



Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria™ for solitary brain metastasis.

BIBLIOGRAPHIC SOURCE(S)

Loeffler JS, Bloomer WD, Buckley JA, Gutin PH, Malcolm AW, Schupak KD, Larson D, Gaspar LE, Gibbs FA, Lewin AA, Mendenhall WM, Schneider JF, Shaw EG, Simpson JR, Wharam MD Jr, Rogers L, Leibel S. Solitary brain metastasis. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun; 215(Suppl): 1111-20. [18 references]

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT
CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Solitary brain metastasis

GUIDELINE CATEGORY

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 treatment procedures for patients with a single brain metastasis

TARGET POPULATION

Patients with a solitary brain metastasis

INTERVENTIONS AND PRACTICES CONSIDERED

1. Whole brain radiotherapy
 - 3750 cGy/15 fractions
 - 4000 cGy/20 fractions
 - 3000 cGy/10 fractions
 - 2000 cGy/5 fractions
 - 5000 cGy/25 fractions
2. Focal therapy
 - Stereotactic radiosurgery
 - Surgical resection
3. Combination Therapy
 - Stereotactic radiosurgery and whole brain radiotherapy
 - Surgery and whole brain radiotherapy
4. Observation

MAJOR OUTCOMES CONSIDERED

- Morbidity or mortality
- Improved care
- Freedom from neurologic progression
- Overall survival
- Quality of life

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, primarily using the National Library of Medicine's MEDLINE database. The developer identified and collected the major applicable articles

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

Expert Consensus (Delphi Method)
Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

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

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the Appropriateness Criteria. 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 1-9, 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. If consensus cannot be reached by this method, 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.

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 and the Chair of the ACR Board of Chancellors.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria™

Clinical Condition: Solitary Brain Metastasis

Variant 1: 55-year-old man status-post right upper lobe for non-small cell lung cancer two years earlier, now with 3 cm right frontal lobe lesion. No clinical or radiographic evidence of extracranial disease. Karnofsky Performance Status (KPS) 90. Lesion was completely resected, confirmed by contrast magnetic resonance imaging scan 24 hours after surgery.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3750/15	6	
4000/20	5	
3000/10	4	
2000/5	2	
5000/25	2	
Focal Therapy		
Stereotactic radiosurgery	2	

Combination Therapy		
Stereotactic radiosurgery plus whole brain radiotherapy	2	
Observation	3	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 2: 45-year-old woman with metastatic breast cancer to multiple bony sites with a 3 cm left parietal lesion. Surgical resection was subtotal in nature, confirmed by postoperative magnetic resonance imaging. Karnofsky Performance Status 80.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3000/10	7	
3750/15	5	
4000/20	4	
2000/5	2	
5000/25	2	
Focal Therapy		
Stereotactic radiosurgery	7	
Surgical resection	2	
Combination Therapy		
Stereotactic radiosurgery plus whole brain radiotherapy	7	
Surgery plus whole brain radiotherapy	2	
Observation	2	
<u>Appropriateness Criteria Scale</u>		

<p>1 2 3 4 5 6 7 8 9</p> <p>1=Least appropriate 9=Most appropriate</p>
--

Variant 3: 70-year-old man with widely metastatic melanoma with a 2 cm right thalamic lesion. Karnofsky Performance Status 60.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3000/10	8	
2000/5	5	
3750/15	3	
4000/20	2	
5000/25	2	
Focal Therapy		
Stereotactic radiosurgery	3	
Surgical resection	2	
Combination Therapy		
Surgery plus whole brain radiotherapy	2	
Stereotactic radiosurgery plus whole brain radiotherapy	2	
Observation	4	
<p><u>Appropriateness Criteria Scale</u></p> <p>1 2 3 4 5 6 7 8 9</p> <p>1=Least appropriate 9=Most appropriate</p>		

Variant 4: 45-year-old woman status-post nephrectomy for renal cell carcinoma six years earlier with a 1 cm lesion in the right lateral cerebellum. Computed tomography of chest/abdomen and bone scan were negative. Karnofsky Performance Status 90.

Treatment	Appropriateness	Comments
-----------	-----------------	----------

	Rating	
Whole Brain Radiotherapy		
2000/5	2	As sole therapy.
3000/10	2	As sole therapy.
3750/15	2	As sole therapy.
4000/20	2	As sole therapy.
5000/25	2	As sole therapy.
Focal Therapy		
Surgical resection	8	
Stereotactic radiosurgery	8	
Combination Therapy		
Surgery plus whole brain radiotherapy	7	
Stereotactic radiosurgery plus whole brain radiotherapy	7	
Observation	2	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 5: 81-year-old male with metastatic small cell carcinoma to lung, bone, and liver with a 2 cm left anterior temporal lobe lesion. Karnofsky Performance Status 70.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3000/10	8	

2000/5	5	
3750/15	4	
5000/25	2	
4000/20	1	
Focal Therapy		
Surgical resection	2	
Stereotactic radiosurgery	1	
Combination Therapy		
Surgery plus whole brain radiotherapy	2	
Stereotactic radiosurgery plus whole brain radiotherapy	2	
Observation	3	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 6: 62-year-old woman status-post chemotherapy/radiotherapy and surgery for esophageal carcinoma. No evidence of extracranial disease with 7 cm lesion in right anterior frontal lobe with 15 mm midline shift. Karnofsky Performance Status 90 on high dose steroids.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3750/15	7	Should have whole brain radiotherapy after surgery.
3000/10	6	Should have whole brain radiotherapy after surgery.
4000/20	5	Should have

		whole brain radiotherapy after surgery.
2000/5	2	
5000/25	2	
Focal Therapy		
Stereotactic radiosurgery	2	
Surgical resection	1	
Combination Therapy		
Surgery plus whole brain radiotherapy	8	
Stereotactic radiosurgery plus whole brain radiotherapy	2	
Observation	2	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 7: 45-year-old male recently diagnosed with 2 cm non-small cell lung cancer left upper lobe with no hilar and mediastinal lymphadenopathy and asymptomatic 2 cm right frontal lesion. Abdominal computed tomography and bone scan were negative. Karnofsky Performance Status 100.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3000/10	6	Should have whole brain radiotherapy after surgery.
3750/15	5	Should have whole brain radiotherapy after surgery.

4000/20	5	Should have whole brain radiotherapy after surgery.
2000/5	2	
5000/25	2	
Focal Therapy		
Surgical resection	3	
Stereotactic radiosurgery	3	
Combination Therapy		
Surgery plus whole brain radiotherapy	8	
Stereotactic radiosurgery plus whole brain radiotherapy	8	
Observation	2	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Summary

Compelling evidence suggests that aggressive local therapy for patients with single brain metastasis is beneficial. There is also evidence to suggest that aggressive local therapy for a patient with a single lesion improves quality of life. If patients have no evidence of progressive extracranial disease, surgical resection or radiosurgery is appropriate therapy. While it appears that the addition of whole brain radiotherapy does not add to survival, it does reduce the risk of further intracranial failure.

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 management of solitary brain metastasis may improve overall survival, provide freedom from neurologic progression, and improve quality of life.

POTENTIAL HARMS

Not stated

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.

Whole brain radiotherapy. The issue of whole brain radiotherapy has been a subject of controversy in the oncology literature for patients with a single brain metastasis. The question of whether surgical resection can be performed without the addition of whole brain radiotherapy has now been put to a Phase III randomized trial which reveals the following:

1. The addition of whole brain radiotherapy to surgical resection produces no overall survival advantage.
2. The overall recurrence rate in the surgically resected area or elsewhere in the central nervous system was 47% in patients who had surgical resection alone versus 10% in patients who received surgery and whole brain radiotherapy.

The question of whether radiosurgery can be performed without the addition of whole brain radiotherapy has been studied retrospectively. Several radiosurgery studies, including a recent review from the University of California-San Francisco, looking at a large number of patients treated with radiosurgery alone for single

and multiple lesions, did not show an improvement in survival in patients treated with whole brain radiotherapy. Based on current data, surgical resection or radiosurgery alone as the treatment for a single brain metastasis followed by serial radiologic examination of the brain may be appropriate. If these patients suffer recurrence in either the locally treated region or elsewhere within the central nervous system, whole brain radiotherapy, focal radiotherapy, radiosurgery, or further surgical resection may be considered. There are no data indicating which of these choices is best.

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)

Loeffler JS, Bloomer WD, Buckley JA, Gutin PH, Malcolm AW, Schupak KD, Larson D, Gaspar LE, Gibbs FA, Lewin AA, Mendenhall WM, Schneider JF, Shaw EG, Simpson JR, Wharam MD Jr, Rogers L, Leibel S. Solitary brain metastasis. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1111-20. [18 references]

ADAPTATION

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

DATE RELEASED

1999

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

ACR Appropriateness Criteria™ Committee, Expert Panel on Radiation Oncology-Brain Metastases Work Group.

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Names of Panel Members: Jay S. Loeffler, MD; William D. Bloomer, MD; Judith A. Buckley, MD; Phillip H. Gutin, MD; Arnold W. Malcolm, MD; Karen D. Schupak, MD; David Larson, MD, PhD; Laurie E. Gaspar, MD; Frederic A. Gibbs, MD; Alan A. Lewin, MD, William M. Mendenhall, MD; Joseph F. Schneider, MD; Edward G. Shaw, MD; Joseph R. Simpson, MD; Moody D. Wharam, Jr., MD; Lisa Rogers, DO; Steven Leibel, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

The ACR Appropriateness Criteria™ are reviewed after five years, if not sooner, depending upon introduction of new and highly significant scientific evidence. The next review date for this topic is 2004.

GUIDELINE AVAILABILITY

Electronic copies: Available from the [American College of Radiology \(ACR\) Web site](#).

Print copies: Available from ACR, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

None available

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.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

Appropriate instructions regarding downloading, use and reproduction of the American College of Radiology (ACR) Appropriateness Criteria™ guidelines may be found at the American College of Radiology's Web site www.acr.org.

© 1998-2004 National Guideline Clearinghouse

Date Modified: 11/8/2004

FIRSTGOV

