Cigna Medical Coverage Policies – Radiology
Pediatric Abdomen Imaging Guidelines

Effective February 1, 2021

Instructions for use

The following coverage policy applies to health benefit plans administered by Cigna. Coverage policies are intended to provide guidance in interpreting certain standard Cigna benefit plans and are used by medical directors and other health care professionals in making medical necessity and other coverage determinations. Please note the terms of a customer's particular benefit plan document may differ significantly from the standard benefit plans upon which these coverage policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a coverage policy.

In the event of a conflict, a customer's benefit plan document always supersedes the information in the coverage policy. In the absence of federal or state coverage mandates, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of:

1. The terms of the applicable benefit plan document in effect on the date of service
2. Any applicable laws and regulations
3. Any relevant collateral source materials including coverage policies
4. The specific facts of the particular situation

Coverage policies relate exclusively to the administration of health benefit plans. Coverage policies are not recommendations for treatment and should never be used as treatment guidelines.

This evidence-based medical coverage policy has been developed by eviCore, Inc. Some information in this coverage policy may not apply to all benefit plans administered by Cigna.

These guidelines include procedures eviCore does not review for Cigna. Please refer to the Cigna CPT code list for the current list of high-tech imaging procedures that eviCore reviews for Cigna.

Pediatric Abdomen Imaging Guidelines

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Procedure Codes Associated with Abdomen Imaging

MRI	CPT®
MRI Abdomen without contrast	74181
MRI Abdomen with contrast (rarely used)	74182
MRI Abdomen without and with contrast	74183
Unlisted MRI procedure (for radiation planning or surgical software)	76498
MRA	**CPT®**
MRA Abdomen	74185
CT	**CPT®**
CT Abdomen without contrast	74150
CT Abdomen with contrast	74160
CT Abdomen without and with contrast	74170
CT Abdomen and Pelvis without contrast	74176
CT Abdomen and Pelvis with contrast	74177
CT Abdomen and Pelvis without and with contrast	74178
CT Guidance for Needle Placement (Biopsy, Aspiration, Injection, etc.)	77012
CT Guidance for and monitoring of Visceral Tissue Ablation	77013
CT Guidance for Placement of Radiation Therapy Fields	77014
Unlisted CT procedure (for radiation planning or surgical software)	76497
CTA	**CPT®**
CTA Abdomen	74175
CTA Abdomen and Pelvis	74174
Ultrasound	**CPT®**
Ultrasound, abdomen; complete	76700
Ultrasound, abdomen; limited	76705
Ultrasound, abdominal wall	76705
Ultrasound, retroperitoneal; complete	76770
Ultrasound, retroperitoneal; limited	76775
Ultrasound, transplanted kidney (with duplex Doppler)	76776
Duplex scan of arterial inflow and venous outflow of abdominal, pelvic, scrotal contents and/or retroperitoneal organs; complete study	93975
Duplex scan of arterial inflow and venous outflow of abdominal, pelvic, scrotal contents and/or retroperitoneal organs; limited study	93976
Duplex scan of aorta, inferior vena cava, iliac vasculature, or bypass grafts; complete	93978
Duplex scan of aorta, inferior vena cava, iliac vasculature, or bypass grafts; limited	93979

PEDAB-1: General Guidelines

PEDAB-1.0: General Guidelines

- A recent (within 60 days) face to face evaluation including a detailed history, physical examination, appropriate laboratory studies, and basic imaging such as plain radiography or ultrasound should be performed prior to considering advanced imaging (CT, MRI), unless the individual is undergoing guideline-supported scheduled follow-up imaging evaluation.
- These guidelines are based upon using advanced imaging to answer specific clinical questions that will affect individual management. Imaging is not indicated if the results will not affect individual management decisions. Standard medical practice would dictate continuing conservative therapy prior to advanced imaging in individuals who are improving on current treatment programs.
- Unless otherwise stated in a specific guideline section, the use of advanced imaging to screen asymptomatic individuals for disorders involving the abdomen is not supported. Advanced imaging should only be approved in individuals who have documented active clinical signs or symptoms of disease.
- Unless otherwise stated in a specific guideline section, repeat imaging studies of the same body area are not necessary unless there is evidence for progression of disease, new onset of disease, and/or documentation of how repeat imaging will affect individual management or treatment decisions.
- Ultrasound
  - Ultrasound should be the initial imaging study of choice in most children with abdominal conditions and should be done prior to advanced imaging.
  - For those individuals who do require advanced imaging after ultrasound, ultrasound can be very beneficial in selecting the proper modality, body area, image sequences, and contrast level that will provide the most definitive information for the individual.
- CPT® codes vary by body area and presence or absence of Doppler imaging and are included in the table at the beginning of this guideline

PEDAB-1.1: Pediatric Abdominal Imaging Age Considerations

Many conditions affecting the abdomen in the pediatric population are different diagnoses than those occurring in the adult population. For those diseases which occur in both pediatric and adult populations, differences may exist in management due to individual age, comorbidities, and differences in disease natural history between children and adults.

- Individuals age <18 years old should be imaged according to the Pediatric Abdomen Imaging Guidelines if discussed. Any conditions not specifically discussed in the Pediatric Abdomen Imaging Guidelines should be imaged according to the General Abdomen Imaging Guidelines. Individuals age ≥18 years should be imaged according to the Abdomen Imaging Guidelines, except where directed otherwise by a specific guideline section.

PEDAB-1.2: Pediatric Abdomen Imaging Appropriate Clinical Evaluation and Conservative Treatment

- See **PEDAB-1.0: General Guidelines**

PEDAB-1.3: Pediatric Abdomen Imaging Modality General Considerations

- Ultrasound
  - See **PEDAB-1.0: General Guidelines**
- MRI
  - MRI Abdomen is generally performed without and with contrast (CPT® 74183) unless the individual has a documented contraindication to gadolinium or otherwise stated in a specific guideline section.
  - Due to the length of time required for MRI acquisition and the need to minimize individual movement, anesthesia is usually required for almost all infants (except neonates) and young children (age <7 years) as well as older children with delays in development or maturity. This anesthesia may be administered via oral or intravenous routes. In this individual population, MRI sessions should be planned with a goal of minimizing anesthesia exposure by adhering to the following considerations:
    - MRI procedures can be performed without and/or with contrast use as supported by these condition-based guidelines. If intravenous access will already be present for anesthesia administration and there is no contraindication for using contrast, imaging without and with contrast may be appropriate if requested. By doing so, the requesting provider may avoid repetitive anesthesia administration to perform an MRI with contrast if the initial study without contrast is inconclusive.
      - Recent evidence-based literature demonstrates the potential for gadolinium deposition in various organs including the brain, after the use of MRI contrast.
      - The U.S. Food and Drug Administration (FDA) has noted that there is currently no evidence to suggest that gadolinium retention in the brain is harmful and restricting gadolinium-based contrast agents (GBCAs) use is not warranted at this time. It has been recommended that GBCA use should be limited to circumstances in which additional information provided by the contrast agent is necessary and the necessity of repetitive MRIs with GBCAs should be assessed.
    - If multiple body areas are supported by eviCore's guidelines for the clinical condition being evaluated, MRI of all necessary body areas should be obtained concurrently in the same session.
  - The presence of surgical hardware or implanted devices may preclude MRI.
  - The selection of best examination may require coordination between the provider and the imaging service. CT may be the procedure of choice in these cases.
- CT

- CT Abdomen typically extends from the dome of the diaphragm to the upper margin of the sacroiliac joints, and CT Abdomen and Pelvis extends from the dome of the diaphragm through the ischial tuberosities.
  - In general, CT Abdomen is appropriate when evaluating solid abdominal organs.
  - In general, CT Abdomen and Pelvis is appropriate when evaluating inflammatory or infectious processes, hematuria, or conditions which appear to involve both the abdomen and the pelvis.
  - In some cases, especially in follow-up of a known finding, it may be appropriate to limit the exam to the region of concern to reduce radiation exposure.
- The contrast level in pediatric CT imaging is specific to the clinical indication, as listed in the specific guideline sections.
- CT Abdomen or Abdomen and Pelvis may be indicated for further evaluation of abnormalities suggested on prior US or MRI studies.
- CT may be indicated without prior MRI or US, as indicated in specific sections of these guidelines.
- CT should not be used to replace MRI in an attempt to avoid sedation unless listed as a recommended study in a specific guideline section.
- The selection of the best examination may require coordination between the provider and the imaging service.

➤ 3D Rendering
- 3D Rendering indications in pediatric abdomen imaging are identical to those for in the general imaging guidelines. See **Preface-4.1: 3D Rendering** in the Preface Imaging Guidelines.

The guidelines listed in this section for certain specific indications are not intended to be all-inclusive; clinical judgment remains paramount and variance from these guidelines may be appropriate and warranted for specific clinical situations.

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PEDAB-2: Generalized Abdominal Pain

- Ultrasound (CPT® 76700 or CPT® 76705) and conservative treatment for initial evaluation of generalized abdominal pain, no red flags signs or symptoms, and normal physical examination and laboratory studies, including stool for blood (and stool culture if diarrhea)
  - Gastroenterology (GI) specialist evaluation is helpful in determining the need for advanced imaging.
- Children with abdominal pain that can be localized to a particular area of the abdomen should be imaged according to the relevant guideline section:
  - **PEDAB-3: Right Lower Quadrant Pain**
  - **PEDAB-4: Flank Pain, Renal Stone**
  - **PEDAB-8: Right Upper Quadrant Pain**
  - **PEDAB-25: Left Upper Quadrant Pain**
  - **PEDAB-29: Left Lower Quadrant Pain**
- CT Abdomen (CPT® 74160) or Abdomen and Pelvis (CPT® 74177) with contrast is indicated unless otherwise specified in a specific guideline section for children with generalized abdominal pain AND ANY of the following red flag signs or symptoms require additional investigation (which may include advanced imaging):
  - Pain that wakes the child from sleep.
  - Unexplained fever (T >100.4°F).
  - Dysphagia.
  - GI bleeding.
  - Significant vomiting.
  - Guarding, rebound tenderness, or other peritoneal signs.
  - Severe chronic diarrhea or nocturnal diarrhea in a toilet-trained child.
  - Failure to thrive, involuntary weight loss, or delay in linear growth or pubertal development.
  - Family history of inflammatory bowel disease, familial polyposis syndrome, celiac disease, or peptic ulcer disease.
  - Abdominal mass, hepatomegaly, and/or splenomegaly on exam.
  - Jaundice.
  - Arthritis.
  - Costovertebral angle tenderness.
  - Perianal disease.
  - Spinal tenderness.

References

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PEDAB-3: Right Lower Quadrant Pain

- For individuals age ≤14 years:
  - Ultrasound (CPT® 76700 or CPT® 76705) is indicated as the initial examination. If positive or negative, no further diagnostic imaging is necessary.
    - If the appendix is not visualized on ultrasound and the white blood cell count is not elevated, no further imaging is necessary.
  - If insufficient local ultrasound expertise exists or the ultrasound findings are inconclusive, ANY of the following studies are indicated for evaluation of right lower quadrant pain:
    - CT Abdomen and Pelvis with contrast (CPT® 74177).
    - CT Abdomen and Pelvis without contrast (CPT® 74176).
    - MRI Pelvis without contrast (CPT® 72195).
    - MRI Pelvis without and with contrast (CPT® 72197).
- For individuals age ≥15 years:
  - ANY of the following studies are indicated:
    - CT Abdomen and Pelvis with contrast (CPT® 74177).
    - CT Abdomen and Pelvis without contrast (CPT® 74176).
    - MRI Pelvis without contrast (CPT® 72195).
    - MRI Pelvis without and with contrast (CPT® 72197).
- If the appendix is absent, follow guidelines in: **PEDAB-2: Generalized Abdominal Pain**

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PEDAB-4: Flank Pain, Renal Stone

- Flank Pain imaging indications in pediatric individuals are very similar to those for adult individuals. See **AB-4: Flank Pain, Rule Out or Known Renal/Ureteral Stone** in the Abdomen Imaging Guidelines.
  - Ultrasound (CPT® 76770 or CPT® 76775) is the preferred initial study in children.
  - CT Abdomen and Pelvis without contrast (CPT® 74176) is indicated if ultrasound is inconclusive.
  - MRI Abdomen without and with contrast (CPT® 74183) and MRI Pelvis without and with contrast (CPT® 72197) is indicated if CT is inconclusive or if significant concern for radiation exposure from frequent CT use for a particular individual.
  - If hematuria is present, See **PEDAB-7: Hematuria** for imaging guidelines.

References

1. Coursey CA, Casalino DD, Remer EM, et al. ACR Appropriateness Criteria® Acute Onset Flank Pain–Suspicion of Stone Disease. Ultrasound Quarterly. 2012;28(3):227-233. doi:10.1097/ruq.0b013e3182625974.
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PEDAB-5: Urinary Tract Infection (UTI)

PEDAB-5.1: Upper Urinary Tract

- Ultrasound evaluation (CPT® 76770 or CPT® 76775) is initial imaging for all children with first time UTI to diagnose hydronephrosis, pyelonephritis, or congenital renal anomaly.
  - If hydronephrosis is present, this should be further evaluated with voiding cystourethrography (VCUG), to evaluate for vesicoureteral reflux.
    - In boys, this is generally accomplished using fluroroscopic imaging and iodinated contrast to exclude urethral abnormalities.
    - In girls, Ureteral Reflux Study (Radiopharmaceutical Voiding Cystogram) (CPT® 78740) is commonly used as urethral abnormalities are rare and this technique results in lower radiation exposure.
- Diuretic renography using Tc-99m MAG 3 (CPT® 78707, CPT® 78708, or CPT® 78709) for:
  - Differentiating a dilated non-obstructed urinary system from a true stenosis (e.g., UPJ obstruction; ureteral-vesical junction [UVJ] obstruction)
  - Quantifying renal parenchymal function.
  - Ultrasound findings that are compatible with a multicystic dysplastic kidney to evaluate function of the affected kidney or a ureteral-pelvic junction (UPJ) obstruction of the contralateral kidney.
  - Diagnostic evaluation of upper tract dilatation when VCUG is negative.
  - Renal function evaluation in individuals with hydronephrosis.
- Post-contrast CT Abdomen (CPT® 74160) has a role in the evaluation of renal abscess or unusual complications such as xanthogranulomatous pyelonephritis, but has no role in the routine evaluation of UTI.
- Magnetic resonance urography (MRU) (CPT® 74183 and CPT® 72197), is not a first line test for the routine evaluation of a UTI, but may be appropriate for investigation of a dilated upper urinary tract.
  - NOTE: MRU requires sedation in young children.
  - MRU can also quantitate renal function.
- Technetium-99m-dimercaptosuccinic acid (Tc-99m DMSA) scintigraphy (CPT® 78700, CPT® 78701, or CPT® 78803), is sensitive for the diagnosis of UTI but there is little benefit in using this after the first episode of a UTI:
  - DSMA is recommended for Detection of post-pyelonephritic renal scarring at least 6 months after the documented upper tract UTI in high risk individuals with recurrent UTIs.
- Children with atypical (poor response to antibiotics within 48 hours, sepsis, poor urine stream, raised creatinine, or non–E coli UTI) or recurrent febrile UTI may be imaged with US kidneys and bladder (CPT® 76770 or CPT® 76775) (preferred) and/or Voiding cystourethrography (CPT® 78740)

PEDAB-5.2: Lower Urinary Tract

- Ultrasound evaluation (CPT® 76770 or CPT® 76775) is initial imaging for all children with first time UTI to diagnose hydronephrosis, pyelonephritis, or congenital renal anomaly.
  - Fluoroscopic Voiding cystourethrography (VCUG) is indicated for detection of possible vesico-ureteral reflux (VUR) in neonates or young children when hydronephrosis is seen on ultrasound.
- The American Academy of Pediatrics clinical practice guidelines no longer recommend routine VCUG for infants and young children from 2 to 24 months of age after the first febrile UTI.
  - The current recommendation is to postpone the VCUG until the second febrile UTI UNLESS there are:
    - Atypical or complex clinical circumstances.
    - Renal/bladder ultrasound reveals hydronephrosis, scarring, or obstructive uropathy.
- Vesicoureteral Reflux (VUR)
  - Fluoroscopic VCUG is typically performed for diagnosis and grading of VUR, and should be the first modality used for diagnosis.
  - Ureteral Reflux Study (Radiopharmaceutical Voiding Cystogram) (CPT® 78740), because of its lower radiation exposure and higher sensitivity for reflux > Grade I, is recommended for follow-up imaging of VUR, and investigation of VUR in siblings of affected individuals.
- Male individuals with first UTI should be evaluated with fluoroscopic VCUG studies rather than radionuclide cystography, to visualize the male urethra for possible abnormalities such as posterior urethral valves, strictures, or diverticula.
- For female individuals, radionuclide cystography (CPT® 78740) may replace fluoroscopic VCUG as the initial study, since urethral anatomy is rarely abnormal except in complex malformations.
- MR urography is indicated for evaluation of ectopic distal ureteral insertion, or other complex lower urinary tract anatomy.

References

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PEDAB-6: Pediatric Acute Gastroenteritis

- Imaging is not indicated in pediatric acute gastroenteritis unless there is a concern for diagnosis other than acute gastroenteritis.
- When necessary, imaging in children with suspected gastroenteritis should begin with plain x-rays abdomen, including supine and left lateral decubitus views. The left lateral decubitus view is useful for the detection of air-fluid levels and for detection of gas in the rectum and to exclude obstruction or bowel perforation.
- Ultrasound (CPT® 76700 or CPT® 76705) if there is organomegaly, palpable mass, or suspicion for complications in the form of intussusception. See **PEDAB-27: Intussusception**
  - While ultrasound (CPT® 76700 or CPT® 76705) may detect findings of gastroenteritis, imaging is not necessary to make the diagnosis of uncomplicated gastroenteritis.
- CT Abdomen and Pelvis with contrast (CPT® 74177) is indicated if abdominal red flag symptoms are present as listed in **PEDAB-2: Generalized Abdominal Pain**.

References

1. Kotloff KL. Acute gastroenteritis in children. *Nelson Textbook of Pediatrics. Chapter 366.* eds Kliegman RM, St. Geme JW III, Blum NJ, Shah SS, Tasker RC, Wilson KM. 21st edition. 2020, pp 2012-2032.

PEDAB-7: Hematuria

- Ultrasound kidneys (CPT® 76770 or CPT® 76775) and bladder (CPT® 76856 or CPT® 76857) asymptomatic gross hematuria or microscopic hematuria with proteinuria present.
- No imaging is appropriate for asymptomatic microscopic hematuria without proteinuria.
- For painful hematuria and no recent trauma, ANY of the following studies can be approved:
  - CT Abdomen and Pelvis without contrast (CPT® 74176)
  - Ultrasound kidneys (CPT® 76770 or CPT® 76775)
  - Ultrasound bladder (CPT® 76856 or CPT® 76857)
- For hematuria and recent trauma, the following studies are indicated:
  - CT Abdomen and Pelvis with contrast (CPT® 74177)
  - CT Cystography (CT Pelvis with bladder contrast – CPT® 72193), if gross hematuria is present and pelvic fracture or traumatic bladder injury is suspected.

Background and Supporting Information

Hematuria is a relatively common complaint in pediatric individuals, and the imaging considerations are different than those occurring in adult individuals.

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PEDAB-8: Right Upper Quadrant Pain

- Right upper quadrant pain imaging indications in pediatric individuals are very similar to those for adult individuals. See **AB-2: Abdominal Pain** in the Abdomen Imaging Guidelines.
  - US abdomen (CPT® 76700) and/or Nuclear medicine imaging of the hepatobiliary system (HIDA scan, CPT® 78226 or CPT® 78227) for complaints of RUQ pain with fever, elevated white blood cell count, positive Murphy sign with suspicion of acute cholecystitis or suspicion of acalculous cholecystitis to confirm or exclude diagnosis.
    - MRI Abdomen with and without contrast (CPT® 74183) or CT Abdomen with contrast (CPT® 74160) when either US or NM is equivocal.
  - US abdomen (CPT® 76700) to confirm diagnosis when complaints of RUQ pain with no fever and normal white blood cell count where a diagnosis of stones and bile duct obstruction are suspected.
    - MRI Abdomen with and without contrast (CPT® 74183) when US or NM is equivocal.
    - CT Abdomen with contrast (CPT® 74160) when US or NM is equivocal.
  - MRI Abdomen without contrast (CPT® 74181), MRI Abdomen without and with contrast (CPT® 74183) in individuals with complaints of RUQ pain with no fever and an ultrasound shows only gallstones.

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PEDAB-9: Inflammatory Bowel Disease, Crohn Disease, or Ulcerative Colitis

Enterography is the most appropriate advanced imaging study for individuals with inflammatory bowel disease (IBD).

- MR Enterography (CPT® 74183 and CPT® 72197) is preferred to avoid radiation exposure for children with suspected IBD.
  - CT Enterography (CPT® 74177) is indicated if MR Enterography is inconclusive or unavailable.
- MR Enterography (CPT® 74183 and CPT® 72197), for children with established IBD, is indicated for the following:
  - Monitoring response to disease-modifying treatment on an annual basis or when treatment change is being considered.
  - Individuals with new or worsening symptoms or suspected complications including abscess, perforation, fistula, or obstruction.
  - CT Enterography (CPT® 74177) can be approved if MR Enterography is inconclusive or unavailable.

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PEDAB-10: Abdominal Sepsis (Suspected Abdominal Abscess)

- Abdominal sepsis imaging indications in pediatric individuals are identical to those for adult individuals.
  - See **AB-3: Abdominal Sepsis (Suspected Abdominal Abscess)** in the Abdomen Imaging Guidelines.

PEDAB-11: Postoperative Pain within 60 Days Following Abdominal Surgery

- CT Abdomen and Pelvis with contrast (CPT® 74177) is indicated in individuals with suspected postoperative complications (e.g. bowel obstruction, abscess, anastomotic leak, etc.).
  - Children can also be evaluated with ultrasound (CPT® 76700 or CPT® 76705) initially (especially in small children or in thin older children) or MRI Abdomen and Pelvis without and with contrast (CPT® 74183 and CPT® 72197).
  - Because MRI may not be practical for the timely evaluation of post-operative abscesses, MRI should only replace CT when the study can be completed in a similar time frame as CT.
- Beyond 60 days postoperatively, See **PEDAB-2: Generalized Abdominal Pain**.

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PEDAB-12: Constipation, Diarrhea, and Irritable Bowel Syndrome

- Irritable bowel is rare in young children, but more common in adolescents. The overwhelming majority of individuals do not require advanced imaging for evaluation of irritable bowel syndrome.
- Constipation associated with red flag signs or symptoms may require advanced imaging:
  - Red flag symptoms for abdominal pain (See **PEDAB-2: Generalized Abdominal Pain**).
  - Clinical suspicion of tethered cord based on abnormal physical findings over the spine or failure of maximal laxative therapy (See **PEDSP-5: Tethered Cord** for imaging guidelines).
- Diarrhea that is associated with additional red flag signs or symptoms may require advanced imaging: (See **PEDAB-2: Generalized Abdominal Pain**).
- Irritable bowel syndrome that is associated with additional red flag signs or symptoms may require advanced imaging: (See **PEDAB-2: Generalized Abdominal Pain**).
- MRI Pelvis without and with contrast (CPT® 72197) if ALL of the following:
  - Hirschsprung disease
  - Post-operative individuals who have signs of complication

Background and Supporting Information

Constipation and diarrhea are extremely common complaints in children. The overwhelming majority of individuals do not require advanced imaging for evaluation of constipation or diarrhea.

References

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PEDAB-13: Abdominal Mass

PEDAB-13.1: Abdominal Wall Mass

- For initial imaging of a newly discovered abdominal wall mass, ANY of the following studies are indicated:
  - Ultrasound (CPT® 76700 or CPT® 76705).
  - MRI Abdomen without contrast (CPT® 74181) or without and with contrast (CPT® 74183).
  - MRI Pelvis without contrast (CPT® 72195) or without and with contrast (CPT® 72197) may be added to MRI Abdomen if below the umbilicus.
- If ultrasound and/or MRI are inconclusive or insufficient for preoperative planning, ANY of the following studies are indicated:
  - CT Abdomen with contrast (CPT® 74160) or without contrast (CPT® 74150).
  - CT Abdomen and Pelvis with contrast (CPT® 74177) or without contrast (CPT® 74176) if below the umbilicus.

PEDAB-13.2: Intra-Abdominal Mass

- Ultrasound (CPT® 76700) should be the initial imaging study for children with an intra-abdominal mass.
- Additional imaging studies will be determined by the results of the ultrasound, and will depend on the location and organ involvement associated with the mass as well as history, physical exam, and laboratory findings. See the following sections for additional imaging guidelines:
  - **PEDONC-1: General Guidelines** in the Pediatric Oncology Imaging Guidelines
  - **PEDONC-5: Pediatric Lymphomas** in the Pediatric Oncology Imaging Guidelines
  - **PEDONC-6: Neuroblastoma** in the Pediatric Oncology Imaging Guidelines
  - **PEDONC-7: Pediatric Renal Tumors** in the Pediatric Oncology Imaging Guidelines
  - **PEDONC-10: Pediatric Germ Cell Tumors** in the Pediatric Oncology Imaging Guidelines
  - **PEDONC-11: Pediatric Liver Tumors** in the Pediatric Oncology Imaging Guidelines
  - **PEDONC-14: Pediatric Adrenocortical Carcinoma (ACC)** in the Pediatric Oncology Imaging Guidelines
  - **PEDAB-15: Liver Lesion Characterization**
  - **PEDAB-17: Adrenal Lesions**
  - **PEDAB-19: Indeterminate Renal Lesion**
  - **PEDAB-26: Spleen**

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PEDAB-14: Renovascular Hypertension and Other Secondary Causes of Hypertension

- Clinical evaluation for suspected hypertension should include repeated blood pressure measurements (generally ≥3 measurements). If these measurements are at or above the age-dependent systolic or diastolic blood pressures requiring further evaluation, as listed in the following table, further evaluation is warranted. Blood pressure may be obtained in-clinic, at home, or by using a wearable ambulatory blood pressure measurement (ABPM) device which records blood pressure at frequent intervals during normal activities and is downloaded later for computer analysis.

Age-Dependent Systolic or Diastolic Blood Pressures Requiring Further Evaluation[16]				
	Boys	Boys	Girls	Girls
Age	Systolic	Diastolic	Systolic	Diastolic
1	98	52	98	54
2	100	55	101	58
3	101	58	102	60
4	102	60	103	62
5	103	63	104	64
6	105	66	105	67
7	106	68	106	68
8	107	69	107	69
9	107	70	108	71
10	108	72	109	72
11	110	74	111	74
12	113	75	114	75
≥13	120	80	120	80

- ANY of the following studies are indicated for initial evaluation of a pediatric individual with suspected secondary hypertension:
  - Doppler or Duplex Ultrasound (CPT® 93975 or CPT® 93976).
  - Complete retroperitoneal ultrasound (CPT® 76770).
  - Captopril renography (CPT® 78709) has largely been abandoned in clinical practice, replaced by CTA and MRA Abdomen, but may be supported for unusual circumstances. All such requests should be forwarded to Medical Directors Review.
- All follow-up requests for pediatric hypertension will go to Medical Directors Review.

Other considerations for imaging evaluation:

- MRA Abdomen (CPT® 74185) or CTA Abdomen (CPT® 74175) may be indicated for pediatric individuals with hypertension to exclude fibromuscular dysplasia or other blood-flow restricting lesions of the renal arteries.
- Echocardiography (CPT® 93306) is indicated at initial evaluation to screen for cardiac abnormalities, coarctation of the aorta, and end-organ damage such as left ventricular hypertrophy.

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PEDAB-15: Liver Lesion Characterization

- Liver lesion characterization imaging indications in pediatric individuals are very similar to those for adult individuals. See **AB-29: Liver Lesion Characterization** in the Abdomen Imaging Guidelines.
- Pediatric-specific imaging considerations includes:
  - US abdomen (CPT® 76700 or CPT® 76705) is the initial study of choice in children. MRI is preferred over CT when possible to reduce radiation exposure.

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PEDAB-16: Pediatric Liver Failure and Cirrhosis

- Elevated liver function testing imaging indications in pediatric individuals are very similar to those for adult individuals. See **AB-30: Abnormal Liver Chemistries** in the Abdomen Imaging Guidelines.
- Liver ultrasound (CPT® 76700) with duplex Doppler (CPT® 93975) is indicated as an initial study for individuals prior to approving CT or MRI for pediatric individuals.
  - MRI Abdomen without and with contrast (CPT® 74183) is indicated for evaluation of ultrasound findings that are inconclusive or technically limited, and is preferred over CT when possible to reduce radiation exposure.
- Repeat liver ultrasound (CPT® 76705) with duplex Doppler (CPT® 93975) is indicated in pediatric individuals in the following circumstances:
  - Known chronic liver dysfunction or cirrhosis of any cause may be reimaged on an annual basis in the absence of new or worsening findings.
  - New or worsening findings on history, physical exam, or laboratory results that suggest progression of liver disease.
  - Doppler ultrasound liver (CPT® 93975 or CPT® 93976) is indicated when portal venous congestion or portal hypertension is suspected.

Background and Supporting Information

- Causes of liver failure or cirrhosis in pediatric individuals are different from adults, and are frequently idiopathic, but commonly due to ONE of the following:
  - Biliary dysfunction (biliary atresia, cystic fibrosis, etc.).
  - Metabolic disease.
  - Post-infectious.
  - Idiopathic causes

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PEDAB-17: Adrenal Lesions

- Abdominal US is the initial imaging study of choice.
  - If an adrenal mass is detected, it can often be adequately evaluated with short interval follow-up retroperitoneal ultrasound (CPT® 76770) in 7 to 10 days.
    - MRI Abdomen without and with contrast (CPT® 74183) or CT Abdomen without and with contrast (CPT® 74170) are indicated to confirm the diagnosis if repeat ultrasound is concerning for neuroblastoma or there is high clinical concern for neuroblastoma. MRI is preferred over CT when possible to reduce radiation exposure. If these studies, confirm neuroblastoma ^{123}I-Metaiodobenzylguanidine (MIBG) scintigraphy is indicated for staging.
  - Neuroblastoma is the most common primary adrenal tumor in pediatric individuals between day 1 and 5 years of age. See **PEDONC-6: Neuroblastoma** in the Pediatric Oncology Imaging Guidelines.

Background and Supporting Information

Adrenal masses in infants and young children usually present as palpable abdominal masses or are detected on in utero US. In the neonates, the common masses are adrenal hemorrhage and neuroblastoma.

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PEDAB-18: Hemochromatosis

PEDAB-18.1: Hereditary (Primary) Hemochromatosis

- Hereditary hemochromatosis imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-11.2: Hereditary (Primary) Hemochromatosis (HH) and Other Iron Storage Diseases** in the Abdomen Imaging Guidelines.

PEDAB-18.2: Transfusion-Associated (Secondary) Hemochromatosis

- T2* MRI has been well established in the determination of organ iron burden in transfusion-associated hemochromatosis. Contrast use is not necessary for evaluation of iron burden. The following studies are indicated for evaluation of transfusion-associated hemochromatosis:
  - MRI Abdomen without contrast (CPT® 74181) for liver iron evaluation.
  - MRI Cardiac without contrast (CPT® 75557) for cardiac iron evaluation.
  - MRI Chest without contrast (CPT® 71550) can be approved as a single study to evaluate both heart and liver iron burden.
  - CPT® 74181 and CPT® 75557 can be approved alone, or together.
  - If requested, CPT® 71550 will evaluate both heart and liver and should not be approved with any other codes.
- Screening MRI is indicated every 12 months for chronically transfused individuals at risk of hemochromatosis.
- Imaging is indicated every 3 months for treatment response in individuals receiving active treatment (chelation and/or phlebotomy).

Background and Supporting Information

Transfusion-associated hemochromatosis is a common complication of exposure to repeated red blood cell transfusions. This can occur in any individual with exposure to >20 transfusion episodes, but is most common among sickle cell disease, thalassemia, bone marrow failure (aplastic anemia, Fanconi anemia, etc.), oncology individuals, and hematopoietic stem cell transplant individuals.

References

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PEDAB-19: Indeterminate Renal Lesion

- Indeterminate renal lesion characterization imaging indications in pediatric individuals are very similar to those for adult individuals. See **AB-36: Renal Failure** in the Abdomen Imaging Guidelines.
- Indeterminate renal lesion imaging indications in pediatric individuals are uncommon and are usually cysts or congenital anomalies.
- Pediatric-specific imaging considerations include the following:
  - CT Abdomen with contrast (CPT® 74160) or MRI Abdomen without and with contrast (CPT® 74183) is indicated for individuals who have simple cysts but are symptomatic and surgical intervention is being considered.
  - CT Abdomen without and with contrast (CPT® 74170) or MRI Abdomen without and with contrast (CPT® 74183) is indicated for pediatric individuals with complex renal cyst identified on ultrasound.
  - For individuals with congenital anomalies, nuclear medicine studies with diuretic renography (CPT® 78708 or CPT® 78709) can be performed to determine function and cystography to determine presence of associated reflux.
  - Individuals with solid renal masses should be imaged according to guidelines in section **PEDONC-7: Pediatric Renal Tumors** in the Pediatric Oncology Imaging Guidelines.

Background and Supporting Information

Pediatric renal cysts have a lower risk of malignant progression than do renal cysts in adults

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PEDAB-20: Hydronephrosis

- Retroperitoneal ultrasound (CPT® 76770) for:
  - Prenatal hydronephrosis within the first week of life, and again after 6 weeks of age.
  - Known hydronephrosis every 3 to 12 months
    - This imaging represents a guideline-supported, scheduled follow-up imaging evaluation, as described in **Preface-3: Clinical Information** in the Preface Imaging Guidelines. A Current evaluation (within 60 days) would not be required for authorization.
- Hydronephrosis associated with urinary tract infection or vesicoureteral reflux. See **PEDAB-5: Urinary Tract Infection (UTI)** for imaging guidelines.
- Retroperitoneal ultrasound (CPT® 76770) and diuretic renography (CPT® 78707, CPT® 78708, or CPT® 78709) for evaluation obstructive uropathy (including ureteropelvic junction obstruction (UPJO)), ureterovesical junction obstruction (UVJO), and bladder outlet obstruction) preoperatively and postoperatively at 3 to 12 months.
  - If hydronephrosis has resolved on postoperative imaging then no further routine imaging is indicated.
- Magnetic resonance urography (MRU) (CPT® 74183 and CPT® 72197) is rarely indicated, but can be approved in individuals with inconclusive ultrasound and diuretic renography.
- CT Abdomen with contrast (CPT® 74160) is rarely indicated, but can be approved in individuals with inconclusive ultrasound and a suspected vascular cause of UPJO.

Background and Supporting Information

Hydronephrosis is a relatively common finding in pediatric individuals.

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PEDAB-21: Polycystic Kidney Disease

- Abdominal ultrasound (CPT® 76700) or retroperitoneal ultrasound (CPT® 76770) for clinical concern of polycystic kidney disease, or for screening individuals who are at risk for autosomal dominant polycystic kidney disease (ADPCKD).

References

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PEDAB-22: Blunt Abdominal Trauma

- Blunt abdominal trauma imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-10.1: Blunt Abdominal Trauma** in the Abdomen Imaging Guidelines.

PEDAB-23: Hernias

- Hernia imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-12: Hernias** in the Abdomen Imaging Guidelines.

PEDAB-24: Abdominal Lymphadenopathy

- Abdominal lymphadenopathy imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-8: Abdominal Lymphadenopathy** in the Abdomen Imaging Guidelines.

PEDAB-25: Left Upper Quadrant Pain

- Left upper quadrant pain imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-2: Abdominal Pain** in the Abdomen Imaging Guidelines.

PEDAB-26: Spleen

- Spleen imaging indications in pediatric individuals are very similar to those for adult individuals. See **AB-35: Indeterminate Renal Lesion** in the Abdomen Imaging Guidelines.
- Pediatric-specific imaging considerations include the following:
  - MRI is preferred over CT when possible to reduce radiation exposure.

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PEDAB-27: Intussusception

- Plain x-rays (supine and left lateral decubitus views) should be performed initially to exclude mass or bowel obstruction from other causes and to detect possible bowel perforation which may be an indication for emergent surgical intervention.
  - Ultrasound (CPT® 76700 or CPT® 76705) is indicated as an initial study if there is a strong suspicion for intussusception, but if negative, plain x-rays of the abdomen should follow.
  - In some institutions, Ultrasound guidance (CPT® 76942) may be used for reduction of colonic or ileocolic intussusception. Generally, this is an urgent or emergent procedure and may not require prior authorization. See Health Plan specific guidance for prior authorization requirements.

Background and Supporting Information

Intussusception, telescoping of one bowel loop into another, is a frequent cause of abdominal pain in young children. It may be associated with bloody stool.

References

1. Maqbool A and Liacouras CA. Intussusception. Nelson Textbook of Pediatrics, Chapter 359.3. eds Kliegman RM, St. Geme JW III, Blum NJ, Shah SS, Tasker RC, Wilson KM. 21st edition. 2020, pp 1965-1967.
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PEDAB-28: Bowel Obstruction

- Bowel obstruction imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-20: Bowel Obstruction and Gastroparesis** in the Abdomen Imaging Guidelines.

PEDAB-29: Left Lower Quadrant Pain

Gastroenterologist evaluation is helpful in determining the appropriate diagnostic pathway in individuals with left lower quadrant pain with or without heme-positive stools or rectal bleeding, since advanced imaging is rarely helpful in the initial evaluation of these individuals.

- Pelvic ultrasound (CPT® 76856) is the initial imaging study of choice for children for detecting gynecologic abnormalities that may cause left lower quadrant pain.
- For male individuals or if ultrasound is inconclusive, advanced imaging may be appropriate for management as directed by gastroenterologic evaluation.

Background and Supporting Information

Diverticulitis is the most common cause of left lower quadrant pain in adults but is extremely rare in children.

References

1. Maqbool A, and Liacouras CA. Major symptoms and signs of digestive tract disorders. Nelson Textbook of Pediatrics, Chapter 332. eds Nelson Textbook of Pediatrics, Chapter XXX eds Kliegman RM, St. Geme JW III, Blum NJ, Shah SS, Tasker RC, Wilson KM. 21st edition 2020, pp 1902-1912.
2. Maqbool A and Liacouras CA, Functional Gastrointestinal Disorders. Nelson Textbook of Pediatrics, Chapter 368. eds Kliegman RM, St. Geme JW III, Blum NJ, Shah SS, Tasker RC, Wilson KM. 21st edition 2020, pp 2041-2045.

PEDAB-30: Celiac Disease (Sprue)

- Celiac disease imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-24: Celiac Disease (Sprue)** in the Abdomen Imaging Guidelines.

PEDAB-31: Transplant

- Liver and kidney transplant imaging indications in pediatric individuals are identical to those for adult individuals. See **AB-43: Hepatic and Abdominal Arteries** in the Abdomen Imaging Guidelines.
- For post-transplant lymphoproliferative disorder in pediatric individuals, See **PEDONC-5.3: Pediatric Aggressive Mature B-Cell Non-Hodgkin Lymphomas (NHL)** in the Pediatric Oncology Imaging Guidelines.

PEDAB-32: Gaucher Disease

- See **PEDPN-4: Gaucher Disease** in the Pediatric Peripheral Nerve Disorders Imaging Guidelines.

PEDAB-33: Vomiting Infant, Malrotation, and Hypertrophic Pyloric Stenosis

- Nonbilious vomiting in otherwise healthy infants may be imaged with Upper GI series (UGI)
- Suspected malrotation is an indication for emergent imaging. If malrotation with mid-gut volvulus is suspected, acute abdominal series (CXR and abdominal views, including supine and upright or supine and left lateral decubitus views), followed by UGI series (preferred) and/or Ultrasound abdomen, limited (CPT® 76705) should be performed. If the abdominal X-rays suggest distal bowel obstruction, water soluble contrast enema should be considered.
- Infants with projectile non-bilious vomiting should be evaluated with US abdomen, limited (CPT® 76705). If initial studies are not diagnostic, repeat studies should be performed, as frequently as daily, until the vomiting resolves or the diagnosis is made. UGI series may be useful as a confirmatory test, may be preferred if US expertise is not available for this condition, or if the clinical presentation is atypical for Hypertrophic Pyloric Stenosis. US is preferred when available, as it involves no contrast or ionizing radiation use.

Background and Supporting Information

- Vomiting in infants is generally classified as either bilious (implying obstruction distal to the Sphincter of Oddi) or non-bilious.
- Bilious vomiting may be a true emergency, as some of the conditions causing this could result in compromise of blood supply to the intestines, a potentially life-threatening situation.
- Hypertrophic Pyloric Stenosis is an idiopathic condition wherein the circular muscle controlling emptying of the stomach thickens, causing a relative obstruction of the gastric outlet. The condition can occur at any age (including occasionally in adults), but the typical child is male, aged 2 to 6 weeks. Projectile non-bilious vomiting is the most common presenting complaint, but the description of projectile vomiting is subjective. The differential diagnosis for non-bilious vomiting includes common conditions such as viral gastroenteritis and gastro-esophageal reflux.

References

1. Hunter AK and Liacouras CA. Hypertrophic pyloric stenosis. Nelson Textbook of Pediatrics. Chapter 329.1. eds Kliegman RM, Stanton BF, St. Geme JW III, et al. 20th edition. 2016, pp 1797-1799.
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