

National Imaging Associates, Inc.	
Clinical guidelines ABDOMEN CTA (Angiography)	Original Date: September 1997
CPT Codes: 74175	Last Revised Date: April 2022 <u>March 2023</u>
Guideline Number: NIA_CG_034-1	Implementation Date: January 20 <u>24</u> 23

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.*
- Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*

IMPORTANT NOTE

When vascular imaging of the aorta and both legs, i.e., CTA aortogram and runoff is desired (sometimes incorrectly requested as Abd/Pelvis CTA & Lower Extremity CTA Runoff), only one authorization request is required, using CPT Code 75635 Abdominal Arteries CTA. This study provides for imaging of the abdomen, pelvis, and both legs. The CPT code description is CTA aorto-iliofemoral runoff; abdominal aorta and bilateral ilio-femoral lower extremity runoff.

When separate requests for CTA abdomen and CTA Pelvis are encountered for processes involving both the abdomen and pelvis (but do NOT need to include legs/runoff), they need to be resubmitted as a single Abdomen/Pelvis CTA, using CPT 74174 (to avoid unbundling). Otherwise, the exam should be limited to the appropriate area (i.e., Abdomen OR Pelvis) that includes the area of concern.

-INDICATIONS FOR ABDOMEN CT ANGIOGRAPHY/CT VENOGRAPHY (CTA/CTV)

For evaluation of known or suspected abdominal vascular disease

Arterial Disease_____

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Abdominal Aortic Aneurysm (AAA) (should be CTA Abdomen and Pelvis if known or suspected aneurysm extends to the pelvis):

- For **asymptomatic** known or suspected abdominal aortic aneurysms, ultrasound should be done prior to advanced imaging. Only when the ultrasound is inconclusive, is advanced imaging with CT or MRI needed
- For **symptomatic** known or suspected AAA (such as recent-onset abdominal pain or back pain, particularly in the presence of a pulsatile or epigastric mass, suspected ~~dissection~~**dissection**, or significant risk factors for AAA) CTA/MRA is appropriate and generally preferred over CT/MRI. (If contrast is contraindicated or other clinical indications for abdomen and/or pelvic imaging are present, then CT/MR may be approved rather than CTA/MRA)
- If there is known complex anatomy, CTA/MRA may be needed.

~~Evaluation of known or suspected aortic aneurysm[‡] (or can approve CTA abdomen and pelvis if concern extends into pelvis)¹⁻³~~

- ~~○ For screening, US is initial study~~
- ~~○ Known or suspected aneurysm > 2.5 cm AND equivocal or indeterminate ultrasound results~~
- ~~○~~
- ~~○ 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~~
- ~~—[‡]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).~~

Other vascular abnormalities seen on prior imaging studies:

- Initial evaluation of inconclusive vascular findings on prior imaging
- Follow-up of known visceral vascular conditions (such as aneurysm, dissection, compression syndromes, arteriovenous malformations (AVMs), fistulas, intramural hematoma, and vasculitis) (if pelvis is also needed, resubmit as CTA Abdomen and Pelvis)
 - Hepatic vascular abnormalities after ultrasound has been performed to clarify or further evaluate findings
- For assessment in patients with spontaneous coronary artery dissection (SCAD), can be done at time of coronary angiography (resubmit as CTA Abdomen and Pelvis if pelvis is needed)¹
- Vascular invasion or displacement by tumor (conventional CT or MRI also appropriate)²
- For known large vessel diseases (inferior vena cava, superior/inferior mesenteric, celiac, splenic or renal arteries/veins), e.g., aneurysm/dissection (non-aortic disease), arteriovenous malformations (AVMs), and fistulas, intramural hematoma, and vasculitis³⁻⁵
- Surveillance may be done with ultrasound at intervals similar to AAA, however, CTA/MRA rather than CT/MRI may be needed for non-aortic disease when ultrasound is inconclusive⁶

- ~~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), 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^{6,7}~~

Vascular ischemia or hemorrhage (needs to be resubmitted as CTA Abdomen and Pelvis unless there is a specific finding limited to the abdomen)

For patients at increased risk for vascular abnormalities (CTA or MRA): (needs to be resubmitted as CTA Abdomen and Pelvis unless there is a specific finding 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 CT/MR abdomen and pelvis (rather than CTA/MRA) may be sufficient and the modality of choice for diagnosing hemorrhage⁶~~
 - ~~For evaluation of suspected mesenteric ischemia/ischemic colitis (can approve CTA/MRA abdomen and pelvis)⁷~~
 - ~~For patients with fibromuscular dysplasia (FMD), a one-time vascular study of the abdomen and pelvis (CTA or MRA)⁸~~
 - ~~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 years⁹~~
 - ~~For assessment in patients with spontaneous coronary artery dissection (SCAD) can be done at time of coronary angiography (also approve CTA pelvis)¹⁰~~
 - ~~Vascular invasion or displacement by tumor~~
- ~~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~~ **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 demonstrated by any of the following^{2, 7-13}:

- ⊖• Unsuccessful control after treatment with 3 or more (>2) anti-hypertensive medication at optimal dosing and one should be a diuretic
- ⊖• 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 dysplasia¹⁴
- ⊖ 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 or accelerated 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 causes¹⁵
- Venous thrombosis if previous studies have not resulted in a clear diagnosis and limited to the abdomen~~(add pelvis CTA/CTV when appropriate)~~
- ~~For known/suspected May-Thurner syndrome (include pelvic CTV)^{20,21}~~
- Vascular invasion or displacement by tumor in the abdomen
- For evaluation of portal venous system (hepatic portal system) after doppler ultrasound has been performed
- For unexplained lower extremity edema (typically unilateral or asymmetric) with negative or inconclusive ultrasound¹⁶
- ~~For diffuse unexplained lower extremity edema with negative or inconclusive ultrasound²²~~

Pre-operative evaluation

- For evaluation of transjugular intrahepatic portosystemic shunt (TIPS) when Doppler ultrasound indicates suspected complications¹⁷⁻²⁰
- Evaluation prior to interventional vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Prior to solid organ transplantation when vascular anatomy is needed
- ~~For pre-transplant evaluation of either liver or kidney~~
- ~~Imaging of the deep inferior epigastric arteries for surgical planning (breast reconstruction surgery), include pelvic CTA/MRA²⁷ - !!~~
- For surgical planning for UPJ (ureteropelvic junction) obstruction to look for a lower pole crossing vessel
- Planning prior Y90 radiation treatment for liver cancer in order to evaluate anatomic variation/shunts/determine best catheter placement/see if coil(s) needed²¹

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 typically needs to include pelvic imaging, therefore Abdomen Pelvis CT/CTA/MRA would usually be the appropriate study.

Other Vascular indications

- ~~Suspected retroperitoneal hematoma or hemorrhage to determine vascular source of hemorrhage, in setting of trauma, tumor invasion, fistula or vasculitis; otherwise, CT/MR abdomen and pelvis (rather than CTA/MRA) may be sufficient and the modality of choice for diagnosing hemorrhage⁶~~
- 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

Other Indications

Further evaluation of indeterminate findings on prior imaging (unless follow up is otherwise specified within the guideline):

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

~~Lower gastrointestinal hemorrhage: Active bleeding in a hemodynamically stable patient or non-localized intermittent bleeding as an alternative to Tc-99m RBC scan when colonoscopy did not localize the bleeding, is contraindicated, or unavailable^{29,30}~~

Chest CTA/Abdomen/~~Pelvis~~ CTA combo

- For evaluation of extensive vascular disease involving the chest and abdominal cavities and pelvic imaging is not needed
- ~~For pre-op or preprocedural evaluation for Transcatheter Aortic Valve Replacement (TAVR)^{22, 23}~~
- ~~Acute aortic dissection³³~~
- ~~Takayasu's arteritis³⁴~~
- ~~Marfans syndrome~~
- ~~Loeys-Dietz~~
- ~~Spontaneous coronary artery dissection (SCAD)~~
- ~~Vascular Ehlers-Danlos syndrome~~

- Post-op complications^{24, 25} and pelvic imaging is not needed
 - Significant post-traumatic or post-procedural vascular complications and pelvic imaging is not needed
-

BACKGROUND

Computed tomography angiography (CTA) 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. CTA uses ionizing radiation and requires the administration of iodinated contrast agent, which is a potential hazard in patients with impaired renal function. Abdominal CTA is not used as a screening tool, e.g., evaluation of asymptomatic patients without a previous diagnosis.

Cross-sectional imaging (liver ultrasound with Doppler, CT or MRI) should be completed no more than a month prior to the transjugular intrahepatic portosystemic shunt (TIPS) to assess for vascular patency and look for hepatic masses or other problems that could complicate the procedure.

Post-procedure, an ultrasound of the liver is conducted a day after to assess shunt patency. Hepatic encephalopathy (HE) is the most common complication and usually occurs 2-3 weeks after insertion of TIPS. Unique complications may include intravascular hemolysis and infection of the shunt. Other complications can include capsule puncture, intraperitoneal bleed, hepatic infarction, fistula, hematuria, thrombosis of stent, occlusion, or stent migration and may require cross-sectional imaging.

Follow-up and maintenance imaging if complications suspected include Doppler ultrasound to assess shunt velocity. If asymptomatic sonogram performed at 4 weeks post placement, then every 6 months to a year. The gold standard for shunt patency is portal venography, usually reserved if concern for shunt occlusion.

OVERVIEW

CTA 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. CTA is used to evaluate the renal arteries and detect renal artery stenosis.

****NF1** may present with hypertension due to renal artery stenosis in children. All young patients (<30 year) with hypertension should be clinically screened for secondary causes of hypertension,

including NF1, so that renal revascularization can be offered before permanent end organ damage has occurred.²⁶

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 ≥ 1.5 x the normal diameter.²⁷ Evaluation of AAA can be 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~~**operator dependent**. CT is used when US is inconclusive or insufficient. When there are suspected complications, complex anatomy and/or surgery is planned, CTA/MRA is preferred.~~CTA/MRA needed only when ultrasound is inconclusive/insufficient or when surgery is planned.~~

~~The Society of Vascular Surgery recommends elective repair of AAA ≥ 5.5 cm in patients at low or acceptable surgical risk.~~²⁹

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.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.²⁹

POLICY HISTORY

Date	Summary
2023	—
April 2022	<ul style="list-style-type: none">• Added indication for UPJ surgery• Clarified note regarding vascular imaging of the aorta and both legs (i.e., CTA aortogram and runoff)• Clarified evaluation of known or suspected aortic aneurysm• Removed follow up intervals for EVAR and AAA since Abdomen Pelvis CTA is usually appropriate study• Added Y90 indication



April 2021	<p>Added Notes:</p> <ul style="list-style-type: none"> For syndromes for which imaging starts in the pediatric age group, MRI preferred ABDOMEN or Pelvis CT ALONE SHOULD ONLY BE APPROVED WHEN DISEASE PROCESS IS SUSPECTED TO BE LIMITED TO THE ABDOMEN or Pelvis. CT Abdomen/Pelvis Combo (CPT Codes: 74176, 74177, 74178) is the correct study when the indication(s) include both the abdomen AND pelvis, such as CTU (CT Urography), CTE (CT Enterography), acute abdominal pain, widespread inflammatory disease or neoplasm. Otherwise, the exam should be limited to the appropriate area. (i.e., Abdomen OR Pelvis) which includes the specific organ, area of known disease/abnormality or the area of concern.
May 2020	<ul style="list-style-type: none"> 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 CTA/abdomen and pelvis CTA
May 2019	<ul style="list-style-type: none"> Added indications for transjugular intrahepatic portosystemic shunt when Doppler ultrasound indicates suspected complications; accelerated hypertension; pre-transplant evaluation of either liver or kidney; imaging of deep inferior epigastric arteries for surgical planning (breast reconstruction surgery) For chest CTA/Abdomen CTA combo: added Transcatheter Aortic Valve Replacement; Acute Aortic dissection; Takayasu's arteritis; post-op complications; significant post-traumatic or post-procedural vascular complications Added and modified Background information and updated references

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ADDITIONAL RESOURCES

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~~Reviewed / Approved by NIA Clinical Guideline Committee~~

POLICY HISTORY

<u>Date</u>	<u>Summary</u>
<u>March 2023</u>	<ul style="list-style-type: none">• <u>Redirected vascular requests for abdomen alone or pelvis imaging alone to resubmit as abdomen and pelvis CTA required unless condition limited to abdomen</u>• <u>Other vascular abnormalities: clarified indication for non-aortic vascular conditions</u>• <u>Transplant: added section</u>• <u>General Information moved to beginning of guideline with added statement on clinical indications not addressed in this guideline</u>• <u>Added statement regarding further evaluation of indeterminate findings on prior imaging</u>• <u>Aligned sections across body imaging guidelines</u>
<u>April 2022</u>	<ul style="list-style-type: none">• <u>Added indication for UPJ surgery</u>• <u>Clarified note regarding vascular imaging of the aorta and both legs (i.e., CTA aortogram and runoff)</u>• <u>Clarified evaluation of known or suspected aortic aneurysm</u>• <u>Removed follow-up intervals for EVAR and AAA since Abdomen Pelvis CTA is usually appropriate study</u>• <u>Added Y90 indication</u>

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