Guideline Summary NGC-8878

Guideline Title

ACR Appropriateness Criteria® follow-up and retreatment of brain metastases.

Bibliographic Source(s)

Patel SH, Robbins JR, Videtic GM, Gore EM, Bradley JD, Gaspar LE, Germano I, Ghafoori P, Henderson MA, Lutz ST, McDermott MW, Patchell RA, Robins HI, Vassil AD, Wippold FJ II, Expert Panel on Radiation Oncology-Brain Metastases. ACR Appropriateness Criteria® follow-up and retreatment of brain metastases. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 8 p. [33 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Wolfson AH, Gasper LE, Videtic GM, Aref AM, Germano I, Goldsmith BJ, Imperato JP, Marcus KJ, McDermott MW, McDonald MW, Patchell RA, Robins HI, Rogers CL, Suh JH, Wippold FJ, Expert Panel on Radiation Oncology-Brain Metastases. ACR Appropriateness Criteria® follow-up and retreatment of brain metastases. [online publication]. Reston (VA): American College of Radiology (ACR); 2009. 7 p. [26 references]

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

Scope

Disease/Condition(s)

Brain metastases

Guideline Category

Evaluation

Treatment

Clinical Specialty

Neurological Surgery

Neurology

Oncology

Radiation Oncology

Radiology

Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of procedures for follow-up and retreatment of patients with brain metastases

Target Population

Patients requiring follow-up and retreatment of brain metastasis

Interventions and Practices Considered

Interventions and Practices Considered

1. Local therapy alone
   - Surgical resection
   - Stereotactic radiosurgery (SRS)
2. Whole brain radiotherapy (WBRT) alone
3. Combined therapy
   - WBRT and radiosurgery
   - Surgery and postoperative WBRT
   - Surgery and postoperative radiosurgery
4. Chemotherapy alone
5. Supportive care
6. Follow-up
   - Magnetic resonance imaging (MRI), head
   - Computed tomography (CT), head
   - Fluorine-18 fluorodeoxyglucose positron emission tomography (FDG-PET), head

Major Outcomes Considered

- Local control rates
- Median survival time
- Utility of imaging procedures for follow-up of brain metastases

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.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Follow-up and Retreatment of Brain Metastasis

Variant 1: 70-year-old man with non-small-cell lung cancer status post lobectomy 3 years ago with a single brain metastasis 6 months ago treated with radiosurgery. Now with new contralateral metastasis in nondominant temporal lobe measuring 2 cm. No extracranial disease present. Mild neurologic symptoms. KPS is 80.

Treatment	Rating	Comments
Local Therapy Alone		
Surgical resection alone	3	
Stereotactic radiosurgery (SRS) alone	6	

Whole Brain Radiotherapy (WBRT) Alone		
2000 cGy/5 fractions	3	
3000 cGy/10 fractions	7	
3750 cGy/15 fractions	7	
4000 cGy/20 fractions	1	
Combined Therapy		
WBRT and radiosurgery	8	
Surgery and postop WBRT	7	Surgical intervention felt to be slightly less appropriate due to advanced age and previous response to radiosurgery.
Surgery and postop radiosurgery	3	Limited evidence supporting combination.
Chemotherapy only	1	
Supportive Care	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

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

Variant 2: 60-year-old man with renal cancer history, status post-surgical resection of two cerebellar metastases and postoperative WBRT (35 Gy in 14 fractions) 18 months ago. Now with new 3 cm left frontal metastasis without edema. KPS is 90. No other signs of recurrence. No neurological symptoms.

Treatment	Rating	Comments
Local Therapy Alone		
Surgical resection alone	8	
Stereotactic radiosurgery (SRS) alone	8	
Whole Brain Radiotherapy (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	1	
3750 cGy/15 fractions	1	
4000 cGy/20 fractions	1	
Combined Therapy		
WBRT and radiosurgery	1	
Surgery and postop WBRT	1	
Surgery and postop radiosurgery	3	Would reserve SRS for future relapse. Recommend close imaging studies for surveillance.
Chemotherapy only	1	
Supportive care	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

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

Variant 3: 44-year-old woman with breast cancer (negative ER/PR, Her2neu receptors) and multiple brain metastases 9 months ago, status post WBRT (3000 cGy in 10 fractions). Now with recurrence of two asymptomatic bilateral anterior frontal masses, 1-2 cm in diameter each. No extracranial disease present. KPS is 80.

Treatment	Rating	Comments
Local Therapy Alone		
Surgical resection alone	2	
Stereotactic radiosurgery (SRS) alone	9	
Whole Brain Radiotherapy (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	1	
3750 cGy/15 fractions	1	
4000 cGy/20 fractions	1	
Combined Therapy		

WBRT and radiosurgery	1	
Surgery and postop WBRT	1	
Surgery and postop radiosurgery	2	
Chemotherapy only	1	
Supportive Care	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

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

Variant 4: 49-year-old woman with melanoma, status post WBRT (3000 cGy in 10 fractions) for multiple metastases 6 months ago. Now with recurrence of one 3.5 cm right parietal metastasis with edema causing weakness. No extracranial disease present. KPS is 70.

Treatment	Rating	Comments
Local Therapy Alone		
Surgical resection alone	9	
Stereotactic radiosurgery (SRS) alone	5	
Whole Brain Radiotherapy (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	1	
3750 cGy/15 fractions	1	
4000 cGy/20 fractions	1	
Combined Therapy		
WBRT and radiosurgery	1	
Surgery and postop WBRT	1	
Surgery and postop radiosurgery	3	
Chemotherapy only	1	
Supportive Care	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

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

Variant 5: Follow-up after treatment of brain metastases. (Assuming in prior variants that treatment was carried out as planned, what is the frequency and modality of imaging in combination with a physical examination?). No extracranial disease present. KPS is 90. Follow-up for the first year.

Radiologic Procedure	Rating	Comments
Initial MRI head ≤3 months	8	
Subsequent MRI head every 4-6 months	8	
FDG-PET head only if MRI or CT abnormality suggests recurrence after radiosurgery or WBRT	5	Could consider this imaging modality to rule out possible tumor necrosis seen on MRI scans.
Subsequent MRI head when symptomatic on physical examination only	3	
Subsequent CT head every 4-6 months	2	
Subsequent FDG-PET head every 4-6 months	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

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

Summary of Literature Review

Recent progress in the management of various metastatic cancers has led to the emergence of increasing numbers of patients with brain metastases. Current estimates suggest that nearly 200,000 new patients develop brain metastases annually in the United States. It has also been estimated that up to 40% of patients with cancer will develop brain metastases. Hence, while progress has been made in decreasing the incidence of lung cancer deaths (largely due to fewer smokers) and prolonging survival in other systemic cancers such as breast and colorectal, the incidence of brain metastases continues to increase as patients with metastatic disease live longer.

The most common source of brain metastases is lung cancer. A recent report on 177 patients with surgically staged IIIA non-small-cell lung cancer (NSCLC) found that 34% of them had cancer recur in the brain as the first site of failure, and that 40% developed brain metastases at some point in their course. In the past, brain metastases were thought to herald the onset of a rapidly fatal course in patients with cancer due to the limited efficacy of systemic therapies and whole-brain radiation therapy (WBRT) (median survival 4-7 months; 2-year survival ≤10%). Survival rates for patients with brain metastases become significant only when extracranial disease is controlled.

There are now several reports of brain metastasis patients surviving >1 or 2 years following treatment, and recently a

There are now several reports of brain metastasis patients surviving >1 or 2 years following treatment, and recently a single institution report from the Cleveland Clinic documented the incidence of 5- and 10-year survivors in a series of nearly 1,300 patients with brain metastases. Thirty-two (2.5%) patients survived ≥5 years, and 15 of these had recurrence of local or distant brain cancer. Thus, as a growing percentage of treated patients may live long enough to experience relapse again in the brain, there is a greater need for appropriate follow-up and management of recurrent brain metastases.

Retreatment for brain metastases may be required following a variety of initial treatments such as WBRT, surgery, radiosurgery, chemotherapy, and combinations of these. The choice of treatment modality after recurrence will depend on the size, number, timing, and location of the recurrent metastases as well as the patient's performance status and extent of disease beyond the central nervous system. There appears to be an increasing number of patients who have received only surgery or radiosurgery as their initial management of brain metastases. This trend is likely driven by the increasing availability of stereotactic radiosurgery (SRS) and improvements in neuroimaging and surgical techniques.

Repeat WBRT

Repeat WBRT has not been routinely administered for retreatment after previous WBRT, primarily due to concerns about severe neurotoxicity. However, one institution recently reported a retrospective review of its database that involved 72 patients who underwent two courses of WBRT for brain metastases. The most common initial fractionation scheme was 20 Gy in 5 fractions, while the most frequent reirradiation schedule was 25 Gy in 10 fractions. The median survival time after reirradiation was 4.1 months. Performance status (Eastern Cooperative Oncology Group criteria), neurological function class (Radiation Therapy Oncology Group classification), and documented response to reirradiation were predictive of survival times. An analysis of the time interval between initial and retreatment with cranial irradiation and of patient age at diagnosis of brain metastases showed that these factors did not impact survival following repeat radiotherapy. However, a response to the first course of brain irradiation did significantly affect survival time after reirradiation to the brain. Although toxicity data were limited, this study suggests that there may be a role for WBRT for the retreatment of progressive brain metastases. (See Variant 1 above.)

Radiosurgery

Radiosurgery for recurrent brain metastases is a viable option if size and number permit. In patients undergoing radiosurgery for recurrence following initial WBRT, two studies reported 1-year local control rates of 91% and 68% and 2-year rates of 84% and 58%, respectively. Good local control, as high as 90%, has been reported in patients who underwent repeat gamma knife SRS to previously treated or newly developed sites, but risk for radiation necrosis increased with repeat treatments to same areas. Radiographic responses following salvage radiosurgery have been well documented, although evidence for a survival benefit is not strong. This modality is increasingly available at many centers. Moreover, a recent review of 10 series totaling 363 patients treated with surgical excision followed by radiosurgery as an alternative to WBRT showed crude local control rates of about 79% with a median survival times of 14.2 months and a 52% rate of new metastasis following SRS. In this cohort, SRS was well tolerated with low rates of necrosis. These data suggest that SRS is one valid approach in managing those patients having brain relapses even after prior WBRT and especially if no more than three metastatic foci are present. (See Variant 2 and Variant 3 above.)

Surgery

Surgery may be indicated for palliation of mass effect from progressive or hemorrhagic brain metastases and may also be an important diagnosis and management tool in determining the nature of a progressive lesion after radiation treatment. Factors to consider regarding the use of surgical resection after prior irradiation include: clinical or radiographic evidence of a progressive lesion, Karnofsky performance status (KPS) >60, and stable or absent extracranial disease. One author reported local control rates range from 69% to 79%, and one retrospective study comparing resection to no resection showed a modest survival benefit. (See Variant 4 above.)

Chemotherapy

Chemotherapy has occasionally been a successful strategy for chemosensitive tumors. Limited evidence suggests that some chemotherapy and biological treatments may be effective in brain metastases. These studies, which are based on smaller experiences, are summarized here. The chemotherapy agents include paclitaxel, cisplatin, carboplatin, docetaxel, etoposide, and topotecan. Temozolomide, capecitabine, and gefitinib have also been reported to be used in treating brain metastases from melanoma, breast cancer, and lung cancer, respectively. Response of brain metastases to antiepidermal growth factor inhibitors such as gefitinib or erlotinib provides some new alternatives for the management of brain metastases. These targeted agents may be particularly attractive for patients with less symptomatic, smaller recurrent brain metastases. Dual tyrosine kinase inhibitors (e.g., lapatinib) have recently been shown to benefit some Her2neu-positive breast cancer patients and also those with recurrent brain metastases. Recent evidence also suggests that bevacizumab may be safe and effective in patients with active brain metastasis from NSCLC.

Supportive Care

Best supportive care is always an option for select patients with recurrent brain metastases. Factors important in evaluating prognosis in these patients include, but are not limited to, performance status, status of extracranial disease, number of brain metastases, and age. Patients with a poorer prognosis may be better served with an earlier discussion of best supportive care considering their reduced survival rates.

Follow-up of Brain Metastases

After the treatment of brain metastasis, determining the proper timing and modality of follow-up imaging and distinguishing treatment response from recurrence are major management considerations. This issue is complicated by the lack of reliable early indicators of response versus progression. One study reported a median time of 8.8 months to new metastasis after initial gamma knife radiosurgery. They recommended close surveillance with a 3-month interval between magnetic resonance imaging (MRI), in order to identify new metastasis early to facilitate the most effective treatment. They found that patients with 3 or more lesions and cancer histologies other than NSCLC were more likely to have additional future metastasis. These patients may benefit most from close surveillance and additional treatments. The most appropriate frequency and choice of imaging modality following treatment of a patient with brain metastases are matters of debate. Given its wide availability in this country and superior sensitivity over computed tomography (CT), MRI is the preferred imaging modality, especially with newer applications such as spectroscopy, diffusion-weighted imaging, and perfusion-weighted imaging. It is an expensive option, however, and its frequency of use should depend on the likelihood of obtaining useful information that is not otherwise available and that could be acted upon for the patient's benefit.

A not uncommon problem after the treatment of brain metastases is the difficulty of differentiating between tumor recurrence and radiation-induced scar tissue or necrosis. This is particularly vexing in asymptomatic patients with high

performance status. Although invasive pathological evaluation remains the only definitive test to make this distinction, it is not always practical or feasible. In an attempt to address this problem, several imaging modalities have been investigated, with most data advocating for fluorine-18 fluorodeoxyglucose (FDG) and carbon-11 methyl methionine positron emission tomography (PET) scanning for this purpose. One study reported on the imaging changes after SRS and found that 22% of 35 metastatic tumors appeared larger on MRI at a mean of 10 weeks after SRS. Eleven had FDG-PET performed for enlarging lesions. Eight of them showed increased brain activity, while three showed decreased activity. Of the eight, however, six were incorrectly predicted based on the patient's subsequent course (alive, mean follow-up of 27 months). A later study showed that FDG-PET imaging is especially effective in detecting tumor recurrence compared to radiation changes in patients with brain metastases from lung cancer. In addition to the previously mentioned imaging studies, dynamic susceptibility-weighted contrast-enhanced MRI has been suggested to improve prediction of tumor response after treatment for brain metastases and help distinguish between necrosis or recurrence. These findings suggest that examination of cerebral blood volume ratios can predict for tumor recurrence. Further research in this arena will likely contribute to better determination of imaging changes after radiation treatments. When recurrence of brain metastasis is confirmed, surgery and particularly radiosurgery may be useful in improving disease control. (See Variant 5 above.)

Summary

The issues regarding postirradiation management and retreatment of brain metastases revolve around three concerns:

- First is the need to assess the effects of and manage treatment of sequelae.
- Second is the need for appropriate surveillance and the ability to accurately distinguish late treatment effects from recurrence, so that further treatment can be administered as appropriately as possible.
- Third is the goal of detecting recurrences prior to the onset of symptoms, when patients may best tolerate additional treatment, and when lesion size does not preclude the use of radiosurgery, arguably the most effective option.

Abbreviations

- CT, computed tomography
- ER, estrogen receptor
- FDG-PET, fluorine-18 fluorodeoxyglucose-positron emission tomography
- KPS, Karnofsky Performance Status
- MRI, magnetic resonance imaging
- PR, progesterone receptor
- SRS, stereotactic radiosurgery
- WBRT, whole brain radiotherapy

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

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

Appropriate follow-up and retreatment of brain metastasis

Potential Harms

- Repeat whole-brain radiation therapy (WBRT) has not been routinely administered for retreatment after previous WBRT, primarily due to concerns about severe neurotoxicity.
- In patients who underwent repeat gamma knife stereotactic radiosurgery (SRS), risk for radiation necrosis increased with repeat treatments to same areas.
- A not uncommon problem after the treatment of brain metastases is the difficulty of differentiating between tumor recurrence and radiation-induced scar tissue or necrosis.

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)

Patel SH, Robbins JR, Videtic GM, Gore EM, Bradley JD, Gaspar LE, Germano I, Ghafoori P, Henderson MA, Lutz ST, McDermott MW, Patchell RA, Robins HI, Vassil AD, Wippold FJ II, Expert Panel on Radiation Oncology-Brain Metastases. ACR Appropriateness Criteria® follow-up and retreatment of brain metastases. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 8 p. [33 references]

Adaptation

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

Date Released

1999 (revised 2011)

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 Radiation Oncology-Brain Metastases

Composition of Group That Authored the Guideline

Panel Members: Samir H. Patel, MD (*Principal Author*); Jared R. Robbins, MD (*Research Author*); Gregory M. M. Videtic, MD (*Panel Chair*); Elizabeth M. Gore, MD (*Panel Vice-chair*); Jeffrey D. Bradley, MD; Laurie E. Gaspar, MD, MBA; Isabelle Germano, MD; Paiman Ghafoori, MD; Mark A. Henderson, MD; Stephen T. Lutz, MD; Michael W. McDermott, MD; Roy A. Patchell, MD; H. Ian Robins, MD, PhD; Andrew D. Vassil, MD; Franz J. Wippold II, MD

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Wolfson AH, Gasper LE, Videtic GM, Aref AM, Germano I, Goldsmith BJ, Imperato JP, Marcus KJ, McDermott MW, McDonald MW, Patchell RA, Robins HI, Rogers CL, Suh JH, Wippold FJ, Expert Panel on Radiation Oncology-Brain Metastases. ACR Appropriateness Criteria® follow-up and retreatment of brain metastases. [online publication]. Reston (VA): American College of Radiology (ACR); 2009. 7 p. [26 references]

The appropriateness criteria are reviewed biennially 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.

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 Portable Document Format (PDF) from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development. Reston (VA): American College of Radiology; 4 p. Electronic copies: Available in Portable Document Format (PDF) from the ACR Web site.

Patient Resources

None available

NGC Status

This summary was completed by ECRI on January 30, 2001. The information was verified by the guideline developer as of February 20, 2001. This NGC summary was updated by ECRI Institute on May 16, 2007. This NGC summary was updated by ECRI Institute on December 19, 2010. This NGC summary was updated by ECRI Institute on March 20, 2012.

Copyright Statement

Disclaimer

NGC Disclaimer

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion-criteria.aspx.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.