

**American College of Radiology  
 ACR Appropriateness Criteria®**

**Clinical Condition:**                      **Palpable Abdominal Mass**

Radiologic Procedure	Rating	Comments	<u>RRL*</u>
CT abdomen with or without contrast	8	Most definitive.	☼ ☼ ☼
US abdomen	7	Less costly and no ionizing radiation.	O
MRI abdomen with or without contrast	6	No ionizing radiation. See statement regarding contrast in text under "Anticipated Exceptions."	O
X-ray abdomen	5	A simple and inexpensive way to evaluate bowel for obstruction or constipation as cause of the "mass."	☼ ☼ ☼
X-ray contrast enema	4		☼ ☼ ☼
X-ray upper GI series	4		☼ ☼ ☼
X-ray upper GI series with small bowel follow-through	4		☼ ☼ ☼
<b><u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate</b>			<b>*Relative Radiation Level</b>

## PALPABLE ABDOMINAL MASS

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### **Summary of Literature Review**

Little has been written about the generic use of imaging in evaluating palpable abdominal masses since the 1980s. Rather, newer reviews and case reports have been focused on evaluation of specific masses using computed tomography (CT), ultrasound (US), and magnetic resonance imaging (MRI).

Investigators have found both US and CT excellent for affirming or excluding a clinically suspected abdominal mass [1-5], with sensitivity and specificity values in excess of 95% [2,5]. This is particularly noteworthy since as few as 16%-38% of patients referred for suspected abdominal mass will have that diagnosis corroborated by an imaging study [6]. So, in most cases, the “mass” initially palpated does not actually exist.

Both US and CT can visualize the organ from which a mass arises. The success of US in determining organ of origin has been 88%-91% [1,2], while CT has fared somewhat better at 93% [5]. US is limited by bowel gas in cases of dilated bowel or by body habitus in some obese individuals. As one might expect, attempts to predict the pathologic diagnosis of masses based on imaging findings are less successful. US studies correctly predicted the pathologic diagnosis in 77%-81% of cases [1,2,7,8], while CT suggested the diagnosis in 88% of cases [5].

Investigators have stressed the ability of CT and US to image masses no matter what their organ of origin and have touted them as first-line procedures for evaluating palpable masses [3,7]. While certain combinations of clinical findings could lend themselves to a more

targeted approach (for example, hematemesis plus a palpable gastric-region mass might merit endoscopy as the first study), cross-sectional imaging in general is well suited to initial evaluation of abdominal masses. Plain radiographs may also be considered as a first step. If the patient reports constipation, a plain radiograph could confirm or exclude that diagnosis or diagnose bowel obstruction or colonic volvulus, for example, without the need for CT. One study in 1981 showed that, compared with strategies not using CT, the use of CT can result in savings in time for diagnosis and overall cost of hospitalization [3].

At the time of this writing, no comparative studies evaluating MRI vs CT or US are available. One recent report of a rare abdominal wall tumor did demonstrate the excellent multiplanar capabilities of MRI [9]. In the absence of data, the usefulness of MRI in evaluating palpable masses is unknown. It is likely comparable to CT and US.

### **Anticipated Exceptions**

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (ie, <30 mL/min/1.73m<sup>2</sup>), and almost never in other patients. There is growing literature regarding NSF. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73m<sup>2</sup>. For more information, please see the [ACR Manual on Contrast Media](#) [10].

### **Relative Radiation Level Information**

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults (see Table below). Additional information regarding radiation dose assessment for

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The American College of Radiology seeks and encourages collaboration with other organizations on the development of the ACR Appropriateness Criteria through society representation on expert panels. Participation by representatives from collaborating societies on the expert panel does not necessarily imply society endorsement of the final document.

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imaging examinations can be found in the ACR Appropriateness Criteria® [Radiation Dose Assessment Introduction](#) document.

Relative Radiation Level Designations		
Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
⊕	<0.1 mSv	<0.03 mSv
⊕ ⊕	0.1-1 mSv	0.03-0.3 mSv
⊕ ⊕ ⊕	1-10 mSv	0.3-3 mSv
⊕ ⊕ ⊕ ⊕	10-30 mSv	3-10 mSv
⊕ ⊕ ⊕ ⊕ ⊕	30-100 mSv	10-30 mSv

\*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (eg, region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as NS (not specified).

#### Supporting Document(s)

- [ACR Appropriateness Criteria® Overview](#)
- [Procedure Contrast Information](#)
- Evidence table under review

The ACR Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the FDA have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

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