Cohere Medical Policy - Magnetic Resonance Imaging (MRI), Abdomen and Magnetic Resonance Cholangiopancreatography (MRCP)

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Other Notices:

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Service: Magnetic Resonance Imaging (MRI), Abdomen and Magnetic Resonance Cholangiopancreatography (MRCP)

Recommended Clinical Approach

The use of contrast and the type of magnetic resonance (MR) contrast (e.g., extracellular or hepatobiliary-specific) should be at the request of the ordering provider with guidance from the radiologist. The MR field of view should be limited to the area of interest and, in some cases, may not be the preferred imaging study.

Medical Necessity Criteria

Indications

- ➔ **Magnetic resonance imaging (MRI), abdomen, and magnetic resonance cholangiopancreatography (MRCP)** are considered appropriate if **ALL** of the following are **TRUE**[1]:
  - ◆ Ultrasound and CT/CTA are contraindicated or inconclusive (e.g., body habitus for ultrasound, anaphylactic reaction due to IV contrast reaction, pregnancy, pediatric); **AND**
  - ◆ **ANY** of the following is **TRUE**:
    - Suspected appendicitis in pregnant people; **OR**
    - Suspected appendicitis in a pediatric patient; **OR**
    - Unexplained abdominal pain in a pregnant person or pediatric patient with non-diagnostic ultrasound; **OR**
    - Suspected abdominal abscess, diverticulitis, complicated UTI in a pregnant person or pediatric patient; **OR**
    - Detection, screening, surveillance, and follow-up of malignancies or metastatic involvement in the abdomen for **ANY** of the following[2-4]:

- To further characterize a lesion previously identified on a CT scan when the CT result is inconclusive; **OR**
- Metastases, known or suspected, including preoperative mapping for liver resection; **OR**
- Known or suspected primary malignancies with an assessment of vascular and biliary invasion, including but not limited to **ANY** of the following[5]:
  - Rising alpha-fetoprotein (AFP) in a high-risk patient or patient with known hepatocellular carcinoma (HCC); **OR**
  - CA 19-9; **OR**
  - Painless jaundice; **OR**
  - Persistent hematuria; **OR**
  - Other biomarker/sign/symptom suggestive of underlying malignancy; **OR**
- Tumor response to treatment (e.g., image-guided liver interventions or tumor ablation, chemoembolization, radioembolization, chemotherapy, radiotherapy, surgery)[6]; **OR**
- Annual screening of a patient with an increased risk of cancer due to **ANY** of the following:
  - Cirrhosis or chronic viral hepatitis where ultrasound or CT is nondiagnostic; **OR**
  - Primary sclerosing cholangitis after age 20[7]; **OR**
  - Known mutation that increases susceptibility (e.g., Von Hippel Lindai, Tuberous Sclerosis, BRCA-1/2); **OR**
  - The patient has two or more first-degree or second-degree relatives with the same or related cancer from the same side of the family; **OR**

- For evaluation of known benign or indeterminate adrenal masses with **ANY** of the following[8-9]:
    - Indeterminate adrenal mass found on initial imaging, and **ANY** of the following:
        - 1-4 cm with follow-up at 6-12 months[10]; **OR**
        - Potential metastatic involvement and less than 4 cm; **OR**
    - Adrenal adenoma, known or suspected based on clinical **AND** laboratory findings; **OR**
- Abdominal wall abnormalities, including hernias[11]; **OR**
- Peritoneal or mesenteric abnormalities such as carcinomatosis, internal hernias, or infarct; **OR**
- Characterization, and follow-up of intra-abdominal fluid collections; **OR**
- Gastrointestinal tract evaluation, as indicated by **ANY** of the following[12]:
    - Celiac disease with recurring symptoms despite maintaining a gluten-free diet for 12 months or more[13]; **OR**
    - Crohn's disease, known or suspected[14]; **OR**
    - Other autoimmune enteritis with small bowel involvement; **OR**
    - Volvulus, internal hernias, incarceration; **OR**
- Hepatobiliary system (liver, bile ducts, gallbladder, and associated structures) as indicated by **ANY** of the following[6]:
    - To further characterize a lesion previously identified on a CT scan when the CT result is inconclusive; **OR**
    - Infection/inflammation (e.g. cholangitis)[6]; **OR**
    - Autoimmune (e.g., autoimmune hepatitis, primary biliary cirrhosis); **OR**

    - Pre-operative or post-operative evaluation (e.g., liver resection, donor or transplant, hepatic shunt placement); **OR**
    - Non-invasive quantification of iron, fat, and fibrosis in chronic liver disease (e.g., hemochromatosis, hemosiderosis, nonalcoholic steatohepatitis [NASH] hepatitis), includes hepatic elastography; **OR**
    - Gallbladder disease, including evaluation of indeterminate polyps/nodules detected with other imaging modalities[15]; **OR**
- Kidney and urinary system disease as indicated by **ANY** of the following[16-19]:
    - Renal cysts with classification of Bosniak IIF or above (up to annually); **OR**
    - Solid indeterminate renal masses (up to annually); **OR**
    - Renal angiomyolipomas more than 3 cm (up to annually); **OR**
    - Characterization of other indeterminate lesions detected with other imaging modalities; **OR**
    - Diagnostic evaluation of concerning signs/symptoms (e.g., pain, concern for rupture, infection, hemorrhage) in a patient with known polycystic kidney disease[20]; **OR**
    - Infectious of inflammatory disease (e.g., complicated pyelonephritis); **OR**
    - Anatomic abnormalities, congenital or acquired (e.g., horseshoe kidney, retroperitoneal fibrosis); **OR**
    - Evaluation of the ureters/collecting system (e.g., stones, tumors, or stricture); **OR**

- Pancreatic abnormalities as indicated by **ANY** of the following[21]:
    - Duct anomaly[22]; **OR**
    - Duct obstruction (e.g., calculi, stricture, or mass)[22]; **OR**
    - Fluid collections; **OR**
    - Pancreatic pseudocysts; **OR**
    - Indeterminate lesions; **OR**
    - Pancreatitis (acute or chronic) with **ANY** of the following [23-24]**:**
        - Concern for complications such as necrosis or abscess; **OR**
        - Lack of response to conservative treatment and management; **OR**
        - Ultrasound did not show clear etiology such as a stone; **OR**
    - Indeterminate cyst in an asymptomatic patient that requires follow-up, and **ANY** of the following is **TRUE**[22,25]:
        - One-year follow-up imaging when interval growth is present on the previous follow-up; **OR**
        - The cyst is less than 1.5 cm without interval growth, and **ANY** of the following is **TRUE**:
            - For patients less than 65 years of age, annually up to five years; **OR**
            - For patients from 65 to 79 years of age, every two years up to ten years; **OR**
            - For patients more than 80 years of age, every two years up to four years; **OR**
        - Cyst is greater than 1.5 cm without interval growth, and **ANY** of the following is **TRUE** :

- The patient is less than 80 years old, and **ANY** of the following frequency limitations is **TRUE**:
    - Up to every 6 months for 2 years from diagnosis; **OR**
    - Up to annually for up to ten years from diagnosis; **OR**
- The patient is greater or equal to 80 years old with a frequency limitation of every 2 years for 4 years; **OR**

- Splenic abnormalities as indicated by **ANY** of the following:
    - Characterization of indeterminate lesions detected with other imaging modalities; **OR**
    - Detection and characterization of suspected diffuse abnormalities of the spleen; **OR**
- Post-traumatic organ injury; **OR**
- Fever of unknown origin greater than 101°F for at least 3 weeks where laboratory and clinical workup has been performed and have not revealed a diagnosis[26-27]; **OR**
- Preoperative, postoperative, or pre-treatment evaluation for **ANY** of the following:
    - Post-surgical complications involving the hepatobiliary system (bile ducts, gallbladder, and associated structures)[6]; **OR**
    - Post-treatment follow-up for **ANY** of the following:
        - Complications of pancreatitis; **OR**
        - Fluid collections; **OR**
        - Pancreatic duct anomalies; **OR**
- Characterization of complex congenital anomalies (e.g., genitourinary and pelvic organs)[16-19]; **OR**
- Repeat imaging of a specific area or structure using the

same imaging modality (in the absence of an existing follow-up guideline) is considered appropriate when **ALL** of the following are **TRUE**:

- There is documented clinical necessity; **AND**
- **ANY** of the following is **TRUE**:
  - A change in clinical status, such as worsening symptoms or the emergence of new symptoms, that may influence the treatment approach; **OR**
  - The requirement for interval reassessment, which may alter the treatment plan; **OR**
  - One-time follow-up of a prior indeterminate finding to assess for interval change; **OR**
  - The need for re-imaging either before or after performing an invasive procedure; **OR**
  - Prior imaging results of the specific area or structure, obtained using the same imaging modality, must be documented and available for comparison.

➔ **Magnetic resonance cholangiopancreatography (MRCP)** is considered appropriate if **ANY** of the following is **TRUE**:

- The patient has **ANY** of the following:
  - Evidence of biliary obstruction or involvement, including **ANY** of the following[28-30]:
    - Biliary duct dilation requiring further work-up; **OR**
    - Jaundice[31]; **OR**
    - Laboratory or biochemical markers, including increased alkaline phosphatase, gamma-glutamyl transpeptidase, or conjugated (direct) bilirubinemia; **OR**

- Known or suspected abnormalities of the pancreatic and biliary ducts, including **ANY** of the following[28-29,32-33]:
    - Acute pancreatitis[34]; **OR**
    - Chronic pancreatitis[34]; **OR**
    - Cystic lesions in the pancreas[22]; **OR**
    - Ductal stones; **OR**
    - Evaluation of bile duct dilation or stricture; **OR**
- Unexplained right upper quadrant pain[15,28-29]; **OR**

◆ Assessment of post-liver transplant biliary complications; **OR**

◆ When ERCP is unsuccessful or contraindicated, or therapeutic ERCP is unlikely to be needed[11,28-29,35]; **OR**

◆ Delineation of ductal anatomy before liver transplantation; **OR**

◆ Detection and anatomic delineation of bile leaks; **OR**

◆ Detection, staging, and post-treatment follow-up of bile duct and gallbladder cancer; **OR**

◆ Evaluation of suspected congenital abnormalities of the gallbladder or bile ducts; **OR**

◆ Follow-up after surgery or intervention; **OR**

◆ Repeat imaging of a specific area or structure using the same imaging modality is considered appropriate when **ALL** of the following is **TRUE**:

- There is documented clinical necessity; **AND**
- No existing follow-up guideline for that indication; **AND**
- Prior imaging results of the specific area or structure, obtained using the same imaging modality, must be documented and available for comparison; **AND**
- **ANY** of the following is **TRUE**:
    - A change in clinical status, such as worsening symptoms or the emergence of new symptoms, that may influence the treatment approach; **OR**
    - The requirement for interval reassessment, which

may alter the treatment plan; **OR**
    - One-time follow-up of a prior indeterminate finding to assess for interval change; **OR**
    - The need for re-imaging either before or after performing an invasive procedure.

Non-Indications

- ➔ **Magnetic resonance imaging (MRI), abdomen or magnetic resonance cholangiopancreatography (MRCP)** are not considered appropriate if **ANY** of the following is **TRUE**:
    - ◆ The patient has undergone advanced imaging of the same body part and for the same indication within 3 months, without being on treatment; **OR**
    - ◆ If contrast is used, history of anaphylactic allergic reaction to gadolinium contrast media with detailed guidelines for use in patients with renal insufficiency; **OR**
    - ◆ The patient has metallic clips on vascular aneurysms; **OR**
    - ◆ Incompatible implantable devices (e.g., pacemakers, defibrillators, cardiac valves); **OR**
    - ◆ Metallic foreign body in orbits/other critical area(s) or within the field of view and obscuring area of concern; **OR**
    - ◆ Benign prostatic hyperplasia (BPH), initial or follow-up imaging.[36]

*NOTE: MRI in patients with claustrophobia should be requested at the discretion of the ordering provider.
**NOTE: MRI in pregnant patients should be requested at the discretion of the ordering provider and obstetric care provider.

Level of Care Criteria

Inpatient or Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
74181	Magnetic resonance imaging (MRI) (e.g., proton), abdomen; without contrast material(s)
74182	Magnetic resonance imaging (MRI) (e.g., proton), abdomen; with contrast material(s)
74183	Magnetic resonance imaging (MRI) (e.g., proton), abdomen, without contrast material(s), followed by contrast material(s) and further sequences
S8037	Magnetic resonance cholangiopancreatography (MRCP)

Medical Evidence

Hernando et al. (2022) reviewed quantitative diffusion MRI of the abdomen and pelvis, which involves employing multiple diffusion encodings and mapping diffusion parameters. Diffusion MRI allows the ability to gauge tissue microstructure sensitivity. In contrast to qualitative diffusion-weighted MRI, the quantitative approach enhances the standardization of tissue characterization, which is crucial for disease detection, staging, and treatment monitoring. Challenges include acquisition artifacts, limitations in signal modeling, and biological variability. Technical performance concerns include addressing physiologic motion (respiratory, peristaltic, and pulsatile), handling image distortions, and managing a low signal-to-noise ratio.[37]

The American Urological Association (AUA) published guidelines on renal mass and localized renal cancer. Based on recommendations from the American College of Radiology (ACR), cross-sectional nervous system imaging is the preferred diagnostic method for identifying or ruling out metastases in the brain and spine. While MRI may exhibit greater sensitivity in detecting small central nervous system (CNS) neoplasms, CT can be beneficial for promptly assessing acute neurological signs or symptoms. MRI benefits patients who cannot receive IV iodinated contrast before and after administering gadolinium. Cross-sectional MRI with diffusion-weighted imaging benefits for patients who cannot tolerate conventional contrast. If there is suspicion of a mass, contrast-enhanced ultrasound can be employed to assess for enhancement.[18-19]

Staubli et al. (2022) performed a randomized control trial (RCT) comparing intraoperative cholangiography (IOC) and magnetic resonance cholangiopancreatography (MRCP) in patients suspected of having common bile duct stones (CBDS). It was a multicenter randomized controlled trial conducted across five hospitals. Patients were randomly assigned to receive either IOC followed by laparoscopic cholecystectomy (LC) with potential endoscopic retrograde cholangiopancreatography (ERCP) or MRCP followed by ERCP and LC if deemed necessary. The primary focus was on the LOS, with

secondary measures encompassing cost, stone detection, and complication rates. The findings indicated that IOC was more effective in diagnosing CBDS than MRCP. Although the median LOS was slightly shorter in the IOC group, this variance did not reach statistical significance. No significant cost difference was observed between the two approaches. However, CBDS were more frequently detected in the IOC group. Complication rates did not exhibit disparity between the two methods. The study concluded that while IOC and MRCP are viable options, IOC stands out for its notably higher diagnostic yield in detecting CBDS. (Clinicaltrials.gov Identifier: NCT02351492).[38]

Suzuki et al. conducted an RCT to evaluate the diagnostic precision of endoscopic ultrasound (EUS) and MRCP in detecting choledocholithiasis cases initially overlooked on CT scans. Patients suspected of having CBDS were divided into two groups: one receiving EUS and the other MRCP. Initially, those diagnosed with CBDS or sludge underwent ERCP, while CBDS-negative patients underwent a second diagnostic procedure, either MRCP or EUS, different from the initial one. The main focus was on the accuracy of diagnosis, with secondary interests in diagnostic capabilities, CBDS detection rates and characteristics during the second examination, and adverse event occurrence. Overall, EUS may provide higher diagnostic ability than MRCP; however, the authors did not note significant differences in recommending one procedure over the other.[39]

Timmerhuis et al. (2021) performed a systematic review of available guidelines for diagnosing a disrupted pancreatic duct in patients with acute pancreatitis. Eight studies with five distinct diagnostic modalities in 142 severe acute pancreatitis patients were included. Endoscopic ultrasound and ERCP reported a sensitivity of 100%. A sensitivity of 83% was reported with MRCP, with or without secretin. A combined cohort of secretin-enhanced MRCP and standard MRCP showed a sensitivity of 92%. Amylase measurements in drain fluid exhibited a sensitivity of 100% and specificity of 50% compared to ERCP. The authors concluded that various diagnostic modalities effectively diagnose disrupted pancreatic ducts in acute pancreatitis patients. Considering the invasiveness of alternative modalities, secretin-enhanced MRCP is recommended as the initial diagnostic approach.[40]

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