Complete Summary

GUIDELINE TITLE

Pre-irradiation evaluation and management of brain metastases.

BIBLIOGRAPHIC SOURCE(S)

Gasper LE, Gutin PH, Rogers L, Schneider JF, Larson D, Bloomer WD, Buckley JA, Lewin AA, Loeffler JS, Malcolm AW, Mendenhall WM, Schupak KD, Simpson JR, Wharam MD Jr, Dillon WP, Mauch PM, Expert Panel on Radiation Oncology-Brain Metastases Work Group. Pre-irradiation evaluation and management of brain metastases. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 7 p. [32 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Gaspar LE, Gutin PH, Rogers L, Schneider JF, Larson D, Bloomer WD, Buckley JA, Gibbs FA, Lewin AA, Loeffler JS, Malcolm AW, Mendenhall WM, Schupak KD, Shaw EG, Simpson JR, Wharam MD Jr, Leibel S. Pre-irradiation evaluation and management of brain metastases. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1105-10.

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

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- May 23, 2007, Gadolinium-based Contrast Agents: The addition of a boxed warning and new warnings about the risk of nephrogenic systemic fibrosis (NSF) to the full prescribing information for all gadolinium-based contrast agents (GBCAs).

COMPLETE SUMMARY CONTENT

** REGULATORY ALERT **
SCOPE

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SCOPE

DISEASE/CONDITION(S)

Brain metastases

GUIDELINE CATEGORY

Evaluation
Management

CLINICAL SPECIALTY

Neurology
Oncology
Radiation Oncology
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of radiologic examinations and treatment procedures for pre-irradiation evaluation and management of brain metastases

TARGET POPULATION

Patients with brain metastases

INTERVENTIONS AND PRACTICES CONSIDERED

1. Magnetic resonance imaging (MRI) of brain with standard-dose contrast
2. Computed tomography (CT) of brain with contrast

3. Magnetic resonance imaging of brain with high-dose contrast
4. Resection (craniotomy)
5. Biopsy only of suspicious intracranial lesion
6. Corticosteroids, 4 mg/day
7. Corticosteroids, 16 mg/day
8. Anticonvulsants (prophylactic)

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

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 peer-reviewed medical journals, and the major applicable articles were identified and collected.

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 Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
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 the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1 to 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 (80) 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 this 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: Pre-Irradiation Evaluation and Management of Brain Metastases

Variant 1: 50-year-old patient with newly diagnosed cancer of any stage and new intracranial signs or symptoms.

Treatment	Appropriateness Rating	Comments
MRI of brain with standard-dose contrast	8	
CT of brain with contrast	7	
MRI of brain with high-dose contrast	3	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

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

Variant 2: 50-year-old man with no known diagnosis of cancer, but with CT scan evidence of solitary metastasis.

Treatment	Appropriateness Rating	Comments
MRI of brain with standard-dose contrast	8	
MRI of brain with high-dose contrast	8	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

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

Variant 3: 50-year-old patient with newly diagnosed non-small cell lung cancer with resectable primary and CT scan evidence of solitary brain metastasis.

Treatment	Appropriateness Rating	Comments
MRI of brain with standard-dose contrast	8	
MRI of brain with high-dose contrast	8	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

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

Variant 4: 50-year-old patient with no known diagnosis of cancer, MRI consistent with solitary metastasis in anterior left frontal lobe, mild headaches, and work up of chest and abdomen negative.

Treatment	Appropriateness Rating	Comments
Resection (craniotomy)	9	
Biopsy only of suspicious intracranial lesion	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

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

Variant 5: 50-year-old patient with melanoma and supratentorial brain metastases, mild edema on imaging, no hydrocephalus, mild neurologic symptoms present, and no history of seizures.

Treatment	Appropriateness Rating	Comments
Corticosteroids, 4 mg/day	8	
Corticosteroids, 16 mg/day	5	

Treatment	Appropriateness Rating	Comments
Anticonvulsants (prophylactic)	4	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

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

Variant 6: 50-year-old patient with non-small cell lung cancer and supratentorial brain metastases, mild edema on imaging, no hydrocephalus, mild neurologic symptoms, and no history of seizures.

Treatment	Appropriateness Rating	Comments
Corticosteroids, 4 mg/day	8	
Corticosteroids, 16 mg/day	5	
Anticonvulsants (prophylactic)	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

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

The pretreatment evaluation for brain metastases occurs primarily in two situations: as part of the staging investigations in a patient who has known systemic cancer, or in the patient who has cerebral or cerebellar symptoms, with or without known systemic cancer. In either case, the evaluation is critical when the presence of brain metastases would alter therapy. The evaluation is also important to identify and appropriately manage brain metastases. Although brain metastases can arise from virtually any primary cancer, lung and breast are the two most common primary sites of cancer in patients presenting with brain metastases. The literature regarding pretreatment evaluation and management is dominated by patients with these primary malignancies.

The choice of treatment for brain metastases is often based on the location and number of metastases identified on imaging studies. Contrast-enhanced MRI is the imaging test of choice in the patient with suspected brain metastases if

surgery or radiosurgery is being considered. Otherwise, CT with contrast enhancement is a reasonable study, albeit less sensitive than MRI.

During the CT era as many as 50% of patients with brain metastases were found to have a single metastasis. However, it is almost certain that the current percentage is lower, given the increased sensitivity of modern MRI. Current patient data, acquired with modern CT and MRI technology, indicate that about 20% of patients thought to have a single brain metastasis based on CT actually have multiple lesions on MRI. Recommended pre-gadolinium studies include T2-weighted and T1- weighted sequences. Recommended post-gadolinium studies include T1-weighted sequences (in at least two orthogonal planes); fluid-attenuated inversion-recovery (FLAIR) sequences have also been shown to complement, but not replace, contrast-enhanced T1 sequences. Contiguous thin slices without skips are necessary to ensure that small lesions are detected.

Several studies have demonstrated that the dose of intravenous contrast selected for MRI may be important in determining the number of lesions as well as the confidence level associated with the radiologic interpretation. One study reported that high-dose contrast (0.3 mmol/kg gadolinium) is superior to standard-dose contrast (0.1 mmol/kg gadolinium) in lesion detection without any increase in serious toxicity. However, high-dose contrast is not commonly used, and its role in individual patient treatment decisions has not been determined. There is also evidence that the strength of the MRI magnet is important in the ability to detect brain metastases. Another study analyzed the subjective assessment of MRIs done with standard-dose or triple-dose contrast in both 1.5 and 3 T magnetic fields. Improved images were obtained with both higher dose of contrast and higher magnet strength. High-dose contrast MRI is potentially most valuable in patients thought to have a single brain metastasis, if the therapeutic approach might change if multiple metastases are found. Dynamic contrast enhanced MRI, (perfusion imaging) and MR Spectroscopy have also been found to be helpful for differentiating single metastases from primary cerebral neoplasms.

The bulk of the literature regarding the use of brain CT or MRI for staging purposes has dealt with lung cancer. Nevertheless, there is still no general agreement on when to use CT or MRI as part of the initial staging evaluation for a patient newly diagnosed with lung cancer. The decision may vary with the type and stage of lung cancer. One prospective study found that MRI did not change the initial stage of asymptomatic patients with small-cell lung cancer. The only patients with asymptomatic brain metastases were those with extensive disease already demonstrated by other tests such as a positive bone scan or liver metastases on CT scan of the abdomen. Although brain MRI appears to be superior to a brain CT scan, CT is still widely used as a staging procedure because of its accessibility and lower cost. One retrospective study concluded that 10% of patients with otherwise operable non-small-cell lung cancer had brain metastases identified on CT scans. The absence of neurologic symptoms did not exclude brain metastases since 64% of patients with metastases detected by CT were asymptomatic. Conversely, another study found that CT scans did not reveal unsuspected brain metastases in patients without strong evidence of disseminated disease, such as neurologic signs or symptoms, bone pain, or elevated serum calcium. This study did not address the utility of CT scans in otherwise operable patients, and it is possible that their patient group had a more advanced stage of

disease at presentation, which would account for the different conclusions reached by the two studies.

Positron emission tomography with 2-deoxy-2-fluroro-D-gluocose (FDG-PET) has been evaluated as a means of identifying brain metastases. PET studies in small numbers of patients have been associated with low sensitivity and specificity rates in the detection of brain metastases. PET scans have also been tested as a means of differentiating various abnormalities already detected by more conventional imaging studies such as CT or MRI. Whole-body FDG-PET is more useful in locating the primary lesion and sites of extracranial metastases in a patient with documented brain metastases. The low sensitivity and specificity of cerebral FDG-PET are likely due to the large background of glucose activity within the brain. Alternative tracers to FDG such as 3-deoxy-3-fluorothymidine (FLT) or thallium-201 may in the future prove to be more useful in the imaging of brain metastases.

Several studies have sought to determine whether histologic confirmation is required following the identification of a suspected solitary metastasis or multiple brain metastases. In one study in which stereotactic biopsy or resection was performed in patients with suspected solitary brain metastasis, 11% of these patients were found to have other tumor histology, or lesions of infectious or inflammatory origin. Stereotactic biopsy is equivalent to resection in determining the correct tissue diagnosis in the majority of patients if an appropriate number of biopsies are obtained with immediately available frozen section confirmation. While multifocal malignant gliomas are relatively uncommon compared with brain metastases, the two clinical conditions may be difficult to distinguish on the basis of current conventional imaging studies. However, new MRI methods (perfusion and MR spectroscopy) have shown improvement in specificity. Together, these observations argue for 1) MRI with increased dose of contrast and, if no additional lesions are identified, 2) histologic verification of the solitary brain lesion in the patient with a controlled primary (noncentral nervous system) cancer after systemic evaluation fails to disclose other sites of disease. With multiple brain lesions that have imaging characteristics compatible with brain metastases, the decision to biopsy or not is based on the clinical picture. Patients with progressive extracranial cancer are seldom subjected to histologic confirmation of multiple brain lesions or new solitary lesions.

It is common practice to obtain a neurosurgical opinion regarding surgical intervention to debulk or completely resect brain metastases in a patient presenting with hydrocephalus due to a posterior fossa metastasis, or in the patient with impending cerebral or cerebellar herniation.

While clinical experience has established the effectiveness of corticosteroids such as dexamethasone in reducing symptoms and MRI evidence of peritumoral edema, the need for corticosteroids in all patients with brain metastases, as well as the appropriate dose of such medication, is the point of some research and controversy. Early studies that concluded that patients with newly diagnosed brain metastases should be placed on steroids prior to whole-brain radiation therapy used unconventional radiation dose/fractionation regimens. For example, in one prospective clinical trial in which various whole-brain radiation dose/fraction schedules were utilized, steroids were started only when there was concern about high intracranial pressure. The results of this study suggest that patients undergoing whole-brain radiation therapy with high doses per fraction should be

started on steroids prior to treatment. Twenty-seven percent of patients treated with a single dose of 1000 cGy single-fraction whole-brain radiation therapy experienced acute signs or symptoms of increased intracranial pressure. This dose fractionation of whole-brain radiation therapy is not in common use at this time. Another study, conducted by the Radiation Therapy Oncology Group (RTOG) nearly two decades ago, found that patients with moderate neurologic signs or symptoms experienced more rapid improvement in their clinical state when radiation treatment was accompanied by steroids. However, steroids did not result in prolongation of progression-free survival or overall survival.

Despite the acknowledged benefits of steroids in reducing edema and alleviating symptoms, the acute and chronic side effects of dexamethasone cannot be ignored. A randomized study comparing dosages of 4, 8, and 16 mg of dexamethasone per day found no advantage to higher dosages compared with 4 mg per day in the patient with no evidence of impending herniation. Steroid-related toxicity was more common at the higher doses. There was, however, a trend toward improved performance 28 days after starting dexamethasone in patients on the high doses of steroids. The study attributed this trend of improvement in the higher-dose group to the early steroid taper in the low-dose group, beginning on the seventh day of cranial irradiation, which led to clinical deterioration in some patients. Based on this observation, the authors of the study recommended 4 mg per day without a dose taper for 28 days in patients without symptoms or signs of mass effect. Another small prospective study suggests that high doses of intravenous steroids given only in the 48 hours before cranial radiation results in objective responses and survival rates similar to those seen in patients continued on steroids throughout radiation therapy. More recently there was a study of 138 patients with primary or metastatic brain tumors treated with radiotherapy. Ninety-one patients with brain metastases were treated with standard-fraction whole brain radiation therapy over 2 to 3 weeks. Most of these patients received dexamethasone with tapering doses, for a mean duration of 6.9 weeks. Clinical improvements, possibly attributable to dexamethasone, were observed in 33% of patients shortly after it was initiated, in 44% during radiotherapy and in 11% after radiotherapy. However, side effects possibly attributable to dexamethasone were frequently observed, including hyperglycemia (47%), peripheral edema (11%), psychiatric disorder (10%), oropharyngeal candidiasis (7%), Cushing's syndrome (4%), muscular weakness (4%), and pulmonary embolism (2%). Among thirteen patients receiving radiotherapy without dexamethasone, treatment was well tolerated, except in one patient with brain stem symptoms. In summary, the panel concluded that there is little compelling evidence suggesting that steroids have a role in the management of brain metastases unless the patients have clinical symptoms caused by elevated intracranial pressure. Likewise, there is no compelling evidence that in the absence of clinical signs, steroids should be started simply because the patient has a brain tumor or because the patient is about to start radiation therapy. Steroids cause toxicity, and any recommendation for steroids must be rendered in light of this fact. Steroid treatment should be tapered as clinically indicated.

Another controversy revolves around the need to initiate prophylactic anticonvulsants in the patient with brain metastases. Approximately 15% of patients with brain metastasis present with seizures, and most such patients are found to have supratentorial lesions. Patients who present with seizures or who develop seizures during therapy should be started on antiseizure medications.

Randomized prospective studies have found no significant reduction in the incidence of first seizures in brain tumor patients placed on prophylactic anticonvulsants. New onset of seizures was experienced by approximately 25% of patients treated with prophylactic anticonvulsants, not significantly different than the percentage of patients experiencing new onset of seizures in the control arm. To determine the benefit of prophylactic anticonvulsants, a meta-analysis of 12 studies was performed (10 of which included patients with brain metastasis) that reported the frequency of seizures following diagnosis of a primary or metastatic brain tumor. There was no evidence that prophylactic anticonvulsants significantly decreased the incidence of first seizure. In the aggregate, these studies recorded a 26% incidence of seizures at or before brain tumor diagnosis (range, 14%-51%), and a 19% incidence of seizures after brain tumor diagnosis (range, 10%-45%). Seizures were more common, both before and after brain tumor diagnosis, in patients with primary as compared to metastatic brain tumors. More than 20% of patients had side effects severe enough to warrant a change in or discontinuation of the anticonvulsants. A subsequent randomized study of prophylactic anticonvulsants versus observation reached a similar conclusion regarding the lack of benefit of prophylactic anticonvulsants.

One clinical situation in which prophylactic anticonvulsants may be warranted is in the patient with malignant melanoma brain metastases. A retrospective study found that prophylactic anticonvulsants in patients with brain metastases from metastatic melanoma reduced the subsequent seizure frequency from 37% to 17%. Possible explanations for the high incidence of seizures in patients with brain metastases from melanoma, as opposed to other histologies, include the tendency for these metastases to be located in the superficial cerebral cortex rather than at the gray-white matter junction. A meta-analysis of studies did not indicate a significant benefit to anticonvulsants in patients with malignant melanoma brain metastases but concluded that further prospective studies of prophylactic anticonvulsants were warranted in this subgroup.

Physicians should also be aware of the potential interaction between anticonvulsants and chemotherapy. Anticonvulsants that induce the P450 system of hepatic metabolism can result in clinically significant reduction of plasma levels of chemotherapies that are metabolized by this system. Anticonvulsants that do not induce this system are available and should be selected if this is a concern.

In summary, the pretreatment evaluation should determine the number, location, and size of the brain metastases. MRI is the recommended imaging technique, preferably with a high-strength magnet, particularly in patients being considered for surgery or radiosurgery. Double or triple-dose contrast during the MRI should be considered if it is important to know the precise number of metastases, such as at the time of radiosurgery. A noncontrast scan should accompany the contrast scan to exclude hemorrhage or fat as the cause of the high signal on postcontrast imaging. A systemic work-up and medical evaluation are important given that subsequent treatment for the brain metastases will also depend on the extent of the extracranial disease and the age and performance status of the patient. Patients with hydrocephalus or impending brain herniation should be started on high doses of corticosteroids and evaluated for possible neurosurgical intervention. Patients with moderate symptoms should receive approximately 4 to 6 mg per day of dexamethasone in divided doses. Routine use of corticosteroids in patients without neurological symptoms is not necessary. There is no proven

benefit of anticonvulsants in the patient who has not experienced seizures, although there may be exceptional subgroups of patients, such as those with melanoma.

Abbreviations

- CT, computed tomography
- MRI, magnetic resonance imaging

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

Selection of appropriate radiologic imaging procedures for identification and management of patients with brain metastases

POTENTIAL HARMS

- Toxicity from steroids, including hyperglycemia, peripheral edema, psychiatric disorder, oropharyngeal candidiasis, Cushing's syndrome, muscular weakness, and pulmonary embolism
- Side effects of anticonvulsants and potential interaction between anticonvulsants and chemotherapy

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

Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Gasper LE, Gutin PH, Rogers L, Schneider JF, Larson D, Bloomer WD, Buckley JA, Lewin AA, Loeffler JS, Malcolm AW, Mendenhall WM, Schupak KD, Simpson JR, Wharam MD Jr, Dillon WP, Mauch PM, Expert Panel on Radiation Oncology-Brain Metastases Work Group. Pre-irradiation evaluation and management of brain metastases. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 7 p. [32 references]

ADAPTATION

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

DATE RELEASED

1999 (revised 2005)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

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 Work Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Laurie E. Gaspar, MD, MBA; Philip H. Gutin, MD; Lisa Rogers, DO; Joseph F. Schneider, MD; David Larson, MD, PhD; William D. Bloomer, MD; Judith A. Buckley, MD; Alan A. Lewin, MD; Jay S. Loeffler, MD; Arnold W. Malcolm, MD; William M. Mendenhall, MD; Karen D. Schupak, MD; Joseph R. Simpson, MD; Moody D. Wharam, Jr., MD; William P. Dillon, MD; Peter M. Mauch, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Gaspar LE, Gutin PH, Rogers L, Schneider JF, Larson D, Bloomer WD, Buckley JA, Gibbs FA, Lewin AA, Loeffler JS, Malcolm AW, Mendenhall WM, Schupak KD, Shaw EG, Simpson JR, Wharam MD Jr, Leibel S. Pre-irradiation evaluation and management of brain metastases. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1105-10.

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 is 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.

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 on January 31, 2006. This summary was updated by ECRI Institute on May 17, 2007 following the U.S. Food and Drug Administration (FDA) advisory on Gadolinium-based contrast agents. This summary was updated by ECRI Institute on June 20, 2007 following the U.S. Food and Drug Administration (FDA) advisory on gadolinium-based contrast agents.

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Date Modified: 9/29/2008