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2024 Computed Tomography Angiography (CTA) Upper Extremities

Diagnostic Imaging

CTA-UpperExt-HH

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Computed Tomography Angiography/Computed Tomography Venography (CTA/CTV) Upper Extremities

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 Upper Extremities Guideline

Computed tomography angiography/computed tomography venography (CTA/CTV) of the upper extremities is considered medically appropriate when the documentation demonstrates **ANY** of the following: [20]

1. Deep venous thrombosis (DVT) or embolism is suspected or known and **ANY** of the following: [15] [9]
    a. Arterial emboli in the upper extremity is suspected.
    b. Central veins evaluation
    c. Ultrasound of arm veins is abnormal, non-diagnostic or indeterminate and treatment planning depends on results.
2. Hand ischemia is suspected or known and **ANY** of the following: [13] [6]
    a. Acute symptoms for **ANY** of the following: (*__NOTE__: *Ultrasound is **NOT** needed for acute symptoms*)
        i. Digit loss is imminent.
        ii. Ischemic ulceration and **NO** segmental temperature change
        iii. Ischemic ulceration with painful ischemia
        iv. Perfusion loss is acute **AND** sustained when acral ulceration is present or absent.
    b. Post revascularization procedure with recurrent symptoms and ultrasound is non-diagnostic or indeterminate.

c. Ulcers are known and vascular cause is suspected, when ultrasound is abnormal, non-diagnostic or indeterminate.

d. Vasculopathy (including Buerger disease and Raynaud's phenomenon) is suspected or known **AND** symptomatic when ultrasound is abnormal and treatment planning depends on results.

3. Hemodialysis graft dysfunction evaluation when ultrasound is non-diagnostic or indeterminate **AND** treatment depends on imaging results. [14] [12]
4. Peri-procedural care to guide pre-procedure, invasive procedure planning or post-procedural follow-up.
5. Prior CTA upper extremity 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.*)
6. Traumatic injury is known and arterial injury is suspected, based on clinical finding. [10] [4]
7. Vascular disease and **EITHER** of the following: [11] [19] [5]
   a. Vascular disease is suspected, prior ultrasound is abnormal, non-diagnostic or indeterminate, for **ANY** of the following:
      i. Aneurysm [16]
      ii. Stenosis/occlusions
      iii. Trauma
      iv. Tumor invasion
      v. Vasculitis [1]
   b. Vascular disease is known, for evaluation.
8. Vascular malformation evaluation and **ANY** of the following: (*__NOTE__: *MRA is preferred, however CTA may be useful in delineating high flow lesions [eg, arteriovenous malformation].*) [18] [6] [2]
   a. High flow lesion is suspected or known.
   b. Prior ultrasound is non-diagnostic or indeterminate.
   c. Ultrasound is completed and results will change management.

CTA/CTV Extremities: Special Circumstances

Computed tomography angiography/computed tomography venography (CTA/CTV) of the extremities may be indicated for **ANY** of the following special circumstances:

1. Arterial obstruction, acute, is suspected. (*__NOTE__: *Arteriography is preferred [gold standard].*) [17] [7]
2. Bypass graft evaluation when ultrasound is non-diagnostic or indeterminate. [12] [14]
3. Renal impairment is known and **ANY** of the following:
    a. On dialysis (*__NOTE:__ *CTA with contrast should be ordered*.)
    b. **NOT** on dialysis and **ANY** of the following:
        i. Impairment is mild to moderate (glomerular filtration rate [GFR] of 30 ml/min to 45 ml/min) (*__NOTE:__ *magnetic resonance angiography (MRA) should be ordered*.)
        ii. Impairment is severe, (GFR is less than 30 ml/min). (*__NOTE__: *MRA without contrast should be ordered.*)

CTA General Contraindications

Computed tomography angiography (CTA) is contraindicated for **ANY** of the following: [3] [8] [21]

- Contrast allergy
- Heart failure is decompensated.
- Hemodynamic instability (eg, abnormal laboratory values, blood pressure instability)
- Renal impairment (glomerular filtration rate is 30 mL/min/1.73m^2)
- Protocol can **NOT** be followed (eg, technical or related to individual).

CTA/CTV Upper Extremities Procedure Codes

Table 1. CTA Upper Extremities Associated Procedure Codes

CODE	DESCRIPTION
73206	Computed tomographic angiography, upper extremity, with contrast material(s), including noncontrast images, if performed, and image postprocessing

CTA Upper Extremities Summary of Changes

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

- Added the following to keep in line with current research:
    - "Hemodialysis graft" indication
    - Indications under "Vascular malformation"
    - "Prior CTA upper extremities" indication

- Citations updated per the evidence.
- Mid-cycle update: added Pediatric Preamble

CTA/CTV Upper Extremities Definitions

Acral is the body part that is furthest from the center (eg, at the ends of the arms or the legs).
Aneurysm refers to weakness in an artery wall, allowing it to abnormally balloon out or widen.
Arteriovenous fistula (AVF) is an abnormal connection between an artery and a vein. It happens when one or more arteries are directly connected to one or more veins or venous spaces called sinuses.
Arteriovenous malformation (AVM) is a tangle of abnormal blood vessels connecting arteries and veins.
Buerger's disease (also known as thromboangiitis obliterans) affects blood vessels in the body, most commonly in the arms and legs. Blood vessels swell, which can prevent blood flow, causing clots to form. This can lead to pain, tissue damage, and even gangrene (the death or decay of body tissues).
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 matierial.
Embolism is an obstruction of an artery, typically by a clot of blood or an air bubble.
Hemodialysis is a medical procedure that removes waste products and fluid from the blood. It also corrects electrolyte imbalances. Hemodialysis is used to treat both acute and chronic kidney failure.
Indeterminate findings are inconclusive or insufficient for treatment planning.
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.
Magnetic resonance angiogram (MRA) is a test that uses a magnetic field and pulses of radio wave energy to provide images of blood vessels inside the body, allowing for evaluation of blood flow and blood vessel wall condition. MRA is used to look for aneurysms, clots, tears in the aorta, arteriovenous malformations and stenosis caused by plaque in the carotid arteries (neck) or blood vessels leading to the lungs, kidneys or legs.
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.

Raynaud's phenomenon/syndrome is a vascular disorder marked by recurrent spasm of the capillaries especially fingers and toes upon exposure to cold, characterized by pallor, cyanosis and redness in succession; usually accompanied by pain, and in severe cases can progress to localized gangrene.
Stenosis is a narrowing or constriction of the diameter of a bodily passage or orifice.
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.
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 a two-dimensional image 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.

CTA/CTV Upper Extremities References

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