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2024 Computed Tomography (CTA) Abdomen

Diagnostic Imaging

CTA-Abdomen-HH

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Guideline Initiated: 06/30/2019

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Computed Tomography Angiography/Venography (CTA/CTV) Abdomen

CTA General Contraindications

Computed tomography angiography (CTA) may be contraindicated for **ANY** of the following:

- Contrast allergy
  References: [8] [34]
- Heart failure is decompensated.
  References: [8] [34]
- Hemodynamic instability (eg, abnormal laboratory values, blood pressure instability)
  References: [8] [34]
- Renal impairment
  References: [8] [34]
- Protocol can **NOT** be followed (eg, technical or related to individual).
  References: [8] [34]

NCD 220.1
See also, **NCD 220.1**: Computed Tomography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

Preamble: Pediatric Diagnostic Imaging

HealthHelp's clinical guidelines for the Diagnostic Imaging program, are intended to apply to both adults and pediatrics (21 years of age or younger), unless otherwise specified within the criteria.

CTA/CTV Abdomen Guideline

Computed tomography angiography (CTA) **OR** computerized tomography venography (CTV) of the abdomen is considered medically appropriate when the documentation demonstrates **ANY** of the following:

1. Arterial disease is suspected or known with **ANY** of the following:
   a. Aneurysm of the abdominal aorta, hepatic, iliac, mesenteric, renal or splenic arteries, is suspected or known, ultrasound is non-diagnostic or indeterminate and **ANY** of the following:

i. Abdominal aortic aneurysm (AAA) is suspected or known.

ii. Anatomy that is complex is known.

iii. Aortic aneurysm surveillance for **ANY** of the following:

A. 2.5 to 3.0 cm; follow-up every 10 years

B. 3.0 cm to 3.9 cm; follow-up every 3 years

C. 4.0 cm to 4.9 cm; follow-up annually

D. 5.0 to 5.4; follow-up every 6 months

b. Abdominal arterial abnormality (eg, aneurysm, arteriovenous malformations [AVM], compression syndromes, dissection, fistulas, intramural hematoma, vasculitis), limited to the abdomen, for evaluation **AND** ultrasound is non-diagnostic or indeterminate.

c. Large vessel disease (aorta, iliac arteries/veins, mesenteric, renal, splenic, vena cava) is known (eg, aneurysm, dissection, fistulas).

d. Spontaneous coronary artery dissection (SCAD) is visualized on prior imaging.

e. Stenosis, renal artery, or resistant hypertension is suspected or known, renal function is normal, and **ANY** of the following: (*__NOTE:__ *if renal function is impaired [eGFR less than 30] use ultrasound*.)

i. Age is under than 30 years old when diagnosed with hypertension **AND** there are **NO** other risk factors including family history.

ii. Age is under 35 years old **AND** fibromuscular dysplasia is suspected with hypertension (diastolic BP is more than 110 mm HG).

iii. Blood pressure (BP) has an acute elevation when previous blood pressures are stable.

iv. Creatinine has an acute elevation **AFTER** initiation of angiotensin converting enzyme inhibitor (ACE inhibitor) **OR** angiotensin receptor blocker (ARB).

v. Flash pulmonary edema, with unknown etiology

vi. Hypertension, accelerated **OR** malignant

vii. Hypertension is known **AND** bruit is auscultated over the renal artery.

viii. Hypertension with new onset when older than age 50 years.

ix. Treatment is **NOT** responsive after 3 or more anti-hypertensive medications (including 1 diuretic), at optimal dosing.

x. Ultrasound demonstrates asymmetric kidney size.

xi. Ultrasound, renal, is abnormal, non-diagnostic or indeterminate.

xii. Vascular disease at high-risk (eg, neurofibromatosis, tuberous sclerosis, William's syndrome) is known.

f. Tumor-related vascular invasion or displacement is demonstrated on prior imaging.

References: [16] [32] [10] [27] [6] [13] [1] [22] [17] [20] [4]

2. Pre-procedural evaluation, to guide treatment planning or post-surgical assessments (within 90 days of procedure) for evaluation of complications or disease recurrence
References: [16]

3. Prior CT or magnetic resonance imaging (MRI) imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)
References: [16]

4. Vascular disease is suspected or known and **ANY** of the following:
   a. Ischemia, localized to the abdomen, is suspected or known. [35]
   b. Upper gastrointestinal bleeding, when endoscopy is abnormal, non-diagnostic or indeterminate.

   References: [16] [18] [30] [15]

5. Venous disease is suspected or known and **ANY** of the following:
   a. Edema of the lower extremity is diffuse, unexplained **AND** ultrasound is non-diagnostic or indeterminate.
   b. Portal venous system (hepatic portal system) evaluation **AFTER** completed ultrasound.
   c. Renal vein thrombosis is suspected, with a known renal mass **OR** from other causes (eg, nephrotic syndrome, primary hypercoagulability disorders, trauma).
   d. Tumor-related vascular invasion **OR** displacement evaluation
   e. Venous thrombosis limited to the abdomen, is suspected **AND** prior imaging is non-diagnostic or indeterminate.

   References: [16] [12] [26] [13] [20]

Combination CTA Chest with CTA Abdomen

Computed tomography angiography (CTA) chest combined with CTA abdomen is considered medically appropriate when the documentation demonstrates **ANY** of the following:

1. Transcatheter aortic valve replacement (TAVR) for pre-operative or pre-procedural planning
   References: [21]
2. Vascular complications are post-traumatic, post-procedural or post-operative.
3. Vascular disease is extensive, involving the chest and abdominal cavities, **AND** pelvic imaging is **NOT** needed.

Combination CTA Chest/CTA Abdomen/CTA Pelvis Guideline

Computed tomography angiography (CTA) chest **combined** with CTA abdomen and CTA pelvis is considered medically appropriate when the documentation demonstrates **ANY** of the following:

1. Connective tissue disease (eg, Loeys Dietz, Marfan's syndrome, vascular Ehlers-Danlos syndrome)
2. Spontaneous coronary artery dissection (SCAD)
   References: [22]
3. Takayasu's arteritis
   References: [24]
4. Transcatheter aortic valve replacement (TAVR) for pre-operative or pre-procedural planning
   References: [21]
5. Vascular complications are post-traumatic, post-procedural or post-operative.
6. Vascular disease involving the chest and abdominal cavities is extensive (eg, intestinal ischemic syndrome, thoracic outlet syndrome), for evaluation.

CTA Chest and CTA Abdomen or CTA Abdomen/Pelvis Combination

A computed tomography angiography (CTA) chest **combined** with CTA abdomen **OR** CTA abdomen/pelvis is considered medically appropriate when the documentation demonstrates **ANY** of the following:

1. Acute aortic dissection
   References: [10] [19]
2. Lower extremity vascular disease evaluation of embolic source.
   Reference: [25]
3. Post-operative complications

4. Takayasu's arteritis
   References: [24] [23]
5. Transcatheter aortic valve replacement (TAVR) for pre-operative or pre-procedural planning
   References: [21]

CTA Abdomen Summary of Changes

CTA Abdomen guideline had the following version changes from 2023 to 2024:

- Added the following to keep in line with current research:
  - Indications under "Stenosis, renal"
  - "Peri-procedural planning" under "Peri-procedural"
  - "Prior imaging is non-diagnostic" under "Vascular disease is suspected"
  - "Spontaneous coronary artery dissection (SCAD)" under "Arterial disease"
- Removed the following as current research does not support the indication:
  - Under "Aneurysm"
    - "Aneurysm is known"
    - "Screening"
  - Under "Arterial disease"
    - "Connective tissue"
    - "Hematoma"
  - "May-Thurner syndrome" under "Venous disease"
  - Under "Pre-procedural"
    - "Epigastric arteries"
    - "Interventional vascular procedure"
  - Under "Vascular disease"
    - "Lower gastrointestinal hemorrhage"
    - "Retroperitoneal hematoma"
- Mid-cycle update: added Pediatric Preamble
- Mid-cycle update: Removed LCD 33959 as is not appropriate for this guideline.

CTA/CTV Abdomen APC Codes

Table 1. CTA Abdomen APC codes

Codes	Description
74175	Computed tomographic angiography, abdomen, with contrast material(s), including noncontrast images, if performed, and image postprocessing
75635	Computed tomographic angiography, abdominal aorta and bilateral iliofemoral lower extremity runoff, with contrast material(s), including noncontrast images, if performed, and image postprocessing
75695	Computed tomographic angiography, abdominal aorta and bilateral iliofemoral lower extremity runoff, with contrast material(s), including noncontrast images, if performed, and image postprocessing

CTA Abdomen Definitions

Aneurysm refers to weakness in an artery wall, allowing it to abnormally balloon out or widen.
Angiotensin-converting enzyme (ACE) inhibitors are medications that block the conversion of angiotensin I to angiotensin II, leading to decreased blood pressure and reduced sodium and water retention.
Angiotensin receptor blockers (ARBs) is a medication that selectively blocks the binding of angiotensin II to the angiotensin II type 1 (AT1) receptor, primarily found in vascular smooth muscle and the adrenal gland, thereby reducing vasoconstriction and aldosterone secretion, which lowers blood pressure and decreases systemic vascular resistance without significantly affecting heart rate.
Ankle-brachial index (ABI) is a measure of the difference in the systolic blood pressure of the arm and ankle calculated by dividing the blood pressure of the ankle by that of the arm. It is a noninvasive diagnostic test that measures the ratio of the systolic blood pressure at the ankle to the systolic blood pressure at the brachial artery to assess for peripheral artery disease (PAD).
Arteriovenous malformation (AVM) are congenital high-flow vascular malformations characterized by abnormal shunting of blood from high-flow feeding arteries to low-resistance veins via a cluster of aberrant blood vessels termed a central nidus, bypassing the normal capillary bed.
Bruit is a sound heard over an artery or vascular channel, indicating turbulent blood flow, often due to an abnormal narrowing of the vessel.
Claudication is a condition in which cramping pain in the leg is induced by exercise, typically caused by obstruction of the arteries.
Computed tomography angiography (CTA) is a medical test that combines a computed tomography (CT) scan with an injection of a special dye to produce pictures of blood vessels and tissues in a part of the body.
Computed tomography venography (CTV) is a technique targeted to assess venous anatomy, determine venous patency and delineate collateral circulation, often using contrast material.

Creatinine is a waste product that comes from the digestion of protein in food and the normal breakdown of muscle tissue. It is removed from the blood through the kidneys.
Critical limb ischemia is defined as the presence of ischemic rest pain, nonhealing wounds or ulcers, or gangrene for more than 2 weeks, with associated evidence of hypoperfusion.
Dissection refers to the separation of the layers within the wall of an artery, most commonly the aorta, due to a tear in the intimal layer, leading to the formation of a false lumen.
Diuretic is a drug that makes the kidneys produce more urine. Diuretics, also known as water pills, help the body get rid of extra fluid and salt. They are used to treat high blood pressure, edema, heart failure and other conditions.
Edema an abnormal infiltration and excess accumulation of serous fluid in connective tissue or in a serous cavity.
Ehlers-Danlos syndrome is a group of hereditary connective tissue disorders that manifests clinically with skin hyperelasticity, hypermobility of joints, atrophic scarring and fragility of blood vessels.
Embolism is an obstruction of an artery, typically by a clot of blood or an air bubble, that has traveled from another part of the body.
Endoscopy is a procedure that uses an endoscope to examine the inside of the body. An endoscope is a thin, tube-like instrument with a light and a lens for viewing. It may also have a tool to remove tissue to be checked under a microscope for signs of disease.
Estimated glomerular filtration rate (eGFR) is a measure of how well the kidneys are working. eGFR is an estimated number based on a blood test, age, sex, body type and race.
Fibromuscular dysplasia is a rare blood vessel disorder that causes arteries to narrow and grow larger. FMD occurs when the strong, flexible cells in arteries are replaced with less strong, less flexible cells. This makes the arteries stiffer and more likely to be damaged.
Fistula is an abnormal connection between two epithelialized surfaces, often involving organs such as the gut, bladder, vagina, or skin, and can result from various causes including surgery, trauma, Crohn's disease, diverticular disease, or malignancy.
Flash pulmonary edema is a sudden and severe accumulation of fluid in the lungs, often due to abrupt increases in afterload or left atrial pressure, leading to life-threatening respiratory distress.
Gangrene is localized death of soft tissues due to loss of blood supply or serious bacterial infection.
Giant cell arteritis is a systemic inflammatory vascular disease that predominantly affects adults over 50 years old, characterized by granulomatous inflammation of the blood vessel walls, particularly the branches of the carotid and vertebral arteries, and is associated with symptoms such as headache, jaw claudication, visual disturbances, and tender/thickened temporal arteries.
Hematoma is a mass of usually clotted blood that forms in a tissue, organ or body space as a result of a broken blood vessel.

Hemodynamic stability refers to the maintenance of adequate blood pressure and perfusion to ensure sufficient oxygen delivery to tissues without the need for excessive pharmacological support.

Table 1. Hemodynamic Assessment

Hemodynamic Parameters	Stable Circulation	Compensated Shock	Hypotensive Shock
Conscious Level	Clear and lucid	Clear and lucid	Restless, combative
Capillary refill	Brisk (less than 2 seconds)	Prolonged (greater than 2 seconds)	Very prolonged, mottled skin
Extremities	Warm and pink	Cool peripheries	Cold, clammy
Peripheral pulse	Good volume	Weak and thready	Feeble or absent
Heart Rate	Normal heart rate for age	Tachycardia for age	Severe tachycardia or bradycardia in late shock
Blood Pressure	Normal blood pressure and pulse pressure for age	Normal systolic pressure but rising diastolic pressure; Narrowing pulse pressure; Postural hypertension	Narrow pulse pressure (greater than or equal to 20 mm/Hg; Hypotension for age; Unrecordable blood pressure
Respiratory Rate	Normal respiratory rate for age	Tachypnea	Hyerpnea or Kussmaul's breathing (metabolic acidosis)
Urine Output	Normal	Reducing trend	Oliguria or anuria

Hemorrhage is a copious or heavy discharge of blood from the blood vessels.

Hepatic portal system is the system of veins that transports blood from the digestive tract to the liver. It consists of the hepatic portal vein and other veins that drain into the hepatic portal vein, viz. the superior mesenteric vein, the inferior mesenteric vein and the splenic vein.

Hypertension (high blood pressure) is defined as a systolic blood pressure of 130 mm Hg or higher and/or a diastolic blood pressure of 80 mm Hg or higher in adults, regardless of the patient's weight in pounds.

Indeterminate findings are inconclusive or insufficient for treatment planning.

Intramural hematoma (IMH) is a collection of blood within the medial layer of the aortic wall without an overt intimal tear or false lumen.

Ischemia is a deficient supply of blood to a body part (such as the heart or brain) due to obstruction of the inflow of arterial blood.

Ischemic rest pain is a severe, unrelenting pain in the lower extremities, typically the feet, that occurs due to advanced peripheral artery disease (PAD) and is aggravated by elevation and relieved by dependency.

Loeys-Dietz syndrome is a rare autosomal dominant connective tissue disorder characterized by aggressive aortic aneurysms, arterial tortuosity, and distinctive craniofacial and skeletal features.

Magnetic resonance imaging (MRI) is a non-invasive diagnostic technique that produces computerized images of internal body tissues and is based on nuclear magnetic resonance of atoms within the body induced by the application of radio waves.
Malignant hypertension is severe hypertension characterized by acute onset, causing necrosis (tissue death) of arteriolar walls in kidney and retinal hemorrhages and is rapidly progressive with poor prognosis.
Marfan syndrome is a disorder of connective tissue inherited as a dominant trait, characterized by abnormal elongation of the long bones and often with ocular and circulatory defects.
Mesenteric is a fold of membrane that attaches the intestine to the abdominal wall and holds it in place.
Nephrotic syndrome is a kidney disorder that causes the body to pass too much protein in the urine. Nephrotic syndrome is usually caused by damage to the clusters of small blood vessels in the kidneys that filter waste and excess water from the blood.
Neurofibromatosis is a rare genetic disorder that causes benign tumors to grow on nerves and other parts of the body. There are three types of neurofibromatosis: neurofibromatosis 1 (NF1), neurofibromatosis 2 (NF2) and schwannomatosis.
Non-diagnostic is a result that does not lead to a confirmed diagnosis.
Pediatric approximate ages are defined by the US Department of Health (USDH), the Food and Drug Administration (FDA), and the American Academy of Pediatrics (AAP) as the following:

- Infancy, between birth and 2 years of age
- Childhood, from 2 to 12 years of age
- Adolescence, from 12 to 21 years of age, further defined by the AAP into:
    1. Early (ages 11–14 years)
    2. Middle (ages 15–17 years),
    3. Late (ages 18–21 years)
    4. Older ages may be appropriate for children with special healthcare needs.

Peripheral artery disease (PAD) is a narrowing or blockage of the blood vessels that carry blood from the heart to the legs. It's caused by a buildup of plaque, also known as atherosclerosis.
Portal venous system is a paired network of valveless veins responsible for blood from all of the abdominal viscera, excluding the kidneys and adrenal glands.
Pulse volume recording (PVR) uses a blood pressure cuff and hand-held Doppler ultrasound device to determine the presence and severity of peripheral artery disease (PAD). The Doppler ultrasound records sound waves that bounce off moving objects, such as blood, to measure speed and flow.

Resistant hypertension is defined as a blood pressure that remains above goal despite concurrent use of three antihypertensive agents of different classes taken at maximally tolerated doses, one of which should be a diuretic (the diuretic should be selected based upon kidney function).

Segmental pressures are measured by combining Doppler ultrasound with blood pressure measurements at various locations in the arms and legs. By detecting differences in blood pressure at specific locations in different limbs, this test helps to diagnose arterial blockages and other circulation problems.

Spontaneous coronary artery dissection (SCAD) is a tear in the wall of a coronary artery. It's an emergency condition that can slow or block blood flow to the heart. This can lead to a heart attack, heart rhythm problems or sudden death.

Stenosis is a narrowing or constriction of the diameter of a bodily passage or orifice.

Surveillance in cancer is the ongoing, timely and systematic collection and analysis of information on new cancer cases, extent of disease, screening tests, treatment, survival and cancer deaths.

Takayasu's arteritis is a chronic inflammatory disease especially of the aorta and its major branches (the brachiocephalic artery and left common carotid artery) that result in progressive stenosis, occlusion and aneurysm formation marked by diminution or loss of the pulse (as in the arm) and ischemic symptoms.

Thrombosis is the formation of a blood clot (partial or complete blockage) within blood vessels, whether venous or arterial, limiting the natural flow of blood and resulting in clinical sequela.

Toe Brachial Index (TBI) is defined as the ratio between the systolic blood pressure in the right or left toe and the higher of the systolic pressure in the right or left arms.

Transcatheter Aortic Valve Implantation/Replacement (TAVI/TAVR) is a minimally invasive procedure that replaces a diseased aortic valve with a man-made or animal tissue valve. TAVR is for patients with severe aortic stenosis, which is a narrowing of the valve opening. The procedure only requires a small cut in the skin and does not require open-heart surgery.

Transjugular intrahepatic portosystemic shunt (TIPS) is a procedure that creates a new connection between two blood vessels in the liver. The procedure involves inserting a stent (tube) into the liver to connect the portal veins to adjacent blood vessels with lower pressure.

Tuberous sclerosis is a genetic disorder of the skin and nervous system that is characterized by the formation of small benign tumors in various organs (such as the brain, kidney, eye and heart), is accompanied by variable symptoms including seizures, developmental delay or intellectual disability, skin lesions (as hypopigmented macules of the trunk and limbs or telangiectatic facial papules) and is inherited as an autosomal dominant trait or results from spontaneous mutation.

Ulcerated is a break in the skin or mucous membrane with loss of surface tissue, disintegration and necrosis of epithelial tissue and often pus.

Ultrasound is the diagnostic or therapeutic use of ultrasound and especially a noninvasive technique involving the formation of images used for the examination and measurement of internal body structures and the detection of bodily abnormalities.

Vasculitis involves inflammation of the blood vessels. The inflammation can cause the walls of the blood vessels to thicken, which reduces the width of the passageway through the vessel. If blood flow is restricted, it can result in organ and tissue damage.

Williams syndrome is a developmental disorder that affects many parts of the body. This condition is characterized by mild to moderate intellectual disability or learning problems, unique personality characteristics, distinctive facial features and heart and blood vessel (cardiovascular) problems.

CTA/CTV Abdomen References

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Disclaimer & Legal Notice

Purpose

The purpose of the HealthHelp's clinical guidelines is to assist healthcare professionals in selecting the medical service that may be appropriate and supported by evidence to safely improve outcomes. Medical information is constantly evolving, and HealthHelp reserves the right to review

and update these clinical guidelines periodically. HealthHelp reserves the right to include in these guidelines the clinical indications as appropriate for the organization's program objectives. Therefore the guidelines are not a list of all the clinical indications for a stated procedure, and associated Procedure Code Tables may not represent all codes available for that state procedure or that are managed by a specific client-organization.

Clinician Review

These clinical guidelines neither preempt clinical judgment of trained professionals nor advise anyone on how to practice medicine. Healthcare professionals using these clinical guidelines are responsible for all clinical decisions based on their assessment. All Clinical Reviewers are instructed to apply clinical indications based on individual patient assessment and documentation, within the scope of their clinical license.

Payment

The use of these clinical guidelines does not provide authorization, certification, explanation of benefits, or guarantee of payment; nor do the guidelines substitute for, or constitute, medical advice. Federal and State law, as well as member benefit contract language (including definitions and specific contract provisions/exclusions) take precedence over clinical guidelines and must be considered first when determining eligibility for coverage. All final determinations on coverage and payment are the responsibility of the health plan. Nothing contained within this document can be interpreted to mean otherwise.

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