

MRA (Magnetic Resonance Angiogram) Head

CPT: 70544, 70545, 70546

1 Major Symptom or Complaint presented as primary indication

1.1 Ataxia

1.1.1 [See Vertebrobasilar Insufficiency](#)

1.2 Calvarial (skull) mass

1.2.1 [See Central Venous Thrombosis](#)

1.3 Cognitive changes documented by testing

1.3.1 Prior history of stroke or TIA

1.3.2 Suspected Vetebrobasilar Insufficiency: See under Working Dagnosis

- Johnson, K A et al Brain imaging in Alzheimer disease. Cold Spring Harb Perspect Med >v.2(4); Apr 2012
- Kantarci K, Jack CR Jr. Neuroimaging in Alzheimer disease: an evidence-based review. Neuroimaging Clin N Am. 2003 May; 13(2):197-209.

1.4 Disorientation (cognitive change)

1.4.1 [See Cognitive Changes](#)

1.5 Dizziness Prior MRI or CT nondiagnostic

NOTE:

"The life-time prevalence of dizziness in general population is estimated from 5.5% to 25-30% in the United States depending on the criteria adopted (Kroenke and Mangelsdorff, 1989; Colledge et al., 1994; Yardley et al., 1998b)."

NOTE:

While vertigo is more than dizziness, lightheadedness or imbalance, vertigo requires the patient to experience a sense of spinning, of either the patient, or the surroundings, for the purposes of prior authorization the terms are interchangeable and approval should be issued if any of the following are present:

1.5.1 Altered mental state

1.5.2 Cranial neuropathies

1.5.3 Diabetes mellitus, by history

1.5.4 Hearing Loss

1.5.5 Loss of vision

1.5.6 Nausea or Vomiting

1.5.7 Nystagmus

1.5.8 Stroke, prior history of

1.5.9 Tinnitus

1.5.10 Weakness or paralysis

References

1. Kevin Barraclough, Adolfo Bronstein Vertigo BMJ 2009;339:b3493, doi: 10.1136/bmj.b3493 (Published 22 September 2009) http://www.bmj.com/content/vol339/issuesep22_1/images/large/bark673889.f1_default.jpeg
2. David E. Newman-Toker, et al; Spectrum of Dizziness Visits to US Emergency Departments: Cross-Sectional Analysis From a Nationally Representative Sample; Mayo Clin Proc. July 2008 83(7):765-775; doi:10.4065/83.7.765
3. C S K Cheung, P S K Mak, K V Manley, J M Y Lam, A Y L Tsang, H M S Chan, T H Rainer, C A Graham Predictors of important neurological causes of dizziness among patients presenting to the emergency department Emerg Med J 2010;27:517-521 doi:10.1136/emj.2009.078014
4. Ropper AH, Brown RH, "Chapter 15. Deafness, Dizziness, and Disorders of Equilibrium" (Chapter). Ropper AH, Brown RH: Adams and Victor's Principles of Neurology, 8th Edition
5. Daroff Robert B, "Chapter 22. Dizziness and Vertigo" (Chapter). Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J: Harrison's Principles of Internal Medicine, 17th Edition: <http://www.accessmedicine.com/content.aspx?aID=2886671>
6. Jeffrey P. Staab; Michael J. Ruckenstein Expanding the Differential Diagnosis of Chronic Dizziness Arch Otolaryngol Head Neck Surg. 2007;133(2):170-176.
7. Irwin Nazareth , Lucy Yardley , Natalie Owen , and Linda Luxon Outcome of symptoms of dizziness in a general practice community sample Fam. Pract. 16: 616-618.
8. M Wasay, N Dubey, and R Bakshi Emerg Dizziness and yield of emergency head CT scan: Is it cost effective? Med J. 2005 April; 22(4): 312. doi: 10.1136/emj.2003.012765. PMCID: PMC1726733
9. Ramos, R Antidepressants and Dizziness Journal of Psychopharmacology 20:5 (sept 2003) p 708

1.6 Double vision, Diplopia

1.6.1 [See Vertebrobasilar Insufficiency](#)

1.7 Dysphagia

1.7.1 [See Vertebrobasilar Insufficiency](#)

1.8 Impaired ability to speak. Dysarthria – (due to CNS disorder)

1.9 Seizures, Focal or generalized

1.9.1 [See Cerebral Venous Thrombosis](#)

1.10 Headache

1.10.1 Thunderclap (sudden onset and severe)

1.10.2 Exertional

1.10.3 Pregnancy, New Onset during

1.10.4 Prior history of HIV or malignancy

1.10.5 Changed pattern (Chronic headache with new features)

1.10.6 Repeated headaches beginning after age 50

1.11 Hearing Loss

1.11.1 [See Vertebrobasilar Insufficiency](#)

1.12 Hemiparesis or paraparesis

1.12.1 [See Cerebral Venous Thrombosis](#)

1.13 Lethargy or Coma

1.13.1 [See Cerebral Venous Thrombosis](#)

1.14 Memory loss (cognitive change)

1.14.1 Prior history of stroke or TIA

1.14.2 Suspected Vetebrobasilar Insufficiency: See under Working Daignosis

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1. Johnson, K A et al Brain imaging in Alzheimer disease. Cold Spring Harb Perspect Med >v.2(4); Apr 2012
2. Kantarci K, Jack CR Jr. Neuroimaging in Alzheimer disease: an evidence-based review. Neuroimaging Clin N Am. 2003 May; 13(2):197-209.

1.15 Mental status changes

1.15.1 Prior history of stroke or TIA

1.15.2 Suspected Vetebrobasilar Insufficiency: See under Working Daignosis

References

1. Johnson, K A et al Brain imaging in Alzheimer disease. Cold Spring Harb Perspect Med >v.2(4); Apr 2012
2. Kantarci K, Jack CR Jr. Neuroimaging in Alzheimer disease: an evidence-based review. Neuroimaging Clin N Am. 2003 May; 13(2):197-209.

1.16 Nausea

1.16.1 [See Vertebrobasilar Insufficiency](#)

1.17 Numbness

1.17.1 [See Vertebrobasilar Insufficiency](#)

1.18 Nystagmus

1.18.1 [See Vertebrobasilar Insufficiency](#)

1.19 Syncope

1.19.1 [See Vertebrobasilar Insufficiency](#)

1.20 Tinnitus

1.20.1 Tinnitus, non pulsatile

1.20.1.1 Suggest MRI with gadolinium

1.20.2 Tinnitus, pulsatile

1.20.2.1 Suggest CTA or MRA of the brain, can also approve contrast enhanced CT

References

1. Lockwood, Alan H., Salvi, Richard J., Burkard, Robert F. Tinnitus N Engl J Med 2002 347: 904-910
2. Jane L. Weissman and Barry E. Hirsch Imaging of Tinnitus: A Review Radiology August 2000 216:2 342-349

1.21 Transient visual changes

1.21.1 [See Cerebral Venous Thrombosis](#)

1.22 Vertigo (also Dizziness) Prior MRI or CT nondiagnostic

NOTE:

While vertigo is more than dizziness, lightheadedness or imbalance, vertigo requires the patient to experience a sense of spinning, of either the patient, or the surroundings, for the purposes of prior authorization the terms are interchangeable and approval should be issued if any of the following are present:

1.22.1 Altered mental state

1.22.2 Diabetes mellitus, by history

1.22.3 Hearing Loss

1.22.4 Loss of vision

1.22.5 Nausea or Vomiting

1.22.6 Nystagmus

1.22.7 Stroke, prior history of

1.22.8 Weakness or paralysis

References

1. Kevin Barraclough, Adolfo Bronstein Vertigo BMJ 2009;339:b3493, doi: 10.1136/bmj.b3493 (Published 22 September 2009) http://www.bmj.com/content/vol339/issuesep22_1/images/large/bark673889.f1.default.jpeg
2. David E. Newman-Toker, et al; Spectrum of Dizziness Visits to US Emergency Departments: Cross-Sectional Analysis From a Nationally Representative Sample; Mayo Clin Proc. July 2008 83(7):765-775; doi:10.4065/83.7.765 C S K Cheung, P S K Mak, K V Manley, J M Y Lam, A Y L Tsang, H M S Chan, T H Rainer, C A Graham Predictors of important neurological causes of dizziness among patients presenting to the emergency department Emerg Med J 2010;27:517-521 doi:10.1136/emj.2009.078014 Ropper AH, Brown RH, "Chapter 15. Deafness, Dizziness, and Disorders of Equilibrium" (Chapter). Ropper AH, Brown RH: Adams and Victor's Principles of Neurology, 8th Edition
3. Daroff Robert B, "Chapter 22. Dizziness and Vertigo" (Chapter). Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J: Harrison's Principles of Internal Medicine, 17th Edition: <http://www.accessmedicine.com/content.aspx?alD=2886671>
4. Jeffrey P. Staab; Michael J. Ruckenstein Expanding the Differential Diagnosis of Chronic Dizziness Arch Otolaryngol Head Neck Surg. 2007;133(2):170-176.
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6. M Wasay, N Dubey, and R Bakshi Emerg Dizziness and yield of emergency head CT scan: Is it cost effective? Med J. 2005 April; 22(4): 312. doi: 10.1136/emj.2003.012765. PMCID: PMC1726733
7. Ramos, R Antidepressants and Dizziness Journal of Psychopharmacology 20:5 (sept 2003) p 708

1.23 Vision Loss

1.23.1 [See Vertebrobasilar Insufficiency](#)

1.24 Visual Changes

1.24.1 [See Vertebrobasilar Insufficiency](#)

- Bradbury, P G, Levy, I S, McDonald, W I Transient uniocular visual loss on deviation of the eye in association with intraorbital tumours. J Neurol Neurosurg

1.25 Vomiting

1.25.1 [See Cerebral Venous Thrombosis](#)

1.25.2 [See Vertebrobasilar Insufficiency](#)

1.26 Weakness involving structures on both sides of the body

1.26.1 [See Vertebrobasilar Insufficiency](#)

2 Working Diagnosis or Rule Out presented as primary indication

2.1 Aneurysm suspected, Screening studies may be repeated at intervals of more than one year, shorter intervals between studies in asymptomatic patients should be referred to physician review.

2.1.1 Autosomal Polycystic Kidney Disease

2.1.2 Carotid Stenosis by Ultrasound

2.1.3 Family history of at least two relatives with subarachnoid hemorrhage

2.1.4 Family history of Cerebral Aneurysm

2.1.5 Family history of multiple Meningiomas

2.1.6 Family history of Polycystic Kidney Disease

2.1.7 Isolated cranial nerve (CN) deficit

References

1. Stefan Graf , Alexander Schischma , Knut E. Eberhardt , Roland Istel , Birgit Stiasny , and Bernd D. Schulze Intracranial aneurysms and dolichoectasia in autosomal dominant polycystic kidney disease *Nephrol. Dial. Transplant.* 17: 819-823. Laura M. Héman, Lisa M. Jongen, H. Bart van der Worp, Gabriel J.E. Rinkel, and Jeroen Hendrikse Incidental Intracranial Aneurysms in Patients With Internal Carotid Artery Stenosis: A CT Angiography Study and a Metaanalysis *Stroke* 40: 1341-1346
2. Chapman, AB, Rubinstein, D, Hughes, R, Stears, JC, Earnest, MP, Johnson, AM, Gabow, PA, Kaehny, WD Intracranial aneurysms in autosomal dominant polycystic kidney disease *N Engl J Med* 1992 327: 916-920 A. Stijntje E. Bor, Hendrik Koffijberg, Marieke J.H. Wermer, and Gabriel J.E. Rinkel Optimal screening strategy for familial intracranial aneurysms: A cost-effectiveness analysis *Neurology* May 25, 2010 74:1671-1679 H.W. Xu, Sheng Qiang Yu, Chang Lin Mei, and Ming Hua Li Screening for Intracranial Aneurysm in 355 Patients With Autosomal-Dominant Polycystic Kidney Disease *Stroke* 42: 204-206 recommends MRA as better screening exam Juvela S, Porras M, Heiskanen O. Natural history of unruptured intracranial aneurysms: a long-term follow-up study. *J Neurosurg* 1993;79:174-182
3. Atlas S, Sheppard L, Goldberg HI, Hurst RW, Listerud J, Flamm E. Intracranial aneurysms: detection and characterization with MR angiography with use of an advanced postprocessing technique in a blinded-reader study. *Radiology* 1997;203:807-814 Chapman, AB, Rubinstein, D, Hughes, R, Stears, JC, Earnest, MP, Johnson, AM, Gabow, PA, Kaehny, WD Intracranial aneurysms in autosomal dominant polycystic kidney disease *N Engl J Med* 1992 327: 916-920
4. Marieke J.H. Wermer, Gabriël J.E. Rinkel, and Jan van Gijn Repeated Screening for Intracranial Aneurysms in Familial Subarachnoid Hemorrhage *Stroke* 2003 34: 2788-2791; The International Study of Unruptured Intracranial Aneurysms Investigators, Unruptured Intracranial Aneurysms – Risk of Rupture and Risks of Surgical Intervention *N Engl J Med* 1998 339: 1725-1733
5. Laura M. Héman, Lisa M. Jongen, H. Bart van der Worp, Gabriel J.E. Rinkel, and Jeroen Hendrikse Incidental Intracranial Aneurysms in Patients With Internal Carotid Artery Stenosis: A CT Angiography Study and a Metaanalysis *Stroke*, Apr 2009; 40: 1341 – 1346. “About 1% of patients with a symptomatic ICA stenosis have an intracranial aneurysm with a higher than negligible risk of rupture...” David O. Wiebers, David G. Piepgras, Fredric B. Meyer, David F. Kallmes, Irene Meissner, John L. D. Atkinson, Michael J. Link, and Robert D. Brown, Jr Pathogenesis, Natural History, and Treatment of Unruptured Intracranial Aneurysms *Mayo Clin. Proc.*, Dec 2004; 79: 1572 – 1583. MR angiography and surgery for unruptured familial intracranial aneurysms in persons with a family history of cerebral aneurysms *Am. J. Roentgenol.* 1999 173: 133-138 Francesca Crawley, Andrew Clifton, and Martin M. Brown Should We Screen for Familial Intracranial Aneurysm? *Stroke* 30: 312-316

2.2 Cerebral Venous Thrombosis Two Symptoms or ONE Symptom and ONE Risk Factor

2.2.1 Clinical Signs and Symptoms

2.2.1.1 Calvarial mass

2.2.1.2 Decreased vision

2.2.1.3 Exophthalmous

2.2.1.4 Focal neurologic deficits

2.2.1.5 Focal or generalized seizures

2.2.1.6 Headache

2.2.1.7 Hemiparesis or paraparesis

2.2.1.8 Lethargy or Coma

2.2.1.9 Mental status changes

2.2.1.10 Papilledema

2.2.1.11 Seizure

2.2.1.12 Transient visual deficits

2.2.1.13 Vomiting

2.2.1.14 Weakness, localized to a single extremity

2.2.2 Risk Factors

2.2.2.1 Cancer

2.2.2.2 Contraceptive medications

2.2.2.3 Dehydration

2.2.2.4 Erythropoietin Use

2.2.2.5 Hypercoagulable state

2.2.2.6 Infections: Sinusitis, middle ear or systemic

2.2.2.7 Marasmus

2.2.2.8 Meningitis

2.2.2.9 Post operative status

2.2.2.10 Post Partum

2.2.2.11 Pregnancy

2.2.2.12 Skull fracture over dural sinus

2.2.2.13 Tamoxifen Use

References

1. Poon, Colin S., Chang, Ja-Kwei, Swarnkar, Amar, Johnson, Michele H., Wasenko, John Radiologic Diagnosis of Cerebral Venous Thrombosis: Pictorial Review Am. J. Roentgenol. 2007 189: S64-75
2. Greenberg Robert D, Castleberry Jerry, "Chapter 29. Eye Emergencies" (Chapter). Stone CK, Humphries RL: CURRENT Diagnosis & Treatment: Emergency Medicine, 6th Edition: <http://www.accessmedicine.com/content.aspx?aID=3104572>.
3. Ropper AH, Brown RH, "Chapter 34. Cerebrovascular Diseases" (Chapter). Ropper AH, Brown RH: Adams and Victor's Principles of Neurology, 8th Edition: <http://www.accessmedicine.com/content.aspx?aID=973845>.
4. Stam J Thrombosis of the cerebral veins and sinuses. Engl J Med. 2005;352(17):1791

2.3 Vertebro Basilar Insufficiency Approve if there are two symptoms, or one symptom and any risk factor

2.3.1 Symptoms

2.3.1.1 Amaurosis fugax

2.3.1.2 Amnesia

2.3.1.3 Aphasia, sudden onset of

2.3.1.4 Ataxia

2.3.1.5 Cognitive changes

2.3.1.6 Conjugate gaze paralysis

2.3.1.7 Cortical blindness

2.3.1.8 Diplopia

2.3.1.9 Disorientation (cognitive change)

2.3.1.10 Dizziness or vertigo with any other neurological sign

2.3.1.11 Double vision, Diplopia

2.3.1.12 Drop Attack

2.3.1.13 Dysarthria

2.3.1.14 Dysphagia

2.3.1.15 Facial numbness or paresthesias

2.3.1.16 Facial pain, unilateral

2.3.1.17 Focal neurologic deficit, sudden onset of

2.3.1.18 Hand spasms

2.3.1.19 Headache, may be unilateral

2.3.1.20 Hearing Loss

2.3.1.21 Homonymous hemianopia

2.3.1.22 Intention tremor

2.3.1.23 Loss of vision,

2.3.1.24 Memory loss (cognitive change)

2.3.1.25 Motor speech disorder

2.3.1.26 Nausea

2.3.1.27 Neck pain

2.3.1.28 Numbness

2.3.1.29 Nystagmus

2.3.1.29.1 Definition: repetitive, rhythmic oscillations of one or both eyes in any or all fields of gaze

2.3.1.30 Oculosympathetic palsy (miosis and ptosis)

2.3.1.31 Ophthalmoplegia

2.3.1.32 Paralysis, of tongue

2.3.1.33 Paralysis, sudden onset of

2.3.1.34 Sensory changes, sudden onset of

2.3.1.35 Syncope

2.3.1.36 Tinnitus

2.3.1.36.1 Tinnitus, non pulsatile

2.3.1.36.1.1 Suggest MRI with gadolinium

2.3.1.36.2 Tinnitus, pulsatile

2.3.1.36.2.1 Suggest CTA or MRA of the brain, can approve contrast enhanced CT

2.3.1.37 Vertigo

2.3.1.37.1 Vertigo requires the patient to experience a sense of spinning, of either the patient, or the surroundings. it is more than dizziness, lightheadedness or imbalance.

2.3.1.38 Visual Changes

2.3.1.39 Vomiting

2.3.1.40 Weakness involving structures on one or both sides of the body

2.3.1.41 Weakness, sudden onset of

2.3.2 Risk Factor for Vertebrobasilar Insufficiency ANY ONE:

2.3.2.1 Autosomal Polycystic Kidney Disease

2.3.2.2 Cardiac irregularities

2.3.2.3 Chronic HTN

2.3.2.4 Circulation problems in other parts of the body

2.3.2.5 Diabetes

2.3.2.6 Drug use

2.3.2.7 Heart disease

2.3.2.8 Hypercholesterolemia

2.3.2.9 inflammatory disorder of the carotid wall

2.3.2.10 Severe anemia

2.3.2.11 Smoker

2.3.2.12 VERY low BP

References:

1. Barnett HJ, Taylor DW, Eliasziw M, et al. Benefit of carotid endarterectomy in patients with symptomatic moderate or severe stenosis: North American Symptomatic Carotid Endarterectomy Trial Collaborators. *N Engl J Med* 1998; 339:1415-1425
2. Mark J.W. Koelemay, Paul J. Nederkoorn, Johannes B. Reitsma, and Charles B. Majoie Systematic Review of Computed Tomographic Angiography for Assessment of Carotid Artery Disease *Stroke* 35: 2306-2312
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4. Josephson, S. A., Bryant, S. O., Mak, H. K., Johnston, S. C., Dillon, W. P., Smith, W. S. Evaluation of carotid stenosis using CT angiography in the initial evaluation of stroke and TIA *Neurology* 2004 63: 457-460
5. Savitz SI, Caplan LR. Vertebrobasilar disease. *N Engl J Med* 2005; 352:2618.
6. 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; 69:346

2.4 TIA or Stroke

2.4.1 Cognitive changes

2.4.1.1 [See *Vertebrobasilar Insufficiency*](#)

2.4.2 Disorientation (cognitive change)

2.4.2.1 [See *Vertebrobasilar Insufficiency*](#)

2.4.3 Dizziness

NOTE:

"The life-time prevalence of dizziness in general population is estimated from 5.5% to 25-30% in the United States depending on the criteria adopted (Kroenke and Mangelsdorff, 1989; Colledge et al., 1994; Yardley et al., 1998b)."

NOTE:

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2.4.3.1 Altered mental state

2.4.3.2 Cranial neuropathies

2.4.3.3 Diabetes mellitus, by history

2.4.3.4 Hearing Loss

2.4.3.5 Loss of vision

2.4.3.6 Nausea or Vomiting

2.4.3.7 Nystagmus

2.4.3.8 Stroke, prior history of

2.4.3.9 Tinnitus

2.4.3.10 Weakness or paralysis

References

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7. Ramos, R Antidepressants and Dizziness Journal of Psychopharmacology 20:5 (sept 2003) p 708

2.4.4 Double vision, Diplopia

2.4.4.1 *See Vertebrobasilar Insufficiency*

2.4.5 Dysphagia

2.4.5.1 *See Vertebrobasilar Insufficiency*

2.4.6 Impaired ability to speak. Dysarthria – (due to CNS disorder)

2.4.7 Seizures, Focal or generalized

2.4.7.1 *See Cerebral Venous Thrombosis*

2.4.8 Hearing Loss

2.4.8.1 *See Vertebrobasilar Insufficiency*

2.4.9 Hemiparesis or paraparesis.

2.4.9.1 *See Cerebral Venous Thrombosis*

2.4.10 Lethargy or Coma.

2.4.10.1 *See Cerebral Venous Thrombosis*

2.4.11 Memory loss (cognitive change)

2.4.11.1 *See Vertebrobasilar Insufficiency*

2.4.12 Mental status changes

2.4.12.1 [See Cerebral Venous Thrombosis](#)

2.4.13 Nausea

2.4.13.1 [See Vertebrobasilar Insufficiency](#)

2.4.14 Numbness

2.4.14.1 [See Vertebrobasilar Insufficiency](#)

2.4.15 Nystagmus

2.4.15.1 [See Vertebrobasilar Insufficiency](#)

2.4.16 Syncope

2.4.16.1 [See Vertebrobasilar Insufficiency](#)

2.4.17 Transient visual changes

2.4.17.1 [See Cerebral Venous Thrombosis](#)

2.4.18 Vertigo (also Dizziness)

NOTE:

While vertigo is more than dizziness, lightheadedness or imbalance, vertigo requires the patient to experience a sense of spinning, of either the patient, or the surroundings, for the purposes of prior authorization the terms are interchangeable and approval should be issued if any of the following are present:

2.4.18.1 Altered mental state

2.4.18.2 Diabetes mellitus, by history

2.4.18.3 Hearing Loss

2.4.18.4 Loss of vision

2.4.18.5 Nausea or Vomiting

2.4.18.6 Nystagmus

2.4.18.7 Stroke, prior history of

2.4.18.8 Weakness or paralysis

References

1. Kevin Barraclough, Adolfo Bronstein Vertigo BMJ 2009;339:b3493, doi: 10.1136/bmj.b3493 (Published 22 September 2009) http://www.bmj.com/content/vol339/issuesep22_1/images/large/bark673889.f1_default.jpeg
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7. Ramos, R Antidepressants and Dizziness Journal of Psychopharmacology 20:5 (sept 2003) p 708

2.4.19 Vision Loss

2.4.19.1 [See Vertebrobasilar Insufficiency](#)

2.4.20 Visual Changes

2.4.20.1 [See Vertebrobasilar Insufficiency](#)

- Bradbury, P G, Levy, I S, McDonald, W I Transient uniocular visual loss on deviation of the eye in association with intraorbital tumours. J Neurol Neurosurg

2.4.21 Vomiting

2.4.21.1 [See Cerebral Venous Thrombosis](#)

2.4.21.2 [See Vertebrobasilar Insufficiency](#)

2.4.22 Weakness

2.4.22.1 [See Vertebrobasilar Insufficiency](#)

- Emerging impact of CTA/perfusion CT on acute stroke thrombolysis in a community hospital M N Brant-Zawadzki, D M Brown, L A Whitaker, W W Peck J NeurolIntervent Surg 2009;1:159-164

3 Abnormal Physical Exam Finding presented as primary indication

3.1 Ataxia

3.1.1 [See Vertebrobasilar Insufficiency](#)

3.2 Bruit

3.3 Calvarial (skull) mass

3.3.1 [See Cerebral Venous Thrombosis](#)

3.4 Conjugate gaze paralysis

3.4.1 [See Vertebrobasilar Insufficiency](#)

3.5 Disorientation (cognitive change)

3.5.1 [See Vertebrobasilar Insufficiency](#)

3.6 Dysarthria – impaired ability to speak due to CNS disorder

3.7 Homonymous hemianopia

3.8 Isolated cranial nerve (CN) deficit

3.9 Ophthalmoplegia

3.9.1 [See Vertebrobasilar Insufficiency](#)

3.10 Papilledema

3.10.1 May be time sensitive, treat as expedited case

3.10.2 [See Cerebral Venous Thrombosis](#)

4 Abnormal Lab or Imaging presented as primary indication

4.1 Evidence of Carotid Stenosis on prior imaging

4.2 Stroke or Cerebral Infarction

5 Significant Prior Medical History presented as primary indication

5.1 AVM Known

5.1.1 Interval study after treatment

5.1.2 New or worsening clinical findings

5.2 Family history of at least two relatives with subarachnoid hemorrhage

5.3 Family history of cerebral Aneurysm

- MR angiography and surgery for unruptured familial intracranial aneurysms in persons with a family history of cerebral aneurysms Am. J. Roentgenol. 1999 173: 133-138
- Francesca Crawley, Andrew Clifton, and Martin M. Brown Should We Screen for Familial Intracranial Aneurysm? Stroke 30: 312-316
- Marieke J.H. Wermer, Gabriël J.E. Rinkel, and Jan van Gijn Repeated Screening for Intracranial Aneurysms in Familial Subarachnoid Hemorrhage Stroke 34: 2788-2791

5.4 Family history of multiple meningiomas

5.5 Family history of polycystic kidney disease

References

1. Stefan Graf , Alexander Schischma , Knut E. Eberhardt , Roland Istel , Birgit Stiasny , and Bernd D. Schulze Intracranial aneurysms and dolichoectasia in autosomal dominant polycystic kidney disease Nephrol. Dial. Transplant. 17: 819-823.
2. Chapman, AB, Rubinstein, D, Hughes, R, Stears, JC, Earnest, MP, Johnson, AM, Gabow, PA, Kaehny, WD Intracranial aneurysms in autosomal dominant polycystic kidney disease N Engl J Med 1992 327: 916-920

5.6 Cerebral Aneurysm, follow-up of known

5.6.1 Interval Follow up

5.6.2 New or Worsening Symptoms

5.7 Preoperative study prior to carotid endarterectomy

5.8 Recent proven stroke

5.9 Subarachnoid hemorrhage