Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

# General

## Guideline Title

ACR Appropriateness Criteria® neck mass/adenopathy.

## Bibliographic Source(s)

Wippold FJ II, Cornelius RS, Berger KL, Broderick DF, Davis PC, Douglas AC, Frey KA, Mechtler LL, Nussenbaum B, Smirniotopoulos JG, Expert Panel on Neurologic Imaging. ACR Appropriateness CriteriaÂ® neck mass/adenopathy. [online publication]. Reston (VA): American College of Radiology (ACR); 2012. 9 p. [98 references]

## Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Mukherji SK, Wippold FJ II, Cornelius RS, Brunberg JA, Davis PC, De La Paz RL, Dormont D, Gray L, Jordan JE, Nussenbaum B, Seidenwurm DJ, Sloan MA, Turski PA, Zimmerman RD, Coley BD, Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria® neck mass/adenopathy. [online publication]. Reston (VA): American College of Radiology (ACR); 2009. 8 p.

# Recommendations

## Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Neck Mass/Adenopathy

Variant 1: Adult presenting with a nonpulsatile solitary neck mass (afebrile).

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| CT neck with contrast | 9 | | |
| MRI neck without and with contrast | 8 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| MRI neck without contrast | 7 | | O |
| CT neck without contrast | 6 | May be appropriate initially if mass relationship to | *Relative |

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| | | thyroid gland is uncertain. | |
| CT neck without and with contrast | 5 | For selected cases if sialolith is suspected. | |
| US neck | 4 | | O |
| MRA neck without and with contrast | 3 | | O |
| CTA neck with contrast | 3 | | |
| FDG-PET/CT neck | 2 | Not for primary diagnosis. | |
| MRA neck without contrast | 1 | | O |
| Arteriography cervicocerebral | 1 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Variant 2: Adult presenting with a solitary neck mass (febrile).

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| CT neck with contrast | 9 | | |
| MRI neck without and with contrast | 8 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| CT neck without contrast | 6 | May be appropriate initially if mass relationship to thyroid gland is uncertain. | |
| MRI neck without contrast | 5 | | O |
| US neck | 4 | | O |
| MRA neck without and with contrast | 3 | | O |
| CTA neck with contrast | 3 | | |
| CT neck without and with contrast | 2 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| FDG-PET/CT neck | 2 | Not for primary diagnosis. | |
| MRA neck without contrast | 1 | | O |
| Arteriography cervicocerebral | 1 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Variant 3: Adult presenting with a pulsatile neck mass.

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| CT neck with contrast | 9 | | |
| CTA neck with contrast | 9 | May be done at same time as CT of neck. | |
| MRI neck without and with contrast | 8 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| MRA neck without and with contrast | 8 | May be done at same time as MRI of neck. See statement regarding contrast in text under "Anticipated Exceptions." | O |
| US neck | 6 | | O |
| MRI neck without contrast | 5 | | O |
| CT neck without contrast | 4 | | |
| Arteriography cervicocerebral | 4 | Useful if preoperative embolization of glomus tumor is planned. | |
| MRA neck without contrast | 3 | | O |
| CT neck without and with contrast | 2 | | |
| FDG-PET/CT neck | 2 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Variant 4: Adult presenting with multiple neck masses.

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| CT neck with contrast | 9 | | |
| MRI neck without and with contrast | 8 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| MRI neck without contrast | 7 | | O |
| CT neck without contrast | 6 | | |
| FDG-PET/CT neck | 4 | | |
| US neck | 4 | To further characterize nodes in anticipation of biopsy. | O |
| CTA neck with contrast | 3 | | |
| MRA neck without and with contrast | 3 | | O |
| MRA neck without contrast | 2 | | O |
| CT neck without and with contrast | 2 | | |
| Arteriography cervicocerebral | 1 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Variant 5: Adult with a history of treatment for cancer presenting with a neck mass.

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| CT neck with contrast | 9 | Complementary with FDG-PET. | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation |

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| | | | |
| FDG-PET/CT neck | 9 | Complementary with CT of neck with contrast. | |
| MRI neck without and with contrast | 8 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| CT neck without contrast | 6 | | |
| MRI neck without contrast | 5 | | O |
| US neck | 4 | Used for localization for biopsy. | O |
| CTA neck with contrast | 3 | | |
| MRA neck without and with contrast | 3 | | O |
| MRA neck without contrast | 2 | | O |
| CT neck without and with contrast | 2 | | |
| Arteriography cervicocerebral | 1 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Variant 6: Child (up to age 14) presenting with a solitary neck mass or multiple neck masses (afebrile).

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| US neck | 9 | | O |
| CT neck with contrast | 8 | | |
| MRI neck without and with contrast | 7 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| MRI neck without contrast | 6 | | O |
| CT neck without contrast | 5 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative |

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| CT neck without and with contrast | 2 | | |
| CTA neck with contrast | 2 | | |
| MRA neck without and with contrast | 2 | | O |
| MRA neck without contrast | 2 | | O |
| Arteriography cervicocerebral | 1 | | |
| FDG-PET/CT neck | 1 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Variant 7: Child (up to age 14) presenting with a solitary neck mass (febrile).

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| US neck | 9 | For palpable neck mass, except retropharyngeal, where CT would be preferred. | O |
| CT neck with contrast | 8 | | |
| MRI neck without and with contrast | 7 | See statement regarding contrast in text under "Anticipated Exceptions." | O |
| MRI neck without contrast | 6 | | O |
| CT neck without contrast | 5 | | |
| CT neck without and with contrast | 2 | | |
| CTA neck with contrast | 2 | | |
| MRA neck without and with contrast | 2 | | O |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative |

| Radiologic Procedure | Rating | Comments | RRL* |
|---|---|---|---|
| MRA neck without contrast | 2 | | O |
| Arteriography cervicocerebral | 1 | | |
| FDG-PET/CT neck | 1 | | |
| Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate | | | *Relative Radiation Level |

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

Summary of Literature Review

Initial Diagnosis

Imaging may be requested in a patient who presents with a palpable neck mass. The clinical presentation may vary. For example, the patient may be an adult or a child, the mass may be painful or nontender, or the patient may be febrile or afebrile. Recommendations for initial imaging studies have changed in past decades with the development and maturation of new imaging modalities.

Magnetic Resonance Imaging (MRI) and Computed Tomography (CT)

In adults, a neck mass is likely to be either neoplastic or inflammatory. In patients up to 20 years of age, neck masses are usually benign, including late presentations of congenital lesions. In patients 20 to 40 years of age, masses are usually malignant. In patients over 40 years of age, especially with a smoking history, the diagnosis overwhelmingly favors a malignancy. Moreover, with the rise of human papillomavirus (HPV)-related oropharyngeal carcinomas in nonsmoking adults, vigilance for carcinoma is now warranted for all adult age groups. In adults who present with a fever, the etiology is often inflammation.

Both CT and MRI can accurately diagnose tumors and inflammation, and therefore CT and MRI should be considered complementary studies. Multidetector CT (MDCT) now appears to be the preferred initial modality for evaluating a patient with a palpable neck mass. Both modalities can be used for initial diagnosis of a primary head and neck malignancy and for staging of cervical lymph nodes. The rapid image acquisition of MDCT reduces physiologic motion and produces a higher consistent image quality compared with MRI. On the other hand, MRI is superior to CT for soft-tissue characterization. MRI is also superior to CT for detecting perineural spread, which is important for initial staging for a variety of skull base tumors. Addition of sequences such as short tau inversion recovery (STIR) may further increase sensitivity of MRI to lymphadenopathy. Advanced CT and MRI techniques, such as perfusion and diffusion imaging are being investigated for possible applications such as differentiating benign from malignant lymph nodes and tumor response.

Use of Contrast

Intravenous contrast is recommended for routine cross-sectional imaging in adults or children presenting with a neck mass with no contraindications to selected contrast agents. Contrast is helpful for assessing tumor margins and is essential for detecting neck abscesses, especially those that are intramuscular. Moreover, contrast enhancement may reveal malignant nodes that are not pathologically enlarged. Intravenous contrast is also helpful for distinguishing vessels from lymph nodes and determining if the mass is hypervascular, as many pulsatile neck masses (especially those in level 2 or 3) are lymph nodes overlying the carotid rather than true vascular masses. Contrast can obscure visualization of sialoliths, and noncontrast CT is recommended in patients presenting with a neck mass suspected of being a swollen major salivary gland due to an obstructing sialolith. MRI may be helpful in patients with nonmineralized sialoliths. Iodine-based contrast may be avoided in patients with thyroid cancer history or when metastatic thyroid cancer is suspected.

Positron Emission Tomography (PET)

The role of PET and now PET combined with CT for assessing neck masses continues to evolve. Some investigators feel that PET/CT is superior to CT alone for evaluating primary site tumor margins and preoperative staging. PET/CT may also be superior to CT alone for staging cervical

lymph nodes. However, it cannot detect lymph node micrometastases. Moreover, some investigators have been more cautious in endorsing PET/CT for such applications as evaluating cystic or necrotic neck masses or treated necks, citing pitfalls with the combined modality. PET/CT should also be considered for patients with stage III/IV disease or with occult primaries, and selectively for other patients. Most recently PET combined with MRI has been introduced; however, this new technique is not yet widely available.

Ultrasound (US)

The use of US for the initial diagnosis of neck masses in adults and children continues to increase. In fact, the overall use of neck US in the United States has generally lagged its use in Europe and Southeast Asia, due in part to greater accessibility of cross-sectional modalities such as CT and MRI here. US is useful in differentiating solid from cystic neck lesions in both adults and children, in recording the size of nodes (at least in the upper neck), and in discriminating high-flow from low-flow vascular malformations. US is also very helpful for image-guided biopsies of nonpalpable or small lesions that are relatively superficial and for biopsies of indeterminate soft tissue in the treated neck. Studies have shown that US-guided fine-needle aspiration of lymph nodes can be useful in staging the N0 neck. The positive predictive value of this technique is high; however, its negative predictive value and its inability to exclude micrometastases remain problematic issues. Some studies have suggested that color Doppler US can distinguish between metastatic and inflammatory neck nodes. Although these results are promising, the results appear to be user dependent. Also, novel techniques such as US elastography are being explored for possible future clinical applications.

Angiography

The role of conventional angiography for initial diagnosis is very limited. The initial imaging modality for evaluating a pulsatile neck mass (glomus tumor, aneurysm) is CT angiography, which now appears to be preferred to MR angiography for these indications. Conventional angiography is used for planning endovascular treatment (tumor embolization, balloon test occlusion, etc.) or for further characterization of vascular neck lesions.

Neck Masses in Children

In children who present with neck masses, congenital etiologies should be added to differential diagnostic considerations. Any recommended imaging study in a child with a neck mass must consider the risk of sedation and radiation dose. In children suspected of having a congenital abnormality, US is usually sufficient for distinguishing a cystic from a solid mass. Color-flow Doppler US is also helpful for characterizing flow in solid lesions. Either CT or MRI can be performed in children suspected of a having a malignancy or a deep neck abscess that may require surgical drainage. MDCT tends to be preferred over MRI due to the lower sedation requirements for a shorter examination time.

Post-treatment

CT and MRI are beneficial in patients previously treated for head and neck squamous cell carcinoma (HNSCCA). Both modalities can assess the extent of locoregional recurrence and look for synchronous lesions in the neck. MRI is superior to CT for characterizing soft tissue and detecting perineural spread. However, due to the length of the examination, MRI is prone to motion artifact in patients treated for advanced disease in whom severe post-treatment mucositis has caused difficulty with pooled secretions. New physiologic techniques such as diffusion-weighted MRI, MR spectroscopy, and MR and CT perfusion have shown promise in attempting to differentiate recurrent tumor from post-treatment changes. However, the results are preliminary, and further investigations are required.

The current literature suggests that PET/CT may be superior to CT or MRI for detecting recurrent tumor. It has the advantage of detecting recurrent HNSCCA based on correlation of anatomic distortion with physiologic abnormality. The sensitivity and specificity of PET/CT for detecting recurrent HNSCCA are in the range of 70% to 100%. However, one must be aware of the range of physiologic activity following treatment to avoid false-positive results. Although PET/CT is commonly used to evaluate post-treatment HNSCCA patients, there is no consensus regarding the proper timing of serial post-treatment surveillance studies. A new modality, PET/MRI, is currently being launched in several centers, but no clinical data regarding its efficacy in recurrent HNSCCA are yet available. The imaging study that is ordered should depend on the clinical indication of the patient and an understanding of the information that the imaging study can provide.

Summary

- CT and MRI are complementary methods for evaluating a patient with a palpable neck mass.
- MDCT is emerging as the preferred modality for the initial diagnostic imaging workup.
- US is increasingly demonstrating usefulness in differentiating solid and cystic neoplasms, in assessing vascular lesions, and in facilitating biopsies.
- CT, MRI, and PET/CT are useful in evaluating the post-treatment cancer patient.

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) (i.e., <30 mL/min/1.73 $m^2$), 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/1.73 $m^2$. For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Abbreviations

- CT, computed tomography
- CTA, computed tomography angiography
- FDG-PET, fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography
- MRA, magnetic resonance angiography
- MRI, magnetic resonance imaging
- US, ultrasound

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 (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as “Varies.” | | |

## Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

# Scope

## Disease/Condition(s)

Neck mass/adenopathy

## Guideline Category

Diagnosis

Evaluation

## Clinical Specialty

Endocrinology

Internal Medicine

Oncology

Pediatrics

Radiology

## Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

## Guideline Objective(s)

To evaluate the appropriateness of initial radiologic examinations for patients with neck mass/adenopathy

## Target Population

Patients with neck mass/adenopathy

## Interventions and Practices Considered

1. Computed tomography (CT) neck
    - With contrast
    - Without contrast
    - Without and with contrast
2. Magnetic resonance imaging (MRI) neck
    - Without and with contrast
    - Without contrast
3. Ultrasound (US) neck
4. Magnetic resonance angiography (MRA) neck
    - Without and with contrast
    - Without contrast
5. CT angiography (CTA) neck with contrast
6. Fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET)/CT neck
7. Arteriography cervicocerebral

## Major Outcomes Considered

Utility of radiologic examinations in differential diagnosis

# Methodology

## Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

## Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches.

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 5 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

## Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

## Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

Strength of Evidence Key

Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis, and results.

Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.

Category 3 - The conclusions of the study may be valid, but the evidence supporting the conclusions is inconclusive or equivocal.

Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

## Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

## Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence for all articles included in the

narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member forms his/her own opinion based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

## Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

## Description of Methods Used to Formulate the Recommendations

Modified Delphi Technique

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distributes surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The ratings are a scale between 1 and 9, which is further divided into three categories: 1, 2, or 3 is defined as "usually not appropriate"; 4, 5, or 6 is defined as "may be appropriate"; and 7, 8, or 9 is defined as "usually appropriate." Each panel member assigns one rating for each procedure per survey round. The surveys are collected and the results are tabulated, de-identified and redistributed after each round. A maximum of three rounds are conducted. The modified Delphi technique enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive bias from fellow panelists in a simple, standardized and economical process.

Consensus among the panel members must be achieved to determine the final rating for each procedure. Consensus is defined as eighty percent (80%) agreement within a rating category. The final rating is determined by the median of all the ratings once consensus has been reached. Up to three rating rounds are conducted to achieve consensus.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is accepted as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the 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.

# 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 evaluation of patients with neck mass/adenopathy

## Potential Harms

- Positron emission tomography/computed tomography (PET/CT) has the advantage of detecting recurrent head and neck squamous cell carcinoma (HNSCCA) based on anatomic distortion with physiologic abnormality. However, one must be aware of the range of physiologic activity following treatment to avoid false-positive results.
- Studies have shown that ultrasound (US) fine-needle aspiration of lymph nodes can be useful in staging the N0 neck; however, its negative predictive value and its inability to exclude micrometastases remain problematic issues.
- Iodine-based contrast may be avoided in patients with thyroid cancer history or when metastatic thyroid cancer is suspected.

Gadolinium-based Contrast Agents

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) (i.e., <30 mL/min/1.73 $m^2$), and almost never in other patients. 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/1.73 $m^2$. For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Relative Radiation Level (RRL)

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 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. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® Radiation Dose Assessment Introduction document (see the "Availability of Companion Documents" field).

# Qualifying Statements

## Qualifying Statements

The 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 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 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.

# Institute of Medicine (IOM) National Healthcare Quality Report Categories

## IOM Care Need

Getting Better

Living with Illness

## IOM Domain

Effectiveness

# Identifying Information and Availability

## Bibliographic Source(s)

Wippold FJ II, Cornelius RS, Berger KL, Broderick DF, Davis PC, Douglas AC, Frey KA, Mechtler LL, Nussenbaum B, Smirniotopoulos JG, Expert Panel on Neurologic Imaging. ACR Appropriateness CriteriaÂ® neck mass/adenopathy. [online publication]. Reston (VA): American College of Radiology (ACR); 2012. 9 p. [98 references]

## Adaptation

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

## Date Released

2009 (revised 2012)

## 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 Neurologic Imaging

## Composition of Group That Authored the Guideline

*Panel Members*: Franz J. Wippold II, MD (*Principal Author and Panel Chair*); Rebecca S. Cornelius, MD (*Panel Vice-chair*); Kevin L. Berger, MD; Daniel F. Broderick, MD; Patricia C. Davis, MD; Annette C. Douglas, MD; Kirk A. Frey, MD, PhD; Laszlo L. Mechtler, MD; Brian Nussenbaum, MD; James G. Smirniotopoulos, MD

## Financial Disclosures/Conflicts of Interest

Not stated

## Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Mukherji SK, Wippold FJ II, Cornelius RS, Brunberg JA, Davis PC, De La Paz RL, Dormont D, Gray L, Jordan JE, Nussenbaum B, Seidenwurm DJ, Sloan MA, Turski PA, Zimmerman RD, Coley BD, Expert Panel on Neurologic Imaging. ACR Appropriateness Criteria® neck mass/adenopathy. [online publication]. Reston (VA): American College of Radiology (ACR); 2009. 8 p.

## Guideline Availability

Electronic copies: Available from the American College of Radiology (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®. Overview. 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®. Literature search process. Reston (VA): American College of Radiology; 1 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Radiation dose assessment introduction. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Manual on contrast media. Reston (VA): American College of Radiology; 90 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Procedure information. Reston (VA): American College of Radiology; 1 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria® neck mass/adenopathy. Evidence table. Reston (VA): American College of Radiology; 2012. 30 p. Electronic copies: Available from the ACR Web site.

## Patient Resources

None available

## NGC Status

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