

# Clinical Appropriateness Guidelines: Advanced Imaging

Appropriate Use Criteria: Pediatric Abdomen & Pelvis

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Proprietary

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# Description and Application of the Guidelines



AIM's Clinical Appropriateness Guidelines (hereinafter "AIM's Clinical Appropriateness Guidelines" or the "Guidelines") are designed to assist providers in making the most appropriate treatment decision for a specific clinical condition for an individual. As used by AIM, the Guidelines establish objective and evidence-based, where possible, criteria for medical necessity determinations. In the process, multiple functions are accomplished:

- To establish criteria for when services are medically necessary
- To assist the practitioner as an educational tool
- To encourage standardization of medical practice patterns
- To curtail the performance of inappropriate and/or duplicate services
- To advocate for patient safety concerns
- To enhance the quality of healthcare
- To promote the most efficient and cost-effective use of services

AIM's guideline development process complies with applicable accreditation standards, including the requirement that the Guidelines be developed with involvement from appropriate providers with current clinical expertise relevant to the Guidelines under review and be based on the most up to date clinical principles and best practices. Relevant citations are included in the "References" section attached to each Guideline. AIM reviews all of its Guidelines at least annually.

AIM makes its Guidelines publicly available on its website twenty-four hours a day, seven days a week. Copies of AIM's Clinical Appropriateness Guidelines are also available upon oral or written request. Although the Guidelines are publicly-available, AIM considers the Guidelines to be important, proprietary information of AIM, which cannot be sold, assigned, leased, licensed, reproduced or distributed without the written consent of AIM.

AIM applies objective and evidence-based criteria and takes individual circumstances and the local delivery system into account when determining the medical appropriateness of health care services. The AIM Guidelines are just guidelines for the provision of specialty health services. These criteria are designed to guide both providers and reviewers to the most appropriate services based on a patient's unique circumstances. In all cases, clinical judgment consistent with the standards of good medical practice should be used when applying the Guidelines. Guideline determinations are made based on the information provided at the time of the request. It is expected that medical necessity decisions may change as new information is provided or based on unique aspects of the patient's condition. The treating clinician has final authority and responsibility for treatment decisions regarding the care of the patient and for justifying and demonstrating the existence of medical necessity for the requested service. The Guidelines are not a substitute for the experience and judgment of a physician or other health care professionals. Any clinician seeking to apply or consult the Guidelines is expected to use independent medical judgment in the context of individual clinical circumstances to determine any patient's care or treatment.

The Guidelines do not address coverage, benefit or other plan specific issues. If requested by a health plan, AIM will review requests based on health plan medical policy/guidelines in lieu of AIM's Guidelines.

The Guidelines may also be used by the health plan or by AIM for purposes of provider education, or to review the medical necessity of services by any provider who has been notified of the need for medical necessity review, due to billing practices or claims that are not consistent with other providers in terms of frequency or some other manner.

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# Administrative Guideline: Ordering of Multiple Studies



Requests for multiple imaging studies to evaluate a suspected or identified condition and requests for repeated imaging of the same anatomic area are subject to additional review to avoid unnecessary or inappropriate imaging.

## Simultaneous Ordering of Multiple Studies

In many situations, ordering multiple imaging studies at the same time is not clinically appropriate because:

- Current literature and/or standards of medical practice support that one of the requested imaging studies is more appropriate in the clinical situation presented; or
- One of the imaging studies requested is more likely to improve patient outcomes based on current literature and/or standards of medical practice; or
- Appropriateness of additional imaging is dependent on the results of the lead study.

When multiple imaging studies are ordered, the request will often require a peer-to-peer conversation to understand the individual circumstances that support the medical necessity of performing all imaging studies simultaneously.

Examples of multiple imaging studies that may require a peer-to-peer conversation include:

- CT brain and CT sinus for headache
- MRI brain and MRA brain for headache
- MRI cervical spine and MRI shoulder for pain indications
- MRI lumbar spine and MRI hip for pain indications
- MRI or CT of multiple spine levels for pain or radicular indications
- MRI foot and MRI ankle for pain indications
- Bilateral exams, particularly comparison studies

There are certain clinical scenarios where simultaneous ordering of multiple imaging studies is consistent with current literature and/or standards of medical practice. These include:

- Oncologic imaging – Considerations include the type of malignancy and the point along the care continuum at which imaging is requested
- Conditions which span multiple anatomic regions – Examples include certain gastrointestinal indications or congenital spinal anomalies

## Repeated Imaging

In general, repeated imaging of the same anatomic area should be limited to evaluation following an intervention, or when there is a change in clinical status such that imaging is required to determine next steps in management. At times, repeated imaging done with different techniques or contrast regimens may be necessary to clarify a finding seen on the original study.

Repeated imaging of the same anatomic area (with same or similar technology) may be subject to additional review in the following scenarios:

- Repeated imaging at the same facility due to motion artifact or other technical issues
- Repeated imaging requested at a different facility due to provider preference or quality concerns
- Repeated imaging of the same anatomic area (MRI or CT) based on persistent symptoms with no clinical change, treatment, or intervention since the previous study
- Repeated imaging of the same anatomical area by different providers for the same member over a short period of time

# Administrative Guideline: Pre-Test Requirements



Critical to any finding of clinical appropriateness under the guidelines for specific imaging exams is a determination that the following are true with respect to the imaging request:

- A clinical evaluation has been performed prior to the imaging request (which should include a complete history and physical exam and review of results from relevant laboratory studies, prior imaging and supplementary testing) to identify suspected or established diseases or conditions.
- **For suspected diseases or conditions:**
  - Based on the clinical evaluation, there is a reasonable likelihood of disease prior to imaging; and
  - Current literature and standards of medical practice support that the requested imaging study is the most appropriate method of narrowing the differential diagnosis generated through the clinical evaluation and can be reasonably expected to lead to a change in management of the patient; and
  - The imaging requested is reasonably expected to improve patient outcomes based on current literature and standards of medical practice.
- **For established diseases or conditions:**
  - Advanced imaging is needed to determine whether the extent or nature of the disease or condition has changed; and
  - Current literature and standards of medical practice support that the requested imaging study is the most appropriate method of determining this and can be reasonably expected to lead to a change in management of the patient; and
  - The imaging requested is reasonably expected to improve patient outcomes based on current literature and standards of medical practice.
- If these elements are not established with respect to a given request, the determination of appropriateness will most likely require a peer-to-peer conversation to understand the individual and unique facts that would supersede the pre-test requirements set forth above. During the peer-to-peer conversation, factors such as patient acuity and setting of service may also be taken into account.

# Computed Tomography (CT) Abdomen – Pediatrics



## CPT Codes

- 74150..... CT abdomen; without contrast
- 74160..... CT abdomen; with contrast
- 74170..... CT abdomen; without contrast, followed by re-imaging with contrast

## Standard Anatomic Coverage

- Diaphragmatic dome to iliac crests
- Scan coverage may vary, depending on the specific clinical indication, but generally extends from the diaphragm to the iliac crests

## Technology Considerations

- Abdominal ultrasound should generally be obtained prior to advanced imaging when evaluating for disease in the hepatobiliary system, pancreas, spleen, kidneys, and in some circumstances bowel (for example, appendicitis and intussusception).
- Abdominal radiographs can evaluate for bowel obstruction, line and catheter placement, abnormal calcification, pneumoperitoneum, and suggest many other pediatric abdominal abnormalities.

## Common Diagnostic Indications

This section contains general abdominal, hepatobiliary, pancreatic, gastrointestinal, genitourinary, splenic, and vascular indications.

**General Abdominal – Whenever possible, guidelines in this section should be superseded by more specific guidelines in subsequent sections**

### Abdominal mass

(any one of the following)

- Following non-diagnostic ultrasound
- Palpable on exam

**Note:** *Ultrasound is suggested as the initial imaging modality when evaluating a palpable abdominal mass. Evaluation depends on location of the mass and age of the patient. See separate indications for **Focal liver lesion**, **Pancreatic mass**, **Genitourinary** (renal and adrenal), and **Pelvic mass**.*

### Abdominal pain

- Following non-diagnostic ultrasound (**any one** of the following)
  - Evaluation of acute abdominal pain when pain is unexplained by clinical findings, physical examination, or other imaging studies
  - Evaluation of chronic or recurrent abdominal pain when a red flag sign is present (see **Table** below)

**Note:** *Acute pain is defined as new onset pain within the past 30 days. Chronic pain is defined as pain lasting more than 30 days; recurrent pain refers to three (3) or more episodes of pain over a period of three (3) or more months. For family history of clinical evidence for **Inflammatory bowel disease (IBD)**, see separate indication.*

#### Red flag signs for evaluation of abdominal pain

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Chronic severe diarrhea (at least three (3) watery stools per day for more than two weeks)</li> <li>• Deceleration of linear growth</li> <li>• Fever of unknown origin</li> <li>• Gastrointestinal bleeding</li> <li>• History of a genetic or congenital syndrome</li> </ul> | <ul style="list-style-type: none"> <li>• Immunocompromised</li> <li>• Involuntary weight loss</li> <li>• Persistent focal abdominal pain, especially right upper or right lower quadrant</li> <li>• Persistent vomiting</li> </ul> |
|--|--|

# Common Diagnostic Indications

Abnormality detected on other imaging study which requires additional clarification to direct treatment

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## Ascites

- For diagnosis and surveillance following non-diagnostic ultrasound
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## Congenital anomaly

**Note:** For congenital anomalies not discussed elsewhere in this guideline

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## Fever of unknown origin

(any **one** of the following)

- Lasting more than three (3) weeks following standard work-up (such as chest x-ray, urine, and/or blood work) to localize the source
  - Immunocompromised patient (any **one** of the following)
    - Chronic steroid use
    - Dialysis patients
    - Immune defects
    - Neutropenia
    - Use of an immune-blocking biologic agent
- 

## Gastrointestinal bleeding

- Following non-diagnostic endoscopy, colonoscopy, or upper/lower GI series
- 

## Hematoma/hemorrhage

**Note:** Includes hemoperitoneum and retroperitoneal bleed. See separate indication for **gastrointestinal bleeding**.

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## Hernia

- Following non-diagnostic ultrasound (any **one** of the following)
  - Diagnosis of a hernia with suspected complications
  - Pre-surgical planning

**Note:** Includes femoral, internal, inguinal, spigelian, ventral, and incisional hernias

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## Infectious or inflammatory process

(any **one** of the following)

- Abscess
  - Diffuse inflammation/phlegmon
  - Fistula
- 

## Lower extremity edema, diffuse and unexplained

**Note:** For female patients, to exclude an occult lesion causing mass effect, vascular compression, or intraluminal thrombi, ultrasound should be considered as the initial imaging modality

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## Post-operative or post-procedure evaluation

**Note:** For post-operative evaluation of conditions not specifically referenced elsewhere in this guideline

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## Preoperative or pre-procedure evaluation

**Note:** For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline

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## Retroperitoneal abnormality

(any **one** of the following)

- Fibrosis
  - Inflammation
  - Neoplasm
-

# Common Diagnostic Indications

## Trauma

- Following significant blunt or penetrating injury to the abdomen

## Tumor, benign or malignant

(any **one** of the following)

- Diagnosis or management of benign neoplasms
- Diagnosis, management, or surveillance of malignant or indeterminate neoplasms

**Note:** *This indication applies only to tumors not otherwise listed in this guideline.*

## Hepatobiliary

### Acute cholecystitis

- Following clinical examination and non-diagnostic ultrasound for the evaluation of right upper quadrant pain when concerned for complications of acute cholecystitis

### Congenital anomaly of the hepatobiliary system

- Clinically suspected and following non-diagnostic ultrasound (any **one** of the following)
  - Biliary hamartoma (von Meyenburg complex)
  - Caroli's disease
  - Congenital hepatic fibrosis
  - Polycystic liver disease
  - Primary sclerosing cholangitis

**Note:** *For biliary atresia, see separate indication for Neonatal jaundice: biliary atresia and neonatal hepatitis. MRCP is a better modality for visualizing abnormalities of the biliary tree.*

### Elevated liver transaminases

- Following non-diagnostic ultrasound

**Note:** *Includes both alanine transaminase (ALT) and aspartate transaminase (AST). In patients taking medications known to cause elevated liver transaminases, these medications should be stopped when possible and liver panels repeated prior to performing advanced imaging (examples include statins for hyperlipidemia, acetaminophen, NSAIDs, Dilantin®, protease inhibitors, and sulfonamides). When appropriate, additional diagnostic labs such as hepatitis panel and serum alpha fetoprotein should be considered.*

### Focal liver lesion characterization

(any **one** of the following)

- Diagnosis, management (including staging), and surveillance of malignant neoplasms (any **one** of the following)
  - Hepatoblastoma
  - Hepatocellular carcinoma
  - Metastasis including neuroblastoma
  - Rhabdomyosarcoma
- Diagnosis or management of benign neoplasms following non-diagnostic ultrasound (any **one** of the following)
  - Focal nodular hyperplasia
  - Hemangioma (generally diagnosis)
  - Hepatic adenoma
  - Infantile hemangioendothelioma
  - Mesenchymal hamartoma

**Note:** *A simple liver cyst with benign characteristics on ultrasound may not require advanced imaging or surveillance.*

## Hepatomegaly

- Following non-diagnostic ultrasound when hepatic enlargement is clinically suspected or worsening

# Common Diagnostic Indications

## Jaundice

(**All** of the following)

- Abnormal liver function tests (elevated transaminases)
- Following non-diagnostic ultrasound
- Unexplained icterus (jaundice)

**Note:** For jaundice in newborn babies, see **Neonatal jaundice** in the CT not indicated section below.

## Pancreatic

### Acute pancreatitis

- With suspected complications (**any one** of the following)
  - Abscess
  - Pancreatic necrosis
  - Peri-pancreatic fluid
  - Pseudocyst
  - Vascular: portal vein thrombosis or pseudoaneurysm

**Note:** Patients with mild acute, uncomplicated pancreatitis usually do not require cross-sectional imaging, aside from ultrasound identification of gallstones and/or biliary ductal calculi.

### Congenital anomaly of the pancreas

- Clinically suspected or following non-diagnostic ultrasound

**Note:** Examples include agenesis of the pancreas, annular pancreas, pancreas divisum, nesidioblastosis

### Pancreatic mass

**Note:** CT pancreas with pancreatic protocol is indicated. MRI pancreas may be performed as an alternative study.

### Pancreatic pseudocyst

(**All** of the following)

- Following non-diagnostic ultrasound
- Patient with prior history of pancreatitis or pancreatic trauma

**Note:** For a patient with known pancreatic pseudocyst requiring follow-up surveillance, ultrasound should be considered as the initial imaging modality.

## Gastrointestinal

### Appendiceal or periappendiceal mass

- Unexplained on physical exam and other imaging study

### Appendicitis

(**any one** of the following)

- Evaluation of suspected appendicitis following non-diagnostic ultrasound (unless ultrasound is not available or expected to be limited due to body habitus)
- Failure of non-surgical treatment
- Post-operative complications

### Bowel obstruction

- Following non-diagnostic radiograph

# Common Diagnostic Indications

## Congenital anomaly of the gastrointestinal system

- When clinically suspected (**any one** of the following)
  - Anorectal malformations
  - Gastrointestinal duplication cyst
  - Gastroschisis and omphalocele

**Note:** CT imaging is not generally indicated in the following congenital anomalies: Meckel's diverticulum, Hirschsprung's disease, pyloric stenosis, small left colon, jejunal or ileal stenosis. For alternative imaging modalities for these clinical situations, please see the "CT not indicated" section below.

## Constipation

- Following non-diagnostic radiograph when there is difficulty with defecation persisting for two or more weeks (**any one of the following**):
  - When symptoms persist after a course of medical management
  - When there are red flag signs (see **table** below)

### Red flag signs for evaluation of constipation

(**any one of the following**)

- Failure to thrive
- Fever
- Following barium enema or anal manometry when there is suspicion for (**any one of the following**)
  - Anal stenosis
  - Impaction in patients less than 1 year of age
  - Tight empty rectum
- Vomiting

## Enteritis and/or colitis

**Note:** Includes neutropenic colitis and radiation enteritis

## Foreign body

- Following non-diagnostic radiograph when there is a high clinical suspicion

## Henoch-Schonlein Purpura (HSP)

## Inflammatory bowel disease (IBD)

### Diagnosis

- Evaluation of suspected Crohn's disease following non-diagnostic upper and lower endoscopy

### Management

- Evaluation of new or worsening symptoms to confirm exacerbation or evaluate for complications, including stricture, abscess or fistula

## Intussusception

(**any one of the following**)

- Following intussusception reduction
- Following non-diagnostic ultrasound

## Ischemic bowel

**Note:** For necrotizing enterocolitis (NEC), radiographs are the diagnostic modality of choice.

# Common Diagnostic Indications

## Genitourinary

### Adrenal hemorrhage

(any **one** of the following)

- Following non-diagnostic ultrasound
- History of trauma

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### Adrenal mass/lesion

(any **one** of the following)

- For characterization of an indeterminate adrenal mass (identified on prior imaging), such as a benign adenoma versus a metastatic deposit
- In neonatal patients, following non-diagnostic ultrasound
- When there is biochemical evidence of an adrenal endocrine abnormality

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### Congenital anomaly of the genitourinary system

- Diagnosis or management following non-diagnostic ultrasound (any **one**♦ of the following):
  - Beckwith-Wiedemann syndrome
  - Bladder and cloacal exstrophy
  - Characterization of a ureterocele
  - Confirmation of the location, structure, and position of the ureters
  - Congenital adrenal hyperplasia
  - Congenital uterovaginal junction (UJ) or ureterovesical junction (UVJ) obstruction
  - Duplex collecting system
  - Management of complications (including infection, urachal carcinoma)
  - Megaureter
  - Pre-operative planning
  - Prune-belly syndrome
  - Renal and adrenal agenesis
  - Renal ectopy (includes crossed fused renal ectopy, horseshoe and pancake kidney)
  - Renal hypoplasia
  - Urachal anomalies (includes patent urachus, urachal cyst, and urachal umbilical sinus)

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### Hematuria

- Following non-diagnostic ultrasound when hematuria is persistent

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### Hydronephrosis

- Following non-diagnostic ultrasound

**Note:** This also includes pyonephrosis, although this is typically a medical emergency.

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### Neoplasm, genitourinary

(any **one** of the following)

- Diagnosis, management, and surveillance of the following malignant tumors (any **one**♦ of the following)
  - Renal (lymphoma, multicystic dysplastic kidney, renal cell carcinoma, or Wilm's tumor)
  - Adrenal (adrenocortical carcinoma, neuroblastoma, or pheochromocytoma)
- Diagnosis and management of the following benign renal neoplasms (angiomyolipoma, multilocular cystic nephroma, or nephroblastomatosis) following non-diagnostic ultrasound

**Note:** Consider ultrasound evaluation for follow up particularly with benign tumors.

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### Nephrocalcinosis

- Following non-diagnostic ultrasound

## Common Diagnostic Indications

### Polycystic kidney disease (PKD)

- Following non-diagnostic ultrasound

**Note:** Includes autosomal dominant (ADPKD) and autosomal recessive (ARPKD) polycystic kidney disease

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### Pyelonephritis

(any **one** of the following)

- Diagnosis of acute complicated pyelonephritis when patient has failed to respond to 72 hours of antibiotic therapy
- Evaluate response to therapy when clinically uncertain

**Note:** Includes complications of acute pyelonephritis, such as emphysematous pyelonephritis and renal abscess

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### Renal mass/lesion requiring further characterization

- Following non-diagnostic ultrasound when lesion does not meet criteria for a simple cyst

**Note:** A simple cyst is defined as having all of the following characteristics: anechoic, circumscribed, thin walled, and posterior acoustic enhancement.

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### Undescended testicle (cryptorchidism)

- Following evaluation with ultrasound
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### Urinary tract calculus

(any **one** of the following)

- Following non-diagnostic ultrasound
  - Following non-diagnostic kidney, ureter, and bladder (KUB) radiograph
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### Xanthogranulomatous pyelonephritis (XPN)

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## Splenic

### Congenital splenic anomaly

(any **one** of the following)

- Asplenia
- Polysplenia
- Splenosis and wandering spleen

**Note:** Accessory spleen (splenule) is a common incidental congenital variant that does not require follow up

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### Splenic hematoma

(any **one** of the following)

- Parenchymal
  - Perisplenic
  - Subcapsular
- 

### Splenic lesion

- Indeterminate on prior imaging (such as ultrasound)

**Note:** Splenic hemangioma is the most common benign splenic tumor and may be followed with splenic ultrasound

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### Splenomegaly

- Following non-diagnostic ultrasound for clinically suspected or worsening splenic enlargement
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# Common Diagnostic Indications

## Vascular

### Aneurysm of the abdominal aorta

- Following non-diagnostic ultrasound and (**any one of the following**)
  - Annual screening in patients with connective tissue disease
  - Follow-up imaging of patients with an established aneurysm/dilation
  - Suspected complication of an aneurysm/dilation
  - Pre/post-operative

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### Aortic dissection

**Note:** *May evaluate with either CT or CTA. Usually results from subdiaphragmatic extension of a thoracic aortic dissection*

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### Thrombosis in the systemic and portal venous circulations

- Following initial evaluation with inconclusive Doppler ultrasound

## CT is generally not indicated in the following clinical situations

The indications listed in this section generally do not require advanced imaging using CT. If there are circumstances that require CT imaging, a peer-to-peer discussion may be required.

### Cystic liver disease

**Note:** *Includes congenital and acquired cysts. Ultrasound is usually sufficient.*

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### Failure to thrive

**Note:** *Chronic condition which is not typically evaluated with advanced imaging.*

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### Gastroenteritis

**Note:** *Imaging is generally not indicated.*

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### Hirschsprung's disease (congenital aganglionosis)

**Note:** *Barium enema and radiography are the radiologic modalities of choice.*

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### Hypospadias

**Note:** *Voiding cystourethrogram is the modality of choice.*

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### Irritable bowel syndrome (IBS)

**Note:** *IBS is a clinical diagnosis. If indicated, plain films and fluoroscopy are the imaging modalities of choice. Advanced imaging is not indicated.*

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### Jejunal or ileal stenosis

**Note:** *Upper gastrointestinal fluoroscopy and radiography are the radiologic modalities of choice.*

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### Meckel's diverticulum or diverticulitis

**Note:** *Meckel's scan is the diagnostic modality of choice. For follow up of an established diagnosis when there are new or worsening symptoms, see indication for infectious or inflammatory process.*

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### Midgut volvulus

**Note:** *Emergent condition, not for outpatient workup. Upper gastrointestinal fluoroscopy and radiography are the diagnostic modalities of choice.*

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### Neonatal jaundice: biliary atresia and neonatal hepatitis

**Note:** *For cases of biliary atresia or neonatal hepatitis, ultrasound and nuclear scintigraphy are the diagnostic imaging modalities of choice.*

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### Posterior urethral valve

**Note:** *Voiding cystourethrogram is the modality of choice.*

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### Pyloric stenosis

**Note:** *Ultrasound and fluoroscopy are the radiologic modalities of choice.*

## Common Diagnostic Indications

### Small left colon syndrome

**Note:** Barium enema and radiography are the radiologic modalities of choice.

### Urinary tract infection

**Note:** In infants and children under 5 years, ultrasound, voiding cystourethrogram (VCUG), and renal scans (technetium-99-dimercaptosuccinic acid [DMSA]), as needed, are used to diagnose and manage urinary tract infections.

**Note:** In children age 5 years and older, advanced imaging is not indicated in the evaluation of a simple urinary tract infection, but could be considered when there is concern for complicated pyelonephritis.

**Note:** For pyelonephritis, see separate indication.

### Vesicoureteral reflux

**Note:** Voiding cystourethrogram, followed by ultrasound, is generally sufficient.

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# Magnetic Resonance Imaging (MRI)

## Abdomen – Pediatrics



### CPT Codes

- 74181..... MRI of abdomen, without contrast
- 74182..... MRI of abdomen, with contrast
- 74183..... MRI of abdomen, without contrast, followed by re-imaging with contrast

### Standard Anatomic Coverage

- Scan coverage depends on the specific clinical indication for the abdominal MRI. General landmarks extend from the diaphragmatic dome to the iliac crests

### Technology Considerations

- Abdominal MRI studies are usually targeted for further evaluation of indeterminate or questionable findings, identified on more standard imaging exams such as ultrasound and CT.
- For evaluation of vascular abnormalities such as renal artery stenosis and celiac/superior mesenteric artery stenosis (in chronic mesenteric ischemia), Doppler ultrasound, MRA or CTA should be considered as the preferred imaging modalities.
- The CPT code assignment for an MRI procedure is based on the anatomic area imaged. Requests for multiple MRI studies of the same anatomic area to address patient positional changes, additional sequences or equipment are not allowed. These variations or extra sequences are included within the original imaging request.
- For pediatric patients, MRI may be the preferred imaging modality in a number of clinical circumstances given its lack of ionizing radiation and excellent soft tissue contrast. However, MRI may require sedation and is more predisposed to artifacts.

### Common Diagnostic Indications

**General Abdominal – Whenever possible, guidelines in this section should be superseded by more specific guidelines in subsequent sections**

#### Abdominal mass

(any **one** of the following)

- Following non-diagnostic ultrasound
- Palpable on exam

**Note:** *Ultrasound is suggested as the initial imaging modality when evaluating a palpable abdominal mass. Evaluation depends on location of the mass and age of the patient. See separate indications for **Focal liver lesion, Pancreatic mass, Genitourinary (renal and adrenal), and Pelvic mass.***

#### Abdominal pain

- Following non-diagnostic ultrasound (**any one** of the following)
  - Evaluation of acute abdominal pain when pain is unexplained by clinical findings, physical examination, or other imaging studies
  - Evaluation of chronic or recurrent abdominal pain when a red flag sign is present (see **Table** below)

**Note:** *Acute pain is defined as new onset pain within the past 30 days. Chronic pain is defined as pain lasting more than 30 days; recurrent pain refers to three (3) or more episodes of pain over a period of three (3) or more months. For family history of clinical evidence for **Inflammatory bowel disease (IBD)**, see separate indication*

Red flag signs for evaluation of abdominal pain	
<ul style="list-style-type: none"> <li>• Chronic severe diarrhea (at least three (3) watery stools per day for more than two weeks)</li> <li>• Deceleration of linear growth</li> <li>• Fever of unknown origin</li> <li>• Gastrointestinal bleeding</li> <li>• History of a genetic or congenital syndrome</li> </ul>	<ul style="list-style-type: none"> <li>• Immunocompromised</li> <li>• Involuntary weight loss</li> <li>• Persistent focal abdominal pain, especially right upper or right lower quadrant</li> <li>• Persistent vomiting</li> </ul>

# Common Diagnostic Indications

## Abnormality detected on other imaging study which requires additional clarification to direct treatment

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### Ascites

- For diagnosis and surveillance following non-diagnostic ultrasound
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### Congenital anomaly

**Note:** For congenital anomalies not discussed elsewhere in this guideline

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### Contraindication to CT

- Patient meets criteria for CT exam but CT is expected to be limited due to contraindications (such as a history of allergic reaction to iodinated radiographic contrast material)
- 

### Fever of unknown origin

(any **one** of the following)

- Lasting more than three (3) weeks following standard work-up (such as chest x-ray, urine, and/or blood work) to localize the source
  - Immunocompromised patient (**any one** of the following)
    - Chronic steroid use
    - Dialysis patients
    - Immune defects
    - Neutropenia
    - Use of an immune-blocking biologic agent
- 

### Hernia

- Following non-diagnostic ultrasound (**any one** of the following)
  - Diagnosis of a hernia with suspected complications
  - Pre-surgical planning

**Note:** Includes femoral, internal, inguinal, spigelian, ventral, and incisional hernias

---

### Infectious or inflammatory process

(any **one** of the following)

- Abscess
  - Diffuse inflammation/phlegmon
  - Fistula
- 

### Post-operative or post-procedure evaluation

**Note:** For post-operative evaluation of conditions not specifically referenced elsewhere in this guideline

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### Preoperative or pre-procedure evaluation

**Note:** For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline

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### Retroperitoneal abnormality

(any **one** of the following)

- Fibrosis
  - Inflammation
  - Neoplasm
- 

### Tumor, benign or malignant

(any **one** of the following)

- Diagnosis or management of benign neoplasms
- Diagnosis, management, or surveillance of malignant or indeterminate neoplasms

**Note:** This indication applies only to tumors not otherwise listed in this guideline.

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# Common Diagnostic Indications

## Hepatobiliary

### Acute cholecystitis

- Following clinical examination and non-diagnostic ultrasound for the evaluation of right upper quadrant pain when concerned for complications of acute cholecystitis

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### Congenital anomaly of the hepatobiliary system

- Clinically suspected and following non-diagnostic ultrasound (**any one** of the following)
  - Biliary hamartoma (von Meyenburg complex)
  - Caroli's disease
  - Congenital hepatic fibrosis
  - Polycystic liver disease
  - Primary sclerosing cholangitis

**Note:** For biliary atresia, see **Neonatal jaundice** in the MRI not indicated section below. MRCP is a better modality for visualizing abnormalities of the biliary tree.

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### Diffuse liver disease

- Following non-diagnostic ultrasound or CT

**Note:** Includes the following hepatic disorders: Chronic hepatitis, cirrhosis, glycogen storage diseases, hemochromatosis, Wilson's disease.

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### Elevated liver transaminases

- Following non-diagnostic ultrasound

**Note:** Includes both alanine transaminase (ALT) and aspartate transaminase (AST). In patients taking medications known to cause elevated liver transaminases, these medications should be stopped when possible and liver panels repeated prior to performing advanced imaging (examples include statins for hyperlipidemia, acetaminophen, NSAIDs, Dilantin®, protease inhibitors, and sulfonamides). When appropriate, additional diagnostic labs such as hepatitis panel and serum alpha fetoprotein should be considered.

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### Focal liver lesion characterization

(**any one** of the following)

- Diagnosis, management (including staging), and surveillance of malignant neoplasms (**any one** of the following)
  - Hepatoblastoma
  - Hepatocellular carcinoma
  - Metastasis including neuroblastoma
  - Rhabdomyosarcoma
- Diagnosis or management of benign neoplasms following non-diagnostic ultrasound (**any one** of the following)
  - Focal nodular hyperplasia
  - Hemangioma (generally diagnosis)
  - Hepatic adenoma
  - Infantile hemangioendothelioma
  - Mesenchymal hamartoma

**Note:** A simple liver cyst with benign characteristics on ultrasound may not require advanced imaging or surveillance

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### Hepatomegaly

- For clinically suspected or worsening hepatic enlargement following non-diagnostic ultrasound

# Common Diagnostic Indications

## Jaundice

(**All** of the following)

- Abnormal liver function tests (elevated transaminases)
- Following non-diagnostic ultrasound
- Unexplained icterus (jaundice)

**Note:** For jaundice in newborn babies, see **Neonatal jaundice** in the MRI not indicated section below.

## Pancreatic

### Acute pancreatitis

- With suspected complications (**any one** of the following)
  - Abscess
  - Pancreatic necrosis
  - Peri-pancreatic fluid
  - Pseudocyst
  - Vascular: portal vein thrombosis or pseudoaneurysm

**Note:** Patients with mild acute, uncomplicated pancreatitis usually do not require cross-sectional imaging, aside from ultrasound identification of gallstones and/or biliary ductal calculi.

### Congenital anomaly of the pancreas

- Clinically suspected or following non-diagnostic ultrasound

**Note:** Examples include agenesis of the pancreas, annular pancreas, pancreas divisum, nesidioblastosis.

### Pancreatic mass

**Note:** CT pancreas with pancreatic protocol is indicated. MRI pancreas may be performed as an alternative study

### Pancreatic pseudocyst

(**All** of the following)

- Following non-diagnostic ultrasound
- Patient with prior history of pancreatitis or pancreatic trauma

**Note:** For a patient with a known pancreatic pseudocyst requiring follow-up surveillance, ultrasound should be considered as the initial imaging modality.

## Gastrointestinal

### Appendiceal or periappendiceal mass

- Unexplained on physical exam and other imaging studies

### Appendicitis

(**any one** of the following)

- Diagnosis following non-diagnostic ultrasound (unless ultrasound is not an available modality)
- Failure of non-surgical treatment
- Post-operative complications

### Bowel obstruction

- Following non-diagnostic radiograph

## Common Diagnostic Indications

### Congenital anomaly of the gastrointestinal system

- When clinically suspected (**any one** of the following)
  - Anorectal malformations
  - Gastrointestinal duplication cyst
  - Gastroschisis and omphalocele

**Note:** MRI imaging is not indicated in the following congenital anomalies: Meckel's diverticulum, Hirschsprung's disease, pyloric stenosis, small left colon, jejunal stenosis, or ileal stenosis. For alternative imaging modalities for these clinical situations, please see the "MRI not indicated" section below.

### Constipation

- Following non-diagnostic radiograph when there is difficulty with defecation persisting for two or more weeks (**any one of the following**)
  - When symptoms persist after a course of medical management
  - When there are red flag signs (see table below)

#### Red flag signs for evaluation of constipation

(**any one of the following**)

- Failure to thrive
- Fever
- Following barium enema or anal manometry when there is suspicion for (**any one of the following**)
  - Anal stenosis
  - Impaction in patients less than 1 year of age
  - Tight empty rectum
- Vomiting

### Henoch Schonlein Purpura (HSP)

### Inflammatory bowel disease (IBD)

#### Diagnosis

- Evaluation of suspected Crohn's disease following non-diagnostic upper and lower endoscopy

#### Management

- Evaluation of new or worsening symptoms to confirm exacerbation or evaluate for complications, including stricture, abscess or fistula

## Genitourinary

### Adrenal hemorrhage

(**any one of the following**)

- Following non-diagnostic ultrasound
- History of trauma

### Adrenal mass/lesion

(**any one of the following**)

- For characterization of an indeterminate adrenal mass identified on prior imaging (such as a benign adenoma versus a metastatic deposit)
  - Neonatal patients, following non-diagnostic ultrasound
- When there is biochemical evidence of an adrenal endocrine abnormality
  - Neonatal patients, following non-diagnostic ultrasound

# Common Diagnostic Indications

## Congenital anomaly of the genitourinary system

- Diagnosis or management following non-diagnostic ultrasound (**any one** of the following):
  - Beckwith-Wiedemann syndrome
  - Bladder and cloacal exstrophy
  - Characterization of a ureterocele
  - Confirmation of the location, structure, and position of the ureters
  - Congenital adrenal hyperplasia
  - Congenital uteropelvic junction (UPJ) or ureterovesical junction (UVJ) obstruction
  - Duplex collecting system
  - Management of complications (including infection, urachal carcinoma)
  - Megaureter
  - Pre-operative planning
  - Prune-belly syndrome
  - Renal and adrenal agenesis
  - Renal ectopy (includes crossed fused renal ectopy, horseshoe and pancake kidney)
  - Renal hypoplasia
  - Urachal anomalies (includes patent urachus, urachal cyst, and urachal umbilical sinus)

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## Hematuria

- Following non-diagnostic ultrasound when hematuria is persistent

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## Hydronephrosis

- Following non-diagnostic ultrasound

**Note:** This also includes pyonephrosis, which is typically handled as a medical emergency

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## Polycystic kidney disease (PKD)

- Following non-diagnostic ultrasound

**Note:** Includes autosomal dominant (ADPKD) and autosomal recessive (ARPKD) disease

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## Neoplasm, genitourinary

(**any one** of the following)

- Diagnosis, management, and surveillance of the following malignant tumors (**any one** of the following)
  - Renal (lymphoma, multicystic dysplastic kidney, renal cell carcinoma, or Wilm's tumor)
  - Adrenal (adrenocortical carcinoma, neuroblastoma, or pheochromocytoma)
- Diagnosis and management of the following benign renal neoplasms (angiomyolipoma, multilocular cystic nephroma, or nephroblastomatosis) following non-diagnostic ultrasound

**Note:** Consider ultrasound evaluation for follow up particularly with benign tumors

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## Renal mass/lesion requiring further characterization

- Following non-diagnostic ultrasound when lesion does not meet criteria for a simple cyst

**Note:** A simple cyst is defined as having all of the following characteristics: anechoic, circumscribed, thin walled, and posterior acoustic enhancement.

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## Undescended testicle (cryptorchidism)

- Following non-diagnostic ultrasound

# Common Diagnostic Indications

## Splenic

### Congenital splenic anomaly

(any **one**♦ of the following)

- Asplenia
- Polysplenia
- Splenosis and wandering spleen

**Note:** *Accessory spleen (splenule) is a common incidental congenital variant that does not require follow up.*

### Splenic hematoma

(any **one** of the following)

- Parenchymal
- Perisplenic
- Subcapsular

### Splenic lesion

- Non-diagnostic on prior imaging (such as ultrasound)

**Note:** *Splenic hemangioma is the most common benign splenic tumor and may be followed with splenic ultrasound.*

### Splenomegaly

- Following non-diagnostic ultrasound for clinically suspected or worsening splenic enlargement

## MRI is generally not indicated in the following clinical situations

The indications listed in this section generally do not require advanced imaging using MRI. If there are circumstances that require MRI imaging, a peer-to-peer discussion may be required.

### Cystic liver disease

**Note:** *Includes congenital and acquired cysts. Ultrasound is usually sufficient.*

### Failure to thrive

**Note:** *Chronic condition which is not typically evaluated with advanced imaging*

### Gastroenteritis

**Note:** *Imaging is generally not indicated.*

### Hirschsprung's disease (congenital aganglionosis)

**Note:** *Barium enema and radiography are the radiologic modalities of choice.*

### Hypospadias

**Note:** *Voiding cystourethrogram is the modality of choice.*

### Irritable bowel syndrome (IBS)

**Note:** *IBS is a clinical diagnosis. If indicated, plain films and fluoroscopy are the imaging modalities of choice. Advanced imaging is not indicated.*

### Jejunal or ileal stenosis

**Note:** *Upper gastrointestinal fluoroscopy and radiography are the radiologic modalities of choice.*

### Meckel's diverticulum or diverticulitis

**Note:** *Meckel's scan is the diagnostic modality of choice. For follow up of an established diagnosis when there are new or worsening symptoms, see indication for infectious or inflammatory process.*

### Midgut volvulus

**Note:** *Emergent condition, not for outpatient workup. Upper gastrointestinal fluoroscopy and radiography are the diagnostic modalities of choice.*

## Common Diagnostic Indications

### Neonatal jaundice: biliary atresia and neonatal hepatitis

**Note:** For cases of biliary atresia or neonatal hepatitis, ultrasound and nuclear scintigraphy are the diagnostic imaging modalities of choice.

### Posterior urethral valve

**Note:** Voiding cystourethrogram is the modality of choice.

### Pyloric stenosis

**Note:** Ultrasound and fluoroscopy are the radiologic modalities of choice.

### Small left colon syndrome

**Note:** Barium enema and radiography are the radiologic modalities of choice.

### Urinary tract infection

**Note:** In infants and children under 5 years, ultrasound, voiding cystourethrogram (VCUG), and renal scans (technetium-99-dimercaptosuccinic acid [DMSA]), as needed, are used to diagnose and manage urinary tract infections

**Note:** In children age 5 years and older, advanced imaging is not indicated in the evaluation of a simple urinary tract infection, but could be considered when there is concern for complicated pyelonephritis

**Note:** For **pyelonephritis**, see separate indication.

### Vesicoureteral reflux

**Note:** Voiding cystourethrogram, followed by ultrasound, is generally sufficient.

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## CPT Codes

74181..... MRI of abdomen, without contrast

## Standard Anatomic Coverage

- Magnetic resonance cholangiopancreatography (MRCP) is used to evaluate the biliary and pancreatic ductal systems non-invasively and is covered under CPT code 74181, abdominal MRI without contrast

## Technology Considerations

- MRCP studies are usually targeted for further evaluation of indeterminate or questionable findings, identified on more standard imaging exams such as ultrasound and CT.
- When magnetic resonance cholangiopancreatography (MRCP) is requested in addition to a MRI of the abdomen, only one MRI abdomen code should be allowed. Additional sequences obtained for MRCP are considered part of the primary procedure.
- MRCP is performed using heavily T2-weighted images to display hyperintense signal from static or slowly-moving fluid-filled structures.
- Advantages of MRCP when compared with ERCP include non-invasive imaging technique, no ionizing radiation, no anesthesia required, often better anatomic visualization proximal to a ductal obstruction, may detect extra-ductal abnormalities not evident by ERCP.
- Disadvantages of MRCP when compared with ERCP include limited spatial resolution and therefore less sensitive exam for detection of more subtle abnormalities, only provides diagnostic information compared with ERCP which has both diagnostic and therapeutic capabilities, as a consequence, MRCP may result in a delay for needed therapeutic interventions performed with ERCP (such as sphincterotomy, stone extraction, stent placement), susceptibility artifact on MRI may occur (for example, from metallic foreign bodies/surgical clips in the right upper abdominal quadrant) and result in image degradation.
- MRCP is appropriate in cases of incomplete or failed ERCP or when ERCP cannot be safely performed (e.g., following pancreatic ductal trauma or a significant allergy to iodinated contrast material) or when ERCP is precluded by anatomic considerations such as a biliary-enteric surgical anastomosis.
- Significant upper abdominal ascites and large cystic/fluid-filled structures may impede visualization of the pancreatic and biliary ductal systems with MRCP.

## Common Diagnostic Indications

### Biliary tract dilatation

(any **one** of the following)

- Biochemical evidence of biliary obstruction
- Unexplained right upper quadrant pain

**Note:** Includes the detection of benign stricture, choledocholithiasis, fistula, and mass lesion (benign or malignant)

### Cystic pancreatic mass

- When pseudocyst is suspected, to determine the relationship between the cyst and the pancreatic duct

### Recurrent acute pancreatitis of unknown etiology

- To identify possible mechanical causes such as congenitally anomalies (e.g., choledochal cyst, pancreas divisum, annular pancreas and duplication cysts)

**Note:** Defined as more than two attacks of acute pancreatitis without evidence for chronic pancreatitis

## Common Diagnostic Indications

### Suspected biliary or pancreatic ductal abnormality

(any **one**♦ of the following)

- Anomalous pancreaticobiliary ductal union (APBDU)
- Biliary hamartoma (von Meyenburg complex)
- Caroli's disease
- Choledochal cyst
- Pancreas divisum
- Primary sclerosing cholangitis

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## CPT Codes

74175..... Computed tomographic angiography, abdomen, with contrast material(s), including non-contrast images, if performed, and image post-processing

74185..... Magnetic resonance angiography, abdomen; without or with contrast

*Angiography includes imaging of all blood vessels, including arteries and veins. The codes above include CT and MR Venography respectively.*

## Standard Anatomic Coverage

- Anatomic coverage for CPT codes 74175 (CTA) and 74185 (MRA) includes the major arterial and/or venous structures in the abdomen, from the diaphragmatic dome through the iliac crests.

## Technology Considerations

- For a combination CTA abdomen and pelvis study, use CPT code 74174.
- For CTA of the abdominal aorta and iliofemoral vasculature with lower extremity runoff, use CPT code 75635.
- For MRA of the abdominal aorta and iliofemoral vasculature, with lower extremity runoff, use the following CPT codes: CPT 74185 MRA Abdomen x 1 and CPT 73725 MRA Lower Extremities x 2.
- Doppler ultrasound examination is an excellent means to identify a wide range of vascular abnormalities, both arterial and venous in origin. This well-established modality should be considered in the initial evaluation of many vascular disorders listed below.
- CTA of the abdomen is an alternative exam in patients who cannot undergo MRA.

## Common Diagnostic Indications

### Aneurysm of the abdominal aorta

- Following non-diagnostic ultrasound (**any one of the following**)
  - Annual screening in patients with connective tissue disease
  - Follow-up imaging of patients with an established aneurysm/dilation
  - Pre/post-operative
  - Suspected complication of an aneurysm/dilation

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### Arteriovenous malformation (AVM) or arteriovenous fistula (AVF)

**Note:** For renal or superficial AVM, ultrasound should be considered as the first imaging modality.

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### Dissection

Of the abdominal aorta and/or branch vessel

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### Hematoma/hemorrhage

Of the abdominal aorta and/or branch vessel

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### Mesenteric ischemia

**Note:** May have an acute or chronic and progressive (intestinal or abdominal angina) presentation

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### Portal hypertension

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### Preoperative or pre-procedure evaluation

**Note:** For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline

# Common Diagnostic Indications

## Prior to resection of pelvic neoplasm

### Pseudoaneurysm

Of the abdominal aorta and/or branch vessel

### Renal artery stenosis

- For suspected renovascular hypertension from renal artery stenosis, required clinical information includes at least 2-3 serial blood pressure measurements and a list of current anti-hypertensive medications. Renal artery CTA or MRA may be performed in the following clinical scenarios: **(any one of the following)**
  - Abdominal bruit, suspected to originate in the renal artery
  - Abrupt onset of hypertension
  - Accelerated or malignant hypertension
  - Deteriorating renal function on angiotensin converting enzyme inhibition
  - Following an abnormal renal Doppler ultrasound suggestive of renal artery stenosis
  - Generalized arteriosclerotic occlusive disease with hypertension
  - Hypertension developing in patients younger than 30 years of age
  - Hypertension with renal failure or progressive renal insufficiency
  - Recurrent, unexplained episodes of “flash” pulmonary edema
  - Refractory hypertension in patients on therapeutic doses of 3 or more anti-hypertensive medications (Note: imaging may not be required for hypertensive patients easily managed with less than 3 anti-hypertensive medications)
  - Unilateral small renal size (difference in renal size greater than 1.5 cm on ultrasound)

**Note:** Doppler ultrasound examination of the renal arteries has been shown in the peer-reviewed literature to be efficacious and cost-efficient in detecting renal artery stenosis. However, it is less sensitive than CTA/MRA for detection of renovascular hypertension.

## Stenosis or occlusion of the abdominal aorta or branch vessels

(any **one**♦ of the following)

- Atherosclerosis
- Thromboembolism
- Other causes

## Surgical planning for a kidney donor

## Surgical planning for renal tumor resection

## Traumatic vascular injury

## Unexplained blood loss in the abdomen

## Vascular anatomic delineation for other surgical and interventional procedures

(any **one**♦ of the following)

- For surgical porto-systemic shunt placement or TIPS (transjugular intrahepatic porto-systemic shunt)
- For hepatic chemo-embolization procedure
- For vascular delineation prior to operative resection of an abdominal neoplasm
- For pre- and post-procedure evaluation of bypass grafts, stents and vascular anastomoses

## Vascular invasion or compression by an abdominal tumor

## Vasculitis

# Common Diagnostic Indications

## Venous thrombosis or occlusion

Evaluation of suspected thrombosis or occlusion of major abdominal vessels, including portal and systemic venous systems

- Ultrasound is recommended as the initial study to evaluate the following:
  - Hepatic or portal vein thrombosis
  - Renal vein thrombosis
  - Splenic vein thrombosis

# Computed Tomography (CT)

## Pelvis – Pediatrics



### CPT Codes

- 72192..... CT of pelvis, without contrast
- 72193..... CT of pelvis, with contrast
- 72194..... CT of pelvis without contrast, followed by re-imaging with contrast

### Standard Anatomic Coverage

- Iliac crests to ischial tuberosities
- Coverage may vary, depending on the specific clinical indication for the exam

### Technology Considerations

- Consider using ultrasound for indications such as differentiation of cystic, complex and solid lesions and initial ascites evaluation.
- Verification of cystic lesions in the pelvis is usually well-established with ultrasound.
- Ultrasound studies may be limited in obese patients.

### Common Diagnostic Indications

This section contains general pelvic, intestinal, genitourinary, vascular, and osseous indications.

**General Pelvic – Whenever possible, guidelines in this section should be superseded by more specific guidelines in subsequent sections**

#### Abnormality detected on other imaging study which requires additional clarification to direct treatment

##### Ascites

- For diagnosis and surveillance following non-diagnostic ultrasound

##### Congenital anomaly

(**All** of the following)

- Following non-diagnostic ultrasound
- MRI is contraindicated or not available
- Further characterization of genitourinary or anorectal malformations is required

**Note:** For congenital anomalies not discussed elsewhere in this guideline.

##### Fever of unknown origin

(any **one** of the following)

- Lasting more than three (3) weeks following standard work-up (such as chest x-ray, urine, and/or blood work) to localize the source
- Immunocompromised patient (**any one** of the following)
  - Chronic steroid use
  - Dialysis patients
  - Immune defects
  - Neutropenia
  - Use of an immune-blocking biologic agent

##### Gastrointestinal bleeding

- Following non-diagnostic endoscopy, colonoscopy, or upper/lower GI series

# Common Diagnostic Indications

## Hematoma/hemorrhage

---

### Hernia

- Following non-diagnostic ultrasound (**any one of the following**)
  - Diagnosis of a hernia with suspected complications
  - Pre-surgical planning

**Note:** Includes femoral, internal, inguinal, spigelian, ventral, and incisional hernias

---

### Infectious or inflammatory process

(**any one** of the following)

- Abscess
  - Diffuse inflammation/phlegmon
  - Fistula
- 

### Lower extremity edema, diffuse and unexplained

**Note:** For female patients, to exclude an occult lesion causing mass effect, vascular compression, or intraluminal thrombi, ultrasound should be considered as the initial imaging modality.

---

### Palpable pelvic mass

- When palpable pelvic mass requires further evaluation following non-diagnostic pelvic ultrasound

**Note:** MRI is preferred over CT.

---

### Pelvic pain

(**any one** of the following)

- For female patients, following non-diagnostic pelvic ultrasound
- Unexplained by clinical findings, physical examination, or other imaging studies

**Note:** MRI is preferred over CT.

---

### Post-operative or post-procedure evaluation

**Note:** For post-operative evaluation of conditions not specifically referenced elsewhere in this guideline

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### Preoperative or pre-procedure evaluation

**Note:** For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline

---

### Retroperitoneal abnormality

(**any one** of the following)

- Fibrosis
  - Inflammation
  - Neoplasm
- 

### Trauma

- Following significant blunt or penetrating injury to the pelvis
- 

### Tumor, benign or malignant

(**any one** of the following)

- Diagnosis or management of benign neoplasms
- Diagnosis, management, or surveillance of malignant or indeterminate neoplasms

**Note:** This indication applies only to tumors not otherwise listed in this guideline.

---

# Common Diagnostic Indications

## Gastrointestinal

### Appendiceal or periappendiceal mass

- Unexplained on physical exam and other imaging studies

### Appendicitis

(any **one** of the following)

- Evaluation of suspected appendicitis following non-diagnostic ultrasound (unless ultrasound is not available or expected to be limited due to body habitus)
- Failure of non-surgical treatment
- Post-operative complications

### Bowel obstruction

- Following non-diagnostic radiograph

### Congenital anomaly of the gastrointestinal system

- When clinically suspected (any **one** of the following)
  - Anorectal malformations
  - Gastrointestinal duplication cyst
  - Gastroschisis
  - omphalocele

**Note:** CT imaging is not generally indicated in the following congenital anomalies: **Meckel's diverticulum, Hirschsprung's disease, pyloric stenosis, small left colon, jejunal or ileal stenosis.** For alternative imaging modalities for these clinical situations, please see the "CT not indicated" section below.

### Constipation

- Following non-diagnostic radiograph when there is difficulty with defecation persisting for two or more weeks<sup>17</sup>  
(any **one** of the following):
  - When symptoms persist after a course of medical management
  - When there are red flag signs (see table below)

#### Red flag signs for evaluation of constipation

(any **one** of the following)

- Failure to thrive
- Fever
- Following barium enema or anal manometry when there is suspicion for (any one of the following)
  - Anal stenosis
  - Impaction in patients less than 1 year of age
  - Tight empty rectum
- Vomiting

### Enteritis and/or colitis

**Note:** Includes neutropenic colitis and radiation enteritis

### Foreign body

- Following non-diagnostic radiograph when there is a high clinical suspicion

### Henoch-Schonlein Purpura (HSP)

# Common Diagnostic Indications

## Inflammatory bowel disease (IBD)

### Diagnosis

- Evaluation of suspected Crohn's disease following non-diagnostic upper and lower endoscopy

### Management

- Evaluation of new or worsening symptoms to confirm exacerbation or evaluate for complications, including stricture, abscess or fistula

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## Ischemic bowel

**Note:** For necrotizing enterocolitis (NEC), radiographs are the diagnostic modality of choice.

## Genitourinary

### Hematuria

- Following non-diagnostic ultrasound when hematuria is persistent

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### Hydronephrosis

- Following non-diagnostic ultrasound

**Note:** This also includes pyonephrosis, which is typically handled as a medical emergency.

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### Undescended testicle (cryptorchidism)

- Following non-diagnostic ultrasound

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### Urinary tract calculus

(any **one** of the following)

- Following non-diagnostic ultrasound
- Following non-diagnostic kidney, ureter, and bladder (KUB) radiograph

## Vascular

### Aneurysm of the iliac or femoral vessels

- Following non-diagnostic ultrasound and (any **one** of the following)
  - Annual screening in patients with connective tissue disease
  - Follow-up imaging of patients with an established aneurysm/dilation
  - Suspected complication of an aneurysm/dilation
  - Pre/post-operative

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### Aortoiliac dissection

- May evaluate with either CT or CTA

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### Thrombosis in the systemic or portal venous circulations

- Following initial evaluation with a non-diagnostic Doppler ultrasound

## Osseous

### Acute pelvic trauma

- Following non-diagnostic pelvic radiograph for fracture evaluation

---

### Developmental dysplasia of the hip (DDH)

- Pre-operative planning

# Common Diagnostic Indications

## Hip osteonecrosis

(any **one** of the following)

- For suspected hip osteonecrosis when (**All** of the following)
  - Patient is unable to undergo hip MRI or radionuclide bone scintigraphy, (Note: Both are more sensitive modalities than hip CT)
  - Patient with normal hip films or inconclusive radiographic evidence of hip osteonecrosis
- For known hip osteonecrosis and femoral head collapse for pre-operative planning to define the location and extent of disease in patients with painful hips

## Osseous tumor evaluation in the pelvis

**Note:** MRI or radionuclide bone scintigraphy may be more appropriate for detection of skeletal metastases and primary bone tumors unless otherwise contraindicated.

## Osteoid osteoma

- Following non-diagnostic hip radiograph

## Sacroiliitis

- Following non-diagnostic sacroiliac joint radiograph

## Stress/insufficiency/avulsion fracture in the pelvis

- Following non-diagnostic radiograph

**Note:** Subsequent advanced imaging generally includes MRI or radionuclide bone scan as the next step.

## Suspicion of pelvic osteomyelitis or septic arthritis

- When the patient is unable to undergo hip MRI or radionuclide bone scintigraphy

## CT is generally not indicated in the following clinical situations

The indications listed in this section generally do not require advanced imaging using CT. If there are circumstances that require CT imaging, a peer-to-peer discussion may be required.

### Failure to thrive

**Note:** Chronic condition which is not typically evaluated with advanced imaging

### Meckel's diverticulum or diverticulitis

**Note:** Meckel's scan is the diagnostic modality of choice. For follow up of an established diagnosis when there are new or worsening symptoms, see indication for **infectious or inflammatory process**.

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# Magnetic Resonance Imaging (MRI)

## Pelvis – Pediatrics



### CPT Codes

- 72195..... MRI of pelvis, without contrast
- 72196..... MRI of pelvis, with contrast
- 72197..... MRI of pelvis, without contrast, followed by re-imaging with contrast

### Standard Anatomic Coverage

- Iliac crests to ischial tuberosities
- Coverage may vary, depending on the specific clinical indication for the exam

### Technology Considerations

- Depending on the patient's presenting signs and symptoms, pelvic imaging should be directed to the most appropriate modality for clinical work-up.
- Diagnostic evaluation of the pelvis may be performed with:
  - Pelvic ultrasound (trans-abdominal and trans-vaginal), which is the initial imaging modality for most gynecologic abnormalities
  - Transabdominal pelvic sonography is also used for urinary bladder assessment, such as post-void residual urine volume
  - Endoscopy and barium examinations are well established procedures for intestinal evaluation
  - Cystoscopy is often used for lower urinary tract assessment
  - Pelvic CT or MRI
- Verification of cystic lesions in the pelvis is usually well-established with ultrasound.
- Ultrasound studies may be limited in obese patients.
  - The CPT code assignment for an MRI procedure is based on the anatomic area imaged. Authorization requests for multiple MRI imaging of the same anatomic area to address patient positional changes, additional sequences or equipment are not allowed.
- For pediatric patients, MRI may be the preferred imaging modality in a number of clinical circumstances given its lack of ionizing radiation and excellent soft tissue contrast. MRI however may require sedation and is more predisposed to artifacts.

### Common Diagnostic Indications

#### Abnormality detected on other imaging study which requires additional clarification to direct treatment

##### Adenomyosis of the uterus

- Following non-diagnostic pelvic ultrasound

##### Adnexal mass

- Following non-diagnostic pelvic ultrasound

**Note:** Usually performed to further evaluate problematic cases which are initially detected on pelvic ultrasound. Some uses of pelvic MRI in adnexal lesion evaluation include: differentiation of an ovarian mass from an exophytic or pedunculated fibroid; more confident identification of an ovarian dermoid/teratoma, following an ultrasound or other imaging exam; and demonstration of findings to suggest malignancy in some adnexal masses. Includes assessment of suspected hemorrhagic cystic lesions and tumors

# Common Diagnostic Indications

## Appendicitis

(any **one** of the following)

- Diagnosis following non-diagnostic ultrasound <sup>1-7</sup> (unless ultrasound is not an available modality)
- Failure of non-surgical treatment
- Post-operative complications

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## Ascites

- For diagnosis and surveillance following non-diagnostic ultrasound<sup>8</sup>

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## Axial Spondyloarthritis (SpA)

(any **one** of the following)

- For diagnosis of Spondyloarthritis when: (**All of the following**)
  - Following non-diagnostic radiograph for sacroiliitis (Grade 0-2)
  - Back pain has persisted for at least three (3) months
  - Clinical evidence for inflammatory back pain defined as at least **four of the following** five features:
    - Age less than 40
    - Insidious (gradual) onset
    - Improvement with exercise
    - No improvement with rest
    - Pain at night which improves on getting up
- Evaluate response to therapy in patients with known ankylosing spondylitis (AS) (**All of the following**)
  - Established diagnosis of ankylosing spondylitis
  - No response to therapy
  - At least three (3) months of tumor necrosis factor (TNF) inhibitor therapy
- Baseline study prior to treatment when the diagnosis of AS is based on radiographic findings

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## Bilateral hip osteonecrosis (avascular necrosis; aseptic necrosis)

- Following non-diagnostic hip radiograph when there is clinical suspicion for osteonecrosis with hip pain

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## Bladder or urethral diverticula

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## Congenital anomaly of the genitourinary system

- Diagnosis or management following non-diagnostic ultrasound: (**any one** of the following)
  - Beckwith-Wiedemann syndrome
  - Bladder and cloacal exstrophy
  - Characterization of a ureterocele
  - Confirmation of the location, structure, and position of the ureters
  - Congenital adrenal hyperplasia
  - Congenital ureteropelvic junction (UPJ) or ureterovesical junction (UVJ) obstruction
  - Duplex collecting system
  - Management of complications (including infection, urachal carcinoma)
  - Megaureter
  - Pre-surgical planning
  - Prune-belly syndrome
  - Renal and adrenal agenesis
  - Renal ectopy (includes crossed fused renal ectopy, horseshoe and pancake kidney)
  - Renal hypoplasia
  - Urachal anomaly (includes patent urachus, urachal cyst, and urachal umbilical sinus)

# Common Diagnostic Indications

## Congenital anomaly of the uterus

- Following non-diagnostic pelvic ultrasound

**Note:** Includes diagnosis of Mullerian duct anomalies; bicornuate, didelphys, septate uterus, and Mayer-Rokitansky

---

## Contraindication to CT

- Patient meets criteria for CT exam but CT is expected to be limited due to contraindications (such as a history of allergic reaction to iodinated radiographic contrast material)
- 

## Endometriosis

- Following non-diagnostic pelvic ultrasound
- 

## Fever of unknown origin

(any **one** of the following)

- Lasting more than three (3) weeks following standard work-up (such as chest x-ray, urine, and/or blood work) to localize the source
  - Immunocompromised patient (any **one** of the following)
    - Chronic steroid use
    - Dialysis patients
    - Immune defects
    - Neutropenia
    - Use of an immune-blocking biologic agent
- 

## Hernia

- Following non-diagnostic ultrasound (any **one** of the following)
  - Diagnosis of a hernia with suspected complications
  - Pre-surgical planning

**Note:** Includes femoral, internal, inguinal, spigelian, ventral, and incisional hernias

---

## Hydrometrocolpos and hematocolpos

- Following non-diagnostic pelvic ultrasound when concerned for genitourinary or anorectal malformation
- 

## Infectious or inflammatory process

(any **one** of the following)

- Abscess
  - Diffuse inflammation/phlegmon
  - Fistula
  - Recurrent cystitis (male with at least two episodes or female with failed antibiotic therapy)
- 

## Inflammatory bowel disease (IBD)

### Diagnosis

- Evaluation of suspected Crohn's disease following non-diagnostic upper and lower endoscopy

### Management

- Evaluation of new or worsening symptoms to confirm exacerbation or evaluate for complications, including stricture, abscess or fistula
- 

## Lower extremity edema, diffuse and unexplained

**Note:** For female patients, to exclude an occult lesion causing mass effect, vascular compression, or intraluminal thrombi, ultrasound should be considered as the initial imaging modality.

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## Obstetrical abnormalities, pelvimetry, or obstetrical complications

# Common Diagnostic Indications

## Osteomyelitis or septic arthritis

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### Palpable pelvic mass

- When palpable pelvic mass requires further evaluation
    - Following non-diagnostic pelvic ultrasound in female patients
- 

## Pelvic floor disorders associated with urinary or bowel incontinence

---

### Pelvic injury

- Following non-diagnostic pelvic or sacral radiograph
- 

### Pelvic pain

(any **one** of the following)

- For female patients, following non-diagnostic pelvic ultrasound
- Unexplained by clinical findings, physical examination, or other imaging studies

**Note:** MRI is preferred over CT.

---

## Pelvic venous thrombosis evaluation

---

### Post-operative or post-procedure evaluation

**Note:** For post-operative evaluation of conditions not specifically referenced elsewhere in this guideline

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### Preoperative or pre-procedure evaluation

**Note:** For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline

---

### Retroperitoneal abnormality

(any **one** of the following)

- Fibrosis
  - Inflammation
  - Neoplasm
- 

## Sacral insufficiency fracture

---

### Sacroiliitis

- Following non-diagnostic sacroiliac joint radiograph
- 

### Sports hernia (athletic pubalgia)

(**All** of the following)

- Pain persists at least 6 weeks
- Non diagnostic radiographs
- Following a trial of conservative therapy that lasts at least 6 weeks
- Patient is a surgical candidate
- Pain is insidious, progressive, worsens with valsalva or movement
- No detectable inguinal or ventral hernia on exam

**Note:** Groin pain can sometimes be referred from the hip. If that is of concern, see separate guideline for femoral neck stress fracture.

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## Common Diagnostic Indications

### Tumor, benign or malignant

(any **one** of the following)

- Diagnosis or management of benign neoplasms
- Diagnosis, management, or surveillance of malignant or indeterminate neoplasms

**Note:** This indication applies only to tumors not otherwise listed in this guideline.

### Undescended testicle (cryptorchidism)

- Following non-diagnostic ultrasound

### MRI is generally not indicated in the following clinical situations

The indications listed in this section generally do not require advanced imaging using MRI. If there are circumstances that require MRI imaging, a peer-to-peer discussion may be required.

#### Failure to thrive

**Note:** Chronic condition which is not typically evaluated with advanced imaging

#### Piriformis syndrome

**Note:** Advanced imaging is generally not indicated.

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## CPT Codes

72191..... Computed tomographic angiography, pelvis, with contrast material(s), including non-contrast images, if performed, and image post-processing

72198..... Magnetic resonance angiography, pelvis; without contrast, followed by re-imaging with contrast

*Angiography includes imaging of all blood vessels, including arteries and veins. The codes above include CT and MR Venography respectively.*

## Standard Anatomic Coverage

- Iliac crests to ischial tuberosities
- Scan coverage may vary, depending on the specific clinical indication for the exam

## Technology Considerations

- For a combination CTA abdomen and pelvis study, use CPT code 74174.
- Doppler ultrasound examination is an excellent means to identify a wide range of vascular abnormalities, both arterial and venous in origin. This well-established modality should be considered in the initial evaluation of many vascular disorders listed below.
- MRA should also be considered in patients with a history of either previous contrast reaction to intravascular administration of iodinated radiographic contrast material or atopy.
- CTA of the pelvis is an alternative exam in patients who cannot undergo MRA.
- Requests for pelvic CTA or MRA in addition to a request for a MRA or CTA abdominal aorta and bilateral iliofemoral lower extremity runoff study are not allowed.
- These guidelines also include indications for CT venography (CTV) and MR venography (MRV).

## Common Diagnostic Indications

### Aneurysm of the iliac vessels

- Following non-diagnostic ultrasound (**any one of the following**)
  - Annual screening in patients with connective tissue disease
  - Follow-up imaging of patients with an established aneurysm/dilation
  - Suspected complication of an aneurysm/dilation
  - Pre/post-operative

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### Arteriovenous malformation (AVM) or arteriovenous fistula (AVF)

**Note:** For renal or superficial AVM, ultrasound should be considered as the first imaging modality

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### Dissection

Of the iliac arteries or branches

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### Hematoma/hemorrhage

Of the Iliac arteries or branches

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### Pseudoaneurysm

Of the Iliac arteries or branches

## Common Diagnostic Indications

**Stenosis or occlusion of the lower abdominal aorta, iliac arteries or other branch vessels in the pelvis**

**Traumatic vascular injury**

**Unexplained blood loss in the pelvis**

**Vascular anatomic delineation for other surgical and interventional procedures**

(any **one**♦ of the following)

- For vascular delineation prior to operative resection of a pelvic neoplasm
- For pre- and post-procedure evaluation of bypass grafts, stents and vascular anastomoses

**Vascular invasion or compression by a pelvic tumor**

**Vasculitis**

**Venous thrombosis or occlusion**

- Following initial evaluation with non-diagnostic Doppler ultrasound

# Computed Tomography (CT) Abdomen and Pelvis Combination – Pediatrics



## CPT Codes

- 74176..... CT of abdomen and pelvis, without contrast
- 74177..... CT of abdomen and pelvis, with contrast
- 74178..... CT of abdomen and pelvis, without contrast, followed by re-imaging with contrast

## Standard Anatomic Coverage

- Diaphragmatic dome through pubic symphysis
- Scan coverage may vary, depending on the specific clinical indication

## Technology Considerations

- Verification of cystic lesions in the abdominal and pelvis is usually well-established with ultrasound
- For abdominal symptoms in the pediatric population, abdominal ultrasound frequently provides diagnostic information without incurring radiation exposure from CT

## Common Diagnostic Indications

This section contains general abdominal and pelvic, gastrointestinal, genitourinary, and vascular indications.

**General Abdominal and Pelvic – Whenever possible, guidelines in this section should be superseded by more specific guidelines in subsequent sections**

### Abdominal mass

(any one of the following)

- Following non-diagnostic ultrasound
- Palpable on exam

**Note:** *Ultrasound is suggested as the initial imaging modality when evaluating a palpable abdominal mass. Evaluation depends on location of the mass and age of the patient. See separate indications for Focal liver lesion, Pancreatic mass, Genitourinary (renal and adrenal), and Pelvic mass.*

### Abdominal pain

(any one of the following)

- Evaluation of acute abdominal pain when pain is unexplained by clinical findings, physical examination, or other imaging studies
- Evaluation of chronic or recurrent abdominal pain when a red flag sign is present (see table below)

**Note:** *Acute pain is defined as new onset pain within the past 30 days. Chronic pain is defined as pain lasting more than 30 days; recurrent pain refers to three (3) or more episodes of pain over a period of three (3) or more months. For family history or clinical evidence for inflammatory bowel disease (IBD), see separate indication.*

#### Red flag signs for evaluation of abdominal pain

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Chronic severe diarrhea (at least three (3) watery stools per day for more than two weeks)</li><li>• Deceleration of linear growth</li><li>• Fever of unknown origin</li><li>• Gastrointestinal bleeding</li><li>• History of a genetic or congenital syndrome</li></ul> | <ul style="list-style-type: none"><li>• Immunocompromised</li><li>• Involuntary weight loss</li><li>• Persistent focal abdominal pain, especially right upper or right lower quadrant</li><li>• Persistent vomiting</li></ul> |
|--|---|

## Abnormality detected on other imaging study which requires additional clarification to direct treatment

# Common Diagnostic Indications

## Ascites

- For diagnosis and surveillance, following non-diagnostic ultrasound

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## Congenital anomaly

**Note:** For congenital anomalies not discussed elsewhere in this guideline

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## Fever of unknown origin

(any **one** of the following)

- Lasting more than three (3) weeks following standard work-up (such as chest x-ray, urine, and/or blood work) to localize the source
- Immunocompromised patient (any **one** of the following)
  - Chronic steroid use
  - Dialysis patients
  - Immune defects
  - Neutropenia
  - Use of an immune-blocking biologic agent

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## Gastrointestinal bleeding

- Following non-diagnostic endoscopy, colonoscopy, or upper/lower GI series

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## Hematoma/hemorrhage

**Note:** Includes hemoperitoneum and retroperitoneal bleed. See separate indication for gastrointestinal bleeding.

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## Hernia

- Following non-diagnostic ultrasound (any **one** of the following)
  - Diagnosis of a hernia with suspected complications
  - Pre-surgical planning

**Note:** Includes femoral, internal, inguinal, spigelian, ventral, and incisional hernias

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## Infectious or inflammatory process

(any **one** of the following)

- Abscess
- Diffuse inflammation/phlegmon
- Fistula

---

## Lower extremity edema, diffuse and unexplained

**Note:** For female patients, to exclude an occult lesion causing mass effect, vascular compression, or intraluminal thrombi, ultrasound should be considered as the initial imaging modality.

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## Post-operative or post-procedure evaluation

**Note:** For post-operative evaluation of conditions not specifically referenced elsewhere in this guideline.

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## Preoperative or pre-procedure evaluation

**Note:** For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline.

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## Retroperitoneal abnormality

(any **one** of the following)

- Fibrosis
- Inflammation
- Neoplasm

# Common Diagnostic Indications

## Trauma

- Following significant blunt or penetrating injury to the abdomen

## Tumor, benign or malignant

(any **one** of the following)

- Diagnosis or management of benign neoplasms
- Diagnosis, management, or surveillance of malignant or indeterminate neoplasms

**Note:** This indication applies only to tumors not otherwise listed in this guideline.

## Gastrointestinal

### Appendiceal or periappendiceal mass

- Unexplained on physical exam and other imaging studies

### Appendicitis

(any **one** of the following)

- Evaluation of suspected appendicitis following non-diagnostic ultrasound (unless ultrasound is not available or expected to be limited due to body habitus)
- Failure of non-surgical treatment
- Post-operative complications

### Bowel obstruction

- Following non-diagnostic radiograph

### Congenital anomalies of the gastrointestinal system

- When clinically suspected (**any one** of the following)
  - Gastrointestinal duplication cyst
  - Gastroschisis and omphalocele
  - Anorectal malformations

**Note:** CT imaging is not indicated in the following congenital anomalies: Meckel's diverticulum. For alternative imaging modalities for these clinical situations, please see the **CT not indicated** section below.

### Constipation

- Following non-diagnostic radiograph when there is difficulty with defecation persisting for two or more weeks (**any one** of the following):
  - When symptoms persist after a course of medical management
  - When there are red flag signs (see table below)

#### Red flag signs for evaluation of constipation

(any **one** of the following)

- Failure to thrive
- Fever
- Following barium enema or anal manometry when there is suspicion for (**any one** of the following)
  - Anal stenosis
  - Impaction in patients less than 1 year of age
  - Tight empty rectum
- Vomiting

### Enteritis and/or colitis

**Note:** This includes neutropenic colitis and radiation enteritis

# Common Diagnostic Indications

## Foreign body

- Following non-diagnostic radiograph when there is a high clinical suspicion

## Henoch-Schonlein Purpura (HSP)

## Inflammatory bowel disease (IBD)

### Diagnosis

- Evaluation of suspected Crohn's disease following non-diagnostic upper and lower endoscopy

### Management

- Evaluation of new or worsening symptoms to confirm exacerbation or evaluate for complications, including stricture, abscess or fistula

## Intussusception

(any **one** of the following)

- Following non-diagnostic ultrasound
- Following intussusception reduction

## Ischemic bowel

**Note:** For necrotizing enterocolitis (NEC), radiographs are the diagnostic modality of choice.

## Genitourinary

### Congenital genitourinary anomalies

- Diagnosis or management following non-diagnostic ultrasound (any **one** of the following)
  - Beckwith-Wiedemann syndrome
  - Bladder and cloacal exstrophy
  - Characterization of a ureterocele
  - Confirmation of the location, structure, and position of the ureters
  - Congenital adrenal hyperplasia
  - Congenital uterovaginal junction (UPJ) or ureterovesical junction (UVJ) obstruction
  - Duplex collecting system
  - Management of complications (including infection, urachal carcinoma)
  - Megaureter
  - Pre-surgical planning
  - Prune-belly syndrome
  - Renal and adrenal agenesis
  - Renal ectopy (includes crossed fused renal ectopy, horseshoe and pancake kidney)
  - Renal hypoplasia
  - Urachal anomalies (includes patent urachus, urachal cyst, and urachal umbilical sinus)

## Hematuria

- Following non-diagnostic ultrasound when hematuria is persistent

## Hydronephrosis

- Following non-diagnostic ultrasound

**Note:** This also includes pyonephrosis, which is typically handled as a medical emergency.

# Common Diagnostic Indications

## Neoplasm, genitourinary

(any **one** of the following)

- Diagnosis, management, and surveillance of the following malignant tumors (**any one** of the following)
  - Renal (lymphoma, multicystic dysplastic kidney, renal cell carcinoma, or Wilm's tumor)
  - Adrenal (adrenocortical carcinoma, neuroblastoma, or pheochromocytoma)
- Diagnosis and management of the following benign renal neoplasms (angiomyolipoma, multilocular cystic nephroma, or nephroblastomatosis) following non-diagnostic ultrasound

**Note:** Consider ultrasound evaluation for follow up particularly with benign tumors

## Pyelonephritis

(any **one** of the following)

- Diagnosis of acute complicated pyelonephritis when patient has failed to respond to 72 hours of antibiotic therapy
- Evaluate response to therapy when clinically uncertain

**Note:** Includes complications of acute pyelonephritis, such as emphysematous pyelonephritis and renal abscess

## Renal mass/lesion requiring further characterization

- Following non-diagnostic ultrasound when lesion does not meet criteria for a simple cyst

**Note:** A simple cyst is defined as having all of the following characteristics: anechoic, circumscribed, thin walled, and posterior acoustic enhancement.

## Undescended testicle (cryptorchidism)

- Following non-diagnostic ultrasound

## Urinary tract calculus

(any **one** of the following)

- Following non-diagnostic ultrasound
- Following non-diagnostic kidney, ureter, and bladder (KUB) radiograph

## Xanthogranulomatous pyelonephritis (XPN)

## Vascular

### Aneurysm of the abdominal and iliac arteries

- Following non-diagnostic ultrasound (**any one** of the following)
  - Annual screening in patients with connective tissue disease
  - Follow-up imaging of patients with an established aneurysm/dilation
  - Suspected complication of an aneurysm/dilation
  - Pre/post-operative

### Aortic dissection

**Note:** May evaluate with either CT or CTA. Usually results from subdiaphragmatic extension of a thoracic aortic dissection.

### Thrombosis in the systemic and portal venous circulations

- Following initial evaluation with non-diagnostic Doppler ultrasound

# Common Diagnostic Indications

## CT is generally not indicated in the following clinical situations

The indications listed in this section generally do not require advanced imaging using CT. If there are circumstances that require CT imaging, a peer-to-peer discussion may be required.

### Cystic liver disease

**Note:** Includes congenital and acquired cysts. Ultrasound is usually sufficient.

### Failure to thrive

**Note:** Chronic condition which is not typically evaluated with advanced imaging.

### Gastroenteritis

**Note:** Imaging is generally not indicated.

### Hirschsprung's disease (congenital aganglionosis)

**Note:** Barium enema and radiography are the radiologic modalities of choice.

### Hypospadias

**Note:** Voiding cystourethrogram is the modality of choice.

### Irritable bowel syndrome (IBS)

**Note:** IBS is a clinical diagnosis. If indicated, plain films and fluoroscopy are the imaging modalities of choice. Advanced imaging is not indicated.

### Jejunal or ileal stenosis

**Note:** Upper gastrointestinal fluoroscopy and radiography are the radiologic modalities of choice.

### Meckel's diverticulum or diverticulitis

**Note:** Meckel's scan is the diagnostic modality of choice. For follow up of an established diagnosis when there are new or worsening symptoms, see indication for infectious or inflammatory process.

### Midgut volvulus

**Note:** Emergent condition, not for outpatient workup. Upper gastrointestinal fluoroscopy and radiography are the diagnostic modalities of choice.

### Neonatal jaundice: biliary atresia and neonatal hepatitis

**Note:** For cases of biliary atresia or neonatal hepatitis, ultrasound and nuclear scintigraphy are the diagnostic imaging modalities of choice.

### Posterior urethral valve

**Note:** Voiding cystourethrogram is the modality of choice.

### Pyloric stenosis

**Note:** Ultrasound and fluoroscopy are the radiologic modalities of choice.

### Small left colon syndrome

**Note:** Barium enema and radiography are the radiologic modalities of choice.

### Urinary tract infection

**Note:** In infants and children under 5 years, ultrasound, voiding cystourethrogram (VCUG), and renal scans (technetium99 dimercaptosuccinic acid [DMSA]), as needed, are used to diagnose and manage urinary tract infections.

**Note:** In children age 5 years and older, advanced imaging is not indicated in the evaluation of a simple urinary tract infection, but could be considered when there is concern for complicated pyelonephritis.

**Note:** For **pyelonephritis**, see separate indication.

### Vesicoureteral reflux

**Note:** Voiding cystourethrogram, followed by ultrasound, is generally sufficient.

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# CT Angiography (CTA) Abdomen and Pelvis Combination – Pediatrics



## CPT Codes

74174..... Computed tomographic angiography, abdomen and pelvis, with contrast material(s), including noncontrast images, if performed, and image postprocessing

*Angiography includes imaging of all blood vessels, including arteries and veins. The code above includes CT Venography.*

## Standard Anatomic Coverage

- Anatomic coverage for CPT code 74174 (CTA abdomen & pelvis combination) includes the major arterial and/or venous structures in the abdomen, from the diaphragmatic dome to the ischial tuberosities.
- Coverage for an abdominal CTA generally includes the abdominal aorta and these visceral arteries (aortic branches): renal arteries, celiac artery, splenic artery, hepatic artery, and superior mesenteric artery origin.
- Coverage for a pelvic CTA includes the aortic bifurcation and these arteries: common iliac artery, internal iliac artery (aka hypogastric) and its branches, and external iliac artery.
- Full evaluation of the superior and inferior mesenteric artery generally requires both CTA abdomen and pelvis.
- Complete evaluation of the femoral artery generally requires CT angiography with iliofemoral lower extremity runoff (CPT 75635).
- These guidelines also include indications for CT venography (CTV).

## Technology Considerations

- For CTA of the abdominal aorta and iliofemoral vasculature with lower extremity runoff, use CPT code 75635
- Doppler ultrasound examination is an excellent means to identify a wide range of vascular abnormalities, both arterial and venous in origin. This well-established modality should be considered in the initial evaluation of many vascular disorders listed below.
- CTA is an alternative exam in patients who cannot undergo MRA.
- Requests for a combination CTA abdomen and pelvis study in addition to a request for a CTA abdominal aorta and bilateral iliofemoral lower extremity runoff study are not allowed.
- The primary reason to combine CTA of the abdomen and pelvis is to evaluate for a vascular disease that affects both the abdominal aorta (covered by the CTA abdomen) and the iliac arteries (covered by CTA pelvis). Some examples include ischemia, occlusion, aneurysm, trauma, and vasculitis.
- Aortic stent grafts often cover the infrarenal abdominal aorta and proximal iliac arteries. CTA abdomen and pelvis should be used to evaluate complications such as endoleak in these cases.
- Aortic dissection will often be requested at a CTA chest (CPT 71275) and abdomen. Pelvis is not required.

## Common Diagnostic Indications

### Aneurysm of the abdominal and iliac arteries

- Following non-diagnostic ultrasound and (**any one of the following**)
  - Annual screening in patients with connective tissue disease
  - Follow-up imaging of patients with an established aneurysm/dilation
  - Suspected complication of an aneurysm/dilation
  - Pre/post-operative

### Arteriovenous malformation (AVM) or arteriovenous fistula (AVF)

**Note:** For renal or superficial AVM, ultrasound should be considered as the first imaging modality.

### Dissection

Of the abdominal aorta and/or branch vessel

# Common Diagnostic Indications

## Hematoma/hemorrhage

Of the abdominal aorta and/or branch vessel

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## Mesenteric ischemia

**Note:** *May have an acute or chronic and progressive (intestinal or abdominal angina) presentation*

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## Preoperative or pre-procedure evaluation

**Note:** *For preoperative evaluation of conditions not specifically referenced elsewhere in this guideline*

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## Prior to resection of pelvic neoplasm

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## Pseudoaneurysm

Of the abdominal aorta and/or branch vessel

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## Stenosis or occlusion of the abdominal aorta or branch vessels

(any **one** of the following)

- Atherosclerosis
  - Thromboembolism
  - Other causes
- 

## Traumatic vascular injury

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## Unexplained blood loss in the abdomen

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## Vascular anatomic delineation for other surgical and interventional procedures

(any **one** of the following)

- For vascular delineation prior to operative resection of an abdominal neoplasm
  - For pre- and post-procedure evaluation of bypass grafts, stents and vascular anastomoses
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## Vascular invasion or compression by an abdominal tumor

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## Vasculitis

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## Venous thrombosis or occlusion

Evaluation of suspected thrombosis or occlusion of major abdominal vessels, including portal and systemic venous systems

- Ultrasound is recommended as the initial study to evaluate the following:
  - Hepatic or portal vein thrombosis
  - Renal vein thrombosis
  - Splenic vein thrombosis