

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

**Clinical Condition: Palpable Abdominal Mass**

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen	8		Med
US abdomen	7		None
MRI abdomen	6		None
X-ray colon barium enema	4	Exam can be used to evaluate selected cases.	Med
X-ray abdomen supine and upright	4		Low
X-ray upper GI series	4	Exam can be used to evaluate selected cases.	Low
X-ray upper GI series with small bowel follow-through	4	Exam can be used to evaluate selected cases.	Med
X-ray abdomen supine	4		Low
X-ray intravenous urography	4	Exam can be used to evaluate selected cases.	Low
<b><u>Rating Scale:</u> 1=Least appropriate, 9=Most appropriate</b>			<b>*Relative Radiation Level</b>

An 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 exams 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.

## PALPABLE ABDOMINAL MASS

Expert Panel on Gastrointestinal Imaging: Spencer B. Gay, MD<sup>1</sup>; Robert L. Bree, MD, MHSA<sup>2</sup>; W. Dennis Foley, MD<sup>3</sup>; Seth N. Glick, MD<sup>4</sup>; Jay P. Heiken, MD<sup>5</sup>; James E. Huprich, MD<sup>6</sup>; Marc S. Levine, MD<sup>7</sup>; Pablo R. Ros, MD, MPH<sup>8</sup>; Max Paul Rosen, MD, MPH<sup>9</sup>; William P. Shuman, MD<sup>10</sup>; Frederick L. Greene, MD<sup>11</sup>; Don C. Rockey, MD.<sup>12</sup>

### Summary of Literature Review

There has been little written about the generic use of imaging in evaluating palpable abdominal masses since the 1980s. Rather, newer research has been both scant and 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% [1,5]. 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].

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% [3,5], while CT has fared slightly better at 93% [1]. US is limited by bowel gas in cases of dilated bowel. 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 [3,5,7], while CT suggested the diagnosis in 88% of cases [1].

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 [2,7]. 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. 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 [2].

At the time of this writing, no comparative studies evaluating MRI are available. From an intuitive standpoint, however, the nonorgan-specific nature and multiplanar imaging capabilities of MRI seem quite suitable for evaluating an abdominal mass. In the absence of data, the usefulness of MRI in evaluating palpable masses is unknown. It is likely comparable to CT and US.

### References

1. Williams MP, Scott IK, Dixon AK. Computed tomography in 101 patients with a palpable abdominal mass. *Clin Radiol* 1984; 35(4):293-296.
2. Dixon AK, Fry IK, Kingham JG, McLean AM, White EE. Computed tomography in patients with an abdominal mass: effective and efficient? A controlled trial. *Lancet* 1981; 1(8231):1199-1201.
3. Aspelin P, Hildell J, Karlsson S, Sigurjonson S. Ultrasonic evaluation of palpable abdominal masses. *Acta Chir Scand* 1980; 146(7):501-506.
4. Holm HH, Gammelgaard J, Jensen F, Smith EH, Hillman BJ. Ultrasound in the diagnosis of a palpable abdominal mass. A prospective study of 107 patients. *Gastrointest Radiol* 1982; 7(2):149-151.
5. Barker CS, Lindsell DR. Ultrasound of the palpable abdominal mass. *Clin Radiol* 1990; 41(2):98-99.
6. Colquhoun IR, Saywell WR, Dewbury KC. An analysis of referrals for primary diagnostic abdominal ultrasound to a general X-ray department. *Br J Radiol* 1988; 61(724):297-300.
7. Annuar Z, Sakijan AS, Annuar N, Kooi GH. Ultrasound in the diagnosis of palpable abdominal masses in children. *Med J Malaya* 1990;45(4):281-287.

<sup>1</sup>Review Author, University of Virginia Health Science Center, Charlottesville, Va; <sup>2</sup>Panel Chair, Radia Medical Imaging, Everett, Wash; <sup>3</sup>Froedtert Hospital East, Milwaukee, Wis; <sup>4</sup>Presbyterian Medical Center, Philadelphia, Pa; <sup>5</sup>Mallinckrodt Institute of Radiology, St. Louis, Mo; <sup>6</sup>Mayo Clinic, Rochester, Minn; <sup>7</sup>Hospital of the University of Pennsylvania, Philadelphia, Pa; <sup>8</sup>Brigham & Women's Hospital, Boston, Mass; <sup>9</sup>Beth Israel Hospital, Boston, Mass; <sup>10</sup>University of Washington, Seattle, Wash; <sup>11</sup>Carolinas Medical Center, Charlotte, NC, American College of Surgeons; <sup>12</sup>University of Texas, Southwest Medical Center, Dallas, Texas, American Gastroenterological Association.

Reprint requests to: Department of Quality & Safety, American College of Radiology, 1891 Preston White Drive, Reston, VA 20191-4397.

An 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 exams 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.