Allina Health

Virginia Piper Cancer Institute Clinical Service Line
System-wide Consensus Guidelines:
Imaging for Central Nervous System Staging in Non-Small Cell Lung Cancer

These guidelines apply to clinical interventions that have well-documented outcomes, but whose outcomes are not clearly desirable for all patients

Reference #: SYS-PC-VPCI-CG-003

Origination Date: September 2013
Next Review Date: September 2019
Effective Date: September 2016

Approval Date: September 2016
Approved By: Allina Health Quality Council

System-wide Ownership Group: Allina Health Lung Cancer Program Committee
System-wide Information Resource: Director of Lung Cancer Clinical Program

SCOPE:

Sites, Facilities, Business Units	Departments, Divisions, Operational Areas	People applicable to
Allina Health – All Facilities that either perform or responsible for ordering imaging during the staging evaluation of patients with non-small cell lung cancer; Abbott Northwestern Hospital, Buffalo Hospital, Cambridge Medical Center, District One Hospital, Mercy Hospital, New Ulm Medical Center, River Falls Area Hospital, Regina Hospital, St. Francis Regional Medical Center, United Hospital, Unity Hospital; MN Oncology and Minneapolis Radiation Oncology	Radiation Oncology Thoracic Surgery Medical Oncology Pulmonology Radiology Virginia Piper Cancer Institute, Cancer Centers	Physicians, Advanced Practice Providers, Cancer Care Coordinators

Guidelines are not meant to replace clinical judgment or professional standards of care. Clinical judgment must take into consideration all the facts in each individual and particular case, including individual patient circumstances and patient preferences. They serve to inform clinical judgment, not act as a substitute for it. These guidelines were developed by a Review Organization. These guidelines may be disclosed only for the purposes of the Review Organization according to Minn. Statutes §145.64 and are subject to the limitations described at Minn. Statutes §145.65

PICO(TS) Framework:
Population Lung cancer patients, all stages
Intervention Brain MRI
Comparison n/a
Outcomes recurrence Ensure patients are receiving appropriate imaging during staging
Timing During diagnostic work up
Setting Medical oncology, Thoracic surgery, Radiation oncology, VPCI practices

CLINICAL PRACTICE GUIDELINES:
Hematogenous spread to the central nervous system is a recognized common risk in patients with non-small cell lung cancer (NSCLC). This has led many clinicians to routinely pursue Central Nervous System (CNS) imaging during the staging evaluation of all patients with NSCLC regardless of stage or symptomatology. The rationale for this is understandable as presence of metastatic disease to the CNS would drastically alter the prognosis and treatment approach for a patient with otherwise early stage disease. However, adding CNS imaging routinely to all patients with NSCLC can significantly increase cost which may not add value if the likelihood of identifying occult metastases is low.

1. Brain MRI is preferred over CT scan although CT is appropriate for patients who have a medical contraindication to MRI.
2. Brain imaging should be performed in all patients who have clinically concerning findings or symptoms regardless of clinical stage.
3. In patients without CNS symptoms, we recommend that all patients with stage III and IV disease should undergo brain imaging as part of their staging evaluation.
4. Incidence of occult brain metastasis in patients with clinical stage IA lung cancer is very low and we do not recommend routine brain imaging in this patient population
5. For patients with stage IB or II disease, incidence of occult brain metastasis remains low but CNS imaging may be considered in patients with high risk histologic features or other concerning clinical features.
6. A false positive rate as high as 10% has been reported in studies evaluating brain lesions in lung cancer patients. If there is any doubt in the etiology of brain lesions in a patient who would otherwise be appropriate for curative therapy, pathologic confirmation may be warranted.

SUPPORTING EVIDENCE:
Current major guidelines differ somewhat on the role of routine brain imaging during the evaluation of patients with clinically early stage NSCLC. NCCN recommends brain MRI for patients with stage IB or above disease. However, they consider brain imaging to be a level 2B recommendation for clinical stage IB through IIB disease. The 2013 ACCP guidelines, however, advocate brain imaging only in patients who are stage III or above.

The incidence of occult brain metastases in asymptomatic patients with clinically localized NSCLC varies by study but from a pooled analysis of the literature, the median is 3% (Silvestri, 2013). Risk factors predicting for a higher risk of brain metastases includes N2 disease (Ferrigno, 1994) and adenocarcinoma histology (Kormas, 1992). A recent large study of screening brain MRI in patients with squamous cell lung cancer demonstrated very low incidence in patients with stage 1A to IIA and that screen MRI prevented futile surgery in only 0.5% of patients (Lee, 2015). There is no data demonstrating that brain MRI improves long term outcome although obviously identification of occult brain metastases can avoid potentially morbid treatments that would not be curative. Given the relatively low incidence of occult brain metastases in this patient population, we do not feel that there is sufficient data to warrant routine imaging in all low risk patients (i.e. without mediastinal nodal involvement). However, in patients with other risk factors such as higher stage, high risk histology or in patients who may be medically borderline for aggressive therapy, a more thorough staging evaluation including brain imaging may be warranted per their providers' clinical judgment.

Significant false positive rates have also been reported in patients with incidental findings noted on MRI including gliomas and brain abscesses (Patchell, 1990). Therefore, if imaging is equivocal for metastatic disease in a patient otherwise clinically appropriate for curative therapy, surgical confirmation of brain metastasis may be warranted.

DEFINITIONS: N/A

SPECIAL ENTITIES: N/A

FORMS: N/A

ALGORITHM: N/A

ADDENDUM:

Plan for Monitoring and Adherence

Who will be measured for guideline adherence?
- Medical Oncologists and Radiation Oncologists

What will be measured?
- % of Stage III and IV NSCLC patients undergoing CNS imaging within 30 days of diagnosis

Where is the data located?
- EDW and Tumor Registry

How will the guideline adherence be monitored?
- It will be monitored through the Lung Program committee and placed on our scorecard.

When will adherence data be collected?
- Ease of gathering data will dictate frequency, but minimally once a year.

Feedback: How can providers document exceptions to guideline adherence?

- Narrative note or provider specific

REFERENCES:

Ferrigno, D. (1994). Cranial computed tomography as a part of the initial staging procedures for patients with non-small cell lung cancer. *Chest, 106*(4), 1025-29.

Kormas, P. (1992). Preoperative computed tomography of the brain in non-small cell bronchogenic carcinoma. *Thorax, 47*(2), 106-108.

Patchell, R. (1990). A randomized trial of surgery in the treatment of single metastases to the brain . *N Engl J Med, 322*(8), 494-500.

Silvestri, G. (2013). Methods for Staging Non-small Cell Lung Cancer: Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest, 143*(5), 211S-250S.

Lee, H. (2015). Incidence of Brain Metastasis at the Initial Diagnosis of Lung Squamous Cell Carcinoma on the Basis of Stage, Excluding Brain Metastasis. *Journal Thoracic Oncology, 11(3), 426-31.*

Alternate Search Terms: N/A

Related Guidelines/Documents

Name	Content ID	Business Unit where Originated
N/A		