AmeriHealth Caritas Louisiana

National Imaging Associates, Inc.*	
Clinical guidelines **ABDOMEN MRA/MRV (Angiography)**	**Original Date: September 1997**
CPT Codes: 74185	**Last Revised Date: April 2021~~1~~**
Guideline Number: NIA_CG_034-2	**Implementation Date: January 2023~~2~~**

IMPORTANT NOTE:

Abdomen/Pelvis Magnetic Resonance Angiography (MRA) & Lower Extremity MRA Runoff Requests: Two authorization requests are required, one Abdomen MRA, CPT code 74185 and one for Lower Extremity MRA, CPT code 73725 (a separate Pelvic MRA request is not required). This will provide imaging of the abdomen, pelvis, and both legs.

INDICATIONS FOR ABDOMEN MR ANGIOGRAPHY/MR VENOGRAPHY (MRA/MRV)

Arterial Disease
For evaluation of known or suspected abdominal vascular disease

- Evaluation of known or suspected aortic aneurysm‡ (also approve MRA pelvis)[1-3] ~~(Chaikof, 2018; Khosa, 2013; Kumar, 2017)~~:
    - For screening, US is initial study
        - Known or suspected aneurysm > 2.5 cm AND equivocal or indeterminate ultrasound results
        - Prior imaging (e.g., ultrasound) demonstrating aneurysm >2.5 cm in diameter
        - Suspected complications of known aneurysm as evidenced by signs/symptoms, such as new onset of abdominal or pelvic pain
        - Surveillance imaging every three years for diameter 2.0-2.9 cm and annually for 3.0-3.4 cm if doppler ultrasound is inconclusive. If > 3.5 cm, < 6 month follow-up (and consider intervention)[4] ~~(Wanhainen, 2019)~~

‡NOTE: For known or suspected abdominal aneurysm, CT/MRI should not be approvable without a contraindication to CTA/MRA (such as severe renal dysfunction, contrast allergy, or another specific reason CT/MRI is preferred).

- Evidence of vascular abnormality seen on prior imaging studies and limited to the abdomen
- For known large vessel diseases (abdominal aorta, inferior vena cava, superior/inferior mesenteric, celiac, splenic, renal or iliac arteries/veins), e.g., aneurysm, dissection, compression syndromes,

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arteriovenous malformations (AVMs), fistulas, intramural hematoma, and vasculitis limited to the abdomen
- For suspected aortic dissection (approve CTA/MRA abdomen and pelvis)
- For diagnosis or follow-up of visceral artery aneurysm[5, 6] ~~(Ibrahim, 2018; Junternamms, 2018)~~
- To determine the vascular source of retroperitoneal hematoma or hemorrhage in the setting of trauma, tumor invasion, fistula or vasculitis when CTA is contraindicated (CT rather than MRA/CTA is the modality of choice for diagnosing hemorrhage ~~(Abe, 2010)~~)[7]~~.~~
- For evaluation of known or suspected mesenteric ischemia/ischemic colitis when CTA is contraindicated (can approve MRA abdomen and pelvis)[8] ~~(ACR, 2018)~~
- For patients with fibromuscular dysplasia (FMD), a one-time vascular study of the abdomen and pelvis (CTA or MRA)[9] ~~(Kadian-Dodov, 2016)~~
- For patients with vascular Ehlers-Danlos syndrome or Marfan syndrome, recommend a one-time study of the abdomen and pelvis (CTA/MRA)
- For Loeys-Dietz, imaging at least every two years[10] ~~(Chu, 2014)~~
- For assessment in patients with spontaneous coronary artery dissection (SCAD), can be done at time of coronary angiography (also approve CTA pelvis)[11] ~~(Crousillat, 2020)~~
- Vascular invasion or displacement by tumor (conventional CT or MRI also appropriate)[12] ~~(Certik, 2015)~~
- For evaluation of hepatic blood vessel abnormalities (aneurysm, hepatic vein thrombosis, stenosis post-transplant) after doppler ultrasound has been performed; to clarify or further evaluate ultrasound findings

For evaluation of known or suspected renal artery stenosis or resistant hypertension in the setting of normal renal function (with impaired renal function, eGFR <30, use US with Doppler) unrelated to recent medication[13] ~~(ACR, 2017)~~ demonstrated by any of the following[14, 15] ~~(Hartman, 2009; Tullus, 2010)~~:
- Unsuccessful control after treatment with 3 or more (>2) anti-hypertensive medication at optimal dosing
- Acute elevation of creatinine after initiation of an angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker (ARB)
- Asymmetric kidney size noted on ultrasound
- Onset of hypertension in a person younger than age 30 without any other risk factors or family history of hypertension
- Significant hypertension (diastolic blood pressure > 110 mm Hg) in a young adult (i.e., younger than 35 years) suggestive of fibromuscular dysplasia
- Diagnosis of a syndrome with a higher risk of vascular disease, such as neurofibromatosis, tuberous sclerosis, and Williams' syndrome
- New onset of hypertension after age 50
- Acute rise in blood pressure in a person with previously stable blood pressures
- Flash pulmonary edema without identifiable causes
- Malignant hypertension
- Bruit heard over renal artery and hypertension
- Abnormal/inconclusive renal doppler ultrasound

Venous Disease

- Suspected renal vein thrombosis in patient with known renal mass or from other causes[16] ~~(Mazhar, 2018)~~
- Venous thrombosis if previous studies have not resulted in a clear diagnosis (add pelvis MRA/MRV when appropriate)
- For known/suspected May-Thurner syndrome (iliac vein compression syndrome include pelvic CTV)[17, 18] ~~(Ibrahim 2012; Wan-Ling, 2012)~~
- Vascular invasion or displacement by tumor (conventional CT or MRI also appropriate)[12] ~~(Certik, 2015).~~
- For evaluation of portal venous system (hepatic portal system) after doppler ultrasound has been performed
- For diffuse unexplained lower extremity edema with negative or inconclusive ultrasound[19] ~~(Hoshino, 2016)~~
- In pregnant women with suspected deep venous thrombosis (DVT) (vs serial compression ultrasound) (include pelvis MRV for iliac veins)[20] ~~(Bates, 2018)~~

Pre-operative evaluation

- For evaluation of transjugular intrahepatic portosystemic shunt (TIPS) when Doppler ultrasound indicates suspected complications
- Evaluation prior to interventional vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation prior to endovascular aneurysm repair (EVAR)
- Imaging of the deep inferior epigastric arteries for surgical planning (breast reconstruction surgery), include pelvic MRA[21] ~~(ACR, 2017)~~
- For pre-transplant evaluation of either liver or kidney
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- **For surgical planning for UPJ (ureteropelvic junction) obstruction to look for a lower pole crossing vessel**
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- **Planning prior Y90 radiation treatment for liver cancer in order to evaluate anatomic variation/shunts/determine best catheter placement/see if coil(s) needed**[22]

Post-operative or post-procedural evaluation

- Evaluation of endovascular/interventional abdominal vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation of post-operative complications, e.g., pseudoaneurysms, related to surgical bypass grafts, vascular stents, and stent-grafts in the peritoneal cavity
- Follow-up for post-endovascular repair (EVAR) or open repair of abdominal aortic aneurysm (AAA) or abdominal extent of iliac artery aneurysms

- Routine, baseline study (post-op/intervention) is warranted within 1-3 months (abdomen and pelvis MRA when CTA is inconclusive **or cannot be performed**)[1, 23] ~~(Chaikof, 2018; Uberoi, 2011)~~
- If asymptomatic at six (6) month-intervals for one (1) year, then annually
- If symptomatic/complications related to stent graft – more frequent imaging may be needed

- 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.

Other Vascular indications

- For evaluation of hepatic blood vessel abnormalities (aneurysm, hepatic vein thrombosis, stenosis post-transplant) after doppler ultrasound has been performed; to clarify or further evaluate ultrasound findings
- Kidney failure or renal insufficiency if initial evaluation performed with ultrasound is inconclusive

Chest MRA/Abdomen MRA/Pelvic MRA combo

- For evaluation of extensive vascular disease involving the chest and abdominal cavities
- For pre-op or preprocedural evaluation for Transcatheter Aortic Valve Replacement (TAVR)[24, 25] ~~(Achenbach, 2012; ACR, 2017)~~
- Acute aortic dissection (CTA or CT preferred)[26] ~~(Barman, 2014)~~
- Takayasi's arteritits[27] ~~(Keser, 2014)~~
- Marfan syndrome
- Loeys-Dietz
- Spontaneous coronary artery dissection (SCAD)
- Vascular Ehlers-Danlos syndrome
- Post-operative complications
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest and/or abdomen and/or pelvis

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BACKGROUND

Magnetic resonance angiography (MRA) generates images of the arteries that can be evaluated for evidence of stenosis, occlusion, or aneurysms. It is used to evaluate the arteries of the abdominal aorta and the renal arteries. Contrast-enhanced MRA requires the injection of a contrast agent, resulting in very high quality images. MRA does not use ionizing radiation, allowing MRA to be used for follow-up evaluations. Abdominal MRA is not used as a screening tool, e.g., evaluation of asymptomatic patients without a previous diagnosis.

OVERVIEW

MRI Follow-up for post-endovascular repair (EVAR) – Although studies have shown that MRA is as sensitive as CT in detecting endoleaks, CTA is generally the study of choice in this evaluation due to convenience, improved spatial resolution, and less artifact from components of the stent graft. MRA is

most helpful in the postoperative evaluation of patients with impaired renal function, but not severe enough to have contraindication to gadolinium administration or when CTA is inconclusive.

MRA and Abdominal Aortic Aneurysm – Endovascular repair is an alternative to open surgical repair of an abdominal aortic aneurysm. It has lower morbidity and mortality rates and is minimally invasive. In order to be successful, it depends on precise measurement of the aneurysm and involved vessels. MRA with gadolinium allows visualization of the aorta and major branches and is effective and reliable for use in planning the placement of the endovascular aortic stent graft. MRA is also used for the detection of postoperative complications of endovascular repair.

Abdominal Aneurysms and general guidelines for follow-up – The normal diameter of the suprarenal abdominal aorta is 3.0 cm and that of the infrarenal is 2.0 cm. Aneurysmal dilatation of the infrarenal aorta is defined as diameter ≥ 3.0 cm or dilatation of the aorta ≥ 1.5x the normal diameter ~~(Khosa, 2013)~~.[2] E~~Initial e~~valuation of AAA **can be** ~~is~~ accurately made by ultrasound. Ultrasound can detect and size AAA, with the advantage of being relatively inexpensive, noninvasive, and not requiring iodinate contrast. The limitations are that overlying bowel gas can obscure findings and the technique is operator-dependent. ~~-~~**CTA/MRA are needed only when ultrasound is insufficient or when surgery is planned.**

~~**Asymptomatic Aneurysms** require treatment when:~~

- ~~The diameter is greater than 2 cm~~
- ~~Identified during pregnancy~~
- ~~Multiple aneurysms are present~~
- ~~Hepatic transplant~~

Recommended intervals for initial follow-up imaging of ectatic aortas and abdominal aortas (follow-up intervals may vary depending on comorbidities and the growth rate of the aneurysm) from the white paper of the ACR Incidental Findings Committee II on vascular findings[2] ~~(Khosa, 2013)~~:
2.5-2.9 cm:……5 yr
3.0-3.4 cm:……3 yr
3.5-3.9 cm:……2 yr
4.0-4.4 cm:……1 yr
4.5-4.9 cm:……6 mo
5.0-5.5 cm:……3-6 mo

The Society of Vascular Surgery has different follow-up intervals for AAA[1] ~~(Chaikof, 2018)~~:
>2.5 cm - <3 cm……..10 yr
3.0 - 3.9 cm……3 yr
4.0 - 4.9 cm……12 mo
5.0 - 5.4 cm……..6 mo.

The Society of Vascular Surgery recommends elective repair of AAA ≥ 5.5 cm in patients at low or acceptable surgical risk ~~(Chaikof, 2018)~~.[1]

MRA and Chronic Mesenteric Ischemia -"MRA has become increasingly accurate in depicting and grading stenosis of the mesenteric vessels, particularly for the celiac artery and SMA, with reported sensitivity and specificity in suspected chronic mesenteric ischemia up to 95% to 100%" and may be used for measuring flow in the SMA and superior mesenteric veins ~~(ACR, 2018)~~.[8]

MRA and Renal Artery Stenosis – Renal artery stenosis is the major cause of secondary hypertension. It may also cause renal insufficiency and end-stage renal disease. Atherosclerosis is one of the common causes of this condition, especially in older patients with multiple cardiovascular risk factors and worsening hypertension or deterioration of renal function. Navigator-gated MR angiography is used to evaluate the renal arteries and detect renal artery stenosis.

MRA and Renal Vein Thrombosis – Renal vein thrombosis is a common complication of nephrotic syndrome and often occurs with membranous glomerulonephritis. Gadolinium-enhanced MRA can demonstrate both the venous and arterial anatomy and find filling defects within renal veins. The test can be used for follow-up purposes as it does not use ionizing radiation.

MRI/CT and acute hemorrhage – MRI is not indicated and MRA/MRV (MR Angiography/Venography) is rarely indicated for evaluation of intraperitoneal or retroperitoneal hemorrhage, particularly in the acute setting. **CT is usually the study of choice** due to its availability, speed of the study, and less susceptibility to artifact from patient motion. Advances in technology have allowed conventional CT to not just detect hematomas but also the source of acute vascular extravasation. In special cases, finer vascular detail to assess the specific source vessel responsible for hemorrhage may require the use of CTA. CTA in diagnosis of lower gastrointestinal bleeding is such an example ~~(Clerc, 2017)~~.[28]

MRA/MRV is often utilized in non-acute situations to assess vascular structure involved in atherosclerotic disease and its complications, vasculitis, venous thrombosis, vascular congestion, or tumor invasion. Although some of these conditions may be associated with hemorrhage, it is usually not the primary reason why MRI/MRA/MRV is selected for the evaluation. A special condition where MRI may be superior to CT for evaluating hemorrhage is to detect an underlying neoplasm as the cause of bleeding ~~(Abe, 2010)~~.[7]

POLICY HISTORY

Date	Summary
April 2022	• **Added indication for UPJ surgery** • **Added "(abdomen and pelvis MRA when CTA is inconclusive or cannot be performed)" to follow-up for EVAR and AAA** • **Added Y90 indication**
April 2021	• No substantive changes
May 2020	• Added compression syndromes for evaluation of vascular disease • Added evaluation of FMD, Vascular Ehlers-Danlos syndrome, Loetz-Dietz • Added May-Thurner • Added to assess DVT in pregnant women vs serial compression ultrasound, to include pelvis

	• Added indications for combo studies for chest MRA/abdomen and pelvis MRA
May 2019	• Added indications for visceral artery aneurysm; suspected chronic mesenteric ischemia; transjugular intrahepatic portosystemic shunt when US indicates suspected complications; imaging of deep inferior epigastric arteries for surgical planning (breast reconstruction surgery) • Added Background information and updated references

REFERENCES

Abe T, Kai M, Miyoshi O, Nagaie T. Idiopathic retroperitoneal hematoma. *Case Rep Gastroenterol.* 2010;4(3):318-322. doi:10.1159/000320590.

Achenbach S, Delgado V, Hausleiter J, et al. SCCT expert consensus document on computed tomography imaging before transcatheter aortic valve implantation (TAVI)/transcatheter aortic valve replacement (TAVR). *J Cardiovasc Comput Tomogr*. 2012 Nov-Dec; 6(6):366-80.

American College of Radiology (ACR). ACR Appropriateness Criteria®. https://acsearch.acr.org/list. Published 2014.

American College of Radiology (ACR). ACR Appropriateness Criteria®. https://acsearch.acr.org/list. Published 2017.

American College of Radiology (ACR). ACR Appropriateness Criteria®. https://acsearch.acr.org/list. Published 2018.

Barman M. Acute aortic dissection. *ESC Eur Society Cardiol*. 2014 Jul 02; 12(25).

Bates SM, Rajasekhar A, et al. American Society of Hematology 2018 guidelines for management of venous thromboembolism: venous thromboembolism in the context of pregnancy. *Blood Adv*. 2018; 2(22):3317-3359.

Certik B, Treska V, Molacek J, et al. Cardiovascular Surgery. How to proceed in the case of a tumor thrombus in the inferior vena cava with renal cell carcinoma. *Cor et Vasa*. April 2015; 57(2):e95-e100.

Chaikof EL, Dalman RL, Eskandari MK, et al. The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *J Vasc Surg*. January 2018; 67(1):2-77.e2. http://www.jvascsurg.org/article/S0741-5214(17)32369-8/fulltext#sec1.3. Retrieved February 15, 2018.

Chu LC, Johnson PT, et al. CT Angiographic Evaluation of Genetic Vascular Disease: Role in Detection, Staging, and Management of Complex Vascular Pathologic Conditions. *AJR*. May 2014; 202(5).

Clerc D, Grass F, Schafer M, et al. Lower gastrointestinal bleeding—computed tomographic angiography, colonoscopy or both? *World J Emerg Surg*. 2017; 12:1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5215140/. Retrieved February 12, 2018.

Crousillat DR, Wood MJ, et al. Spontaneous Coronary Artery Dissection: An Update for the Interventionalist. *Cath Lab Digest*. 2020 Mar; 28(3).

Farsad K, Kolbeck KJ. Clinical and radiologic evaluation of patients before TIPS creation. *AJR Am J Roentgenol*. 2014 Oct; 203(4):739-45.

Hartman R, Kawashima A. Radiologic evaluation of suspected renovascular hypertension. *Am Fam Physician*. August 1, 2009; 80(3):273-279. https://www.aafp.org/afp/2009/0801/p273.html. Retrieved February 15, 2018.

Hoshino Y, Machida M, et al. Unilateral leg swelling: Differential diagnostic issue other than deep venous thrombosis. *J Gen Fam Med*. 2016; 17(4):311-314.

Ibrahim F, Dunn J, Rundback J, et al. Visceral artery aneurysms: Diagnosis, surveillance, and treatment. *Curr Treat Options Med*. 2018 Oct 26; 20(12):97.

Ibrahim W, Zakarey AS, et al. Endovascular Management of May-Thurner Syndrome. *Ann Vasc Dis*. 2012; 5(2):217-221.

Jesinger RA, Thoreson AA, Lamba R. Abdominal and pelvic aneurysms and pseudoaneurysms: Imaging review with clinical, radiologic, and treatment correlation. Radiographics. 2013; 33(3):E71-96. doi: 10.1148/rg.333115036.

Juntermanns B, Bernheim J, Karaindros K, et al. Visceral artery aneurysms. *Gefasschirurgie*. 2018; 23(Suppl 1):19-22.

Kadian-Dodov D, Gornik HL, et al. Dissection and Aneurysm in Patients with Fibromuscular Dysplasia: Findings from the US Registry for FMD. *J Am Coll Cardiol*. 2016; 68(2.)

Keser G, Direskeneli H, Aksu K. Management of Takayasu arteritis: A systematic review. *Rheumatology (Oxford)*. 2014 May; 53(5):793-801.

Khosa F, Krinsky G, Macari M, et al. Managing incidental findings on abdominal and pelvic CT and MRI, Part 2: White paper of the ACR Incidental Findings Committee II on vascular findings. *J Am Coll Radiol*. 2013; 10(10):789-794. doi:10.1016/j.jacr.2013.05.021.

Kumar Y, Hooda K, et al. Abdominal Aortic Aneurysm. Pictorial review of common appearance and complications. *Ann Transl Med*. 2017; 5(12):256.

Maki JH, Wilson GJ, Eubank WB. Navigator-gated MR angiography of the renal arteries: A potential screening tool for renal artery stenosis. *AJR Am J Roentgenol*. 2007; 188(6):W540-546. http://www.ajronline.org/content/188/6/W540.long.

Mazhar HR, Aeddula NR. Renal Vein Thrombosis. StatPearls. Treasure Island, FL. StatPearls Publishing; 2019-2018 Dec 26.

Michaely HJ, Attenberger UI, Kramer H, et al. Abdominal and pelvic MR angiography. *Magn Reson Imaging Clin N Am*. 2007; 15(3):301-314. http://www.ncbi.nlm.nih.gov/pubmed/17893051.

Mohler ER, Townsend RR. Advanced therapy in hypertension and vascular disease. 1st ed. Hamilton, Ontario: BC Decker, Inc; 2006. http://books.google.com/books?hl=en&lr=&id=sCgURxhCJ-8C&oi=fnd&pg=PA224&dq=abdominal+cta+and+hypertension&ots=cJxa6qcpRr&sig=ahv53M5fWFAtEmeLeNyfEFFErPo#PPA227,M1.

Nael K, Saleh R, Lee M, et al. High spatial resolution contrast enhanced MR angiography of abdominal arteries with parallel acquisition at 3.0 T: Initial experience in 32 patients. *AJR Am J Roentgenol*. 2006; 187:W77-85. http://www.ajronline.org/content/187/1/W77.full.pdf+html.

Owen JW, Saad NE, Foster G, et al. The feasibility of using volumetric phase-contrast MR imaging (4D Flow) to assess for transjugular intrahepatic portosystemic shunt dysfunction. *J Vasc Interv Radiol*. 2018 Dec; 29(12):1717-24.

Schwope RB, Alper HJ, Talenfeld AD. MR angiography for patient surveillance after endovascular repair of abdominal aortic aneurysms. *AJR Am J Roentgenol*. 2007; 188:W334-W340. http://www.ajronline.org/content/188/4/W334.full.pdf+html.

Shah A, Stavropoulos SW. Imaging surveillance following endovascular aneurysm repair. *Semin Intervent Radiol*. March 2009; 26(1):10-16. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3036458/.

Shih MC, Angle JF, Leung DA, et al. CTA and MRA in mesenteric ischemia: Part 2, normal findings and complications after surgical and endovascular treatment. *AJR Am J Roentgenol*. 2007a; 188:462-471. http://www.ajronline.org/content/188/2/462.full.pdf+html.

Shih MC, Hagspiel KD. CTA and MRA in mesenteric ischemia: Part 1, role in diagnosis and differential diagnosis. *AJR Am J Roentgenol*. 2007b; 188:452-461. http://www.ajronline.org/content/188/2/452.full.pdf+html.

Soulez G, Pasowicz M, Benea G, et al. Renal artery stenosis evaluation: diagnostic performance of gadobenate dimeglumine-enhanced MR angiography--comparison with DSA. *Radiology*. 2008; 247(1):273-285. http://radiology.rsna.org/content/247/1/273.full.pdf+html.

Textor SC, Lerman L. Renovascular hypertension and ischemic nephropathy. *Am J Hypertens*. 2010; 23(11):1159-1169. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3078640/.
Tullus K, Roebuck DJ, McLaren CA, et al. Imaging in the evaluation of renovascular disease. *Pediatr Nephrol*. June 2010; 25(6):1049-1056. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2855432/. Retrieved February 15, 2018.

Uberoi R, Tsetis D, Shrivastava V, et al. Standard of practice for the interventional management of isolated iliac artery aneurysms. *Cardiovasc Intervent Radiol*. 2011; 34(1):3-13. doi:10.1007/s00270-010-0055-0.

Wanhainen A, Verzini F, Van Herzeele I, et al. Editor's choice – European Society for Vascular Surgery (ESVS) 2019 clinical practice guidelines on the management of abdominal aorto-iliac artery aneurysms. *Eur J Vasc Endovascul Surg*. 2019 Jan; 57(1):8-93.

Wan-Ling MW, Wen-ShengT, et al. Comprehensive MDCT Evaluation of Patients with Suspected May-Thurner Syndrome. *AJR*. 2012;199(5).

Zucker EJ, Ganguli S, et al. Imaging of Venous Compression Syndromes. *Cardiovasc Diagn Ther*. 2016; 6(6):519-532.

Reviewed / Approved by NIA Clinical Guideline Committee

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.

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1. Chaikof EL, Dalman RL, Eskandari MK, et al. The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm. *J Vasc Surg*. Jan 2018;67(1):2-77.e2. doi:10.1016/j.jvs.2017.10.044
2. Khosa F, Krinsky G, Macari M, Yucel EK, Berland LL. Managing incidental findings on abdominal and pelvic CT and MRI, Part 2: white paper of the ACR Incidental Findings Committee II on vascular findings. *J Am Coll Radiol*. Oct 2013;10(10):789-94. doi:10.1016/j.jacr.2013.05.021
3. Kumar Y, Hooda K, Li S, Goyal P, Gupta N, Adeb M. Abdominal aortic aneurysm: pictorial review of common appearances and complications. *Ann Transl Med*. Jun 2017;5(12):256. doi:10.21037/atm.2017.04.32
4. Wanhainen A, Verzini F, Van Herzeele I, et al. Editor's Choice - European Society for Vascular Surgery (ESVS) 2019 Clinical Practice Guidelines on the Management of Abdominal Aorto-iliac Artery Aneurysms. *Eur J Vasc Endovasc Surg*. Jan 2019;57(1):8-93. doi:10.1016/j.ejvs.2018.09.020
5. Ibrahim F, Dunn J, Rundback J, Pellerito J, Galmer A. Visceral Artery Aneurysms: Diagnosis, Surveillance, and Treatment. *Curr Treat Options Cardiovasc Med*. Oct 26 2018;20(12):97. doi:10.1007/s11936-018-0696-x
6. Juntermanns B, Bernheim J, Karaindros K, Walensi M, Hoffmann JN. Visceral artery aneurysms. *Gefasschirurgie*. 2018;23(Suppl 1):19-22. doi:10.1007/s00772-018-0384-x
7. Abe T, Kai M, Miyoshi O, Nagaie T. Idiopathic Retroperitoneal Hematoma. *Case Rep Gastroenterol*. Sep 11 2010;4(3):318-322. doi:10.1159/000320590
8. American College of Radiology. ACR Appropriateness Criteria® Imaging of Mesenteric Ischemia. American College of Radiology. Updated 2018. Accessed November 5, 2021. https://acsearch.acr.org/docs/70909/Narrative/

9. Kadian-Dodov D, Gornik HL, Gu X, et al. Dissection and Aneurysm in Patients With Fibromuscular Dysplasia: Findings From the U.S. Registry for FMD. *J Am Coll Cardiol*. Jul 12 2016;68(2):176-85. doi:10.1016/j.jacc.2016.04.044
10. Chu LC, Johnson PT, Dietz HC, Fishman EK. CT angiographic evaluation of genetic vascular disease: role in detection, staging, and management of complex vascular pathologic conditions. *AJR Am J Roentgenol*. May 2014;202(5):1120-9. doi:10.2214/ajr.13.11485
11. Crousillat DR, Wood MJ. Spontaneous Coronary Artery Dissection: An Update for the Interventionalist. HMP Global Learning Network. Updated March 2020. Accessed January 10, 2022. https://www.hmpgloballearningnetwork.com/site/cathlab/content/spontaneous-coronary-artery-dissection-update-interventionalist
12. Čertík B, Třeška V, Moláček J, Šulc R. How to proceed in the case of a tumour thrombus in the inferior vena cava with renal cell carcinoma. *Cor et Vasa*. 2015/04/01/ 2015;57(2):e95-e100. doi:https://doi.org/10.1016/j.crvasa.2015.02.015
13. Harvin HJ, Verma N, Nikolaidis P, et al. ACR Appropriateness Criteria(®) Renovascular Hypertension. *J Am Coll Radiol*. Nov 2017;14(11s):S540-s549. doi:10.1016/j.jacr.2017.08.040
14. Hartman RP, Kawashima A. Radiologic evaluation of suspected renovascular hypertension. *Am Fam Physician*. Aug 1 2009;80(3):273-9.
15. Tullus K, Roebuck DJ, McLaren CA, Marks SD. Imaging in the evaluation of renovascular disease. *Pediatr Nephrol*. Jun 2010;25(6):1049-56. doi:10.1007/s00467-009-1320-9
16. Mazhar HR, Aeddula NR. Renal Vein Thrombosis. *StatPearls*. StatPearls Publishing Copyright © 2021, StatPearls Publishing LLC.; 2021.
17. Ibrahim W, Al Safran Z, Hasan H, Zeid WA. Endovascular management of may-thurner syndrome. *Ann Vasc Dis*. 2012;5(2):217-21. doi:10.3400/avd.cr.12.00007
18. Wu WL, Tzeng WS, Wu RH, et al. Comprehensive MDCT evaluation of patients with suspected May-Thurner syndrome. *AJR Am J Roentgenol*. Nov 2012;199(5):W638-45. doi:10.2214/ajr.11.8040
19. Hoshino Y, Machida M, Shimano Si, et al. Unilateral Leg Swelling: Differential Diagnostic Issue Other than Deep Vein Thrombosis. *Journal of General and Family Medicine*. 2016;17(4):311-314.
20. Bates SM, Rajasekhar A, Middeldorp S, et al. American Society of Hematology 2018 guidelines for management of venous thromboembolism: venous thromboembolism in the context of pregnancy. *Blood Adv*. Nov 27 2018;2(22):3317-3359. doi:10.1182/bloodadvances.2018024802
21. American College of Radiology. ACR Appropriateness Criteria® Imaging of Deep Inferior Epigastric Arteries for Surgical Planning (Breast Reconstruction Surgery). American College of Radiology. Updated 2017. Accessed January 10, 2022. https://acsearch.acr.org/docs/3101591/Narrative/
22. Kim SP, Cohalan C, Kopek N, Enger SA. A guide to (90)Y radioembolization and its dosimetry. *Phys Med*. Dec 2019;68:132-145. doi:10.1016/j.ejmp.2019.09.236
23. Uberoi R, Tsetis D, Shrivastava V, Morgan R, Belli AM. Standard of practice for the interventional management of isolated iliac artery aneurysms. *Cardiovasc Intervent Radiol*. Feb 2011;34(1):3-13. doi:10.1007/s00270-010-0055-0
24. Achenbach S, Delgado V, Hausleiter J, Schoenhagen P, Min JK, Leipsic JA. SCCT expert consensus document on computed tomography imaging before transcatheter aortic valve implantation (TAVI)/transcatheter aortic valve replacement (TAVR). *J Cardiovasc Comput Tomogr*. Nov-Dec 2012;6(6):366-80. doi:10.1016/j.jcct.2012.11.002

25. American College of Radiology. ACR Appropriateness Criteria® Imaging for Transcatheter Aortic Valve Replacement. American College of Radiology. Updated 2017. Accessed January 4, 2022. https://acsearch.acr.org/docs/3082594/Narrative/
26. Barman M. Acute aortic dissection. *ESC e-J Cardio Pract*. 2014;12(25):02Jul2014. doi:https://www.escardio.org/Journals/E-Journal-of-Cardiology-Practice/Volume-12/Acute-aortic-dissection
27. Keser G, Direskeneli H, Aksu K. Management of Takayasu arteritis: a systematic review. *Rheumatology (Oxford)*. May 2014;53(5):793-801. doi:10.1093/rheumatology/ket320
28. Clerc D, Grass F, Schäfer M, Denys A, Demartines N, Hübner M. Lower gastrointestinal bleeding-Computed Tomographic Angiography, Colonoscopy or both? *World J Emerg Surg*. 2017;12:1. doi:10.1186/s13017-016-0112-3

ADDITIONAL RESOURCES

1. **Farsad K, Kolbeck KJ. Clinical and radiologic evaluation of patients before TIPS creation. *AJR Am J Roentgenol*. Oct 2014;203(4):739-45. doi:10.2214/ajr.14.12999**
2. Jesinger RA, Thoreson AA, Lamba R. Abdominal and pelvic aneurysms and pseudoaneurysms: imaging review with clinical, radiologic, and treatment correlation. *Radiographics*. May 2013;33(3):E71-96. doi:10.1148/rg.333115036
3. Maki JH, Wilson GJ, Eubank WB, Glickerman DJ, Millan JA, Hoogeveen RM. Navigator-gated MR angiography of the renal arteries: a potential screening tool for renal artery stenosis. *AJR Am J Roentgenol*. Jun 2007;188(6):W540-6. doi:10.2214/ajr.06.1138
4. Michaely HJ, Attenberger UI, Kramer H, Nael K, Reiser MF, Schoenberg SO. Abdominal and pelvic MR angiography. *Magn Reson Imaging Clin N Am*. Aug 2007;15(3):301-14, v-vi. doi:10.1016/j.mric.2007.06.001
5. Mohler ER, Townsend RR. *Advanced therapy in hypertension and vascular disease*. 1st ed. BC Decker, Inc; 2006.
6. Nael K, Saleh R, Lee M, et al. High-spatial-resolution contrast-enhanced MR angiography of abdominal arteries with parallel acquisition at 3.0 T: initial experience in 32 patients. *AJR Am J Roentgenol*. Jul 2006;187(1):W77-85. doi:10.2214/ajr.05.1440
7. Owen JW, Saad NE, Foster G, Fowler KJ. The Feasibility of Using Volumetric Phase-Contrast MR Imaging (4D Flow) to Assess for Transjugular Intrahepatic Portosystemic Shunt Dysfunction. *J Vasc Interv Radiol*. Dec 2018;29(12):1717-1724. doi:10.1016/j.jvir.2018.07.022
8. Schwope RB, Alper HJ, Talenfeld AD, Cohen EI, Lookstein RA. MR angiography for patient surveillance after endovascular repair of abdominal aortic aneurysms. *AJR Am J Roentgenol*. Apr 2007;188(4):W334-40. doi:10.2214/ajr.06.0584
9. Shah A, Stavropoulos SW. Imaging Surveillance following Endovascular Aneurysm Repair. *Semin Intervent Radiol*. Mar 2009;26(1):10-6. doi:10.1055/s-0029-1208378
10. Shih MC, Angle JF, Leung DA, et al. CTA and MRA in mesenteric ischemia: part 2, Normal findings and complications after surgical and endovascular treatment. *AJR Am J Roentgenol*. Feb 2007;188(2):462-71. doi:10.2214/ajr.05.1168
11. Shih MC, Hagspiel KD. CTA and MRA in mesenteric ischemia: part 1, Role in diagnosis and differential diagnosis. *AJR Am J Roentgenol*. Feb 2007;188(2):452-61. doi:10.2214/ajr.05.1167

12. Soulez G, Pasowicz M, Benea G, et al. Renal artery stenosis evaluation: diagnostic performance of gadobenate dimeglumine-enhanced MR angiography--comparison with DSA. *Radiology*. Apr 2008;247(1):273-85. doi:10.1148/radiol.2471070711
13. Textor SC, Lerman L. Renovascular hypertension and ischemic nephropathy. *Am J Hypertens*. Nov 2010;23(11):1159-69. doi:10.1038/ajh.2010.174
14. Zucker EJ, Ganguli S, Ghoshhajra BB, Gupta R, Prabhakar AM. Imaging of venous compression syndromes. *Cardiovasc Diagn Ther*. Dec 2016;6(6):519-532. doi:10.21037/cdt.2016.11.19

Reviewed / Approved by NIA Clinical Guideline Committee

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.