral stroke in patients with asymptomatic carotid stenosis on best medical treatment: A prospective, population-based study. *Stroke*. 2010; 41(1):e11.

Mundinger GS, Dorafshar AH, Gilson MM, et al. Blunt-mechanism facial fracture patterns associated with internal carotid artery injuries: recommendations for additional screening criteria based on analysis of 4,398 patients. *J Oral Maxillofac Surg*. December 2013; 71(12):2092-2100.

Nash M, Rafay MF. Craniocervical arterial dissection in children: Pathophysiology and management. *Pediatr Neurol*. 2019 Jun; 95:9-18. doi:10.1016/j.pediatrneurol.2019.01.020. [Epub 2019 Feb 2.](#)

Nguyen RP, Shah LM, Quigley EP, et al. Carotid body detection on CT angiography. *AJNR Am J Neuroradiol*. 2011 Jun; 32(6):1096-99.

Pegge SAH, Steens SCA, Kunst HPM, et al. Pulsatile tinnitus: Differential diagnosis and radiological work-up. *Curr Radiol Rep*. 2017; 5(1):5.

Potter BJ, Pinto DS. Subclavian steal syndrome. *Circulation*. 2014 Jun; 129(22):2320-3.

Rerkasem K, Rothwell PM. Carotid endarterectomy for symptomatic carotid stenosis. *Cochrane Database Syst Rev*. 2011.

[Robertson RL, Palasis S, Rivkin, MJ, et al. ACR Appropriateness Criteria® Cerebrovascular Disease-Child. *J Am Coll Radiol*. 2020;17\(5S\):S36-S54. doi:10.1016/j.jacr.2020.01.036](#)

Sacco RL, Kasner SE, Broderick JP, et al. An updated definition of stroke for the 21st century: A statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2013; 44:2064–2089.

[Salmela MB, Mortazavi S, Jagadeesan, BD, et al. ACR Appropriateness Criteria® Cerebrovascular Disease. *J Am Coll Radiol*. 2017;14\(5S\):S34-S61. doi:10.1016/j.jacr.2017.01.05](#)

Sanelli PC, Sykesa JB, Ford AL, et al. Imaging and treatment of patients with acute stroke: An evidence-based review. *AJNR Am J Neuroradiol*. 2014; 35:1045-1051.

Searls DE, Pazdera L, Korbel E, et al. Symptoms and signs of posterior circulation ischemia in the new England medical center posterior circulation registry. *Arch Neurol*. 2012; 69(3):346.

Simon LV, Mohseni M. Vertebral Artery Injury. *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2019. <https://www.ncbi.nlm.nih.gov/books/NBK470363/>.

Shakir HJ, Davies JM, Shallwani H, et al. Carotid and vertebral dissection imaging. *Curr Pain Headache Rep*. 2016 Dec; 20(12):68.

Wintermark M, Sanelli PC, Albers GW, et al. Imaging recommendations for acute stroke and transient ischemic attack patients: A joint statement by the American Society of Neuroradiology, the American College of Radiology, and the Society of NeuroInterventional Surgery. *AJNR Am J Neuroradiol*. 2013 Nov-Dec; 34(11):E117-27. doi: 10.3174/ajnr.A3690. ~~Epub 2013 Aug 1.~~

[Yang CW, Carr JC, Futterer SF, et al. Contrast-enhanced MR angiography of the carotid and vertebrobasilar circulations. *AJNR Am J Neuroradiol*. 2005;26\(8\):2095-2101.](#)

Zhu FP, Luo S, Wang ZJ, et al. Takayasu arteritis: Imaging spectrum at multidetector CT angiography. *Br J Radiol*. 2012 Dec; 85(1020):e1282-1292.

Reviewed / Approved by

Reviewed / Approved by

M. Atif Khalid MD

M. Atif Khalid, M.D., Medical Director, Radiology

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.

Disclaimer: Magellan Healthcare service authorization policies do not constitute medical advice and are not intended to govern or otherwise influence the practice of medicine. These policies are not meant to supplant your normal procedures, evaluation, diagnosis, treatment and/or care plans for your patients. Your professional judgement must be exercised and followed in all respects with regard to the treatment and care of your patients. These policies apply to all Magellan Healthcare subsidiaries including, but not limited to, National Imaging Associates (“Magellan”). The policies constitute only the reimbursement and coverage guidelines of Magellan. Coverage for services varies for individual members in accordance with the terms and conditions of applicable Certificates of Coverage, Summary Plan Descriptions, or contracts with governing regulatory agencies. Magellan reserves the right to review and update the guidelines at its sole discretion. Notice of such changes, if necessary, shall be provided in accordance with the terms and conditions of provider agreements and any applicable laws or regulations.