National Imaging Associates, Inc.*	
Clinical guidelines **ABDOMEN MRA (~~Angiography)~~ Angiography)**	**Original Date: September 1997**
CPT Codes: 74185	**Last Revised Date: ~~May~~ April 2021~~0~~**
Guideline Number: NIA_CG_034-2	**Implementation Date: January 2022~~1~~**

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~~ANGIOGRAPHY/MR VENOGRAPHY~~enography~~ (MRA/MRV)~~:~~

~~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).~~

~~For evaluation of known or suspected abdominal vascular disease:~~

Arterial Disease:~~Arterial Disease:~~

For evaluation of known or suspected abdominal vascular disease~~:~~

- Evaluation of known or suspected aortic aneurysm‡ (also approve MRA pelvis) (Chaikof, 2018; Khosa, 2013; K~~h~~umar, 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~~ **follow**-up (and consider intervention) (Wa~~i~~nhainen, 2019)

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

‡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, arteriovenous malformations (AVMs), and 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 (Ibrahim, 2018; Junternamms, 2018)
- To determine the vascular source of retroperitoneal hematoma or hemorrhage (to determine a vascular source of hemorrhage in the setting of trauma, tumor invasion, fistula or vasculitis when CTA is **contraindicated**) **when CTA is contraindicated (CT rather than MRA/CTA) is the modality of choice for diagnosing hemorrhage (Abe, 2010)).**
- For evaluation of **known or** suspected acute mesenteric ischemia/ischemic colitis when CTA is contraindicated **(can approve CTA/MRA abdomen and pelvis)** (ACR, 2018).
- For suspected chronic mesenteric ischemia
- **For patients with fibromuscular dysplasia (FMD), a one-time vascular study of the abdomen and pelvis (CTA or MRA) (Kadian-Dodov, 2016)**
- **For patients with vVascular Ehlers-Danlos syndrome or Marfan syndrome, recommend a one-time study of the abdomen and pelvis (CTA/MRA)**
- **For Loeystz-Dietz, imaging at least every two years (Chu, 2014).**
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- **For assessment in patients with spontaneous coronary artery dissection (SCAD), can be done at time of coronary angiography (also approve CTA pelvis) (Crousillat, 2020).**
- **Vascular invasion or displacement by tumor (cConventional CT or MRI also appropriate) (Certik, 2015).**
- Vascular invasion or displacement by tumor
- Evidence of vascular abnormality seen on prior imaging studies and limited to the abdomen.
- Suspected retroperitoneal hematoma or hemorrhage (to determine vascular source of hemorrhage in setting of trauma, tumor invasion, fistula, or vasculitis; otherwise MR (rather than MRA) is sufficient and the modality of choice for diagnosing hemorrhage).
- **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.**
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- **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)** or

~~impaired renal function~~ unrelated to recent medication (ACR, 2017) demonstrated by any of the following (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 angiotensi~~o~~n converting enzyme inhibitor (ACE inhibitor) or angiotensi~~o~~n receptor blocker (ARB)~~.~~
- ~~o~~ Asymmetric kidney size noted on ultrasound~~.~~
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- 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~~**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 (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 com~~p~~ression syndrome (~~.~~include pelvic CTV) (Ibrahim 2012; Wan-Ling, 2012)**
- **Vascular invasion or displacement by tumor (c~~C~~onventional CT or MRI also appropriate) (Certik, 2015).** ~~Vascular invasion or displacement by tumor in the abdomen.~~
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- ~~For diffuse unexplained lower extremity edema with negative or inconclusive ultrasound (Hoshino, 2016)~~
- ~~For May-Thurner syndrome (include pelvic MRV) (Ibrahim 2012; Wan-Ling, 2012)~~
- ~~In pregnant women with suspected deep venous thrombosis (DVT) (vs serial compression ultrasound) (include pelvis MRV for iliac veins) (Bates, 2018)~~**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 (Hoshino, 2016)

- In pregnant women with suspected deep venous thrombosis (DVT) (vs serial compression ultrasound) (include pelvis MRV for iliac veins) (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)
- ~~For pre-transplant evaluation of either liver or kidney.~~
- Imaging of the deep inferior epigastric arteries for surgical planning (breast reconstruction surgery), include pelvic MRA (ACR, 2017)
- For pre-transplant evaluation of either liver or kidney.

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) (Chaikof, 2018; Uberoi, 2011).
    - If a~~A~~symptomatic at six (6) ~~month~~ month~~-~~intervals for one (1) year, then annually.
    - If s~~S~~ymptomatic/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 patients with fibromuscular dysplasia (FMD), a one-time vascular study of the abdomen and pelvis (CTA or MRA) (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 Loetz-Dietz imaging at least every two years (Chu, 2014)~~
- ~~Vascular invasion or displacement by tumor. Vascular invasion or displacement by tumor.~~
- ~~Suspected retroperitoneal hematoma or hemorrhage (to determine vascular source of hemorrhage in setting of trauma, tumor invasion, fistula, or vasculitis; otherwise CT (rather than CTA) is sufficient and the modality of choice for diagnosing hemorrhage).~~
- 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 transjugular intrahepatic portosystemic shunt (TIPS) when Doppler ultrasound indicates suspected complications~~
- Kidney failure or renal insufficiency if initial evaluation performed with u~~U~~ltrasound 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) (Achenbach, 2012; ACR, 2017)~~
- Acute aortic dissection (CTA or CT preferred) (Barman, 2014)
- Takayasi's arteritits (K~~e~~ea~~a~~ser, 2014)
- Marfan syndrome
- Loe~~y~~yst~~z~~-Dietz
-
- Spontaneous coronary artery dissection (SCAD)
- Vascular Ehlers-Danlos syndrome
- Post-operative complications
- ~~Significant~~
- Significant p~~p~~ost-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~~ **Contrast**-enhanced MRA requires the injection of a contrast agent, ~~which results~~**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.

~~**Abd/Pelvis MRA & Lower Extremity MRA Runoff Requests**: Two (2) authorization requests are required, one Abd MRA, CPT code 74185 and one for Lower Extremity MRA, CPT code 73725. This will provide imaging of the abdomen, pelvis, and both legs.~~

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 – ~~p:~~
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). Initial evaluation of AAA is accurately made by ultrasound. Ultrasound can detect and size AAA, with the advantage of being relatively inexpensive, noninvasive, and not requiring ~~e~~ iodinate contrast. The limitations are that overlying bowel gas can obscure findings and the technique is ~~operator~~ **operator**-dependent.

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 (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 (~~SVS~~**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).

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).

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 the 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 – ~~e:~~ 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 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).

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).

POLICY HISTORY~~:~~

Date	Summary
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

~~**Review Date:** May 2019~~
~~**Review Summary:**~~
- ~~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)~~
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- ~~Added indications for combo studies for chest MRA/abdomen and pelvis MRA~~

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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.