

CIGNA MEDICAL COVERAGE POLICIES - RADIOLOGY

Abdomen Imaging Guidelines

Effective Date: February 3, 2026



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.

CPT® (Current Procedural Terminology) is a registered trademark of the American Medical Association (AMA). CPT® five-digit codes, nomenclature and other data are copyright 2025 American Medical Association. All Rights Reserved. No fee schedules, basic units, relative values or related listings are included in the CPT book. AMA does not directly or indirectly practice medicine or dispense medical services. AMA assumes no liability for the data contained herein or not contained herein.

© Copyright 2025 EviCore healthcare

Table of Contents

Guideline	Page
General Guidelines (AB-1)	4
Abdominal Pain (AB-2)	27
Abdominal Sepsis (Suspected Abdominal Abscess) (AB-3)	36
Flank Pain, Rule Out or Known Renal/Ureteral Stone (AB-4)	39
Mesenteric/Colonic Ischemia (AB-6)	49
Post-Operative Pain Within 60 Days Following Abdominal Surgery –	
Abdominal Procedure (AB-7)	56
Abdominal Lymphadenopathy (AB-8)	59
Bariatric Surgery and Percutaneous Gastrostomy (AB-9)	66
Blunt Abdominal Trauma (AB-10)	73
Gaucher Disease and Hemochromatosis (AB-11)	76
Hernias (AB-12)	82
Abdominal Mass (AB-13)	88
Lower Extremity Edema (AB-14)	95
Zollinger-Ellison Syndrome (ZES-Gastrinoma) (AB-15)	97
Adrenal Cortical Lesions (AB-16)	99
Abdominal Aortic Aneurysm (AAA), Iliac Artery Aneurysm (IAA), and Visceral	
Artery Aneurysms Follow-Up of Known Aneurysms and Pre-Op Evaluation	
(AB-17)	121
Abdominal Aortic Aneurysm (AAA) and Iliac Artery Aneurysm (IAA)-Post	
Endovascular or Open Aortic Repair (AB-18)	125
Aortic Dissection and Imaging for Other Aortic Conditions (AB-19)	127
Bowel Obstruction, Gastroparesis, and Bloating (AB-20)	130
Diarrhea, Constipation, and Irritable Bowel (AB-21)	140
GI Bleeding (AB-22)	150
Inflammatory Bowel Disease (AB-23)	157
Celiac Disease (Sprue) (AB-24)	166
CT Colonography (CTC) (AB-25)	169
Cirrhosis and Liver Screening for Hepatocellular Carcinoma (HCC); Ascites	
and Portal Hypertension (AB-26)	173
MR Cholangiopancreatography (MRCP) (AB-27)	184
Gallbladder (AB-28)	188
Liver Lesion Characterization (AB-29)	192
Abnormal Liver Chemistries (AB-30)	204
Pancreatic Lesion (AB-31)	210
Pancreatic Pseudocysts (AB-32)	217

Pancreatitis (AB-33)	219
Spleen (AB-34)	232
Indeterminate Renal Lesion (AB-35)	238
Renal Failure (AB-36)	246
Renovascular Hypertension (AB-37)	249
Polycystic Kidney Disease (AB-38)	251
Hematuria and Hydronephrosis (AB-39)	255
Urinary Tract Infection (UTI) (AB-40)	263
Patent Urachus (AB-41)	270
Transplant (AB-42)	272
Hepatic and Abdominal Arteries (AB-43)	298
This section intentionally left blank (AB-44)	306
Liver Elastography (AB-45)	308
Hiccups (AB-46)	314
Retroperitoneal Fibrosis (AB-47)	317
Fistulae (AB-48)	321

General Guidelines (AB-1)

Guideline	Page
Abbreviations for Abdomen Imaging Guidelines.....	5
General Guidelines (AB-1.0).....	8
Overview (AB-1.1).....	12
CT Imaging (AB-1.2).....	13
MR Imaging (AB-1.3).....	15
MR Enterography and Enteroclysis Coding Notes (AB-1.4).....	16
Ultrasound (AB-1.5).....	17
Abdominal Ultrasound (AB-1.6).....	18
Retroperitoneal Ultrasound (AB-1.7).....	19
This section intentionally left blank (AB-1.8).....	20
Contrast-Enhanced Ultrasound (AB-1.9).....	21
Quantitative MRI (AB-1.10).....	22
RADCAT Grading System (AB-1.11).....	23
Pregnancy Considerations for Imaging (AB-1.12).....	24
References (AB-1).....	25

Abbreviations for Abdomen Imaging Guidelines

AB.GG.Abbreviations.A

v1.0.2026

Abbreviations for Abdomen Imaging Guidelines

AAA	abdominal aortic aneurysm
AASLD	American Association for the Study of Liver Diseases
ACE	angiotensin-converting enzyme
ACG	American College of Gastroenterology
ACR	American College of Radiology
ACTH	adrenocorticotrophic hormone
AFP	alpha-fetoprotein
AGA	American Gastroenterological Association
ALT	alanine aminotransferase
ASGE	American Society for Gastrointestinal Endoscopy
AST	aspartate aminotransferase
AUA	American Urological Association
BEIR	Biological Effects of Ionizing Radiation
BUN	blood urea nitrogen
CAG	Canadian Association of Gastroenterology
CNS	central nervous system

Abdomen Imaging Guidelines

Abbreviations for Abdomen Imaging Guidelines

CT	computed tomography
CTA	computed tomography angiography
CTC	computed tomography colonography (aka: virtual colonoscopy)
DVT	deep vein thrombosis
ERCP	endoscopic retrograde cholangiopancreatography
EUS	endoscopic ultrasound
FNH	focal nodular hyperplasia
GFR	glomerular filtration rate
GGT	gamma glutamyl transferase
GI	gastrointestinal
HCC	hepatocellular carcinoma
HCPCS	Healthcare Common Procedural Coding System (commonly pronounced: "hix pix")
HU	Hounsfield units
IAA	iliac artery aneurysm
IV	intravenous
KUB	kidneys, ureters, bladder (plain frontal supine abdominal radiograph)
LFT	liver function tests
MASLD	metabolic dysfunction associated steatotic liver disease (formerly known as NAFLD)

Abbreviations for Abdomen Imaging Guidelines

MRCP	magnetic resonance cholangiopancreatography
MRA	magnetic resonance angiography
MRE	magnetic resonance elastography
MRI	magnetic resonance imaging
mSv	millisievert
NAFLD	nonalcoholic fatty liver disease (now known as MASLD)
PA	posteroanterior projection
PET	positron emission tomography
RAS	renal artery stenosis
RBC	red blood cell
SBFT	small bowel follow through
SPECT	single photon emission computed tomography
VC	virtual colonoscopy (CT colonography)
PFT	pulmonary function tests
WBC	white blood cell
ZES	Zollinger-Ellison Syndrome

General Guidelines (AB-1.0)

AB.GG.0001.0.A

v1.0.2026

- A pertinent clinical evaluation since the new onset or change in symptoms is required prior to advanced imaging:
 - A pertinent clinical evaluation should include the following:
 - A detailed history and physical examination relevant to the current complaint
 - Appropriate laboratory studies
 - Non-advanced imaging modalities such as plain x-ray or ultrasound of the area of concern
 - For an established individual, a meaningful technological contact (telehealth visit, telephone call, electronic mail, or messaging) since the onset of change in symptoms can serve as a pertinent clinical evaluation.

Red Flag Findings

- The following signs and symptoms can be indicative of more serious conditions. Documentation of abdominal pain along with ANY of the following warrants exclusion from prerequisites to advanced imaging:
 - History of malignancy with a likelihood or propensity to metastasize to abdomen
 - Immunocompromised individual (e.g., on immunosuppressive therapy, history of HIV)
 - Fever (≥ 101 degrees Fahrenheit)
 - Elevated WBC $> 10,000$, or above the upper limit of normal for the particular lab reporting the result
 - Low WBC (absolute neutrophil count < 1000)
 - Palpable mass of clinical concern and/or without benign features
 - GI bleeding, overt or occult, not obviously hemorrhoidal
 - Abdominal tenderness documented as moderate or severe
 - Peritoneal signs, such as guarding or rebound tenderness
 - Suspected complication of bariatric surgery
 - Notation by the ordering provider that the individual has a "surgical abdomen"
 - Age ≥ 60 years with unintentional weight loss of ≥ 10 lbs. or $\geq 5\%$ of body weight over 6 months or less, without an identifiable reason
- See the condition-specific sections for when the above list of exclusionary criteria apply and lead directly to advanced imaging.

Imaging Recommended Per Drug Manufacturer

- When follow-up imaging for the purposes of monitoring or screening is recommended in the package insert for a particular drug therapy or medication, that imaging may be medically necessary.

Complications Related to COVID-19

- Please refer to the appropriate condition-specific guideline relevant to the presenting signs or symptoms in individuals with potential sequelae of COVID-19.
 - Examples include:
 - For suspected acute mesenteric ischemia, see: **Mesenteric Ischemia (AB-6.1)**
 - For suspected renal failure, see: **Renal Failure (AB-36.1)**

Pre-operative Radiologic Imaging

- If imaging is requested by the operating surgeon to support planned surgery, the imaging is considered medically necessary.
- Please refer to the appropriate condition-specific guideline relevant to the clinical condition for pre-operative imaging indications (e.g., **Percutaneous Gastrostomy (AB-9.2)**)
- Radiologic therapeutic intervention is addressed elsewhere in this Guideline.
 - Radiologic management of lower GI bleeding, see: **Small Bowel Bleeding Suspected (AB-22.2)**
 - Radiologic management of mesenteric ischemia, see: **Mesenteric/Colonic Ischemia (AB-6.1)**
 - Radiologic management of portal hypertension, see: **Portal Hypertension (AB-26.3)**

3D Rendering

- CPT[®] 76377 (3D rendering requiring image post-processing on an independent workstation) or CPT[®] 76376 (3D rendering not requiring image post-processing on an independent workstation) is medically necessary in the following clinical scenarios:
 - Pre-operative planning for complex surgical cases
 - CT Urogram (See: **Hematuria and Hydronephrosis (AB-39)**)
 - MRCP (See: **MR Cholangiopancreatography (MRCP) (AB-27)**)
- CPT[®] codes for 3D rendering should not be billed in conjunction with computer-aided detection (CAD), MRA, CTA, nuclear medicine SPECT studies, PET, PET/CT, or CT Colonography (virtual colonoscopy).

Health Equity Considerations

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social

conditions in which individuals are born, grow, live, work, and age. Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

Evidence Discussion

Except as noted in condition-specific sections of these Abdominal Guidelines, initial evaluation by ultrasound is generally prerequisite to advanced imaging modalities. Ultrasound requires no ionizing radiation, is cost effective, helps determine most appropriate next advanced imaging study (CT vs. MRI) and contrast level, is readily accessible, and often can be scheduled same day.

When Red Flag signs and symptoms are present, literature supports early use of computer tomography (CT) and/or magnetic resonance imaging (MRI) without need for a prior ultrasound. Red Flags include:

- Risk of metastases: Liver, lung, and regional lymph nodes are frequent metastatic targets readily identified by advanced abdominal imaging. Metastatic foci are less readily identified by ultrasound in the hollow viscus than solid abdominal organs - e.g., in high prevalence metastatic spread to the gas-filled stomach by breast cancer (27%), lung cancer (23%), renal cell cancer (7.6%), and malignant melanoma (7%).²⁰
- Fever: Accompanied by abdominal pain, or in combination with vomiting, bloody stools, unexplained weight loss, or persistent fever requires urgent imaging evaluation. CT and MRI are better suited than ultrasound in localizing and characterizing gut-related urgencies such as bowel blockage, abdominal ischemia, acute inflammatory conditions (diverticulitis, flares of inflammatory bowel disease, perforation), and obstructing tumors.²¹
- Abnormal white cell number: Neutropenia or leukocytosis warrants definitive advanced imaging to avoid delays in diagnosis and treatment, especially in immunocompromised settings, for life-threatening pathology such as neutropenic enterocolitis (typhilitis) or the various infectious, inflammatory, or injurious conditions described in the Abdominal Guideline sections in which an elevated white cell count is seen.²²
- Concerning palpable mass: The imaging approach to diagnosis varies by location and clinician-concern. For intra-abdominal masses, contrast-enhanced CT and ultrasound examination have demonstrated accuracy. For abdominal wall masses, which may arise from muscle, subcutaneous tissue, or connective tissue, MRI, CT, and ultrasound all provide diagnostic value. When mass is accompanied by abdominal pain, advanced imaging modalities may facilitate care.²³

- GI bleeding: When the source of bleeding is unidentified after upper endoscopy and/or colonoscopy, subsequent diagnostic modalities should be guided by clinical presentation, hemodynamic stability, and local expertise. CT angiography demonstrates a sensitivity of 86% and specificity of 95% in acute GI bleeding and is useful in directing definitive hemostatic treatment.²⁴
- Significant abdominal tenderness, with or without peritoneal signs: Rapid onset of severe abdominal pain with significant tenderness, an acute abdomen or surgical abdomen, may indicate a potentially life-threatening condition requiring urgent surgical intervention for which accurate and timely diagnosis is critical. Advanced imaging also offers greater accuracy than ultrasound in the setting of a painless acute abdomen seen in older people, children, the immunocompromised, and in the last trimester of pregnancy.²⁵
- Suspected complication of bariatric surgery: Early advanced imaging followed by emergent intervention avoids morbidity in Roux-en-Y individuals with internal hernias or in balloon recipients with bowel obstruction or perforated gastrojejunal ulcer.²⁶
- Unexplained weight loss: Problematic weight loss in the older adult is defined by the United States Omnibus Budget Reconciliation Act of 1987 (Title IV: subtitle C: Nursing Home Reform) as a loss of 5% of body weight in one month or 10% over a period of six months or longer. Unintentional weight loss is associated with an increased risk of death among older adults.²⁷

Overview (AB-1.1)

AB.GG.0001.1.A

v1.0.2026

- GI Specialist evaluations can be helpful, particularly in determining mesenteric/colonic ischemia, diarrhea/constipation, irritable bowel syndrome (IBS), or need for MRCP.
- Abdominal imaging begins at the diaphragm and extends to the umbilicus or iliac crest.
- Pelvic imaging begins at the iliac crest and extends to the pubis.
 - The uterus, fallopian tubes and ovaries arise out of the pelvis and are considered pelvic organs. If the uterus or adnexa rise out of the pelvic cavity, above the level of the iliac crest or umbilicus on physical exam or previous imaging, abdominal imaging may be added for the completion of imaging.
- Imaging for clinical concerns at the dividing line can be providers' choice (abdomen and pelvis; abdomen or pelvis).

CT Imaging (AB-1.2)

AB.GG.0001.2.A

v1.0.2026

- CT imaging is a more generalized modality. CT Abdomen is usually performed with contrast (CPT® 74160):
 - Oral contrast has no relation to the IV contrast administered. Coding for contrast only refers to IV contrast. There is no coding for oral contrast.
 - Exceptions are noted in these guidelines and include:
 - CT Abdomen with contrast (CPT® 74160) or without and with contrast (CPT® 74170) with suspicion of a solid organ lesion (liver, kidney, pancreas, spleen)
 - Please refer to the specific guideline for the lesion in question for specific guidance.
 - CT Abdomen without contrast (CPT® 74150) or CT Abdomen and Pelvis without contrast (CPT® 74176) if there is renal insufficiency/failure, or a documented allergy to contrast. It can also be considered medically necessary for diabetics or the very elderly.
 - CT Abdomen and Pelvis without and with contrast (CPT® 74178 – CT Urogram) for certain urologic conditions (e.g. hematuria).
 - Shellfish allergy:
 - It is commonly assumed that an allergy to shellfish infers iodine allergy, and that this implies an allergy to CT iodinated contrast media. However, this is NOT true. Shellfish allergy is due to tropomyosins. Iodine plays no role in these allergic reactions. Allergies to shellfish do not increase the risk of reaction to IV contrast any more than that of other allergens.
 - CT Abdomen and Pelvis, usually with contrast (CPT® 74177), is considered medically necessary when signs or symptoms are generalized, or involve a lower quadrant of the abdomen.
 - CT Enterography (CPT® 74177) combines CT imaging with large volumes of ingested neutral bowel contrast material to allow visualization of the small bowel.
 - CT Enteroclysis
 - A tube is placed through the nose or mouth and advanced into the duodenum or jejunum. Bowel contrast material is infused through the tube and CT imaging is performed either with or without intravenous contrast.
 - CT Enteroclysis is used to allow visualization of the small bowel wall and lumen. CT Enteroclysis may allow better or more consistent distention of the small bowel than CT Enterography.
 - Report by assigning: CPT® 74176 or CPT® 74177
 - Triple-phase CT
 - 3 phases of a triple-phase CT are:

- 1) Hepatic arterial phase,
- 2) Portal venous phase, and
- 3) Washout or delayed acquisitions phase.
- It should be noted that, in general, a pre-contrast or non-contrast CT is usually not needed in a standard triple-phase CT, except in those individuals previously treated with locoregional embolic or ablative therapies. Other specific instances in which a prior non-contrast CT is medically necessary for the evaluation of liver lesions are noted in **Liver Lesion Characterization (AB-29.1)**.
- CT Colonography (CTC)
 - There are 3 CPT[®] codes for CTC:
 - CPT[®] 74263: Screening CTC (only used for screening procedures)
 - CPT[®] 74261: CTC without contrast
 - CPT[®] 74262: CTC with contrast
 - See: **CT Colonography (CTC) (AB-25)** for further indications for these procedures

MR Imaging (AB-1.3)

AB.GG.0001.3.A

v1.0.2026

- MRI may be preferred as a more targeted study in cases of renal failure, in individuals allergic to intravenous CT contrast, and as noted in these guidelines.
 - MRI Abdomen with contrast only is essentially never performed. If contrast is indicated, MRI Abdomen without and with contrast (CPT[®] 74183) should be considered medically necessary.
 - For pregnant individuals ultrasound or MRI without contrast should be used to avoid radiation exposure. The use of gadolinium contrast agents is limited during pregnancy, as gadolinium contrast agents cross the placenta and enter the amniotic fluid with unknown long-term effects on the fetus.
 - See: **Pregnancy Considerations for Imaging (AB-1.12)** for additional discussion of this issue
- MR Elastography (CPT[®] 76391) replaces MRI Abdomen (CPT[®] 74183 or CPT[®] 74181) for requests for MR Elastography liver (See: **Liver Elastography (AB-45)**)

MR Enterography and Enteroclysis

Coding Notes (AB-1.4)

AB.GG.0001.4.A

v1.0.2026

- MR Enterography or Enteroclysis is reported in one of two ways:
 - MRI Abdomen without and with contrast (CPT[®] 74183), or
 - MRI Abdomen without and with contrast (CPT[®] 74183) and MRI Pelvis with and without contrast (CPT[®] 72197)

Ultrasound (AB-1.5)

AB.GG.0001.5.A**v1.0.2026**

- Ultrasound, also called sonography, uses high frequency sounds waves to image body structures.
 - The routine use of 3D and 4D rendering (post-processing) in conjunction with ultrasound is not medically necessary.
 - All ultrasound studies require permanently recorded images either stored on film or in a Picture Archiving and Communication System (PACS).
 - The use of a hand-held or any Doppler device that does not create a hard-copy output is considered part of the physical examination and is not separately billable. This exclusion includes devices that produce a record that does not permit analysis of bi-directional vascular flow.
- Duplex scan describes an ultrasonic scanning procedure for characterizing the pattern and direction of blood flow in arteries and veins with the production of real-time images integrating B-mode 2D vascular structures, Doppler spectral analysis, and color flow Doppler imaging.
 - The minimal use of color Doppler alone, when performed for anatomical structure identification during a standard ultrasound procedure, is not separately reimbursable.

Abdominal Ultrasound (AB-1.6)

AB.GG.0001.6.A**v1.0.2026**

- Complete abdominal ultrasound (CPT[®] 76700) includes all of the following required elements:
 - Liver, gallbladder, common bile duct, pancreas, spleen, kidneys, upper abdominal aorta, and inferior vena cava
 - If a particular structure or organ cannot be visualized, the report should document the reason.
- Limited abdominal ultrasound (CPT[®] 76705) is without all of these required elements and can refer to a specific study of a single organ, a limited area of the abdomen, or a follow-up study.
 - Further, CPT[®] 76705 should:
 - Be assigned to report follow-up studies once a complete abdominal ultrasound (CPT[®] 76700) has been performed; and
 - Be assigned to report ultrasonic evaluation of diaphragmatic motion; and
 - Be reported only once per individual imaging session; and
 - Not be reported with CPT[®] 76700 for the same individual for the same imaging session

Retroperitoneal Ultrasound (AB-1.7)

AB.GG.0001.7.A

v1.0.2026

- Complete retroperitoneal ultrasound (CPT® 76770) includes all of the following required elements:
 - Kidneys, lymph nodes, abdominal aorta, common iliac artery origins, inferior vena cava
 - For urinary tract indications, a complete study can consist of kidneys and bladder
- Limited retroperitoneal ultrasound (CPT® 76775) studies are without all of these required elements and can refer to a specific study of a single organ, a limited area of the abdomen, or a follow-up study.
 - Further, CPT® 76775 should:
 - Be assigned to report follow-up studies once a complete retroperitoneal ultrasound (CPT® 76770) has been performed; and
 - Be reported only once per individual imaging session; and
 - Not be reported with CPT® 76770 for the same individual for the same imaging session

This section intentionally left blank (AB-1.8)

AB.GG.0001.8.C

v1.0.2026

Contrast-Enhanced Ultrasound (AB-1.9)

AB.GG.0001.9.A**v1.0.2026**

Ultrasound with contrast (CEUS, CPT[®] 76978, CPT[®] 76979) is an emerging technology that may be as good, if not better, than CT or MRI in certain circumstances. Abdominal Imaging Guidelines address its use as appropriate. CPT[®] 76978 refers to the initial imaging of the first lesion, and CPT[®] 76979 refers to additional lesions that are imaged subsequently.

Quantitative MRI (AB-1.10)

AB.GG.0001.10.A

v1.0.2026

- Quantitative MRI analysis of tissue composition (CPT[®] 0648T, 0649T, 0697T and 0698T)
 - These CPT codes are experimental and investigational.
 - See: **Quantitative MR Analysis of Tissue Composition (Preface-4.8)** and **Fatty Liver (Metabolic Associated Steatotic Liver Disease (MASLD), Formerly Known as NAFLD) (AB-29.2)** for further discussion of these modalities.

RADCAT Grading System (AB-1.11)

AB.GG.0001.11.A

v1.0.2026

- The RADCAT (Radiology Report Categorization) Grading System was developed in order to communicate to ordering physicians (most commonly in the ER setting) the relative urgency of a radiologic finding. It is not related to the LI-RADs reporting system, nor does it necessarily imply the need for follow-up imaging, as opposed to clinical follow-up. The rating system is as follows:
 - RADCAT 1: Normal Result
 - RADCAT 2: Routine Result
 - RADCAT 3: Result with recommendation for non-urgent routine follow-up
 - RADCAT 4: Priority Result
 - RADCAT 5: Critical Result

Pregnancy Considerations for Imaging (AB-1.12)

AB.GG.0001.12.A

v1.0.2026

The American College of Obstetricians and Gynecologists has issued guidelines with regards to imaging during pregnancy and lactation. Their recommendations are as follows:¹⁵

- Ultrasonography and magnetic resonance imaging (MRI), which are not associated with exposure to ionizing radiation, are the imaging modalities of choice for pregnant individuals. These modalities should be limited to situations in which the results are expected to address a clinically relevant question or otherwise provide medical benefit to the individual.
- With few exceptions, radiation exposure through radiography, computed tomography (CT) scan, or nuclear medicine imaging techniques is at a dose much lower than the exposure associated with fetal harm.
 - If these techniques are necessary in addition to ultrasound or MRI or are more readily available for the diagnosis in question, they should not be withheld from a pregnant individual.
- The use of gadolinium contrast with MRI should be limited; it may be used as a contrast agent in a pregnant individual only if it significantly improves diagnostic performance and is expected to improve fetal or maternal outcome.
- With regards to iodinated IV contrast media, "it is generally recommended that contrast only be used if absolutely required to obtain additional diagnostic information that will affect the care of the fetus or woman during pregnancy."

References (AB-1)

v1.0.2026

1. Faerber EN, Benator RM, Browne LP, et al. ACR–SPR Practice Parameter For The Safe And Optimal Performance Of Fetal Magnetic Resonance Imaging (MRI) American College of Radiology. Published 2014.
2. ACR Practice Guideline for Imaging Pregnant or Potentially Pregnant Adolescents and Women with Ionizing Radiation. American College of Radiology. Published 2014.
3. Runyon BA. Management of adult patients with ascites due to cirrhosis: An update. *Hepatology*. 2009;49(6):2087-2107.(revised 2012).
4. Berzigotti A, Ashkenazi E, Reverter E, et al. Non-Invasive Diagnostic and Prognostic Evaluation of Liver Cirrhosis and Portal Hypertension. *Disease Markers*. 2011;31(3):129-138.
5. Choi J-Y, Lee J-M, Sirlin CB. CT and MR Imaging Diagnosis and Staging of Hepatocellular Carcinoma: Part II. Extracellular Agents, Hepatobiliary Agents, and Ancillary Imaging Features. *Radiology*. 2014;273(1):30-50. doi:10.1148/radiol.14132362.
6. Chiorean L, Tana C, Braden B, et al. Advantages and Limitations of Focal Liver Lesion Assessment with Ultrasound Contrast Agents: Comments on the European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB) Guidelines. *Medical Principles and Practice*. 2016;25(5):399-407. doi:10.1159/000447670.
7. Claudon M, Dietrich C, Choi B, et al. Guidelines and Good Clinical Practice Recommendations for Contrast Enhanced Ultrasound (CEUS) in the Liver – Update 2012. *Ultraschall in der Medizin - European Journal of Ultrasound*. 2012;34(01):11-29. doi:10.1055/s-0032-1325499.
8. Beyer L, Wassermann F, Pregler B, et al. Characterization of Focal Liver Lesions using CEUS and MRI with Liver-Specific Contrast Media: Experience of a Single Radiologic Center. *Ultraschall in der Medizin - European Journal of Ultrasound*. 2017;38(06):619-625. doi:10.1055/s-0043-105264.
9. Trillaud H, Bruel J-M, Valette P-J, et al. Characterization of focal liver lesions with SonoVue®-enhanced sonography: International multicenter-study in comparison to CT and MRI. *World Journal of Gastroenterology*. 2009;15(30):3748. doi:10.3748/wjg.15.3748.
10. Marrero JA, Kulik LM, Sirlin CB, et al. Diagnosis, Staging, and Management of Hepatocellular Carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases. *Hepatology*. 2018;68(2):723-750. doi:10.1002/hep.29913.
11. Baig, Mudassar. "Shellfish Allergy and Relation to Iodinated Contrast Media: United Kingdom Survey." *World Journal of Cardiology* 6, no. 3 (2014): 107-111. doi:10.4330/wjc.v6.i3.107.
12. Schabelman, Esteban, and Michael Witting. "The Relationship of Radiocontrast, Iodine, and Seafood Allergies: A Medical Myth Exposed." *The Journal of Emergency Medicine* 39, no. 5 (2010): 701-07. doi:10.1016/j.jemermed.2009.10.014.
13. Beckett, Katrina R., Andrew K. Moriarity, and Jessica M. Langer. "Safe Use of Contrast Media: What the Radiologist Needs to Know." *RadioGraphics* 35, no. 6 (2015): 1738-750. doi:10.1148/rq.2015150033.
14. Swenson DW, Baird GL, Portelli DC, Mainiero MB, Movson JS. Pilot study of a new comprehensive radiology report categorization (RADCAT) system in the emergency department. *Emergency Radiology*. 2017;25(2):139-145. doi:10.1007/s10140-017-1565-8.
15. Guidelines for diagnostic imaging during pregnancy and lactation. Committee Opinion No. 723. American College of Obstetricians and Gynecologists. *Obstet Gynecol*. 2017;130:e210–6.
16. Longo SA, Moore RC, Canzoneri BJ, Robichaux A. Gastrointestinal conditions during pregnancy. *Clin. Colon Rectal Surg*. 2010;23(2):80-89. doi:10.1055/s-0030-1254294.
17. Aslanian HR, Lee JH, Canto MI. AGA clinical practice update on pancreas cancer screening in high risk individuals: expert review. *Gastroenterology*. 2020;159(1):358-362. doi:10.1053/j.gastro.2020.03.088.
18. National Institute for Health and Care Excellence (NICE). Upper gastrointestinal tract cancers. In: Suspected cancer: recognition and referral. 2015. <https://www.nice.org.uk/guidance/ng12/chapter/Recommendations-organised-by-site-of-cancer#upper-gastrointestinal-tract-cancers>.
19. Baluch, A., Shewayish, S. (2019). Neutropenic Fever. In: Velez, A., Lamarche, J., Greene, J. (eds) Infections in Neutropenic Cancer Patients. Springer, Cham. https://doi.org/10.1007/978-3-030-21859-1_8.

20. Weigt J, Malfertheiner P. Metastatic disease in the stomach. *Gastrointest Tumors*. 2015;2(2):61–64. doi:10.1159/000431304.
21. Banerjee A. Emergency clinical diagnosis. *Gastrointestinal Emergencies*. 2017:235–260. doi:10.1007/978-3-319-50718-7.
22. Chow EJ, Bishop KD. Painless neutropenic enterocolitis in a patient undergoing chemotherapy. *Curr Oncol*. 2016;23(5):e514–e516. doi:10.3747/co.23.3119.
23. Fowler KJ, Garcia EM, Kim DH, et al. ACR Appropriateness Criteria® Palpable Abdominal Mass-Suspected Neoplasm. *J Am Coll Radiol*. 2019;16(11S):S384–S391. doi:10.1016/j.jacr.2019.05.014.
24. Sik B, Kim M, Li BT, et al. Diagnosis of gastrointestinal bleeding: A practical guide for clinicians. *World J Gastrointest Pathophysiol*. 2014;5(4):467–478. doi: 10.4291/wjgp.v5.i4.467.
25. Ragsdale L, Southerland L. Acute abdominal pain in the older adult. *Emerg Med Clin North Am*. 2011;29(2):429–48. doi:10.1016/j.emc.2011.01.012.
26. Fry BT, Finks JF. Abdominal pain after roux-en-y gastric bypass-a review. *JAMA Surg*. 2023;158(10):1096–1102. doi:10.1001/jamasurg.2023.3211.
27. Stajkovic S, Aitken EM, Holryod-Leduc J. Unintentional weight loss in older adults. *CMAJ*. 2011;183(4):443–449. doi:10.1503/cmaj.101471.
28. American College of Radiology (ACR); Society of Abdominal Radiology (SAR); Society for Pediatric Radiology (SPR); Society of Advanced Body Imaging (SABI). ACR-SABI-SAR-SPR Practice Parameter for the Performance of Computer Tomography (CT) of the Abdomen and Computed Tomography (CT) of the Pelvis. Revised 2021. American College of Radiology. Accessed July 28, 2025. <https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Practice-Parameters-and-Technical-Standards>

Abdominal Pain (AB-2)

Guideline	Page
Abdominal Pain (AB-2.2).....	28
Right Upper Quadrant and Epigastric Pain (AB-2.3).....	32
References (AB-2).....	34

Abdominal Pain (AB-2.2)

AB.AP.0002.2.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- For pregnant individuals, see **Pregnancy Considerations for Imaging (AB-1.12)**
 - Abdominal and/or Pelvic and/or Transvaginal ultrasound (CPT® 76700 and/or CPT® 76856 and/or CPT® 76830) is medically necessary initially to avoid ionizing radiation.
 - MRI Abdomen and/or MRI Pelvis without contrast (CPT® 74181 and or CPT® 72195) is medically necessary if the initial US is considered non-diagnostic.
- For the evaluation of left lower (including suspected diverticulitis), right lower (including suspected appendicitis), left upper, mid-abdominal, and/or non-specific abdominal pain regardless of duration (acute or chronic, defined respectively as less than or to equal to 6 months, or greater than or equal to 6 months):
 - CT Abdomen with contrast (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary if ANY of the following are present:
 - Age ≥65
 - Prior Abdominal and/or Pelvic US appropriate to the area of concern have been performed and demonstrate a need for additional imaging OR do not explain the source of pain
 - Recent laboratory studies related to the current episode have been performed and are non-diagnostic OR do not point to a specific etiology
 - Laboratory studies may include: CBC with differential, CMP, BMP, chemistry profile including electrolytes, glucose, creatinine, BUN with liver chemistries, ESR, amylase and lipase, CRP, inflammatory markers, pregnancy testing for reproductive age individuals, and urinalysis
 - All the specific laboratory studies listed are not required, but a relevant work-up should be performed in order to direct further advanced imaging appropriately.
- For follow-up imaging of diverticulitis:
 - CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary for ANY of the following:
 - acute diverticulitis if symptoms or elevated WBC persists despite treatment
 - diverticulitis treated with radiologic intervention (e.g., drainage procedure)
 - complicated diverticulitis, including confirmed abscess, fistulae, free fluid, or perforation. (See: **Abdominal Sepsis/Suspected Abdominal Sepsis (AB-3)**)
- For the evaluation of non-operative treatment of acute appendicitis:

- One-time CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary for EITHER of the following:
 - symptoms suspicious for recurrent appendicitis OR
 - post non-operative treatment follow-up
- For the evaluation of splenic etiologies such as suspected infarct or abscess (severe pain and tenderness, fever, history of atrial fibrillation):
 - CT Abdomen without and with contrast or with contrast (CPT® 74170 or CPT® 74160)
- For the evaluation of suspected small or large bowel etiologies (e.g., ischemia, obstruction, volvulus, or perforation):
 - CT Abdomen with contrast (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177)
- For the evaluation of suspected gastroenteritis and/or enterocolitis in the presence of any red flag findings:
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
 - If no red flag findings are present, initial evaluation should include history and physical exam, as well as relevant laboratory testing and/or abdominal x-ray.
 - For suspected ischemic enterocolitis, see: **Mesenteric Ischemia (AB-6.1)** or **Colonic Ischemia (Including Ischemic Colitis) (AB-6.2)**
 - For known or suspected IBD, see: **IBD (Crohn's Disease or Ulcerative Colitis) (AB-23.1)**
- For pain described as pelvic, see: **Pelvic Pain/Dyspareunia, Female (PV-11.1)**, **Male Pelvic Disorders (PV-19.1)** or other appropriate sections based on likely etiology.

CPT® Codes for Abdominal Pain (AB-2.2)

CPT® 74150	CT Abdomen without contrast	CPT® 76700	Ultrasound, complete Abdomen
CPT® 74160	CT Abdomen with contrast	CPT® 76705	Ultrasound, limited Abdomen
CPT® 74176	CT Abdomen and Pelvis without contrast	CPT® 76830	Ultrasound, Transvaginal
CPT® 74177	CT Abdomen and Pelvis with contrast	CPT® 76856	Ultrasound, complete Pelvis
CPT® 74181	MRI Abdomen without contrast	CPT® 72195	MRI Pelvis without contrast

CPT® Codes for Abdominal Pain (AB-2.2)

CPT® 74183	MRI Abdomen without and with contrast	CPT® 72197	MRI Pelvis without and with contrast
------------	---------------------------------------	------------	--------------------------------------

Evidence Discussion

There are many potential causes of abdominal pain. Standard-of-care evaluation generally begins with complete history, physical examination, and directed laboratory testing. The initial approach establishes differential diagnoses and clinical options. It also clarifies what imaging modality and body region are medically necessary to achieve the highest diagnostic yield while reducing radiation exposure and overutilization.^{1,3,5}

In the absence of red flags, Abdominal and/or Pelvic ultrasound is generally cost effective when performed early in the diagnostic paradigm. Although image quality may degrade due to overlying gas in the gut, US offers advantages in that it requires no contrast agents nor radiation exposure, can be used in pregnancy, and is readily available in evaluation of most conditions manifesting with abdominal pain.^{1,3,5}

Per ASCRS, colonic endoscopic evaluation is recommended to confirm the diagnosis after resolution of acute diverticulitis to exclude malignancy, especially when initial CT scan supports abscess, shouldering, or shelf-like appearance of a presumed inflammatory mass, obstruction, mesenteric or retroperitoneal adenopathy.¹⁸

Non-operative treatment of acute appendicitis offers a unique imaging opportunity. CT Abdomen and Pelvis with contrast is preferred to assess post-treatment response, to identify coexisting pathology masked by appendiceal inflammation, and when surgery is considered for symptoms that recur or fail to improve due to progression of disease or complications.⁷

Advanced imaging is further warranted, especially in follow-up to non-diagnostic ultrasound, when both acute and non-acute signs and symptoms pose a diagnostic and therapeutic challenge. The optimal choice of imaging modality is guided by contemporary medical literature and specialty societal recommendations.

- CT imaging of the Abdomen and Pelvis provides high diagnostic value as initial imaging in red flag circumstances and/or in follow-up when serial imaging is necessary as defined by guidelines or ultrasound is indeterminate. CT imaging can characterize gut-related urgencies including, but not limited to, bowel blockage, abdominal ischemia, and obstructing tumors. CT is highly sensitive for acute inflammatory conditions, such as diverticulitis and appendicitis. CT offers relatively brief imaging acquisition times but requires use of ionizing radiation typically in combination with intravenous contrast, making it non-ideal in pregnant individuals.^{3,5,7}

- MRI is typically reserved for pregnant individuals when ultrasound proved non-diagnostic. MRI is also relatively contraindicated for individuals who cannot tolerate confined space, long image acquisition times, and loud repetitive noise. Relative to evaluation of abdominal pain, the American College of Radiology opined "MRI is less sensitive for extraluminal air and urinary tract calculi, is more time-consuming to perform, and requires an active screening process for indwelling devices and metal, and more subject to motion artifacts in symptomatic individuals."^{3,5,7}

Right Upper Quadrant and Epigastric Pain (AB-2.3)

AB.AP.0002.3.C

v1.0.2026

- The presence of any red flag findings per **AB-1.0: General Guidelines** precludes adjudication based on any other criteria.
- For pregnant individuals, see: **Pregnancy Considerations for Imaging (AB-1.12)**
- For the evaluation of right upper quadrant pain in the absence of red flag findings:
 - Abdominal ultrasound (complete or limited) (CPT® 76700 or CPT® 76705) is the initial diagnostic test
 - CT Abdomen with contrast (CPT® 74160) or MRCP/MRI (MRI Abdomen without or without and with contrast) (CPT® 74181 or CPT® 74183) if ultrasound is equivocal or nondiagnostic
- For the evaluation of epigastric pain or dyspepsia in the absence of red flag findings:
 - Ultrasound Abdomen (CPT® 76700 or CPT® 76705) to assess for biliary/pancreatic disease is the initial study
 - CT Abdomen with contrast (CPT® 74160) or MRI Abdomen without and with contrast (CPT® 74183), or MRCP (CPT® 74181 or CPT® 74183), is medically necessary to further evaluate non-diagnostic findings on ultrasound
 - CT Abdomen with contrast (CPT® 74160), or MRI Abdomen without and with contrast (CPT® 74183) is medically necessary for persistent symptoms after a negative or inconclusive ultrasound as well as ONE of the following:
 - Test and treat for *Helicobacter pylori* (*H. pylori*) and a trial of acid suppression with a proton pump inhibitor (PPI) for 4-8 weeks if eradication is successful, but symptoms do not resolve OR
 - An empiric trial of acid suppression with a PPI for 4-8 weeks

Special Considerations for Suspicion of Pancreatic Cancer

CT Abdomen with contrast (CPT® 74160), CT Abdomen and Pelvis with contrast (CPT® 74177), or MRI Abdomen without and with contrast (CPT® 74183) is appropriate for suspicion of pancreatic cancer in individuals aged ≥60 years with weight loss and any ONE of the following:

- diarrhea
- back pain
- abdominal pain
- nausea
- vomiting

- constipation
- new onset diabetes
- abnormal lab results raising the possibility of pancreatic cancer (e.g., elevated CA 19-9, GGTP, alkaline phosphate, or bilirubin)
- non-diagnostic or negative prior US

If none of the above signs or symptoms applies, follow criteria for epigastric pain and dyspepsia.

See also: **Pancreatic Cancer-Suspected Diagnosis (ONC-13.2)** in the Oncology Imaging Guidelines.

Evidence Discussion

Many specific conditions may manifest with pain in the right upper abdominal quadrant and/or epigastrium. Dyspepsia is common and often best evaluated by empiric response to acid suppression therapy, assessment of treatment efficacy when H.Pylori is identified, and endoscopy.^{2,4,6,7}

For non-peptic causation of right upper and epigastric abdominal pain, ultrasound is the initial imaging study. Ultrasound is a readily available modality that offers good diagnostic utility while eliminating exposure to ionizing radiation. Ultrasound when diagnostic may confirm diagnoses of biliary and/or pancreatic disease, of space-occupying lesions, and of vascular concerns.^{2,4,6,7}

When indeterminate, ultrasound may help direct what advanced imaging modality and contrast is medically necessary—e.g., MRCP/ERCP for dilated biliary ducts, CT for pancreatitis, MRI/CT with and without contrast to better characterize abdominal mass lesions. While CT is highly sensitive for acute inflammatory conditions and offers relatively brief image acquisition times, it requires use of ionizing radiation. MRI is typically reserved for pregnant individuals when ultrasound proved non-diagnostic but is relatively contraindicated for individuals who cannot tolerate confined space, prolonged image acquisitions, loud repetitive noise. Relative to evaluation of abdominal pain, the American College of Radiology opined "MRI is less sensitive for extraluminal air and calculi, is more time-consuming to perform, and requires an active screening process for indwelling devices and metal, and more subject to motion artifacts in symptomatic individuals."^{2,4,6,7}

References (AB-2)

v1.0.2026

1. Yew KS, George MK, Allred HB. Acute Abdominal Pain in Adults: Evaluation and Diagnosis. *Am Fam Physician*. 2023;107(6):585-596.
2. Moayyedi P, Lacy BE, Andrews CN, Enns RA, Howden CW, Vakil N. ACG and CAG Clinical Guideline: Management of Dyspepsia [published correction appears in *Am J Gastroenterol*. 2017 Sep;112(9):1484. doi: 10.1038/ajg.2017.238.]. *Am J Gastroenterol*. 2017;112(7):988-1013. doi:10.1038/ajg.2017.154
3. Expert Panel on Gastrointestinal Imaging, Weinstein S, Kim DH, et al. ACR Appropriateness Criteria® Left Lower Quadrant Pain: 2023 Update. *J Am Coll Radiol*. 2023;20(11S):S471-S480. doi:10.1016/j.jacr.2023.08.013
4. Expert Panel on Gastrointestinal Imaging, Russo GK, Zaheer A, et al. ACR Appropriateness Criteria® Right Upper Quadrant Pain: 2022 Update. *J Am Coll Radiol*. 2023;20(5S):S211-S223. doi:10.1016/j.jacr.2023.02.011
5. Expert Panel on Gastrointestinal Imaging, Scheirey CD, Fowler KJ, et al. ACR Appropriateness Criteria® Acute Nonlocalized Abdominal Pain. *J Am Coll Radiol*. 2018;15(11S):S217-S231. doi:10.1016/j.jacr.2018.09.010
6. Expert Panel on Gastrointestinal Imaging, Vij A, Zaheer A, et al. ACR Appropriateness Criteria® Epigastric Pain. *J Am Coll Radiol*. 2021;18(11S):S330-S339. doi:10.1016/j.jacr.2021.08.006
7. Expert Panel on Gastrointestinal Imaging, Garcia EM, Camacho MA, et al. ACR Appropriateness Criteria® Right Lower Quadrant Pain-Suspected Appendicitis. *J Am Coll Radiol*. 2018;15(11S):S373-S387. doi:10.1016/j.jacr.2018.09.033
8. Expert Panel on Gastrointestinal Imaging, Galgano SJ, McNamara MM, et al. ACR Appropriateness Criteria® Left Lower Quadrant Pain-Suspected Diverticulitis. *J Am Coll Radiol*. 2019;16(5S):S141-S149. doi:10.1016/j.jacr.2019.02.015
9. Ringel-Kulka, Tamar, et. al. Evaluation of Chronic Abdominal Pain in Adults. Nov 28, 2018. Epocrates (Content by British Medical Journal).
10. Charles, G, Chery, M, King Channell, M. Chronic Abdominal Pain: Tips for the Primary Care Provider. *Osteopathic Family Physician*; Jan/Feb, 2019.11(1).
11. Talan DA, Saltzman DJ, Deugarte DA, Moran GJ. Methods of conservative antibiotic treatment of acute uncomplicated appendicitis. *Journal of Trauma and Acute Care Surgery*. 2019;86(4):722-736. doi:10.1097/ta.0000000000002137.
12. Gans SL, Pols MA, Stoker J, Boermeester MA. Guideline for the Diagnostic Pathway in Patients with Acute Abdominal Pain. *Digestive Surgery*. 2015;32(1):23-31. doi:10.1159/000371583.
13. DiSaverio S, Podda M, De Simone B, et. al. Diagnosis and treatment of acute appendicitis: 2020 update of the WSES (World Society of Emergency Surgery) Jerusalem guidelines. *World J Emerg Surg*. 2020;15:27. doi:10.1186/s13017-020-00306-3.
14. Longo SA, Moore RC, Canzoneri BJ, Robichaux A. Gastrointestinal conditions during pregnancy. *Clin. Colon Rectal Surg*. 2010; 23(2):80-89. doi:10.1055/s-0030-1254294.
15. Guidelines for diagnostic imaging during pregnancy and lactation. Committee Opinion No. 723. American College of Obstetricians and Gynecologists. *Obstet Gynecol*. 2017;130:e210-6.
16. Von-Mühlen B, Franzon O, Beduschi MG, Kruehl N, Lupselo D. AIR score assessment for acute appendicitis. *Arg Bras Cir Dig*. 2015;28(3):171-173. doi:10.1590/S0102-672020150003000006.
17. Snyder MJ, Guthrie M, Cagle S. Acute appendicitis: efficient diagnosis and management. *Am Fam Physician*. 2018;98(1):25-33.
18. Hall J, Hardiman K, Lee S, et. al. The American Society of Colon and Rectal Surgeons clinical practice guidelines for the treatment of left-sided colonic diverticulitis. *Dis Colon Rectum*. 2020;63:728-747. doi:10.1097/DCR.0000000000001679.
19. Schultz JK, Azhar N, Binda GA, et. al. European Society of Coloproctology: guidelines for the management of diverticular disease of the colon. *Colorectal Disease*. 2020;22(2):5-28. doi:10.1111/codi.15140.
20. Strate LL, Morris AM. Epidemiology, pathophysiology, and treatment of diverticulitis. *Gastroenterology*. 2019;156:1282-1298. doi:10.1053/j.gastro.2018.12.033.
21. Schreyer AG, Lauer G. S2K guidelines for diverticular disease and diverticulitis: diagnosis, classification, and therapy for the radiologist. *Rofo*. 2015;187(8):676-84. doi:10.1055/s-0034-1399526.28.

22. Aslanian HR, Lee JH, Canto MI. AGA clinical practice update on pancreas cancer screening in high risk individuals: expert review. *Gastroenterology*. 2020;159(1):358-362. doi:10.1053/j.gastro.2020.03.088.29.
23. National Institute for Health and Care Excellence (NICE). Upper gastrointestinal tract cancers. In: Suspected cancer: recognition and referral. 2015. <https://www.nice.org.uk/guidance/ng12/chapter/Recommendations-organised-by-site-of-cancer#upper-gastrointestinal-tract-cancers>.
24. Doubova M, Cortel-LeBlanc MA, Mckinnon M, et al. Risk factors for acute appendicitis among adult individuals with indeterminate ultrasound. *CJEM*. 2025;27(1):27-31. doi:10.1007/s43678-024-00793-2
25. Scorza K, Williams A, Phillips D, et al. Evaluation of Nausea and Vomiting. *American Family Physician*. 2007; 76(1):76-84
26. Shane AL, Mody RK, Crump JA, et. al. 2017 Infectious Disease Society of America clinical practice guidelines for the diagnosis and management of infectious diarrhea. *Clin Infect Dis*. 2017;65(12):e45-e80. doi:10.1093/cid/cix669.
27. Expert Panel on Gastrointestinal Imaging, Chang KJ, Marin D, et al. ACR Appropriateness Criteria® Suspected Small-Bowel Obstruction. *J Am Coll Radiol*. 2020;17(5S):S305-S314. doi:10.1016/j.jacr.2020.01.025
28. Tome J, Kamboj AK, Sweetser S. A Practical 5-Step Approach to Nausea and Vomiting. *Mayo Clin Proc*. 2022;97(3):600-608. doi:10.1016/j.mayocp.2021.10.030
29. Bonomo RA, Tamma PD, Abrahamian FM, et al. 2024 clinical practice guideline update by the Infectious Diseases Society of America on complicated intra-abdominal infections: diagnostic imaging of suspected acute intra-abdominal abscess in adults, children, and pregnant people.
30. Expert Panel on Gastrointestinal Imaging: Sahar Soleimani et al. ACR Appropriateness Criteria on acute left upper quadrant pain. *J Am Coll Radiol*. 2025
31. American College of Radiology (ACR); Society of Abdominal Radiology (SAR); Society for Pediatric Radiology (SPR); Society of Advanced Body Imaging (SABI). ACR-SABI-SAR-SPR Practice Parameter for the Performance of Computer Tomography (CT) of the Abdomen and Computed Tomography (CT) of the Pelvis. Revised 2021. American College of Radiology. Accessed July 28, 2025. <https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Practice-Parameters-and-Technical-Standards>
32. Expert Panel on GYN and OB Imaging, Brook OR, Dadour JR, et al. ACR Appropriateness Criteria® Acute Pelvic Pain in the Reproductive Age Group: 2023 Update. *J Am Coll Radiol*. 2024;21(6S):S3-S20. doi:10.1016/j.jacr.2024.02.014
33. Tayebi, A., Olamaeian, F., Mostafavi, K. et al. Assessment of Alvarado criteria, ultrasound, CRP, and their combination in patients with suspected acute appendicitis: a single centre study. *BMC Gastroenterol* 24, 243 (2024). <https://doi.org/10.1186/s12876-024-03333-5>

Abdominal Sepsis (Suspected Abdominal Abscess) (AB-3)

Guideline	Page
Abdominal Sepsis/Abscess (AB-3.1).....	37
Reference (AB-3).....	38

Abdominal Sepsis/Abscess (AB-3.1)

AB.AS.0003.1.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- For abdominal symptoms associated with fever and/or elevated white blood cell count ANY of the following are medically necessary:
 - CT Abdomen with contrast (CPT® 74160)
 - CT Pelvis with contrast (CPT® 72193)
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
- For intraperitoneal abscess:
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
 - Interval imaging as requested
- For follow-up imaging of known abnormal fluid collections after medical management or catheter drainage, ANY of the following are medically necessary:
 - Serial Ultrasound (CPT® 76705)
 - CT Abdomen with contrast (CPT® 74160)
 - CT Pelvis with contrast (CPT® 72193)
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
 - The interval can be days, weeks, or months based on the clinical course of the individual

Evidence Discussion

- Individuals presenting with potential abdominal sepsis or an abscess represent an urgent clinical concern. Therefore, individuals exhibiting abdominal symptoms accompanied by fever or an elevated WBC count (or any red flag) should proceed directly to advanced imaging without further evaluation. A CT scan of the abdomen and/or pelvis with contrast is typically the appropriate study for such evaluations.²
- Interval imaging may be medically necessary for abscesses or other fluid collections, particularly after catheter drainage. Both ultrasound and CT imaging are appropriate for serial imaging. The timing of serial imaging is not specified and should be based on the individual's unique clinical course.¹

Reference (AB-3)

v1.0.2026

1. ACR Appropriateness Criteria® Acute (nonlocalized) Abdominal Pain and Fever or Suspected Abdominal Abscess. American College of Radiology, Published 2012. Rev. 2018.
2. Expert Panel on Gastrointestinal Imaging; Scheirey CD, Fowler KJ, et al. ACR Appropriateness Criteria® Acute Nonlocalized Abdominal Pain. J Am Coll Radiol. 2018;15(11S):S217-S231. doi:10.1016/j.jacr.2018.09.0
3. Bonomo RA, Chow AW, Edwards MS, et al. 2024 clinical practice guideline update by the Infectious Diseases Society of America on complicated intra-abdominal infections: risk assessment, diagnostic imaging, and microbiological evaluation in adults, children, and pregnant people. Clin Infect Dis. 2024;79(Suppl 3):S81-S87. doi:10.1093/cid/ciae346.
4. Expert Panels on Thoracic, Gastrointestinal, and Urological Imaging, Brixey AG, Fung A, et al. ACR Appropriateness Criteria® Sepsis. J Am Coll Radiol. 2024;21(6S):S292-S309. doi:10.1016/j.jacr.2024.02.029
5. Expert Panel on Interventional Radiology, Weiss CR, Bailey CR, et al. ACR Appropriateness Criteria® Radiologic Management of Infected Fluid Collections. J Am Coll Radiol. 2020;17(5S):S265-S280. doi:10.1016/j.jacr.2020.01.034

Flank Pain, Rule Out or Known Renal/ Ureteral Stone (AB-4)

Guideline	Page
Ultrasound (AB-4.0).....	40
Suspected Renal/Ureteral Stone(s) (AB-4.1).....	41
Observation of Known Renal/Ureteral Stone(s) (AB-4.2).....	42
Follow-Up of Treated Renal/Ureteral Stone (AB-4.3).....	44
Annual Surveillance (AB-4.4).....	46
This section intentionally left blank (AB-4.5).....	47
References (AB-4).....	48

Ultrasound (AB-4.0)

AB.US.0004.0.A**v1.0.2026**

- For the evaluation of flank pain and/or suspected renal or ureteral calculi, retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775) is medically necessary in place of CT Abdomen and Pelvis for any initial or follow-up indications, if requested by provider.

Suspected Renal/Ureteral Stone(s) (AB-4.1)

AB.US.0004.1.A

v1.0.2026

- CT Abdomen and Pelvis without contrast (CPT[®] 74176) is medically necessary for ANY of the following:
 - Suspected renal/ureteral stone with symptoms in non-pregnant adults (flank pain/renal colic) OR
 - Suspected staghorn calculi
- CT Abdomen and Pelvis without contrast (CPT[®] 74176) or CT Urogram (CPT[®] 74178) is medically necessary for the following:
 - Suspicion renal/ureteral stones (flank pain/renal colic) with hematuria
- Ultrasound (CPT[®] 76770 or CPT[®] 76775) or MRI Abdomen and Pelvis without contrast (CPT[®] 74181 and CPT[®] 72195) is medically necessary for the following:
 - Suspected renal/ureteral stone in pregnant individuals (flank pain/renal colic)
 - The use of gadolinium contrast agents is contraindicated during pregnancy unless the specific need for that procedure outweighs risk to the fetus.
- Suspected renal/ureteral stone in children (flank pain/renal colic)
 - See: **Flank Pain, Renal Stone (PEDAB-4)** in the Pediatric Abdomen Imaging Guidelines

Evidence Discussion

Non-contrast CT (NCCT) is the imaging study of choice for initial evaluation of individuals with acute onset of flank pain and suspicion of stone disease without known prior stone disease. Non-contrast CT (NCCT) can reliably characterize the location and size of an offending ureteral calculus, identify complications, and diagnose alternative etiologies of abdominal pain. For individuals with known disease and recurrent symptoms of urolithiasis, NCCT remains the test of choice for evaluation.¹⁷

Although less sensitive in the detection of stones, ultrasound may have a role in evaluating for signs of obstruction. Radiography potentially has a role, although has been shown to be less sensitive than NCCT.¹

In pregnancy, given radiation concerns, ultrasound is recommended as the initial modality of choice with potential role for non-contrast MRI.⁴

In scenarios where stone disease is suspected and initial NCCT is inconclusive, contrast-enhanced imaging, either with MRI or CT/CT Urogram may be medically necessary.¹⁷

Observation of Known Renal/Ureteral Stone(s) (AB-4.2)

AB.US.0004.2.A

v1.0.2026

- Radiopaque Stones
 - Initial follow-up imaging:
 - Retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775) and KUB X-ray
 - Subsequent follow-up imaging:
 - If initial follow-up ultrasound and KUB are negative, and there is no hematuria and individual is asymptomatic:
 - See: **Annual Surveillance (AB-4.4)**
 - If initial follow-up ultrasound and KUB demonstrates hydronephrosis, retained stone, or if the individual has persistent hematuria, or is symptomatic:
 - CT Abdomen and Pelvis without contrast (CPT[®] 74176)
- Non-radiopaque Stones (i.e. radiolucent)
 - Initial follow-up imaging:
 - CT Abdomen and Pelvis without contrast (CPT[®] 74176)
 - Subsequent follow-up imaging:
 - If CT is negative:
 - See: **Annual Surveillance (AB-4.4)**
 - If CT demonstrates a retained stone, hydronephrosis, or if the individual is being evaluated for surgery:
 - Further imaging can be considered on an individual basis
- ANY of the following are medically necessary for surgical/procedural evaluation of staghorn calculi:
 - CT Abdomen and Pelvis (contrast as requested)
 - 3-D reconstruction (CPT[®] 76377 or CPT[®] 76376)
 - Nuclear kidney imaging (CPT[®] 78707, CPT[®] 78708, or CPT[®] 78709) when there is concern for a poorly functioning kidney

Background and Supporting Information

- Radiopaque versus radiolucent stones on plain radiograph:
 - Radiopaque
 - Calcium-based stones (70-80%)
 - Struvite stones (triple phosphate) (usually opaque but variable – 15-20%)
 - Radiolucent

- Uric acid (5-10%)
- Cystine (1-3%)
- Medication stones (e.g. indinavir) (1%)

Evidence Discussion

Serial imaging can be used to follow the progress of a passing stone and might also be used by the urologist and/or nephrologist as they monitor non-obstructing stones for growth. No evidence was found on the optimum frequency of imaging in people who have or have had renal or ureteric stones.¹⁵

Non-contrast CT of the abdomen and pelvis consistently provides the most accurate diagnosis but also exposes individuals to ionizing radiation. Traditionally, ultrasonography has a lower sensitivity and specificity than CT but does not require use of radiation. However, when these imaging modalities were compared in a randomized controlled trial they were found to have equivalent diagnostic accuracy. Both modalities have advantages and disadvantages. Kidney, ureter, bladder (KUB) plain film radiography is most helpful in evaluating for interval stone growth in individuals with known stone disease and is less useful in the setting of acute stones. MRI provides the possibility of 3D imaging without exposure to radiation, but it is costly and currently stones are difficult to visualize.¹⁶

Follow-up imaging for asymptomatic individuals with radiopaque stones should be with retroperitoneal ultrasound and plain film radiography. Follow-up for radiolucent stones, hydronephrosis or retained stone on ultrasound, or symptomatic individuals, non-contrast CT is medically necessary.¹⁶

Individuals with staghorn calculi who are being considered for surgery, CT Abdomen and Pelvis (any contrast level), with or without 3-D reconstruction can be performed. Additionally, nuclear imaging may be medically necessary when there is concern for poor kidney function.¹²

Follow-Up of Treated Renal/Ureteral Stone (AB-4.3)

AB.US.0004.3.A

v1.0.2026

- Post-shock wave lithotripsy (SWL):
 - Retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775) is the appropriate initial follow-up imaging.
 - Retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775) and/or CT Abdomen and Pelvis (contrast as requested) is medically necessary for ANY of the following:
 - Individuals who are symptomatic
 - Individuals with hydronephrosis
 - Individuals who have residual fragments
 - Individuals treated by SWL who have passed fragments, are asymptomatic, and without hydronephrosis can be followed according to **Annual Surveillance (AB-4.4)**.
- Post-medical expulsive therapy (MET):
 - Retroperitoneal ultrasound is medically necessary for individuals treated by MET who have passed a stone and are symptomatic
 - CT Abdomen and Pelvis (contrast as requested) is medically necessary if hydronephrosis is demonstrated with ultrasound
 - Individuals treated by MET who have passed a stone and are asymptomatic can be followed according to **Annual Surveillance (AB-4.4)**.
- Post-ureteroscopic extraction with an intact stone:
 - Retroperitoneal ultrasound is medically necessary for individuals without symptoms.
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177) is medically necessary for individuals with symptoms or hydronephrosis demonstrated on ultrasound.
 - Individuals without symptoms or without hydronephrosis demonstrated on ultrasound can be followed according to **Annual Surveillance (AB-4.4)**.
- Post-ureteroscopic extraction requiring fragmentation of the stone(s):
 - Retroperitoneal ultrasound is medically necessary for individuals without symptoms.
 - CT Abdomen and Pelvis without contrast (CPT[®] 74176) is medically necessary for individuals without symptoms, but hydronephrosis demonstrated on ultrasound.
 - Individuals without symptoms or without hydronephrosis demonstrated on ultrasound can be followed according to **Annual Surveillance (AB-4.4)**.

- Retroperitoneal ultrasound and KUB for individuals with symptoms and a radiopaque stone
- CT Abdomen and Pelvis without contrast (CPT[®] 74176) is medically necessary for individuals with symptoms and a non-radiopaque stone.
- Post-surgical/procedural treatment of staghorn calculi:
 - CT Abdomen and Pelvis without contrast (CPT[®] 74176)
 - Retroperitoneal ultrasound and/or CT Abdomen and Pelvis (contrast as requested) is medically necessary for individuals with persistent symptoms and/or hydronephrosis.

Evidence Discussion

Following treatment for renal stones, retroperitoneal ultrasound is the recommended initial modality for follow-up. CT scan is medically necessary in individuals with symptoms or if hydronephrosis identified on ultrasound. Ultrasound is subsequently recommended for annual surveillance in asymptomatic individuals.⁷

Annual Surveillance (AB-4.4)

AB.US.0004.4.A**v1.0.2026**

- Annual surveillance is medically necessary for stable individuals with a history of stones to assess for stone growth or formation of new stones:
 - Plain x-ray (KUB) is medically necessary for individuals with radiopaque stones.
 - Retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775) is the preferred modality for individuals with non-radiopaque stones.

Evidence Discussion

Plain x-ray is cost-effective and readily available for surveillance of radiopaque stones. Ultrasound is preferred for most individuals with radiolucent stones. One year imaging interval is recommended for stable individuals, but this may be tailored on stone activity or clinical signs.⁷

This section intentionally left blank (AB-4.5)

AB.US.0004.5.C

v1.0.2026

References (AB-4)

v1.0.2026

1. Fulgham PF, Assimos DG, Pearle MS, et al. Clinical Effectiveness Protocols for Imaging in the Management of Ureteral Calculous Disease: AUA Technology Assessment. *The Journal of Urology*. 2013;189(4):1203-1213.
2. Dubinsky TJ, Sadro CT. Acute Onset Flank Pain–Suspicion of Stone Disease. *Ultrasound Quarterly*. 2012;28(3):239-240.
3. Faerber EN, Benator RM, Browne LP, et al. ACR–SPR Practice Parameter for the Safe and Optimal Performance of Fetal Magnetic Resonance Imaging (MRI). *American College of Radiology*. (Revised 2015).
4. Juliebo-Jones P, Somani BK, Baug S, Beisland C, Ulvik O. Management of Kidney Stone Disease in Pregnancy: A Practical and Evidence-Based Approach. *Curr Urol Rep*. 2022;23(11):263-270. doi:10.1007/s11934-022-01112-x
5. Banks KP, Green ED, Brown RKJ, et al. ACR–SPR Practice Guideline for the Performance of Renal Scintigraphy. (Revised 2017). *American College of Radiology*.
6. Expert Panel on Urologic Imaging, Wong-You-Cheong JJ, Nikolaidis P, et al. ACR Appropriateness Criteria® Renal Failure. *J Am Coll Radiol*. 2021;18(5S):S174-S188. doi:10.1016/j.jacr.2021.02.019
7. Pearle MS, Godfarb DS, Assimos DG. Medical management of kidney stones: AUA guideline. *American Urological Association (AUA)*. 2019.
8. Assimos D, Krambeck A, Miller NL, et al. Surgical Management of Stones: American Urological Association/Endourological Society Guideline, PART I. *Journal of Urology*. 2016;196(4):1153-1160. doi:10.1016/j.juro.2016.05.090.
9. Assimos D, Krambeck A, Miller NL, et al. Surgical Management of Stones: American Urological Association/Endourological Society Guideline, PART II. *Journal of Urology*. 2016;196(4):1161-1169. doi:10.1016/j.juro.2016.05.091.
10. Cheng PM, Moin P, Dunn MD, Boswell WD, Duddalwar VA. What the radiologist needs to know about urolithiasis: part 1 – pathogenesis, types, assessment, and variant anatomy. *AJR Am J Roentgenol*. 2012;198(6):W540-7. doi:10.2214/AJR.10.7285.
11. Gupta K, Feiertag N, Gottlieb J, et. al. Imaging after ureteroscopy: practice patterns, patient adherence and impact on subsequent management in an urban academic hospital system. *Urology*. 2023;171:49-56. doi:10.1016/j.urology.2022.08.056.
12. Sharbaugh A, Morgan Nikonow T, Kunkel G, Semins MJ. Contemporary best practice in the management of staghorn calculi. *Ther Adv Urol*. 2019;11:1756287219847099. doi:10.1177/1756287219847099.
13. Marien T, Miller NL. Treatment of the infected stone. *Urol Clin North Am*. 2015;42:459–472. doi:10.1016/j.ucl.2015.05.009.
14. Flannigan R, Choy WH, Chew B, Lange D. Renal struvite stones—pathogenesis, microbiology, and management strategies. *Nat Rev Urol*. 2014;11:333-341. doi:10.1038/nrurol.2014.99.
15. National Institute for Health and Care Excellence (NICE). NICE guideline – renal and ureteric stones: assessment and management. 2019;123(2):220-232. doi:10.1111/bju.14654.
16. Brisbane W, Bailey MR, Sorensen MD. An overview of kidney stone imaging techniques. *Nat Rev Urol*. 2016;13(11):654–662.
17. Expert Panel on Urological Imaging, Gupta RT, Kalisz K, et al. ACR Appropriateness Criteria® Acute Onset Flank Pain-Suspicion of Stone Disease (Urolithiasis). *J Am Coll Radiol*. 2023;20(11S):S315-S328. doi:10.1016/j.jacr.2023.08.020

Mesenteric/Colonic Ischemia (AB-6)

Guideline	Page
Mesenteric Ischemia (AB-6.1).....	50
Colonic ischemia (including ischemic colitis) (AB-6.2).....	53
References (AB-6).....	55

Mesenteric Ischemia (AB-6.1)

AB.MI.0006.1.A

v1.0.2026

Acute Mesenteric Ischemia

- Suspicion of acute mesenteric ischemia, ONE of the following:
 - CTA Abdomen and/or Pelvis (Mesenteric) (CPT® 74175, or CPT® 74174, or CPT® 72191) (preferable), OR
 - MRA Abdomen and/or Pelvis (CPT® 72198 and/or CPT® 74185), OR
 - CT Abdomen and Pelvis with contrast (CPT® 74177)

Chronic Mesenteric Ischemia

- Suspicion of chronic mesenteric ischemia:
 - Mesenteric Artery Duplex Ultrasound (CPT® 93975 or CPT® 93976) and/or ONE of the following:
 - CTA Abdomen and Pelvis (CPT® 74174) OR
 - MRA Abdomen and Pelvis (CPT® 74185 and CPT® 72198)
- For clinical concern of median arcuate ligament syndrome, see: **Median Arcuate Ligament Syndrome, Nutcracker Syndrome and other Abdominal Vascular Compression Syndromes (PVD-18)** in the Peripheral Vascular Disease (PVD) Imaging Guidelines
- For suspicion of superior mesenteric artery syndrome, see: **Superior Mesenteric Artery (SMA) Syndrome (AB-20.4)**

Pre- and Post-Treatment for Mesenteric Ischemia

- Pre-operative evaluation, if not already performed (including prior to endovascular intervention):
 - CTA Abdomen and Pelvis (CPT® 74174)
- Post-procedure surveillance imaging following invasive treatment for mesenteric ischemia (celiac, superior mesenteric, and inferior mesenteric angioplasty with or without stenting, or mesenteric artery bypass grafting):
 - Baseline Duplex Ultrasound (CPT® 93975 or CPT® 93976) within 1 month of the procedure
 - Duplex Ultrasound (CPT® 93975 or CPT® 93976) at 6 months, 12 months, 18 months, and 24 months, then annually thereafter
 - CT Abdomen with contrast (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) or CTA Abdomen (CPT® 74175) or CTA Abdomen and Pelvis (

CPT® 74174) or MRA Abdomen (CPT® 74185) and if requested, MRA Pelvis (CPT® 72198):

- For symptoms suggesting recurrent ischemia OR
- In the absence of symptoms, following a Duplex Ultrasound if, on the Duplex study:
 - Celiac axis:
 - PSV >370 cm/s or a substantial increase from the post-treatment baseline PSV (substantial increase has not been defined) or demonstration of restenosis ≥70%
 - Superior mesenteric artery:
 - PSV >420 cm/s, or a substantial increase from the post-treatment baseline PSV (substantial increase has not been defined) or demonstration of restenosis of ≥70%
 - Inferior mesenteric artery:
 - Substantial increase from the post treatment baseline PSV (substantial increase has not been defined)

Surveillance of Asymptomatic Mesenteric Artery Occlusive Disease

- Annual Mesenteric Artery Duplex Ultrasound (CPT® 93975 or CPT® 93976)

Evidence Discussion

- Mesenteric ischemia reflects decreased intestinal blood flow through the mesenteric vessels. Causes include: mesenteric artery embolism (often seen with atrial fibrillation), mesenteric artery thrombosis (typically from progressive atherosclerosis that may range from non-occlusive low flow to frank occlusion), and mesenteric vein thrombosis (commonly due to hyper-coagulable states).⁵
- Typical presentation of acute mesenteric ischemia is based on severe abdominal pain out of proportion to findings on physical exam, usually in individuals with a combination of the following risk factors: advanced age, hyperlipidemia, heart disease, hypercoagulability, renal failure, inflammatory conditions (e.g., vasculitis, pancreatitis, diverticulitis), recent vascular catheterization, substance use (e.g., tobacco smoking, cocaine).⁵
- Chronic mesenteric ischemia (CMI) is a syndrome related to inadequate blood flow, typically related atherosclerotic occlusive disease affecting the mesenteric circulation. Blood flow to the bowel is from the celiac artery, superior mesenteric artery, and inferior mesenteric artery. Ischemia may occur when there is significant disease affecting at least two of three arteries; however, symptoms related to severe disease isolated to one artery is also possible. Symptoms may be characterized by postprandial abdominal pain, "food fear," diarrhea, or weight loss. Revascularization

is typically recommended once CMI is diagnosed; this may be done via an endovascular approach (angioplasty and stenting) or through open reconstruction.¹⁴

- Duplex ultrasound provides an excellent screening tool for mesenteric artery occlusive disease. Duplex ultrasound is recommended for regular evaluation of individuals treated for mesenteric ischemia. Duplex ultrasound requires no ionizing radiation and is readily available. Duplex ultrasound findings help to determine the next most appropriate advanced imaging study if needed. Duplex ultrasound has a high negative predictive value of 99% with overall accuracy of 96% in ruling out significant stenosis.¹⁰⁻¹³
- CTA is recommended as an additional diagnostic tool in chronic mesenteric ischemia because it provides excellent image detail and helps to better define mesenteric lesions. Disadvantages of CTA include ionizing radiation, expense, and the need for a contrast agent.¹
- MRA is considered an alternative modality to CTA. MRA boasts sensitivity and specificity of over 95% for detection of significant stenosis. However, it is limited in its ability to characterize degree of calcification, requires contrast administration, is not as widely available, and presents limitation in individuals with metallic implants.¹²

Colonic ischemia (including ischemic colitis) (AB-6.2)

AB.MI.0006.2.C

v1.0.2026

- If colonic ischemia is suspected in the setting of significant abdominal pain, CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary as the first imaging modality if ANY of the following:
 - lower GI bleed; **or**
 - moderate or severe tenderness; **or**
 - fever (≥ 101 degrees); **or**
 - guarding, rebound tenderness, or other peritoneal signs; **or**
 - elevated WBC as per the testing laboratory's range
- Repeat imaging for asymptomatic individuals or unchanged symptoms, including routine post-operative imaging, is generally not medically necessary.
- CTA Abdomen (CPT® 74175) or CTA Abdomen and Pelvis (CPT® 74174) or MRA Abdomen (CPT® 74185) and if requested, MRA Pelvis (CPT® 72198) is medically necessary for the suspicion of right sided or pancolonic ischemia (per the initial CT Abdomen and Pelvis).

Background and Supporting Information

- Suspicion of colonic ischemia based on sudden cramping abdominal pain accompanied by urgency to defecate and passage of bright red blood, maroon blood, or bloody diarrhea, with risk factors including cardiovascular disease, diabetes mellitus, kidney disease, previous abdominal surgery, use of constipating medications, COPD, and atrial fibrillation.

Evidence Discussion

- Based on ACG Clinical Guideline: "In contrast to AMI (acute mesenteric ischemia) in which conventional mesenteric angiography or CTA plays an essential role, vascular imaging studies are not medically necessary in most individuals with suspected CI (colonic ischemia) because by the time of presentation, colon blood flow has usually returned to normal and the observed changes are not from ongoing ischemia but rather reflect the ischemic insult with or without reperfusion injury."⁴
- CT scan is recommended as first-line imaging for individuals with ischemic colitis. CT allows for identification and/or exclusion of other causes of abdominal pain; may suggest diagnosis of colonic ischemia, including distribution of disease; and may allow assessment of disease severity.⁴

- CT-angiogram (CTA) is generally not medically necessary, since in most cases, blood flow has returned to normal by the time of clinical presentation. CTA may be helpful in distinguishing between acute mesenteric ischemia (AMI) and ischemic colitis. In diagnosing AMI, sensitivity and specificity are reported to be over 90%. Isolated right sided colonic ischemia (IRCI) carries a worse prognosis than other distributions of colitis and may represent evidence of significant SMA disease; as such, CTA is medically necessary to fully evaluate the vasculature and potentially prevent catastrophic associated complications.⁴
- Radiation and contrast related complications are risks associated with CT and CTA.¹¹
- MRA also allows for evaluation of the proximal celiac artery and SMA. Advantages include high sensitivity and specificity. Disadvantages include poor visualization of distal vessels and non-occlusive ischemia, long acquisition times, and motion susceptibility artifact which could potentially delay treatment. In contrast to CTA, MRA is "less likely to show ischemic findings within the bowel itself."¹¹
- Alternative imaging studies include non-contrast CT scan, ultrasound, and barium enema:
 - Non-contrast CT scan – there is a lack of literature related to this imaging modality; however, signs of ischemia, including evaluation of bowel and vasculature, rely on use of contrast.¹¹
 - Ultrasound – Experience "in the setting of CI is very limited,"also, there is a low specificity, high false negative rate.⁴
 - Duplex US (arterial study) – there may be a role; however, various factor, including difficulty evaluating distal vessels and non-occlusive ischemia, as well as acquisition time, and individual discomfort do limit utility in evaluating for acute mesenteric ischemia.¹¹
 - Barium enema – originally described in diagnosis of CI in the 1960s. There is a very limited role today, as CT and colonoscopy are preferred. Modern usage is mainly to follow ischemic strictures in a chronic setting.⁴

References (AB-6)

v1.0.2026

1. Expert Panel on Interventional Radiology, Lam A, Kim YJ, et al. ACR Appropriateness Criteria® Radiologic Management of Mesenteric Ischemia: 2022 Update. *J Am Coll Radiol*. 2022;19(11S):S433-S444. doi:10.1016/j.jacr.2022.09.006).
2. Menke J. Diagnostic Accuracy Of Multidetector CT In Acute Mesenteric Ischemia: Systematic Review And Meta-Analysis. *Radiology*. 2010; 256: 93-101.
3. Olivia IB, Davarpanah AH, Rybicki FJ, et. Al ACR Appropriateness Criteria- Imaging of Mesenteric Ischemia 2018.The American College of Radiology.
4. Brandt LJ, Feuerstadt P, Longstreth GF, et al. Epidemiology, Risk Factors, Patterns of Presentation, Diagnosis, and Management of Colonic Ischemia. *American College of Gastroenterology*. 2015; 110: 18-44.
5. Bala M, Catena F, Kashuk J, et al. Acute mesenteric ischemia: updated guidelines of the World Society of Emergency Surgery. *World J Emerg Surg*. 2022;17(1):54. Published 2022 Oct 19. doi:10.1186/s13017-022-00443-x
6. Zierler RE, Jordan WD, Lal BK, et al. The Society for Vascular Surgery practice guidelines on follow-up after vascular surgery arterial procedures. *Journal of Vascular Surgery*. 2018;68(1):256-284. doi:10.1016/j.jvs.2018.04.018.
7. Peck MA, Conrad MF, Kwolek CJ, Lamuraglia GM, Paruchuri V, Cambria RP. Intermediate-term outcomes of endovascular treatment for symptomatic chronic mesenteric ischemia. *Journal of Vascular Surgery*. 2010;51(1). doi:10.1016/j.jvs.2009.06.064.
8. Cai W, Li X, Shu C, et al. Comparison of Clinical Outcomes of Endovascular Versus Open Revascularization for Chronic Mesenteric Ischemia: A Meta-analysis. *Annals of Vascular Surgery*. 2015;29(5):934-940. doi:10.1016/j.avsg.2015.01.010.
9. Alahdab F, Arwani R, Pasha AK, et al. A systematic review and meta-analysis of endovascular versus open surgical revascularization for chronic mesenteric ischemia. *Journal of Vascular Surgery*. 2018;67(5):1598-1605. doi:10.1016/j.jvs.2017.12.046.
10. Björck M, Koelemay M, Acosta S, et al. Editor's choice – management of the diseases of mesenteric arteries and veins. Clinical practice guidelines of the European Society of Vascular Surgery (ESVS). *Eur J Vasc Endovasc Surg*. 2017;53:460-510.
11. Ginsburg M, Obara P, Lambert D, et al. Expert Panels on Vascular Imaging and Gastrointestinal Imaging: ACR Appropriateness Criteria ® Imaging of Mesenteric Ischemia. *J Am Coll Radiol*. 2018;15(11S):S332-40.
12. Huber TS, Björck M, Chandra A, et al. Chronic mesenteric ischemia: Clinical practice guidelines from the Society for Vascular Surgery. *J Vasc Surg*. 2021;73:87S-115S.
13. Zierler RE, Jordan WD, Lal BK, et al. The Society for Vascular Surgery practice guidelines on follow-up after vascular surgery arterial procedures. *J Vasc Surg*. 2018;68(1):256-284.
14. Ahmed M. Ischemic bowel disease in 2021. *World J Gastroenterol*. 2021;27(29):4746-4762. doi:10.3748/wjg.v27.i29.4746
15. Yu H, Kirkpatrick IDC. An Update on Acute Mesenteric Ischemia. *Can Assoc Radiol J*. 2023;74(1):160-171. doi:10.1177/08465371221094280
16. Reintam Blaser A, Koitmäe M, Laisaar KT, et al. Radiological diagnosis of acute mesenteric ischemia in adult patients: a systematic review and meta-analysis. *Sci Rep*. 2025;15(1):9875. Published 2025 Mar 22. doi:10.1038/s41598-025-94846-w
17. Reintam Blaser, A. et al. Incidence, diagnosis, management and outcome of acute mesenteric ischaemia: a prospective, multicentre observational study (AMESI Study). *Crit. Care*. 28, 32 (2024).

Post-Operative Pain Within 60 Days Following Abdominal Surgery – Abdominal Procedure (AB-7)

Guideline	Page
Post-Op Pain and/or Complication Within 60 Days (AB-7.1).....	57
References (AB-7).....	58

Post-Op Pain and/or Complication Within 60 Days (AB-7.1)

AB.OP.0007.1.A

v1.0.2026

- CT Abdomen and/or Pelvis with contrast (CPT[®] 74177, or CPT[®] 74160, or CPT[®] 72193) is medically necessary for suspected post-operative/post-procedure complications (e.g., bowel obstruction, abscess, anastomotic leak, or post-endoscopic complication).
- Beyond 60 days post-operatively, see: **Abdominal Pain (AB-2)**.
- For liver post-transplant indications and imaging, see: **Liver Transplant, Post-Transplant Imaging (AB-42.3)**
- For kidney post-transplant indications and imaging, see: **Kidney Transplant, Post Transplant (AB-42.6)**
- For suspected ureter or bladder injury indications and imaging, see **Ureteral and/or Bladder Trauma of Injury (PV-25.1)**

Evidence Discussion

Early investigation with advanced imaging is medically necessary to identify post-operative/post-procedural complications. Most complications manifest within the first 2 months.^{1,2}

CT imaging is the mainstay for abdominal imaging in the post-operative period due to its high resolution and speed. It is particularly effective at identifying abdominal fluid collections in the peri-hepatic and peri-splenic areas, as well as in the pelvis. CT may also differentiate between post-operative seromas, hematomas, and abscesses, aiding in the drainage of these collections. The use of contrast is recommended to enhance diagnostic accuracy.^{1,2}

References (AB-7)

v1.0.2026

1. ACR Appropriateness Criteria[®] acute (nonlocalized) abdominal pain and fever or suspected abdominal abscess. American College of Radiology. Published 2012. Rev. 2018.
2. Caraianni C, Yi D, Petrescu B, Dietrich C. Indications for abdominal imaging: When and what to choose?. J Ultrason. 2020;20(80):e43-e54. doi:10.15557/JoU.2020.0008
3. Barbaro A, Eldredge TA, Shenfine J. Diagnosing anastomotic leak post-esophagectomy: a systematic review. Disease of the Esophagus. 2021;34(2):1-15. doi:10.1093/dote/daaa076.
4. Yu L, Chen G, Wang H, et al. MRI diagnose post-operative anastomotic leak in patients with rectal cancer; preliminary experience. BMC Surgery. 2022;22:422. doi:10.1186/s12893-022-01872-w.

Abdominal Lymphadenopathy (AB-8)

Guideline	Page
Abdominal Lymphadenopathy (AB-8.1).....	60
Inguinal Lymphadenopathy (AB-8.2).....	62
Sclerosing Mesenteritis and Mesenteric Panniculitis (AB-8.3).....	63
References (AB-8).....	65

Abdominal Lymphadenopathy (AB-8.1)

AB.AL.0008.1.A

v1.0.2026

- History of malignancy
 - Refer to oncology guidelines specific for known malignancy
 - Biopsy may be considered
- For suspected lymphoproliferative disorder:
 - Imaging modality for biopsy is at the discretion of the interventional radiologist
 - Imaging studies performed as part of a CT-, MR-, or Ultrasound-guided procedure should be reported using appropriate CPT® codes, see: **CT-, MR-, or Ultrasound-Guided Procedures (Preface-4.2)**
 - PET/CT (CPT® 78815) is medically necessary prior to biopsy in order to determine a more favorable site for biopsy, when a prior biopsy was nondiagnostic, or a relatively inaccessible site is contemplated which would require invasive surgical intervention for biopsy attempt.
- If clinical, laboratory findings, biopsy, or PET suggest benign etiology, and no history of malignancy:
 - First follow-up imaging at 3 months
 - CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary
 - Additional follow-up imaging at 6 and 12 months, if no improvement at 3 months
 - CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary
 - Further imaging is NOT medically necessary if clinically significant changes are not seen within one year of follow-up imaging.
- If a follow-up CT demonstrates a concerning change, biopsy should be performed.
 - If biopsy is inconclusive, PET/CT (CPT® 78815) is medically necessary

Evidence Discussion

Abdominal lymphadenopathy can be associated with infectious, autoimmune, and malignant etiologies.¹² Lymph node size is a key indicator of potential malignancy. Lymph nodes exceeding 10 mm in short-axis diameter are generally considered suspicious, particularly in individuals with a history of cancer or systemic symptoms. Whenever possible, tissue pathology is preferred in the diagnosis of enlarged lymph nodes.¹³

CT remains the main modality for evaluation of intra-abdominal lymph nodes. This can be used for identification, follow-up, and guidance for percutaneous biopsy. Serial CT should be done with consideration of radiation exposure.^{6,12}

PET/CT, although not specific for malignancy, can assist in identifying alternate sites for biopsy in individuals with a previously non-diagnostic biopsy or when lymph nodes are relatively inaccessible and biopsy would require an invasive surgical intervention.⁹

Inguinal Lymphadenopathy (AB-8.2)

AB.AL.0008.2.A

v1.0.2026

There is no evidence-based support for advanced imaging of clinically evidenced isolated inguinal lymphadenopathy without biopsy. Advanced imaging should be directed by results of biopsy. If biopsy results are negative or benign, then advanced imaging is not medically necessary.

- High suspicion of lymphoma: See **Non-Hodgkin Lymphomas (ONC-27)** and **Hodgkin Lymphoma (ONC-28)** in the Oncology Imaging Guidelines
- Prior history of malignancy: See **Metastatic Cancer, Carcinoma of Unknown Primary Site, and Other Types of Cancer (ONC-31)** in the Oncology Imaging Guidelines
- If biopsy is positive for malignancy, advanced imaging is guided by sections specific to the histological diagnosis.

Background and Supporting Information

- Localized inguinal lymphadenopathy should prompt:
 - search for adjacent extremity injury or infection
 - 3 to 4 weeks of observation if clinical picture is benign
 - excisional or image guided core needle biopsy under ultrasound or CT guidance of most abnormal lymph node if condition persists or malignancy suspected
- Generalized inguinal lymphadenopathy should prompt:
 - diagnostic work-up, including serological tests, for systemic diseases and
 - excisional or image guided core needle biopsy under ultrasound or CT guidance of most abnormal lymph node if condition persists or malignancy suspected

Evidence Discussion

Inguinal adenopathy is benign and self-limited in most individuals. History and physical alone can often identify the cause of the adenopathy. Biopsy remains the primary diagnostic tool in evaluation of undiagnosed inguinal adenopathy. This can be done with fine needle aspiration or core needle biopsy. Diagnostic rates can be improved with the use of ultrasound.⁷

There is no evidence-based support for advanced imaging of inguinal adenopathy in the absence of biopsy results that would direct that imaging. If benign, no further work-up is necessary.

Sclerosing Mesenteritis and Mesenteric Panniculitis (AB-8.3)

AB.AL.0008.3.A

v1.0.2026

- For new or worsening clinical symptoms with a diagnosis of sclerosing mesenteritis or mesenteric panniculitis:
 - CT Abdomen and Pelvis without and with contrast (CPT® 74178) is medically necessary
- Requests for follow-up imaging in asymptomatic individuals or for sequential imaging to monitor for the development of malignancy is based upon size of lymph nodes:
 - Asymptomatic individuals with lymph nodes less than 10mm meet medical necessity for annual CT Abdomen and/or Pelvis with and without contrast OR MRI Abdomen and/or Pelvis with and without contrast for 2 consecutive years to ensure benign stability.
 - If lymph nodes are greater than or equal to 10mm, PET/CT (CPT® 78815) or biopsy is considered medically necessary.

Background and Supporting Information

- Sclerosing mesenteritis and mesenteric panniculitis are rare, incompletely understood entities that are characterized by an idiopathic inflammatory condition of the mesentery. The diagnosis is typically suggested by characteristic radiologic findings known as Coulier's criteria. To support the diagnosis, at least three of the five criteria should be met including:
 - mesenteric mass that encases or displaces adjacent structures without evidence of direct invasion
 - increased attenuation of mesenteric fat (hyperattenuating fat)
 - presence of soft-tissue nodules or mesenteric lymph nodes with the affected area
 - fatty halo (low-attenuation ring) surrounding lymph nodes or mesenteric vessels
 - hyperattenuating pseudocapsule encasing the mesenteric lesion
- Sclerosing mesenteritis may represent a spectrum of diseases (e.g., retractile mesenteritis, mesenteric panniculitis, and mesenteric lipodystrophy) or may be stages of one disease with progression.
- The chronic inflammation may result in fibrosis with a mass effect and can involve the gut (causing obstruction), the mesenteric vessels, and other intra-abdominal or retroperitoneal organs. The etiology is uncertain but may be secondary to trauma (previous abdominal surgery), an autoimmune process, ischemia, infection, and possibly may represent a paraneoplastic syndrome secondary to a malignancy, though this is controversial.

- There is an increased prevalence of malignancy in individuals with sclerosing mesenteritis, and this has resulted in requests for sequential imaging in stable or asymptomatic individuals. In addition, requests may be made to assess the clinical response in those undergoing active treatment.
- However, studies have reported that the data on potentially developing a subsequent malignancy is inconclusive and thus “it does not seem justified to subject individuals with mesenteric panniculitis, especially those in whom other associations such as abdomino-pelvic surgery may explain the mesenteric panniculitis findings, to multiple follow-up CT scans with the aim of detecting a future malignancy.”
- In addition, there is no correlation between radiologic and clinical findings, and management decisions are guided by the severity and type of symptoms. Thus, sequential radiologic imaging to assess treatment response is not recommended.

Evidence Discussion

Recommendation for follow-up imaging in individuals with suspected malignancy-associated conditions vary significantly, ranging from no imaging to annual examination over five years. While some meta-analyses show no detectable increase in cancer risk, other studies suggest a slight long-term increased risk of lymphoma in individuals without initial malignancy indicators, with most cases detected within the first year. Imaging is also used to monitor inflammation progression, although data remains limited. In general, individuals with stable disease and no radiologic progression after two years do not require frequent imaging. However, if new suspicious features arise, such as significant growth in mesenteric masses or new lymphadenopathy, a biopsy is advised. For asymptomatic individuals without initial signs of malignancy, annual CT scans for two years are recommended to ensure disease stability, and thereafter performed for concerning symptoms.¹⁰

CT scan of the Abdomen and Pelvis is the preferred modality in the diagnosis of new or worsening symptoms.¹¹

References (AB-8)

v1.0.2026

1. Nyberg L, Björk J, Björkdahl P, Ekberg O, Sjöberg K, Vigren L. Sclerosing mesenteritis and mesenteric panniculitis – clinical experience and radiological features. *BMC Gastroenterology*. 2017;17(1). doi:10.1186/s12876-017-0632-7.
2. Green MS, Chhabra R, Goyal H. Sclerosing mesenteritis: a comprehensive clinical review. *Annals of Translational Medicine*. 2018;6(17):336-336. doi:10.21037/atm.2018.07.01.
3. Catlow J, Twemlow M, Lee T. PWE-141 Should we reimaging mesenteric panniculitis? *Small Bowel*. 2017. doi:10.1136/gutjnl-2017-314472.386.
4. Halligan S, Plumb A, Taylor S. Mesenteric panniculitis: systematic review of cross-sectional imaging findings and risk of subsequent malignancy. *European Radiology*. 2016;26(12):4531-4537. doi:10.1007/s00330-016-4298-2.
5. Protin-Catteau L, Thiéfin G, Barbe C, Jolly D, Soyer P, Hoeffel C. Mesenteric panniculitis: review of consecutive abdominal MDCT examinations with a matched-pair analysis. *Acta Radiologica*. 2016;57(12):1438-1444. doi:10.1177/0284185116629829.
6. Heller M, Harisinghani M, Neitlich J, et al. Managing incidental findings on abdominal and pelvic CT and MRI, part 3: white paper of the ACR Incidental Findings Committee II on splenic and nodal findings. *American College of Radiology*. 2013;10(11):833-839.
7. Gaddey HL, Riegel AM. Unexplained Lymphadenopathy: Evaluation and Differential Diagnosis. *American Family Physician*. *Am Fam Physician*. 2016 Dec 1;94(11):896-903.
8. Schwartz FR, James O, Kuo PH, et al. Lymphatic Imaging: current noninvasive and invasive techniques. *Semin Intervent Radiol*. 2020;37(3):237–249.
9. Zeman MN, Green C, Akin EA. Spectrum of [18F]FDG-PET/CT Findings in benign lymph node pathology. *Mol Imaging Biol*. 2021;23(4):469–480.
10. Worthington MT, Wolf JL, Crockett SD, Pardi DS. AGA Clinical Practice Update on Sclerosing Mesenteritis: Commentary. *Clin Gastroenterol Hepatol*. 2025;23(6):902-907.e1. doi:10.1016/j.cgh.2024.12.025
11. Saha B, Tome J, Wang XJ. Sclerosing Mesenteritis: A Concise Clinical Review for Clinicians. *Mayo Clin Proc*. 2024;99(5):812-820. doi:10.1016/j.mayocp.2024.01.019
12. Expert Panel on Gastrointestinal Imaging, Fowler KJ, Garcia EM, et al. ACR Appropriateness Criteria® Palpable Abdominal Mass-Suspected Neoplasm. *J Am Coll Radiol*. 2019;16(11S):S384-S391. doi:10.1016/j.jacr.2019.05.014
13. Kwon Y, Lee MK. Diagnostic Performance and Safety of Ultrasound-Guided Core Needle Biopsy for Diagnosing Lymphoma: A Systematic Review and Meta-Analysis. *Cancer Med*. 2025;14(1):e70414. doi:10.1002/cam4.70414
14. Walker CW, Hulseley B, Pompa M. Evaluating lymphadenopathy. *JAAPA*. 2025;38(6):20-27. doi:10.1097/01.JAA.0000000000000212

Bariatric Surgery and Percutaneous Gastrostomy (AB-9)

Guideline	Page
Bariatric Post-Operative Complications (AB-9.1).....	67
Percutaneous Gastrostomy (AB-9.2).....	69
References (AB-9).....	71

Bariatric Post-Operative Complications (AB-9.1)

AB.BS.0009.1.A

v1.0.2026

- For the evaluation of post-operative complications:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177), CT Abdomen with contrast (CPT[®] 74160), or CTA Abdomen and Pelvis (CPT[®] 74174) is medically necessary for individuals who have had weight loss surgery and present with suspected complications evidenced by:
 - nausea or vomiting OR
 - abdominal pain/tenderness OR
 - fever OR
 - abdominal distension OR
 - suspected hernia
- Internal hernias in individuals who have had Roux-en-Y gastric bypasses may have intermittent and relatively mild abdominal symptoms which require immediate evaluation with CT imaging.
- See: **Post-Operative Pain Within 60 Days Following Abdominal Surgery – Abdominal Procedure (AB-7)**

Background and Supporting Information

- Bariatric procedures include gastric banding, gastric bypass, sleeve gastrectomy, and biliopancreatic diversion procedures.

Evidence Discussion

- Pre-operative assessment:^{4,11,16}
 - In individuals with previous surgery of the foregut, imaging may be medically necessary for surgical planning. This is addressed in **Abdomen Imaging Guidelines: General Guidelines (AB 1.0)** under pre-operative radiology imaging. "If imaging is requested by the operating surgeon to support planned surgery, the imaging may be approved."
 - Routine use of preoperative advanced imaging is considered "usually not appropriate" by the American College of Radiology ACR Appropriateness Criteria[®] for Preoperative and Postoperative Imaging for Bariatric Procedures.
- Post-operative complications:
 - Bariatric surgery can result in numerous complications that may not be apparent after initial evaluation or ultrasound. These include internal hernias, marginal

ulceration, intussusception, stenosis, perforations, and leaks. A systematic review of splenic complications showed that splenic abscess and splenic infarct were the most common splenic complications.¹² Symptoms concerning for complications include weight loss failure, heartburn, nausea and vomiting, abdominal pain, fever, abdominal distention, abdominal tenderness, leukocytosis, and suspicion of a hernia.¹²

- CT is highly sensitive in the setting of symptomatic patients with suspected complications and is considered the gold standard imaging.^{12,14,15,16} Contrast is helpful to evaluate for anastomotic leaks.¹⁶
- CTA is a useful imaging option for post-operative complications where blood supply is potentially compromised, such as suspected splenic infarct.¹³
- Internal hernias in individuals who have had Roux-en-Y gastric bypasses may have intermittent and relatively mild abdominal symptoms which require immediate evaluation with CT imaging.¹⁷
- Though abdominal pain in post-operative bariatric individuals may be gallbladder induced and an ultrasound would be helpful for this diagnosis, the complications of bariatric surgery can become quickly life-threatening, so any request for CT imaging in the post-operative bariatric individual should not be delayed with recommendations for ultrasound, even if the examination does not indicate any signs or symptoms of more serious or complicated disease.^{4,10,11}

Percutaneous Gastrostomy (AB-9.2)

AB.BS.0009.2.A

v1.0.2026

- Percutaneous Endoscopic Gastrostomy (PEG)
 - CT Abdomen with or without contrast (CPT[®] 74160 or 74150) is medically necessary:
 - For pre-operative assessment in the presence of:
 - abdominal wall defects such as an open abdomen OR
 - the presence of “ostomy” sites or drain tubes OR
 - abdominal surgical scars or prior major abdominal surgery (e.g. laparotomy, laparoscopy) OR
 - known situs inversus OR
 - known paraesophageal hernia OR
 - previous endoscopic attempt did not achieve adequate transillumination through the abdominal wall or compression and a suitable site for PEG placement could not be determined
 - Percutaneous Gastrostomy via Interventional Radiologist using CT guidance
 - A pre-operative CT Abdomen with or without contrast (CPT[®] 74160 or 74150) is medically necessary for complicated cases in which a safe window cannot be determined via fluoroscopy.
 - See above indications for CT prior to endoscopic or surgical gastrostomy tube placement for pre-operative indications.
 - Suspected complication of an endoscopically or IR-placed gastrostomy or jejunostomy tube:
 - CT Abdomen with or without contrast (CPT[®] 74160 or 74150) or CT Abdomen and Pelvis with or without contrast (CPT[®] 74177 or 74176)

Background and Supporting Information

- A percutaneous endoscopic gastrostomy utilizes endoscopic guidance in order to place the feeding tube.
- The optimal site for gastrostomy placement is determined by illuminating the abdominal wall from the stomach using the scope and simultaneously indenting the wall with the finger and visualizing that indentation endoscopically.
 - Routine CT prior to this is generally not medically necessary.
 - A study retrospectively compared complication rates between individuals who underwent a pre-procedure CT vs. those that did not and found no difference in the rate of bleeding events, need for operative intervention, or accidental tube dislodgement.

- One individual in the non-CT group had an injury due to the tube being placed through the colon, but in that case, there was failure of transillumination through the abdominal wall.
- The authors concluded, “routine CT to evaluate for unfavorable anatomy such as overlying liver or transverse colon prior to PEG tube placement does not result in a reduced complication rate. Safe site selection utilizing the correct technique of transillumination of the abdominal wall and visualization of the indentation of the operator’s finger is essential for safe PEG tube placement.”

Evidence Discussion

The use of routine pre-procedure CT scans does not result in lower complication rates for endoscopic percutaneous gastrostomy. A retrospective study comparing complication rates between individuals who underwent pre-procedure CT scans and those who did not found no difference in the rate of bleeding events, need for operative intervention, or accidental tube dislodgement. Thus, pre-procedure CT of the abdomen is reserved for complex placement scenarios.¹⁻⁹

Post-procedure, the role of CT imaging is to assist in identifying complications, allowing fast visualization of issues such as a migrated internal bumper or injury to internal viscera.¹⁻⁹

References (AB-9)

v1.0.2026

1. Gaetke-Udager K, Wasnik A, Kaza R, et al. A Guide To Imaging In Bariatric Surgery. *Emergency Radiology*, June 2014; 21(3):309-319.
2. Levine MS and Carucci LR. Imaging of Bariatric Surgery: Normal Anatomy and Postoperative Complications. *Radiology*. 2014;270(2):327-341.
3. Varghese JC and Roy-Choudhury SH. Radiological imaging of the GI tract after bariatric surgery. *Gastrointestinal Endoscopy*. 2009;70(6):1176-1181.
4. Schneider R, Lazaridis I, Kraljević M, Beglinger C, Wölnerhanssen B, Peterli R. The impact of preoperative investigations on the management of bariatric patients; results of a cohort of more than 1200 cases. *Surgery for Obesity and Related Diseases*. 2018;14(5):693-699. doi:10.1016/j.soard.2018.01.009.
5. Miskimins RJ, Glenn JM, Kanya C, Paffett CL, Arshad S, Auyang ED. Routine CT Prior to PEG tube placement does not reduce complication rates. Poster presented at SAGES 2017 Annual Meeting.
6. Itkin M, DeLegge MH, Fang JC, et. al. Multidisciplinary practical guidelines for gastrointestinal access for enteral nutrition and decompression from the Society of Interventional Radiology and American Gastroenterological Association Institute, with endorsement by Canadian Interventional Radiological Association and Cardiovascular and Interventional Radiological Society of Europe. *AGA*. 2011;131:742-765. doi:10.1053/j.gastro.2011.06.001.
7. Jain R, Maple JT, Anderson MA, et. al. The role of endoscopy in enteral feeding. *Gastrointest Endosc*. 2011;74(1):7-12. doi:10.1016/j.gie.2010.10.021.
8. Arvanitakis M, Gkolfakis P, Despott EJ, et. al. Endoscopic management of enteral tubes in adult patients - part 1: definitions and indications. *Endoscopy*. 2021;53:81-92. doi:10.1055/a-1303-7449.
9. Arvanitakis M, Gkolfakis P, Despott EJ, et. al. Endoscopic management of enteral tubes in adult patients - part 2: peri- and post-procedural management. *Endoscopy*. 2021;53:178-195. doi:10.1055/a-1331-8080.
10. Ghaderi I, Gondal AB, Samamé J, Serrot F, Galvani CA. Preoperative endoscopic and radiologic evaluation of bariatric patients: what do they add? *J Gastrointest Surg*. 2020;24(4):764-771. doi:10.1007/s11605-019-04219-8.
11. Schlottmann F, Nayyar A, Herbella FAM, Patti MG. Preoperative evaluation in bariatric surgery. *J Laparoendosc Adv Surg Tech A*. 2018;28(8):925-929. doi:10.1089/lap.2018.0391.
12. Mousavimaleki A, Amr B, Taherzadeh M, Rokhgireh S, Setaredan SA, Kermansaravi M. Post-bariatric splenic complications; diagnosis and treatment. A systematic review. *Obesity Surgery*. 2022;32:3125-3137.
13. Khalil A, Gomez E, Gowda PC, et al. Assessment of arterial supply to the stomach after bariatric surgery using multidetector CT arteriography. *Abdom Radiol (NY)*. 2024;49(12):4198-4208. doi:10.1007/s00261-024-04467-6.
14. Edwards MA, Powers K, Vosburg RW, et al. American Society for Metabolic and Bariatric Surgery: postoperative care pathway guidelines for Roux-en-Y gastric bypass. *American Society for Metabolic and Bariatric Surgery*. 2025;21(5):523-536. doi:10.1016/j.soard.2025.01.005.
15. Musella M, Cantoni V, Green R, et al. Efficacy of postoperative upper gastrointestinal series (UGI) and computed tomography (CT) scan in bariatric surgery: a meta-analysis on 7516 patients. *Obesity Surgery*. 2018;28:2396-2405.
16. Pietryga JA, Santillan CS, Korngold EK, et al. ACR Appropriateness Criteria® Preoperative and postoperative imaging for bariatric procedures. Available at: <https://acsearch.acr.org/docs/3195149/Narrative/>. American College of Radiology. 2025.
17. Kagoma YK, Gayer G. Computed Tomography of Internal Hernias Following Laparoscopic Roux-en-Y Gastric Bypass Surgery. *Semin Ultrasound CT MR*. 2018;39(2):145-150. doi:10.1053/j.sult.2017.11.002
18. Nawas MA, Oor JE, Goense L, et al. The diagnostic accuracy of abdominal computed tomography in diagnosing internal herniation following Roux-en-Y gastric bypass surgery: a systematic review and meta-analysis. 2022;275(5):856-863. doi:10.1097/SLA.0000000000005247.
19. Altinoz A, Maasher A, Jouhar F, et al. Diagnostic laparoscopy is more accurate than computerized tomography for internal hernia after Roux-en-Y gastric bypass. *American Journal of Surgery*. 2020;220(1):214-216.
20. American College of Radiology ACR Appropriateness Criteria - Preoperative and Postoperative imaging for Bariatric Procedures. 2025

21. Gutjahr CJ, Iverson EP, Walker ST, Johnson JD, Shukla UC, Terrell W. Utility of pre-procedural CT and abdominal radiography before percutaneous radiologic gastrostomy placement. *Abdom Radiol (NY)*. 2020;45(2):571-575. doi:10.1007/s00261-019-02352-1.
22. Khalil A, Gomez E, Gowda PC, et al. Assessment of arterial supply to the stomach after bariatric surgery using multidetector CT arteriography. *Abdom Radiol (NY)*. 2024;49(12):4198-4208. doi:10.1007/s00261-024-04467-6.

Blunt Abdominal Trauma (AB-10)

Guideline	Page
Blunt Abdominal Trauma (AB-10.1).....	74
References (AB-10).....	75

Blunt Abdominal Trauma (AB-10.1)

AB.BA.0010.1.A

v1.0.2026

- Abdominal and/or Pelvic ultrasound (CPT® 76700 and/or CPT® 76856) is medically necessary for the evaluation of blunt abdominal trauma when requested.
- CT Abdomen and/or Pelvis with contrast (CPT® 74160, or CPT® 72193, or CPT® 74177) is medically necessary for:
 - High probability of intra-abdominal injury after blunt abdominal trauma, with new onset of ANY of the following conditions:
 - Abdominal pain or tenderness
 - Pelvic or femur fracture
 - Lower rib fracture
 - Costal margin tenderness or evidence of thoracic wall trauma
 - Diminished breath sounds
 - Vomiting
 - Pneumothorax
 - Hematocrit <30%
 - Hematuria
 - Elevated AST
 - Non-examinable individual (intoxicated, less than fully conscious, Glasgow Coma Scale Score <13, etc.)
 - Evidence of abdominal wall trauma or presence of a seat-belt sign
 - If an ultrasound demonstrates definitive abnormalities or yields inconclusive findings

Evidence Discussion

Intra-abdominal injury is an indication for ultrasound (US) and/or advanced imaging. Advanced imaging in acute trauma is generally with CT of the Abdomen and/or Pelvis with contrast. Both US and CT can be completed rapidly. CT with contrast can provide more detailed images of blood vessels and tissues, helping to better identify areas of bleeding, inflammation, or injury.¹ A seat belt sign is a linear area of bruising, abrasion or erythema across the abdomen, chest, or neck in the distribution of a seat belt. The presence of a seat belt sign is strongly associated with intra-abdominal injury.⁸

References (AB-10)

v1.0.2026

1. Shuman WP, Ralls PW, Balfe DM, et al. Imaging of blunt abdominal trauma. American College of Radiology. ACR Appropriateness Criteria. Radiology. 2000;215 Suppl:143-151.
2. Soto JA and Anderson SW. Multidetector CT of Blunt Abdominal Trauma. Radiology. 2012;265(3):678-693.
3. Nishijima DK, Simel DL, Wisner DH, et al. Does this adult patient have a blunt intra-abdominal injury? *JAMA* 2012; 307:1517.
4. Washington State Department of Health Office of Community Health Systems: Trauma Clinical Guideline. May 2017. <https://www.doh.wa.gov/Portals/1/Documents/Pubs/530168.pdf>.
5. Jansen JO, Yule SR, Loudon MA. Investigation of blunt abdominal trauma. *Bmj*. 2008;336(7650):938-942. doi:10.1136/bmj.39534.686192.80.
6. Diercks DB, Mehrotra A, Nazarian DJ, Promes SB, Decker WW, Fesmire FM. Clinical Policy: Critical Issues in the Evaluation of Adult Patients Presenting to the Emergency Department With Acute Blunt Abdominal Trauma. *Annals of Emergency Medicine*. 2011;57(4):387-404. doi:10.1016/j.annemergmed.2011.01.013.
7. Expert Panel on Urological Imaging, Heller MT, Oto A, et al. ACR Appropriateness Criteria® Penetrating Trauma-Lower Abdomen and Pelvis. *J Am Coll Radiol*. 2019;16(11S):S392-S398. doi:10.1016/j.jacr.2019.05.023
8. Pourmand A, Terrebonne E, Shapovalov V, Kartiko S, AlRemeithi R, Tran QK. Prevalence of intra-abdominal injury among patients with seatbelt signs, a systematic review and meta-analysis. *Am J Emerg Med*. 2024;76:199-206. doi:10.1016/j.ajem.2023.11.058

Gaucher Disease and Hemochromatosis (AB-11)

Guideline	Page
Gaucher Disease (AB-11.1).....	77
Hereditary (Primary) Hemochromatosis (HH) and Other Iron Storage Diseases (AB-11.2).....	78
References (AB-11).....	81

Gaucher Disease (AB-11.1)

AB.GD.0011.1.A

v1.0.2026

- For evaluation of neurologic involvement in Gaucher Disease, see: **Gaucher Disease (Storage Disorders) (PN-8.6)** in the Peripheral Nerve Disorders (PND) Imaging Guidelines.

Hereditary (Primary) Hemochromatosis (HH) and Other Iron Storage Diseases (AB-11.2)

AB.GD.0011.2.A

v1.0.2026

- MRI Abdomen without contrast (CPT[®] 74181) for iron quantification
 - If transferrin iron saturation (TS) $\geq 45\%$ OR elevated serum ferritin (males [assigned at birth] > 300 ng/ml, females [assigned at birth] > 200 ng/ml) **AND**
 - Genetic studies for hemochromatosis have been performed and results are ANY of the following:
 - Negative for hemochromatosis
 - C282Y/H63D compound heterozygote
 - C282Y heterozygote
 - Non-C282Y homozygote

Note:

For C282Y/C282Y homozygote, iron quantification generally not indicated. Workup is as follows:

- If serum ferritin > 1000 ug/L or elevated liver enzymes:
 - Liver biopsy for fibrosis staging and rule out concurrent liver disease
- If serum ferritin < 1000 ug/L and normal liver enzymes:
 - Therapeutic phlebotomy

Note:

Studies indicate that measurements of hepatic iron concentration by MRI may be more useful in ruling out than diagnosing clinically significant iron overload. MRI can distinguish between primary and secondary iron overload based on iron uptake in the reticuloendothelial system.)

-
- For the evaluation of suspected hepatic iron overload in chronic transfusional states (e.g., sickle cell disease, thalassemia, oncology patients, bone marrow failure, and stem cell transplant individuals):
 - MRI Abdomen without contrast (CPT[®] 74181) for iron quantification can be performed annually.

- See: **Transfusion-Associated (Secondary) Hemochromatosis (PEDAB-18.2)** in the Pediatric Abdomen Imaging Guidelines regarding transfusion-associated hepatic iron deposition.
- If clinical, biopsy, or radiological findings suggest advanced fibrosis or cirrhosis and HCC surveillance is requested, then follow HCC Screening Guidelines – See: **Chronic Liver Disease, Cirrhosis and Screening for HCC (AB-26.1)**.
- Role of MR Elastography (CPT[®] 76391):
 - The role of MR Elastography to assess the degree of fibrosis in the setting of hemochromatosis is not yet clearly defined and thus not currently considered medically necessary.

Background and Supporting Information

- An elevated serum ferritin >1000 mcg/l is associated with an increased risk of cirrhosis and mortality in C282 homozygotes, while a serum ferritin <1000 mcg/l is associated with a very low likelihood of cirrhosis.
- The role of serial MRI for monitoring hepatic iron concentration in hemochromatosis has not been defined. Treatment is phlebotomy and results are monitored by serum ferritin.
- One of the main limitations of MR Elastography is that artifact from excess iron deposition degrades signal intensity in MRE sequences, leading to technical failure of elastography and a decrease in MRE's diagnostic reliability. The latest ACG Clinical Guideline (2019) indicated that MRI for the purpose of estimating hepatic iron concentration is appropriate in the circumstances described above. However, "if there is a concomitant need to stage hepatic fibrosis, then liver biopsy is the preferred method." The ACG diagnostic algorithm for the workup of hemochromatosis does not include MR Elastography at any stage, including the evaluation for the presence, absence, or degree of fibrosis.

Evidence Discussion

The ACG Clinical Guideline indicated that MRI without contrast is the preferred modality for assessing hepatic iron concentration in iron overload conditions, including primary hereditary hemochromatosis (HH) as well as in secondary, multi-transfusion conditions, such as sickle cell disease, thalassemia, and in oncology individuals and those with bone marrow failure, in whom it can be done annually. MRI offers several key advantages. MRI can distinguish between primary and secondary iron overload based on uptake in the reticuloendothelial system, is non-invasive, radiation-free, and has the ability to be performed on both liver and heart. In addition, it is useful for screening, as noted, in the appropriate populations.⁹

CT has been used but presents the negatives of radiation exposure. Dual-energy scans are required to compensate for background attenuation, so its use is reserved for individuals without access to MRI.¹⁵

Ultrasound-based elastography can assess the need for biopsy. However, Magnetic Resonance Elastography (MRE) is not preferred due to MRI signal degradation by excess iron and is not recommended by the ACG at any stage of the work-up.⁹

For individuals with iron indices indicative of classic HH, iron mobilized by well-controlled phlebotomy can provide an alternative estimate of total body iron comparable to liver iron quantification. Serial MRI monitoring of hepatic iron concentration has not been defined; instead, serum ferritin levels are monitored during phlebotomy.¹⁶

References (AB-11)

v1.0.2026

- Weinreb NJ, Aggio MC, Andersson HC, et al. Gaucher disease type 1: revised recommendations on evaluations and monitoring for adult patients. *Seminars in Hematology*, 2004, 41(4 Suppl 5), 15-22.
- Taouli B, Ehman RL, Reeder SB. Advanced MRI Methods for Assessment of Chronic Liver Disease. *American Journal of Roentgenology*. 2009;193(1):14-27.
- Penugonda N. Cardiac MRI in Infiltrative Disorders: A Concise Review. *Current Cardiology Reviews*, 2010, 6(2), 134-136.
- Chavhan GB, Babyn PS, Thomas B, et al. Principles, Techniques, and Applications of T2*-based MR Imaging and Its Special Applications. *RadioGraphics*. 2009;29(5):1433-1449.
- Sarigianni M, Liakos A, Vlachaki E, et al. Exam 1: Accuracy of Magnetic Resonance Imaging in Diagnosis of Liver Iron Overload: A Systematic Review and Meta-analysis. *Clinical Gastroenterology and Hepatology*. 2015;13(1). Accessed October 19, 2017. [http://www.cghjournal.org/article/S1542-3565\(14\)00928-8/fulltext](http://www.cghjournal.org/article/S1542-3565(14)00928-8/fulltext).
- Zoller H, and Henninger B. Pathogenesis, Diagnosis, and Treatment of Hemochromatosis: *Dig Dis* 2016;34:364-373.
- Kanwar P, Kowdley KV. Diagnosis and treatment of hereditary hemochromatosis: an update. *Expert Review of Gastroenterology & Hepatology*. 2013;7(6):517-530. doi:10.1586/17474124.2013.816114.
- Bacon BR, Adams PC, Kowdley KV, Powell LW, Tavill AS. Diagnosis and management of hemochromatosis: 2011 Practice Guideline by the American Association for the Study of Liver Diseases. *Hepatology*. 2011;54(1):328-343. doi:10.1002/hep.24330.
- Kowdley KV, Brown KE, Ahn J, Sundaram V. ACG Clinical Guideline. Hereditary Hemochromatosis. *The American Journal of Gastroenterology*. 2019;1. doi:10.14309/ajg.0000000000000315.
- Degnan AJ, Ho-Fung VM, Ahrens-Nicklas RC, et al. Imaging of non-neuronopathic Gaucher disease: recent advances in quantitative imaging and comprehensive assessment of disease involvement. *Insights into Imaging*. 2019;10(1). doi:10.1186/s13244-019-0743-5.
- Wagner M, Corcuera-Solano I, Lo G, et al. Technical Failure of MR Elastography Examinations of the Liver: Experience from a Large Single-Center Study. *Radiology*. 2017;284(2):401-412. doi:10.1148/radiol.2016160863.
- Ghoz HM, Kröner PT, Stancampiano FF, et al. Hepatic iron overload identified by magnetic resonance imaging-based T2* is a predictor of non-diagnostic elastography. *Quantitative Imaging in Medicine and Surgery*. 2019;9(6):921-927. doi:10.21037/qims.2019.05.13.
- Yin M, Glaser KJ, Talwalkar JA, Chen J, Manduca A, Ehman RL. Hepatic MR Elastography: Clinical Performance in a Series of 1377 Consecutive Examinations. *Radiology*. 2016;278(1):114-124. doi:10.1148/radiol.2015142141.
- Fitzsimons EJ, Cullis JO, Thomas DW, Tsochatzis E, Griffiths WJH. Diagnosis and therapy of genetic haemochromatosis (review and 2017 update). *British Journal of Haematology*. 2018;181(3):293-303. doi:10.1111/bjh.15164.
- Wood JC. Guidelines for quantifying iron overload. *Hematology Am Soc Hematol Educ Program*. 2014;2014:210.
- Angelucci E, Brittenham GM, McLaren CE, et al. Hepatic iron concentration and total body iron stores in thalassemia major. *N Engl J Med*. 2000;343:327.
- Hernando D, Zhao R, Yuan Q, et al. Multicenter Reproducibility of Liver Iron Quantification with 1.5-T and 3.0-T MRI. *Radiology*. 2023;306(2):e213256. doi:10.1148/radiol.213256
- Cusi K, Isaacs S, Barb D, et al. American Association of Clinical Endocrinology Clinical Practice Guideline for the Diagnosis and Management of Nonalcoholic Fatty Liver Disease in Primary Care and Endocrinology Clinical Settings: Co-Sponsored by the American Association for the Study of Liver Diseases (AASLD). *Endocr Pract*. 2022;28(5):528-562. doi:10.1016/j.eprac.2022.03.010
- Rinella ME, Neuschwander-Tetri BA, Siddiqui MS, et al. AASLD Practice Guidance on the clinical assessment and management of nonalcoholic fatty liver disease. *Hepatology*. 2023;77(5):1797-1835. doi:10.1097/HEP.0000000000000323

Hernias (AB-12)

Guideline	Page
Inguinal or Femoral Hernia, or Indeterminate Groin Pain (AB-12.1).....	83
Spigelian, Ventral, Umbilical, or Incisional Hernia (AB-12.2).....	85
Hiatal Hernia (AB-12.3).....	86
References (AB-12).....	87

Inguinal or Femoral Hernia, or Indeterminate Groin Pain (AB-12.1)

AB.IH.0012.1.A

v1.0.2026

- Clinical examination alone is usually sufficient for confirming the diagnosis of an evident groin hernia.
- If musculoskeletal ailments such as osteitis pubis or athletic pubalgia are in the differential, see: **Joint Instability and Dysfunction (MS-30.1)** or **Muscle and Tendon Injury (MS-11.1)** in the Musculoskeletal Imaging Guidelines.
- Ultrasound, pelvic limited (CPT[®] 76857) or pelvic complete (CPT[®] 76856) is the initial imaging study if:
 - vague groin swelling with diagnostic uncertainty OR
 - poor localization of swelling (as might be seen with a small hernia and prominent overlying fat) OR
 - intermittent swelling not present on examination OR
 - other/indeterminate groin complaints without swelling
- If ultrasound is indeterminate or non-diagnostic, ONE of the following is medically necessary:
 - CT Pelvis with contrast (CPT[®] 72193) or without contrast (CPT[®] 72192)
 - MRI Pelvis without contrast (CPT[®] 72195) or with and without contrast (CPT[®] 72197)
- For suspected incarceration or strangulation (**initial ultrasound is not required**):
 - CT Pelvis with contrast (CPT[®] 72193) or without contrast (CPT[®] 72192)
- For chronic post-surgical groin pain (after hernia repair):
 - Pelvic ultrasound (CPT[®] 76856 or CPT[®] 76857) or US-guided nerve block
 - CT Pelvis with contrast (CPT[®] 72193) or without contrast (CPT[®] 72192) or MRI Pelvis without contrast (CPT[®] 72195) or without and with contrast (CPT[®] 72197) can be approved if either ultrasound or ultrasound-guided nerve block is indeterminate or non-diagnostic, to assess for other, non-neuropathic causes.

Evidence Discussion

- Diagnosis of inguinal and femoral hernias is usually possible by history and physical alone. When the diagnosis is in question because physical exam is inconclusive or symptoms are vague, ultrasound should be the initial imaging study. Ultrasound can provide useful information without the risk of radiation. It is readily available, easily performed and can be used in conjunction with provocative maneuvers such as valsalva to help delineate a hernia. These provocative maneuvers are more difficult to perform during CT scanning, which gives a more static image.²

- In the event of an inconclusive ultrasound or if there is a concern for a complicated hernia, imaging of the pelvis with either CT or MRI is appropriate. Abdominal imaging is not medically necessary for evaluation of an inguinal or femoral hernia.²
- Post-surgical pain can be associated with neuropathy, recurrence, or mesh complications. These problems should be evaluated with US and/or nerve block as well prior to proceeding to advanced imaging if these studies are indeterminate.⁸

Spigelian, Ventral, Umbilical, or Incisional Hernia (AB-12.2)

AB.IH.0012.2.A

v1.0.2026

- For known or suspected primary or recurrent Spigelian hernia (anterior abdominal wall hernia through the semilunar line), ventral hernia, umbilical, or incisional hernia:
 - CT Abdomen without or with contrast (if at or above the umbilicus) (CPT[®] 74150 or CPT[®] 74160) OR
 - CT Pelvis without or with contrast (if below the umbilicus) (CPT[®] 72192 or CPT[®] 72193) OR
 - CT Abdomen and Pelvis without or with contrast (if above and below the umbilicus, or indeterminate) (CPT[®] 74176 or CPT[®] 74177)

Evidence Discussion

- Hernias of the abdominal wall can have a variable presentation and a challenging physical exam. In addition, there may be secondary hernias that are not noted on physical exam or the hernia may track through different layers of the abdominal wall. The size of the hernia defect is also an important consideration in determining operative approach. Ultrasound is limited in being able to evaluate size and extent of hernia through various tissue planes. Advanced imaging may be medically necessary for both diagnosis and in planning treatment. Limits to imaging only involve targeting imaging to the appropriate body region.⁷

Hiatal Hernia (AB-12.3)

AB.IH.0012.3.A

v1.0.2026

- CT Chest with contrast (CPT® 71260) and/or CT Abdomen with contrast (CPT® 74160) is medically necessary to evaluate ANY of the following:
 - For pre-operative treatment planning
 - Suspected complication of primary disease or surgery

Background and Supporting Information

- Complications of hiatal hernia may include a gastric volvulus (torsion) within the chest cavity, vomiting, chest pain, or difficulty in swallowing.

Evidence Discussion

- Hiatal hernias can become symptomatic. If so, evaluation should follow the guidelines for the specific symptom complex (such as reflux, cough, abdominal or chest pain, vomiting, dysphagia, abnormal chest x-ray, etc.).⁹
- To avoid unnecessary testing and radiation exposure, advanced imaging for hiatal hernias should be reserved for specialist requests for pre-operative evaluation or for complications of the primary disease or surgery.⁹

References (AB-12)

v1.0.2026

1. Expert Panel on Gastrointestinal Imaging, Fowler KJ, Garcia EM, et al. ACR Appropriateness Criteria® Palpable Abdominal Mass-Suspected Neoplasm. J Am Coll Radiol. 2019;16(11S):S384-S391. doi:10.1016/j.jacr.2019.05.014
2. Shakil A, Aparicio K, Barta E, Munez K. Inguinal Hernias: Diagnosis and Management. Am Fam Physician. 2020;102(8):487-492.
3. Expert Panel on Urological Imaging, Gerena M, Allen BC, et al. ACR Appropriateness Criteria® Acute Onset of Scrotal Pain-Without Trauma, Without Antecedent Mass: 2024 Update. J Am Coll Radiol. 2024;21(11S):S364-S371. doi:10.1016/j.jacr.2024.08.011
4. International guidelines for groin hernia management. Hernia. 2018;22(1):1-165. doi:10.1007/s10029-017-1668-x.
5. Murphy KP, Oconnor OJ, Maher MM. Adult Abdominal Hernias. *American Journal of Roentgenology*. 2014;202(6). doi:10.2214/ajr.13.12071.
6. Peters JH. SAGES guidelines for the management of hiatal hernia. *Surgical Endoscopy*. 2013;27(12):4407-4408. doi:10.1007/s00464-013-3212-0.
7. Expert Panel on Gastrointestinal Imaging, Garcia EM, Pietryga JA, et al. ACR Appropriateness Criteria® Hernia. J Am Coll Radiol. 2022;19(11S):S329-S340. doi:10.1016/j.jacr.2022.09.016
8. Plumb AA, Rajeswaran G, Abbasi MA, Masci L, Warren O, Wilson J. Contemporary imaging of inguinal hernia and pain. Br J Radiol. 2022;95(1134):20220163. doi:10.1259/bjr.20220163
9. Sfara A, Dumitrascu DL. The management of hiatal hernia: an update on diagnosis and treatment. Med Pharm Rep. 2019;92(4):321-325. doi:10.15386/mpr-1323

Abdominal Mass (AB-13)

Guideline	Page
Abdominal Wall Mass (AB-13.1).....	89
Indeterminate Intra-Abdominal Mass (AB-13.2).....	90
Abnormal Findings on Endoscopy/Colonoscopy (AB-13.3).....	92
References (AB-13).....	94

Abdominal Wall Mass (AB-13.1)

AB.AM.0013.1.A

v1.0.2026

- Abdominal ultrasound and/or Pelvic ultrasound (CPT[®] 76700 or CPT[®] 76705 and/or CPT[®] 76856) is medically necessary as the initial imaging study to assess an abdominal wall or subcutaneous mass.
- MRI Abdomen without and with contrast (CPT[®] 74183) or CT Abdomen with contrast (CPT[®] 74160) is medically necessary to further characterize a suspected malignant or indeterminate mass detected on ultrasound.
 - Pelvic imaging may be medically necessary depending on the location of the mass.

Evidence Discussion

- Mass lesions of the subcutaneous tissue and abdominal wall are generally benign and can be diagnosed through physical examination (such as lipomas, fibromas, epidermal inclusion cysts, etc.). For lesions that require imaging for further delineation, ultrasound is the initial study of choice. Ultrasound allows for real-time imaging, and the addition of Doppler techniques can help identify vascular lesions. It is highly specific for benign lesions.¹ If the ultrasound image is inconclusive, it can guide the choice of additional imaging modalities, body areas, and contrast levels.
- Subsequent or second-line imaging for indeterminate ultrasound findings includes CT with contrast or MRI with and without contrast. ACR Appropriateness Criteria[®] stated, "CT is widely considered fast and accurate for excluding or confirming a mass" and "may be additionally helpful in the setting of suspected hernia, congenital abnormalities, hematomas, and infections."¹ It is not necessary to perform CT without and with contrast as little diagnostic value is gained by the additional imaging without contrast.⁵ MRI is particularly useful for evaluating masses that appear sarcomatous prior to biopsy. ACR stated, "Although helpful in defining relationship of masses to adjacent fascia, muscles, and vessels, MRI is often not specific enough to establish a definitive diagnosis."¹ The appropriate body region for imaging depends on the location of the mass.

Indeterminate Intra-Abdominal Mass (AB-13.2)

AB.AM.0013.2.A

v1.0.2026

- For a palpable abdominal mass on physical examination:
 - Abdominal ultrasound (CPT® 76700) and/or Pelvic ultrasound (CPT® 76856) is medically necessary in lieu of CT, if requested
 - CT Abdomen with contrast (CPT® 74160) if above the umbilicus
 - CT Abdomen and Pelvis with contrast (CPT® 74177) if extending below the umbilicus
 - CT Pelvis with contrast (CPT® 72193) if involving the pelvis
- Indeterminate findings on a prior CT or ultrasound:
 - MRI Abdomen without and with contrast (CPT® 74183)
 - MRI Pelvis without and with contrast (CPT® 72197) is medically necessary to evaluate if the mass extends below the umbilicus or involves the pelvis
- For a pulsatile abdominal mass, suspected aortic aneurysm: See: **Abdominal Aortic Aneurysm (AAA) (PVD-6.3)** in the Peripheral Vascular Disease (PVD) Imaging Guidelines.
- For females (assigned at birth) with a suspected adnexal mass or fibroid: See: **Adnexal Mass/Ovarian Cysts (PV-5)** or **Leiomyomata/Uterine Fibroids and Other Uterine Masses(PV-12)** in the Pelvis Imaging Guidelines.
- Pregnant individual:
 - Abdominal and/or Pelvic and/or Transvaginal ultrasound (CPT® 76700 and/or CPT® 76856 and/or CPT® 76830) is appropriate for initial imaging.

Evidence Discussion

- The origins and characteristics of a palpable intra-abdominal mass are difficult to determine on physical exam. For intra-abdominal masses, contrast-enhanced CT and ultrasound examination have demonstrated accuracy. Although ultrasound may be limited by body habitus or bowel gas, it offers several advantages.¹ Ultrasound requires no ionizing radiation, is cost effective, helps determine most appropriate next advanced imaging study (CT vs. MRI), is readily accessible, and often can be scheduled same day.
- ACR Appropriateness Criteria® stated, "CT demonstrated high positive predictive value (99%) and negative predictive value (97%) for determining the presence or absence of a mass and correctly identified the organ of origin in 93% of individuals with palpable abnormalities on clinical examination." (2019) MRI is useful for

further delineation of an indeterminate mass found on US or CT due to its excellent sensitivity for soft-tissue differentiation.¹

Abnormal Findings on Endoscopy/ Colonoscopy (AB-13.3)

AB.AM.0013.3.A

v1.0.2026

The following criteria applies to findings on endoscopy or colonoscopy that have NOT been diagnosed or biopsy-proven as malignant. For biopsy-proven malignancy, refer to the appropriate Oncology Imaging Guideline.

- For suspicious (not clearly benign) submucosal lesion(s) noted in the stomach or small bowel or gastric extrinsic compression on colonoscopy, ONE of the following is medically necessary:
 - CT Abdomen with contrast (CPT® 74160) OR
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
- For suspicious (not clearly benign) lesion(s) noted above the rectum (in the colon or small bowel), unexplained colonic extrinsic compression on colonoscopy, or pre-operative planning for complete surgical removal of a polypoid lesion the following are medically necessary,
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
 - MRI Pelvis without and with contrast (CPT® 72197) or MRI Pelvis without contrast (CPT® 72195) is medically necessary in addition to CT when there is an additional suspicious lesion(s) in the distal sigmoid or rectum
- For submucosal rectal lesions or unexplained extrinsic compression in the rectum:
 - MRI Pelvis without and with contrast (CPT® 72197), or if requested, MRI Pelvis without contrast (CPT® 72195)
- For criteria specific to biopsy-proven colorectal cancer, See **Colorectal Cancer – Initial Work-up/Staging (ONC-16.2)** in the Oncology Imaging Guidelines.
- For criteria specific to biopsy-proven Gastrointestinal Stromal Tumor (GIST): See **Gastrointestinal Stromal Tumor (GIST) (ONC-12.5)** in the Oncology Imaging Guidelines.
- For criteria specific to biopsy-proven gastric cancer: See **Gastric Cancer - Initial Work-up/Staging (ONC-14.9)** in the Oncology Imaging Guidelines.

Evidence Discussion

- Endoscopic ultrasound with or without fine-needle aspiration is the preferred initial imaging modality to further characterize a gastric submucosal lesion detected on endoscopy. Rectal endoscopic ultrasound is the preferred initial imaging study to further characterize submucosal rectal lesions.^{2,3}

- Radiographic modalities may be warranted when endoscopic and/or rectal ultrasound cannot be performed (e.g. stricture or severe inflammatory process prohibit passage of probe, etc.), is indeterminate, findings indicate need for further characterization, there is external impression(s) against the gut wall, and/or therapeutic need to understand extent of visualized disease and/or of the origin of an endoscopically-apparent malignancy. Choice of the optimal imaging modality requires consideration of factors such as age, gender, fertility, co-morbidities, medications, and allergies.
- Ultrasound can provide high resolution imaging of the liver, gallbladder, bile ducts, pancreas, spleen, kidneys, and abdominal vasculature. It can also provide information regarding phase and direction of blood flow in arteries and veins via Duplex scanning. Ultrasound requires no ionizing radiation, is readily available being mobile, cost effective, and easier to schedule for same day testing. However, image quality may be limited due to bowel gas (a particular disadvantage in assessment of endoscopically-identified gut lesions), poor acoustic window acquisition, obesity, and sonographer experience level.
- Computed tomography (CT) of the abdomen offers excellent 3-dimensional resolution of the gut and its surrounding structures, especially when performed with use of oral and/or intravenous (IV) contrast agents. CT scan requires a significant dose of ionizing radiation but is ideally suited to characterizing lesions within the gut because the quick speed of image acquisition reduces the potential for motion artifact. The NCCN-recommended imaging of a suspected metastatic adenocarcinoma includes CT imaging of the chest, abdomen, and pelvis.⁴
- Magnetic resonance imaging (MRI) uses a magnetic field to capture excellent 3-dimensional soft tissue resolution. As with CT scans, the technique is often performed with IV contrast agents, and with specialized techniques, can be directed either at whole or parts of the abdomen or at specific abdominal structures (e.g., MR elastography of liver, MR enterography of small bowel, MR cholangiopancreatography [MRCP] of the biliary and pancreatic system). MRI yields better soft contrast resolution than CT and does not expose individuals to ionizing radiation, but due to longer image time is motion artifact-prone and thus less suited to resolving gastrointestinal detail. MRI has disadvantages in that it may require sedation in those with claustrophobia and in young individuals who may be unable to hold still and follow directions. MRI also cannot be performed in those with ferrous magnetic implants or non-removable foreign bodies.⁸

References (AB-13)

v1.0.2026

1. Fowler KJ, Garcia EM, Kim DH, et al. ACR Appropriateness Criteria Palpable abdominal mass-suspected neoplasm. Available at: <https://acsearch.acr.org/docs/69473/Narrative/>. American College of Radiology. 2019.
2. Evans JA, Chandrasekhara V, Chathadi KV, et al. The role of endoscopy in the management of premalignant and malignant conditions of the stomach. *Gastrointestinal Endoscopy*. 2015;82(1):1-8. doi:10.1016/j.gie.2015.03.1967.
3. Faulx AL, Kothari S, Acosta RD, et al. The role of endoscopy in subepithelial lesions of the GI tract. *Gastrointestinal Endoscopy*. 2017;85(6):1117-1132. doi:10.1016/j.gie.2017.02.022.
4. Benson AB, Venook AP, Adam M, et al. National Comprehensive Cancer Network (NCCN) Guidelines Version 4.2025, June 27, 2025. Colon cancer, available at: https://www.nccn.org/professionals/physician_gls/pdf/colon.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Colon cancer V4.2025, June 27, 2025. ©2025 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.
5. Benson AB, Venook AP, Adam M, et al. National Comprehensive Cancer Network (NCCN) Guidelines Version 2.2025, March 31, 2025. Rectal cancer, available at: https://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Rectal cancer V2.2025, 3/31/2025. ©2025 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.
6. Rex DK, Hassan C, Bourke MJ. The colonoscopist's guide to the vocabulary of colorectal neoplasia: histology, morphology, and management. *Gastrointestinal Endoscopy*. 2017;86(2):253-263. doi:10.1016/j.gie.2017.03.1546
7. Emmanuel A, Gulati S, Ortenzi M, Burt M, Hayee B, Haji A. Radiological staging investigations before endoscopic resection of large colorectal lesions: significant burden with no benefit. *Gut*. 2018;67(Suppl 1). doi:10.1136/gutjnl-2018-bsgabstracts.94.
8. Maccioni F, Busato L, Valenti A, et al. Magnetic resonance imaging of the gastrointestinal tract: current role, recent advancements and future perspectives. *Diagnostics (Basel)*. 2023;13(14):2410. doi:10.3390/diagnostics13142410.

Lower Extremity Edema (AB-14)

Guideline	Page
Lower Extremity Edema (AB-14).....	96

Lower Extremity Edema (AB-14)

AB.14.A

v1.0.2026

In the setting of IVC thrombus secondary to the filter or concern for proximal DVT (iliofemoral), see: **Acute Limb Swelling (PVD-12)** and for evaluation of chronic limb swelling/May-Thurner Syndrome, see: **Chronic Limb Swelling Due to Venous Insufficiency/Venous Stasis Changes/Varicose Veins (PVD-13)** in the Peripheral Vascular Disease Imaging Guidelines.

Zollinger-Ellison Syndrome (ZES- Gastrinoma) (AB-15)

Guideline	Page
Zollinger-Ellison Syndrome (ZES-Gastrinoma) (AB-15.1).....	98

Zollinger-Ellison Syndrome (ZES- Gastrinoma) (AB-15.1)

AB.15.1.A

v1.0.2026

- For suspected gastrinoma, see: **Neuroendocrine Cancers and Adrenal Tumors (ONC-15)** in the Oncology Imaging Guidelines.

Adrenal Cortical Lesions (AB-16)

Guideline	Page
Adrenal Cortical Lesions (AB-16).....	100
Asymptomatic Adrenal Cortical Lesions (AB-16.1).....	101
References (AB-16.1).....	108
Adrenal Hormone Excess/Symptomatic Adrenal Lesions (AB-16.2).....	109
References (AB-16.2).....	118
Adrenal Insufficiency (AB-16.3).....	119
References (AB-16.3).....	120

Adrenal Cortical Lesions (AB-16)

AB.AC.0016.A
v1.0.2026

Procedure Code	Description
CPT® 74150	CT Abdomen without contrast
CPT® 74160	CT Abdomen with contrast
CPT® 74170	CT Abdomen without and with contrast
CPT® 74181	MRI Abdomen without contrast
CPT® 74183	MRI Abdomen without and with contrast
CPT® 78812	PET, Skull Base to Mid-Thigh
CPT® 78815	PET/CT, Skull Base to Mid-Thigh

Asymptomatic Adrenal Cortical Lesions (AB-16.1)

AB.AC.0016.1.A

v1.0.2026

Overall Considerations

- The following recommendations are for asymptomatic individuals:
 - For symptomatic individuals, see: **Symptomatic Adrenal Cortical Lesions (AB-16.2)**.
 - US is not a prerequisite study for advanced imaging in the evaluation of any adrenal abnormality.
- Abdominal pain may be present in large or rapidly expanding adrenal tumors due to mass effect or hemorrhage.
 - If the source of abdominal pain is suspected to be an incidental adrenal mass and initial imaging was indeterminate, immediate reimaging with a dedicated adrenal protocol study (see 3 imaging modalities below) is reasonable irrespective of the size of the mass.
 - See: **Abdominal Pain (AB-2)** in the Abdomen Imaging Guidelines for imaging recommendations if abdominal pain is unrelated to the adrenal mass.
- The three imaging modalities that can be used for definitive benign characterization of an adrenal mass are:
 - CT Abdomen without contrast (CPT[®] 74150)
 - CT Abdomen without and with contrast (CPT[®] 74170)
 - CS-MRI (chemical shift MRI, CPT[®] 74181)
- The following list represents definitively benign characteristics of the adrenal gland. This list applies wherever "benign characteristics" are mentioned in the table below:
 - ≤10 HFU on CT
 - ≥60% absolute washout or ≥40% relative washout on CT abdomen without and with contrast with calculated washout (adrenal protocol CT, CPT[®] 74170)
 - An important exception to the washout rule: Non-adenomatous adrenal masses that may show elevated washout on adrenal protocol CT but are not benign include:
 - adrenal metastasis from hypervascular tumors (e.g. RCC and HCC)
 - pheochromocytoma
 - adrenocortical carcinoma
 - clinical suspicion should be used in these cases to guide further investigation

- Decreased signal on Chemical Shift MRI (CS-MRI, CPT® 74181)
- Cyst (if imaging was completed with and without contrast and "no enhancement"-defined as <10HFU change between unenhanced and enhanced/contrasted CT)
- Adrenal myelolipoma (macroscopic fat)
- If definitively benign diagnosis cannot be made during follow up imaging using dedicated CT adrenal protocol (If <60% absolute washout or <40% relative washout) or lack of signal drop out on MRI chemical shift:
 - Additional imaging is medically necessary at 6-12 months from initial follow up, OR
 - Consider resection for possible primary adrenocortical carcinoma after biochemical evaluation and exclusion of pheochromocytoma.
 - For individuals who are poor surgical candidates, if ordered by or in consultation with an endocrinologist, endocrine surgeon, or urologist:
 - Imaging as requested
- CT Abdomen without and with contrast (CPT® 74170) may be medically necessary in place of any below recommended CT Abdomen without contrast for the following:
 - Facility protocol is to cease imaging if adrenal mass is found to have HFU<10 on initial non-contrasted images
- MRI Abdomen without contrast (CPT® 74181) is medically necessary in place of CT for the following:
 - Clips that cause artifacts when using CT
 - Allergy to CT contrast
 - Individuals in whom radiation exposure should be limited (children, pregnant individuals, individuals with known germline mutations, and individuals with recent excessive radiation exposure)
- CS MRI may not detect the intracellular lipid in an adrenal mass if HFU is 30 HU or more on CT without contrast. CS MRI is less effective than CT without and with contrast with calculated washout for adenomas with unenhanced attenuation of more than 20 HU
- Below imaging can be applied to bilateral adrenal masses, with each lesion addressed separately.

Mass Characteristics and Appropriate Imaging

Mass Details	Imaging Study
- Asymptomatic AND - Incidentally found on US, CT, or MRI of area OTHER than the abdomen or if seen only on US of the abdomen AND - Any size AND - No history of cancer	CT Abdomen without contrast (CPT[®] 74150)
- Asymptomatic AND - Incidentally found on CT Chest without contrast, entirely imaged, and fully characterized as indeterminate by HFU score AND >2 cm AND - No history of cancer	CT Abdomen without and with contrast (CPT[®] 74170) in lieu of above recommended CT Abdomen without contrast
- Asymptomatic AND - Incidentally found on CT or MRI of the Abdomen or Abdomen and Pelvis AND <1 cm in short axis AND - No history of cancer	- No further imaging is medically necessary - It is uncertain as to whether subcentimeter nodularity or adrenal thickening qualifies as an adrenal mass on radiology reports
- Asymptomatic AND - Incidentally found on CT or MRI of the Abdomen or Abdomen and Pelvis AND - No prior imaging for comparison AND - Diagnostic with benign imaging characteristics AND ≥1 cm AND - No history of cancer	- No further imaging is medically necessary, regardless of size - The risk of malignancy in a mass with diagnostically benign findings on imaging is extremely low

Mass Details	Imaging Study
• Asymptomatic AND • 1 cm to 2 cm AND • Incidentally detected and indeterminate on any CT or MRI Abdomen or Abdomen and Pelvis AND • No prior imaging for comparison AND • No history of cancer	• Reimaging is medically necessary at 12 months from the initial indeterminate study, as follows*: ◦ CT Abdomen without and with contrast (CPT[®] 74170 - adrenal protocol), CT Abdomen without contrast (CPT[®] 74150), or CS-MRI (chemical shift MRI, CPT[®] 74181) ▪ No further imaging is medically necessary after initial 12 month study if ANY of the following: - Definitively benign characteristics - Stable in size (change <8mm) over >1 year (likely benign adenoma) *NOTE: These instructions are regarding indeterminate lesions without prior studies to compare, in asymptomatic individuals. If prior imaging exists for comparison and radiology report shows stability over 1 year or if the imaging study already shows definitively benign characteristics, no further imaging is medically necessary

Mass Details	Imaging Study
- Asymptomatic AND >2 cm to <4 cm AND - Incidentally detected and indeterminate on any CT or MRI Abdomen or Abdomen and Pelvis AND - No prior imaging for comparison AND - No history of cancer	- Reimaging is medically necessary immediately after initial indeterminate study, as follows*: - CT Abdomen without and with contrast (CPT® 74170 - adrenal protocol), or CS-MRI (chemical shift MRI, CPT® 74181) - Further follow-up imaging is medically necessary at 6 and 12 months - No further imaging is medically necessary if the initial study or follow up study has definitively benign characteristics or if follow up study shows stability in size (change <8mm) over >1 year (as likely benign adenoma) *NOTE: These instructions are regarding indeterminate lesions without prior studies to compare, in asymptomatic individuals . If prior imaging exists for comparison and radiology report shows stability over 1 year or if the imaging study already shows definitively benign characteristics no further imaging is medically necessary.
- Asymptomatic AND ≥4 cm AND - Incidentally detected and indeterminate on any CT or MRI Abdomen or Abdomen and Pelvis AND - No prior imaging for comparison AND - No history of cancer	- Reimaging is medically necessary immediately after initial indeterminate study, as follows: - CT Abdomen without and with contrast (CPT® 74170) or chemical shift MRI (CPT® 74181) - Consider resection for possible primary adrenocortical carcinoma - See: Adrenocortical Carcinoma (ONC-15.13) in the Oncology Imaging Guidelines

Mass Details	Imaging Study
- History of cancer with a likelihood or propensity to metastasize to the adrenal gland or abdomen - Incidentally detected and indeterminate on any CT or MRI Abdomen or Abdomen and Pelvis	See: Adrenal Gland Metastases (ONC-31.4) in the Oncology Imaging Guidelines
Known adrenal mass with benign characteristics, but newly symptomatic or new hormonal excess	Repeat imaging per Adrenal Hormone Excess/Symptomatic Adrenal Lesions (AB-16.2)

Background and Supporting Information

Benign Adenoma Imaging Characteristics

	Findings consistent with Adenoma:	Indeterminate for Adenoma:
CT Abdomen without contrast	≤10 Hounsfield Units	>10 Hounsfield Units
CT Abdomen WWO with calculated washout	≥60% absolute washout or ≥40% relative washout	<60% absolute washout <40% relative washout
Chemical Shift MRI	Signal drop out	Lack of signal drop out

- Endocrine guidelines recommend biochemical evaluation in all incidental adrenal lesions (with the exception of myelolipomas and cysts). However laboratory results are NOT required for imaging in an asymptomatic individual.
- Most benign adenomas, which account for up to 75% of adrenal incidentalomas, are lipid rich and thus easily characterized because they measure 10HFU or less on CT without contrast. CT Abdomen without and with contrast with calculated washout and chemical shift MRI help identify lipid poor adenomas, which are the next most common group. Masses which remain indeterminate include pheochromocytomas (up to 7%) and primary adrenal cancers or metastases to the adrenal glands (approximately 4%).
- Adrenal masses are often found incidentally on CT scans performed WITH contrast to evaluate abdominal symptoms. While CT scans performed with contrast only may report the HFU of an adrenal mass, most benign adenomas are labeled "indeterminate" originally because non-contrasted HFU and HFU after washout cannot be measured or calculated.

- An "Adrenal Protocol CT" measures pre-contrast HFU of an adrenal mass as well as the HFU during "wash out" of contrast medium after 60 to 90 seconds [early] and 10 to 15 minutes [delayed]. Benign adenomas show more rapid and efficient contrast washout as compared to malignant adrenal masses.
- When an adrenal mass shows avid enhancement on CT scan ($>110 - 120$ HU), a pheochromocytoma should be considered.
- In addition to the imaging features in the grid which are considered "diagnostic" of a benign adrenal mass, other radiographic characteristics "suggestive" of a benignity include: smooth/round shape, homogeneous content, lack of calcification/hemorrhage/necrosis, growth rate <1 cm/year, lack of FDG avidity on PET, and <4 cm.
- Radiographic characteristics "suggestive" of malignancy include: irregular margins/shape, heterogeneous content, presence of calcification/hemorrhage/necrosis, growth rate >1 cm/year, presence of FDG avidity on PET, and $>4-6$ cm.
- Malignancies most likely to metastasize to the adrenal glands include lung cancer, gastrointestinal cancer, melanoma, and renal-cell carcinoma.

Evidence Discussion

- CT scan of the abdomen is the recommended initial study to evaluate adrenal gland nodules. A CT scan may expose patients to radiation; however, it takes less time to perform and is less costly than an MRI. Additionally, CT scans are superior to MRI when evaluating lesions with higher density, particularly when using an adrenal CT protocol for washout measurements.⁸
- 75% of adrenal incidentalomas are benign, nonfunctioning adenomas. They are lipid-rich, with low density, exhibit Hounsfield Units (HU) of 10 or less, and have other benign characteristic appearances that make them easily identifiable on an unenhanced CT of the abdomen. The sensitivity and specificity for adenoma characterization are 71% and 98%, respectively, when using unenhanced CT scan for lesions having a density of 10 or less HU.⁸
- Unenhanced CT scans of lesions with a density greater than 30 HU had a 66.6% chance of remaining indeterminate, even after evaluation with chemical shift MRI.⁸
- A chemical shift MRI (CS-MRI) of the abdomen is also useful for characterizing adrenal gland masses with lower density. It is an alternative for follow-up studies when there is a contraindication to CT or contrast or during pregnancy. However, it should be cautioned that MRI may not detect intracellular lipid when the adrenal mass has a HU > 30 . MRI is also less sensitive in evaluation of masses with higher HU over 20 compared to CT scans that calculate contrast wash out times.⁸
- Adrenal protocol CT, with its high sensitivity (98%) and specificity (92%), should be the study of choice to differentiate between adenomas and non-adenomas when an adrenal mass remains indeterminate.⁸

References (AB-16.1)

v1.0.2026

1. Vaidya A, Hamrahian A, Bancos I, Fleseriu M, Ghayee HK. The evaluation of incidentally discovered adrenal masses. *Endocr Pract.* 2019;25(2):178-192.
2. Corwin MT, Remer EM. Adrenal Washout CT: Point-Not Useful for Characterizing Incidentally Discovered Adrenal Nodules. *AJR Am J Roentgenol.* 2021;216(5):1166-1167.
3. Kebebew E. Adrenal Incidentaloma. *N Engl J Med.* 2021;384(16):1542-1551.
4. Grajewski KG, Caoili EM. Adrenal Washout CT: Counterpoint-Remains a Valuable Tool for Radiologists Characterizing Indeterminate Nodules. *AJR Am J Roentgenol.* 2021;216(5):1168-1169.
5. Kiseljak-Vassiliades K, Bancos I, Hamrahian A, et al. American Association of Clinical Endocrinology Disease State Clinical Review on the Evaluation and Management of Adrenocortical Carcinoma in an Adult: a Practical Approach. *Endocr Pract.* 2020;26(11):1366-1383.
6. Zeiger MA, Thompson GB, Duh QY, et al. The American Association of Clinical Endocrinologists and American Association of Endocrine Surgeons medical guidelines for the management of adrenal incidentalomas. *Endocr Pract.* 2009;15 Suppl 1:1-20.
7. Mayo-Smith WW, Song JH, Boland GL, et al. Management of Incidental Adrenal Masses: A White Paper of the ACR Incidental Findings Committee. *J Am Coll Radiol.* 2017;14(8):1038-1044.
8. Expert Panel on Urological Imaging, Mody RN, Remer EM, et al. ACR Appropriateness Criteria® Adrenal Mass Evaluation: 2021 Update. *J Am Coll Radiol.* 2021;18(11S):S251-S267.
9. Park JJ, Park BK, Kim CK. Adrenal imaging for adenoma characterization: imaging features, diagnostic accuracies and differential diagnoses. *Br J Radiol.* 2016;89:20151018.

Adrenal Hormone Excess/Symptomatic Adrenal Lesions (AB-16.2)

AB.AC.0016.2.A

v1.0.2026

Overall Considerations

- Prior to advanced imaging, adrenal hormone excess must be clinically suspected and then biochemically confirmed via testing listed in the table below.
- The following imaging recommendations can also be followed in asymptomatic individuals with an adrenal incidentaloma who are found to have abnormalities at initial hormonal evaluation.
- For severe hormone elevation or rapidly progressing symptoms for which adrenocortical carcinoma is suspected, see: **Adrenocortical Carcinoma (ONC-15.13)** in the Oncology Imaging Guidelines.

Condition	Signs/Symptoms (not required to be documented for imaging)	Laboratory requirements PRIOR to initial adrenal imaging	Indicated Imaging
Suspected cortisol excess (adrenal Cushing's Syndrome)	- Weight gain - Hyperglycemia/diabetes - Low bone mineral density/fractures - Hyperpigmented Striae - Lipodystrophy ("buffalo hump")	- ACTH low/suppressed AND - Cortisol elevation documented by any of the following: - Elevated AM cortisol following overnight 1mg dexamethasone suppression (cortisol >1.8 mcg/dL) - Elevated late night salivary cortisol - Elevated urine free cortisol	- CT Abdomen without contrast (CPT[®] 74150) - If CT Abdomen without contrast shows an indeterminate adrenal mass, the following is medically necessary immediately: - CT Abdomen without and with contrast adrenal protocol (CPT[®] 74170) OR - MRI Abdomen without contrast chemical shift (CPT[®] 74181)

Condition	Signs/Symptoms (not required to be documented for imaging)	Laboratory requirements PRIOR to initial adrenal imaging	Indicated Imaging
Suspected adrenal hyper-androgenism/virilizing adrenal tumor	- Hirsutism - Virilization (voice deepening, clitoromegaly)	- Elevated serum DHEAS AND/OR - Elevated testosterone	- CT Abdomen without contrast (CPT[®] 74150) - If CT Abdomen without contrast shows an indeterminate mass, the following is medically necessary immediately: - CT Abdomen without and with contrast adrenal protocol (CPT[®] 74170) OR - MRI Abdomen without contrast chemical shift (CPT[®] 74181) - In individuals with an elevated testosterone level and an ovarian etiology is suspected, see: <u>Polycystic Ovary Syndrome (PV-8.1)</u> in the Pelvis Imaging Guidelines and <u>Ovarian Cancer-Suspected/ Diagnosis (ONC-21.2)</u> in the

Condition	Signs/Symptoms (not required to be documented for imaging)	Laboratory requirements PRIOR to initial adrenal imaging	Indicated Imaging
			Oncology Imaging Guidelines.
Suspected feminizing adrenal tumor	- Gynecomastia - Testicular atrophy	- Elevated serum estradiol AND - Non-elevated serum LH AND - No testicular mass seen on dedicated imaging	- CT Abdomen without contrast (CPT[®] 74150) - If CT Abdomen without contrast shows an indeterminate adrenal mass, the following is medically necessary immediately: - CT Abdomen without and with contrast adrenal protocol (CPT[®] 74170) OR - MRI Abdomen without contrast chemical shift (CPT[®] 74181)

Condition	Signs/Symptoms (not required to be documented for imaging)	Laboratory requirements PRIOR to initial adrenal imaging	Indicated Imaging
Suspected primary aldosteronism (Conn's Syndrome)	- HTN - Hypokalemia	- Serum aldosterone >15-20ng/dL in the setting of suppressed renin* and spontaneous hypokalemia (K<3.5mEq/L) OR - Confirmatory testing** showing lack of aldosterone suppression. (See Background and Supporting Information on renin* levels and confirmatory testing**)	- CT Abdomen without contrast (CPT® 74150) - If CT Abdomen without contrast shows an indeterminate adrenal mass, the following is medically necessary immediately: - CT Abdomen without and with contrast adrenal protocol (CPT® 74170) OR - MRI Abdomen without contrast chemical shift (CPT® 74181)

Condition	Signs/Symptoms (not required to be documented for imaging)	Laboratory requirements PRIOR to initial adrenal imaging	Indicated Imaging
Suspected pheo-chromocytoma/paraganglioma	- HTN - Palpitations - Tremor - Pallor - Flushing - Hyperadrenergic spells	- Elevated plasma free metanephrines OR - Elevated urinary fractionated metanephrines	- CT Abdomen and Pelvis without and with contrast (CPT[®] 74178), CT Abdomen and Pelvis with contrast (CPT[®] 74177), or MRI Abdomen (CPT[®] 74183) and Pelvis (CPT[®] 72197) without and with contrast - See also: <u>Adrenal Nuclear Imaging (AB-16.4)</u> and <u>Adrenal Tumors (ONC-15.10)</u> in the Oncology Imaging Guidelines and <u>Hereditary Paraganglioma-Pheochromocytoma Syndromes (PEDONC-2.13)</u> in the Pediatric and Special Populations Oncology Imaging Guidelines
Suspected adrenocortical carcinoma	- Rapidly progressive symptoms - Elevation of multiple adrenal hormones	NA	See: <u>Adrenocortical Carcinoma (ONC-15.13)</u> in the Oncology Imaging Guidelines

Condition	Signs/Symptoms (not required to be documented for imaging)	Laboratory requirements PRIOR to initial adrenal imaging	Indicated Imaging
- Confirmed adrenal hormone excess AND - Requested for surgical planning AND - Requested by or in consultation with an endocrinologist, endocrine surgeon, or urologist	NA	NA	Repeat imaging as requested

Background and Supporting Information

- Surgery is the management of choice for individuals with virilizing adrenal tumors, feminizing adrenal tumors, pheochromocytoma/PGL, and suspected adrenocortical carcinoma due to an increased risk of malignancy and/or comorbidity. Adrenal masses that secrete excess cortisol (adrenal Cushing's syndrome) or aldosterone (primary hyperaldosteronism/Conn's syndrome) are rarely malignant; however, surgery is also definitive management.

Suspected cortisol excess (adrenal Cushing's syndrome)

- Low or suppressed ACTH levels (<10 pg/mL) are consistent with an adrenal source.
- DHEAS levels are also low in adrenal Cushing's syndrome.
- The diagnosis of Cushing's syndrome can be delayed for years due to the insidious nature of clinical presentation and the complexity of diagnostic testing.

Suspected adrenal hyperandrogenism/virilizing adrenal tumor

- Testosterone is produced by both the ovary (primary source) and adrenal gland while DHEA and DHEAS are produced almost exclusively by the adrenal gland.
- The magnitude of the androgen level is of poor predictive value for tumors, although a very high testosterone (adult-male range) or DHEAS level (>700 $\mu\text{g/dL}$) is suggestive.

Suspected feminizing adrenal tumor

- Adrenal tumors, mainly carcinomas (extremely rare, 0.5–2.0 per million), can secrete both estrogens and high amounts of adrenal androgens, which aromatize to estrogens. In this case, gynecomastia is usually of recent onset, progresses rapidly and testicular atrophy can also be seen.
- Common causes of excessive endogenous estrogens should be excluded prior to adrenal imaging. These include increased secretion from testis (Leydig cell or Sertoli cell tumors, stimulation of normal Leydig cells by LH or hCG) and increased aromatization of androgens to estrogens (aging, obesity, alcoholic cirrhosis, hyperthyroidism, drugs, hCG-secreting tumors, aromatase excess syndrome).

Suspected primary aldosteronism (Conn's syndrome)

- A positive screen for primary aldosteronism is an aldosterone level >15 - 20ng/dL in the setting of suppressed renin* (plasma renin activity <0.6 - 1.0ng/mL/hour or plasma renin concentration <5 - 8.2 mU/L) and spontaneous hypokalemia ($\text{K} < 3.5\text{mEq/L}$).
- The most common dynamic confirmatory tests include the oral sodium suppression test, the seated intravenous saline suppression test, the fludrocortisone suppression test, and the captopril challenge test, and results that indicate a "positive" result are unique to the each test. For example, if oral sodium loading is used, a 24-hour urine aldosterone excretion of more than 12 mcg in the setting of 24-hour urine sodium excretion of more than 200 mEq is diagnostic of primary aldosteronism (and values of more than 10 mcg/24 hours are strongly suggestive).
- Primary hyperaldosteronism may be managed medically with mineralocorticoid receptor antagonists (spironolactone and eplerenone) in cases of bilateral adrenal disease or poor surgical candidacy. If there has been no recent adrenal imaging, reimaging can be considered in cases of diagnostic uncertainty or poor response to medical therapy.

Suspected pheochromocytoma/paraganglioma

- A pheochromocytoma (85% of chromaffin tumors) arises from the chromaffin cells in the adrenal medulla and commonly produces one or more of the following catecholamines: epinephrine, norepinephrine and dopamine.
- A paraganglioma (15-20% of chromaffin tumors) arises from the extra-adrenal chromaffin cells of the sympathetic paravertebral ganglia of the thorax, abdomen, and pelvis (catecholamine producing) or the parasympathetic ganglia along the glossopharyngeal and vagal nerves in the neck and base of skull (not catecholamine producing).

- Cases of pheochromocytoma/paraganglioma can be sporadic but one-third are hereditary and due to germ-line mutations that may increase malignant potential

Suspected adrenocortical carcinoma

- Adrenocortical carcinoma may be suspected radiographically or clinically. Approximately 60% of individuals present with evidence of adrenal steroid hormone excess, with or without virilization. Hormonally inactive ACCs typically produce symptoms related to tumor burden, including abdominal pain, back pain, early satiety, and weight loss.
- See: **Adrenocortical Carcinoma (ONC-15.13)**

Evidence Discussion

- Advanced imaging is medically necessary when there is biochemical confirmation of adrenal hormone excess.^{2,7,10,13}
- CT of the abdomen is the initial imaging study of choice to identify adrenal adenomas when adrenal hormone excess is confirmed. CT scans are readily available and can identify if adrenal lesions are present and can show characteristics of the lesions that help to distinguish benign lesions from indeterminate lesions.^{2,7,10,13}
- MRI with chemical shift can further help characterize lesions that are indeterminate on CT scan.^{2,7,10,13}
- Including the pelvis in CT scan imaging is medically necessary when evaluating for pheochromocytomas or paragangliomas as these tumors can appear in both the abdominal and pelvis areas and also indicated for staging purposes when adrenal carcinoma is suspected.^{2,7,10,13}

References (AB-16.2)

v1.0.2026

1. Fleseriu M, Auchus R, Bancos I, et al. Consensus on diagnosis and management of Cushing's disease: a guideline update. *Lancet Diabetes Endocrinol*. 2021;9(12):847-875. doi:10.1016/S2213-8587(21)00235-7
2. Vaidya A, Hamrahian A, Bancos I, Fleseriu M, Ghayee HK. The evaluation of incidentally discovered adrenal masses. *Endocr Pract*. 2019;25(2):178-192.
3. Nieman LK, Biller BM, Findling JW, et al. Treatment of Cushing's Syndrome: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab*. 2015;100(8):2807-2831.
4. Goodman NF, Cobin RH, Futterweit W, et al. American association of clinical endocrinologists, american college of endocrinology, and androgen excess and pcos society disease state clinical review: guide to the best practices in the evaluation and treatment of polycystic ovary syndrome--part 1. *Endocr Pract*. 2015;21(11):1291-1300.
5. Fassnacht M, Arlt W, Bancos I, et al. Management of adrenal incidentalomas: European Society of Endocrinology Clinical Practice Guideline in collaboration with the European Network for the Study of Adrenal Tumors. *Eur J Endocrinol*. 2016;175(2):G1-G34.
6. Martin KA, Anderson RR, Chang RJ, et al. Evaluation and Treatment of Hirsutism in Premenopausal Women: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab*. 2018;103(4):1233-1257.
7. Shah MH, Goldner WS, Benson AB, et al. Neuroendocrine and Adrenal Tumors, Version 2.2021, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw*. 2021;19(7):839-868. Published 2021 Jul 28.
8. Carlson HE. Approach to the patient with gynecomastia. *J Clin Endocrinol Metab*. 2011;96(1):15-21.
9. Kanakis GA, Nordkap L, Bang AK, et al. EAA clinical practice guidelines-gynecomastia evaluation and management. *Andrology*. 2019;7(6):778-793.
10. Funder JW, Carey RM, Mantero F, et al. The Management of Primary Aldosteronism: Case Detection, Diagnosis, and Treatment: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab*. 2016;101(5):1889-1916.
11. Vaidya A, Carey RM. Evolution of the Primary Aldosteronism Syndrome: Updating the Approach [published correction appears in *J Clin Endocrinol Metab*. 2021 Jan 1;106(1):e414]. *J Clin Endocrinol Metab*. 2020;105(12):3771-3783.
12. Hundemer GL, Vaidya A. Primary Aldosteronism Diagnosis and Management: A Clinical Approach. *Endocrinol Metab Clin North Am*. 2019;48(4):681-700.
13. Lenders JW, Duh QY, Eisenhofer G, et al. Pheochromocytoma and paraganglioma: an endocrine society clinical practice guideline. *J Clin Endocrinol Metab*. 2014;99(6):1915-1942.

Adrenal Insufficiency (AB-16.3)

AB.AC.0016.3.A

v1.0.2026

- CT Abdomen (contrast as requested) is medically necessary if the cause of primary adrenal insufficiency is unclear.
 - MRI Abdomen (contrast as requested) is medically necessary if CT is contraindicated.
- Imaging is NOT medically necessary if clinical presentation and labs are consistent with ANY of the following:
 - Primary autoimmune destruction of the adrenal cortex (Addison's disease)
 - Congenital adrenal hyperplasia
 - Adrenoleukodystrophy

Background and Supporting Information

- Imaging can detect infiltrative disease, adrenal hemorrhage, infections, and malignant tumors which may be the cause of adrenal dysfunction.

Evidence Discussion

A CT scan of the abdomen is medically necessary to evaluate the cause of primary adrenal insufficiency when it is unclear.¹⁻⁴

- If screening tests for autoimmune or genetic causes of primary adrenal insufficiency are positive, then imaging is not medically necessary.
- Other causes of primary adrenal insufficiency include adrenal hemorrhage, infiltrative diseases, infections such as tuberculosis, and tumors. All of these can be identified by a CT scan of the abdomen.
- The CT scan is usually readily available, relatively quick to process, and therefore preferred over MRI as the initial study unless contraindicated.
- It can accurately identify the size, location, and appearance of adrenal tumors, as well as the presence of local or vascular invasion, lymph node involvement, and distant metastases in the majority of individuals.
- The CT scan can also accurately identify hemorrhage of the adrenal gland.
- While an abdominal ultrasound is less expensive, it does not provide the precise anatomic definition seen on a CT scan, making the CT scan the preferred study.

References (AB-16.3)

v1.0.2026

1. Bornstein SR, Allolio B, Arlt W, et al. Diagnosis and Treatment of Primary Adrenal Insufficiency: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab*. 2016;101(2):364-389.
2. Badawy M, Gaballah AH, Ganeshan D, et al. Adrenal hemorrhage and hemorrhagic masses; diagnostic workup and imaging findings. *Br J Radiol*. 2021;94;202110753.
3. Huang Y, Tang Y, Zhang X, Zeng N, Li R, Chen T. Evaluation of primary adrenal insufficiency secondary to tuberculous adrenalitis with computed tomography and magnetic resonance imaging: current status. *World J Radiol*. 2015;7(10):336-342. doi:10.4329/wjr.v7.i10.336.
4. Udelsman R, Fishman EK. Radiology of the adrenal. *Endocrinology and Metabolism Clinics of North America*. 2000;29(1):27-41.

Abdominal Aortic Aneurysm (AAA), Iliac Artery Aneurysm (IAA), and Visceral Artery Aneurysms Follow-Up of Known Aneurysms and Pre- Op Evaluation (AB-17)

Guideline	Page
Abdominal Aortic Aneurysm (AAA) (AB-17.1).....	122
Iliac Artery Aneurysm (IAA) (AB-17.2).....	123
Visceral Artery Aneurysm (AB-17.3).....	124

Abdominal Aortic Aneurysm (AAA) (AB-17.1)

AB.17.1.A**v1.0.2026**

- For the evaluation of an abdominal aortic aneurysm or pulsatile abdominal mass, see: **Abdominal Aortic Aneurysm (AAA) (PVD-6.3)** in the Peripheral Vascular Disease Imaging Guidelines.

Iliac Artery Aneurysm (IAA) (AB-17.2)

AB.17.2.A

v1.0.2026

- For the evaluation of iliac artery aneurysm (IAA) see: **Iliac Artery Aneurysm (IAA) (PVD-6.4)** in the Peripheral Vascular Disease Imaging Guidelines.

Visceral Artery Aneurysm (AB-17.3)

AB.17.3.A**v1.0.2026**

- For the evaluation of known or suspected visceral artery aneurysm, see: **Visceral Artery Aneurysm (PVD-6.5)** in the Peripheral Vascular Disease Imaging Guidelines.

Abdominal Aortic Aneurysm (AAA) and Iliac Artery Aneurysm (IAA)-Post Endovascular or Open Aortic Repair (AB-18)

Guideline	Page
AAA, IAA, Post Endovascular or Open Aortic Repair (AB-18.1).....	126

Abdomen Imaging Guidelines

AAA, IAA, Post Endovascular or Open Aortic Repair (AB-18.1)

AB.18.1.A

v1.0.2026

- For open aortic abdominal aneurysm repair and additional imaging indications, see: **Post Aortic Endovascular/Open Surgery Surveillance Studies (PVD-6.8)** in the Peripheral Vascular Disease Imaging Guidelines.

Aortic Dissection and Imaging for Other Aortic Conditions (AB-19)

Guideline	Page
Aortic Dissection and Other Aortic Conditions (AB-19.1).....	128
Imaging for Other Aortic Conditions (AB-19.2).....	129

Aortic Dissection and Other Aortic Conditions (AB-19.1)

AB.19.1.A

v1.0.2026

- For the evaluation of aortic dissection and other aortic conditions, see: **Aortic Imaging** in the Peripheral Vascular Disease Imaging Guidelines.

Imaging for Other Aortic Conditions (AB-19.2)

AB.19.2.A

v1.0.2026

- For imaging indications for other aortic conditions, see: **Aortic Imaging** in the Peripheral Vascular Disease Imaging Guidelines.

Bowel Obstruction, Gastroparesis, and Bloating (AB-20)

Guideline	Page
Bowel Obstruction (AB-20.1).....	131
This section intentionally left blank (AB-20.2).....	133
Nausea and Vomiting as the Primary Symptom (AB-20.3).....	134
Superior Mesenteric Artery (SMA) Syndrome (AB-20.4).....	136
Bloating, Gas, and Distention (AB-20.5).....	137
References (AB-20).....	139

Bowel Obstruction (AB-20.1)

AB.BO.0020.1.A

v1.0.2026

- Suspected bowel obstruction:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177) is medically necessary
 - Pediatric individuals:
 - MRI Abdomen and Pelvis without and with contrast (CPT[®] 74183 and CPT[®] 72197) is medically necessary in lieu of CT, if requested.
 - Pregnant individuals:
 - MRI Abdomen and Pelvis without contrast (CPT[®] 74181 and CPT[®] 72195) is medically necessary
 - If the etiology or level of suspected intermittent or low-grade small bowel obstruction remains undetermined and additional imaging is needed after CT Abdomen and Pelvis ONE of the following is medically necessary:
 - CT Enteroclysis (CPT[®] 74176 or CPT[®] 74177) OR
 - CT Enterography (CPT[®] 74177) OR
 - MR Enteroclysis (CPT[®] 74183 and CPT[®] 72197) OR
 - MR Enterography (CPT[®] 74183 and CPT[®] 72197)
- CT Enterography (CPT[®] 74177) is medically necessary if there is a suspected small bowel tumor as a cause of the small bowel obstruction (including a history of no prior abdominal or pelvic surgery, no known hernia and/or concomitant obscure GI bleeding):
- When Crohn's Disease is the suspected cause of small bowel obstruction:
 - See: Suspected **IBD (Crohn's Disease or Ulcerative Colitis) (AB-23.1)** and **Known IBD (AB-23.2)**
- For small bowel obstruction in individuals with a history of bariatric surgery, see: **Bariatric Surgery Post-Operative Complications (AB-9.1)**

Background and Supporting Information

- Complete or high-grade obstruction can be defined as no fluid or gas passing beyond the site of obstruction. In incomplete or partial obstruction (low-grade), some fluid or gas passes beyond the point of obstruction. A plain film is not required prior to advanced imaging for suspicion of either high- or low- grade obstruction.

Evidence Discussion

In individuals suspected of having small or large bowel obstruction, the best imaging modality is CT of the abdomen and pelvis. Such imaging plays a crucial role in both diagnosis and management. Computed tomography (CT) is more useful than plain

radiographs especially in identifying the severity, location, etiology, inflammation, and complications of bowel obstructions including ischemia, necrosis, and perforation. Magnetic resonance imaging (MRI) can be a useful alternative to CT imaging in special populations for whom radiation exposure needs to be limited, but the higher prevalence of motion artifact may make images more difficult to interpret.¹

This section intentionally left blank (AB-20.2)

AB.BO.0020.2.C

v1.0.2026

Nausea and Vomiting as the Primary Symptom (AB-20.3)

AB.BO.0020.3.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- Nausea and vomiting as the primary symptom
 - An initial assessment should be performed prior to imaging requests. Diagnostic testing for nausea and vomiting should be targeted at finding the etiology suggested by a thorough history and physical examination. In the absence of more complicated or serious disease, if the cause is not obvious or suggestive from the history and physical, laboratory data including a CBC, chemistry profile, and, in a reproductive-age individual, pregnancy testing, should be performed prior to advanced radiographic imaging. Imaging is based on the findings of the initial evaluation as follows:
 - CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary for ANY of the following:
 - If the initial assessment does not suggest a specific cause
 - If the evaluation proves unproductive
 - Symptoms suggesting mucosal disease (e.g. GERD, suspicion of ulcer disease):
 - EGD prior to advanced imaging
 - If nausea and vomiting remains unexplained despite workup and CT Abdomen and Pelvis is negative:
 - Gastric emptying study (CPT® 78264)
 - Symptoms suggesting an intracranial etiology (vertigo/nystagmus, associated headache, or neurogenic vomiting suggested by a positional nature and/or associated with other neurologic signs and symptoms):
 - See: **Headache (HD-11)** , **Dizziness, Vertigo and Syncope (HD-23)** , or other Head Imaging Guidelines depending on the predominant neurologic presentation
 - See: **General Guidelines – Other Imaging Situations (HD-1.7)** in the Head Imaging Guidelines for persistent, unexplained nausea and vomiting, when GI evaluation is negative.
 - Nausea and vomiting associated with RUQ pain, dyspeptic symptoms or epigastric pain, see: **Right Upper Quadrant and Epigastric Pain (AB-2.3)**

Evidence Discussion

Nausea and vomiting are common symptoms encountered in medicine. Prior to imaging studies, an evaluation including a detailed history including duration, frequency, and severity should be performed. Diagnostic testing for nausea and vomiting should focus on finding the etiology of the symptoms. In addition to a detailed history and physical examination, laboratory work up and pregnancy testing may reveal the etiology of symptoms. The purpose of the initial assessment is to define whether the symptom complex suggests a central (neurologic), endocrine (e.g. pregnancy, thyroid disorder), iatrogenic (chemotherapy/medication-induced), obstructive (e.g., low-grade small bowel obstruction), or a mucosal (gastritis, peptic ulcer disease) etiology. If mucosal disease causing vomiting is suspected, upper endoscopy should be performed prior to advanced imaging. If gallbladder disease is suspected, right upper quadrant ultrasound should be performed. If neurologic symptoms are present, advanced brain imaging may be indicated depending on symptoms and presentation. If the initial evaluation of nausea and vomiting does not reveal a specific cause, advanced imaging may be pursued. CT abdomen and pelvis with contrast provides valuable information regarding abdominal and pelvic anatomy such as obstruction or inflammation and may be used to evaluate nausea and vomiting when clinically appropriate.^{7,10,11,12}

Superior Mesenteric Artery (SMA) Syndrome (AB-20.4)

AB.BO.0020.4.A

v1.0.2026

- CTA Abdomen (CPT[®] 74175) or MRA Abdomen (CPT[®] 74185) are medically necessary for clinical suspicion of SMA syndrome and ANY of the following:
 - Recent significant weight loss which leads to a loss of retroperitoneal fat
 - Presence of a severe debilitating illness such as malignancy, malabsorption syndromes, AIDS, high-level trauma, and extensive burns
 - History of corrective spine surgery for scoliosis
 - Anorexia Nervosa
 - Abdominal surgery
 - Congenital short ligament of Treitz
 - Radiologic findings or history suggestive of duodenal obstruction
 - Failure to diagnose persistent nausea and/or vomiting despite the workup outlined in **Nausea and Vomiting as the Primary Symptom (AB-20.3)**

Background and Supporting Information

- SMA syndrome is a rare cause of duodenal obstruction in which there is a decrease in the aortomesenteric angle with resulting compression of the duodenum by the SMA.
- The typical clinical scenario includes an episode of weight loss followed by chronic food intolerance with nausea and vomiting, further weight loss, and epigastric pain, and can be relieved by lying prone or in the left lateral decubitus position.
- The diagnosis can be suspected with barium studies demonstrating delayed passage of contrast beyond the duodenum, dilatation of the first and second portions of the duodenum, anti-peristaltic flow of barium proximal to the obstruction, and relief of obstruction when placed in the prone, knee-chest, or left lateral position, or with an upper endoscopy revealing pulsatile extrinsic compression of the duodenum, or plain films suggesting duodenal obstruction.

Evidence Discussion

The gold standard test for suspicion of SMA syndrome is a CTA of the abdomen or an MRA of the abdomen, which confirms the diagnosis and provides a measurement of the angle between the SMA and the abdominal aorta. All other investigative modalities may suggest an obstruction at the third portion of the duodenum but are not diagnostic.²¹⁻²³

Bloating, Gas, and Distention (AB-20.5)

AB.BO.0020.5.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- For bloating as the primary symptom, present for at least 3 months, see: **Irritable Bowel Syndrome (AB-21.4)**
- For documented suspicion of bowel obstruction (e.g., individuals with prior abdominal surgery, previous history of SBO, known adhesions, history of Crohn's Disease, etc.) see: **Bowel Obstruction (AB-20.1)**.
- If associated with constipation, see: **Constipation (AB-21.3)**
- If associated with dyspeptic symptoms, see: **Right Upper Quadrant and Epigastric Pain (AB-2.3)**
- CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary if ANY of the following present:
 - History of malignancy with a likelihood or propensity to metastasize to abdomen
 - Fever (≥ 101 degrees Fahrenheit)
 - Elevated WBC $> 10,000$, or above the upper limit of normal for the particular lab reporting the result
 - Low WBC (absolute neutrophil count < 1000)
 - Palpable mass of clinical concern and/or without benign features
 - GI bleeding, overt or occult, not obviously hemorrhoidal
 - Abdominal tenderness documented as moderate or severe
 - Peritoneal signs, such as guarding or rebound tenderness
 - Suspected complication of bariatric surgery
 - Notation by the ordering provider that the patient has a "surgical abdomen"
 - Age > 60 years with unintentional weight loss of ≥ 10 lbs. or $\geq 5\%$ of body weight over 6 months or less, without an identifiable reason

Background and Supporting Information

Bloating and distension are among the most common gastrointestinal complaints, and appears in 96% of individuals with IBS, and 20-30% of the general population. Bloating is the subjective perception of increased abdominal pressure. Distension is the objective finding of increased abdominal girth.

The following approaches were offered by the American Gastroenterological Association (AGA)²⁰ as Best Practice Advice in evaluation and management of belching, abdominal bloating, and distension:

- Clinical history and physical examination findings and impedance pH monitoring can help to differentiate between gastric and supra-gastric belching.
- Rome IV criteria (see also: **Irritable Bowel Syndrome [AB-21.4]**) should be used to diagnose primary abdominal bloating and distention.
- Carbohydrate enzyme deficiencies may be ruled out with dietary restriction and/or breath testing. In a small subset of at-risk patients, small bowel aspiration or biopsy may be warranted.
- Serologic testing may rule out celiac disease in individuals with bloating and, if serologies are positive, a small bowel biopsy should be done to confirm the diagnosis.
- Abdominal imaging and upper endoscopy should be restricted to individuals with alarm features, recent worsening symptoms, or an abnormal physical examination.
- Gastric emptying studies should not be ordered routinely for bloating and distention, but may be considered if nausea and vomiting are present. See also: **Gastroparesis and Dumping Syndrome (AB-20.2)**
- Whole gut motility and radiopaque transit studies should be restricted to individuals with refractory lower GI symptoms and suspected neuromyopathic conditions.
- When abdominal bloating and distention may be related to constipation or difficult evacuation, anorectal physiology testing is suggested to rule out a pelvic floor disorder. See also: **Constipation (AB-21.3)**

Evidence Discussion

Determining when symptoms of bloating, gas, and distention require imaging is done by risk stratification using demographics factors such as patient age as well as concomitant signs and symptoms.

- Computer tomography (CT) of the abdomen offers excellent 3-dimensional resolution of the gut and its surrounding structures, especially when performed with use of oral and/or intravenous (IV) contrast agents. CT imaging captures all of the abdominal organs and the surrounding cavity and mesentery. It is central to the evaluation of this condition because it can accurately diagnose the presence and location of obstruction, malignancy, vascular insufficiency, or infection, which are important pathologic diagnoses to identify or exclude in the subset of high-risk individuals. CT scan requires a significant dose of ionizing radiation but is ideally suited to imaging lesions within the gut because the speed of image acquisition reduces the potential for motion artifact. Typically performed with IV contrast in individuals with normal kidney function, there is the added risk of allergic reaction to contrast; however the contrast enhances the ability to evaluate for both infectious and vascular conditions.^{8,9,19}

References (AB-20)

v1.0.2026

1. Expert Panel on Gastrointestinal Imaging, Chang KJ, Marin D, et al. ACR Appropriateness Criteria® Suspected Small-Bowel Obstruction. *J Am Coll Radiol*. 2020;17(5S):S305-S314. doi:10.1016/j.jacr.2020.01.025
2. Donohoe KJ, Maurer AH, Ziessman HA. Society of Nuclear Medicine Procedure Guideline for Gastric Emptying and Motility, Version 2.0. Society of Nuclear Medicine and Molecular Imaging. Published June 6, 2004.
3. Parkman HP, Hasler WL, RS Fisher. American Gastroenterological Association Medical Position Statement: diagnosis and treatment of gastroparesis. *Gastroenterology*, 2004; 127:1589-1591
4. Abell TL, Camilleri M, Donohoe KJ, et al. Consensus recommendations for gastric emptying scintigraphy: A joint report of the American Neurogastroenterology and Motility Society and the Society of Nuclear Medicine, *Am J Gastroenterol*, 2008; 103:753-763.
5. Sarnelli G, Caenepeel P, Geypens B, et al. Symptoms associated with impaired gastric emptying of solids and liquids in Functional dyspepsia, *Am J Gastroenterol*, 2003; 98:783-788.
6. Lawal A, Barboi A, Krasnow A, et al. Rapid gastric emptying is more common than gastroparesis in individuals with autonomic dysfunction, *Am J Gastroenterol*, 2007; 102:618-623.
7. Chial HJ, Camilleri M, Williams DE, et al. Rumination Syndrome in Children and Adolescents: Diagnosis, Treatment, and Prognosis, *Pediatrics*, 2003;111(1):158-62
8. Paulson EK, Thompson WM. Review of Small-Bowel Obstruction: The Diagnosis and When to Worry. *Radiology*. 2015;275(2):332-342. doi:10.1148/radiol.15131519.
9. Mullan CP, Siewert B, Eisenberg RL. Small Bowel Obstruction. *American Journal of Roentgenology*. 2012;198(2). doi:10.2214/ajr.10.4998.
10. American Gastroenterological Association medical position statement: Nausea and vomiting. *Gastroenterology*. 2001;120(1):261-262. doi:10.1053/gast.2001.20515.
11. Scorza K, Williams A, Phillips JD, Shaw J. Evaluation of Nausea and Vomiting, *American Family Physician*, 2007; 76(1):76-84.
12. Quigley EM, Hasler WL, Parkman HP. AGA technical review on nausea and vomiting. *Gastroenterology*. 2001;120(1):263-286. doi:10.1053/gast.2001.20516.
13. Baluch, A., Shewayish, S. (2019). Neutropenic Fever. In: Velez, A., Lamarche, J., Greene, J. (eds) Infections in Neutropenic Cancer Patients. Springer, Cham. https://doi.org/10.1007/978-3-030-21859-1_8.
14. Sinagra E, Raimondo D, Albano D, et al. Superior Mesenteric Artery Syndrome: Clinical, Endoscopic, and Radiological Findings. *Gastroenterology Research and Practice*. 2018;2018:1-7. doi:10.1155/2018/1937416.
15. Zaraket V, Deeb L. Wilkies Syndrome or Superior Mesenteric Artery Syndrome: Fact or Fantasy. *Case Reports in Gastroenterology*. 2015;9(2):194-199. doi:10.1159/000431307.
16. Merrett ND, Wilson RB, Cosman P, Biankin AV. Superior Mesenteric Artery Syndrome: Diagnosis and Treatment Strategies. *Journal of Gastrointestinal Surgery*. 2008;13(2):287-292. doi:10.1007/s11605-008-0695-4.
17. Foley A, Burgell R, Barrett JS, Gibson PR. Management strategies for abdominal bloating and distension. *Gastroenterol Hepatol*. 2014;10(9):531-571.
18. Scarpellini E, Arts J, Karamanolis G, et. al. International consensus on the diagnosis and management of dumping syndrome. *Nat Rev Endocrinol*. 2020;16:448-466. doi:10.1038/s41574-020-0357-5.
19. Lacy BE, Cangemi D, Vazquez-Roque M. Management of chronic abdominal distension and bloating. *Clin Gastroenterol Hepatol*. 2021;19(2):219-231.e.1. doi:10.1016/j.cgh.2020.03.056.
20. Moshiree B, Drossman D, Shaukat A. AGA clinical practice update on the evaluation and management of belching, abdominal bloating, and distention. *Gastroenterology*. 2023;165:791-800.
21. Oka A, et al. Superior mesenteric artery syndrome: diagnosis and management. *World J Clin Cases*. 2023;15:3369-3384.
22. Sinagra E, Raimondo D, Albano D, et al. Superior mesenteric artery syndrome: clinical, endoscopic, and radiological findings. *Gastroenterology Research and Practice*. 2018;2018:1-7.
23. Zaraket V, Deeb L. Wilkies Syndrome or superior mesenteric artery syndrome: fact or fantasy. *Case Reports in Gastroenterology*. 2015;9(2):194-199.

Diarrhea, Constipation, and Irritable Bowel (AB-21)

Guideline	Page
Acute and Persistent Diarrhea (Up to 30 Days) (AB-21.1).....	141
Chronic Diarrhea (More than 30 Days) (AB-21.2).....	143
Constipation (AB-21.3).....	145
Irritable Bowel Syndrome (AB-21.4).....	147
References (AB-21).....	149

Acute and Persistent Diarrhea (Up to 30 Days) (AB-21.1)

AB.DC.0021.1.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- Routine advanced imaging is not medically necessary for uncomplicated diarrhea (up to 30 days in duration).
- Prior to advanced imaging, individuals with travel and/or dysenteric (including bloody) diarrhea should undergo biological assessment and/or antimicrobial treatment.
- CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary if:
 - Suspected ischemia (See: **Mesenteric Ischemia (AB-6.1)** and **Colonic Ischemia (AB-6.2)**) OR
 - Older (>50) individuals with significant abdominal pain OR
 - Previous gastric bypass OR
 - Immunocompromised OR
 - Obstruction, toxic megacolon, or perforation suspected

Evidence Discussion

Acute or persistent diarrhea is a common complaint that most often results from self-limited infectious or digestive causes, and for this reason, imaging is generally not medically necessary. Four weeks or more is used as the time frame to describe when diarrhea is no longer considered acute because "intestinal infections, the most common cause of acute diarrhea, typically resolve in 1 week or 4 weeks at the most".¹⁴ However, in a subset of individuals and in the setting of clinical suspicion, imaging is medically necessary to exclude vascular insufficiency, perforation, obstruction and severe metabolic derangement. Determining the situations in which imaging is medically necessary is based on provider concern for such conditions in addition to demographic factors such as age and prior medical and surgical history. When imaging is medically necessary, CT scan with contrast is the modality of choice.^{2,11}

- Computer tomography (CT) of the abdomen offers excellent 3-dimensional resolution of the gut and its surrounding structures, especially when performed with use of oral and/or intravenous (IV) contrast agents. CT imaging captures all of the abdominal organs and the surrounding cavity and mesentery. It is central to the evaluation of this condition because it can accurately diagnose the presence and location of obstruction, malignancy, vascular insufficiency, toxic megacolon, and perforation in the subset of high-risk individuals. CT scan requires a significant dose of ionizing radiation but is ideally suited to imaging lesions within the gut because the speed of

image acquisition reduces the potential for motion artifact. Typically performed with IV contrast in individuals with normal kidney function, there is the added risk of allergic reaction to contrast, however the contrast enhances the ability to evaluate for both infectious and vascular conditions.^{2,11}

Chronic Diarrhea (More than 30 Days) (AB-21.2)

AB.DC.0021.2.A

v1.0.2026

- Prior to advanced imaging, basic lab work should include routine CBC, chemistries, as well as stool tests for pathogens.
- CT Abdomen with contrast (CPT[®] 74160), CT Abdomen and Pelvis with contrast (CPT[®] 74177), CT Enterography (CPT[®] 74177), or MR Enterography (CPT[®] 74183 or CPT[®] 74183 and CPT[®] 72197), is considered medically necessary if ALL of the following have been performed:
 - Colonoscopy has been performed and is nondiagnostic or suggestive of inflammatory bowel disease
 - Fecal calprotectin or fecal lactoferrin
 - Testing for giardia antigen or PCR for giardia
 - Testing for celiac disease with serum IgA tissue transglutaminase (tTG)
- See: **Suspected IBD (Crohn's Disease or Ulcerative Colitis) (AB-23.1)** for concerns regarding inflammatory bowel disease.

Evidence Discussion

Chronic diarrhea is defined as "a condition in which diarrhea that persists or recurs for four weeks or more causing various problems in daily life." Four weeks or more is used as the time frame because "intestinal infections, the most common cause of acute diarrhea, typically resolve in 1 week or 4 weeks at the most".¹⁴

The initial evaluation of chronic diarrhea (more than 30 days) involves non-imaging modalities (blood tests, stool tests, and colonoscopy), to evaluate for celiac disease, giardia, and inflammatory bowel disease. If these evaluations are non-diagnostic, imaging can be considered to identify more unusual causes of chronic diarrhea such as obstruction, malignancy, biliary causes, and small bowel disorders such as small bowel Crohn's disease.^{6,11}

- Computer tomography (CT) of the abdomen offers excellent 3-dimensional resolution of the gut and its surrounding structures, especially when performed with use of oral and/or intravenous (IV) contrast agents. CT imaging captures parts or the whole of the abdomen, or can be directed to interrogate with specialized techniques a specific organ. Depending on clinical suspicion, for this condition, CT of the abdomen, CT of the abdomen and pelvis or specialized CT enterography of the small bowel may be employed. CT scan requires a significant dose of ionizing radiation, but is ideally

suited to imaging lesions within the gut because the speed of image acquisition reduces the potential for motion artifact.^{6,11}

- Magnetic resonance imaging (MRI) uses a magnetic field to capture excellent 3-dimensional resolution. As with CT scans, the technique is often performed with IV contrast agents, and can with specialized techniques be directed either at whole or parts of the abdomen or at specific abdominal structures. For this condition MR enterography delivers high resolution images of small bowel mucosa to evaluate for the subtle inflammatory changes such as those seen in small bowel Crohn's disease. MRI yields better soft contrast resolution than CT and does not expose individuals to ionizing radiation, but due to longer image time is motion artifact-prone and thus less suited to resolving gastrointestinal detail. In addition, and especially in youths, MRI may require sedation.^{6,11}

Constipation (AB-21.3)

AB.DC.0021.3.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary if:
 - Concern for obstruction
- MRI Defecography (MRI Pelvis without contrast CPT® 72195) is medically necessary if the following conditions are met:
 - Individual has undergone ano-rectal manometry **and** a balloon-expulsion test, **and** the results confirm a defecatory disorder or are inconclusive, **and** the individual has failed a trial of biofeedback or other conservative therapy.

OR

- Balloon expulsion test is normal and there is a need to identify structural lesions.

OR

- To guide planned surgical therapy for rectoceles, cystoceles, or uterine prolapse.

Background and Supporting Information

- The work-up and treatment of constipation usually proceeds with a history and physical followed by empiric medication or dietary trials.
 - In general, a colonoscopy is performed prior to advanced imaging in an individual presenting with chronic constipation if the alarm symptoms of blood in the stool, anemia, or weight loss are present.
- Defecography can be used in the evaluation of constipation to obtain information regarding the structural causes of outlet dysfunction (e.g. rectal prolapse, rectocele, or enterocele).
- Defecography can be performed either as a barium study with fluoroscopy (conventional defecography or CD), or with MRI (D-MRI). In a comparative study, D-MRI was found to be less diagnostic than CD for diagnosing rectocele and enterocele, but superior in identifying intussusception.
- Serial manometry may be used to assess therapeutic response to pelvic floor directed management strategies.

Evidence Discussion

Clinical presentation and results of minimally invasive testing determine the situations in which constipation requires imaging.

- Computer tomography (CT) of the abdomen offers excellent 3-dimensional resolution of the gut and its surrounding structures, especially when performed with use of oral and/or intravenous (IV) contrast agents. CT imaging captures all of the abdominal organs and the surrounding cavity and mesentery. It is central to the evaluation of individuals with constipation alongside red flag symptoms that suggest infection or malignancy. CT scan requires a significant dose of ionizing radiation but is ideally suited to imaging lesions within the gut because the speed of image acquisition reduces the potential for motion artifact. Typically performed with IV contrast in individuals with normal kidney function, there is the added risk of allergic reaction to contrast; however, the contrast enhances the ability to evaluate for both infectious and malignant conditions.^{3,4,5}
- MRI Defecography is a dynamic study evaluating the movement of abdominal and pelvic structures during the expulsion phase. It is used as an alternative to fluoroscopy and is superior to fluoroscopy in identifying intussusception. Magnetic resonance imaging (MRI) uses a magnetic field to capture excellent 3-dimensional resolution. MRI yields better soft contrast resolution than CT and fluoroscopy and does not expose individuals to ionizing radiation, but due to longer image time is motion artifact-prone and thus less suited to resolving gastrointestinal detail. In addition, and especially in youths, MRI may require sedation.^{3,4,5}
- For this condition, MR Defecography is performed without contrast, eliminating contrast-related risk. MR Defecography is medically necessary in refractory constipation when minimally invasive diagnostic modalities such as manometry and balloon-expulsion have confirmed a defecatory disorder or are nondiagnostic or for guiding surgical planning of pelvic structural abnormalities.^{3,4,5}

Irritable Bowel Syndrome (AB-21.4)

AB.DC.0021.4.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- Advanced imaging in the absence of alarm symptoms has a very low yield, but can be considered medically necessary in the following circumstances:
 - CT Abdomen with contrast (CPT® 74160) or CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary in the following circumstances:
 - Presence of ANY of the following alarm symptoms:
 - Weight loss
 - Frequent nocturnal awakenings due to gastrointestinal symptoms
 - Fever
 - Blood in the stool or iron deficiency anemia (See: **GI Bleeding (AB-22)** for appropriateness of imaging in this circumstance)
 - New onset and progressive symptoms
 - Onset of symptoms after age 50
 - Family history of colon cancer or inflammatory bowel disease
 - Findings of an abdominal mass
 - Presence of lymphadenopathy
 - After ALL of the following studies have been performed:
 - Fecal calprotectin $\geq 50\text{ug/g}$ or fecal lactoferrin $\geq 4.0\text{ug/g}$ or CRP >0.5 in individuals with diarrhea-predominance
 - Testing for giardia antigen or PCR for giardia
 - Celiac testing should also be performed in individuals with diarrhea-predominance IBS, and if positive see: **Celiac Disease (AB-24.1)** for imaging guidance.
 - See also: Background and Supporting Information in IBD (**Crohn's Disease or Ulcerative Colitis (AB-23.1)**)

Background and Supporting Information

- Irritable bowel syndrome is characterized by abdominal pain associated with altered bowel habits, abdominal distention, and bloating. It is important to understand that IBS is a positive diagnosis, not a diagnosis of exclusion. ACG guidelines (2021) strongly suggest that IBS be assessed with a “positive diagnostic strategy as compared to a diagnostic strategy of exclusion”. Subtypes include IBS-C (constipation-predominant), IBS-D (diarrhea-predominant), IBS-M (mixed), and unclassified IBS. Rome IV Criteria for the diagnosis of irritable bowel syndrome are:

- Recurrent abdominal pain, on average ≥ 1 d/wk in the past 3 months, related to ≥ 2 of the following:
 - Defecation
 - Change in stool frequency
 - Change in stool appearance (form)

Evidence Discussion

Risk stratification (using demographics factors such as individual age, family history, timing of symptoms, concomitant symptoms, and physical exam findings) determines the situations in which imaging is medically necessary for irritable bowel syndrome. In a subset of individuals, imaging is medically necessary to exclude inflammatory conditions such as Crohn's disease and malignant conditions such as bowel cancer.^{7,8,9}

- Computer tomography (CT) of the abdomen offers excellent 3-dimensional resolution of the gut and its surrounding structures, especially when performed with use of oral and/or intravenous (IV) contrast agents. CT imaging captures all of the abdominal organs and the surrounding cavity and mesentery. It is central to the evaluation of this condition because it can accurately identify both the presence and location of inflammatory conditions and malignant conditions in the appropriately identified subset of high-risk individuals. CT scan requires a significant dose of ionizing radiation but is ideally suited to imaging lesions within the gut because the speed of image acquisition reduces the potential for motion artifact. Typically performed with IV contrast in individuals with normal kidney function, there is the added risk of allergic reaction to contrast; however, the contrast enhances the ability to evaluate for both inflammatory and malignant conditions.^{7,8,9}

References (AB-21)

v1.0.2026

1. O'Connor OJ, McSweeney SE, McWilliams S, et al. Role of radiologic imaging in irritable bowel syndrome: Evidence-based review. *Radiology*. 2012;262(2):485-494.
2. Riddle MS, Dupont HL, Connor BA. ACG Clinical Guideline: Diagnosis, Treatment, and Prevention of Acute Diarrheal Infections in Adults. *The American Journal of Gastroenterology*. 2016;111(5):602-622.
3. Bharucha A. Exam 3: American Gastroenterological Association Technical Review on Constipation. *Gastroenterology*. 2013;144(1).
4. van Iersel JJ, Jonkers F, Verheijen PM et al. (2017), Comparison of dynamic magnetic resonance defaecography with rectal contrast and conventional defaecography for posterior pelvic floor compartment prolapse. *Colorectal Dis*. 19: O46–O53.
5. Wald A, Bharucha AE, Limketkai B, et al. ACG clinical guidelines: management of benign anorectal disorders. *Am. J. Gastroenterol*. 2021;116(10):1987-2008. doi:10.14309/ajg.0000000000001507.
6. Menees SB, Powell C, Kurlander J, Goel A, Chey WD. A meta-analysis of the utility of c-reactive protein, erythrocyte sedimentation rate, fecal calprotectin and fecal lactoferrin to exclude inflammatory bowel disease in adults with IBS. *The American Journal of Gastroenterology*. 2015;110(3):444-454. doi:10.1038/ajg.2015.
7. Sultan S, Malhotra A. Irritable Bowel Syndrome. *Annals of Internal Medicine*. 2017;166(11). doi:10.7326/aitc201706060.
8. An Evidence-Based Position Statement on the Management of Irritable Bowel Syndrome. *The American Journal of Gastroenterology*. 2008;104(S1). doi:10.1038/ajg.2008.122.
9. Ford AC, Moayyedi P, Lacy BE, et al. American College of Gastroenterology monograph on the management of Irritable Bowel Syndrome and chronic idiopathic constipation. *The American Journal of Gastroenterology*. 2014;109(S1). doi:10.1038/ajg.2014.187.
10. Foley A, Burgell R, Barrett JS, Gibson PR. Management strategies for abdominal bloating and distension. *Gastroenterol Hepatol (NY)*. 2014;10(9):561-571.
11. Smalley W, Falck-Ytter C, Carrasco-Labra A, Wani S, Lytvyn L, Falck-Ytter Y. AGA clinical practice guidelines on the laboratory evaluation of functional diarrhea and diarrhea-predominant Irritable Bowel Syndrome in adults (IBS-D). *Gastroenterology*. 2019;157(3):851-854. doi:10.1053/j.gastro.2019.07.004.
12. Lacy BE, Pimentel M, Brenner DM, et. al. ACG clinical guideline: management of Irritable Bowel Syndrome. *Am J Gastroenterol*. 2021;116(1):17-44. doi:10.14309/ajg.0000000000001036.
13. Bharucha AD, Dorn SD, Lembo A, Pressman A. American Gastroenterological Association medical position statement on constipation. *Gastroenterology*. 2013;144:211-217. doi:10.1053/j.gastro.2012.10.029.
14. Iihara E, Manabe N, Ohkubo H, et al. Evidence-based clinical guidelines for chronic diarrhea 2023. *Digestion*. 2024;105:480-497. doi:10.1159/000541121.
15. Vasant DH, Paine PA, Black CJ, et al. British Society of Gastroenterology guidelines on the management of irritable bowel syndrome. *Gut*. 2021;70:1214-1240. doi:10.1136/gutjnl-2021-324598.
16. Savarino E, Zingone F, Barberio B, et al. Functional bowel disorders with diarrhoea: clinical guidelines of the United European Gastroenterology and European Society for Neurogastroenterology and Motility. *United European Gastroenterology Journal*. 2022;10(6):519-607. doi:10.1008/ueg2.12259.
17. Lenti MV, Hammer HF, Tacheci I, et al. European consensus on malabsorption - UEG & SIGE, LGA, SPG, SRGH, CGS, ESPCG, EAGEN, ESPEN, and ESPGHAN. Part 2: screening, special populations, nutritional goals, supportive care, primary care perspective. *United European Gastroenterology Journal*. 2025;13(5):773-797. doi:10.1002/ueg2.70011.
18. Lenti MV, Hammer HF, Tacheci I, et al. European consensus on malabsorption - UEG & SIGE, LGA, SPG, SRGH, CGS, ESPCG, EAGEN, ESPEN, and ESPGHAN. Part 1: definitions, clinical Phenotypes, and diagnostic testing for malabsorption. *United European Gastroenterology Journal*. 2025;13(4):599-613. doi:10.1002/ueg2.70012.
19. Arasaradnam RP, Brown S, Forbes A, et al. Guidelines for the investigation of chronic diarrhoea in adults: British Society of Gastroenterology, 3rd edition. *Gut*. 2018;67(8):1380–99

GI Bleeding (AB-22)

Guideline	Page
GI Bleeding (AB-22.1).....	151
Small Bowel Bleeding Suspected (AB-22.2).....	153
References (AB-22).....	155

GI Bleeding (AB-22.1)

AB.GI.0022.1.A

v1.0.2026

- CTA Abdomen (CPT® 74175), CTA Abdomen and Pelvis (CPT® 74174), or CT Abdomen and Pelvis with contrast (CPT® 74177) are medically necessary for the initial evaluation of ANY of the following:
 - If therapeutic angiography is being considered
 - If colonoscopy cannot be performed in an individual with active lower GI bleeding
 - If endoscopy cannot be performed in an individual with active upper GI bleeding
 - If surgery is being considered for treatment of GI bleeding
 - GI bleeding and moderate to severe abdominal pain and/or tenderness
 - GI bleeding and hemodynamic instability
 - If there is concern for an aorto-enteric fistula (known or suspected aortic aneurysm, history of any type of aortic aneurysm repair)
- If there is brisk active bleeding AND endoscopy does not reveal a source
 - Gastrointestinal Bleeding Scintigraphy (CPT® 78278) is medically necessary
- Iron Deficiency Anemia:
 - If the bleeding is of suspected gastrointestinal origin:
 - Upper endoscopy and colonoscopy should be performed, unless contraindicated
 - Small bowel video capsule endoscopy is medically necessary, if endoscopies are negative
 - If small bowel video capsule endoscopy is negative OR for further evaluation of abnormal video capsule findings ONE of the following is medically necessary:
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
 - CT Enterography (CPT® 74177)
 - MR Enterography (CPT® 74183 or CPT® 74183 and CPT® 72197) is medically necessary if there is a contraindication to CT Enterography.
- If the bleeding is determined to be non-gastrointestinal, refer to the appropriate condition-based guideline.

Evidence Discussion

In individuals suspected of having GI bleeding, after initial endoscopic evaluation if feasible, the best imaging modality is CT or CTA of the abdomen and pelvis. Such imaging plays a crucial role in both diagnosis and management. Computed tomographic angiography (CTA) is more expedient and accurate at localizing the site of bleeding as compared to gastrointestinal bleeding scintigraphy (tagged RBC scintigraphy) which can be a useful alternative in the setting of active GI bleeding, especially if it is slow or

intermittent. CTA is the exam of choice for potential causes of catastrophic bleeding such as aortoenteric fistula, transmural bowel injuries, and mesenteric hemorrhage.²⁴

Small Bowel Bleeding Suspected (AB-22.2)

AB.GI.0022.2.C

v1.0.2026

- If the small bowel is the suspected source of bleeding, and if endoscopic studies (upper endoscopy, colonoscopy and if available video capsule endoscopy) are unrevealing:
 - CT Enterography (CPT[®] 74177) is medically necessary
 - MR Enterography (CPT[®] 74183 or CPT[®] 74183 and CPT[®] 72197) is medically necessary, if there is a contraindication to CT Enterography
- Meckel's scan (CPT[®] 78290) is medically necessary if bleeding is suspected from a Meckel's diverticulum.

Evidence Discussion

The goal of identifying the source of GI tract bleeding is to identify lesion, location, and ability to perform therapeutic intervention. Bleeding from the small bowel is uncommon, accounting for approximately 5–10% of all individuals presenting with gastrointestinal (GI) bleeding. The initial diagnostic modality of choice is endoscopy or colonoscopy to help identify lesions and execute appropriate interventions.^{20,21,22,23}

Video capsule endoscopy (VCE) is considered a first-line modality for small bowel investigation. Its main advantages are that it is noninvasive and allows examination of the entire length of the small bowel in 70–90% individuals with diagnostic yield of 38–83% in individuals with suspected small bowel bleeding. The main utility of this test lies in its high positive (94–97%) and negative predictive value (83–100%) in the evaluation of GI bleeding. Findings on VCE leading to endoscopic or surgical intervention or a change in medical management have been reported in 37–87% of individuals.^{6,19,20,21,22,23}

Providers occasionally request a CT or MR Enterography prior to the administration of a VCE, in order to assess whether there is pathology that might impede passage of the capsule and cause retention. This is not supported as a routine procedure prior to VCE. It should be noted that a patency capsule is available, and that this may identify individuals at higher risk of retention. However, guidance from the consensus group of the American College of Gastroenterology recommends that in individuals with obstructive symptomatology, imaging (MR Enterography or CT Enterography) should be performed prior to VCE. This group would also include high risk individuals with a known history of Crohn's Disease, known history of strictures or other obstruction, history of previous pelvic or abdominal radiation, or suspected tumor.^{6,19,20,21,22,23}

Computed tomographic enterography is medically necessary in individuals with suspected obstruction before VCE or after negative VCE examinations, women who are pregnant, and individuals who are unable to swallow the VCE capsule.^{6,19,20,21,22,23}

Cross-sectional imaging techniques optimized for imaging the small bowel are advantageous due to ability to see all bowel loops without superimposition and the visualization of extra-luminal structures. Enterography can be performed with either CT or MR. CT is more widely used in the setting of GI bleeding because of the superior temporal and spatial resolution compared with MR and is more widely available. CT can detect vascular and inflammatory abnormalities, which may be missed on VCE. Because of the small number of studies regarding MR enterography, this exam is not routinely recommended in lieu of CT enterography, but can be considered medically necessary in individuals aged <40 years because of lower radiation exposure.^{6,19,20,21,22,23}

References (AB-22)

v1.0.2026

1. Laing CJ, Tobias T, Rosenblum DI, Banker WL, et al. Acute gastrointestinal bleeding: emerging role of multidetector CT angiography and review of current imaging Techniques. *Radiographics*. 2007;27:1055-1070.
2. Thakral D, Stein DJ, Saltzman JR. Diagnosis of Occult and Obscure Gastrointestinal Bleeding. *Gastrointest Endosc Clin N Am*. 2024;34(2):317-329. doi:10.1016/j.giec.2023.09.006
3. Barkun AN, Bardou M, Kuipers EJ, et al. International Consensus Upper Gastrointestinal Bleeding Conference Group. International Consensus Recommendations on the Management of Individuals with Nonvariceal Upper Gastrointestinal Bleeding. *Ann Intern Med*. 2010 Jan 19;152(2):101-13.
4. Wilkins T, Khan N, Nabh A, et al. Diagnosis and Management of Upper Gastrointestinal Bleeding. *Am Fam Physician*. 2012 Mar 1;85(5):469-76.
5. Strate LL, Gralnek IM. ACG Clinical Guideline. Management of Individuals with Acute Lower Gastrointestinal Bleeding. *Amer. J. Gastroenterol*. Advance Online Publication 1 March 2016.
6. Gerson L, et al. ACG Clinical Guideline: Diagnosis and Management of Small Bowel Bleeding. *Amer J Gastroenterol*. 2015;110:1265-1287.
7. Laine L, Jensen D. Management of Individuals with Ulcer Bleeding. *Am J. Gastroenterol* 2012;107:345-360.
8. Garcia-Tsao G, et al. Prevention and Management of Gastroesophageal Varices and Variceal Hemorrhage in Cirrhosis. *Amer J Gastroenterol*. 2007;102:2086-2102.
9. Short M and Domagalski J, Iron deficiency Anemia: Evaluation and Management. *Am. Fam. Physician*. 2013 Jan 15;87(2):98-104.
10. Garcia-Lopez S, Bermejo F. A guide to diagnosis of iron deficiency and iron deficiency anemia in Digestive Diseases. *World Journal of Gastroenterology*. 2009 Oct 7; 5(37):4638-4643.
11. Ghosh S. Investigating Iron Deficiency Anemia without Clinical Evidence of Gastrointestinal Blood Loss. *Canadian Journal of Gastroenterology*. 2012;26(10):686-686.
12. Raju GS, Gerson L, Das A, et al. American Gastroenterological Association (AGA) Institute medical position statement on obscure gastrointestinal bleeding. *Gastroenterology*. 2007;133:1694-1696.
13. Enns RA, Hookey L, Armstrong D, et al. Clinical Practice Guidelines for the Use of Video Capsule Endoscopy. *Gastroenterology*. 2017;152(3):497-514. doi:10.1053/j.gastro.2016.12.032.
14. Flemming J, Cameron S. Small bowel capsule endoscopy. *Medicine*. 2018;97(14). doi:10.1097/md.00000000000010148.
15. Technology status evaluation report on wireless capsule endoscopy. *Gastrointestinal Endoscopy*. 2014;79(5):805-815.
16. Imran H, Alexander JT, Jackson CD. Lower gastrointestinal hemorrhage. *JAMA*. 2024;331(19):1666-1667. doi:10.1001/jama.2023.25841
17. Sengupta N, Feuerstein JD, Jairath V, et al. Management of patients with acute lower gastrointestinal bleeding: An updated ACG guideline. *Am J Gastroenterol*. 2023;118(2):208-231. doi:10.14309/ajg.0000000000002130
18. Nagpal P, Dane B, Aghayev A, et. al. Expert Panels on Vascular and Gastrointestinal Imaging. ACR Appropriateness Criteria® Nonvariceal Upper Gastrointestinal Bleeding. *Am Coll Radiol (ACR)*; 2024. <https://acsearch.acr.org/docs/69413/Narrative/>.
19. Pasha SF, Leighton JA, Das A, et al. Double-balloon enteroscopy and capsule endoscopy have comparable diagnostic yield in small-bowel disease: a meta-analysis. *Clin Gastroenterol Hepatol*. 2008;6(6):671-6. doi:10.1016/j.cgh.2008.01.005.
20. Rondonotti E, Villa F, Mulder CJ, et al. Small bowel capsule endoscopy in 2007: indications, risks and limitations. *World J Gastroenterol*. 2007;13:6140-6149.
21. Delvaux M, Fassler I, Gay G. Clinical usefulness of the endoscopic video capsule as the initial intestinal investigation in patients with obscure digestive bleeding: validation of a diagnostic strategy based on the patient outcome after 12 months. *Endoscopy*. 2004;36:1067-1073.
22. Pennazio M, Santucci R, Rondonotti E, et al. Outcome of patients with obscure gastrointestinal bleeding after capsule endoscopy: report of 100 consecutive cases. *Gastroenterology*. 2004;126:643-653.
23. Huprich JE, Fletcher JG, Fidler JL et al. Prospective blinded comparison of wireless capsule endoscopy and multiphase CT enterography in obscure gastrointestinal bleeding. *Radiology*. 2011;260:744-751.

24. Wortman JR, Landman W, Fulwadhva UP, Viscomi SG, Sodickson AD. CT angiography for acute gastrointestinal bleeding: what the radiologist needs to know. Br J Radiol. 2017;90(1075):20170076. doi:10.1259/bjr.20170076
25. Auerbach M, DeLoughery TG, Tirnauer JS. Iron Deficiency in Adults: A Review. JAMA. 2025;333(20):1813-1823. doi:10.1001/jama.2025.0452

Inflammatory Bowel Disease (AB-23)

Guideline	Page
Suspected IBD (Crohn’s Disease or Ulcerative Colitis) (AB-23.1).....	158
Known IBD (AB-23.2).....	160
Perirectal/Perianal Crohn's Disease (AB-23.3).....	161
Primary Sclerosing Cholangitis (PSC) (AB-23.4).....	162
References (AB-23).....	164

Suspected IBD (Crohn's Disease or Ulcerative Colitis) (AB-23.1)

AB.IB.0023.1.A

v1.0.2026

- Suspected Crohn's Disease or Ulcerative Colitis:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177) OR CT Enterography (CPT[®] 74177) OR MR Enterography (CPT[®] 74183 or CPT[®] 74183 and CPT[®] 72197) is medically necessary for ANY of the following:
 - History of malignancy with a likelihood or propensity to metastasize to abdomen
 - Fever (≥ 101 degrees Fahrenheit)
 - Elevated WBC $>10,000$, or above the upper limit of normal for the particular lab reporting the result
 - Palpable mass of clinical concern and/or without benign features
 - GI bleeding, overt or occult, not obviously hemorrhoidal
 - Abdominal tenderness documented as moderate or severe
 - Peritoneal signs, such as guarding or rebound tenderness
 - Suspected complication of bariatric surgery
 - Notation by the ordering provider that the patient has a "surgical abdomen"
 - Age >60 years with unintentional weight loss of ≥ 10 lbs. or $\geq 5\%$ of body weight over 6 months or less, without an identifiable reason
 - Chronic diarrhea without the above signs or symptoms, see: **Diarrhea, Constipation, and Irritable Bowel (AB-21)**
 - CT Enterography (CPT[®] 74177) OR MR Enterography (CPT[®] 74183 or CPT[®] 74183 and CPT[®] 72197) is medically necessary for the evaluation of chronic abdominal pain with diarrhea in the absence of red flag criteria (as noted in **General Guidelines AB-1.0**) when there is documented concern for inflammatory bowel disease and if ANY of the following:
 - There is a positive family history of inflammatory bowel disease, **OR**
 - There are endoscopy or colonoscopy findings suggestive of inflammatory bowel disease, **OR**
 - Elevated inflammatory markers (fecal lactoferrin ≥ 4.0 ug/g, CRP >0.5 mg/dL, or fecal calprotectin ≥ 50 ug/g), **OR**
 - Diagnosis is still in doubt after colonoscopy and evaluation of inflammatory markers, and Crohn's disease is suspected
 - CT Abdomen and Pelvis with or without contrast (CPT[®] 74177 or CPT[®] 74176) can be performed prior to endoscopy if requested by or in consultation with the provider who will be performing the endoscopy.

Note:

Serologic markers and genetic markers are currently under investigation with regards to their value in diagnosing inflammatory bowel disease, and are sometimes used as a screening test for IBD in which other examinations are negative. At the current time they are not considered suitable as a screening test for inflammatory bowel disease in individuals with GI symptoms, and the routine use of serologic or genetic markers for the diagnosis of IBD is not indicated. Thus, an isolated positive marker result in an individual without any other findings to suggest IBD, especially in the presence of negative inflammatory markers and endoscopic examinations, is not, in and of itself, an indication for advanced imaging.

- Serologic markers include anti-glycan antibodies, such as ASCA, ACCA, ALCA, AMCA, Anti-L, Anti-C, Anti-OmpC, Anti-Is, Anti-Cbir, pANCA, PAB, GAB

Background and Supporting Information

Studies have demonstrated the negative predictive value of a low fecal calprotectin and CRP with regards to inflammatory bowel disease. Chey, et al. in a meta-analysis demonstrated that a fecal calprotectin <40mcg/g or a CRP ≤0.5 mg/dl effectively excludes inflammatory bowel disease in individuals with IBS. Katsinelos, et al. reviewed wireless capsule endoscopy results in individuals with abdominal pain and diarrhea. The diagnostic yield of capsule endoscopy in individuals with abdominal pain and diarrhea with positive inflammatory markers was 90.1%, and 0% in individuals with abdominal pain and diarrhea with negative inflammatory markers. This led the Canadian Association of Gastroenterology to recommend against the use of capsule endoscopy in individuals with chronic abdominal pain or diarrhea as their only symptoms and no evidence of biomarkers associated with Crohn's Disease, stating "CE (capsule endoscopy) is not warranted in most individuals who present with chronic abdominal pain in the absence of positive tests for inflammatory markers or abnormal findings on endoscopy or imaging".

Evidence Discussion

In individuals with suspected inflammatory bowel disease, cross-sectional imaging can be performed after initial endoscopy is suggestive of inflammatory changes or if abnormal inflammatory markers concerning for IBD, or positive family history of IBD. Cross-sectional imaging methods such as computed tomography and magnetic resonance imaging are complementary to endoscopy, which allows diagnosis of disease when endoscopy is negative and diagnosis is still in doubt.^{1,2,3,4,16}

Known IBD (AB-23.2)

AB.IB.0023.2.A**v1.0.2026**

- CT Abdomen and Pelvis with contrast (CPT[®] 74177), CT Enterography (CPT[®] 74177), or MR Enterography (CPT[®] 74183 or CPT[®] 74181 and CPT[®] 72197 or CPT[®] 72195) is medically necessary for known Crohn's Disease or Ulcerative Colitis and ANY of the following:
 - To determine change in treatment
 - Monitoring response to therapy
 - Suspected complications including abscess, perforation, fistula, or obstruction

Evidence Discussion

Cross-sectional imaging methods such as computed tomography and magnetic resonance imaging are utilized to evaluate IBD disease activity, extra-enteric complication and response to therapy with a great impact on patient management. Magnetic resonance imaging (MRI) either with or without contrast or diffusion weighted has now emerged as suitable radiation-free alternative to CT imaging, with comparable diagnostic accuracy.^{1,2,3,4,20,21,22,23}

MRE should be used preferentially in young individuals and in individuals in whom it is likely that serial exams will need to be performed, because of the absence of any radiation exposure.^{1,2,3,4,20,21,22,23}

Perirectal/Perianal Crohn's Disease (AB-23.3)

AB.IB.0023.3.A

v1.0.2026

- Perirectal/Perianal Fistula:
 - MRI Pelvis without and with contrast (CPT[®] 72197)
 - Endoscopic ultrasound is preferential to CT in this setting.
 - CT Pelvis with contrast (CPT[®] 72193) is an inferior study in this setting, and should be used when MRI or Endoscopic ultrasound cannot be performed.
- Perirectal/Perianal Abscess:
 - MRI Pelvis without and with contrast (CPT[®] 72197)
 - CT Pelvis with contrast (CPT[®] 72193) is inferior but can be considered medically necessary as an alternative if desired.

This section is applicable to individuals with Crohn's Disease. See: **Fistula in Ano (PV-21.1)** and **Perirectal Abscess (PV-21.2)** in the Pelvis Imaging Guidelines for non-Crohn's related perirectal and/or perianal fistulae.

Evidence Discussion

Cross-sectional imaging methods such as magnetic resonance imaging and computed tomography are utilized to evaluate Crohn's related complications like perirectal and/or perianal fistulae or abscess. CT is useful in evaluating abscesses and inflammation; however, due to its limited resolution, defining fistulas may be difficult. MRI, which has better resolution, along with endoscopic ultrasound, are highly accurate in defining perianal and perirectal fistulas and are the preferred modalities for diagnosing fistulas secondary to Crohn's disease.⁴

Primary Sclerosing Cholangitis (PSC)

(AB-23.4)

AB.IB.0023.4.A

v1.0.2026

- Primary Sclerosing Cholangitis (PSC):
 - MRCP is medically necessary to assess for PSC in those:
 - with IBD and any elevated liver study (including alkaline phosphatase, GGTP, bilirubin, AST, or ALT)
 - without IBD, but with persistent cholestatic liver tests. (See: **Abnormal Liver Chemistries (AB-30)**)
 - Ultrasound (CPT® 76700 or 76705) or MRI/MRCP is medically necessary as surveillance for cholangiocarcinoma in individuals with PSC every 6 months.

Background and Supporting Information

Primary sclerosing cholangitis (PSC) is a chronic liver and biliary tract disease that can result in stricturing and fibrosis of the intra- and extra- hepatic biliary ducts, as well as end-stage liver disease. It is most often associated with inflammatory bowel disease. Biliary obstruction can occur anywhere along the biliary tree, resulting in cholangitis, and there is a high risk of the development of cholangiocarcinoma, which must be strongly considered in individuals with PSC and a dominant stricture, as well as an increased risk of gallbladder polyps and other malignancies. As such, imaging plays an important role in the diagnosis and follow-up of PSC.

See: **Chronic Liver Disease, Cirrhosis and Screening for HCC (AB-26.1)**

Background and Supporting Information PSC (Primary Sclerosing Cholangitis) vs PBC (Primary Biliary Cholangitis)

Evidence Discussion

The diagnosis of primary sclerosing cholangitis can be confirmed via magnetic resonance cholangiography (MRCP) when suspected, in individuals with IBD or in individuals with persistent cholestasis, in the absence of known IBD. Surveillance for cholangiocarcinoma in individuals with PSC is important because it allows for disease progression as well as monitoring for the development of cancer. Studies show that there is survival benefit to routine surveillance with MRCP, although ultimately the reason for this survival benefit is not clear.²⁴ MRI has been shown to have better diagnostic performance than ultrasound in detecting early stage cholangiocarcinoma (a potential risk for individuals with PSC) and earlier detection is associated with more favorable prognostic features.²⁵ Data is variable on the optimal timeframe for

surveillance imaging with some sources using benchmarks of annual imaging; this guideline allows for regular cross-sectional imaging with ultrasound or MR every 6 months.^{5,18,19,24,25}

References (AB-23)

v1.0.2026

1. Lichtenstein GR, Loftus EV, Isaacs KL, Regueiro MD, Gerson LB, Sands BE. ACG Clinical Guideline: Management of Crohn's Disease in Adults. *American Journal of Gastroenterology*. 2018;113(4):481-517. doi:10.1038/ajg.2018.27.
2. Hara AK, Leighton JA, Heigh RI, et al. Crohn Disease of the Small Bowel: Preliminary Comparison among CT Enterography, Capsule Endoscopy, Small-Bowel Follow-through, and Ileoscopy | *Radiology*.
3. Lin MF, Narra V. Developing role of magnetic resonance imaging in Crohn's disease. *Current Opinion in Gastroenterology*. 2008;24(2):135-140.
4. Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® Crohn's disease. American College of Radiology (ACR); Reviewed 2021.
5. Lindor KD, Kowdley KV, Harrison ME, et al. ACG Clinical Guideline: primary sclerosing cholangitis. *Amer J Gastroenterol*. 2015;110:646-659. doi:10.1038/ajg.2015.112.
6. Razumilava, N. et al. Cancer Surveillance in individuals with primary sclerosing cholangitis. *Hepatology*. 2011;54: 842-1852.
7. Chapman R, Fevery J, Kalloo A, et al. Diagnosis and Management of Primary Sclerosing Cholangitis. *Hepatology*. 2010;51(2).
8. Katsinelos P, Fasoulas K, Beltsis A, et al. Diagnostic yield and clinical impact of wireless capsule endoscopy in patients with chronic abdominal pain with or without diarrhea: A Greek multicenter study. *European Journal of Internal Medicine*. 2011;22(5). doi:10.1016/j.ejim.2011.06.012.
9. Enns RA, Hookey L, Armstrong D, et al. Clinical Practice Guidelines for the Use of Video Capsule Endoscopy. *Gastroenterology*. 2017;152(3):497-514. doi:10.1053/j.gastro.2016.12.032.
10. Menees SB, Powell C, Kurlander J, Goel A, Chey WD. A Meta-Analysis of the Utility of C-Reactive Protein, Erythrocyte Sedimentation Rate, Fecal Calprotectin and Fecal Lactoferrin to Exclude Inflammatory Bowel Disease in Adults With IBS. *The American Journal of Gastroenterology*. 2015;110(3):444-454. doi:10.1038/ajg.2015.6.
11. Ziech M, Felt-Bersma R, Stoker J. Imaging of Perianal Fistulas. *Clinical Gastroenterology and Hepatology*. 2009;7(10):1037-1045. doi:10.1016/j.cgh.2009.06.030.
12. Berman L. Utility of magnetic resonance imaging in anorectal disease. *World Journal of Gastroenterology*. 2007;13(23):3153. doi:10.3748/wjg.v13.i23.3153.
13. Vogel JD, Johnson EK, Morris AM, et al. Clinical Practice Guideline for the Management of Anorectal Abscess, Fistula-in-Ano, and Rectovaginal Fistula. *Diseases of the Colon & Rectum*. 2016;59(12):1117-1133. doi:10.1097/dcr.0000000000000733.
14. Long MD, Sands BE. What Is the Role of the Inflammatory Bowel Disease Panel in Diagnosis and Treatment? *Clinical Gastroenterology and Hepatology*. 2018;16(5):618-620. doi:10.1016/j.cgh.2018.02.010
15. Magro F, Gionchetti P, Eliakim R, et al. Third European Evidence-based Consensus on Diagnosis and Management of Ulcerative Colitis. Part 1: Definitions, Diagnosis, Extra-intestinal Manifestations, Pregnancy, Cancer Surveillance, Surgery, and Ileo-anal Pouch Disorders. *Journal of Crohn's and Colitis*. 2017;11(6):649-670. doi:10.1093/ecco-jcc/jjx008.
16. Rubin DT, Ananthakrishnan AN, Siegel CA, Sauer BG, Long MD. ACG Clinical Guideline. Ulcerative Colitis in Adults. *The American Journal of Gastroenterology*. 2019;114(3):384-413. doi:10.14309/ajg.0000000000000152.
17. Smalley W, Falck-Ytter C, Carrasco-Labra A, Wani S, Lytvyn L, Falck-Ytter Y. AGA clinical practice guidelines on the laboratory evaluation of functional diarrhea and diarrhea-predominant Irritable Bowel Syndrome in adults (IBS-D). *Gastroenterology*. 2019;157(3):851-854. doi:10.1053/j.gastro.2019.07.004.
18. Assis DN, Bowlus CL. Recent advances in the management of primary sclerosing cholangitis. *Clinical Gastroenterology and Hepatology*. 2023;21:2065-2075. doi:10.1016/j.cgh.2023.04.004.
19. Chazouilleres O, Beuers U, Bergquist, et al. EASL clinical practice guidelines on sclerosing cholangitis. *Journal of Hepatology*. 2022;77:761-806. doi:10.1016/j.jhep.2022.05.011.
20. Seo N, Park SH, et al. MR Enterography for the evaluation of small-bowel inflammation in Crohn disease by using diffusion-weighted imaging without intravenous contrast material: a prospective noninferiority study. *Radiology*. 2016;278(3):762-772. doi:10.1148/radiol.2015150809.

21. Kim JS, Jang HY, Park SH, et al. MR Enterography assessment of bowel inflammation severity in Crohn disease using the MR index of activity score: modifying roles of DWI and effects of contrast phases. *AJR Am J Roentgenol*. 2017;208(5):1022-1029. doi:10.2214/AJR.16.17324.
22. Qiu Y, Mao R, Chen L, et al. Systematic review with meta-analysis: magnetic resonance enterography vs. computed tomography enterography for evaluating disease activity in small bowel Crohn's disease. *Aliment Pharmacol Ther*. 2014;40(2):134-46. doi:10.1111/apt.12815.
23. Soydan, L, et al. Can MR enterography and diffusion-weighted imaging predict disease activity assessed by simple endoscopic score for Crohn's disease? *Journal of the Belgian Society of Radiology*. 2019;103(1):10,1-9. doi:10.5334/jbsr.1521.
24. Tan N, Ngu N, Worland T, et al. Surveillance MRI is associated with improved survival in patients with primary sclerosing cholangitis. *Hepatol Commun*. 2024;8(5):e0442. doi:10.1097/HC9.0000000000000442.
25. Eaton JE, Welle CL, Bakhshi Z, et al. Early cholangiocarcinoma detection with magnetic resonance imaging versus ultrasound in primary sclerosing cholangitis. *Hepatology*. 2021;73(5):1868-1881. doi:10.1102/hep.31575.

Celiac Disease (Sprue) (AB-24)

Guideline	Page
Celiac Disease (AB-24.1).....	167
References (AB-24).....	168

Celiac Disease (AB-24.1)

AB.CD.0024.1.A

v1.0.2026

- CT Abdomen and Pelvis with contrast (CPT[®] 74177), CT Enteroclysis (CPT[®] 74176 or CPT[®] 74177), or CT Enterography (CPT[®] 74177), or MR Enterography (CPT[®] 74183, or CPT[®] 74183 and CPT[®] 72197) is medically necessary for:
 - one-time study after initial, confirmed diagnosis of celiac disease OR
 - confirmed celiac disease and new or continued symptoms (e.g., bloating, diarrhea, abdominal pain, weight loss, distention, evidence of malabsorption, anemia) despite adherence to 6 months of a gluten free diet

Background and Supporting Information

- Celiac is an autoimmune disease in which the villi of the small intestine are damaged from eating gluten (found in wheat, barley, and rye).
- Complications of celiac disease include ulcerative jejunitis, lymphoma, and small intestinal adenocarcinoma.
- Diagnosis is made by blood testing:
 - Anti-tissue transglutaminase antibody [anti-tTG], anti-endomysium antibody (EMA), total IgA count, CBC to detect anemia, ESR, C-reactive protein, complete metabolic panel, vitamin D, E, B12 levels.
- Endoscopy with biopsy of the small bowel is performed to confirm the diagnosis of celiac disease if anti-tTG and/or EMA tests are positive.
- Capsule endoscopy may be used to confirm diagnosis of celiac disease in individuals with positive serology and negative biopsy, or when there is contraindication to biopsy or EGD.

Evidence Discussion

Serologic studies with antibody testing and upper endoscopy and small bowel biopsies are usually performed to confirm the diagnosis of celiac disease.¹ The findings on standard barium examination are often not specific. Abdominal pain, bloating, diarrhea, and evidence of malabsorption are frequent symptoms of celiac disease, as well as indications for CT imaging. The use of standard CT abdominal imaging, as well as CT Enteroclysis and CT Enterography, allow for the noninvasive assessment of the small bowel to evaluate the extent of disease and identify complications of the disease (including ulcerative jejunoileitis, lymphoma, and small bowel tumors). Early diagnosis of these disorders allows specific treatment to be initiated to prevent increased morbidity and mortality. Added advantages of CT imaging for the diagnosis of celiac disease are simultaneous visualization of the small and large bowel, as well as visualization of mesenteric lymph nodes to determine the presence of mesenteric adenopathy.^{5,7}

References (AB-24)

v1.0.2026

1. Rubio-Tapia A, Hill ID, Kelly CP, Calderwood AH, Murray JA. ACG Clinical Guidelines: Diagnosis and Management of Celiac Disease. *The American Journal of Gastroenterology*. 2013;108(5):656-676.
2. Weyenberg SJV, Mulder CJ, Waesberghe JHTV. Small Bowel Imaging in Celiac Disease. *Digestive Diseases*. 2015;33(2):252-259. doi:10.1159/000369516.
3. Radmard AR, Taheri APH, Nik ES, et al. MR enterography in nonresponsive adult celiac disease: Correlation with endoscopic, pathologic, serologic, and genetic features. *Journal of Magnetic Resonance Imaging*. 2017;46(4):1096-1106. doi:10.1002/jmri.25646.
4. Elsayes KM, Al-Hawary MM, Jagdish J, Ganesh HS, Platt JF. CT Enterography: Principles, Trends, and Interpretation of Findings. *RadioGraphics*. 2010;30(7):1955-1970. doi:10.1148/rg.307105052.
5. Green PHR, Paski S, Ko CW, Rubio-Tapia A. AGA clinical practice update on management of refractory celiac disease: expert review. *Gastroenterology*. 2022;163:1461-1469. doi:10.1053/j.gastro.2022.07.086.
6. Scholz,FJ, Afnan, J, Behr, SC. CT findings in adult celiac disease. *Radiographics*. 2011;31:977-992.
7. Penizzotto,A , Vespa, F, Gove,RL, et al. CT and MR enterography in the evaluation of celiac disease. *RadioGraphics*. 2024;44(4):230122.
8. Lacy BE, Pimentel M, Brenner DM, et al. ACG Clinical Guideline: Management of Irritable Bowel Syndrome. *Am J Gastroenterol*. 2021;116(1):17-44. doi:10.14309/ajg.000000000000103

CT Colonography (CTC) (AB-25)

Guideline	Page
CTC (AB-25.1).....	170
References (AB-25).....	172

CTC (AB-25.1)

AB.CT.0025.1.A

v1.0.2026

Note:

A screening CTC (CPT® 74263) can ONLY be used for an individual who is a candidate for average risk screening as defined below. It cannot be used for any other indication. If the request for a CTC is for any other reason than average risk screening, please refer to diagnostic CTC indications. A diagnostic CTC would be the appropriate code, if approvable, for any other reason than average risk screening. This would include surveillance for a history of colon polyps, the evaluation of a change in bowel habits, abdominal pain, bleeding, etc. Please refer to the definition below of an average-risk individual, as well as the circumstances for which a diagnostic CTC is appropriate.

- Screening CTC (CPT® 74263) for colorectal cancer is NOT medically necessary if:
 - FIT-DNA (multi-targeted stool DNA test) within the last 3 years, OR
 - colonoscopy within the last 10 years
- Screening CTC (CPT® 74263) is medically necessary every 5 years for colorectal cancer for:
 - Average-risk individuals ages 45 to 75
 - Average risk is defined as:
 - no previously diagnosed colorectal cancer, or colonic adenomas, or inflammatory bowel disease involving the colon
 - Individuals between 76 to 85 if there is no history of a previously negative colonoscopy or CTC, or, if in the opinion of the provider, the benefits of screening outweigh the risks.
 - Individuals with a SINGLE first-degree relative diagnosed at age >60 years with colorectal cancer or an advanced adenoma can be screened with CTC beginning at age 40.
 - If there are 2 or more first degree relatives at any age with CRC or an advanced adenoma, or a first degree relative <60, the individual should be screened via colonoscopy, not CTC.
- Diagnostic CTC without contrast (CPT® 74261) is medically necessary for:
 - Failed conventional colonoscopy due to a known colonic lesion, structural abnormality, or technical difficulty, and/or
 - Conventional colonoscopy is medically contraindicated. Contraindications may include:
 - Coagulopathy
 - Intolerance to sedation

- Elderly ≥80 years of age
- Recent (within the last 60 days) myocardial infarction (MI)
- Diagnostic CTC with contrast (CPT[®] 74262) is medically necessary if:
 - there is a known obstructing colorectal malignancy so that staging prior to surgery can be performed, if desired.
 - there is a clearly stated indication for IV contrast to evaluate extra-colonic organs. When performed in this setting, a CTC with contrast will substitute for a CT Abdomen and Pelvis such that an additional CT Abdomen and Pelvis would generally not be medically necessary.
- MRI Colonography:
 - Currently, no published society-endorsed guideline with respect to colorectal cancer screening lists MRI Colonography as an alternative screening study. As such, requests for MRI Colonography would be considered investigational at this time. There is no specific CPT assigned for this procedure. It is sometimes requested as an MRI Abdomen and MRI Pelvis.

Background and Supporting Information

CT Colonography is routinely performed without contrast, and IV contrast is not needed in most cases.

Evidence Discussion

When it comes to screening with CT colonography, guidelines differ regarding the best approach for colorectal cancer (CRC) screening in asymptomatic, average-risk individuals. Generally, CTC is not advised for screening in individuals at an increased risk for CRC. This includes those with a history of adenomas or CRC, inflammatory bowel disease, or familial CRC syndromes.^{1,2,3,4}

CTC is comparable to colonoscopy in terms of sensitivity and specificity, takes only about 15 minutes, is non-invasive, and often requires no sedation. However, the cathartic agents recommended for CTC are the same as those for conventional colonoscopy. Additionally, CTC imaging is associated with considerable radiation exposure and detected polyps cannot be removed during the procedure. Therefore, those with positive findings on their CTC will require a follow-up colonoscopy.^{1,2,3,4}

Notably, the American Cancer Society and US Preventive Services Task Force recommend CTC for screening.^{3,8,9}

References (AB-25)

v1.0.2026

1. Lin JS, Piper MA, Perdue LA, et al. Screening for Colorectal Cancer. *JAMA*, 2016;315(23):2576. doi:10.1001/jama.2016.3332.
2. Yee J, Kim DH, Rosen MP, et al. ACR Appropriateness Criteria® Colorectal cancer screening. Last review date: 2018.
3. Rex DK, Boland CR, Dominitz JA, et al. Colorectal Cancer Screening: Recommendations for Physicians and Patients From the U.S. Multi-Society Task Force on Colorectal Cancer. *Gastroenterology*. 2017;153(1):307-323. doi:10.1053/j.gastro.2017.05.013.
4. Yau TY, Alkandari L, Haaland B, Low W, Tan CH. Is intravenous contrast necessary for detection of clinically significant extracolonic findings in patients undergoing CT colonography? *The British Journal of Radiology*. 2014;87(1036):20130667. doi:10.1259/bjr.20130667.
5. Spada C, Stoker J, Alarcon O, et al. Clinical indications for computed tomographic colonography: European Society of Gastrointestinal Endoscopy (ESGE) and European Society of Gastrointestinal and Abdominal Radiology (ESGAR) Guideline. *Endoscopy*. 2014;46(10):897-915. doi:10.1055/s-0034-1378092.
6. ACR-SAR-SCBT-MR: Practice Parameter for the Performance of Computed Tomography (CT) Colonography in Adults. 2014.
7. Scalise P, Mantarro A, Pancrazi F, Neri E. Computed tomography colonography for the practicing radiologist: A review of current recommendations on methodology and clinical indications. *World Journal of Radiology*. 2016;8(5):472. doi:10.4329/wjr.v8.i5.472.
8. U.S. Preventative Services Task Force. Colorectal cancer: screening. Draft recommendation statement. October 27, 2020. <https://uspreventiveservicestaskforce.org/uspstf/draft-recommendation/colorectal-cancer-screening3#fullrecommendationstart>.
9. Wolf AMD, Fonthan ETH, Church TR, et al. Colorectal cancer screening for average-risk adults: 2018 guideline update from the American Cancer Society. *CA*. 2018;68(4):250-281. doi:10.3322/caac.21457.
10. Shaukat A, Kahi CJ, Burke CA, Rabeneck L, Sauer BG, Rex D. ACG clinical guidelines: colorectal cancer screening 2021. *Am J Gastroenterol*. 2021;116(3):458-479. doi:10.14309/ajg.0000000000001122.
11. O'connor B, Boakye-Ansa NK, Brown CA, et al. Predictors of CT colonography use: results from the 2019 national health interview cross-sectional survey. *J Am Coll Radiol*. 2022;19(7):874-880. doi:10.1016/j.jacr.2022.03.018.
12. Final Recommendation Statement. Colorectal Cancer: Screening. Effective 5/18/2021. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening#fullrecommendationstart>. doi:10.7326/M23-0779.
13. Qaseem A, Harrod CS, Crandall CJ, Wilt TJ. Screening for colorectal cancer in asymptomatic average-risk adults: A guidance statement from the American College of Physicians (Version 2). *Annals of Internal Medicine*. 2023;176(8).

Cirrhosis and Liver Screening for Hepatocellular Carcinoma (HCC); Ascites and Portal Hypertension (AB-26)

Guideline	Page
Chronic Liver Disease, Cirrhosis and Screening for HCC (AB-26.1)	174
Ascites (AB-26.2).....	178
Portal Hypertension (AB-26.3).....	179
Monitoring After Fontan Procedure (AB-26.4).....	181
References (AB-26).....	182

Chronic Liver Disease, Cirrhosis and Screening for HCC (AB-26.1)

AB.CL.0026.1.A

v1.0.2026

HCC Screening and Surveillance

- Ultrasound (CPT[®] 76700 or CPT[®] 76705) every 6 months for HCC screening is medically necessary in ANY of the following circumstances:
 - All individuals, regardless of etiology, with cirrhosis or advanced fibrosis (e.g., Fibrosis Score F3 or greater on an elastography study, or results of a lab study such as FIB-4 or a biopsy indicative of severe activity or advanced fibrosis).
 - All individuals with Hepatitis B, regardless of the presence of cirrhosis or advanced fibrosis.
- See: **Hepatic Arteries and Veins (AB-43.1)** for individuals with Chronic Budd-Chiari Syndrome (BCS) and HCC surveillance in Budd-Chiari Syndrome/Hepatic Vein Thrombosis.
- See: **Monitoring After Fontan Procedure (AB-26.4)** for individuals who have undergone the FONTAN procedure.
- See: **General Guidelines (AB-1.0)** for use of medications or treatments which increase risk of HCC.

Evaluation of Liver Nodules

- If liver nodule is identified in the setting of chronic liver disease:
 - Less than 1cm
 - Repeat US in 3 months, then every 3 to 6 months
 - If stable for 2 years, then return to US every 6 months
 - Greater than or equal to 1cm
 - Multiphase CT Liver (either CPT[®] 74160 or CPT[®] 74170) or MRI Abdomen (CPT[®] 74183) should be performed.
 - If negative: Return to routine surveillance via US in 6 months.
 - If Li-RADS NC (non-categorizable): Repeat the same study or an alternative diagnostic imaging ≤3 months. (Note: non-categorizable refers to a technical problem with the study, such as image omission or severe degradation)
 - If Li-RADS 1 (definitely benign): Return to routine surveillance via US in 6 months.

- If Li-RADS 2 (probably benign): CT or MRI in 6 months can be approved (US requests are approvable if desired). If unchanged, return to routine surveillance via US.
- If Li-RADS 3 (intermediate): CT or MRI in 3-6 months, and can be repeated every 6 months 2 more times, for a total of 18 months from the initial finding. If no change by 18 months, return to US surveillance every 6 months.
- If Li-RADS 4 (probable HCC): Repeat or alternative imaging in ≤ 3 months. If HCC confirmed: See: **Upper GI Cancers (ONC-14)** in the Oncology Imaging Guidelines.
- If Li-RADS 5 (HCC confirmed): See: **Upper GI Cancers (ONC-14)** in the Oncology Imaging Guidelines.
- If Li-RADS M (Malignant, not definitely HCC): Repeat or alternative imaging in ≤ 3 months, and follow appropriate Oncology guidelines upon diagnosis.
- Exceptions to the above algorithms:
 - Advanced imaging (Multiphase CT Liver (either CPT[®] 74160 or CPT[®] 74170) or MRI Abdomen (CPT[®] 74183) for surveillance may be substituted for US in the following circumstances:
 - Obesity (BMI >35)
 - Marked parenchymal heterogeneity (suggestive of advanced liver fibrosis) noted on US
 - Visualization limitations noted on US which could be technical (such as obscuration by intestinal gas, chest wall deformity, etc.), or those related to structural or parenchymal changes in the liver
 - For individuals on the Liver Transplant list: See: **Liver Transplant, Pre-Transplant (AB-42.1)**
 - For Magnetic Resonance Elastography (MRE) indications, see: **Liver Elastography (AB-45)**
- Alpha-fetoprotein ≥ 20 ng/mL: Multiphasic CT or MRI Abdomen:
 - Further imaging should follow the above Li-RADS algorithm, depending on the findings of the CT or MRI.
 - If the initial CT or MRI does not reveal a lesion, but the AFP increases on subsequent testing, additional advanced imaging by CT or MRI may be approved.
- Contrast-Enhanced Ultrasound (CEUS)
 - Further studies are needed to assess the value of CEUS in this setting, and it is not medically necessary at this time.

Background and Supporting Information

When performed for liver lesion evaluation, a multiphase CT protocol may include non-contrast imaging as well as arterial, portal venous, and delayed-phase post-contrast imaging. However, these protocols do not always require non-contrast imaging which

may not provide additional information in many scenarios. Therefore, a multiphase CT for liver lesion evaluation can be requested as CPT® 74160 (CT Abdomen with contrast) or CPT® 74170 (CT Abdomen without and with contrast).

The presence of liver disease in the absence of advanced fibrosis or cirrhosis, with the exception for those circumstances indicated above, is not an indication for screening. This would include, for example, MASLD (metabolic dysfunction associated steatotic liver disease, formerly known as NAFLD), the presence of which is not an indication for screening in the absence of either advanced fibrosis or cirrhosis

The American Association for the Study of Liver Diseases (AASLD) revised its guidelines with respect to surveillance for HCC in individuals with cirrhosis in 2018. The recommended algorithm now includes either US alone or US with serum AFP every 6 months. It should be noted that “modification of this surveillance strategy based on the etiology of liver diseases or risk stratification models cannot be recommended at this time.”

In addition, the AASLD also issued a subsequent Practice Guidance in 2018 and this document forms the basis of these guidelines. The AASLD has adopted the Li-RADS classification of liver lesions with respect to HCC surveillance imaging for individuals with advanced liver disease, and follow-up imaging protocols are based on this system. In view of this, the Li-RADS classification now informs imaging protocols used in this guideline.

Note: PSC (Primary Sclerosing Cholangitis) vs. PBC (Primary Biliary Cholangitis)

These 2 entities sound similar, and both are cholestatic, but they are different diseases, and as such have different monitoring requirements.

PSC is an idiopathic cholestatic disease characterized by chronic inflammation, progressive fibrosis, and stricturing of the *medium and large-sized* extra-hepatic or intra-hepatic bile ducts. Segmental bile duct dilation proximal to areas of stricturing creates the characteristic beaded appearance on a cholangiogram, such as MRCP. This may progress and eventually lead to cirrhosis as well. It is most commonly associated with inflammatory bowel disease. From a surveillance standpoint, PSC may be complicated by disease-associated malignancies, including cholangiocarcinoma, hepatocellular carcinoma, and pancreatic cancer. Thus, follow-up imaging in this setting is generally via MRCP +/- MRI Abdomen (CPT® 74181 or CPT® 74183) – See: **Primary Sclerosing Cholangitis (PSC) (AB-23.4)**.

PBC is a complex, chronic, and slowly progressive autoimmune liver disease that predominately affects women, and is characterized by cholestatic liver biochemistries as well as the presence of AMA (Anti-Mitochondrial Antibodies), and results in T-lymphocyte-mediated destruction of *small* intrahepatic bile ducts. This may ultimately lead to cirrhosis, and thus an increased risk of hepatocellular carcinoma. Because of this, surveillance via US screening protocols for HCC are followed in PBC.

It may be necessary, when the diagnosis of PBC is uncertain, for an MRCP to be performed in order to distinguish between PBC and PSC. However, MRI or MRCP is not used for serial monitoring for PBC, once the diagnosis is established. This is in contradistinction to PSC, in which MRCP is used to surveil for cholangiocarcinoma, as discussed above.

Evidence Discussion

Ultrasound has several advantages over advanced imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI). Ultrasound requires no ionizing radiation, is readily available, cost-effective, and often allows for same-day scheduling. The reproducibility of results has made it the initial modality of choice for imaging hepatobiliary conditions and screening for hepatocellular carcinoma (HCC) for the past 20 years. Ultrasound also helps to determine the next appropriate advanced imaging study - whether CT, MRI, or magnetic resonance cholangiopancreatography (MRCP) - along with contrast levels.^{19,21,24,25}

Disadvantages include image quality degradation due to bowel gas, challenges in acquiring an acoustic window, obesity, and sonographer inexperience.^{19,21,24,25}

Although emerging data may support CT and MRI-based liver surveillance, AASLD does not currently recommend their routine use in individuals at risk for HCC. Studies from Asia suggest that both two-phase CT and hepatobiliary contrast-enhanced MRI are more sensitive for early-stage HCC detection compared to US-based surveillance, with sensitivities of 83% and 86% versus 28%–29%, respectively. However, neither CT nor MRI has been validated in Western patient cohorts without chronic viral hepatitis B. Additionally, CT-based surveillance raises concerns about radiation and contrast exposure, especially if conducted semiannually. Similarly, MRI contrast agents present concerns regarding radiology service capacity, patient acceptance, and cost-effectiveness.^{19,21,24,25}

Relative to surveillance, AASLD acknowledges the suboptimal performance of CT or MRI in accurately diagnosing HCC in lesions <1cm. AASLD recommends observing individuals with sub-centimeter liver lesions on ultrasound by repeat short-interval surveillance using ultrasound and AFP in 3-6 months. Imaging by multiphase CT or contrast-enhanced MRI is advised for those with new or enlarging solid liver lesions >1 cm and individuals with unequivocally elevated AFP independent of ultrasound results.^{19,21,24,25}

Ascites (AB-26.2)

AB.CL.0026.2.A

v1.0.2026

- Abdominal ultrasound (CPT[®] 76700 or CPT[®] 76705) and/or Doppler (CPT[®] 93975) with diagnostic paracentesis required for all initial evaluations of ascites to determine the need for further or advanced imaging.
 - Further advanced imaging is determined by the nature of etiology of the ascites (e.g., portal hypertension secondary to cirrhosis, malignancy such as ovarian or pancreatic, heart failure, etc.).
- Peritoneal-venous shunt patency study (CPT[®] 78291) is considered medically necessary for evaluation of shunt patency and function in an individual with ascites.

Background and Supporting Information

- Guidance from the American Association for the Study of Liver Diseases (2021) indicates that the initial evaluation of individuals with ascites should include a medical history, physical examination, abdominal US with Doppler, lab studies including CBC, Liver function tests, serum and urine electrolytes and paracentesis with ascitic fluid analysis, which then guides further management. They specifically note that "A diagnostic paracentesis should be performed in all individuals with new-onset ascites that is accessible for sampling".

Evidence Discussion

According to AASLD guidance for ascites management, Doppler ultrasound is the preferred initial radiologic test. Ultrasound is highly sensitive for diagnosing ascites and does not expose individuals to radiation.¹⁵

Depending on the analysis of the ascitic fluid, further imaging such as CT (to evaluate for malignancy or cirrhosis) or an echocardiogram (for heart failure) may be warranted.^{3,12,13}

For individuals with refractory ascites and a LaVeen Shunt, a nuclear peritoneal-venous shunt study is the recommended imaging choice.^{3,12,13}

Portal Hypertension (AB-26.3)

AB.CL.0026.3.A

v1.0.2026

- In evaluating the cause of portal hypertension:
 - Abdominal US (CPT[®] 76700 or CPT[®] 76705) and/or Duplex Doppler US [CPT[®] 93975] of the liver and upper abdomen is medically necessary to distinguish ANY of the following:
 - pre-hepatic causes (including portal vein thrombosis, extrinsic compression from a tumor)
 - intrahepatic causes (including cirrhosis)
 - post-hepatic (including hepatic vein thrombosis)
- CT Abdomen with contrast (CPT[®] 74160) or MRI Abdomen with contrast (CPT[®] 74183) is medically necessary for ANY of the following indications:
 - Ultrasound is technically limited in assessing hepatic and/or portal vessels
 - Suspicion of portal vein thrombosis, cavernous transformation, or extrinsic impression, but ultrasound was indeterminate
 - Portal hypertension along with secondary signs are present (including splenomegaly or porto-systemic collaterals)
- For TIPS (transjugular intrahepatic portosystemic shunt)
 - See: **Hepatic Arteries and Veins (AB-43.1)**

Background and Supporting Information

- Causes of portal hypertension can be divided into pre-hepatic (e.g., portal vein thrombosis, extrinsic compression from a tumor), intrahepatic (e.g. cirrhosis) and post-hepatic (e.g., hepatic vein thrombosis).
- Most cases of portal hypertension are caused by cirrhosis. Cirrhosis is a histologic diagnosis. The term compensated advanced chronic liver disease (cACLD) encompasses a spectrum of fibrosis and cirrhosis that may be difficult to distinguish on clinical grounds alone since cACLD individuals may manifest with few signs or symptoms.
- When cirrhosis progresses to "decompensated advanced chronic liver disease" (dACLD) individuals may present with ascites, encephalopathy, varices. The most feared complication of portal hypertension is the development of gastro-esophageal varices with hemorrhage
- The gold standard for the assessment of portal hypertension is the Hepatic Venous Pressure Gradient (HPVG [pressure gradient between portal vein and the inferior vena cava]), which is an invasive test. This is the pressure gradient between portal vein and the inferior vena cava. Clinically significant portal hypertension (CSPH) is defined by HPVG of > 10 mm Hg. Measurement of HPVG requires invasive testing.

There is however a non-invasive test alternative to guide imaging and to risk stratify between CSPH and cACLD. This test combines the Platelet Count with measurement of liver stiffness (LSM), typically from transient elastography (e.g., FibroScan). Risk is best summarized by the "Rule of Five."

- The "Rule of Five," thresholds are as follows:
 - LSM < 15 kPa and platelet count > 150,000/mm³: Low risk of CSPH — endoscopy can be avoided.
 - LSM between 15–25 kPa or platelet count < 150,000/mm³: Intermediate risk — further evaluation or endoscopy may be needed.
 - LSM ≥ 25 kPa: High likelihood of CSPH — endoscopy is recommended.

Evidence Discussion

Initial evaluation of individuals suspected of portal hypertension (PH) should always include a detailed history and physical exam, as well as appropriate lab studies and non-invasive assessment of liver parenchyma by ultrasound. Valuable information is added about alterations in hepatic vascular flow per Doppler ultrasound.^{27,28}

In cases of uncertainty, abdominal CT scan or MRI may be warranted. Individual specific factors however should be herein considered such as pregnancy, tolerance to long image acquisition time and confined spaces, high cost, as well as exposure to contrast agents and ionizing.^{21,22,23}

Surrogate markers of clinically significant portal hypertension (CSPH) include the presence of gastroesophageal varices or portosystemic collaterals. When such markers are not apparent, clarification may require invasive studies such as liver biopsy or hepatic venous pressure gradient (HVPG) measurement.²⁷

However, non-invasive studies have emerged as preferred assessment tools when cACLD is suspected. Transient elastography (TE) correlates liver stiffness (LSM) with the degree of liver fibrosis. Patients with LSM 5-10 kPa do not have cACLD and can be monitored for liver disease progression by serial LSM every 2-3 years.^{27,28}

More recent refinement of non-invasive risk assessment of CSPH combines LSM and platelet count. Individuals at low risk of gastro-esophageal varices can be monitored annually. For individuals with higher risk for cACLD or CSPH the "Rule of Five" guides further decision-making.

Monitoring After Fontan Procedure (AB-26.4)

AB.CL.0026.4.A

v1.0.2026

- Abdominal ultrasound (CPT[®] 76700 or CPT[®] 76705) and Doppler (CPT[®] 93975) are medically necessary every 6 months or per institution protocol.
- MR Elastography (CPT[®] 76391) is medically necessary every 6 months
- If any sized lesions are detected on ultrasound:
 - MRI Abdomen without contrast, or without and with contrast (CPT[®] 74181 or CPT[®] 74183) with follow-up timeframes as requested.
- If advanced fibrosis or cirrhosis is detected on any imaging modality:
 - HCC monitoring every 6 months after advanced fibrosis or cirrhosis is detected with MRI Abdomen without contrast, or without and with contrast (CPT[®] 74181 or CPT[®] 74183) is medically necessary.
- CT Abdomen and Pelvis with contrast (CPT[®] 74177), CT Abdomen with contrast (CPT[®] 74160), or other elastography techniques (i.e., Fibroscan) can be used to assess and monitor individuals with contraindications to MRI (e.g., pacemaker devices, etc.).

Evidence Discussion

Individuals with single-ventricle physiology who have undergone the Fontan Procedure which redirects venous blood flow to the pulmonary circulation invariably develop liver complications, which can include the development of nodules and cirrhosis secondary to the altered vascular anatomy, and thus are at risk for hepatocellular carcinoma. In addition, the congestive hepatopathy associated with the Fontan procedure makes differentiation of focal liver lesions from congestive changes more challenging than other cirrhotic conditions. Thus, most institutions use MRI rather than US for monitoring in the setting of cirrhosis. In addition, the evaluation for HCC is challenging due to the vascular changes associated with the Fontan procedure, because the typical HCC pattern of delayed venous-phase contrast washout may not be appreciated within the background congestive hepatopathy. Thus, biopsy is usually required. Also, distinguishing dysplastic lesions from true HCC based on LiRADS criteria is very challenging as well. There are no current society endorsed guidelines, and institutions may vary in the monitoring of chronic liver disease in this patient population. The above algorithm represents an accepted approach and is consistent with the consensus from the Fontan-Associated Liver Disease proceedings from the American College of Cardiology Shareholders Meeting (2015) as well as the consensus of a multidisciplinary group of American Society of Transplantation members (2020).^{2,7,8,15}

References (AB-26)

v1.0.2026

1. Heimbach JK, Kulik LM, Finn RS, et al. AASLD guidelines for the treatment of hepatocellular carcinoma. *Hepatology*. 2018;67(1):358-380. doi:10.1002/hep.29086
2. Benson AB, D'Angelica MI, Abrams T, et al. National Comprehensive Cancer Network (NCCN) Guidelines Version 1.2024 – April 9, 2024. Hepatocellular Carcinoma, available at: https://www.nccn.org/professionals/physician_gls/pdf/hcc.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Hepatocellular Carcinoma, V1.2024 – April 9, 2024. © 2024 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.
3. Ascites SR, Katz J. Portal Hypertension Imaging: Practice Essentials, Radiography, Computed Tomography. Published June 9, 2017.
4. Khanna R, Sarin SK. Non-cirrhotic portal hypertension – Diagnosis and management. *Journal of Hepatology*. 2014;60(2):421-441.
5. Marrero JA, Kulik LM, Sirlin CB, et al. Diagnosis, Staging, and Management of Hepatocellular Carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases. *Hepatology*. 2018;68(2):723-750. doi:10.1002/hep.29913.
6. Diamond T, Ovchinsky N. Fontan-associated liver disease: Monitoring progression of liver fibrosis. *Clinical Liver Disease*. 2018;11(1):1-5. doi:10.1002/cld.681.
7. Daniels CJ, Bradley EA, Landzberg MJ, et al. Fontan-Associated Liver Disease. *Journal of the American College of Cardiology*. 2017;70(25):3173-3194. doi:10.1016/j.jacc.2017.10.045.
8. Munsterman ID, Duijnhouwer AL, Kendall TJ, et al. The clinical spectrum of Fontan-associated liver disease: results from a prospective multimodality screening cohort. *European Heart Journal*. 2018;40(13):1057-1068. doi:10.1093/eurheartj/ehy620.
9. Lindor KD, Bowlus CL, Boyer J, Levy C, Mayo M. Primary Biliary Cholangitis: 2018 Practice Guidance from the American Association for the Study of Liver Diseases. *Hepatology*. June 2018. doi:10.1002/hep.30145.
10. Primary Biliary Cirrhosis and Primary Sclerosing Cholangitis: a Review Featuring a Womens Health Perspective. *Journal of Clinical and Translational Hepatology*. 2014;2(4). doi:10.14218/jcth.2014.00024.
11. European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. *J Hepatol*. 2010;53(3):397-417. doi:10.1016/j.jhep.2010.05.004.
12. Aithal GP, Palaniyappan N, China L, et. al. Guidelines on the management of ascites in cirrhosis. *Gut*. 2020;Epub ahead of print;1-21. doi:10.1136/gutjnl-2020-321790.
13. Oey RC, van Buuren HR, de Man RA. The diagnostic work-up in patients with ascites: current guidelines and future prospects. *Neth J Med*. 2016;74(8):330-335.
14. Emamaullee J, Zaidi AN, Schiano T, et. al. Fontan-associated liver disease. Screening, management and transplant considerations. *Circulation*. 2020;142:519-604.
15. Biggins SW, Anglei P, Garcia-Tsao G, et. al. Diagnosis, evaluation, and management of ascites, spontaneous bacterial peritonitis and hepatorenal syndrome: 2021 practice guidance by the American Association for the Study of Liver Diseases. *Hepatology*. 2021;74(2):1014-1048.
16. Hemgenix. Package insert. CSL Behring LLC; 2022. <https://www.fda.gov/media/163467/download>.
17. Chavhan GB, Yoo S, Lam CZ, Khanna G. Abdominal imaging of children and young adults with Fontan circulation: pathophysiology and surveillance. *American Journal of Roentgenology*. 2021;217(1):207-217. doi:10.2214/AJR.20.23404.
18. National Bleeding Disorders Foundation Medical and Scientific Advisory Council. MASAC recommendations on screening for development of hepatocellular cancer in persons with hepatitis B and C. National Bleeding Disorders Foundation (New York, NY). Available at: https://www.bleeding.org/sites/default/files/document/files/270_HBCHVC.pdf.
19. Singal AG, Llovet JM, Yarchoan M, et al. AASLD practice guidance on prevention, diagnosis, and treatment of hepatocellular carcinoma. *Hepatology*. 2023;78:1922-1965. doi:10.1097/HEP.0000000000000466.

20. Conangla-Planes M, et al. Imaging diagnosis of portal hypertension. *Radiologia (Engl Ed)*. 2018;60(4):290-300.
21. Kaplan DE, Ripoll C, Thiele M, et al. AASLD practice guidance on risk stratification and management of portal hypertension and varices in cirrhosis. *Hepatology*. 2024;79(5):1180-1211. doi:10.1097/HEP.0000000000000647.
22. deFranchis R, Bosch J, Garcia-Tsao G, Reiberger T, Ripoll C.. Baveno VII – renewing consensus in portal hypertension. *J Hepatol*. 2022;76(4):959-974. doi:10.1016/j.jhep.2021.12.022.
23. Berzigotti A, et al. Noninvasive diagnostic and prognostic evaluation of liver cirrhosis and portal hypertension. *Disease Markers*. 2011;3:129-138.
24. Zhang B, Yang B, Tang Z. Randomized controlled trial of screening for hepatocellular carcinoma. *J Cancer Res Clin Oncol*. 2004;130(7):417-22. doi:10.1007/s00432-004-0552-0.
25. Kim H, An J, Park J, et al. MRI is cost effective for HCC surveillance in high-risk patients with cirrhosis. *Hepatology*. 2019;69:1599-1613.
26. Gupta P, Soundararajan R, Patel A, Kumar-M P, Sharma V, Kalra N. Abbreviated MRI for HCC screening: a systematic review and meta-analysis. *J Hepatol*. 2021;75:108-119.
27. Kaplan DE, Ripoll C, Thiele M, et al. AASLD Practice Guidance on risk stratification and management of portal hypertension and varices in cirrhosis. *Hepatology*. 2024;79(5):1180-1211. doi:10.1097/HEP.0000000000000647
28. Sterling RK, Duarte-Rojo A, Patel K, et al. AASLD Practice Guideline on imaging-based noninvasive liver disease assessment of hepatic fibrosis and steatosis. *Hepatology*. 2025;81(2):672-724. doi:10.1097/HEP.0000000000000843
29. Lin HH, Peng YJ, Chang CF, et al. Heterogenous liver parenchymal enhancement in CT is a favorable prognosis of HCC after hepatic resection. *Am J Cancer Res*. 2024;14(6):2984-2993. Published 2024 Jun 15. doi:10.62347/MYNS2426

MR Cholangiopancreatography (MRCP) (AB-27)

Guideline	Page
MRCP (AB-27.1).....	185
References (AB-27).....	187

MRCP (AB-27.1)

AB.MR.0027.1.A

v1.0.2026

- MRCP (Magnetic Resonance Cholangio Pancreatography) is a non-invasive imaging procedure, which is used to visualize the biliary and pancreatic ductal system. It is used most often in the following circumstances:
 - Suspected gallstone pancreatitis (See: **Pancreatitis (AB-33)**)
 - Suspected biliary pain (See: **Right Upper Quadrant and Epigastric Pain (AB-2.3)**)
 - Pancreatic cyst and pseudocyst evaluation (See: **Pancreatic Lesion (AB-31)**, and **Pancreatitis (AB-33)**)
 - Choledochal cyst surveillance (See: **Biliary Disease PEDAB-16.2**)
 - Evaluation of abnormal liver chemistries (See: **Abnormal Liver Chemistries (AB-30.1)**)
 - Evaluation of the pancreas secondary to abdominal trauma with suspected duct injury or pseudocyst
 - Recurrent pancreatitis of unknown etiology (See: **Pancreatitis (AB-33)**)
 - Evaluation and follow-up of Primary Sclerosing Cholangitis (See: **Primary Sclerosing Cholangitis (PSC) (AB-23.4)**)
 - Evaluation of jaundice (See: **Abnormal Liver Chemistries (AB-30.1)**)
 - Evaluation of congenital anomalies of the cystic and hepatic ducts
 - Post-surgical biliary anatomy and complications (See: **Liver Transplant, Post-Transplant Imaging (AB-42.3)**)
 - For further evaluation of ultrasound or CT findings of abnormally dilated biliary duct, dilated pancreatic duct, or enlargement or fullness of the pancreas.
- Code assignment for MRCP
 - In general, there is no specific CPT code to describe MRCP. To report an MRCP, one of the MRI Abdomen codes should be selected, depending on contrast needs (CPT® 74181, CPT® 74182, or CPT® 74183). There is also a level II HCPCS code for MCRP, S8037. Simultaneous billing of any of these codes is redundant and unnecessary.
 - Reporting or billing a *second* MRI code to represent the “MRCP portion” of the study is not supported. When this occurs, it is usually seen as two simultaneous MRI requests, an MRI Abdomen without and with contrast (CPT® 74183) AND an additional MRI Abdomen without contrast (CPT® 74181). This second MRI code, as noted, is not supported. Both the primary MRI Abdomen AND the MRCP portion of the study are covered by the single MRI Abdomen code (CPT® 74183).

- Requests for 3D rendering (either CPT[®] 76376 or CPT[®] 76377) are approvable, if requested, in addition to the primary MRI Abdomen code (CPT[®] 74181, CPT[®] 74182, or CPT[®] 74183).

Evidence Discussion

Magnetic Resonance Cholangiopancreatography (MRCP) is the preferred imaging modality for assessing the biliary and pancreatic systems, offering soft tissue contrast resolution without ionizing radiation exposure. Literature highlights MRCP's high sensitivity and specificity in detecting various hepatobiliary pathologies, including choledocholithiasis, cholangitis, pancreatitis and pancreatic neoplasms. Moreover, MRCP provides detailed visualization of the pancreatic duct and biliary tree, facilitating accurate diagnosis and surgical planning. While ERCP is the gold standard for visualization of pancreaticobiliary ducts and provides opportunity for therapeutic intervention, MRCP is a non-invasive method that has gained wide acceptance for diagnostic evaluation.^{1,2,4}

Limitations around MRCP include its slower acquisition time with associated higher sensitivity to motion artifact, potential need for sedation, contraindications related to ferrous magnetic implants or foreign bodies, and relatively higher cost compared to alternate options, such as ultrasound or CT. Accessibility could also be an issue, potentially leading to diagnostic delays in some healthcare settings. Safety concerns mainly revolve around gadolinium-based contrast agents, particularly in individuals with compromised renal function.^{1,2,4}

References (AB-27)

v1.0.2026

1. Faerber EN, Benator RM, Browne LP, et al. American College of Radiology. ACR practice guideline for the performance of magnetic resonance imaging (MRI) of the abdomen. Reston (VA): American College of Radiology (ACR); 2010 (revised 2015).
2. Kaltenthaler EC, Walters SJ, Chilcott J, et al. MRCP compared to diagnostic ERCP for diagnosis when biliary obstruction is suspected: a systematic review. *BMC Medical Imaging*. 2006;6(1).
3. Griffin N, Charles-Edwards G, Grant LA. Magnetic resonance cholangiopancreatography: the ABC of MRCP. *Insights into Imaging*. 2011;3(1):11-21. doi:10.1007/s13244-011-0129-9.
4. McDonald RJ, McDonald JS, Kallmes DF, et al. Intracranial gadolinium deposition after contrast-enhanced MR imaging. *Radiology*. 2015;275(3):772-82.

Gallbladder (AB-28)

Guideline	Page
Gallbladder (AB-28.1).....	189
References (AB-28).....	191

Gallbladder (AB-28.1)

AB.GP.0028.1.A

v1.0.2026

- Findings on ultrasound or EUS suspicious for malignancy:
 - CT Abdomen with or without and with contrast (CPT[®] 74160 or CPT[®] 74170)
- Findings on ultrasound inconclusive for adenomyomatosis:
 - Contrast-Enhanced US (CEUS, CPT[®] 76978, CPT[®] 76979)
 - If US and CEUS are inconclusive for adenomyomatosis:
 - MRI Abdomen without and with contrast (CPT[®] 74183)
- For confirmed gallbladder malignancy:
 - See **Gallbladder and Biliary Tumors - Initial Work-up/Staging (ONC-14.6)** in the Oncology Imaging Guidelines

Gallbladder Polyps

- Individuals at increased risk for gallbladder malignancy (if surgery not chosen):
 - Age >50
 - Primary Sclerosing Cholangitis
 - Indian ethnicity
 - Sessile polyp or gallbladder wall thickening >4mm
- Increased risk for gallbladder malignancy:
 - Polyp <6 mm
 - Ultrasound at 6 months, then yearly for 5 years
 - Polyp 6-9 mm (If cholecystectomy is not chosen)
 - Ultrasound at 6 months, then yearly for 5 years
- No increased risk for gallbladder malignancy:
 - Polyp <6 mm
 - Ultrasound at 1, 3, and 5 years
 - Polyp 6-9 mm
 - Ultrasound at 6 months, and then yearly for 5 years
- Gallbladder polyp ≥10 mm:
 - Surgery recommended. If surgery not performed, follow guidelines for increased risk of gallbladder malignancy as noted above.
- Alternative Imaging:
 - Endoscopic ultrasound (EUS) may provide additional information in the diagnosis of gallbladder polyps. There is insufficient data that advanced imaging (CT or MRI) should be used ahead of conventional ultrasound in the investigation of gallbladder polyps.

Evidence Discussion

Transabdominal ultrasound is the preferred modality for surveillance of polyps, aiming for stability at the 5-year mark as an endpoint. There is insufficient data that advanced imaging (CT or MRI) should be used ahead of conventional ultrasound in the investigation of gallbladder polyps.¹

Cholecystectomy is recommended for symptomatic individuals, lesions that increase by more than 2 mm in size, and polypoid lesions in individuals who are considered high risk.⁸

There is no role for CT, MRI, or endoscopic ultrasound in the surveillance of polypoid lesions of the gallbladder. However, advanced imaging is useful in evaluation of ultrasound findings that are suspicious for malignancy. CT can help to demonstrate any bile duct dilation as well as assist in staging, planning, and management of any found malignancy.⁴

Ultrasound is also the preferred modality for gallbladder adenomyomatosis. Bonatti, et al. state "the use of high-frequency probes and a precise focal depth adjustment enable correct identification and characterization of GA in the majority of cases" (2017). MRI is reserved only for instances of suspected gallbladder adenomyomatosis when ultrasound techniques are inconclusive.⁵

References (AB-28)

v1.0.2026

1. Wiles R, Thoeni RF, Barbu ST, et al. Management and follow-up of gallbladder polyps. *European Radiology*. 2017;27(9):3856-3866. doi:10.1007/s00330-017-4742-y.
2. Andrén-Sandberg Å. Diagnosis and Management of Gallbladder Polyps. *North American Journal of Medical Sciences*. 2012;4(5):203. doi:10.4103/1947-2714.95897.
3. McCain RS, Diamond A, Jones C, Coleman HG. Current practices and future prospects for the management of gallbladder polyps: A topical review. *World Journal of Gastroenterology*. 2018;24(26):2844-2852. doi:10.3748/wjg.v24.i26.2844.
4. Anderson MA, Appalaneni V, Ben-Menachem T, et al. The role of endoscopy in the evaluation and treatment of patients with biliary neoplasia. *Gastrointestinal Endoscopy*. 2013;77(2):167-174. doi:10.1016/j.gie.2012.09.029.
5. Bonatti M, Vezzali N, Lombardo F, et al. Gallbladder adenomyomatosis: imaging findings, tricks and pitfalls. *Insights Imaging*. 2017;8(2):243-253. doi:10.1007/s13244-017-0544-7.
6. Golse N, Lewin M, Rode A, Sebah M, Mabrut J-Y. Gallbladder adenomyomatosis: diagnosis and management. *J Visc Surg*. 2017;154(5):345-353. doi:10.1016/j.jviscsurg.2017.06.004.
7. Stringer M, Ceylan H, Ward K, Wyatt J. Gallbladder polyps in children—classification and management. *J Pediatr Surg*. 2003;38(11):1680-4.
8. Foley KG, Lahaye MJ, Thoeni RF, et al. Management and follow-up of gallbladder polyps: updated joint guidelines between the ESGAR, EAES, EFISDS and ESGE. *Eur Radiol*. 2022;32(5):3358-3368. doi:10.1007/s00330-021-08384-w

Liver Lesion Characterization (AB-29)

Guideline	Page
Liver Lesion Characterization (AB-29.1).....	193
Fatty Liver (Metabolic Associated Steatotic Liver Disease (MASLD), formerly known as NAFLD) (AB-29.2).....	197
Polycystic Liver Disease (AB-29.3).....	199
Isolated or Incidental Hepatomegaly (AB-29.4).....	200
References (AB-29).....	202

Liver Lesion Characterization (AB-29.1)

AB.LL.0029.1.C

v1.0.2026

Note:

Advanced imaging approvals in this section refers to MRI Abdomen without and with contrast (CPT® 74183), CT Abdomen with contrast (CPT® 74160), CT Abdomen without and with contrast (CPT® 74170) and Contrast-Enhanced Ultrasound (CPT® 76978-initial lesion, CPT® 76979-additional lesions). In the following section, if only CT Abdomen with contrast (CPT® 74160) is noted as the appropriate study, it is because the American College of Radiology has determined that a prior without contrast study does not provide any added benefit. It should also be noted that a standard "triple-phase CT" liver does not involve a prior without contrast study (See: CT Imaging (AB-1.2))

Indeterminate Liver Lesions

- Indeterminate liver lesion discovered on US:
 - Indeterminate Liver Lesion ≥ 1 cm on initial imaging
 - No suspicion or evidence of extrahepatic malignancy or underlying liver disease:
 - MRI Abdomen without and with contrast (CPT® 74183) or CT Abdomen with contrast (CPT® 74160) or Contrast-Enhanced US (CEUS, CPT® 76978, CPT® 76979)
 - Known history of extrahepatic malignancy:
 - MRI Abdomen without and with contrast (CPT® 74183) or CT Abdomen with contrast or without and with contrast (CPT® 74160 or CPT® 74170)
 - Known history of chronic liver disease:
 - See: **Chronic Liver Disease, Cirrhosis, and Screening for HCC (AB-26.1)**
 - Indeterminate Liver Lesion < 1 cm on initial imaging
 - Known underlying chronic liver disease:
 - See: **Chronic Liver Disease, Cirrhosis, and Screening for HCC (AB-26.1)**
 - Known history of an extrahepatic malignancy:
 - MRI Abdomen without and with contrast (CPT® 74183) is the preferred study.
 - Contrast-Enhanced US (CPT® 76978, CPT® 76979) is appropriate.
- Indeterminate liver lesion discovered on non-contrast CT or non-contrast MRI
 - Liver lesion on initial imaging:
 - No suspicion or evidence of extrahepatic malignancy or underlying liver disease:
 - Multiphase CT Abdomen with contrast (CPT® 74160), MRI Abdomen without and with contrast (CPT® 74183), or CEUS (CPT® 76978 and/or CPT® 76979)

- Known history of extrahepatic malignancy:
 - MRI Abdomen without and with contrast (CPT® 74183), CT Abdomen with contrast or without and with contrast (CPT® 74160 or CPT® 74170), or CEUS (CPT® 76978 or CPT® 76979)
- Known chronic liver disease:
 - See: **Chronic Liver Disease, Cirrhosis, and Screening for HCC (AB-26.1)**
- Additional scenarios and follow-up imaging for an indeterminate lesion in an individual based on risk factors:
 - Low risk individuals defined as:
 - No known primary malignancy
 - No hepatic dysfunction (abnormal liver tests)
 - No underlying chronic liver disease
 - No history of alcoholism, sclerosing cholangitis, choledochal cysts, hemochromatosis, or anabolic steroid use
 - High risk individuals would have ONE or MORE of the above conditions
 - Indeterminate lesion <1cm on US, CT, or MRI, **low-risk** individual and no suspicious imaging features noted on the study
 - No further imaging
 - Indeterminate lesion <1cm in **high-risk individuals** on US, CT, or unenhanced MRI not specifically dealt with in the above guidelines:
 - MRI Abdomen without and with contrast (CPT® 74183)
 - If, after MRI, the lesion remains indeterminate or not fully characterized
 - See: **Liver Metastases (ONC-31.2)** or malignancy-specific guidelines in the Oncology Imaging Guidelines.
 - If biopsy cannot be performed, follow-up MRI can be obtained in 3-6 months. Additional imaging in this setting can be considered on an individual basis. This timeframe would also apply if the lesion is indeterminate and an MRI with Eovist is requested for further evaluation in this setting.
 - Most lesions ≥1cm can be categorized by MRI or histology. For lesions which have been categorized, regardless of size, see below.
- **Focal Liver Lesions**
- For the imaging of specific focal liver lesions:
 - Suspected hepatic adenoma:
 - MRI is considered the best technique for characterization. Follow-up imaging can be CT Abdomen (CPT® 74160 or CPT® 74170) or MRI Abdomen (CPT® 74183) every 6 months for 2 years, and then annually, to establish any growth patterns and assess for malignant transformation.
 - Hepatic Hemangioma (if not completely characterized on initial CT without a liver protocol):

- Multiphase CT Abdomen (CPT® 74160 or CPT® 74170) or MRI Abdomen (CPT® 74183)
- Follow-up imaging is medically necessary as follows:
 - In individuals with cirrhosis or chronic hepatitis B, continued imaging with multiphase CT Abdomen (CPT® 74160 or CPT® 74170) or MRI Abdomen (CPT® 74183) every 3-6 months for one year.
 - For continued HCC surveillance after one year, see also: **Chronic Liver Disease, Cirrhosis and Screening for HCC (AB-26.1)**
 - Giant hemangiomas (>4cm) can be followed by limited abdominal US in 6-12 months. If no change in size, no further follow-up is indicated, unless it becomes symptomatic.
 - See below for pre-operative considerations
- Focal Nodular Hyperplasia (FNH):
 - MRI Abdomen (CPT® 74183) or CT Abdomen (CPT® 74160 or CPT® 74170) to confirm a diagnosis of FNH. The use of Eovist contrast is often diagnostic in differentiating FNH from other lesions seen on MRI or CT.
 - Additional follow-up is annual US for 2 to 3 years in women diagnosed with FNH who are continuing to use oral contraceptives. Follow-up with CT (CPT® 74160 or CPT® 74170) or MRI (CPT® 74183) can be done if the lesion is not adequately visualized on US.
- Hepatic cysts:
 - Asymptomatic, simple cysts do not require additional follow-up.
 - For complicated cysts (US shows internal septations, fenestrations, calcifications, irregular walls, as well as the presence of daughter cysts):
 - CT Abdomen (CPT® 74160 or CPT® 74170) or MRI Abdomen (CPT® 74183) can be performed
- **Additional indications for advanced imaging (MRI Abdomen or CT Abdomen):**
 - If documented that a percutaneous liver biopsy is to be considered if imaging is atypical or inconclusive.
 - Fatty liver (hepatic steatosis) on US with a focal liver lesion.
 - **If there is a technical limitation to US (e.g. marked heterogeneity, or other specifically noted technical limitations of US such as obscuration by intestinal gas, chest wall deformity, etc.)
 - For suspected liver metastases, see: **Liver Metastases (ONC-31.2)** in the Oncology Imaging Guidelines
- Preoperative studies for individuals with large hemangiomas or adenomas considered for resection:
 - MRA Abdomen (CPT® 74185) or CTA Abdomen (CPT® 74175) can be considered
- For Indeterminate Lesions ≥1cm in categories for which defined guidelines do not exist (i.e., underlying chronic liver disease, **Chronic Liver Disease, Cirrhosis,**

and Screening for HCC (AB-26.1), underlying malignancy, **Liver Metastases (ONC-31.2)** or the specific malignancy in the Oncology Imaging Guidelines, hepatic adenoma, etc.) a biopsy should be considered when the findings from advanced imaging are inconclusive. In clinical situations when a biopsy cannot be performed (such as a medical contraindication or a liver transplant candidate due to the risk of needle-tract seeding), or is inconclusive, a short-term surveillance MRI can be performed in 3-4 months to monitor lesion stability.

- This can be repeated every 6 months, as necessary in this scenario. This timeframe would also apply if an MRI with Eovist is requested for short-term follow-up of an indeterminate lesion imaged on MRI Abdomen without and with contrast performed with other contrast, such as gadolinium. An exception would be if the differential is between FNH vs. hepatic adenoma or other benign lesions. FNH follow-up is yearly, and hepatic adenoma would require a 6 month follow-up study; if the differential of the lesion is between FNH and hepatic adenoma, then the follow-up study should be 6 months.

Evidence Discussion

For further characterization of a liver lesion seen on other imaging, CT offers high spatial resolution and rapid image acquisition, making it suitable for initial characterization of liver lesions. CT can be highly accurate in establishing whether or not a liver lesion is benign.^{1,2} CT Abdomen is generally not the appropriate study in liver lesions < 1 cm with a known history of an extrahepatic malignancy due to the resolution of CT does not allow for definitive characterization of lesions <1cm.

MRI provides superior soft tissue contrast and multi-parametric capabilities, facilitating further tissue characterization when needed (particularly small lesions). Nonetheless, the use of gadolinium-based contrast agents in MRI poses safety concerns, including the risk of nephrogenic systemic fibrosis (NSF) in individuals with impaired renal function. For individuals with a history of malignancy outside the liver, MRI is more accurate at differentiating between benign and malignant lesions. Thus, CT is not recommended over MRI in this scenario.^{1,2}

Fatty Liver (Metabolic Associated Steatotic Liver Disease (MASLD), formerly known as NAFLD) (AB-29.2)

AB.LL.0029.2.A

v1.0.2026

- Fatty liver (hepatic steatosis) incidentally discovered on imaging (US/CT/MRI) or suspected:
 - Magnetic Resonance Elastography (MRE) (CPT[®] 76391) may be medically necessary if criteria are met, see: **Liver Elastography (AB-45)**
 - Magnetic Resonance-Protein Density Fat Fraction (MRI-PDFF, usually requested as CPT[®] 74181 or 74183), MR Spectroscopy (MR-S, CPT[®] 76390), and the multiparametric MRI referred to as Liver Multiscan (LMS, Category III CPT[®] code 0648T or 0649T) for evaluation of fatty liver disease:
 - With regards to the above procedures, their main current utility is in assessing response to therapy in clinical trials. Their role in clinical practice, or with what frequency one would image, has not been defined. In view of this, they are experimental and investigational at this time.
 - HCC Screening for Fatty Liver with cirrhosis or advanced fibrosis:
 - See: **Chronic Liver Disease, Cirrhosis, and Screening for HCC (AB-26.1)**
 - MRI or CT for the further evaluation of incidentally discovered fatty liver on US, in the absence of a specific finding needing further characterization such as a nodule, is generally not medically necessary. See: **Liver Lesion Characterization and Additional Indications for Advanced Imaging (AB-29.1)**. In addition, the finding of fatty liver alone on CT with contrast does not require MRI for confirmation.
 - Requests for imaging studies to screen individuals at high-risk for MASLD (formerly known as NAFLD) (e.g., diabetes or obesity) or for screening family members of individuals with MASLD is not approvable at this time.

Evidence Discussion

Fatty liver is often detected incidentally by ultrasound, CT, or MRI performed for other indications. Fat detected in the liver may have many causes including medications, starvation, excessive alcohol intake, other chronic medical illnesses, and metabolic syndrome. Non-Alcoholic Fatty Liver Disease (NAFLD), now known as Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), is the most common cause of steatotic (fatty) liver. NAFLD (used throughout henceforth) can often lead to serious liver injury (non-alcoholic steatohepatitis: NASH) and complications of cirrhosis. Therefore,

monitoring using additional imaging modalities may be medically necessary, in addition to other non-invasive tests.³²

For those individuals where fatty liver is incidentally discovered on imaging (US/CT/MRI) or in conditions where NAFLD is suspected, Magnetic Resonance Elastography (MRE) may be medically necessary.³²

Other procedures, such as Magnetic Resonance-Protein Density Fat Fraction, MR Spectroscopy, and the multiparametric MRI referred to as Liver Multiscan may be ordered for evaluation of fatty liver disease but their main current utility is in assessing response to therapy in clinical trials and are considered investigational.³²

Requests for imaging studies to screen individuals at high-risk for NAFLD (e.g., diabetes or obesity) or for screening family members of individuals with NAFLD is not medically necessary at this time.^{3, 32}

Polycystic Liver Disease (AB-29.3)

AB.LL.0029.3.A

v1.0.2026

- Polycystic Liver Disease
 - Defined as >20 cysts, or the presence of cysts occupying one-half the volume of the hepatic parenchyma.
 - Most commonly seen as an extra-renal manifestation of Autosomal Dominant Polycystic Kidney Disease, though may occur as Autosomal Dominant Polycystic Liver Disease.
 - Imaging:
 - For prognostication purposes MRI Abdomen (CPT[®] 74183) or CT Abdomen (CPT[®] 74160 or CPT[®] 74170) can be performed initially to assess liver volume.
 - Surveillance imaging of asymptomatic individuals is not medically necessary.
 - Suspected complications such as cyst rupture or hemorrhage (manifested by acute pain in the upper abdomen):
 - MRI Abdomen (CPT[®] 74183) or CT Abdomen (CPT[®] 74160 or CPT[®] 74170)

Evidence Discussion

Ultrasonography is the first step in diagnosing polycystic liver disease (PLD). Abdominal ultrasound to screen for PLD should be offered to all individuals diagnosed with autosomal dominant polycystic kidney disease (ADPKD). Imaging follow up is not routinely medically necessary in asymptomatic individuals. CT Abdomen or MRI Abdomen may be medically necessary in symptomatic individuals to assess the extent of PLD/cyst burden and to assess the liver volume. MRI or CT can be used in PLD to evaluate the distribution of cysts within the liver parenchyma and the relation to hepatic vasculature. Ultrasound or MRI Abdomen may medically necessary to diagnose cyst hemorrhage, when suspected. CT Abdomen is not medically necessary to diagnose cyst hemorrhage. CT may detect gas or calcification but is less accurate for assessing cyst contents. There is no need to screen family members of individuals with PLD for the presence of hepatic cysts unless symptoms are present. Screening for intracranial aneurysms is not medically necessary for individuals with PCLD. Routine post treatment imaging is not medically necessary.³³⁻³⁸

Isolated or Incidental Hepatomegaly (AB-29.4)

AB.LL.0029.4.A

v1.0.2026

- Initial imaging of hepatomegaly discovered or suspected on physical examination:
 - US Abdomen (CPT[®] 76700 or CPT[®] 76705) and Duplex (CPT[®] 93975 or CPT[®] 93976)
- Further evaluation of abnormalities on initial ultrasound that require further characterization:
 - Refer to specific guidelines for the abnormality detected on US
 - Fatty liver (liver steatosis), see: **Fatty Liver (Metabolic Associated Steatotic Liver Disease (MASLD), formerly known as NAFLD) (AB-29.2)**
 - Hepatic lesion, see: **Liver Lesion Characterization (AB-29.1)**
- Hepatomegaly discovered on ultrasound and no indeterminate abnormalities:
 - Medical workup, including lab studies such as liver tests, and history and physical should be performed to assess for suspected underlying disease (e.g. infiltrative disease such as amyloid, lymphoma, etc.)
 - Lab abnormalities and/or symptoms of a specific disease process should follow imaging studies outlined in the guideline for that disease process.
 - Advanced imaging in the absence of symptoms or lab abnormalities indicative of an underlying disorder is not medically necessary.

Background and Supporting Information

As noted by the AASLD "...imaging tests, such as ultrasound, computed tomography (CT), and MR, do not reliably reflect the spectrum of liver histology in individuals with NAFLD." In addition, "MR imaging, either by spectroscopy or by proton density fat fraction is an excellent noninvasive modality for quantifying hepatic fat and is being widely used in NAFLD clinical trials.....However, the utility of noninvasively quantifying HS (hepatic steatosis) in individuals with NAFLD in routine clinical care is limited."³

Evidence Discussion

Hepatomegaly (enlarged liver) can be detected by physical exam and imaging studies, such as ultrasound, CT, MRI and nuclear medicine studies. An enlarged or palpable liver does not always indicate primary liver disease, so advanced imaging should be directed by history, other physical findings and laboratory results.^{1,3,14,21}

An enlarged liver can be caused by^{1,3,14,21}:

- Primary liver disease (hepatitis, alcoholic liver disease, NAFLD (non-alcoholic fatty liver disease), other causes of liver inflammation)
- Metastatic or primary liver tumors
- Infiltrative disease (such as amyloidosis, infiltrative lymphoma)
- Impaired venous outflow (such as right heart failure, Budd-Chiari syndrome)
- Storage disorders (such as Gaucher Disease, Alpha-1 antitrypsin deficiency)
- Polycystic liver disease
- Other less common causes

Initial imaging studies should be chosen based on history, physical exam, laboratory studies and prior imaging studies. Usually, ultrasound of the abdomen and/or duplex scan would be the initial tests. Advanced imaging, such as CT or MRI are likely to be considered medically necessary based on findings based on specific guidelines based on the abnormality detected on ultrasound.^{1,3,14,21}

References (AB-29)

v1.0.2026

1. Lalani T, Rosen MP, Blake MA, Baker ME, et al. Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® liver lesion -- initial characterization. American College of Radiology (ACR), 2014.
2. Gore RM, Pickhardt PJ, Mortelet KJ, et al. Management of Incidental Liver Lesions on CT: A White Paper of the ACR Incidental Findings Committee. *Journal of the American College of Radiology*. 2017;14(11):1429-1437. doi:10.1016/j.jacr.2017.07.018.
3. Chalasani N, Younossi Z, Lavine JE, et al. The diagnosis and management of nonalcoholic fatty liver disease: Practice guidance from the American Association for the Study of Liver Diseases. *Hepatology*. 2017;67(1):328-357. doi:10.1002/hep.29367.
4. Heimbach JK, Kulik LM, Finn RS, et al. AASLD guidelines for the treatment of hepatocellular carcinoma. *Hepatology*. 2017;67(1):358-380. doi:10.1002/hep.29086.
5. Albrecht T. Dynamic Vascular Pattern of Focal Liver Lesions with Contrast-Enhanced Ultrasound: Latest Results with SonoVue. *Contrast-Enhanced Ultrasound in Clinical Practice*:1-22. doi:10.1007/88-470-0357-1_1.
6. Nolsøe CP, Lorentzen T. International guidelines for contrast-enhanced ultrasonography: ultrasound imaging in the new millennium. *Ultrasonography*. 2016;35(2):89-103. doi:10.14366/usg.15057.
7. Greenbaum LD. Foreword to Guidelines and Good Clinical Practice Recommendations for Contrast Enhanced Ultrasound (CEUS) in the Liver – Update 2012. *Ultrasound in Medicine & Biology*. 2013;39(2):186. doi:10.1016/j.ultrasmedbio.2012.09.021.
8. Chalasani N, Younossi Z, Lavine JE, et al. The Diagnosis and Management of Non-alcoholic Fatty Liver Disease: Practice Guideline by the American Gastroenterological Association, American Association for the Study of Liver Diseases, and American College of Gastroenterology. *Gastroenterology*. 2012;142(7):1592-1609. doi:10.1053/j.gastro.2012.04.001.
9. Chandok N. Polycystic liver disease: a clinical review. *Annals of Hepatology*. 2012;11(6):819-826. doi:10.1016/s1665-2681(19)31406-1.
10. Cnossen WR, Drenth JP. Polycystic liver disease: an overview of pathogenesis, clinical manifestations and management. *Orphanet Journal of Rare Diseases*. 2014;9(1):69. doi:10.1186/1750-1172-9-69.
11. Aerts RMV, Laarschot LFVD, Banales JM, Drenth JP. Clinical management of polycystic liver disease. *Journal of Hepatology*. 2018;68(4):827-837. doi:10.1016/j.jhep.2017.11.024.
12. Schiffman, Mitchell. Director, Liver Institute of Virginia. Assessment of Liver Masses. Presentation at 2019 American College of Gastroenterology Hepatology School and Eastern Regional Postgraduate Course. Washington, DC, June 7-9, 2019.
13. Aytaman, Ayse. Hepatocellular Carcinoma. Presentation at 2019 American College of Gastroenterology Hepatology School and Eastern Regional Postgraduate Course. Washington, DC, June 7-9, 2019.
14. Singal, Amit. Approach to Liver Lesions: Abnormal Sonogram, Please Evaluate. Medical Director, Liver Tumor Program, UT Southwestern Medical College. Presentation at 2019 American College of Gastroenterology Hepatology School and Eastern Regional Postgraduate Course. Washington, DC, June 7-9, 2019.
15. Bell, Daniel. Et. al. Hepatocellular Carcinoma *Radiopedia*
16. Marrero JA, Kulik LM, Sirlin CB, et al. Diagnosis, Staging, and Management of Hepatocellular Carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases. *Hepatology*. 2018;68(2):723-750. doi:10.1002/hep.29913.
17. Castera L, Friedrich-Rust M, Loomba R. Noninvasive Assessment of Liver Disease in Patients With Nonalcoholic Fatty Liver Disease. *Gastroenterology*. 2019;156(5). doi:10.1053/j.gastro.2018.12.036
18. Chartampilas E. Imaging of nonalcoholic fatty liver disease and its clinical utility. *Hormones*. 2018;17(1):69-81. doi:10.1007/s42000-018-0012-x
19. EASL–EASD–EASO Clinical Practice Guidelines for the management of non-alcoholic fatty liver disease. *Journal of Hepatology*. 2016;64(6):1388-1402. doi:10.1016/j.jhep.2015.11.004
20. Caussy C, Reeder SB, Sirlin CB, Loomba R. Noninvasive, Quantitative Assessment of Liver Fat by MRI-PDFF as an Endpoint in NASH Trials. *Hepatology*. 2018;68(2):763-772. doi:10.1002/hep.29797

21. American College of Radiology ACR Appropriateness Criteria® Liver Lesion-Initial Characterization Revised 2020. <https://acsearch.acr.org/docs/69472/Narrative/>.
22. National Institute for Health and Care Excellence (NICE-UK). Liver Multiscan for Liver Diagnosis. Medtech Innovation Briefing 26April2019.
23. Breiman R, Beck J, Korobkin M, et al. Volume determinations using computed tomography. *AJR Am J Roentgenol*. 1982;138:329–33.
24. McNeal G, Maynard W, Branch R, et al. Liver volume measurements and three-dimensional display from MR images. *Radiology*. 1988;169:851–4.
25. Heymsfield S, Fulenwider T, Nordlinger B, et al. Accurate measurement of liver, kidney, and spleen volume and mass by computerized axial tomography. *Ann Intern Med*. 1979;90:185–7.
26. Gosink B, Leymaster C. Ultrasonic determination of hepatomegaly. *J Clin Ultrasound*. 1981;9:37–44.
27. Kratzer W, Fritz V, Mason RA, et al. Factors affecting liver size: a sonographic survey of 2080 subjects. *J Ultrasound Med*. 2003;22:1155.
28. Kudo M. Riedel's lobe of the liver and its clinical implication. *Intern Med*. 2000;39:87.
29. Loloi J, Patel A, McDevitt P, et al. How Strongly Do Physical Examination Estimates and Ultrasonographic Measurements of Liver Size Correlate? A Prospective Study. *Am J Med*. 2019;32:103.
30. Karlo C, Reiner CS, Stolzmann P, et al. CT- and MRI-based volumetry of resected liver specimen: comparison to intraoperative volume and weight measurements and calculation of conversion factors. *Eur J Radiol*. 2010;75:e107.
31. Farraher SW, Jara H, Chang KJ, et al. Liver and spleen volumetry with quantitative MR imaging and dual-space clustering segmentation. *Radiology*. 2005;237:322.
32. Rinella ME, Neuschwander-Tetri BA, Siddiqui MS, et al. AASLD practice guidance on the clinical assessment and management of nonalcoholic fatty liver disease. *Hepatology*. 2023;77(5):1797-1835.
33. Mavilia MG, et al., Differentiating cystic liver lesions: a review of imaging modalities, diagnosis and management. *J Clin Transl Hepatol*. 2018;6(2):208-216.
34. Chandok N. Polycystic liver disease: a clinical review. *Ann Hepatol*. 2012;11(6):819–8264.
35. Gevers TJG, Drenth JPH. Diagnosis and management of polycystic liver disease. *Nat Rev Gastroenterol Hepatol*. 2013;10(2):101–108.
36. van Aerts RMM, Van de Laarschot LFM, Banales JM, Drenth JPH. Clinical management of polycystic liver disease. *J Hepatol*. 2018;68(4):827–837.
37. Drenth J, Barten T, Hartog H, et al. EASL clinical practice guidelines on management of cystic liver diseases. *J Hepatol*. 2022;77(4):1083–1108.
38. Wong MYW, McCaughan GW, Strasser SI. An update on the pathophysiology and management of polycystic liver disease. *Expert Rev Gastroenterol Hepatol*. 2017;11(6):569–581.
39. Frenette C, Mendiratta-Lala M, Salgia R, et al. ACG clinical guideline: focal liver lesions. *The American Journal of Gastroenterology*. 2024;119(7):1235-1271. doi:10.14309/ajg.0000000000002857.

Abnormal Liver Chemistries (AB-30)

Guideline	Page
Abnormal Liver Chemistries (AB-30.1).....	205
References (AB-30).....	209

Abnormal Liver Chemistries (AB-30.1)

AB.LC.0030.1.A

v1.0.2026

Elevated AST and/or ALT (>33 IU/l for males [assigned at birth], >25 IU/l for females [assigned at birth]) and other LFTs are normal or Hepatocellular pattern of elevation (AST and ALT disproportionately elevated to ALKP):

- <2X normal:
 - Repeat lab after 3 weeks and discontinuation of medications associated with elevated LFTs (such as statins, niacin, sulfa, rifampin, tetracycline, estrogen) if applicable.
 - If LFTs remain elevated: Abdominal US (CPT® 76700 or CPT® 76705)
 - Above studies do not explain the cause of the elevated transaminases AND HAV IgG, HBsAg, HBcAb, HBsAb, HCV Ab, iron panel (may include ferritin, serum iron, iron-binding capacity, or transferrin saturation) have been performed and are inconclusive:
 - CT Abdomen with contrast (CPT® 74160)
- 2 to 15X normal:
 - Abdominal US (CPT® 76700 or CPT® 76705)
 - Above studies do not explain the cause of the elevated transaminases AND HAV IgG, HBsAg, HBcAb, HBsAb, HCV Ab, iron panel (may include ferritin, serum iron, iron-binding capacity, or transferrin saturation) have been performed and are inconclusive:
 - CT Abdomen with contrast (CPT® 74160)
- >15X normal:
 - Abdominal US with Doppler (CPT® 76700 or CPT® 76705 and CPT® 93975) OR
 - CT Abdomen with contrast (CPT® 74160) OR
 - CT Abdomen and Pelvis with contrast (CPT® 74177)
 - Above studies do not explain the cause of the elevated transaminases AND HAV IgG, HBsAg, HBcAb, HBsAb, HCV Ab, iron panel (may include ferritin, serum iron, iron-binding capacity, or transferrin saturation) have been performed and are inconclusive:
 - MRI Abdomen without and with contrast (CPT® 74183) and/or MRCP (CPT® 74181)

- If the findings suggest chronic liver disease, see: **Chronic Liver Disease, Cirrhosis and Screening for HCC (AB-26.1)**
- If the findings suggest hemochromatosis, see: **Hereditary (Primary) Hemochromatosis (HH) and Other Iron Storage Disease (AB-11.2)**

Elevated alkaline phosphatase level (or GGT), and other LFTs are normal or Cholestatic pattern of elevation (ALKP elevated disproportionately to AST and ALT)

- If isolated ALKP elevation, GGT should be obtained for confirmation of hepatic etiology, prior to imaging.
- If ALKP is elevated with other LFTs, no confirmatory test is necessary.
 - Confirmed hepatic etiology of elevated ALKP:
 - Abdominal or RUQ ultrasound (CPT® 76700 or CPT® 76705)
 - Dilated biliary ducts on US:
 - MRCP
 - No dilated biliary ducts on US:
 - Anti-mitochondrial antibody (AMA) should be checked prior to advanced imaging.
 - If AMA is negative, and ALKP >2X ULN:
 - MRCP
 - If AMA is negative, and ALKP 1 to 2X ULN:
 - observe for 6 months
 - if ALKP remains elevated after 6 months: MRCP
 - CT Abdomen with contrast (CPT® 74160) if the above studies are unrevealing or individual cannot undergo MRCP.

Isolated elevated bilirubin (no other LFTs elevated)

- Elevation is unconjugated (elevated indirect bilirubin), and no other LFT elevations:
 - No advanced imaging
- Elevation is conjugated (elevated direct bilirubin)
 - RUQ ultrasound
 - Dilated biliary ducts on ultrasound:
 - MRCP
 - No dilated biliary ducts on US:

- Anti-mitochondrial antibody (AMA) should be checked prior to advanced imaging
 - AMA negative and elevation persists or is unexplained:
 - MRCP or liver biopsy
- CT Abdomen with contrast (CPT® 74160) if the above studies are unremarkable or the individual cannot undergo MRCP.

Clinical jaundice, no known predisposing condition

- Abdominal ultrasound (CPT® 76700 or CPT® 76705)
 - For further imaging, follow guideline for elevated bilirubin
- Clinical jaundice, suspected mechanical obstruction based on clinical condition or laboratory values (e.g., known choledocholithiasis, acute and chronic pancreatitis, suspected stricture from a recent invasive procedure, previous biliary surgery, suspected tumor):
 - CT Abdomen with contrast (CPT® 74160) or MRI and/or MRCP (CPT® 74183 or CPT® 74181)
- US findings suggesting mechanical biliary obstruction, non- diagnostic or technically limited US (e.g., large amounts of intestinal gas, obesity with BMI >35):
 - CT Abdomen with contrast (CPT® 74160) or MRI and/or MRCP (CPT® 74183 or CPT® 74181)

Additional considerations

- For individuals with elevated LFTs and suspicion of sclerosing cholangitis, such as those with IBD, see: **Primary Sclerosing Cholangitis (PSC) (AB-23.4)**.
- For individuals with elevated LFTs and history of underlying malignancy, please refer to the specific oncology guidelines, when appropriate.
- Requests for additional advanced imaging (CT, MRI, etc.) are based on the prior imaging results, as appropriate to the finding (for example, if a lesion is identified that needs further characterization, refer to liver lesion imaging as per **Liver Lesion Characterization (AB-29.1)**)
- For MRE indications, see: **Liver Elastography (AB-45)**

Background and Supporting Information

- The standard laboratory tests commonly referred to as “LFTs” include bilirubin, alkaline phosphatase (alkphos or ALKP), aspartate transaminase (AST), alanine transaminase (ALT), and gamma-glutamyl transferase (GGT).
- The major patterns of elevation which affect work-up are:
- Hepatocellular (AST and ALT disproportionately elevated to ALKP)

- Cholestatic (ALKP elevated disproportionately to AST and ALT)
- Mixed pattern (ALKP, AST, and ALT all elevated)
- Isolated hyperbilirubinemia (elevated bilirubin and normal ALKP, ALT and AST)
- "R" Ratio
 - "R" Ratio: The so-called "R" ratio can be used to determine whether a pattern of multiple elevated liver chemistries is predominately cholestatic or hepatocellular in origin
 - $R = (\text{ALT} / \text{Upper limit of normal (ULN)}) / (\text{ALKP} / \text{ULN ALKP})$
 - If the "R" ratio:
 - >5 = hepatocellular
 - <2 = cholestatic
 - 2-5 = mixed pattern
 - For hepatocellular, use AST or ALT elevation guidelines
 - For cholestatic, use ALKP elevation guidelines
 - Use ULN for ALT as noted above, and ULN for alkphos based on the individual lab report

Evidence Discussion

Liver blood tests look at how well the liver is functioning and can indicate whether there is any damage or inflammation inside the liver. Obtaining liver chemistries for both screening and diagnostic purposes are essential. When abnormalities are found they will frequently direct the provider to obtain further diagnostic testing including advanced imaging.^{1,11}

A liver blood test looks at the chemicals (enzymes), proteins and other substances made by the liver to assess whether levels of any of these are abnormal. The major initial tests are for alanine transaminase, aspartate transaminase, alkaline phosphatase, and gamma-glutamyl transpeptidase.^{1,11}

Repeating abnormal tests helps to confirm damage to the liver.^{1,11}

The synthetic function of the liver can be assessed by evaluating levels of albumin and vitamin-dependent clotting factors.^{1,11}

Iron storage, autoimmune, infectious, cholestatic, hepatocellular, drug induced, and other liver diseases are identified, followed, and diagnosed with the help of abnormal liver chemistries.^{1,11}

Liver chemistries are an essential part of the non-invasive diagnosis and management of liver disease.^{1,11}

References (AB-30)

v1.0.2026

1. Kwo P, et al. ACG Clinical Guideline: Evaluation of Abnormal Liver Chemistries. *Am J Gastroenterol* 2017; 112:18-35.
2. O'Shea RS, Dasarthy S, McCullough AJ. ACG practice guidelines: alcoholic liver disease. *American Journal of Gastroenterology*. 2010;105:14-32.
3. Expert Panel on Gastrointestinal Imaging, Hindman NM, Arif-Tiwari H, et al. ACR Appropriateness Criteria® Jaundice. *J Am Coll Radiol*. 2019;16(5S):S126-S140. doi:10.1016/j.jacr.2019.02.012
4. EASL Clinical Practice Guidelines: Management of cholestatic liver diseases. *Journal of Hepatology*. 2009;51(2):237-267. doi:10.1016/j.jhep.2009.04.009.
5. Fargo, MV, et.al, Evaluation of Jaundice in Adults. *Am Fam Physician*, 2017;95(3):164-68.
6. Aronsohn A, Gondal B. A Systematic Approach to Patients with Jaundice. *Seminars in Interventional Radiology*. 2016;33(04):253-258. doi:10.1055/s-0036-1592331.
7. Arif-Tiwari H, Porter KK, Kamel IR, et al. ACR Appropriateness Criteria® Abnormal Liver Function Tests. Available at <https://acsearch.acr.org/docs/3158167/Narrative>. American College of Radiology.
8. Kalas MA, Chavez L, Leon M, Taweessdt PT, Surani S. Abnormal liver enzymes: A review for clinicians. *World J Hepatol*. 2021;13(11):1688-1698. doi:10.4254/wjh.v13.i11.1688.
9. Kamaya A, Fetzer DT, Seow JH, et al. LI-RADS US Surveillance Version 2024 for Surveillance of Hepatocellular Carcinoma: An Update to the American College of Radiology US LI-RADS. *Radiology*. 2024;313(3):e240169. doi:10.1148/radiol.240169
10. Expert Panel on Gastrointestinal Imaging, Arif-Tiwari H, Porter KK, et al. ACR Appropriateness Criteria® Abnormal Liver Function Tests. *J Am Coll Radiol*. 2023;20(11S):S302-S314. doi:10.1016/j.jacr.2023.08.02
11. Guerra Ruiz AR, Crespo J, López Martínez RM, et al. Measurement and clinical usefulness of bilirubin in liver disease. *Adv Lab Med*. 2021;2(3):352-372. Published 2021 Jul 9. doi:10.1515/almed-2021-0047

Pancreatic Lesion (AB-31)

Guideline	Page
Pancreatic Cystic Lesions (AB-31.1).....	211
Incidental Pancreatic Mass or Suspected Metastatic Disease to Pancreas (AB-31.2).....	215
References (AB-31).....	216

Pancreatic Cystic Lesions (AB-31.1)

AB.PC.0031.1.A

v1.0.2026

- Pancreatic Cyst seen on Imaging-Initial Management:
 - MRI Abdomen (CPT[®] 74183) and/or MRCP are the tests of choice for initial evaluation.
 - Both MRI Abdomen and MRCP may be medically necessary, but only one CPT[®] 74183 should be used, not two.
 - CT Pancreatic protocol (CPT[®] 74160) or EUS are alternatives in individuals who are unable to undergo MRI.
 - Indeterminate cysts may benefit from a second imaging modality or EUS prior to proceeding with surveillance. MRI/MRCP can be approved to better characterize the lesion, without reference to the timeframe for follow-up imaging, if a previous US or CT Abdomen has been performed.
 - Radiographic diagnosis of a non-neoplastic cyst or classic features of a serous cystadenoma
 - No further imaging
 - If ANY of the following are present the individual should proceed to EUS + FNA and depending on findings, surgical consultation:
 - Main duct >5mm
 - Cyst ≥3cm
 - Change in main duct caliber with upstream atrophy
 - If EUS does not reveal findings of main duct involvement, patulous ampulla, cytology with high-grade dysplasia or pancreatic malignancy, or a mural nodule, then follow up MRI should be performed in 6 months.
- Pancreatic Cyst Follow up Imaging
 - If high risk features (See below High Risk Considerations and Features) are not present, then the next follow-up imaging proceeds as follows:
 - Cyst <1cm: MRI in 2 years
 - Cyst 1-<2cm: MRI in 1 year
 - Cyst 2-3cm: if cyst is not clearly an Intraductal papillary mucinous neoplasms (IPMN) or Mucinous cystic neoplasm (MCN) then proceed with EUS. If it is an IPMN or MCN, then MRI at 6-12 months.
 - If the cyst is determined to be a serous cystadenoma, then no further evaluation unless symptomatic.
- Additional Surveillance for a presumed Intraductal papillary mucinous neoplasms (IPMN) or Mucinous cystic neoplasms (MCN) (imaging from time of presentation):
 - Cyst <1cm

- MRI every 2 years for 4 years
- If stable after 4 years consider lengthening of interval imaging
- If increase in cyst size, then MRI or EUS in 6 months
- If stable, repeat again in 1 year and if stable return to MRI every 2 years
- Cyst 1-<2cm
 - MRI yearly for 3 years
 - If stable for 3 years, then change to MRI every 2 years for 4 years
 - If stable after the additional 4 years, consider lengthening of interval for surveillance
 - If increase in cyst size, repeat MRI in 6 months. If stable, repeat MRI in 1 year and if remains stable, resume original surveillance schedule.
- Cyst 2-<3cm
 - MRI every 6-12 months for 3 years
 - If stable after 3 years, change to MRI every year for 4 years
 - If remains stable, consider lengthening of surveillance interval
- Cyst ≥3cm
 - MRI alternating with EUS every 6 months for 3 years
 - If stable for 3 years, increase interval to MRI alternating with EUS yearly for 4 years
 - If remains stable, consider lengthening of surveillance interval
 - If increase in cyst size, EUS + FNA
- Additional considerations
 - Individuals with asymptomatic cysts that are diagnosed as pseudocysts on initial imaging and clinical history, or are determined to be serous cystadenomas, do not require further evaluation.
 - Individuals who are not medically fit for surgery should not undergo further surveillance of incidentally found pancreatic cysts, irrespective of size.
 - Surveillance should be discontinued if an individual is no longer a surgical candidate. However, follow-up imaging can be performed if requested for a symptomatic cyst (such as the development of jaundice secondary to cyst), in which palliative treatment might be available.
 - High-Risk Considerations and Features
 - Individuals with IPMNs or MCNs with new onset or worsening diabetes
 - Rapid increase in cyst size (>3mm/year) during surveillance may have an increased risk of malignancy and should undergo a short-interval MRI or EUS.
 - Additional high-risk features which may prompt early evaluation are:
 - jaundice secondary to the cyst
 - acute pancreatitis secondary to the cyst

- significantly elevated CA 19-9
- presence of a mural nodule or solid component either within the cyst or in the pancreatic parenchyma
- dilation of the main pancreatic duct >5mm
- focal dilation of the pancreatic duct concerning for main duct IPMN or an obstructing lesion
- IPMNs or MCNs measuring ≥3cm in diameter
- presence of high-grade dysplasia or pancreatic cancer on cytology. In this circumstance, imaging should be at the discretion of the provider.
- Post-op surveillance
 - Surgically resected serous cystadenomas, pseudocyst, or other benign cyst:
 - No additional imaging after resection
 - Surgically resected mucinous cystic neoplasms (MCNs) without an associated pancreatic malignancy (can have low, intermediate, or high-grade dysplasia):
 - No additional post-op surveillance
 - Surgically resected MCNs with invasive cancer:
 - Standard surveillance-based pancreatic cancer guidelines (See: **Pancreatic Cancer-Surveillance/Follow-up (ONC-13.5)** in the Oncology Imaging Guidelines) for 5 years. No surveillance required after 5 years.
 - Surgically resected IPMNs
 - IPMN with cancer
 - Pancreatic cancer surveillance guidelines (See: **Pancreatic Cancer-Surveillance/Follow-up (ONC-13.5)** in the Oncology Imaging Guidelines)
 - IPMN with high-grade dysplasia
 - MRI Abdomen (CPT[®] 74183) or EUS every 6 months
 - IPMN with low- or intermediate-grade dysplasia
 - MRI Abdomen (CPT[®] 74183) every 2 years
 - Surgically resected solid-pseudopapillary neoplasm with negative margins:
 - MRI Abdomen (CPT[®] 74183) yearly for 5 years
- See: **MR Cholangiopancreatography (MRCP) (AB-27)** for coding guidelines for MRCP.

Evidence Discussion

- Some pancreatic cystic lesions have malignant potential and need to be followed by either advanced imaging, endoscopic ultrasound, or both.^{1,2,6}
- Advanced imaging includes MRI, MRCP, and CT imaging as these modalities are most effective in characterizing these lesions. MRI abdomen or MRCP are the initial studies of choice. The American Gastroenterological Association states, "MRI is the preferred surveillance imaging modality over computed tomography because MRI does not expose the individual to radiation and better demonstrates the structural

relationship between the pancreatic duct and associated cyst. Also, MRI is less invasive than EUS". Thus, CT is reserved as an alternative for individuals who are unable to undergo MRI.¹

- Follow-up imaging may or may not be medically necessary based on the nature of the cystic lesion, the size, or change in size of the lesion and how rapidly the size of the lesion changes. Smaller lesions with no concerning characteristics or changes undergo less surveillance due to the small absolute risk of malignancy. Concerning features such as rapid increase in size have increased risk of malignancy and therefore undergo more frequent or longer-term surveillance intervals.^{1,2,6}

Incidental Pancreatic Mass or Suspected Metastatic Disease to Pancreas (AB-31.2)

AB.PC.0031.2.A

v1.0.2026

- For the evaluation of incidental pancreatic mass or suspected metastatic disease to the pancreas, CT Abdomen with contrast with dual phase imaging (CPT[®] 74160), or MRI Abdomen without and with contrast (CPT[®] 74183).

Evidence Discussion

A pancreatic protocol CT involves scan acquisition during a parenchymal and portal venous phase, each of which are post-contrast administration. Dual phase, MDCT (multidetector CT) scans play a critical role in diagnosing and staging pancreatic cancers. MR and EUS can be used in groups of individuals where CT scan results are inconclusive in tumor localization and/or staging, particularly in vascular involvement.^{7,8}

References (AB-31)

v1.0.2026

1. Vege SS, Ziring B, Jain R, et al. and the Clinical Guidelines Committee Guideline American Gastroenterological Association Institute guideline on the diagnosis and management of asymptomatic neoplastic pancreatic cysts. *Gastroenterol.* 2015 Apr;148(4):819-822.
2. Elta GH, Enestvedt BK, Sauer BG, Lennon AM. ACG Clinical Guideline: Diagnosis and Management of Pancreatic Cysts. *The American Journal of Gastroenterology.* 2018;113(4):464-479. doi:10.1038/ajg.2018.14.
3. Tempero MA, Malafa MP, Al-Hawary M, et al. Pancreatic Adenocarcinoma, Version 2.2021, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw.* 2021;19(4):439-457. Published 2021 Apr 1. doi:10.6004/jnccn.2021.001. Pancreatic adenocarcinoma, available at: https://www.nccn.org/professionals/physician_gls/pdf/pancreatic.pdf. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines™) for Pancreatic adenocarcinoma V 2.2021. © 2021 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines™ and illustrations herein may not be reproduced in any form for any purpose without the express written permission of the NCCN. To view the most recent and complete version of the NCCN Guidelines™, go online to NCCN.org.
4. American College of Radiology ACR Appropriateness Criteria® Staging of Pancreatic Ductal Adenocarcinoma. New 2017. <https://acsearch.acr.org/docs/3099847/Narrative/>.
5. Gijón de la Santa L, Pérez Retortillo JA, Miguel AC, Klein LM. Radiology of pancreatic neoplasms: an update. *World J Gastrointestinal Oncol.* 2014;6(9):330-343. doi:10.4251/wjgo.v6.i9.330.
6. Muthusamy VR. ASGE clinical guideline on the role of endoscopy in the diagnosis and treatment of cystic pancreatic neoplasms. *Gastrointestinal Endoscopy.* 2016;84(1):1-9.
7. McKinney M, Griffin MO, Tolat PP. Multimodality Imaging for the Staging of Pancreatic Cancer. *Surg Oncol Clin N Am.* 2021;30(4):621-637. doi:10.1016/j.soc.2021.06.006
8. Megibow AJ. Pancreatic Cysts: Radiology. *Gastrointest Endosc Clin N Am.* 2023;33(3):519-531. doi:10.1016/j.giec.2023.03.008

Pancreatic Pseudocysts (AB-32)

Guideline	Page
Pancreatic Pseudocysts (AB-32.1).....	218

Pancreatic Pseudocysts (AB-32.1)

AB.32.1.A

v1.0.2026

See: Acute Pancreatitis (AB-33.1) or Chronic Pancreatitis (AB-33.2)

Pancreatitis (AB-33)

Guideline	Page
Acute Pancreatitis (AB-33.1)	220
Chronic Pancreatitis (AB-33.2)	224
Exocrine Pancreatic Insufficiency (AB-33.3)	227
Asymptomatic Elevation of Pancreatic Enzymes (AB-33.4)	229
References (AB-33)	230

Acute Pancreatitis (AB-33.1)

AB.PX.0033.1.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- Imaging:
 - Initial imaging for suspicion of pancreatitis (typical symptoms, <48 to 72 hours, first-time presentation)
 - Abdominal ultrasound (CPT[®] 76700 or CPT[®] 76705)
 - Purpose is to establish the presence/absence of gallstones and biliary ductal dilation.
 - Doppler ultrasound (CPT[®] 93975) can be approved to assess vasculature, if requested.
 - If ultrasound or CT is performed and is nondiagnostic due to technical limitation (obesity, overlying gas, etc.):
 - MRI/MRCP (CPT[®] 74183 or CPT[®] 74181)
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177) or CT Abdomen with contrast (CPT[®] 74160) if ultrasound is nondiagnostic and MRI/MRCP cannot be performed.
 - In suspected acute biliary pancreatitis and/or cholangitis (dilated ducts or choledocholithiasis on ultrasound, elevated liver chemistries with a negative ultrasound, suspicion of cholangitis (classic triad is RUQ pain, fever, and jaundice))
 - MRI/MRCP (CPT[®] 74183 or CPT[®] 74181)
 - Initial imaging with atypical signs and symptoms when diagnoses other than pancreatitis are being considered (e.g., bowel perforation, bowel ischemia):
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177) or CT Abdomen with contrast (CPT[®] 74160)
 - MRI/MRCP* (CPT[®] 74181 or CPT[®] 74183) can be considered medically necessary for pregnant individuals (non-contrast), or those with renal insufficiency (without or without and with depending on request).
 - Follow-up imaging (late phase and thereafter):
 - Continued or worsening symptoms:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177), CT Abdomen with contrast (CPT[®] 74160) or MRI and/or MRCP (CPT[®] 74183 or CPT[®] 74181)
 - Follow-up of known pancreatic or peri-pancreatic fluid collections (including pseudocysts), to follow-up symptomatic collections, or for interventional planning:

- MRI/MRCP (CPT[®] 74183 or CPT[®] 74181) or CT Abdomen and Pelvis (CPT[®] 74177)
 - If requested, CT Abdomen with contrast (CPT[®] 74160) or Abdominal ultrasound (CPT[®] 76705 or CPT[®] 76700) can be approved.

Note:

Frequency or intervals for additional follow-up is not defined and depends on clinical circumstances, response to therapy, etc.

- If, despite initial imaging, the etiology of the pancreatitis is still in doubt:
 - MRI/MRCP (CPT[®] 74183 or CPT[®] 74181) or CT Abdomen and Pelvis with (CPT[®] 74177)
 - If requested, CT Abdomen with contrast (CPT[®] 74160) can be approved.
- Acute recurrent pancreatitis
 - Abdominal ultrasound (CPT[®] 76705 or CPT[®] 76700)
 - MRI/MRCP (CPT[®] 74183 or CPT[®] 74181)
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177)
 - See: **Chronic Pancreatitis (AB-33.2)**

Background and Supporting Information

- While MRI/MRCP will give better evaluation of the pancreatic parenchyma as well as biliary and pancreatic ducts, it does NOT provide coverage and adequate evaluation of the bowel to assess alternative diagnoses such as bowel ischemia or perforation.
- Knowledge base:
 - Acute pancreatitis (2 of 3 of the following criteria):
 - Characteristic abdominal pain (typically epigastric or left upper quadrant pain with radiation to the back, chest, or flank)
 - Amylase or lipase > 3 times the upper limit of normal
 - Radiographic evidence of pancreatitis on cross-sectional imaging
 - Early Phase takes place in the first week
 - Goals of imaging:
 - Establish the correct diagnosis or provide an alternative diagnosis
 - Establish the etiology
 - Stage the morphologic severity
 - Assess for complications in individuals who deteriorate or fail to improve
 - Late phase can last weeks to months thereafter
 - Goals of imaging:
 - Monitor established pancreatic collections
 - Delineate the presence of symptomatic and asymptomatic complications
 - Guide interventional procedures

- Etiologies of pancreatitis:
 - Gallstones and alcohol account for 75-80% of all cases
 - Hypercalcemia, hypertriglyceridemia, medications, a benign or malignant obstruction, pancreatic mass, genetic causes (hereditary pancreatitis), autoimmune pancreatitis (IgG4), infectious etiologies, ischemia secondary to vascular disease, anatomic abnormalities (e.g., pancreas divisum), physiologic abnormalities (Sphincter of Oddi dysfunction), idiopathic causes.
- Complications:
 - Early Phase
 - Generally manifests as a systemic inflammatory response
 - In the first week, imaging findings correlate poorly with clinical severity
 - Advanced imaging is most useful when performed 5-7 days after admission, when local complications have developed and pancreatic necrosis can be clearly defined
 - IEP=acute interstitial edematous pancreatitis
 - Necrotizing Pancreatitis
 - Late Phase:
 - APFC (Acute peripancreatic fluid collection) occurs during the first 4 weeks. If it does not resolve within 4 weeks, it can become organized and develop into a pseudocyst, which contains only fluid with no nonliquefied components.
 - Walled-off necrosis (sequelae of necrotizing pancreatitis): inhomogenous nonliquefied components, encapsulated with a wall.

Note:

Most cases of pancreatitis are mild. More severe cases are usually hospitalized and imaging is performed in that setting. The majority of imaging requests are for the initial evaluation of suspected pancreatitis in individuals with epigastric pain, and then the follow-up imaging of discharged individuals with respect to complications experienced during the hospitalization, to further elucidate the etiology of the pancreatitis if this was not previously established, or to evaluate continued post-discharge symptoms.

Evidence Discussion

Abdominal imaging is useful to confirm the diagnosis of acute pancreatitis (AP). As per 2024 ACG Guidelines, abdominal ultrasound should be performed as the initial imaging study in individuals with AP to evaluate for biliary pancreatitis. Advanced imaging should be reserved for individuals in whom the diagnosis is unclear. When ultrasound results are inconclusive due to overlying bowel gas or other patient factors, or when amylase and/or lipase levels remain elevated, CT or MRI should be considered as the next step. Although contrast-enhanced CT offers over 90% sensitivity and specificity in diagnosing

acute pancreatitis, its routine use is not recommended since the diagnosis is clear in many individuals who typically experience a mild, uncomplicated course.^{1-5,21}

In individuals who fail to improve after 48–72 hours, exhibiting persistent symptoms such as pain, fever, nausea/vomiting, and inability to tolerate oral feeding, imaging studies like CT or MRI/MRCP are recommended. These are used to assess local complications, including necrotizing pancreatitis or pancreatic or peri-pancreatic fluid collections.

Although MRI takes more time and can be challenging for claustrophobic individuals, it offers advantages for those with contrast allergies or renal insufficiency. Additionally, MRI can more accurately detect stones in the common bile duct (CBD) and diagnose pancreatic duct disease or follow up on symptomatic fluid collections.^{1-5,21}

Chronic Pancreatitis (AB-33.2)

AB.PX.0033.2.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- If chronic pancreatitis is suspected:
 - Initial imaging:
 - CT Abdomen with contrast or without and with contrast (CPT[®] 74160 or CPT[®] 74170) OR MRI Abdomen without and with contrast (CPT[®] 74183)
 - If diagnostic criteria are met (pancreatic calcification in combination with pancreatic atrophy and/or dilated pancreatic duct):
 - No further imaging indicated (See below regarding worsening symptoms)
 - If initial CT is inconclusive or nondiagnostic of chronic pancreatitis:
 - MRI/MRCP with secretin enhancement (CPT[®] 74183 or CPT[®] 74181), OR
 - Endoscopic ultrasound (EUS)
 - If EUS is inconclusive, pancreatic function testing and/or ERCP is medically necessary
 - If abdominal ultrasound is requested at any stage for evaluation of chronic pancreatitis, this can be approved in lieu of advanced imaging
 - If initial imaging fails to confirm chronic pancreatitis, but the clinical suspicion remains, the above testing can be repeated in 6 months.
- Known chronic pancreatitis with worsening symptoms or pain:
 - CT Abdomen with or without and with contrast (CPT[®] 74160 or CPT[®] 74170), MRI/MRCP (CPT[®] 74183 OR CPT[®] 74181) OR Abdominal ultrasound (CPT[®] 76700 or CPT[®] 76705) is medically necessary
 - Possible etiologies of worsening pain include:
 - peptic ulcer disease
 - GI cancers
 - pseudocysts
 - duodenal or common bile duct obstruction
 - pancreatic duct stone or strictures
 - inflammatory masses at the head of the pancreas
- For pre-surgical planning or post-surgical evaluation for treatment of complications of chronic pancreatitis
 - CT Abdomen with or without and with contrast (CPT[®] 74160 or CPT[®] 74170), OR MRI/MRCP (CPT[®] 74183 or CPT[®] 74181) OR Abdominal ultrasound (CPT[®] 76700 or CPT[®] 76705)
- Routine screening for pancreatic cancer in chronic pancreatitis

- Routine surveillance to monitor for the occurrence of pancreatic cancer in individuals with chronic pancreatitis is not supported at this time. For other indications for imaging in chronic pancreatitis, see the above. For pancreatic cancer screening guidelines in inherited syndromes, including hereditary pancreatitis, see: **Screening Studies for Pancreatic Cancer (ONC-13.1)** in the Oncology Imaging Guidelines.

Background and Supporting Information

- Clinical signs of chronic pancreatitis include history of alcohol use, abdominal pain, weight loss, steatorrhea, malabsorption, recurrent pancreatitis, fatty food intolerance, low fecal elastase.

Evidence Discussion

CT or MRI is used as first-line diagnostic imaging for chronic pancreatitis (CP) as they are both universally available, reproducible, and valid when compared to other imaging modalities. While ultrasound has been used for many years as a non-invasive and inexpensive method to evaluate the pancreas, there are considerable limitations that limit its diagnostic utility.^{8,13}

Due to its discrepancy in cost, availability, invasiveness, and objectivity, as well as its low specificity, endoscopic ultrasound (EUS) should be used only if the diagnosis is still in question after cross-sectional imaging is performed.^{8,13}

Individuals with early CP may have completely normal conventional MRCP/MRI studies, and only the secretin stimulation will depict the mildly abnormal pancreatic duct compliance.^{8,13}

When the diagnosis of CP cannot be made following standard cross-sectional imaging or EUS, secretin-enhanced MRCP is suggested as it allows for better visualization of the main- and side-branch ducts by stimulating release of bicarbonate from the pancreatic duct cells and allows for quantification of the degree of filling into the duodenum which may correlate with the severity of CP and also help quantify the degree of exocrine pancreatic function. It does carry a high cost, which is why it is recommended to be used only when diagnosis is not confirmed with first-line testing. However, EUS does carry poor interobserver agreement, and definitive diagnosis is felt to also require advanced radiologic imaging. It is also a more invasive procedure. For this reason, there are also practice guidelines that advocate for the use of MRI/MRCP with secretin enhancement prior to EUS.^{8,13}

While multiple other imaging modalities, such as contrast-enhanced EUS, ERCP, transcutaneous ultrasonography, and pancreatic elastography have been used to establish the diagnosis of CP, high-quality RCT evidence is not available to warrant their inclusion as first-line diagnostic tests for CP.^{8,13}

As noted in the American College of Gastroenterology Clinical Guideline for Chronic Pancreatitis, "There is a lack of evidence to suggest that performing screening examinations on individuals with CP (chronic pancreatitis) to detect malignancy is beneficial. Although the overall prevalence of pancreatic malignancy is increased in individuals with CP, there are no RCTs (randomized controlled trials), systematic reviews, or meta-analyses to support screening this individual population for pancreatic malignancy." As such, the ACG Guideline concludes "at this time there is no definitive benefit to screen individuals with CP for pancreatic ductal adenocarcinoma. This is based on the invasive and costly nature of testing, the inherent difficulty in screening given the structural changes of CP, and the inability to alter in many cases the natural history of the disease even if malignancy is detected at an early stage."¹³

Exocrine Pancreatic Insufficiency (AB-33.3)

AB.PX.0033.3.A

v1.0.2026

- The presence of any red flag findings per **General Guidelines (AB-1.0)** precludes adjudication based on any other criteria.
- Pancreatic Insufficiency
 - The initial evaluation for pancreatic insufficiency should include ONE of the following laboratory results:
 - Elevation in fecal fat
 - Fecal elastase <200 mcg/g
 - Serum trypsinogen <20ng/mL
 - CT Abdomen with (CPT[®] 74160) or without and with contrast (CPT[®] 74170) OR MRI/MRCP (CPT[®] 74183 or 74181) for the evaluation of suspected pancreatic insufficiency:
 - for suspected pancreatic insufficiency with any one of the above laboratory findings
 - For suspected pancreatic insufficiency due to known chronic pancreatitis, see: **Chronic Pancreatitis (AB-33.2)**
 - For suspected pancreatic insufficiency due to known cystic fibrosis, see: **(PEDAB-16)** and **(PEDCH-5.1)**
 - For suspected pancreatic cancer, see: **Pancreatic Cancer – Suspected/ Diagnosis (ONC-13.2)**

Background and Supporting Information

- Exocrine pancreatic insufficiency (EPI) reflects reduced pancreatic enzymes with resulting maldigestion/malabsorption. When intraduodenal levels of lipase fall below 5-10% of normal output, individuals may manifest with abdominal pain, bloating/ cramping, flatulence, and progressive steatorrhea.

Evidence Discussion

Fecal elastase is the most appropriate initial test for exocrine pancreatic insufficiency (EPI) with a level <100 ug/g of stool providing good evidence of EPI, and levels of 100-200 ug/g being indeterminate for EPI. It is an indirect measurement that is simple, noninvasive, and relatively non-expensive. While direct measurements of pancreatic secretions in to the duodenum are accurate, they are invasive, time-consuming and a more significant burden to the patient than this indirect test.²⁴

Quantitative fecal fat testing is generally not practical for routine clinical use.²⁴

While cross-sectional imaging methods such as CT and MRI/MRCP cannot be used to solely identify EPI, they play an important role in the diagnosis of both benign and malignant pancreatic disease, and can also identify gross pancreatic structural changes. Cross-sectional imaging is thus useful for diagnosing underlying pancreatic disease as well as abnormalities that may support an EPI diagnosis.²⁴

EPI develops in more than half of individuals with chronic pancreatitis, 27-62% of individuals with relapsing acute pancreatitis, 85% of individuals with cystic fibrosis, and 50-92% of individuals with unresectable pancreatic ductal adenocarcinoma. It is seen in 40-50% of individuals with resectable pancreatic ductal adenocarcinoma before treatment and 65% after treatment. It should thus be suspected in these individuals.²⁴

Asymptomatic Elevation of Pancreatic Enzymes (AB-33.4)

AB.PX.0033.4.A

v1.0.2026

- If there is the incidental elevation of amylase or lipase:
 - If isolated amylase elevation, prior to imaging, the source of the elevation should be confirmed as pancreatic by the performance of amylase isoenzymes demonstrating that the source is not salivary, or the absence of macroamylase should be ascertained by blood test.
 - If the lipase is elevated alone or in combination with an elevated amylase, or If the amylase is confirmed as pancreatic in origin:
 - Abdominal Ultrasound is medically necessary initially.
 - If US is inconclusive, nondiagnostic, or the elevated pancreatic enzymes persist:
 - MRI/MRCP is medically necessary (CPT[®] 74183).
 - It is best performed as a secretin-stimulation test in this setting.
 - CT Abdomen (pancreatic protocol, CPT[®] 74160) is medically necessary if there is a contraindication to MRI.
 - If the pancreatic enzyme elevation persists at one year, either of the above studies can be repeated.

Evidence Discussion

Abdominal imaging is required for the differential evaluation of elevated serum amylase and/or lipase levels and can confirm the diagnosis of acute pancreatitis. Biliary duct dilation and stone disease are readily apparent on an ultrasound, which should be performed as the initial imaging study.²¹⁻²³

When ultrasound results are inconclusive due to overlying bowel gas or other patient factors, or when amylase and/or lipase levels remain elevated, CT or MRI should be considered as the next step. Although contrast-enhanced CT offers over 90% sensitivity and specificity in diagnosing acute pancreatitis, its routine use is not recommended since the diagnosis is clear in many individuals who typically experience a mild, uncomplicated course.²¹⁻²³

References (AB-33)

v1.0.2026

1. Imaging Assessment of Etiology and Severity of Acute Pancreatitis. The Pancreapedia: Exocrine Pancreas Knowledge Base. doi:10.3998/panc.2016.31.
2. Foster BR, Jensen KK, Bakis G, Shaaban AM, Coakley FV. Revised Atlanta Classification for Acute Pancreatitis: A Pictorial Essay—Erratum. *RadioGraphics*. 2019;39(3):912-912. doi:10.1148/rg.2019194003.
3. Expert Panel on Gastrointestinal Imaging, Porter KK, Zaheer A, et al. ACR Appropriateness Criteria® Acute Pancreatitis. *J Am Coll Radiol*. 2019;16(11S):S316-S330. doi:10.1016/j.jacr.2019.05.017
4. Greenberg JA, Hsu J, Bawazeer M, et al. Clinical practice guideline: management of acute pancreatitis. *Canadian Journal of Surgery*. 2016;59(2):128-140. doi:10.1503/cjs.015015.
5. Testoni PA. Acute recurrent pancreatitis: Etiopathogenesis, diagnosis and treatment. *World Journal of Gastroenterology*. 2014;20(45):16891. doi:10.3748/wjg.v20.i45.16891.
6. Pan G, Wan MH, Xie K-L, et al. Classification and Management of Pancreatic Pseudocysts. *Medicine*. 2015;94(24). doi:10.1097/md.0000000000000960.
7. Oconnor OJ, Buckley JM, Maher MM. Imaging of the Complications of Acute Pancreatitis. *American Journal of Roentgenology*. 2011;197(3). doi:10.2214/ajr.10.4339.
8. Conwell DL, Lee LS, Yadav D, et al. American Pancreatic Association Practice Guidelines in Chronic Pancreatitis. *Pancreas*. 2014;43(8):1143-1162. doi:10.1097/mpa.0000000000000237.
9. Lohr JM, Dominguez-Munoz E, Rosendahl J, et al. United European Gastroenterology evidence-based guidelines for the diagnosis and therapy of chronic pancreatitis (HaPanEU). *United European Gastroenterology Journal*. 2017;5(2):153-199. doi:10.1177/2050640616684695.
10. Forsmark CE. Management of Chronic Pancreatitis. *Gastroenterology*. 2013;144(6). doi:10.1053/j.gastro.2013.02.008.
11. Duggan SN, Chonchubhair HMN, Lawal O, O'Connor DB, Conlon KC. Chronic pancreatitis: A diagnostic dilemma. *World Journal of Gastroenterology*. 2016;22(7):2304-2313. doi:10.3748/wjg.v22.i7.2304.
12. Conwell DL, Wu BU. Chronic Pancreatitis: Making the Diagnosis. *Clinical Gastroenterology and Hepatology*. 2012;10(10):1088-1095. doi:10.1016/j.cgh.2012.05.015.
13. Gardner TB, Adler DG, Forsmark CE, Sauer BG, Taylor JR, Whitcomb DC. ACG Clinical Guideline: Chronic Pancreatitis. *The American Journal of Gastroenterology*. 2020;115(3):322-339. doi:10.14309/ajg.0000000000000535.
14. Capurso G, Traini M, Piciocchi M, Signoretti M, Arcidiacono PG. Exocrine pancreatic insufficiency: prevalence, diagnosis, and management. *Clin Exp Gastroenterol*. 2019;12:129-39. doi:10.2147/CEG.S168266.
15. Forsmark CE. Diagnosis and management of exocrine pancreatic insufficiency. *Curr Treat Options Gastroenterol*. 2018;16(3):306-315. doi:10.1007/s11938-018-0186-y.
16. Singh VK, Yadav D, Garg PK. Diagnosis and management of chronic pancreatitis: a review. *JAMA*. 2019;322(4):2422-34. doi:10.1001/jama.2019.19411.
17. Durie P, Baillargeon J-D, Bouchard S, Donnellan F, Zepeda-Gomez S, Teshima C. Diagnosis and management of pancreatic exocrine insufficiency (PEI) in primary care: consensus guidance of a Canadian expert panel. *Curr Med Res Opin*. 2018;34(1):25-33. doi:10.1080/03007995.2017.1389704.
18. Lohr J, Oliver M, Frulloni L. Synopsis of recent guidelines on pancreatic exocrine insufficiency. *United European Gastroenterol J*. 2013;1(2):79-83. doi:10.1177/2050640613476500.
19. Gono W, Hayashi TY, Hayashi N, Abe O. Association between chronic asymptomatic pancreatic hyperenzymemia and pancreatic ductal anomalies: a magnetic resonance cholangiopancreatography study. *Abdom Radiol (NY)*. 2019;44(2):2494-2500. doi:10.1007/s00261-019-02004-4.
20. Mariani A. Chronic asymptomatic pancreatic hyperenzymemia: is it a benign anomaly or a disease? *JOP: Journal of the Pancreas*. 2010;11(2):95-8. doi:10.6092/1590-8577/3840.
21. Tenner S, Vege SS, Sheth SG, et al. American College of Gastroenterology guidelines: management of acute pancreatitis. *Am J Gastroenterol*. 2024;119:419-437. doi:10.14309/ajg.00000000000002645.
22. Banks PA, Bollen TL, Dervenis C, et al. Classification of acute pancreatitis – 2012: revision of Atlanta classification and definitions by international consensus. *Gut*. 2013;62:102-111.

23. Al-Haddad M, Wallace MB. Diagnostic approach to patients with acute idiopathic pancreatitis, what should be done? *World J Gastroenterol*. 2008;14:1007–1010.
24. Whitcomb DC, Buchner AM, Forsmark CE. AGA Clinical Practice Update on the Epidemiology, Evaluation, and Management of Exocrine Pancreatic Insufficiency: Expert Review. *Gastroenterology*. 2023;165(5):1292-1301. doi:10.1053/j.gastro.2023.07.007
25. Sheth SG, Machicado JD, Chhoda A, et al. American Society for Gastrointestinal Endoscopy guideline on the role of endoscopy in the management of chronic pancreatitis: methodology and review of evidence. *Gastrointest Endosc*. 2025;101(1):e1-e53. doi:10.1016/j.gie.2024.05.017

Spleen (AB-34)

Guideline	Page
Spleen (AB-34.1)	233
Splenic Trauma (AB-34.2)	236
References (AB-34)	237

Spleen (AB-34.1)

AB.SP.0034.1.C

v1.0.2026

- Incidental splenic findings on US:
 - CT Abdomen (CPT® 74170) or MRI Abdomen (CPT® 74183) is medically necessary
- Incidental splenic findings on CT or MRI:
 - Imaging is diagnostic of a benign lesion (simple cyst, hemangioma) or characteristics are benign-appearing (homogeneous, low attenuation, no enhancement, smooth margins):
 - No follow-up imaging
 - Imaging characteristics are not diagnostic:
 - Prior imaging available:
 - One year stability: no follow up imaging
 - Lack of stability: consider MRI if not done, biopsy, or PET/CT (CPT® 78815).
 - No prior imaging:
 - No known malignancy:
 - Suspicious imaging features: (suggesting possible malignancy)
 - MRI Abdomen (CPT® 74183) if not already done or biopsy
 - If MRI still inconclusive and biopsy is not feasible then PET/CT (CPT® 78815) is medically necessary.
 - Indeterminate imaging features: (equivocal but not suspicious for malignancy)
 - Follow up MRI Abdomen (CPT® 74183) in 6 and 12 months.
 - Known malignancy:
 - <1 cm: follow up MRI Abdomen (CPT® 74183) in 6 and 12 months.
 - ≥1 cm: consider MRI Abdomen (CPT® 74183) if not done, biopsy
 - If MRI still inconclusive and biopsy is not feasible then PET/CT (CPT® 78815) is medically necessary.
 - (See diagnosis-specific in the Oncology Imaging Guidelines).
 - Clinically detected splenomegaly
 - Abdominal US (CPT® 76700 or CPT® 76705) should be the first imaging study to evaluate splenic size.
 - If splenomegaly is confirmed, the following evaluation is medically necessary prior to advanced imaging:
 - CBC, evaluation of the peripheral blood smear, LFTs, UA, chest x-ray, HIV testing.

- CT Abdomen without and with contrast or with (CPT® 74170 or CPT® 74160) is medically necessary if the etiology of the splenomegaly remains unexplained.
- MRI Abdomen (CPT® 74183) is medically necessary for pregnant individuals, or individuals with iodinated contrast allergy.

Background and Supporting Information

These guidelines are consistent with ACR recommendations for the follow-up of incidental splenic masses. It is noteworthy, however, that a recent study from Beth Israel Deaconess Medical Center in which the authors retrospectively reviewed 379 individuals who were found to have an incidental splenic mass on CT found that in individuals without a history of malignancy, constitutional symptoms of fever or weight loss, or left upper quadrant or epigastric pain (205/379) there were 2 incidences of malignancy. However, in both of these cases the splenic masses were neither isolated nor indeterminate findings as the CTs demonstrated disease in other locations. An isolated splenic malignancy (which can occur but is very rare) was found only in 2 individuals and both of these had constitutional symptoms. Thus, the authors claim that "the isolated and incidentally found splenic mass is of unlikely clinical significance, regardless of its appearance," They concluded that "in individuals with an incidental splenic mass identified at imaging and with the absence of a history of malignancy, fever, weight loss, or pain in the left upper quadrant or epigastrium, such masses are highly likely to be benign regardless of their appearance. Additional imaging or follow-up is not medically necessary, even if the mass does not show the appearance of simple cyst. Further work-up is only needed if the splenic mass is seen in conjunction with other findings worrisome for malignancy." These authors challenge the use of the ACR guidelines.

Evidence Discussion

- Splenomegaly is usually the result of systemic disease, and diagnostic studies should be directed toward identifying the etiology. Ultrasound is the preferred modality for documentation of splenomegaly found on physical exam. If the etiology of the splenomegaly is determined (benign or malignant), follow-up imaging would be addressed relative to that disease process.¹⁰
- The accuracy, cost-effectiveness, and lack of radiation make abdominal ultrasonography a first-line step for confirmation of size.¹⁰
- Both CT and MRI are valid studies for initial evaluation and follow-up of indeterminate splenic lesions due to the non-specific hypoechogenicity found on ultrasound. These should be performed both with and without contrast to improve diagnosis of a solid organ lesion. Nuclear medicine imaging is rarely needed but has a role in detection of accessory splenic lesions.¹¹

- There is no evidence-based data supporting the use of serial CT or MRI scans to monitor individuals with incidental splenic lesions that have benign characteristics or lesions that are stable after one year.

Splenic Trauma (AB-34.2)

AB.SP.0034.2.A

v1.0.2026

- Ultrasound Abdomen (CPT® 76700 or CPT® 76705) and Pelvis (CPT® 76856 or CPT® 76857) or CT Abdomen and Pelvis without and with contrast (CPT® 74178) or CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary for ANY of the following:
 - Blunt abdominal trauma with suspected splenic rupture, OR
 - Suspected post-procedural splenic injury, OR
 - Individuals with penetrating trauma to the left upper quadrant. See: **Blunt Abdominal Trauma (AB-10)**

Background and Supporting Information

Splenomegaly is usually the result of systemic disease, and diagnostic studies are directed toward identifying the causative disease. Complete blood count with differential, LFT's, and peripheral blood smear examination are often performed prior to considering advanced imaging. There is no evidence-based data to support performing serial CT or MRI to follow individuals with incidental splenic lesions.

Evidence Discussion

Spleen being a vascular organ, prompt diagnosis and management of potentially life-threatening bleeding is the primary goal. Emergency splenectomy remains a life-saving procedure; hence, the goal of imaging is to utilize abdominal imaging to determine injury to organs and vasculature with speed and accuracy. Thus, CT and ultrasound (US) are the primary imaging methods to determine splenic injury.^{4,6}

US is useful in trauma individuals as it is able to rapidly determine the presence of fluid in peritoneal space. However, it cannot rule out injury to organs with accuracy.^{4,6}

CT scan has increased sensitivity and specificity for organ and vascular injury and for identifying individuals a surgical approach. CT is highly sensitive for identifying significant intra-abdominal pathology (97 to 98 percent sensitivity and 97 to 99 percent specificity).^{4,6}

Although a noncontrast CT scan may demonstrate sub-capsular hematoma or hemoperitoneum, a contrast-enhanced CT is better able to demonstrate parenchymal and vascular injuries.^{4,6}

MRI is not recommended as an imaging study of choice because it is time-consuming to perform and is not as readily accessible as the imaging methods mentioned above (especially in hemodynamically unstable individuals).^{4,6}

References (AB-34)

v1.0.2026

1. Heller M et. al. Managing Incidental Findings on Abdominal and Pelvic CT and MRI, Part 3. *Journal of the American College of Radiology*, Vol. 10, Issue 11, Pages 833-839, Nov. 2013.
2. Thut D et. al. A diagnostic approach to splenic lesions. *Appl. Radiology* 2017; 46 (2): 7-22(B)
3. Saboo SS, Krajewski KM, O'Regan KN, et al. Spleen in haematological malignancies: spectrum of imaging findings. *British Journal of Radiology*. 2012;85:81-92 2012.
4. Benter T, Klühs L, Teichgräber U. Sonography of the spleen. *J Ultrasound Med*. 2011;30:1281-93.
5. Killeen KL, Shanmuganathan K, Boyd-Kranis R, et al. CT findings after embolization for blunt splenic trauma. *J Vasc Interv Radiol*. Feb 2001;12(2):209-14.
6. Naulet P, Wassel J, Gervaise A, et al. Evaluation of the value of abdominopelvic acquisition without contrast injection when performing a whole body CT scan in a patient who may have multiple trauma. *Diagn Interv Imaging*. 2013;94(4):410-7.
7. Boscak AR, Shanmuganathan K, Mirvis SE, et al. Optimizing trauma multidetector CT protocol for blunt splenic injury: need for arterial and portal venous phase scans. *Radiology*. 2013;268(1):79-88.
8. Royal HD, Brown ML, Drum DE. Society of Nuclear Medicine Procedure guideline for hepatic and splenic imaging 3.0, version 3.0, approved July 20, 2003.
9. Siewert B, Millo NZ, Sahi K, et al. The incidental splenic mass at CT: does it need further work-up? An observational study. *Radiology*. 2018;287(1):156-166. doi:10.1148/radiol.2017170293.
10. Sommer A, Mendez AM. Splenomegaly: diagnosis and management in adults. *Am Fam Physician*. 2021;104(3):271-276.
11. Vanhoenacker FM, Op de Beeck B, De Schepper AM, et al. Vascular disease of the spleen. *Semin Ultrasound CT MR*. 2007;28:35-51.

Indeterminate Renal Lesion (AB-35)

Guideline	Page
Indeterminate Renal Lesion – General Information (AB-35.0).....	239
Indeterminate Renal Lesion (AB-35.1).....	240
Pre-operative Assessment for Robotic Kidney Surgery (AB-35.2).....	244
References (AB-35).....	245

Indeterminate Renal Lesion – General Information (AB-35.0)

AB.RL.0035.0.A

v1.0.2026

For acute flank pain, rule out renal stone, see: Flank Pain, Rule Out or Known Renal/Ureteral Stone (AB-4)

Indeterminate Renal Lesion (AB-35.1)

RL.AB.0035.1.A

v1.0.2026

- Incidental Renal Mass on Ultrasound
 - If categorized as simple cyst or Bosniak I or II, no further imaging is medically necessary.
 - Otherwise ONE of the following is medically necessary:
 - CT Abdomen without and with contrast (CPT[®] 74170)
 - MRI Abdomen without and with contrast (CPT[®] 74183)
 - Contrast-Enhanced Ultrasound (CPT[®] 76978) for one lesion
 - Targeted Dynamic Ultrasound (CPT[®] 76979) if more than one lesion
- CT Abdomen without and with contrast (CPT[®] 74170) or MRI Abdomen without and with contrast (CPT[®] 74183) is medically necessary for further characterization if the original study reveals incomplete visualization of a renal lesion (for example, if only partially visualized on a CT Chest).
- Incidental Renal Mass on CT
 - If characterized as heterogeneous (thick or irregular wall, mural nodule, septa, or calcification):
 - Considered indeterminate. MRI Abdomen without and with contrast (CPT[®] 74183) OR CT Abdomen without and with contrast (CPT[®] 74170) is medically necessary
 - If characterized as homogeneous (thin or imperceptible wall, NO mural nodule, septa, or calcification):
 - 10 to 20 HU (Hounsfield units)
 - Likely benign, not fully characterized: no further work-up
 - 21 to 69 HU
 - Indeterminate: MRI Abdomen without and with contrast (CPT[®] 74183) OR CT Abdomen without and with contrast (CPT[®] 74170) is medically necessary
 - ≥70 HU
 - Hemorrhagic or proteinaceous cyst, unlikely to be neoplastic: no further work-up
 - If characterized as TSTC (too small to characterize) and homogeneous:
 - If labeled likely benign cyst, not fully characterized:
 - No further work-up
 - If labeled inconclusive based on subjective evaluation:
 - Considered indeterminate. MRI Abdomen without and with contrast (CPT[®] 74183) (preferred) OR CT Abdomen without and with contrast (CPT[®] 74170)

- is medically necessary ideally within 6-12 months but no sooner than 6 months.
- Incidental cystic renal mass on CT or MRI without and with contrast (completely characterized, and does NOT contain fat)
 - Bosniak I (benign simple) or II (minimally complicated)
 - No further work-up
 - Bosniak IIF
 - CT Abdomen without and with contrast (CPT[®] 74170) or MRI Abdomen without and with contrast (CPT[®] 74183) is medically necessary at 6 and 12 months, then yearly for 5 years
 - If no changes for 5 years, cyst is considered benign and of no clinical significance
 - Bosniak III or IV should be referred for additional management or if chosen, active surveillance see: **Surveillance (ONC-17.4)** in the Oncology Imaging Guidelines
 - Incidental solid renal mass or incidental mass too small to characterize evaluated on CT or MRI without and with contrast and does NOT contain fat
 - TSTC (too small to characterize)
 - If labeled likely benign cyst:
 - No further work-up
 - If labeled inconclusive based on subjective evaluation:
 - MRI Abdomen without and with contrast (CPT[®] 74183) (preferred), OR CT Abdomen without and with contrast (CPT[®] 74170) is medically necessary ideally within 6-12 months but no sooner than 6 months.
 - If solid mass <1.0cm
 - MRI Abdomen without and with contrast (CPT[®] 74183) (preferred), OR CT Abdomen without and with contrast (CPT[®] 74170) is medically necessary beginning at 6 months, then yearly for 5 years
 - If stable at 5 years (average growth ≤3mm per year): No further work-up
 - If mass shows growth (≥4mm per year) or morphologic change: refer for management, consider renal biopsy. If biopsy is technically challenging or relatively contraindicated, a T2 weighted image MRI Abdomen without and with contrast (CPT[®] 74183) is medically necessary
 - Solid mass 1.0-4.0cm:
 - Considered a small renal neoplasm: refer for management, consider biopsy. If biopsy is technically challenging or relatively contraindicated, a T2 weighted imaging MRI Abdomen without and with contrast (CPT[®] 74183) is medically necessary. If active surveillance chosen due to limited life expectancy or co-morbidities, see: **Surveillance (ONC-17.4)** in the Oncology Imaging Guidelines
 - Solid renal mass >4.0cm

- Considered a renal neoplasm: refer for management, or biopsy. If biopsy is technically challenging or relatively contraindicated, a T2 weighted image MRI Abdomen without and with contrast (CPT® 74183) is medically necessary. If active surveillance chosen due to limited life expectancy or co-morbidities, see: **Surveillance (ONC-17.4)** in the Oncology Imaging Guidelines
- Incidental renal mass containing fat (contains a region of interest measuring <-10 HU on CT)
 - No calcification angiomyolipoma (AML)
 - Solitary and without documentation of growth:
 - <4cm: no further work-up
 - If no prior imaging study for comparison, one follow-up MRI Abdomen (CPT® 74183) OR CT Abdomen (CPT® 74170) can be repeated in 6-12 months to assess for any growth.
 - ≥4cm, and considered an AML with potential for clinical symptoms: refer for management.
 - Multiple lesions or growth documented based on old studies:
 - Refer for management. If active surveillance chosen due to limited life expectancy or co-morbidities, see: **Surveillance (ONC-17.4)** in the Oncology Imaging Guidelines.
 - With calcification (suspected renal cell carcinoma):
 - CT Abdomen without and with contrast (CPT® 74170) OR MRI Abdomen without and with contrast (CPT® 74183) is medically necessary if only a non-contrast CT has been performed. If active surveillance is chosen due to limited life expectancy or co-morbidities, see: **Surveillance (ONC-17.4)** in the Oncology Imaging Guidelines.
- Active Surveillance: For all Active Surveillance indications, see: **Surveillance (ONC-17.4)** in the Oncology Imaging Guidelines

Note: PET/CT or PET/MRI are not considered medically necessary because their role evaluating the incidental renal mass is limited.

Bosniak Classification:

I- Benign simple cyst with a hairline thin wall without septa, calcification, or solid component. Homogeneous near-water attenuation density (10 to 20 HU) without enhancement.

II- Benign minimally complicated cyst that may contain a few hairline thin septa that may have “perceived” but not measurable enhancement. Fine calcification or a segment of slightly thickened calcification may be present in the wall or septa. Also, a well-marginated nonenhancing homogeneous mass <3cm with density above simple fluid attenuation (hyperdense cyst).

IIF- Usually benign complicated renal cyst with multiple hairline thin septa or minimal smooth thickening of the wall or septa. Wall or septa may contain thick and nodular calcification and may have “perceived” but not measurable enhancement. Also, a well-margined intrarenal nonenhancing mass >3cm with density above simple fluid.

III -Indeterminate complicated cystic renal mass with thickened irregular walls or septa that have measurable enhancement.

IV-Malignant cystic renal mass with enhancing soft tissue components (cystic renal cell carcinoma).

Evidence Discussion

Advantages of ultrasound includes universal availability, portability, and lack of ionizing radiation. Doppler ultrasound can distinguish between cystic and solid lesions, as well as characterize the quality, presence, and velocity of flow. Therefore, ultrasound can classify a lesion as either a simple cyst or a Bosniak I or II, eliminating the need for further imaging.^{1,9,10}

The American Urological Association recommends that individuals with a solid or complex cystic renal mass obtain high quality, multiphase, cross-sectional abdominal imaging to optimally characterize any renal lesion seen on ultrasound, or found incidentally on other imaging studies or non-contrast enhanced abdominal imaging.^{1,9,10}

Advanced imaging techniques such as computer tomography (CT) and magnetic resonance imaging (MRI) offer excellent 3-dimensional resolution. CT scans expose individuals to a significant dose of ionizing radiation; however, their rapid image acquisition reduces the potential for motion artifacts. In contrast, MRI provides better soft tissue contrast resolution than CT and does not involve ionizing radiation exposure. Yet, its longer imaging times make it prone to motion artifacts and may necessitate sedation. Additionally, MRIs are contraindicated for individuals with non-MRI compliant implants or ferromagnetic foreign bodies.^{1,9,10}

Pre-operative Assessment for Robotic Kidney Surgery (AB-35.2)

RL.AB.0035.2.A

v1.0.2026

- Pre-operative assessment for robotic kidney surgery is medically necessary as follows:
 - If not previously performed:
 - CT Abdomen without and with contrast (CPT[®] 74170) OR
 - MRI Abdomen without and with contrast (CPT[®] 74183)
 - CTA Abdomen (CPT[®] 74175) or CTA Abdomen and Pelvis (CPT[®] 74174) OR
 - MRA Abdomen (CPT[®] 74185), or MRA Abdomen and Pelvis (CPT[®] 74185 and CPT[®] 72198)

Evidence Discussion

Robotic kidney surgery is typically performed for renal masses. Preoperative imaging is essential for:¹⁰

- Characterizing a renal mass
- Assessing local extension
- Evaluation vascular anatomy
- Planning surgical approach.

CT Abdomen and pelvis without and with contrast is appropriate and provides detailed anatomical and vascular information.¹⁰

- CT scans expose individuals to a significant dose of ionizing radiation; however, their rapid image acquisition reduces the potential for motion artifacts.¹⁰

MRI Abdomen without and with contrast is also medically necessary and can be used as an alternative to CT in individuals with contrast allergy or renal insufficiency.¹⁰

- MRI provides better soft tissue contrast resolution than CT and does not involve ionizing radiation exposure.¹⁰

References (AB-35)

v1.0.2026

1. Herts BR, Silverman SG, Hindman NM, et al. Management of the Incidental Renal Mass on CT: A White Paper of the ACR Incidental Findings Committee. *Journal of the American College of Radiology*. 2018;15(2):264-273. doi:10.1016/j.jacr.2017.04.028.
2. Finelli A, Ismaila N, Russo P. Management of Small Renal Masses: American Society of Clinical Oncology Clinical Practice Guideline Summary. *Journal of Oncology Practice*. 2017;13(4):276-278. doi:10.1200/jop.2016.019620.
3. Campbell S, Uzzo RG, Allaf ME, et al. Renal Mass and Localized Renal Cancer: AUA Guideline. *The Journal of Urology*. 2017;198(3):520-529. doi:10.1016/j.juro.2017.04.100.
4. Zhao PT, Richstone L, Kavoussi LR. Laparoscopic partial nephrectomy. *International Journal of Surgery*. 2016;36:548-553. doi:10.1016/j.ijsu.2016.04.028.
5. Lane BR, Campbell SC, Gill IS. 10-Year Oncologic Outcomes After Laparoscopic and Open Partial Nephrectomy. *Journal of Urology*. 2013;190(1):44-49. doi:10.1016/j.juro.2012.12.102.
6. Barr RG, Peterson C, Hindi A. Evaluation of Indeterminate Renal Masses with Contrast-enhanced US: A Diagnostic Performance Study. *Radiology*. 2014;271(1):133-142. doi:10.1148/radiol.13130161.
7. Nicolau C, Buñesch L, Paño B, et al. Prospective evaluation of CT indeterminate renal masses using US and contrast-enhanced ultrasound. *Abdominal Imaging*. 2014;40(3):542-551. doi:10.1007/s00261-014-0237-3.
8. Zarzour JG, Lockhart ME, West J, et al. Contrast-Enhanced Ultrasound Classification of Previously Indeterminate Renal Lesions. *Journal of Ultrasound in Medicine*. 2017;36(9):1819-1827. doi:10.1002/jum.14208.
9. Campbell SC, Clark PE, Chang SS et al. Renal mass and localized renal cancer: evaluation, management, and follow-up: AUA guideline part I. *J Urol*. 2021;206:199.
10. Expert Panel on Urologic Imaging, Wang ZJ, Nikolaidis P, et al. ACR Appropriateness Criteria® Indeterminate Renal Mass. *J Am Coll Radiol*. 2020;17(11S):S415-S428. doi:10.1016/j.jacr.2020.09.010

Renal Failure (AB-36)

Guideline	Page
Renal Failure (AB-36.1).....	247
References (AB-36).....	248

Renal Failure (AB-36.1)

AB.PCRF.0036.1.C

v1.0.2026

- Initial evaluation of acute or chronic renal failure with EITHER of the following:
 - Ultrasound kidney and bladder (CPT® 76770 or CPT® 76775)
 - Doppler Ultrasound (CPT® 93975 or CPT® 93976)
- MRA Abdomen (CPT® 74185) is medically necessary when there is suspected:
 - renal vein/caval thrombosis OR
 - renal artery stenosis as cause of renal failure
- CT Abdomen without contrast (CPT® 74150) is not medically necessary except to rule out ureteral obstruction or retroperitoneal mass.

Evidence Discussion

The main role of imaging is to detect treatable causes of renal failure such as ureteral obstruction or renovascular disease and to evaluate renal size and morphology. Ultrasound is the modality of choice for initial imaging, with duplex Doppler reserved for suspected renal artery stenosis or thrombosis. ACR appropriateness criteria states that ultrasound contrast media are not nephrotoxic, ultrasound has the greatest diagnostic value in the detection of hydronephrosis, and ultrasound is highly sensitive for hydronephrosis and bladder distention. It also allows for evaluation of general information about the kidney such as size and shape. CT may be appropriate, particularly for urinary tract obstruction. CT is useful in determining the cause of hydronephrosis by demonstrating if mass or obstruction is present and at what level in the urinary tract. MRA is useful when renovascular causes of failure are suspected. MRA has shown to be able to detect renal artery stenosis. However, the use of iodinated and gadolinium-based contrast should be evaluated critically depending on specific patient factors and cost-benefit ratio.^{1,3}

Tc-99m dimercaptosuccinic acid (DMSA) scintigraphy is ideal for functional renal cortical imaging and is most useful for detection of focal renal parenchymal abnormalities and scars in the setting of acute or chronic pyelonephritis or for differential renal function.^{1,3}

Tc-99m mercaptoacetyl triglycine (MAG3) is the most frequently used renal tubular agent, specifically to quantify renal tubular extraction.^{1,3}

References (AB-36)

v1.0.2026

1. Expert Panel on Urologic Imaging, Wong-You-Cheong JJ, Nikolaidis P, et al. ACR Appropriateness Criteria® Renal Failure. *J Am Coll Radiol*. 2021;18(5S):S174-S188. doi:10.1016/j.jacr.2021.02.019
2. National Kidney Foundation. KDOQI Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification. 2012. *Am J Kidney Disease*, 2002;39(2 Supp 1):S1-S266.
3. Kim C, Becker M, Grant F, et al., ACR–SPR Practice Guideline for the Performance of Renal Scintigraphy. Revised 2017. The American College of Radiology.

Renovascular Hypertension (AB-37)

Guideline	Page
Renovascular Hypertension (AB-37.1).....	250

Renovascular Hypertension (AB-37.1)

AB.37.1.A

v1.0.2026

- For consideration of Renovascular Hypertension/Renal Artery Stenosis, see:
Renovascular Hypertension/Renal Artery Stenosis (PVD-6.6) in the Peripheral Vascular Disease Imaging Guidelines

Polycystic Kidney Disease (AB-38)

Guideline	Page
Polycystic Kidney Disease (AB-38.1).....	252
References (AB-38).....	254

Polycystic Kidney Disease (AB-38.1)

AB.PK.0038.1.A

v1.0.2026

- Retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775) is medically necessary for:
 - suspected polycystic kidney disease OR
 - screening individuals at risk for autosomal dominant polycystic disease (ADPKD)
 - In the absence of any clinical change, follow-up screening is not medically necessary if a screening ultrasound was performed at age 40 or later and was negative for any cysts. (The negative predictive value of an ultrasound in this age group is 100% for both PKD1 and PKD2, if no cysts are identified.)
 - If an initial ultrasound is negative for any cysts, a follow-up ultrasound is medically necessary at the discretion of the ordering provider for individuals <40 years of age.
- MRI Abdomen without contrast (CPT[®] 74181) is medically necessary:
 - if a cystic renal lesion is detected in an individual at-risk of PKD, for prognostic purposes
 - for volume averaging (Total Kidney Volume – TKV) prior to medical treatment and for post treatment follow-up for PKD.

Background and Supporting Information

- Ultrasound is very effective in establishing a diagnosis of ADPKD, though may miss early small cysts. However, the negative predictive value in the various age groups of a negative ultrasound is as follows:
 - ≥40: 100% for PKD1 and PKD2
 - 30-39: 100% for PKD1 and 96.8% for PKD2
 - 5-29: 99.1% for PKD1 and 83.5% for PKD2
- In addition, the preferable advanced imaging study is MRI Abdomen without contrast (CPT[®] 74181). This is because of the increased risk of gadolinium-induced nephrogenic fibrosis in individuals with PKD.

Evidence Discussion

Screening studies are important for individuals at risk for polycystic kidney disease, as well as imaging protocols to assess and monitor renal parenchyma and evolving cysts, which can predict patient outcomes.¹

Screening protocols that utilize ultrasonography, a readily available and safe imaging modality, can reliably quantify and characterize renal cysts, aiding in the diagnosis of ADPKD. A negative ultrasound result has a high negative predictive value for excluding ADPKD.¹

After diagnosis, advanced imaging may be medically necessary to assess total kidney volume, and to characterize cystic renal lesions, such as before treatment/procedures. Optimal follow-up imaging intervals in this setting have not yet been established. Requests for follow-up imaging can be considered on a case-by-case basis.⁵

Given the significant association with CKD, contrast (both gadolinium and iodine-based) would preferentially be avoided for both CT and MR. The choice of advanced imaging would typically be magnetic resonance imaging without contrast unless the benefits outweigh the risks.¹

References (AB-38)

v1.0.2026

1. Torres VE, Ahn C, Barten TRM, et al. KDIGO 2025 clinical practice guideline for the evaluation, management, and treatment of autosomal dominant polycystic kidney disease (ADPKD): executive summary. *Kidney Int.* 2025;107(2):234-254. doi:10.1016/j.kint.2024.07.010
2. Belibi FA, Edelstein CL. Unified ultrasonographic diagnostic criteria for polycystic kidney disease. *J Am Soc Nephrol.* 2009;20(1):6-8. doi:10.1681/ASN.2008111164
3. Chebib FT, Torres VE. Autosomal Dominant Polycystic Kidney Disease: Core Curriculum 2016. *American Journal of Kidney Diseases.* 2016;67(5):792-810. doi:10.1053/j.ajkd.2015.07.037.
4. Gastel MDAV, Messchendorp AL, Kappert P, et al. T1 vs. T2 weighted magnetic resonance imaging to assess total kidney volume in patients with autosomal dominant polycystic kidney disease. *Abdominal Radiology.* 2017;43(5):1215-1222. doi:10.1007/s00261-017-1285-2.
5. Alam A, Dahl NK, Lipschutz JH, et al. Total Kidney Volume in Autosomal Dominant Polycystic Kidney Disease: A Biomarker of Disease Progression and Therapeutic Efficacy. *American Journal of Kidney Diseases.* 2015;66(4):564-576. doi:10.1053/j.ajkd.2015.01.030.

Hematuria and Hydronephrosis (AB-39)

Guideline	Page
Hematuria with Urinary Tract Infection (UTI) (AB-39.1)	256
Asymptomatic Hematuria (AB-39.2)	257
Hematuria and Flank Pain (Suspicion for Renal/ureteral Stones) (AB-39.3)	260
Hydronephrosis of Unexplained or Indeterminate Cause (AB-39.4)	261
References (AB-39)	262

Hematuria with Urinary Tract Infection (UTI) (AB-39.1)

AB.HH.0039.1.A

v1.0.2026

- Individuals suspected to have a UTI as the etiology of microscopic hematuria should be treated for the UTI and should then undergo repeat urinalysis to confirm resolution of the hematuria.
- If the hematuria persists following treatment of UTI, proceed with the risk-based evaluation as per **Asymptomatic Hematuria (AB-39.2)**.

Background and Supporting Information

- Signs and symptoms of UTI: urinary frequency, burning on urination, urgency, dysuria, positive urine leukocyte esterase, presence of WBCs in the urine, fever, elevated WBC as per the testing laboratory's range

Evidence Discussion

An individual who is diagnosed with microscopic hematuria, defined by the American Urological Association guidelines as 3 or more RBC/HPF, and is found to have a concomitant urinary tract infection should have a repeat urinalysis to confirm resolution of the hematuria based on the AUA guidelines.⁶

If microscopic hematuria persists after treatment of the infection, the individual should undergo risk assessment based on the AUA guidelines which provide guidance on the use of advanced imaging.⁶

Asymptomatic Hematuria (AB-39.2)

AB.HH.0039.2.A

v1.0.2026

- A positive dipstick should prompt a microscopic examination.
- Microscopic hematuria is defined as ≥ 3 red blood cells per high power field.
- Prior to imaging for the evaluation of microscopic hematuria, individuals should be stratified into low, intermediate, or high risk, based on the following criteria:
 - Low risk (individual meets ALL criteria listed)
 - Women <50 years of age or Men <40 years of age
 - Never smoker or <10 pack years
 - 3-10 RBC/HPF on a single urinalysis
 - No additional risk factors for urothelial cancer:
 - Irritative lower urinary tract symptoms
 - Prior pelvic radiation therapy
 - Prior cyclophosphamide/ifosfamide chemotherapy
 - Family history of urothelial cancer or Lynch Syndrome
 - Occupational exposures to benzene chemicals or aromatic amines (e.g. rubber, petrochemicals, dyes)
 - Chronic indwelling foreign body in the urinary tract
 - Intermediate risk (individual meets ANY ONE of these criteria)
 - Women age 50-59 years, Men age 40-59 years
 - 10-30 pack years of smoking
 - 11-25 RBC/HPF on a single urinalysis
 - Low-risk individual with no prior evaluation and 3-10 RBC/HPF on repeat urinalysis
 - Any one of the additional risk factors for urothelial cancer (see above)
 - High-risk (individual meets ANY ONE of these criteria)
 - Women or Men ≥ 60 years
 - >30 pack-years of smoking
 - >25 RBC/HPF on a single urinalysis
 - Gross hematuria
- Low- or intermediate-risk individuals:
 - Renal ultrasound (combined with cystoscopy)
 - Low-risk individuals may opt for observation with repeat urinalysis within 6 months. If no imaging was performed initially, and follow-up urinalysis reveals persistent hematuria with 3-10 RBC/HPF the individual may be imaged according to Intermediate-Risk criteria. If >10 RBC/HPF, they should be imaged according to High-risk guidelines.

- High-risk individuals
 - CT Urogram (CPT[®] 74178) is medically necessary (3D imaging is appropriate if requested)
 - If CT is contraindicated, MR Urography is medically necessary (CPT[®] 74183 and 72197)
 - If both CT and MR are contraindicated due to contrast, non-contrast CT Urography or renal ultrasound should be performed. See also: **Pregnancy Considerations for Imaging (AB-1.12)**.
- Persistent microscopic hematuria if previously evaluated by renal ultrasound
 - Imaging as per High-risk individuals above
- For the evaluation of microscopic hematuria in individuals with inherited risk factors for renal cortical tumors, ONE of the following imaging studies is medically necessary:
 - Renal ultrasound OR
 - CT Abdomen without and with contrast (CPT[®] 74170) OR
 - MRI Abdomen without and with contrast (CPT[®] 74183)

Note:

Inherited risk factors for renal cortical tumors include:

- Von Hippel Lindau
 - Birt-Hogg-Dube
 - Hereditary Papillary Renal Cell Cancer
 - Hereditary Leiomyomatosis Renal Cell Cancer
 - Tuberous Sclerosis
-

- Follow-up
 - Individuals with a negative hematuria evaluation who undergo repeat urinalysis
 - If repeat urinalysis is negative:
 - No further workup
 - If repeat urinalysis demonstrates persistent hematuria
 - Repeat imaging as requested (Renal Ultrasound or CT Urography)
 - **Note:** 3-D Reconstruction enhances a CT Urogram. Requests for 3-D reconstruction (CPT[®] 76377 or 76376) for a CT Urogram can be considered medically necessary.
-

Evidence Discussion

- Microscopic hematuria is defined as ≥ 3 red blood cells per high power field. Hematuria is NOT defined as a positive dipstick. A positive dipstick should prompt a microscopic examination. A positive dipstick is not considered as defining microhematuria.⁶

- Low-risk individuals with microscopic hematuria may opt for a repeat urinalysis prior to proceeding to a workup. Intermediate-risk and high-risk individuals should undergo a workup with upper and lower tract imaging.^{5,6}
 - Upper tract imaging with renal ultrasound is the standard for low and intermediate individuals given the overall low rate of malignancy detected in individuals with microscopic hematuria. Renal ultrasound is noninvasive, readily available, and carries no risk of ionizing radiation while demonstrating a high sensitivity for renal masses and hydronephrosis.
 - Upper tract imaging for high risk individuals should include advanced imaging with urography (CT with/without contrast is preferred with associated 3D rendering if requested). MR Urogram (MR Abdomen and Pelvis with/without contrast) can be performed if CT is contraindicated.
 - Individuals with severe renal dysfunction, dye allergy, or other reasons where both CT and MRI are contraindicated should undergo renal ultrasound or non-contrast CT paired with retrograde pyelography.
- Individuals with microhematuria with family history of renal cell carcinoma or known genetic renal tumor syndrome should undergo upper tract imaging (renal ultrasound, CT or MR Urography) regardless of risk category.^{1,6}
- An individual with previous negative workup with persistent microscopic hematuria may undergo repeat upper tract imaging.^{1,6}

Hematuria and Flank Pain (Suspicion for Renal/ureteral Stones) (AB-39.3)

AB.HH.0039.3.A

v1.0.2026

- CT Abdomen and Pelvis without contrast (CPT® 74176) OR CT Urogram (CPT® 74178)
 - Request for 3-D reconstruction (CPT® 76377 or CPT® 76375) to be performed with a CT Urogram is considered medically necessary.
 - US abdomen or retroperitoneum is medically necessary in lieu of CT for any of the above indications.

Evidence Discussion

- Individuals with flank pain presenting with either microscopic or gross hematuria should undergo advanced imaging with CT of the abdomen and pelvis.
 - The choice of contrast is at the discretion of the provider and may differ for individuals with previous history or high risk of nephrolithiasis and individuals with a higher risk of malignancy.
 - 3D reconstruction of CT Urography may be performed as requested.
 - Alternatively, the provider may request abdominal or retroperitoneal ultrasound in lieu of a CT initially.

Hydronephrosis of Unexplained or Indeterminate Cause (AB-39.4)

AB.HH.0039.4.A

v1.0.2026

- CT Urogram (CPT® 74178)
 - Requests for 3-D reconstruction (CPT® 76377 or CPT® 76375) to be performed with a CT Urogram is considered medically necessary.
 - US abdomen or retroperitoneum is medically necessary in lieu of a CT for any of the above indications.
- Retroperitoneal Ultrasound (CPT® 76770) is medically necessary every 6 to 12 months for the following:
 - uncomplicated hydronephrosis OR
 - neurogenic bladder OR
 - myelomeningocele (open spinal dysraphism) OR
 - spina bifida

Evidence Discussion

- A new diagnosis of hydronephrosis without a known cause should undergo further workup. Advanced imaging with CT Urography with 3D reconstruction may be performed if requested to evaluate the course of the urinary tract for obstruction.⁷
- Alternatively, the provider may request abdominal or retroperitoneal ultrasound in lieu of a CT initially.⁷
- Individuals with known chronic, uncomplicated hydronephrosis or individuals with neurogenic bladder (spina bifida or other neurologic conditions) may undergo surveillance imaging with retroperitoneal ultrasound every 6-12 months to monitor for progression or development of hydronephrosis to prevent renal deterioration.⁷

References (AB-39)

v1.0.2026

1. Expert Panel on Urological Imaging, Wolfman DJ, Marko J, et al. ACR Appropriateness Criteria® Hematuria. J Am Coll Radiol. 2020;17(5S):S138-S147. doi:10.1016/j.jacr.2020.01.028
2. Expert Panel on Interventional Radiology, Scheidt MJ, Hohenwarter EJ, et al. ACR Appropriateness Criteria® Radiologic Management of Urinary Tract Obstruction. J Am Coll Radiol. 2020;17(5S):S281-S292. doi:10.1016/j.jacr.2020.01.039
3. Expert Panel on Urological Imaging, Gupta RT, Kalisz K, et al. ACR Appropriateness Criteria® Acute Onset Flank Pain-Suspicion of Stone Disease (Urolithiasis). J Am Coll Radiol. 2023;20(11S):S315-S328. doi:10.1016/j.jacr.2023.08.020
4. Raman SP, Horton KM, Fishman EK. MDCT Evaluation of Ureteral Tumors: Advantages of 3D Reconstruction and Volume Visualization. *American Journal of Roentgenology*. 2013;201(6):1239-1247. doi:10.2214/ajr.13.10880.
5. Georgieva MV, Wheeler SB, Erim D, et al. Comparison of the Harms, Advantages, and Costs Associated With Alternative Guidelines for the Evaluation of Hematuria. *JAMA Internal Medicine*. 2019;179(10):1352. doi:10.1001/jamainternmed.2019.2280.
6. Barocas DA, Lotan Y, Matulewicz RS, et al. Updates to Microhematuria: AUA/SUFU Guideline (2025). J Urol. 2025;213(5):547-557. doi:10.1097/JU.0000000000004490
7. Expert Panel on Urological Imaging, Whitworth P 3rd, Courtney KG, et al. ACR Appropriateness Criteria® Hydronephrosis on Prior Imaging-Unknown Cause. J Am Coll Radiol. 2024;21(6S):S144-S167. doi:10.1016/j.jacr.2024.02.020

Urinary Tract Infection (UTI) (AB-40)

Guideline	Page
Urinary Tract Infection (AB-40.0).....	264
Pyelonephritis (AB-40.1).....	265
Lower Urinary Tract Infection (AB-40.2).....	267
References (AB-40).....	269

Urinary Tract Infection (AB-40.0)

AB.UT.0040.0.A

v1.0.2026

These guidelines refer to UTI without Hematuria.

For UTI with Hematuria, see: **Hematuria and Hydronephrosis (AB-39)**

Pyelonephritis (AB-40.1)

AB.UT.0040.1.A

v1.0.2026

- CT Abdomen and Pelvis without and with contrast (CPT® 74178) or CT Abdomen and Pelvis with contrast (CPT® 74177) is medically necessary if:
 - suspected complicated: diabetes, immunocompromised, history of stones, prior renal surgery, or fever ≥ 101 F (≥ 38.5 C) OR
 - not responding to therapy after 3 days OR
 - recurrent pyelonephritis (at least 1 prior pyelonephritis) OR
 - males with first time UTI or recurrent UTI without etiology

Note:

3-D Reconstruction enhances a CT Urogram (CPT® 74178).

Requests for 3-D reconstruction (CPT® 76377 or 76376) for a CT Urogram can be considered medically necessary.

-
- MRI Abdomen without or with and without contrast (CPT® 74181 or CPT® 74183) is medically necessary if:
 - Elevated creatinine
 - Pregnant individuals should be evaluated initially by renal ultrasound (CPT® 76770 or CPT® 76775) and if further imaging is medically necessary, MRI Abdomen and Pelvis without contrast (CPT® 74181 and CPT® 72195).

Evidence Discussion

- Pyelonephritis is a clinical diagnosis and advanced imaging is often not beneficial according to guidance from the American College of Radiology and the American Urological Association, as a majority of individuals will clinically improve with appropriate antibiotic therapy.^{1,9,10}
- Advanced imaging may be medically necessary with contrasted CT (urography if requested) in individuals with complicated clinical pictures which may include immunocompromised individuals or those with diabetes mellitus, history of nephrolithiasis, prior renal surgery, or those with fever. All males with urinary tract infection are considered to have a complicated urinary tract infection and thus advanced imaging may be considered medically necessary.^{1,9,10}
- Alternative imaging with MRI of the abdomen and pelvis with and without contrast may be medically necessary if renal dysfunction is present.^{1,9,10}
- If an individual is unresponsive to therapy after 3 days, or if there is at least one prior episode of pyelonephritis, advanced imaging may be medically necessary.^{1,9,10}

- Pregnant individuals are considered high risk for complications from pyelonephritis, however first line imaging should be with renal ultrasound to avoid ionizing radiation exposure. If further imaging is felt medically necessary, MRI of the abdomen and pelvis without contrast may be performed.^{1,3,9,10}

Lower Urinary Tract Infection (AB-40.2)

AB.UT.0040.2.A

v1.0.2026

- CT Abdomen and Pelvis without and with contrast (CPT® 74178) is medically necessary if:
 - suspected complicated: diabetes, immunocompromised, history of stones, prior renal surgery, or fever ≥ 101 F (≥ 38.5 C) OR
 - not responding to therapy after 3 days OR
 - males with first time UTI or recurrent UTI without etiology OR
 - recurrent UTI ≥ 3 per year OR
 - recommendation by or in consultation with a urologist or specialist

Note: 3-D Reconstruction enhances a CT Urogram (CPT® 74178). Requests for 3-D reconstruction (CPT® 76377 or 76376) for a CT Urogram can be considered medically necessary.

- MRI Abdomen and MRI Pelvis without or with and without contrast (CPT® 74181 and CPT® 72195 or CPT® 74183 and CPT® 72197) is medically necessary if requested when ALL of the following apply:
 - Criteria (as above) for CT Abdomen and Pelvis without and with contrast are met, AND
 - Elevated creatinine
- See: **Periurethral Cysts and Urethral Diverticula (PV-13)** in the Pelvis Imaging Guidelines

Evidence Discussion

- Advanced imaging for a lower urinary tract infection is not beneficial in most clinical scenarios according to guidance from the American College of Radiology and the American Urological Association, as few individuals with cystitis will progress to an upper urinary tract infection.^{1,2,8,9}
- CT of the abdomen and pelvis with and without contrast may be medically necessary in the context of a complicated urinary tract infection, recurrent urinary tract infections (greater than 3 episodes in one year), or if recommended by a urologist or specialist.^{1,2,8,9}
- Complicated urinary tract infections may include immunocompromised individuals or those with diabetes mellitus, history of nephrolithiasis, prior renal surgery, or those with fever. All males with urinary tract infection are considered to have a complicated urinary tract infection and thus advanced imaging may be considered medically necessary.^{1,2,8,9}

- Alternative imaging with MRI of the abdomen and pelvis with and without contrast may be medically necessary if renal dysfunction is present.^{1,2,8,9}

References (AB-40)

v1.0.2026

1. Expert Panel on Urological Imaging, Smith AD, Nikolaidis P, et al. ACR Appropriateness Criteria® Acute Pyelonephritis: 2022 Update. *J Am Coll Radiol*. 2022;19(11S):S224-S239. doi:10.1016/j.jacr.2022.09.017
2. Expert Panel on Urological Imaging, Venkatesan AM, Oto A, et al. ACR Appropriateness Criteria® Recurrent Lower Urinary Tract Infections in Females. *J Am Coll Radiol*. 2020;17(11S):S487-S496. doi:10.1016/j.jacr.2020.09.003
3. Davis R, Jones JS, Barocas DA, et al. Diagnosis, Evaluation and Follow-Up of Asymptomatic Microhematuria (AMH) in Adults: AUA Guideline. *Journal of Urology*. 2012;188(6s):2473-2481. doi:10.1016/j.juro.2012.09.078.
4. Silverman SG, Leyendecker JR, Amis ES. What Is the Current Role of CT Urography and MR Urography in the Evaluation of the Urinary Tract? *Radiology*. 2009;250(2):309-323. doi:10.1148/radiol.2502080534.
5. Hooton TM. Uncomplicated Urinary Tract Infection. *New England Journal of Medicine*. 2012;366(11):1028-1037. doi:10.1056/nejmcp1104429.
6. Suskind AM, Saigal CS, Hanley JM, Lai J, Setodji CM, Clemens JQ. Incidence and Management of Uncomplicated Recurrent Urinary Tract Infections in a National Sample of Women in the United States. *Urology*. 2016;90:50-55. doi:10.1016/j.urology.2015.11.051.
7. Gupta K, Hooton TM, Naber KG, et al. International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. *Clinical Infectious Diseases*. 2011;52(5). doi:10.1093/cid/ciq257.
8. Anger JT, Bixler BR, Holmes RS, Lee UJ, Santiago-Lastra Y, Selph SS. Updates to Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline. *J Urol*. 2022;208(3):536-541. doi:10.1097/JU.0000000000002860
9. Expert Panel on Urological Imaging, Wolfman DJ, Marko J, et al. ACR Appropriateness Criteria® Hematuria. *J Am Coll Radiol*. 2020;17(5S):S138-S147. doi:10.1016/j.jacr.2020.01.028

Patent Urachus (AB-41)

Guideline	Page
Patent Urachus (AB-41.1).....	271

Patent Urachus (AB-41.1)

AB.41.1.A**v1.0.2026**

For evaluation of suspected patent urachus, see: **Patent Urachus (PV-23.1)** in the Pelvis Imaging Guidelines.

Transplant (AB-42)

Guideline	Page
Liver Transplant, Pre-Transplant (AB-42.1).....	273
Liver Transplant, Living Donor Pre-Transplant Imaging (Donor Imaging) (AB-42.2).....	283
Liver Transplant, Post-Transplant Imaging (AB-42.3).....	284
Post-Transplant Lymphoproliferative Disorder (PTLD) (AB-42.4).....	288
Kidney Transplant, Pre-Transplant Imaging Studies (AB-42.5).....	289
Kidney Transplant, Post-Transplant (AB-42.6).....	293
Heart Transplant (AB-42.7).....	294
References (AB-42).....	295

Liver Transplant, Pre-Transplant (AB-42.1)

AB.TX.0042.1.A

v1.0.2026

- Individuals **WITHOUT hepatocellular carcinoma (HCC)** referred to a transplant center for liver transplant evaluation can undergo advanced imaging as follows:
 - Per the transplant institution's protocol, OR
 - Per the studies and intervals listed below:

Imaging Study	Interval	Comments
Both of the following US studies: - Abdominal US (CPT[®] 76700 or CPT[®] 76705) and - Doppler (CPT[®] 93975)	Every 6 months	
ONE of the following abdomen/pelvis advanced imaging studies: - CT Abdomen (CPT[®] 74160 or CPT[®] 74170) - MRI Abdomen (CPT[®] 74183)	- Annually - Individuals with known cholangiocarcinoma may have more frequent repeat of studies at left per institution's protocol	
Additional abdomen/pelvis advanced imaging, for individuals on the transplant list with known Primary Sclerosing Cholangitis (PSC): MRCP (See: MRCP (AB-27.1) for acceptable CPT[®] codes)	Per the transplant institution's protocol	

Imaging Study	Interval	Comments
CT Chest with or without contrast (CPT® 71260 or CPT® 71250)	- One-time - Individuals with known cholangiocarcinoma may have more frequent repeat of studies at left per institution's protocol	Repeat studies based on clinical indications per Chest Imaging Guidelines
ONE of the following: - MRI Bone Marrow Blood Supply (CPT® 77084) or - Bone scan (CPT® 78306)	One-time	
Echocardiography with ONE of the following: - CPT® 93306 (preferred) - CPT® 93307 - CPT® 93308	Annually	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications
CT Coronary angiography (CCTA) (CPT® 75574)	Annually	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications
Stress imaging in place of but not in addition to CT Coronary angiography (CCTA) - ONE of the following: - CPT® 93350 - CPT® 93351 - CPT® 78452 - CPT® 75563 - CPT® 78492 - CPT® 78431	Annually	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications

Imaging Study	Interval	Comments
For individuals with systemic amyloidosis: - Cardiac MRI – ONE of the following: - CPT[®] 75557 - CPT[®] 75561 - If Cardiac MRI is contraindicated or indeterminate, ONE of the following SPECT studies may be performed: - CPT[®] 78803 - CPT[®] 78830	One-time	See: <u>Cardiac Imaging in Transplant CD-16</u> for descriptions of CPT codes or further indications
If required to further assess CAD seen on a recent CCTA that is of uncertain physiologic significance, CT-FFR (Noninvasive estimated coronary fractional flow reserve derived from coronary computed tomography angiography) with ONE of the following: - CPT[®] 0501T - CPT[®] 75580	One-time	See: <u>Cardiac Imaging in Transplants CD-16</u> for descriptions of CPT codes or further indications

Imaging Study	Interval	Comments
In place of CT Coronary angiography or stress imaging for initial pre-transplant evaluation, OR If CT Coronary angiography and/or CT-FFR or stress imaging is abnormal WITH addition of right heart catheterization if requested for evaluation of pulmonary hypertension: ◦ Left heart catheterization or left and right heart catheterization with ONE of the following: ▪ CPT[®] 93458 ▪ CPT[®] 93454 ▪ CPT[®] 93460 ▪ CPT[®] 93456 ◦ Or if prior CABG, with ONE of the following: ▪ CPT[®] 93459 ▪ CPT[®] 93455 ▪ CPT[®] 93461 ▪ CPT[®] 93457	◦ One-time	Repeat studies as per <u>Cardiac Imaging in Transplant CD-16</u>
ONE of the following, for vascular evaluation in anticipation of transplant: ◦ CTA (CPT[®] 74175) ◦ MRA Abdomen (CPT[®] 74185)	◦ One-time	

Imaging Study	Interval	Comments
ANY of the following may be performed immediately prior to transplant: ◦ Abdominal US (CPT[®] 76700 or CPT[®] 76705) AND Doppler (CPT[®] 93975) ◦ CT Abdomen (CPT[®] 74160 or CPT[®] 74170) OR MRI Abdomen (CPT[®] 74183) ◦ CT Abdomen and Pelvis (CPT[®] 74177) or CT Pelvis (CPT[®] 72193) ◦ CTA (CPT[®] 74175) OR MRA Abdomen (CPT[®] 74185)	◦ Once, immediately prior to transplant	

- Individuals **WITH hepatocellular carcinoma (HCC)** referred to a transplant center for liver transplant evaluation can undergo advanced imaging as follows:
 - Per the transplant institution's protocol, OR
 - Per the studies and intervals listed below:

Imaging Study	Interval	Comments
Both of the following US studies: ◦ Abdominal US (CPT[®] 76700 or CPT[®] 76705) and ◦ Doppler (CPT[®] 93975)	◦ Every 6 months	

Imaging Study	Interval	Comments
ONE of the following abdomen/pelvis advanced imaging studies: ◦ CT Abdomen (CPT[®] 74160 or CPT[®] 74170) ◦ MRI Abdomen (CPT[®] 74183)	◦ Every 3 months ▪ Can be approved at interval as requested according to the transplant center's protocol for waitlisted individuals under active locoregional therapy to control tumor growth (i.e., tumor ablation)	
◦ CT Chest with contrast (CPT[®] 71260)	◦ Every 6 months ▪ Can be approved at interval as requested according to the transplant center's protocol for waitlisted individuals under active locoregional therapy to control tumor growth (i.e., tumor ablation)	
◦ Bone Scan (CPT[®] 78306)	◦ Every 6 months	
Echocardiography with ONE of the following: ◦ CPT[®] 93306 (preferred) ◦ CPT[®] 93307 ◦ CPT[®] 93308	◦ Annually	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications
CT Coronary angiography (CCTA) (CPT [®] 75574)	◦ Once in 3 years	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications

Imaging Study	Interval	Comments
Stress imaging in place of but not in addition to CT Coronary angiography (CCTA) - ONE of the following: ◦ CPT[®] 93350 ◦ CPT[®] 93351 ◦ CPT[®] 78452 ◦ CPT[®] 75563 ◦ CPT[®] 78492 ◦ CPT[®] 78431	◦ Annually	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications
For individuals with systemic amyloidosis: ◦ Cardiac MRI – ONE of the following: ▪ CPT[®] 75557 ▪ CPT[®] 75561 ◦ If Cardiac MRI is contraindicated or indeterminate, ONE of the following SPECT studies may be performed: ▪ CPT[®] 78803 ▪ CPT[®] 78830	◦ One-time	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications

Imaging Study	Interval	Comments
If required to further assess CAD seen on a recent CCTA that is of uncertain physiologic significance, CT-FFR (Noninvasive estimated coronary fractional flow reserve derived from coronary computed tomography angiography) with ONE of the following: ◦ CPT[®] 0501T ◦ CPT[®] 75580	◦ One-time	See: Cardiac Imaging in Transplant CD-16 for descriptions of CPT codes or further indications

Imaging Study	Interval	Comments
In place of CT Coronary angiography or stress imaging for initial pre-transplant evaluation, OR If CT Coronary angiography and/or CT-FFR or stress imaging is abnormal WITH addition of right heart catheterization if requested for evaluation of pulmonary hypertension: ◦ Left heart catheterization or left and right heart catheterization with ONE of the following: ▪ CPT[®] 93458 ▪ CPT[®] 93454 ▪ CPT[®] 93460 ▪ CPT[®] 93456 ◦ Or if prior CABG, with ONE of the following: ▪ CPT[®] 93459 ▪ CPT[®] 93455 ▪ CPT[®] 93461 ▪ CPT[®] 93457	◦ One-time	Repeat studies as per <u>Cardiac Imaging in Transplant CD-16</u>

Imaging Study	Interval	Comments
ANY of the following may be performed immediately prior to transplant: ◦ Abdominal US (CPT[®] 76700 or CPT[®] 76705) AND Doppler (CPT[®] 93975) ◦ CT Abdomen (CPT[®] 74160 or CPT[®] 74170) OR MRI Abdomen (CPT[®] 74183) ◦ CT Abdomen and Pelvis (CPT[®] 74177) or CT Pelvis (CPT[®] 72193) ◦ CTA (CPT[®] 74175) OR MRA Abdomen (CPT[®] 74185) ◦ MRI Bone Marrow Blood Supply (CPT[®] 77084)	◦ Once, immediately prior to transplant	

Liver Transplant, Living Donor Pre-Transplant Imaging (Donor Imaging) (AB-42.2)

AB.TX.0042.2.A

v1.0.2026

- CT Abdomen with contrast (CPT® 74160) OR CT Abdomen without and with contrast (CPT® 74170) OR MRI Abdomen without and with contrast (CPT® 74183) is medically necessary to assess liver anatomy and volumetrics.
- MRCP is medically necessary to assess biliary anatomy (See: **MRCP (AB-27.1)** for proper coding)
- CTA Abdomen without and with contrast (CPT® 74175) OR MRA Abdomen without and with contrast (CPT® 74185) is medically necessary to assess vascular anatomy.
- For donor imaging post-transplant, imaging is medically necessary per transplant center protocol. If no transplant center protocol exists, see condition-specific guideline appropriate to the individual's signs and symptoms.

Evidence Discussion

Living donor liver transplantation (LDLT) has become a widely accepted solution to alleviate the ongoing shortage of cadaveric livers for deceased donor liver transplantation (DDLT). Radiologic evaluation plays a crucial role in assessing both donor candidates and recipients to confirm their eligibility and determine the most suitable surgical approach.⁵⁴

A comprehensive pre-operative assessment of the vascular, liver volume, and biliary anatomy is vital for the safe and successful harvesting, transplantation, and long-term success of the graft. Computed tomography (CT) and magnetic resonance imaging (MRI) are the preferred imaging techniques for this purpose. These cross-sectional methods offer detailed views of the vascular and biliary structures, assess the hepatic parenchyma, and enable volumetric analysis.^{16,55}

LDLT evaluation typically combine MRI/MRCP and CT to leverage the higher spatial resolution of CT for arterial evaluation and the superior soft tissue, parenchymal and biliary analysis provided by MRI. Besides examining the liver parenchyma for abnormalities such as steatosis, a detailed evaluation of the hepatic volume, vascular and biliary system for significant anatomic variants is essential, as these variants can influence surgical techniques and outcomes for both recipients and donors.⁵⁶

Liver Transplant, Post-Transplant Imaging (AB-42.3)

AB.TX.0042.3.A

v1.0.2026

- Cardiac Imaging:
 - See: **Cardiac Imaging in Transplants CD-16** in the Cardiac Imaging Guidelines
- Suspected post-operative complications:
 - Vascular thrombosis (suspected hepatic artery thrombosis) imaging is medically necessary as follows:
 - Doppler ultrasound (CPT® 93975)
 - CTA Abdomen without and with contrast (CPT® 74175) OR MRA Abdomen without and with contrast (CPT® 74185)
 - Suspicion of biliary anastomotic strictures:
 - MRCP (See: **MRCP (AB-27.1)** for appropriate CPT codes)
 - Vascular imaging as above for vascular thrombosis may also be requested and considered medically necessary for this indication
 - Other suspected post-operative complications (e.g., infection, etc.)
 - Imaging as requested by the transplant institution or team
- Transplant individuals without prior HCC or cholangiocarcinoma:
 - Routine post-transplant imaging is not medically necessary.
 - If cirrhosis develops post-transplant:
 - See: **Cirrhosis and Liver Screening for Hepatocellular Carcinoma (HCC) (AB-26.1)**, **Ascites (AB-26.2)**, and **Portal Hypertension (AB-26.3)** for HCC screening guidelines.
 - Fibrosis assessment post-liver transplant:
 - Transient elastography (CPT® 91200) is medically necessary, which is the most studied modality in this setting.
- Surveillance after transplant for HCC is medically necessary as follows:
 - Based on RETREAT score
 - 0 points: No additional screening needed
 - 1-3 points: CT or MRI Abdomen (CPT® 74160, or CPT® 74170, or CPT® 74183) and CT Chest (CPT® 71260 or CPT® 71250) every 6 months for 2 years.
 - 4 points: CT or MRI Abdomen (CPT® 74160, or CPT® 74170, or CPT® 74183) and CT Chest (CPT® 71260 or CPT® 71250) every 6 months for 5 years
 - ≥5 points: CT or MRI Abdomen (CPT® 74160, or CPT® 74170, or CPT® 74183) and CT Chest (CPT® 71260 or CPT® 71250) every 3 months for 2 years, then every 6 months between the 2nd and 5th years.

- If there is a suspicion of recurrent tumor based on clinical findings and/or sequentially increasing AFP:
 - CT Abdomen (CPT[®] 74160 or CPT[®] 74170) or MRI Abdomen (CPT[®] 74183) is medically necessary
- Imaging after transplant for primary sclerosing cholangitis (PSC):
 - Suspected recurrence of PSC;
 - MRCP (See: **MRCP (AB-27.1)** for proper coding)
- Imaging after transplant for cholangiocarcinoma is medically necessary as follows:
 - Liver ultrasound (CPT[®] 76705 or CPT[®] 76700) or MRI Abdomen and MRCP (CPT[®] 74183) every 6 months for 5 years post-transplantation.
 - CT Chest (CPT[®] 71250 or CPT[®] 71260) every 6 months for 5 years post-transplantation

Background and Supporting Information

Consensus guidelines regarding post-transplant surveillance imaging have not yet been established. There have been recent attempts to establish evidence-based guidelines, including the development of the RETREAT score, validated recently in a study conducted at University of California, San Francisco, Mayo Clinic-Rochester, and Mayo Clinic-Jacksonville. This scoring system has been adopted for use by UCSF and guides post-transplant imaging for individuals who have undergone transplant for HCC.

The RETREAT score is a protocol used to estimate the risk of tumor recurrence after liver transplantation in individuals who have been transplanted for the treatment of hepatocellular carcinoma. It is comprised of three factors which are assessed before and after transplant. Points are assigned based on criteria which include the alpha-fetoprotein level before liver transplantation, the presence or absence of microvascular invasion, and the sum of the diameter of the largest viable tumor and the number of viable nodules on pathologic examination of the explant liver.

The RETREAT score is obtained by adding the total number of points scored in each of the 3 variables (range 0-8). For example: RETREAT score=0 if the individual has AFP 0-20 ng/mL at LT, no vascular invasion and no viable tumor in the explant.

The RETREAT score is calculated as follows:

Risk Factor	Score
Alpha-fetoprotein level before LT	
0-20	0
21-99	1

Risk Factor	Score
100-999	2
≥1000	3
Microvascular invasion present	2
Sum of the diameter of the largest viable tumor and the number of viable nodules	
0	0
1.1-4.9	1
5.0-9.9	2
≥10	3

Evidence Discussion

Clinical manifestations of liver transplant complications can be subtle and non-specific and medical imaging plays an important role. Often, a rise in liver enzymes is the earliest sign of graft problems, allowing for timely clinical intervention to protect allograft function.^{20-22,24-30,32,33}

Throughout the lifetime of a post liver transplant individual, complications affecting the liver allograft could be caused by vascular and biliary complications, immune-mediated injury, drug-related issues, infectious complications, and recurrence of the primary liver disease.^{20-22,24-30,32,33}

Thus, managing these individuals depends on a thorough clinical history, symptoms, laboratory data, and imaging studies; at times multiple imaging modalities are required.

There is no specific consensus of what type, or when a post liver transplant individual will need or require an imaging test and it typically depends on post liver transplant imaging protocols specific to a transplant centre, or abnormal laboratory tests.^{20-22,24-30,32,33}

However, as standard practice, ultrasound sonography plus colour-Doppler ultrasound examination is routinely performed at 24–48 h, on the 7th day and 21st day (Mayo Clinic protocol), and on the first and third month after transplantation to evaluate the

liver parenchyma and vascular structures integrity. The frequency and indication vary between transplant centres, and post-transplant protocols.^{20-22,24-30,32,33}

In addition, testing is performed anytime there is an unexpected change in liver enzymes potentially including additional testing such as CT imaging and MR imaging techniques, including contrast-enhanced CT or MR angiography and MR cholangiography to further evaluate the transplanted liver. These tests can reveal abnormalities in vascular structures, bile ducts, liver parenchyma, and extrahepatic tissues.^{20-22,24-30,32-33}

In the case of a history of pre-liver transplant hepatocellular carcinoma (HCC), even with adherence to Milan criteria, HCC recurs post-LT in 10%–15% and is the most common cause of death in this population.^{20-22,24-30,32,33}

A multicenter analysis has proposed and validated a risk stratification score, Risk Estimation of Tumor Recurrence After Transplant (RETREAT), which incorporates AFP at LT, vascular invasion, the sum of the largest viable tumor diameter, and number of viable tumors on explant.^{20-22,24-30,32,33}

RETREAT stratifies 5-year recurrence risk from <3% in individuals without viable tumor on explant or microvascular invasion and AFP <20ng/ml (i.e., RETREAT 0) up to 75% in the highest-risk individuals (RETREAT≥5).⁶

In this population, because the two most common sites of post-transplant recurrence are the lung (~40%) followed by the liver (33%), surveillance is advised. The AASLD advises surveillance for detection of post-transplant HCC recurrence using multiphasic contrast-enhanced abdominal CT or MRI and chest CT scan. The optimal timing and duration of post-transplant surveillance is uncertain; however, risk scores may be considered to guide decisions.^{20-22,24-30,32,33}

Beyond allograft-related complications, metabolic syndrome, cardiovascular disease, renal dysfunction, and malignancies are leading causes of morbidity and mortality in this individual population. These individuals will require cardiovascular evaluation, breast cancer, and lung cancer surveillance per individual risk and transplant centre expert team recommendations as some individuals could carry a slightly higher risk than the non-transplant population.^{20-22,24-30,32,33}

Post-Transplant Lymphoproliferative Disorder (PTLD) (AB-42.4)

AB.TX.0042.4.A

v1.0.2026

- CT Chest with contrast (CPT[®] 71260) and CT Abdomen and Pelvis with contrast (CPT[®] 74177) is medically necessary for known or suspected PTLD.
- Additional evaluation of suspected PTLD is the same as the evaluation of lymphoma. See: **Post-Transplant Lymphoproliferative Disorders (ONC-27.9)** in the Oncology Imaging Guidelines for further recommendations
- Routine use of imaging to screen for PTLD is not medically necessary as there is insufficient supporting evidence.

Background and Supporting Information

- Post-transplant lymphoproliferative disease (PTLD) is a major complication of solid organ transplantation and the spectrum ranges from benign hyperplasia to malignant lymphoma. It has an incidence of 1-20%, and is usually related to Epstein-Barr virus infection in the setting of immunosuppression.

Evidence Discussion

For suspected PTLD advanced imaging studies are extremely helpful. CT Chest/ Abdomen/Pelvis with contrast are the mainstay for known or suspected PTLD. PTLD generally is rapid growing and small ill-defined masses of lymphoid tissue cannot be initially identified on sonography. Since PTLD has the potential of being reversed by decreasing immunosuppression, early detection with more advanced imaging can very beneficial.³⁷

Kidney Transplant, Pre-Transplant Imaging Studies (AB-42.5)

AB.TX.0042.5.A

v1.0.2026

Pre-Transplant Evaluation (Per Institution Protocol)

- Individuals referred to a transplant center for kidney or kidney-pancreas transplant evaluation can undergo advanced imaging as follows:
 - Per the transplant institution's protocol, OR
 - Per the studies and intervals listed below:

Imaging Study	Interval	Comments
ONE of the following abdomen/pelvis imaging studies is medically necessary: - CT Abdomen and Pelvis without contrast (CPT[®] 74176) - CT Abdomen and Pelvis with contrast (CPT[®] 74177) - CTA Abdomen without and with (CPT[®] 74175) - CTA Abdomen and Pelvis (CPT[®] 74174) - CTA Pelvis without and with (CPT[®] 72191)	One-time	
ONE of the following echocardiography studies is medically necessary: - CPT[®] 93306 (preferred) - CPT[®] 93307 - CPT[®] 93308	Annual	See also: <u>Cardiac Imaging in Transplant CD-16</u> for descriptions of CPT codes or further indications
ONE of the following stress imaging studies is medically necessary: - CPT[®] 93350 - CPT[®] 93351 - CPT[®] 78452 - CPT[®] 75563 - CPT[®] 78492 - CPT[®] 78431	Annual	See also: <u>Cardiac Imaging in Transplant CD-16</u> for descriptions of CPT codes or further indications

Additional Pre-Transplant Evaluation (Per Indication)

Individuals referred to a transplant center for kidney or kidney-pancreas transplant evaluation can undergo the following additional advanced imaging when the listed indications are met:

Indication	Imaging Study	Interval	Comments
20 pack-year history of smoking	ONE of the following is medically necessary: - CT Chest without contrast (CPT[®] 71250) - CT Chest with contrast (CPT[®] 71260)	One-time	For lung cancer screening with Low Dose Computed Tomography (LDCT), see: <u>U.S. Preventative Services Task Force: Lung Cancer Screening (Commercial and Medicaid) (CH-33.1)</u>
Autosomal dominant polycystic kidney disease	ONE of the following is medically necessary: - MRA Head (CPT[®] 70544, 70545, or 70546) - CTA Head (CPT[®] 70496)	One-time	Repeat imaging as per <u>Intracranial Aneurysms (HD-12.1)</u>
- History of stroke, or - History of TIA, or - Carotid bruit on exam	ONE of the following is medically necessary: Carotid duplex bilateral study (CPT[®] 93880 or CPT[®] 73882)	One-time	Repeat imaging as per <u>Initial Imaging (PVD-3.1)</u>
Presence of systemic amyloidosis	ONE of the following cardiac MRI studies is medically necessary: - CPT[®] 75557 - CPT[®] 75561	One-time	See also: <u>Cardiac Imaging in Transplant CD-16</u> for descriptions of CPT codes or further indications

Indication	Imaging Study	Interval	Comments
BOTH of the following: • Presence of systemic amyloidosis AND • Cardiac MRI is either contraindicated or indeterminate	ONE of the following nuclear medicine studies is medically necessary: • CPT[®] 78803 • CPT[®] 78830	One-time	See also: <u>Cardiac Imaging in Transplant CD-16</u> for descriptions of CPT codes or further indications
• In place of stress imaging for initial pre-transplant evaluation, or • Stress imaging is positive for ischemia	ONE of the following heart catheterization is medically necessary: • CPT[®] 93458 • CPT[®] 93454 • If prior CABG: ◦ CPT[®] 93459 ◦ CPT[®] 93455	One-time	Repeat imaging as per <u>Cardiac Imaging in Transplant CD-16</u>

Kidney Donor Nephrectomy or Pre-Transplant Nephrectomy

Indication	Imaging Study	Comments
• Individuals being evaluated for living kidney donation, or • Individual is planning removal of one or both kidneys	ONE of the following is medically necessary: • CTA Abdomen (CPT[®] 74175) • MRA Abdomen (CPT[®] 74185) • MRI Abdomen without and with contrast (CPT[®] 74183)	For CTA and MRA, 3D rendering is included with the original study

Evidence Discussion

Individuals being assessed for kidney or kidney-pancreas transplant require advanced imaging of the abdomen and/or pelvis either with or without contrast (to include angiography). This allows assessment of any intra-abdominal pathology, which may complicate transplantation. MR angiography may be indicated for assessment of the

native kidneys when considering pre-transplant nephrectomy. Individuals may also be assessed according to the standardized imaging protocol of the transplant center.¹⁴⁻¹⁸

Although there is some debate regarding coronary artery disease (CAD) screening and transplant outcomes, a preoperative cardiac workup is essential for prognostication given the significant association with chronic kidney disease (CKD) and CAD. This may include a transthoracic echocardiogram as well as a stress echocardiogram and/or cardiac catheterization.¹⁴⁻¹⁸

Cardiac MRI can be performed in individuals with systemic amyloidosis, as cardiac involvement is the leading cause of morbidity and mortality. If the MRI is indeterminate or contraindicated, myocardial Tc-99m pyrophosphate imaging may be performed.¹⁴⁻¹⁸

Individuals with an extensive smoking history of greater than 20 pack-years may undergo CT of the chest (either with or without contrast), which is guided by evidence of the National Lung Screening Trial to reduce risk of mortality.¹⁴⁻¹⁸

Any individual with a history of transient ischemic attack (TIA) or stroke may undergo a carotid duplex study for preoperative assessment. Individuals with autosomal dominant polycystic kidney disease (ADPKD) may undergo MR or CT angiography of the head to screen for aneurysms.¹⁴⁻¹⁸

Individuals being assessed for kidney donation should have advanced abdominal imaging with CT or MR angiography to assess kidney size and vasculature.¹⁴⁻¹⁸

Kidney Transplant, Post-Transplant (AB-42.6)

AB.TX.0042.6.A

v1.0.2026

- Ultrasound of transplanted kidney:
 - Current ultrasound imaging protocols of the transplanted kidney commonly include a Doppler study and are coded as CPT® 76776.
 - Do not report non-invasive vascular codes CPT® 93975 and CPT® 93976 in conjunction with CPT® 76776.
 - Ultrasound of the transplanted kidney performed without duplex Doppler should be reported as a limited retroperitoneal ultrasound (CPT® 76775).

Evidence Discussion

- Imaging evaluation of the transplanted kidney may be necessary for routine surveillance or to allow for early diagnosis of post-transplant complications or graft dysfunction.¹⁴⁻¹⁸
- The preferred initial imaging is duplex ultrasound with Doppler as this provides readily-available, reliable imaging which is non-invasive and does not require the use of ionizing radiation nor intravenous contrast.¹⁴⁻¹⁸

Heart Transplant (AB-42.7)

AB.TX.0042.7.A

v1.0.2026

- For cardiac transplant imaging indications, see: **Cardiac Imaging in Transplants (CD-16)**

References (AB-42)

v1.0.2026

1. Carruso S, Miraglia R, et al. Imaging in liver transplantation. *World Journal of Gastroenterology*. 2009;15(6):675-683.
2. Pomfret E, Washburn K, Wald C, et al. Report of a national conference on liver allocation in patients with hepatocellular carcinoma in the United States. *Liver Transplant*. 2010;16(3):262-78.
3. Sahani D, Mehta A, Blake M, et al. Preoperative hepatic vascular evaluation with CT and MR angiography: implications for surgery. *RadioGraphics*. 2004;24:1367-1380. 2017.
4. Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for management of EBV-associated post-transplant lymphoproliferative disease (PTLD) in solid organ transplant.
5. Lucey, Michael, et al. Long-Term Management of the Successful Adult Liver Transplant: 2012 Practice Guideline by AASLD and the American Society of Transplantation.
6. Mehta N, Heimbach J, Harnois DM, et al. Validation of a Risk Estimation of Tumor Recurrence After Transplant (RETREAT) Score for Hepatocellular Carcinoma Recurrence After Liver Transplant. *JAMA Oncology*. 2017;3(4):493. doi:10.1001/jamaoncol.2016.5116.
7. Filgueira NA. Hepatocellular carcinoma recurrence after liver transplantation: Risk factors, screening and clinical presentation. *World Journal of Hepatology*. 2019;11(3):261-272. doi:10.4254/wjh.v11.i3.261.
8. Xu M, Doyle MM, Banan B, et al. Neoadjuvant Locoregional Therapy and Recurrent Hepatocellular Carcinoma after Liver Transplantation. *Journal of the American College of Surgeons*. 2017;225(1):28-40. doi:10.1016/j.jamcollsurg.2017.03.015.
9. Cai L, Yeh BM, Westphalen AC, Roberts JP, Wang ZJ. Adult living donor liver imaging. *Diagnostic and Interventional Radiology*. 2016;22(3):207-214. doi:10.5152/dir.2016.15323.
10. Liu D, Chan ACY, Fong DYT, Lo C-M, Khong P-L. Evidence-Based Surveillance Imaging Schedule After Liver Transplantation for Hepatocellular Carcinoma Recurrence. *Transplantation*. 2017;101(1):107-111. doi:10.1097/tp.0000000000001513.
11. Bajer L, Slavcev A, Macinga P, et al. Risk of recurrence of primary sclerosing cholangitis after liver transplantation is associated with de novo inflammatory bowel disease. *World Journal of Gastroenterology*. 2018;24(43):4939-4949. doi:10.3748/wjg.v24.i43.4939.
12. Ligeti K, Müller LP, Müller-Tidow C, Weber T. Risk factors, diagnosis, and management of posttransplant lymphoproliferative disorder: improving patient outcomes with a multidisciplinary treatment approach. *Transplant Research and Risk Management*. 2017;Volume 9:1-14. doi:10.2147/trrm.s84744.
13. Aghayev A, Gupta S, Dabiri BE, Steigner ML. Vascular imaging in renal donors. *Cardiovascular Diagnosis and Therapy*. 2019;9(S1). doi:10.21037/cdt.2018.11.02.
14. Sawinski D, Locke JE. Evaluation of Kidney Donors: Core Curriculum 2018. *American Journal of Kidney Diseases*. 2018;71(5):737-747. doi:10.1053/j.ajkd.2017.10.018.
15. Kidney Disease: Improving Global Outcomes (KDIGO) Kidney Transplant Candidate Work Group. KDIGO Clinical Practice Guideline on the Evaluation and Management of Candidates for Kidney Transplantation. *Transplantation*. 2020;104: S1 – S103.
16. Cheng XS, VanWagner LB, Costa SP, et al. Emerging evidence on coronary heart disease screening in kidney and liver transplantation candidates: a scientific statement from the American Heart Association. *Circulation*. 2022;146:e299–e324. doi.org/10.1161/CIR.0000000000001104.
17. Kumamaru KK, Kondo T, Kumamaru H, et al. Repeat coronary computed tomographic angiography in patients with a prior scan excluding significant stenosis. *Circ Cardiovasc Imaging*. 2014;7:788-795. doi.org/10.1161/CIRCIMAGING.113.001549.
18. VanWagner LB, Harinstein ME, Runo JR, et al. Multidisciplinary approach to cardiac and pulmonary vascular disease risk assessment in liver transplantation: An evaluation of the evidence and consensus recommendations. *Am J Transplant*. 2018;18:30–42. doi.org/10.1111/ajt.14531.
19. Löffler AI, Gonzalez JA, Sundararaman SK, et al. Coronary computed tomography angiography demonstrates a high burden of coronary artery disease despite low-risk nuclear studies in pre-liver transplant evaluation. *Liver Transplantation*. 2020; 26(11):1398–1408. doi.org/10.1002/lt.25869.

20. Harding-Theobald E, Kriss M. Evaluation and management of abnormal liver enzymes in the liver transplant recipient: When, why, and what now? *Clin Liver Dis (Hoboken)*. 2023;21(6):178-186.
21. Hernandez Mdel P, Martin P, Simkins J. Infectious complications after liver transplantation. *Gastroenterol Hepatol (NY)*. 2015;11:741-53.
22. Delgado-Moraleda JJ, Ballester-Vallés C, Marti-Bonmati L. Role of imaging in the evaluation of vascular complications after liver transplantation. *Insights Imaging*. 2019;78:10.
23. Singh AK, Nachiappan AC, Verma HA, et al. Postoperative imaging in liver transplantation: what radiologists should know. *RadioGraphics*. 2010;30(2):339-351.
24. Girometti R, Como G, Bazzocchi M, Zuiani C. Post-operative imaging in liver transplantation: State-of-the-art and future perspectives. *World J Gastroenterol*. 2014;20(20):6180-6200.
25. Di Martino M, Rossi M, Mennini G, et al. Imaging follow-up after liver transplantation. *Br J Radiol*. 2016;89(1064):20151025.
26. Lucey MR, Terrault N. Long-term management of the successful adult liver transplant: 2012 practice guideline by the American Association for the Study of Liver Diseases and the American Society of Transplantation Liver Transplantation. 2013;19(1):3-26.
27. Singh S, Watt KD. Long-term medical management of the liver transplant recipient: what the primary care physician needs to know. *Mayo Clin Proc*. 2012;87(8):779-90.
28. Singal AG, Llovet JM, Yarchoan M, et al. AASLD Practice Guidance on prevention, diagnosis, and treatment of hepatocellular carcinoma. *Hepatology*. 2023;78(6):1922-1965.
29. Agostini C, Bucciante S, Risaliti M, et al. Complications in post-liver transplant patients. *J Clin Med*. 2023;12(19):6173.
30. Berry PA, Melendez HV, Wendon JA. Postoperative care of the liver-transplant patient. *Surgical Intensive Care Medicine*. 2010:629-38.
31. Ito K, Siegelman ES. MR imaging of complications after liver transplantation. *American Journal of Roentgenology*. 2000;175(4):943-1191.
32. Brookmeyer CE, Bhatt S, Fishman EK, Sheth S. Multimodality imaging after liver transplant: top 10 important complications. *RadioGraphics*. 2022;42(3):702-721.
33. Mohan R, Rice J. A practical approach to extrahepatic cancer screening before and after liver transplant. *Clin Liver Dis (Hoboken)*. 2023;21(6):169-172.
34. Keshtkar A, Karbasian F, Reihani H, et al. A pediatric case series of catastrophic gastrointestinal complications of posttransplant lymphoproliferative disease with increasing incidence, high association with coronavirus disease 2019, higher mortality, and a plea for early endoscopy to prevent late fatal outcome. *J Med Case Rep*. 2023;17(1):396.
35. Keshtkar A, Karbasian F, Reihani H, et al. *J Med Case Rep*. 2023;17(1):396. doi:10.1186/s13256-023-04123-5.
36. Lee M, Abousaud A, Harkins RA, et al. Important considerations in the diagnosis and management of post-transplant lymphoproliferative disorder. *Curr Oncol Rep*. 2023;25(8):883-895.
37. Dharnidharka VR, Webster AC, Martinez OM, Preiksaitis JK, Leblond V, Choquet S. Post-transplant lymphoproliferative disorders. *Nat Rev Dis Primers*. 2016;2:15088. doi:10.1038/nrdp.2015.88.
38. Marcellis L, Tousseyn T. The tumor microenvironment in post-transplant lymphoproliferative disorders. *Cancer Microenviron*. 2019;12(1):3-16. doi:10.1007/s12307-018-00219-5.
39. Morscio J, Tousseyn T. Recent insights in the pathogenesis of post-transplantation lymphoproliferative disorders. *World J Transplant*. 2016;6(3):505-16. doi:10.5500/wjt.v6.i3.505.
40. Styczynski J, van der Velden W, Fox CP, et al. Sixth European Conference on Infections in Leukemia, a joint venture of the Infectious Diseases Working Party of the European Society of Blood and Marrow Transplantation (EBMT-IDWP), the Infectious Diseases Group of the European Organization for Research and Treatment of Cancer (EORTC-IDG), the International Immunocompromised Host Society (ICHS) and the European Leukemia Net (ELN). Management of Epstein-Barr Virus infections and post-transplant lymphoproliferative disorders in patients after allogeneic hematopoietic stem cell transplantation: Sixth European Conference on Infections in Leukemia (ECIL-6) guidelines. *Haematologica*. 2016;101(7):803-11. doi:10.3324/haematol.2016.144428.
41. Marie E, Navallas M, Navarro OM, et al. Posttransplant Lymphoproliferative disorder in children: a 360-degree perspective. *Radiographics*. 2020;40(1):241-265. doi:10.1148/rp.2020190103.
42. Vrachliotis TG, Vaswani KK, Davies EA, Elkahammas EA, Bennett WF, Bova JG. CT findings in posttransplantation lymphoproliferative disorder of renal transplants. *AJR Am J Roentgenol*. 2000;175(1):183-8. doi:10.2214/ajr.175.1.1750183.

43. Martin P, DiMartini A, Feng S, Brown Jr. R, Fallon M. Evaluation for liver transplantation in adults: 2013 practice guideline by the American Association for the Study of Liver Diseases and the American Society of Transplantation. *Hepatology*. 2014;59(3):p 1144-1165. doi:10.1002/hep.26972.
44. Hashem B. El-Serag, MD, MPH, Surveillance for hepatocellular carcinoma: in whom and how? *Therap Adv Gastroenterol*. 2011;4(1):5-10.
45. Kubota K, Ina H, Okada Y, Irie T. Growth rate of primary single hepatocellular carcinoma: determining optimal screening interval with contrast enhanced computed tomography. *Dig Dis Sci*. 2003;48: 581-586.
46. Bacon BR, Adams PC, Kowdley KV, Powell LW, Tavill AS. Diagnosis and management of hemochromatosis: 2011 Practice Guideline by the American Association for the Study of Liver Diseases. *Hepatology*. 2011;54(1):328-343. doi:10.1002/hep.24330.
47. Moawad AW, Elsayes KM, Benamar F, Rao K, Sun J, Szklaruk J. Value of follow-up chest computed tomography in the surveillance of patients with hepatocellular carcinoma. *J Hepatocell Carcinoma*. 2020;7:331-335. doi:10.2147/JHC.S280175.
48. Bowlus CL, Arrivé L, Bergquist A, et al. AASLD practice guidance on primary sclerosing cholangitis and cholangiocarcinoma. *Hepatology*. 2023;77(2):p 659-702. doi: 10.1002/hep.32771.
49. Lindor KD, Bowlus CL, Boyer J, Levy C, Mayo M. Primary biliary cholangitis: 2018 practice guidance from the American Association for the Study of Liver Diseases. *Hepatology*. 2019;69(1):394-419. doi:10.1002/hep.30145.
50. Colli A, Fraquelli M, Casazza G, et al. Accuracy of ultrasonography, spiral CT, magnetic resonance, and Alpha-fetoprotein in diagnosing hepatocellular carcinoma: a systematic review: CME. *American Journal of Gastroenterology*. 2006;101(3):513-523.
51. Adam R, McMaster P, O'Grady JG, et al. Evolution of liver transplantation in Europe: report of the European Liver Transplant Registry. *Liver Transpl*. 2003;9:1231-1243.
52. Baskiran A, Kahraman AS, Cicek IB, Sahin T, Isik B, Yilmaz S. Preoperative evaluation of liver volume in living donor liver transplantation. *North Clin Istanbul*. 2017;5(1):1-5.
53. Borhani AA, Khaled M, Elsayes MD. Imaging evaluation of living liver donor candidates: techniques, protocols, and anatomy. *RadioGraphics*. 2021; 41:1572-1591.
54. Vernuccio F, Whitney SA, Ravindra K, Marin D. CT and MR imaging evaluation of living liver donors. *Abdom Radiol (NY)*. 2021;46(1):17-28.
55. Henedige T, Anil G, Madhavan K. Expectations from imaging for pre-transplant evaluation of living donor liver transplantation. *World J Radiol*. 2014;6(9):693-707.
56. Liu JP, Lerut J, Yang Z, Li ZK, Zheng SS. Three-dimensional modeling in complex liver surgery and liver transplantation. *Hepatobiliary Pancreat Dis Int*. 2022;21(4):318-324. doi:10.1016/j.hbpd.2022.05.01

Hepatic and Abdominal Arteries (AB-43)

Guideline	Page
Hepatic Arteries and Veins (AB-43.1).....	299
Abdominal Veins Other than Hepatic and Portal Veins (AB-43.2).....	303
Renal Vein Thrombosis (AB-43.3).....	304
References (AB-43).....	305

Hepatic Arteries and Veins (AB-43.1)

AB.HA.0043.1.A

v1.0.2026

- Portal Vein Thrombosis (PVT):
 - Doppler US (CPT[®] 93975) is the initial noninvasive modality for the diagnosis of Portal Vein Thrombosis
 - CT Abdomen with contrast (CPT[®] 74160 or 74170 – 4 phase CT), MRI Abdomen without and with contrast (CPT[®] 74183) or CTA Abdomen (CPT[®] 74175) is medically necessary for ANY of the following:
 - to assess the extension of thrombus into the mesenteric veins when Doppler US (or other imaging, such as abdominal US) is positive for PVT
 - to exclude tumor thrombus among individuals with cirrhosis who develop new portal and/or mesenteric vein thrombosis
 - for continued concern for PVT (for example in an individual with a hypercoagulable state or abdominal malignancy) if Doppler US is negative or inconclusive
 - To assess for development of intestinal ischemia among individuals with known portal and/or mesenteric vein thrombosis (MVT) (e.g., development of fever, rebound, leukocytosis, elevated serum lactate levels):
 - In lieu of the above imaging modalities, if requested: CT Abdomen and Pelvis with contrast (CPT[®] 74177) is medically necessary.
 - For suspicion of portal hypertensive or portal cavernoma cholangiopathy in individuals with known PVT or MVT (cholestatic liver chemistry profile (See **Abnormal Liver Chemistries (AB-30.1)**), known portal cavernoma, extrahepatic biliary abnormalities on imaging):
 - MRCP (CPT[®] 74183 or CPT[®] 74181) is medically necessary

Note: Portosystemic collaterals in the region surrounding the common bile duct in individuals with chronic PVT can be associated with common bile duct obstruction.

- For routine follow-up of PVT:
 - US/Doppler every 6 months. If these are reported as not providing adequate visualization, CT Abdomen (CPT[®] 74160), MRI Abdomen (CPT[®] 74183), or CTA Abdomen (CPT[®] 74175), is medically necessary.
- For follow-up of PVT being treated with anticoagulation:
 - US/Doppler, CT Abdomen (CPT[®] 74160), MRI Abdomen (CPT[®] 74183), or CTA Abdomen (CPT[®] 74175) is medically necessary in 3-6 months.
 - Further follow-up every 6 months with US/Doppler unless these are reported as not providing adequate visualization, in which case any of the above studies can be approved.

- TIPS (transjugular intrahepatic portosystemic shunt)
 - Pre-procedure evaluation:
 - Abdominal US, including Doppler (CPT[®] 76700 and/or CPT[®] 93975), Multiphase CT Abdomen (CPT[®] 74160 or CPT[®] 74170), Multiphase CTA Abdomen (CPT[®] 74175), Multiphase MRA Abdomen (CPT[®] 74185), or MRI Abdomen liver protocol (CPT[®] 74183) is medically necessary
 - Echocardiogram (CPT[®] 93306) (see: **Transthoracic Echocardiography (TTE) – Indications/Initial Evaluation (CD-2.2)**)
 - For routine follow-up to monitor stent patency:
 - US with Doppler (CPT[®] 93975) is medically necessary 7-14 days after shunt creation, and then at 3 months, 6 months, and then every 6 months thereafter.
 - If requested earlier than the above intervals because of a clinical deterioration or suspicion of stent occlusion, the Doppler is medically necessary.
 - If Doppler imaging is indeterminate or if there is a negative Doppler with clinical signs of worsening portal hypertension the following is medically necessary:
 - Multiphase CT Abdomen (CPT[®] 74160 or CPT[®] 74170), Multiphase CTA Abdomen (CPT[®] 74175), Multiphase MRA Abdomen (CPT[®] 74185), or MRI Abdomen liver protocol (CPT[®] 74183)
 - Echocardiogram (CPT[®] 93306) is medically necessary for the following:
 - One time post-procedure for routine follow up
 - Any time post-procedure:
 - for new signs or symptoms
 - for concern for new or worsening pulmonary hypertension
 - See also: **Frequency of Echocardiography Testing (CD-2.3)** in the Cardiac Imaging Guidelines
- For the evaluation of Budd-Chiari Syndrome
 - Doppler US (CPT[®] 93975) is the initial diagnostic test for the evaluation of BCS.
 - CT Abdomen with contrast (CPT[®] 74160), or MRI Abdomen without and with contrast (CPT[®] 74183) or CTA Abdomen (CPT[®] 74175) is medically necessary for ANY of the following:
 - to assess thrombus extension
 - to rule out tumor thrombus
 - to assess response to anticoagulation therapy
 - if there is high suspicion of BCS despite a negative or inconclusive Doppler US
 - to additionally assess indeterminate hepatic nodules detected on the prior US (any of the above studies or CT Abdomen without and with contrast CPT[®] 74170)
 - For pre-operative evaluation of anticipated interventional vascular therapies or TIPS the following is medically necessary:

- Abdominal US, including Doppler (CPT[®] 76700 and/or CPT[®] 93975), Multiphase CT Abdomen (CPT[®] 74160 or CPT[®] 74170), Multiphase CTA Abdomen (CPT[®] 74175), Multiphase MRA Abdomen (CPT[®] 74185), or MRI Abdomen liver protocol (CPT[®] 74183)
- For HCC Surveillance in individuals with chronic BCS the following is medically necessary:
 - Abdominal US (CPT[®] 76700 or CPT[®] 76705) and serum alpha-fetoprotein every 6 months
 - Triphasic CT Abdomen (CPT[®] 74160 or CPT[®] 74170), or MRI Abdomen (CPT[®] 74183) for the evaluation of hepatic nodules seen on US or AFP ≥ 15 ng/ml.
 - The LiRADS reporting system does not apply to HCC surveillance in this population, due to the vascular origin of many of the hepatic imaging abnormalities.
- Hereditary Hemorrhagic Telangiectasia (HHT)
 - The liver may be involved in individuals with HHT, and artery-to-vein or vein-to-vein shunting may occur resulting in liver vascular malformations (LVMs).
 - Screening the liver for LVMs is not medically necessary.
 - For symptoms suggestive of liver vascular malformations (LVMs) (including an audible bruit or palpable thrill over the hepatic region on physical examination, abnormal liver tests) or for the development of signs or symptoms of heart failure, biliary ischemia, hepatic encephalopathy, mesenteric ischemia, or portal hypertension the following is medically necessary:
 - CT Abdomen (CPT[®] 74160), CTA Abdomen (CPT[®] 74175), MRI Abdomen with and without (CPT[®] 74183), MRCP (CPT[®] 74183), or MRA Abdomen (CPT[®] 74185)
- CTA Abdomen and Pelvis (CPT[®] 74174), or CTA Abdomen (CPT[®] 74175) or MRA Abdomen (CPT[®] 74185) is medically necessary additionally for:
 - Evaluation of portal and hepatic veins prior to or following surgical intervention for the treatment of portal hypertension (See: **Portal Hypertension (AB-26.3)**)
 - Evaluation of hepatic vasculature prior to and following embolization procedure (See: **Hepatocellular Carcinoma (HCC) – Restaging/Recurrence (ONC-14.4)** and **Hepatocellular Carcinoma (HCC) – Surveillance/Follow-up (ONC-14.5)** and **Liver Metastases (ONC-31.2)** in the Oncology Imaging Guideline)
 - Evaluation of hepatic vasculature prior to planned hepatectomy (See: **Liver Transplant, Pre-Transplant (AB-42.1)**)
 - Evaluation of liver donor (See: Liver Transplant, **Living Donor Pre-Transplant Imaging (Donor Imaging) (AB-42.2)** for specific guidance)
- Hepatic arterial aneurysms:
 - See: **Visceral Artery Aneurysm (PVD-6.5)** in the Peripheral Vascular Disease Imaging Guidelines

Background and Supporting Information

Primary Budd-Chiari Syndrome is due to thrombotic occlusion of the hepatic venous outflow tract. Most individuals have an underlying prothrombotic condition such as a myeloproliferative disease, an inherited thrombophilia (e.g. Factor V Leiden), a systemic disease such as vasculitis, or hormonal factors, such as recent oral contraceptive use. Secondary Budd-Chiari Syndrome is caused by malignant tumors or extrinsic compression of the hepatic veins.

LI-RADS assessment should not be applied to individuals <18 years old or those with cirrhosis from congenital hepatic fibrosis secondary to vascular disorders (e.g, Budd-Chiari syndrome, chronic portal vein occlusion, cardiac congestion, hereditary hemorrhagic telangiectasia).

Evidence Discussion

- In cases of Primary Budd-Chiari syndrome, Doppler ultrasound is widely used to evaluate hepatic/portal vasculature. Ultrasonographic evaluation is associated with advantages such as high sensitivity and specificity, and also high positive and negative predictive values.⁵
- Advantages of Doppler ultrasound include low cost, wide availability, and lack of radiation exposure.⁵
- One disadvantage of Doppler ultrasound is its limited ability to evaluate certain anatomies. For instance, it may not be able to detect the extension of portal vein thrombus into splanchnic vessels.⁵
- CT scan is highly accurate in evaluating hepatic vasculature, with sensitivity, specificity, PPV and NPV in the range of 90-99%.⁵
- Advantages of CT scan include better visualization of structures, such as thrombus extension. Another advantage of CT is that it allows for concomitant evaluation of bowel.⁵
- CT scan has drawbacks such as higher cost, radiation exposure, and potential complications from the use of contrast, when compared to ultrasound.⁵
- MRI and MRA may be more appropriate as alternative to CT. Advantages include lack of radiation and a "better safety profile." Disadvantages include longer image acquisition time, higher cost, and various technical limitations., including signal loss, overestimation of stenoses, and contraindications/complications related to implanted metallic devices.⁵
- Pre-TIPS (Transjugular Intrahepatic Portosystemic Shunt), endovascular variceal obliteration or embolization, should ideally include cross-sectional imaging to have an adequate anatomical map of the portal vein and hepatic veins.¹⁷
- Screening the liver for LVMs is not medically necessary. As per recent ACG Guidelines, "there is no evidence to suggest that making a diagnosis in an asymptomatic individual has clinical benefits or prevents death."⁵

Abdominal Veins Other than Hepatic and Portal Veins (AB-43.2)

AB.HA.0043.2.A

v1.0.2026

- CTA Abdomen and Pelvis (CPT[®] 74174), or CTA Abdomen (CPT[®] 74175) or MRA Abdomen (CPT[®] 74185) is medically necessary if ONE of the following:
 - Nephrotic syndrome
 - Renal vein thrombosis
 - Mesenteric vein thrombosis
- Suspicion of iliac vein thrombus when a lower extremity duplex or abdominal duplex is inconclusive or equivocal, see: **Acute Deep Venous Thrombosis (DVT) (PVD 12.2)**
- Suspicion of inferior vena cava thrombus when a lower extremity duplex or abdominal duplex is inconclusive or equivocal, see: **Acute Deep Venous Thrombosis (DVT) (PVD 12.2)**

Evidence Discussion

- Computed Tomography Angiography (CTA) is a diagnostic imaging test that can assess both arterial and venous structures, as well as nonvascular structures in cases of venous thrombosis.^{18,19} By combining the evaluation of both vascular and nonvascular findings, it is possible to achieve a sensitivity of 96% and a specificity of 90-94% when assessing for mesenteric venous obstruction.¹⁸
- In cases of chronic mesenteric venous thrombosis, duplex ultrasound can be a helpful tool for diagnosis. However, due to potential technical difficulties such as overlying bowel gas or limited acoustic windows, imaging may not always be possible.^{18,19} In such cases, a CTA scan may be a better option as it allows for a more comprehensive evaluation of both vascular and intestinal structures.¹⁸
- Contrast-enhanced Magnetic Resonance Angiography (MRA) has been shown to provide a vascular assessment that is comparable to catheter angiography.¹
- Compared to catheter angiography, MRA is less invasive, cheaper, and does not expose individuals to ionizing radiation.¹
- Various MRA techniques allow for quantification of blood flow as well as evaluation of oxygen saturation, which are not possible with CTA.¹
- MRA is less dependent on the operator compared to vascular ultrasound and is less prone to limitations related to individual body habitus or overlying bowel gas.¹
- Disadvantages of MRA are motion artifact and risk of nephrogenic systemic fibrosis with gadolinium exposure in individuals with severe renal insufficiency.¹

Renal Vein Thrombosis (AB-43.3)

AB.HA.0043.3.A

v1.0.2026

- MRA Abdomen (CPT® 74185) is medically necessary if ONE of the following:
 - Nephrotic syndrome
 - Proteinuria – 3 grams or more in 24 hours
 - Lupus nephritis
 - Hypercoagulable state, ONE of the following:
 - Antiphospholipid antibodies
 - Behçet's syndrome
 - Protein C deficiency
 - Protein S deficiency

Evidence Discussion

- Computed Tomography Angiography (CTA) is a diagnostic imaging test that can assess both arterial and venous structures, as well as nonvascular structures in cases of venous thrombosis.^{18,19} By combining the evaluation of both vascular and nonvascular findings, it is possible to achieve a sensitivity of 96% and a specificity of 90-94% when assessing for mesenteric venous obstruction.¹⁸
- In cases of chronic mesenteric venous thrombosis, duplex ultrasound can be a helpful tool for diagnosis. However, due to potential technical difficulties such as overlying bowel gas or limited acoustic windows, imaging may not always be possible.^{18,19} In such cases, a CTA scan may be a better option as it allows for a more comprehensive evaluation of both vascular and intestinal structures.¹⁸
- Contrast-enhanced Magnetic Resonance Angiography (MRA) has been shown to provide a vascular assessment that is comparable to catheter angiography.¹
- Compared to catheter angiography, MRA is less invasive, cheaper, and does not expose patients to ionizing radiation.¹
- Various MRA techniques allow for quantification of blood flow as well as evaluation of oxygen saturation, which are not possible with CTA.¹
- MRA is less dependent on the operator compared to vascular ultrasound and is less prone to limitations related to individual body habitus or overlying bowel gas.¹
- Disadvantages of MRA are motion artifact and risk of nephrogenic systemic fibrosis with gadolinium exposure in individuals with severe renal insufficiency.¹

References (AB-43)

v1.0.2026

1. American College of Radiology (ACR), North American Society for Cardiovascular Imaging (NASCI), Society for Pediatric Radiology (SPR). ACR-NASCI-SPR practice guideline for the performance of pediatric and adult body magnetic resonance angiography (MRA). *Am Coll Radiol*. Revised 2020.
2. Nghiem HV, Winter TC III, Mountford MC, et al. Evaluation of the portal venous system before liver transplantation: value of phase-contrast MR angiography. *AJR*. 1995;164:871-878.
3. American Association for the Study of Liver Disease (AASLD). AASLD practice guidelines: the role of transjugular intrahepatic portosystemic shunt (TIPS) in the management of portal hypertension. *Hepatology*. 2010;51:1-16.
4. Lee SS, Kim TK, Byun JH, et al. Hepatic arteries in potential donors for living related liver transplantation: evaluation with multi-detector row CT angiography. *Radiology*. 2003; 227:391-399.
5. Simonetto DA, Singal AK, Garcia-Tsao G, Caldwell SH, Ahn J, Kamath PS. ACG Clinical Guideline. *The American Journal of Gastroenterology*. 2020;115(1):18-40. doi:10.14309/ajg.0000000000000486.
6. Boyer TD, Haskal ZJ. The role of transjugular intrahepatic portosystemic shunt (TIPS) in the management of portal hypertension: Update 2009. *Hepatology*. 2009;51(1):306-306. doi:10.1002/hep.23383.
7. Kapoor B, Sands M, Copelan A. Transjugular Intrahepatic Portosystemic Shunt: Indications, Contraindications, and Patient Work-Up. *Seminars in Interventional Radiology*. 2014;31(03):235-242. doi:10.1055/s-0034-1382790.
8. Dariushnia SR, Haskal ZJ, Midia M, et al. Quality Improvement Guidelines for Transjugular Intrahepatic Portosystemic Shunts. *Journal of Vascular and Interventional Radiology*. 2016;27(1):1-7. doi:10.1016/j.jvir.2015.09.018.
9. Margini C, Berzigotti A. Portal vein thrombosis: the role of imaging in the clinical setting. *Dig Liver Dis*. 2017;49(2):113-120. doi:10.1016/j.dld.2016.11.013.
10. Northup PG, Garcia-Pagan JC, Garcia-Tsao G, et al. Vascular liver disorders, portal vein thrombosis, and procedural bleeding in patients with liver disease: 2020 practice guidance by the American Association for the Study of Liver Diseases. *Hepatology*. 2020;73(1):366-413. doi:10.1002/hep.31646.
11. Humbert M, Kovacs G, Hoeper MM, et al. 2022 ESC/ERS guidelines for the diagnosis and treatment of pulmonary hypertension. *European Respiratory Journal*. 2022;61(3). doi:10.1183/13993003.00879-2022.
12. Boike JR, Thornburg BG, Asrani SK, et al. North American practice-based recommendations for transjugular intrahepatic portosystemic shunts in portal hypertension. *Clinical Gastroenterology and Hepatology*. 2022;20(8):1636-1662.e36. doi:10.1016/j.cgh.2021.07.018.
13. Billey C, Billet S, Robic MA, et al. A prospective study identifying predictive factors of cardiac decompensation after transjugular intrahepatic portosystemic shunt: the Toulouse algorithm. *Hepatology*. 2019;70(6):1928-1941. doi:10.1002/hep.30934.
14. Chopard R, Albertsen IE, Piazza G. Diagnosis and treatment of lower extremity venous thromboembolism: a review. *JAMA*. 2020;324(17):1765-1776.
15. Needleman L, Cronan JJ, Lilly MP, et al. Ultrasound for lower extremity deep venous thrombosis. multidisciplinary recommendations from the Society of Radiologists in Ultrasound Consensus Conference. *Circulation*. 2018;137:1505-1515.
16. Sloves J, Almeida J. Venous duplex ultrasound protocol for ilioacaval disease. *J Vasc Surg Venous Lymphat Disord*. 2018;6(6):748-757.
17. Lee EW, Eghtesad B, Garcia-Tsao G, et al. AASLD practice guidance on the use of TIPS, variceal embolization, and retrograde transvenous obliteration in the management of variceal hemorrhage. *Hepatology*. 2024;79(1):224-250.
18. Björck M, Koelemay M, Acosta S, et al. Editor's choice – management of the diseases of mesenteric arteries and veins. Clinical practice guidelines of the European Society of Vascular Surgery (ESVS). *Eur J Vasc Endovasc Surg*. 2017;53:460-510.
19. Ginsburg M, Obara P, Lambert D, et al. Expert Panels on Vascular Imaging and Gastrointestinal Imaging: ACR Appropriateness Criteria® Imaging of Mesenteric Ischemia. *J Am Coll Radiol*. 2018;15(11S):S332-40.

This section intentionally left blank (AB-44)

Guideline	Page
This section intentionally left blank (AB-44).....	307

This section intentionally left blank (AB-44)

AB.44.C

v1.0.2026

Liver Elastography (AB-45)

Guideline	Page
Liver Elastography (AB-45).....	309
References (AB-45).....	312

Liver Elastography (AB-45)

AB.LE.0045.A

v1.0.2026

- Initial staging of liver fibrosis in suspected fatty liver disease (hepatic steatosis):
 - Transient Elastography or Vibration-Controlled Transient Elastography (VCTE, e.g. Fibroscan) (CPT[®] 91200) is medically necessary as the initial imaging modality.
 - Typically repeated within a 3-year period. If repeat transient elastography fails, see MRE criteria below
 - Magnetic Resonance Elastography (MRE, CPT[®] 76391) is medically necessary for ANY of the following:
 - Transient Elastography failure despite use of an XL-probe, OR BMI ≥ 35
 - Conflict between clinical picture and transient elastography results (e.g., individual with portal hypertension but VCTE suggests no fibrosis)
 - VCTE liver stiffness measurement of ≥ 8 kPa
 - FIB 4 score of >2.67
 - Liver biopsy demonstrates fibrosis stage F2-F4
- Special considerations for MRE:
 - For MRE requests in the setting of hemochromatosis, see: **Hereditary (Primary) Hemochromatosis (HH) and Other Iron Storage Diseases (AB-11.2)**
 - For individuals for whom drug treatment is a consideration and EITHER of the following:
 - Evaluation for liver stiffness as part of required assessment for drug candidacy
 - Evaluation for liver stiffness to assess treatment efficacy as required by the drug manufacturer and/or FDA
 - Note: The correct CPT code for MR Elastography is CPT[®] 76391. It is a stand-alone code and it does not require an additional CPT code such as MRI Abdomen (CPT[®] 74183).
 - An additional MRI Abdomen code should only be approved if there is another appropriate indication for it, other than the Elastography study (for example, MRE for fibrosis scoring in MASLD (formerly known as NAFLD) due to a BMI ≥ 35 , AND further evaluation of an indeterminate hepatic lesion).
- The use of other ultrasound elastographic codes (CPT[®] 76981, CPT[®] 76982, and CPT[®] 76983) is not medically necessary.

Background and Supporting Information

- For the assessment of fibrosis in chronic liver disease, the American Gastroenterological Association recommends Vibration Controlled Transient Elastography (VCTE) as the preferred imaging modality over MR Elastography

(MRE), except in the case of MASLD (formerly known as NAFLD) in high-risk populations.

- Transient Elastography (VCTE) is the most studied elastography technique and informs multiple evidence-based guidelines with respect to fibrosis scoring. No national evidence-based guideline recommends the use of either Acoustic Radiation Force Impulse Imaging (ARFI) or real-time tissue elastography (RTTE) over the use of VCTE for any clinical protocol, nor is there direct evidence that ARFI or RTTE improves health outcomes over and above VCTE.
- Vibration-Controlled Transient Elastography (VCTE) (e.g. Fibroscan, CPT® 91200) may be considered medically necessary to assess for advanced fibrosis and cirrhosis in conditions including:
 - Hepatitis C
 - Hepatitis B
 - Chronic alcoholic liver disease
 - All other chronic liver diseases
- Liver fibrosis staging: The most common staging system is METAVIR, which uses a scale of F0 to F4 (F0 indicates no fibrosis, while F4 represents cirrhosis). Other staging systems include Ishak and Batts-Ludwig, which also assess fibrosis based on histological examination of liver tissue. For Ishak Scoring System: Stages 0-5: Progressively more severe fibrosis, with stage 5 being the most advanced before cirrhosis; Stage 6: Cirrhosis. For Batts-Ludwig Scoring System: Grades 0-4: Progressively more severe fibrosis, with grade 4 being cirrhosis.
- FIB-4 index is calculated as follows²²:
 - $FIB-4 = (Age \text{ in years} \times AST \text{ level}) / (Platelet \text{ count} \times \sqrt{\text{of ALT}})$

Evidence Discussion

Targeted screening of populations at increased risk for advanced liver disease is advised to identify and manage those with clinically significant fibrosis.^{10,22,23,26}

Although liver biopsy remains the reference standard for the grading and staging of nonalcoholic steatohepatitis (NASH), it has important limitations related to risk, cost, and sampling error. Noninvasive biomarkers are emerging as valuable tools for predicting adverse liver-related outcomes.^{10,22,23,26}

The most validated laboratory-based fibrosis biomarker is FIB-4, which outperforms other calculations in its ability to identify individuals with a low probability of advanced fibrosis. A FIB-4 score > 2.67 is associated with a high risk of advanced fibrosis.^{10,22,23,26}

Liver stiffness is a physical characteristic of the liver that increases with fibrosis severity. Vibration Controlled Transient Elastography (VCTE), e.g., Fibroscan, is the most commonly used method to assess liver stiffness. Transient elastography (VCTE) is the

most studied elastography technique and informs multiple evidence-based guidelines with respect to fibrosis scoring. No national evidence-based guideline recommends the use of either ARFI or real-time tissue elastography (RTTE) over the use of VCTE for any clinical protocol, nor is there direct evidence that ARFI or RTTE improves health outcomes over and above VCTE. VCTE-derived liver stiffness measurement (LSM) of < 8 kPa can be used to rule out advanced fibrosis, especially if used with FIB-4. An LSM between 8 and 12kPa may be associated with fibrotic NASH, and a value > 12 kPa is associated with a high likelihood of advanced fibrosis.^{10,22,23,26}

For the assessment of cirrhosis in individuals with hepatitis C, the American Gastroenterological Association (AGA) noted that VCTE was recommended over MRE with the exception of NAFLD in high-risk populations, in which MRE resulted in a lower rate of false positives compared to VCTE.^{10,22,23,26}

Magnetic Resonance Elastography (MRE) is not the first-line approach for risk stratification, however it becomes an important tool when clinical uncertainty exists, concomitant cross-sectional imaging is needed, there is a discrepancy between the clinical picture and VCTE results, or when VCTE is unavailable or limited by individual factors.^{10,22,23,26}

Liver stiffness measurements can provide important context when evaluating individuals for potential drug therapy. While not a formal requirement, imaging-based fibrosis assessment is often part of a comprehensive clinical evaluation.²⁷

Liver stiffness can also be used to monitor response to therapy over time. For individuals undergoing treatment with Resmetirom, a follow-up elastography assessment at 12 months may help determine whether the therapy is effective or if adjustments are needed.²⁷

References (AB-45)

v1.0.2026

1. American Gastroenterologic Association Institute guideline on the role of elastography in the evaluation of liver fibrosis. *Gastroenterology*. 2017;152:1536-1543.
2. Conti CB, Cavalcoli F, Fraquelli M, Conte D, Massironi S. Ultrasound elastographic techniques in focal liver lesions. *World Journal of Gastroenterology*. 2016;22(9):2647. doi:10.3748/wjg.v22.i9.2647.
3. The diagnosis and management of nonalcoholic fatty liver disease: Practice guidance from the American Association for the Study of Liver Diseases. *Clinical Liver Disease*. 2018;11(4):81-81. doi:10.1002/cld.722.
4. Li Q, Dhyani M, Grajo JR, Sirlin C, Samir AE. Current status of imaging in nonalcoholic fatty liver disease. *World Journal of Hepatology*. 2018;10(8):530-542. doi:10.4254/wjh.v10.i8.530.
5. Imajo K, Kessoku T, Honda Y, et al. Magnetic Resonance Imaging More Accurately Classifies Steatosis and Fibrosis in Patients With Nonalcoholic Fatty Liver Disease Than Transient Elastography. *Gastroenterology*. 2016;150(3). doi:10.1053/j.gastro.2015.11.048.
6. Chalasani N, Younossi Z, Lavine JE, et al. The diagnosis and management of nonalcoholic fatty liver disease: Practice guidance from the American Association for the Study of Liver Diseases. *Hepatology*. 2017;67(1):328-357. doi:10.1002/hep.29367.
7. Vuppalanchi R, Siddiqui MS, Natta MLV, et al. Performance characteristics of vibration-controlled transient elastography for evaluation of nonalcoholic fatty liver disease. *Hepatology*. 2017;67(1):134-144. doi:10.1002/hep.29489.
8. Castera L, Friedrich-Rust M, Lomboa R. Noninvasive assessment of liver disease in patients with nonalcoholic fatty liver disease. *Gastroenterology*. 2019;156(5). doi:10.1053/j.gastro.2018.12.036.
9. Kanwal F, Shubbrook JH, Adams LA, et al. Clinical care pathways for the risk stratification and management of patients with nonalcoholic fatty liver disease. *Gastroenterology*. 2021;161(5):1657-1669.
10. Long MT, Nouredin M, Lim JK. AGA Clinical practice update: Diagnosis and management of nonalcoholic fatty liver disease in lean individuals: Expert review. *Gastroenterology*. 2022;163(3):764-774.e1.
11. Muraj S, Ahmed A, Kim D. Recent epidemiology of nonalcoholic fatty liver disease. *Gut Liver*. 2021;15(2):206-216. doi:10.5009/gnl20127.
12. Sanyal AJ, Van Natta ML, Clark J, et al. Prospective Study of outcomes in adults with nonalcoholic fatty liver disease. *N Engl J Med*. 2021;385:1559-1569 doi:10.1056/NEJMoa2029349.
13. Cusi K, Isaacs S, Barb D, et al. American Association of Clinical Endocrinology clinical practice guideline for the diagnosis and management of nonalcoholic fatty liver disease in primary care and endocrinology clinical settings. *Endocr Pract*. 2022;28(5):528-562. doi:10.1016/j.eprac.2022.03.010.
14. Mantovani A, Dalbeni A. Treatments for NAFLD: state of the art. *Int J Mol Sci*. 2021;22(5):2350. doi:10.3390/ijms22052350.
15. Selvaraj EA, Mózes EF, Jayaswal ANA, et al. Diagnostic accuracy of elastography and magnetic resonance imaging in patients with NAFLD: a systemic review and meta-analysis. *J Hepatol*. 2021;(75):770-785. doi:10.1016/j.jhep.2021.04.044.
16. Imajo K, Honda Y, Kobayashi T, et al. Direct comparison of US and MR elastography for staging liver fibrosis in patients with nonalcoholic fatty liver disease. *Clin Gastro Hepatol*. 2022;20:908-917. doi:10.1016/j.cgh.2020.12.016.
17. Ajmera A, Nguyen K, Tamaki N, et al. Prognostic utility of magnetic resonance elastography and MEFIB index in predicting liver-related outcomes and mortality in individuals at risk of and with nonalcoholic fatty liver disease. *Therap Adv Gastroenterol*. 2022;(15):1-13.doi:10.1177/17562848221093869.
18. Younossi ZM, Nouredin M, Bernstein D, et al. Role of noninvasive tests in clinical gastroenterology practices to identify patients with nonalcoholic steatohepatitis at high risk of adverse outcomes: expert panel recommendations. *Am J Gastroenterol*. 2021;116(2):254-262. doi:10.14309/ajg000000000001054.
19. Orci LA, Sanduzzi-Zamparelli M, Caballol B, et al. Incidence of hepatocellular carcinoma in patients with nonalcoholic fatty liver disease: a systemic review, meta-analysis, and meta-regression. *Clin Gastroenterol Hepatol*. 2022;20(2):283-292. doi:10.1016/j.cgh.2021.05.002.
20. Sterling RK, Lissen E, Clumeck N, et al. Development of a simple noninvasive index to predict significant fibrosis patients with HIV/HCV co-infection. *Hepatology*. 2006;43:1317-1325.

21. Gidener T, Dierkhising RA, Mara KC, et. al. Change in serial liver stiffness measurement by magnetic resonance elastography and outcomes in NAFLD. *Hepatology*. 2023;77(1):268-274. doi:10.1002/hep.32594.
22. Sterling RK, Duarte-Rojo A, Patel K, et al. AASLD practice guideline on imaging-based on non-invasive liver disease assessments of hepatic fibrosis and steatosis. *Hepatology*. 2024. Online ahead of print. doi:10.1097/HEP.0000000000000843.
23. Jophilin LL, Singal AK, Bataller R, et al. ACG clinical guideline: alcohol-associated liver disease. *Am J Gastroenterol*. 2024;119:30-54. Doi:10.14309/ajg.0000000000002572.
24. Loomba R, et al. The 20% rule of NASH progression: the natural history of advanced fibrosis and cirrhosis caused by NASH. *Hepatology*. 2019;70(6):1885-1888.
25. Farrell A, et al. Epidemiology of non-alcoholic fatty liver disease-related hepatocellular carcinoma: a western perspective. *Hepatoma Res*. 2020;(6):18.
26. Rinella, ME, Neuschwander-Tetri, BA, et al., AASLD Practice Guidance on the clinical assessment and management of nonalcoholic fatty liver disease. *Hepatology*. 2023;77:1797-1839.
27. Chen VL, Morgan TR, Rotman Y, et al. Resmetirom therapy for metabolic dysfunction-associated steatotic liver disease: October 2024 updates to AASLD Practice Guidance. *Hepatology*. 2025;81(1):312-320. doi:10.1097/HEP.0000000000001112

Hiccups (AB-46)

Guideline	Page
Hiccups (AB-46.0).....	315
References (AB-46).....	316

Hiccups (AB-46.0)

AB.HI.0046.0.A

v1.0.2026

- Hiccups may be associated with cerebrovascular disease, brain tumors, and intracranial injury, though it would be very rare for hiccups to be the only presenting symptom of serious neurologic disease. If concern is expressed for neurologic involvement, please see the appropriate guideline in HD imaging (e.g., **Neuromyelitis Optica and NMO Spectrum Disorders (HD-16.2)** and **Anti-MOG syndromes (HD-16.3)**)
- Hiccups <48 hours without any localizing or specific symptoms:
 - No advanced imaging is medically necessary
- Hiccups ≥48 hours:
 - History and physical examination, laboratory and CMP and baseline chest x-ray
 - Abnormal or negative chest x-ray with symptoms referable to the chest:
 - CT Chest with contrast (CPT[®] 71260) is medically necessary
 - Lab or history/physical findings suggest a gastrointestinal etiology:
 - CT Abdomen with contrast (CPT[®] 74160) is medically necessary

Evidence Discussion

If there are additional signs or symptoms to evaluate, further testing is medically necessary. CT Chest and/or bronchoscopy is the study of choice for evaluation wheezing, dyspnea, abnormal chest radiography, or abnormal pulmonary function tests. MRI Brain and/or lumbar puncture are indication for potential central nervous system causes. Evaluation of esophageal and other symptoms is performed with upper endoscopy, esophageal manometry, and/or CT Abdomen. Cardiac etiologies may be evaluated with EKG & Echo.³⁻⁶

References (AB-46)

v1.0.2026

1. *British Journal of General Practice*. Hiccups. A Common Problem with Some Unusual Causes and Cures: 2016;66(652):584-586.
2. Steger M, Schneemann M, Fox M. Systemic review: the pathogenesis and pharmacological treatment of hiccups. *Alimentary Pharmacology & Therapeutics*. 2015;42(9):1037-1050. doi:10.1111/apt.13374.
3. Pooran N, Lee D, Sideridis K. Protracted hiccups due to severe erosive esophagitis: a case series. *J Clin Gastroenterol*. 2006;40:183.
4. Brañuelas Quiroga J, Urbano García J, Bolaños Guedes J. Hiccups: a common problem with some unusual causes and cures. *Br J Gen Pract*. 2016;66:584-586.
5. Yamazaki Y, Sugiura T, Kurokawa K. Sinister hiccups. *Lancet*. 2008; 371:1550.
6. Bredenoord AJ. Management of belching, hiccups, and aerophagia. *Clinical Gastroenterology & Hepatology*. 2013;11(1):6-12.

Retroperitoneal Fibrosis (AB-47)

Guideline	Page
Retroperitoneal Fibrosis (AB-47.0).....	318
References (AB-47).....	320

Retroperitoneal Fibrosis (AB-47.0)

AB.RP.0047.0.A

v1.0.2026

- Individuals diagnosed with retroperitoneal fibrosis:
 - ONE of the following every 3 months is medically necessary until stability demonstrated:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177)
 - MRI Abdomen and Pelvis without contrast (CPT[®] 74181 and CPT[®] 72195)
 - MRI Abdomen and Pelvis with and without contrast (CPT[®] 74183 and CPT[®] 72197)
 - Retroperitoneal or Abdominal ultrasound (CPT[®] 76770 or CPT[®] 76700) can be considered medically necessary if requested.
 - After stability established repeat imaging is medically necessary every 6 months.
 - Requests for non-contrasted studies in individuals with renal insufficiency is medically necessary. Gadolinium may induce nephrogenic systemic fibrosis in individuals with moderate or severe renal insufficiency, especially if the GFR is <30 ml/min.
 - Additional imaging:
 - CT Chest (CPT[®] 71260) is also medically necessary upon initial diagnosis if requested, to further evaluate for the possibility of malignancy as an underlying etiology.
- PET/CT (CPT[®] 78815)
 - Can be considered medically necessary initially, after diagnosis, to establish avidity patterns to assess for the likelihood of malignancy and for stratification for the likelihood of response to steroids.
 - Follow-up is considered medically necessary if there is documentation of an anticipated therapeutic change based on the results (such as a change in immunosuppression therapy or stent removal).
- Methysergide-induced retroperitoneal fibrosis:
 - Methysergide for migraine treatment is generally no longer available but is rarely being used at some centers. It has a known complication of retroperitoneal fibrosis.
 - Individual screening is medically necessary at baseline and then every 6 months with ONE of the following:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177)
 - CT Abdomen and Pelvis without contrast (CPT[®] 74176)
 - MRI Abdomen and Pelvis without and with contrast (CPT[®] 74183 and CPT[®] 72197)
 - MRI Abdomen and Pelvis without contrast (CPT[®] 74181 and CPT[®] 72195)

- Retroperitoneal ultrasound (CPT[®] 76770 or CPT[®] 76775)

Background and Supporting Information

Retroperitoneal fibrosis is a rare disease, and may be idiopathic (IgG4 or non-IgG-4 related) or secondary. Secondary causes include malignancy, infections, previous radiation therapy, previous abdominal surgery, drugs such as methysergide, and biologic agents.

Evidence Discussion

- Ultrasound may be used as a screening tool, but has low sensitivity and is often insufficient to distinguish retroperitoneal fibrosis from other abdominal masses.²
- CT and MR allow for characterizing morphology and extent of retroperitoneal fibrosis both at initial diagnosis and in treatment monitoring. It also helps to define the involved vascular structures, and can visualize disease in other abdominal viscera that may be associated with retroperitoneal fibrosis. CT may have advantages in imaging availability and imaging time. MR may have advantages in avoiding ionizing radiation and improved soft tissue characterization.¹
- PET may be used to evaluate metabolic activity and may be of value after diagnosis to characterize active inflammation versus malignancy and to document response to treatment. The role of PET scan in establishing a diagnosis is limited due to the potential for nonspecific uptake.^{1,6,7}
- Follow-up may be appropriate every 3-12 months to assess disease status and response to therapy.¹

References (AB-47)

v1.0.2026

1. Retroperitoneal Fibrosis Clinical Presentation: History and Physical Examination. Retroperitoneal Fibrosis Clinical Presentation: History and Physical Examination. <https://emedicine.medscape.com/article/458501-clinical>. Published May 30, 2019.
2. Vaglio A, Maritati F. Idiopathic Retroperitoneal Fibrosis. *Journal of the American Society of Nephrology*. 2016;27(7):1880-1889. doi:10.1681/asn.2015101110.
3. Runowska M, Majewski D, Puszczewicz M. Retroperitoneal fibrosis – the state-of-the-art. *Reumatologia/Rheumatology*. 2016;5:256-263. doi:10.5114/reum.2016.63667.
4. Urban M, Palmisano A, Nicastro M, Corradi D, Buzio C, Vaglio A. Idiopathic and secondary forms of retroperitoneal fibrosis: A diagnostic approach. *La Revue de Médecine Interne*. 2015;36(1):15-21. doi:10.1016/j.revmed.2014.10.008.
5. EMA restricts methysergide use, concern over fibrosis. *Reactions Weekly*. 2014;1491(1):2-2. doi:10.1007/s40278-014-9172-x.
6. Fendler WP, Eiber M, Stief CG, Herrmann K. A PET for All Seasons: 18 F-Fluorodeoxyglucose to Characterize Inflammation and Malignancy in Retroperitoneal Fibrosis? *European Urology*. 2017;71(6):934-935. doi:10.1016/j.eururo.2017.01.019.
7. Gu L, Wang Y, Zhang X. Re: Archie Fernando, James Pattison, Catherine Horsfield, David D'Cruz, Gary Cook, Tim O'Brien. [18F]-Fluorodeoxyglucose Positron Emission Tomography in the Diagnosis, Treatment Stratification, and Monitoring of Patients with Retroperitoneal Fibrosis: A Prospective Clinical Study. *Eur Urol* 2017;71:926–33. *European Urology*. 2017;72(2). doi:10.1016/j.eururo.2017.02.029.
8. Łoń I, Wieliczko M, Lewandowski J, Małyszko J. Retroperitoneal fibrosis is still an underdiagnosed entity with poor prognosis. *Kidney and Blood Pressure Research*. 2022;47(3):151-62.
9. Peisen F, Thaiss WM, Ekert K, et al. Retroperitoneal fibrosis and its differential diagnoses: the role of radiological imaging. *InRöFo-Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren*. 2020;192(10):929-936).
10. Urban ML, Palmisano A, Nicastro M, Corradi D, Buzio C, Vaglio A. Idiopathic and secondary forms of retroperitoneal fibrosis: a diagnostic approach. *La Revue de medecine interne*. 2015;36(1):15-21.
11. Kermani TA, Crowson CS, Achenbach SJ, Luthra HS. Idiopathic retroperitoneal fibrosis: a retrospective review of clinical presentation, treatment, and outcomes. *Mayo Clin Proc*. 2011;86(4):297-303. doi:10.4065/mcp.2010.0663.

Fistulae (AB-48)

Guideline	Page
Fistulae (AB-48).....	322
References (AB-48).....	324

Fistulae (AB-48)

AB.FD.0048.A

v1.0.2026

- Suspected enteric fistulae
 - ONE of the following is medically necessary:
 - MR Enterography (CPT[®] 74183 or CPT[®] 74181 and CPT[®] 72197 or CPT[®] 72195), OR
 - CT Enterography or CT Abdomen and Pelvis with contrast (CPT[®] 74177), OR
 - MRI Abdomen and Pelvis without and with contrast (CPT[®] 74183 and CPT[®] 72197)
- Suspected colovesical fistulae
 - ONE of the following is medically necessary:
 - CT Abdomen and Pelvis without contrast (CPT[®] 74176), OR
 - MR Enterography (CPT[®] 74183 or CPT[®] 74181 and CPT[®] 72197 or CPT[®] 72195), OR
 - MRI Abdomen and Pelvis without and with contrast (CPT[®] 74183 and CPT[®] 72197)
- Enterocutaneous fistulae
 - Suspected enterocutaneous fistulae or surgical planning of known complex fistulae:
 - ONE of the following is medically necessary:
 - CT Abdomen and Pelvis with contrast (CPT[®] 74177), OR
 - MR Enterography (CPT[®] 74183 or CPT[®] 74181 and CPT[®] 72197 or CPT[®] 72195), OR
 - MRI Abdomen and Pelvis without and with contrast (CPT[®] 74183 and CPT[®] 72197)
- Complicated diverticulitis with fistula, see: **Lower Abdominal Pain (AB-2.2)**
- Perianal/perirectal fistulae and abscess related to Crohn's disease, see: **Perirectal/Perianal Crohn's Disease (AB-23.3)**
- Other fistulae related to Crohn's disease, see: **Known IBD (AB-23.2)**
- Perianal/perirectal fistulae NOT related to Crohn's disease, see: **Fistula in Ano (PV-21.1)** in the Pelvis Imaging Guidelines
- For colovaginal, rectovesicular, rectovaginal, or urinary-vaginal communicating fistulae, see: **Pelvic Fistula (PV-21.3)** in the Pelvis Imaging Guidelines
- For pilonidal cyst, see: **Pilonidal Cyst (PV-21.4)** in the Pelvis Imaging Guidelines

Background and Supporting Information

- Examples of gastrointestinal fistulae include tracheo- and broncho-esophageal, entero-cutaneous, entero-enteric, entero-colic, entero-vesical, colo-vesical, recto-vaginal, perianal, and aorto-enteric.
- Etiologies of fistulae include: complication of inflammatory disease (e.g., Diverticulitis, Crohn's disease), complication of surgical procedures (which are the most common cause of intestinal fistula, comprising more than half of all fistulae), obstetric injury (e.g., recto-vaginal, ano-vaginal), malignancy, radiation, non-surgical injuries, and foreign bodies.

Evidence Discussion

Magnetic resonance imaging (MRI) and small intestine contrast enhanced ultrasonography (SICUS) have now emerged as suitable radiation-free alternatives to CT imaging, with comparable diagnostic accuracy. MRI is often considered the imaging modality of choice for evaluation of fistulae owing to its superior soft-tissue contrast and ability to provide surgeons with the highest quality information derived from just one study, including anatomic location of fistulae and associated pelvic pathology.^{1,2,11,12,13}

References (AB-48)

v1.0.2026

1. Expert Panel on Gastrointestinal Imaging. ACR Appropriateness Criteria® Crohn's disease. American College of Radiology (ACR); Reviewed 2021.
2. Lichtenstein GR, Loftus EV, Isaacs KL, Regueiro MD, Gerson LB, Sands BE. ACG Clinical Guideline: Management of Crohn's Disease in Adults. *American Journal of Gastroenterology*. 2018;113(4):481-517. doi:10.1038/ajg.2018.27.
3. Gribovskaja-Rupp I, Melton GB. Enterocutaneous fistula: proven strategies and updates. *Clin Colon Rectal Surg*. 2016;29(2):130.
4. Qiu Y, Mao R, Chen L, Li H, He Y, Zeng R, Li P, Chen H. Systematic review with meta-analysis: magnetic resonance enterography vs. computed tomography enterography for evaluating disease activity in small bowel Crohn's disease. *Aliment Pharmacol Ther*. 2014;40(2):134-46. doi:10.1111/apt.12815.
5. Panes J, Bouhnik Y, Reinisch W, et al. Imaging techniques for assessment of inflammatory bowel disease: joint ECCO and ESGAR evidence-based consensus guidelines. *J Crohn's Colitis*. 2013;7:556-585.
6. Jensen, Kjeldsen J, Rafaelsen S R, Nathan T. Diagnostic accuracies of MR enterography and CT enterography in symptomatic Crohn's disease. *Scand J Gastroenterol*. 2011;46:1449-1457.
7. Greer MC, Taylor SA. Perianal imaging in Crohn disease: current status with a focus on MRI, from the AJR Special Series on imaging of inflammation. *AJR Am J Roentgenol*. 2022;218(5):781-792. doi:10.2214/AJR.21.26615.
8. Scharitzer M, Koizar B, Vogelsang H, et al. Crohn's disease: prevalence, MR features, and clinical significance of enteric and colonic sinus tracts. *Eur Radiol*. 2020;30(10):5358-5366. doi:10.1007/s00330-020-06935-1.
9. Guimarães LS, Greer MC, Dillman JR, Fletcher JG. Magnetic resonance in Crohn's disease: diagnosis, disease burden, and classification. *Magn Reson Imaging Clin N Am*. 2020;28(1):31-44. doi:10.1016/j.mric.2019.08.003.
10. Tang YZ, Booth TC, Swallow D, et al. Imaging features of colovesical fistulae on MRI. *Br J Radiol*. 2012;85(1018):1371-5. doi:10.1259/bjr/55871151.
11. Dolejs SC, Penning AJ, Guzman MJ, et al. Perioperative Management of Patients with Colovesical Fistula. *J Gastrointest Surg*. 2019;23(9):1867-1873. doi:10.1007/s11605-018-4034-0
12. Expert Panel on Gastrointestinal Imaging, Levy AD, Liu PS, et al. ACR Appropriateness Criteria® Anorectal Disease. *J Am Coll Radiol*. 2021;18(11S):S268-S282. doi:10.1016/j.jacr.2021.08.009
13. Vogel JD, Johnson EK, Morris AM, et al. Clinical Practice Guideline for the Management of Anorectal Abscess, Fistula-in-Ano, and Rectovaginal Fistula. *Dis Colon Rectum*. 2016;59(12):1117-1133. doi:10.1097/DCR.000000000000073