Complete Summary

GUIDELINE TITLE

Incidentally discovered adrenal mass.

BIBLIOGRAPHIC SOURCE(S)

Francis IR, Baumgarten DA, Bluth EI, Bush WH Jr, Casalino DD, Curry NS, Israel GM, Jafri SZ, Kawashima A, Papanicolaou N, Remer EM, Sandler CM, Spring DB, Fulgham P, Expert Panel on Urologic Imaging. Incidentally discovered adrenal mass. [online publication]. Reston (VA): American College of Radiology (ACR); 2007. 8 p. [48 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Choyke PL, Amis ES, Bigongiari LR, Bluth EI, Bush WH, Fritzsche PJ, Holder LE, Newhouse JH, Sandler CM, Segal AJ, Resnick MI, Rutsky EA. The incidentally discovered adrenal mass. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):753-60.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Adrenal mass

GUIDELINE CATEGORY

Evaluation

CLINICAL SPECIALTY

Endocrinology
Nuclear Medicine
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of radiologic procedures for the evaluation of incidentally discovered adrenal mass

TARGET POPULATION

Patients with adrenal mass

Note: This diagnostic appropriateness discussion is limited to patients with masses detected incidentally during computed tomography, ultrasound, or. magnetic resonance imaging evaluation.

INTERVENTIONS AND PRACTICES CONSIDERED

1. X-ray of the abdomen
2. Computed tomography (CT) scan
    - Abdomen with and without contrast
3. Magnetic resonance imaging (MRI) of the abdomen with and without contrast
4. Nuclear medicine (NUC)
    - Iodocholesterol scan
    - Metaiodobenzylguanidine (MIBG)
5. FDG-PET whole body
6. Ultrasound (US) of the adrenal gland
7. INV (invasive) biopsy of the adrenal gland

MAJOR OUTCOMES CONSIDERED

Utility of radiologic procedures in the evaluation of patients with adrenal mass

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed

by participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by the Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Incidentally Discovered Adrenal Mass

Variant 1: No history of malignancy; mass <3 cm in diameter.

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen without contrast	8	Presumes that a noncontrast CT has not already been performed.	Med
Initial follow-up CT	8	Assumes that there is no significant	NS

Radiologic Procedure	Rating	Comments	RRL*
or MR at 6 to 12 months		change on the first follow-up exam.	
CT abdomen with contrast	8	Indicated if noncontrast CT is indeterminate (density >10 HU) or adrenal mass is discovered on early contrast-enhanced CT.	Med
MRI abdomen without contrast	8	May be helpful when nonenhanced CT is equivocal.	None
INV biopsy adrenal gland	3	A biopsy should only be performed if there are no noninvasive options.	IP
NUC MIBG	2	Only for suspicion of pheochromocytoma.	Low
NUC iodocholesterol scan	1	This agent may be used to detect functionally active adenomas.	High
FDG-PET whole body	1		High
X-ray abdomen	1		Low
US adrenal gland	1		None
MRI abdomen with contrast	1	Promising technique, but not fully studied.	None
Rating Scale: 1=Least appropriate, 9=Most appropriate			***Relative Radiation Level**

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: No history of malignancy; mass 3 to 5 cm in diameter. Larger lesions should be removed.

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen without contrast	8	Presumes that a noncontrast CT has not already been performed.	Med
Initial follow-up CT or MRI at 3 to 6 months	8	Assumes that there is no significant change on the first follow-up exam.	NS

Radiologic Procedure	Rating	Comments	RRL*
CT abdomen with contrast	8	Indicated if noncontrast CT is indeterminate (density >10 HU) or adrenal mass is discovered on early contrast-enhanced CT.	Med
MRI abdomen without contrast	8	Indicated if lesion is identified only on a contrast-enhanced CT and further characterization is required. If the lesion is indeterminate on a noncontrast CT, the MRI is unlikely to add information. Indicated if mass is discovered incidentally on MRI study.	None
INV biopsy adrenal gland	6		IP
FDG-PET whole body	6	Should be performed if CT and MRI are inconclusive. Some malignancies (including renal cancer) may not be PET avid.	High
NUC MIBG	3	Not indicated unless there are biochemical indications of pheochromocytoma.	Low
NUC iodocholesterol scan	2	For functional adenomas.	High
MRI abdomen with contrast	2		None
US adrenal gland	1		None
X-ray abdomen	1		Low
Rating Scale: 1=Least appropriate, 9=Most appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 3: History of malignancy.

Radiologic Procedure	Rating	Comments	RRL*
Initial follow-up CT or MRI at 3 to 6	8	Assumes that there is no significant change on the first follow-up exam.	NS

Radiologic Procedure	Rating	Comments	RRL*
months			
CT abdomen without contrast	8	Presumes that a noncontrast CT has not already been performed.	Med
INV biopsy adrenal gland	8	To confirm metastases and in cases where imaging is inconclusive.	IP
CT abdomen with contrast	8	Indicated if noncontrast CT is indeterminate (density >10 HU) or adrenal mass is discovered on early contrast-enhanced CT.	Med
MRI abdomen without contrast	8	Indicated if lesion is identified only on a contrast-enhanced CT and further characterization is required. If the lesion is indeterminate on a noncontrast CT, the MRI is unlikely to add information. Indicated if mass is discovered incidentally on MRI study.	None
FDG-PET whole body	6	Documented indications are for lung cancer, colon cancer, lymphoma, and neuroendocrine tumors; however, it is likely that adrenal metastases from other primary tumors may be detectable by FDG-PET.	High
NUC MIBG	2	Only for suspicion of pheochromocytoma.	Low
NUC iodocholesterol scan	2	For functionally active lesions.	High
MRI abdomen with contrast	2		None
US adrenal gland	1		None
X-ray abdomen	1		Low
Rating Scale: 1=Least appropriate, 9=Most appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

The adrenal "incidentaloma" is an unsuspected and asymptomatic mass, usually detected on computed tomography (CT) obtained for other purposes. Incidentally discovered adrenal masses can range in size from 5 mm to over 15 cm, but the larger the lesion the more likely it is to be symptomatic. The majority of incidentalomas are benign and most often represent adenomas. The prevalence of adenomas in the general population, as summarized by one group of researchers ranges from 1%-2%, although autopsy studies have shown rates as high as 6.6%-8.7% depending on the age distribution of the patient sample. The risk of primary adrenal cortical carcinoma in this population is quite small, on the order of 0.06%; however, among patients with adrenal masses the risk is reported to be as high as 4.7%. Other malignancies of the adrenal include angiosarcomas, lymphomas, and malignant pheochromocytomas. These are diminishingly rare in the general population.

Metastatic disease without a known history of primary malignancy is also unusual, occurring in about 4% of patients with incidentally discovered adrenal masses and less than 1% of the general population.

The situation is different for patients with a known history of malignancy. In this setting, the rate of metastatic disease is 25%-72% depending on size and type of primary lesion. For instance, bronchogenic and renal carcinomas and melanoma have a relatively higher rate of adrenal metastases than other epithelial malignancies.

The guidelines suggested here only apply to masses detected incidentally during CT, ultrasound (US), or magnetic resonance imaging (MRI) evaluation. The patient is free of symptoms, although the mass may later prove to be functional (i.e., Cushing's or Conn's adenoma or pheochromocytoma). The appropriateness of performing additional studies to ascertain whether the mass is more likely benign or malignant is discussed herein.

Size

Size is an important variable in predicting malignancy of an incidentally discovered adrenal mass. Smaller lesions, presumably because they grow more slowly, are usually benign. Conversely, larger lesions, because they have already demonstrated the potential for growth, are often malignant. However, it is important to distinguish between populations with and without a history of malignancy. One group of researchers studying 342 patients without a history of malignancy, found only a 1.5% rate of malignancy in the adrenal, and all malignant lesions were >5 cm. Another study found 3 of 23 incidental lesions to be malignant, and all were >3 cm. In contrast, in patients with a history of malignancy, one study found that 87% of lesions <3 cm were benign and that more than 95% of lesions >3 cm were malignant. In a similar population, another group found that only 79% of lesions <2.5 cm were benign. Another study in a mixed population showed that a threshold of 3.1 cm discriminated 93% of lesions. Thus, size (3 to 5 cm) predicts benignity much better in a population without known malignancy. Size is an important variable in a population with a known malignancy, but there is more overlap for a given threshold diameter. Overall, size is considered too unreliable to be used alone as a criterion for malignancy.

Endocrinologic Function

Even though incidentally discovered adrenal masses are by definition asymptomatic, a significant proportion will show subclinical function. One group of researchers found that 23% of patients who had an adrenal mass but no history of malignancy had detectable secretion of aldosterone, cortisol, or catecholamines. A similar study found that percentage to be 12%. Routine endocrinologic screening of patients with incidentalomas has been recommended for lesions larger than 4 cm. The Swedish Cooperative Study of 388 patients with adrenal incidentalomas found that 5% of them were hypersecreting and included pheochromocytomas (70%) and functional cortical adenomas (30%). Thus, testing for subclinical hyperfunction may be warranted in selected cases. Two recent series have found a much higher percentage of pheochromocytomas discovered incidentally (29% to 59%) than previously thought.

Computed Tomography

CT not only detects incidentally discovered adrenal masses but also offers one of the best means of differentiating the benign from the malignant. Some benign lesions such as cysts and myelolipomas are readily identified by CT by their imaging features. Adrenal adenomas contain lipid to varying degrees, and this lowers their attenuation coefficient on non-contrast-enhanced CT. One group of researchers showed that when 0 Hounsfield units (HU) was used as a threshold value, the sensitivity for adenomas was 48% without any false positives. If the threshold was increased to 10 HU, the sensitivity was 56% with a 4% false positive rate. This has been confirmed by another study; however, a similar study found that no false positives were seen up to a threshold of 16.5 HU. One group has shown that there is some variability in the density measurements on different CT scanners. A threshold value of 10 HU is generally accepted as a cutoff value for a region of interest obtained over the lesion. Another study has demonstrated that using histograms of pixel values rather than the average value of the region of interest allows more adenomas to be identified while preserving a high specificity. If 5% or more of the pixels of a lesion are less than 0 HU, the lesion is very likely to be an adenoma. This is of particular relevance after contrast media has been given. Although sensitivity is reduced compared to nonenhanced CT, the use of histogram analysis can improve the sensitivity for adenoma from 10% to 36% if >5% of pixels are negative.

In a more recent study of 208 pathologically proven adrenal masses, negative pixels were seen in enhanced metastases, adrenal carcinomas, and pheochromocytomas. In addition, the authors noted that using a 5% negative pixel threshold improved specificity for adenoma diagnosis; however, the low sensitivity precluded clinical usefulness. Nonetheless, nonenhanced CT is a relatively inexpensive yet highly specific test for differentiating adenomas and some benign nonadenomas from malignant lesions, and histogram analysis may further improve its sensitivity.

One group of researchers has shown that delayed enhanced CT and use of washout percentages are better able to distinguish adenomas from metastases. Adenomas are not only lower in CT density but also tend to wash out faster after intravenous contrast. This may result from the increased "leakiness" of malignant vessels compared with benign lesions. Another group showed that following a delay of 15 minutes after the administration of intravenous contrast, the sensitivity and specificity of CT could be greatly improved (sensitivity >95%,

specificity >97%). Another study had similar results using 30-minute delay times (sensitivity 97%, specificity 100%). The accuracy of washout values was validated in another study of 166 adrenal masses, accurate characterization being achieved in 96% of masses. Thus, this technique is very promising and may be superior to nonenhanced CT and MRI in evaluating adrenal masses.

Follow-up CT has been recommended for lesions deemed to be low risk for malignancy based on their small size. The usual recommendation is that follow-up CT should be performed within 3 to 12 months to insure that there is no growth. However, anecdotal evidence of slow-growing metastases exists.

Magnetic Resonance Imaging

MRI has until recently been insufficiently specific to be useful in this setting. Various adrenal mass-to-liver or adrenal mass-to-fat ratios and calculated T2 values were demonstrated to be inconsistent among institutions and field strengths. At their best they demonstrated a 30% overlap between adenomas and metastases.

Dynamic enhanced MRI depends on the differences in timing and intensity of enhancement of lesions after the intravenous administration of a gadolinium chelate bolus. One group of researchers demonstrated that this method was correct 91% of the time in differentiating benign and malignant lesions. Another group however, using fat-suppressed T1-weighted MRI, showed that while there were differences in the mean enhancement between adenomas and metastases there was also too much overlap between the categories to make the test useful. In summary, while this technique showed initial promise, in view of mixed results in the literature it is currently not used widely to distinguish adenomas from malignant adrenal masses.

Chemical shift MRI (CSI), introduced by Leroy-Willig et al in 1989, relies on differentiating lesions by their relative fat content, malignant lesions having virtually no lipid. Another study showed that CSI was correct in 96% of cases, and another study showed that the technique was 100% correct when using a slight variation. Unfortunately, all of these studies were performed in a mixed population of patients with regard to the history of malignancy, so results may not be directly applicable to populations either with or without known malignancy (patient mix will greatly influence results). Moreover, while Mitchell's technique has proven the most reliable, there is no universal agreement about technique or whether the same results will be seen at different field strengths.

Since then, several authors have shown excellent results in a relevant population using simpler CSI techniques. Analytic methods have also varied from simple visual assessment of signal loss on out-of-phase (OOP) imaging compared to in-phase (IP) imaging to quantitative measures of signal loss. One group of researchers concluded that a signal intensity index (IP-OOP/IP) was superior to other methods that normalized signal to spleen, liver, or muscle.

Another study concluded, however, that superior results could be obtained by normalizing the signal to kidney. This group demonstrated substantial advantages to applying CSI imaging in cases where the CT density measurement was between 10 and 30 HU (i.e., indeterminate by CT). For instance, in adenomas with

densities between 10 and 30 HU, 89% of the lesions were correctly characterized by CSI. Similar results have been obtained by another group who concluded that up to 60% of lesions misclassified by CT density units can be correctly characterized as adenomas by chemical shift MRI. One other study demonstrated that even heterogeneous loss of signal is evidence of a benign lesion. Thus, chemical shift MRI may have better sensitivity and specificity than nonenhanced CT.

Adrenal Biopsy

Biopsy of the incidental adrenal mass has been performed under CT guidance for over 20 years. Most studies on the efficacy of adrenal biopsy have been performed in a mixed population of patients. Biopsy samples insufficient to make a diagnosis are obtained in 4% to 19% (mean = 15%) of cases. When sufficient material is obtained, the accuracy of biopsy is 96% to 100% for malignant lesions. Biopsy interpretation is more difficult in benign processes. Complication rates range from 8% to 12% and consist of bleeding, pneumothorax, infection, and anecdotes of tumor tracking. Several deaths have been reported after an adrenal biopsy of a pheochromocytoma. One group of researchers demonstrated that when biopsy was compared to CT and MRI it had the highest combination of sensitivity and specificity (83% and 100%, respectively). Thus, biopsy is better suited to a population with a high risk of malignant lesions and is most useful when noninvasive studies are negative. The role of adrenal biopsy has evolved, and it is now performed to exclude the presence of metastases when noninvasive tests are inconclusive.

Radionuclide Studies

Iodocholesterol (NP 59) scans are not in widespread use in the United States. NP 59 studies will detect any lesion with functioning adrenal tissue. Thus, hyperfunctional adenomas (Conn's and Cushing's adenomas) and many nonhyperfunctioning adenomas will bind this agent. When the CT and NP 59 scan are concordant, the lesion is benign in all cases. In patients without a history of tumor, only 52% of benign lesions demonstrated this pattern in a study by one group of researchers; however, the majority of the remainder was also benign.

Homogeneous uptake was seen in two adrenal cancers. One group of researchers studying a population of patients with a history of tumor, showed that most (82%) of lesions with discordant uptake were metastatic; 11% were indeterminate. Thus, radionuclide studies are very useful if concordant, but overlap significantly if they are discordant with the CT findings.

Metaiodobenzylguanidine (MIBG) studies are useful in patients suspected of a pheochromocytoma, but this is rarely the case in the incidentally detected adrenal mass.

Fluorine-18-2-fluoro-2-deoxy-D-glucose (FDG)-labeled for positron emission tomography (PET) can be used to identify metastases in oncologic patients with various cancers. FDG-PET is sensitive to metabolically active lesions, and metastases usually show greater uptake than benign lesions. In several studies there have been few false positives with FDG-PET, and excellent sensitivity has been achieved. False negative scans have occurred in renal cell carcinoma

metastases. Specific uptake values (SUV) are typically greater than 4 for metastatic disease and less than 4 for benign lesions. Thus, FDG-PET imaging is particularly promising for evaluating adrenal masses related to lung, colon, melanoma, and lymphoma but may not be the method of choice for renal cell carcinoma.

Summary

For patients with no history of malignancy, most small (<3 cm) incidentally discovered adrenal masses are benign, and an extensive and costly workup is usually not justified. Endocrinologic evaluation should be considered, as subclinical hyperfunction is present in 5% of adrenal incidentalomas. If workup is deemed clinically important, unenhanced CT or chemical shift MRI is useful for effectively excluding a large number of patients from consideration for a malignancy. Follow-up with CT or MRI is another valid method of assessing the nature of the small incidentaloma. FDG-PET evaluation or adrenal biopsy should only be considered for lesions considered indeterminate by CT or MRI. For incidentalomas between 3 to 5 cm the following could be considered: follow-up CT, unenhanced CT, delayed enhanced CT with use of washout percentages, chemical shift MRI, an endocrinologic evaluation, FDG-PET, adrenal biopsy (if pheochromocytoma is excluded), or surgery. Follow-up CT or CSI are the most reasonable choices. Lesions larger than 5 cm should be removed due to the higher risk of malignancy.

For patients with a history of malignancy, the incidentally discovered adrenal mass is more often malignant, and thus even smaller adrenal lesions are suspect. It is important to exclude from further evaluation any patient with widespread nonadrenal metastases since, in this setting, the presence or absence of adrenal metastases is unlikely to influence the patient's outcome. The unenhanced CT, delayed enhanced CT, and chemical shift MRI are relatively inexpensive and readily available tests in this setting. If these are inconclusive, FDG-PET should be considered prior to biopsy, as a lesion with a high SUV is likely malignant. Adrenal biopsy should be reserved for cases where the noninvasive techniques are equivocal and to confirm the presence of metastases. In patients suspected of having a functional lesion, iodocholesterol or MIBG studies may be useful. Plain radiography and US have a very limited role in assessing adrenal lesions.

Anticipated Exceptions

Patients with pheochromocytoma should not have adrenal biopsy unless properly pretreated. This diagnosis should be excluded prior to biopsy with urinary or plasma catecholamine levels. In equivocal cases a glucagons stimulation test should be done before biopsy of a potential pheochromocytoma.

Abbreviations

- CT, computed tomography
- FDG-PET, fluorodeoxyglucose positron emission tomography
- HU, Hounsfield units
- INV, invasive
- IP, in progress
- Med, medium
- MIBG, metaiodobenzylguanidine

- MR, magnetic resonance
- MRI, magnetic resonance imaging
- NS, not specified
- NUC, nuclear medicine
- US, ultrasound

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for the evaluation of patients with adrenal mass

POTENTIAL HARMS

- The relative radiation level is high for NUC iodocholesterol and fluorodeoxyglucose positron emission tomography, medium for computed tomography of the abdomen with and without contrast, and low with X-ray of the abdomen and nuclear medicine metaiodobenzylguanidine.
- Complication rates of adrenal biopsy range from 8% to 12% and consist of bleeding, pneumothorax, infection, and anecdotes of tumor tracking. Several deaths have been reported after an adrenal biopsy of a pheochromocytoma.

CONTRAINDICATIONS

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Patients with pheochromocytoma should not have adrenal biopsy unless properly pretreated. This diagnosis should be excluded prior to biopsy with urinary or plasma catecholamine levels.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (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 U.S. Food and Drug Administration (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.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Francis IR, Baumgarten DA, Bluth EI, Bush WH Jr, Casalino DD, Curry NS, Israel GM, Jafri SZ, Kawashima A, Papanicolaou N, Remer EM, Sandler CM, Spring DB, Fulgham P, Expert Panel on Urologic Imaging. Incidentally discovered adrenal mass. [online publication]. Reston (VA): American College of Radiology (ACR); 2007. 8 p. [48 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 (revised 2007)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Urologic Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Isaac R. Francis, MD; Deborah A. Baumgarten, MD; Edward I. Bluth, MD; William H. Bush, Jr., MD; David D. Casalino, MD; Nancy S. Curry, MD; Gary M. Israel, MD; S. Zafar H. Jafri, MD; Akira Kawashima, MD; Nicholas Papanicolaou, MD; Erick M. Remer, MD; Carl M. Sandler, MD; David B. Spring, MD;Pat Fulgham, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Choyke PL, Amis ES, Bigongiari LR, Bluth EI, Bush WH, Fritzsche PJ, Holder LE, Newhouse JH, Sandler CM, Segal AJ, Resnick MI, Rutsky EA. The incidentally discovered adrenal mass. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):753-60.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® *Anytime*, *Anywhere*™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria®. Relative radiation level information. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on February 10, 2006. This NGC summary was updated by ECRI Institute on November 16, 2007.

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