

National Imaging Associates, Inc.	
<b>Clinical guidelines/considerations</b> <b><u>NON SMALL CELL LUNG CANCER-</u></b> <b><u>RADIATION ONCOLOGY</u></b>	<b>Date: March 2011</b> <b>Page 1 of 10</b>
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## **INTRODUCTION:**

Lung cancer is the leading cause of cancer-related deaths of both men and women in the United States. The World Health Organization divides lung cancer into two types: non-small cell lung cancer (NSCLC) as discussed in this guideline and small cell lung cancer (SCLC). The most common lung cancer, NSCLC, includes various histologies: squamous carcinoma, adenocarcinoma, and large cell carcinoma. These are grouped together for purposes of diagnosis, staging, prognosis, and treatment. In general, tissue diagnosis is used to classify patients into one of three groups reflecting the extent of the disease and the treatment approach: surgically resectable disease, locally and/or regionally advanced disease, and metastatic disease.

Surgery alone has been the standard treatment for patients with resectable NSCLC for many years. However, patients with completely resected disease have disappointing survival rates. Relapse often occurs at distant sites which suggest that NSCLC may be a systemic disease when diagnosed. Chemotherapy and radiation therapy are now treatment considerations in both the preoperative and postoperative settings.

Prognosis and treatment of NSCLC are based on the staging of the cancer which documents the extent of cancer growth and spread. The initial goal of staging is to determine if the tumor is surgically resectable. Some patients with resectable disease may be cured by surgery while others, due to contraindications to surgery, may be candidates for radiation therapy for curative intent or for local control. Patients with locally and/or regionally advanced disease and metastatic disease may benefit from radiation therapy either alone or combined with chemotherapy for palliative treatment.

## **GOAL OF THE GUIDELINE:**

This guideline outlines several methods suitable for the delivery of radiation therapy to treat lung cancer. These include the use of external beam radiation therapy such as; three-dimensional conformal radiation therapy (3D-CRT), endobronchial brachytherapy, postoperative radiation therapy (PORT) and stereotactic body radiation (SBRT). Endobronchial brachytherapy and SBRT are aggressive approaches justified, in part, for non-resectable tumors. While these advances in treatment offer a range of regimens, the goal of this guideline is to guide diagnosis and treatment to the most efficient, comparatively effective, diagnostic and treatment pathway. With the exception of

medically inoperable tumors and extreme palliative circumstances, radiation treatment is performed, in all cases, in conjunction with surgical intervention.

## **GENERAL CONSIDERATIONS:**

Surgical resection is the preferred treatment for early stage NSCLC. Assessment of the patient's overall medical condition, including pulmonary reserve, is important in considering the potential benefits of surgery, especially since an immediate post-operative mortality rate of 3% to 5% can be expected.

Radiation therapy with curative intent is an acceptable alternative to surgery for patients presenting with inoperable stage I and II disease. These patients may either be unable to tolerate a surgical resection or they may refuse surgery based on risk considerations. Reported 5-year survival rates for patients receiving radiation therapy for inoperable stage I and II disease suggest that radiotherapy may offer a chance for long term survival ranging from 10% to 27%.

Patients with stage IIIA disease are a relatively heterogeneous group. Some patients present with resectable tumors and microscopic metastases to lymph nodes, while others present with bulky, unresectable local-regional disease. Therapeutic approaches require consideration of the extent of disease; radiation, surgery and chemotherapy in various combinations are considered for treatment. Although subsets of patients have been reported with 5-year survivals of up to 10%, generally the results are less. Reported studies suggest that postoperative radiation therapy (PORT) may be associated with an increase in survival in patients with N2 nodal disease but not in patients with N0 and N1 nodal disease.

Patients with locally advanced, unresectable stage III disease may benefit from radiation therapy administered sequentially with chemotherapy. However, the combination of thoracic radiotherapy delivered concurrently with cisplatin-based chemotherapy has been shown to provide the greatest survival benefit.

Patients with stage II and stage III disease may present with Pancoast tumors that form at the extreme apex, in the superior sulcus of the lung. The tumors may invade pleura, chest wall, brachial plexus, subclavian vessels, and vertebral bodies. Treatment options for these patients include aggressive treatment for cure with a combination of preoperative radiation and surgical resection.

## MEDICALLY NECESSARY INDICATIONS FOR RADIATION THERAPY AND TREATMENT OPTIONS:

- **Resectable Tumors**
  - Surgically operable – T1,N0 (margins positive)
    - Postoperative 3D-CRT +/- chemotherapy
  - Surgically operable – T2,N0 (margins positive)
    - Postoperative 3D-CRT +/- chemotherapy
  - Surgically operable – T1-2,N1, T3,N0
    - Postoperative 3D-CRT + chemotherapy
  - Surgically operable – T1-3,N2
    - Postoperative 3D-CRT + chemotherapy
  - Surgically operable – T3-4, N0-N1 (resectable) (Superior Sulcus Tumors)
    - Preoperative 3D-CRT + concurrent chemotherapy
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  - Post Operative Radiation Dose Guidelines (based on margin status)
    - Negative margins: 50-54 Gy
    - Gross positive margin: 60-70 Gy
    - Microscopic positive margin/extracapsular nodal extension: 54-60 Gy
  - Pre Operative Radiation Therapy Dosage Guidelines
    - 45-50 Gy
  
- **Non-Resectable Tumors**
  - Medically inoperable – Stage I Disease
    - Definitive 3D-CRT/chemoradiation (60-74 Gy)
    - Stereotactic body radiation therapy is an option for inoperable Stage I disease located in the peripheral lung. Typical dose fractionation schemes:
      - 30-34 Gy x 1 (< 2 cm tumor, > 1 cm from chest wall)
      - 15-20 Gy x 3 (< 5 cm tumor, > 1cm from chest wall)
      - 12-12.5 Gy x 4 (< 5 cm tumor, < 1 cm from chest wall)
      - 10-11 Gy x 5 (< 5 cm tumor, < 1 cm from chest wall)
  - Medically inoperable– Stage II and Stage III disease
    - Definitive 3D-CRT/chemoradiation (60 -74 Gy)
  - Medically or surgically inoperable Stage IIIA (locally advanced) (60-74 Gy)
    - 3D-CRT + concurrent chemotherapy
    - 3D-CRT + concurrent chemotherapy followed by resection
  - Inoperable Stage IV
  - 3D External radiation as palliative therapy to relieve pain, airway or endobronchial obstruction, and other symptoms.

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*Unless otherwise indicated standard radiation fractionation consists of 1.8 Gy to 2.0 Gy per day*

- **Endobronchial Brachytherapy**
  - Patients with primary tumors who are not otherwise candidates for surgical resection or external-beam radiation therapy due to comorbidities or location of the tumor
  - Palliative therapy for airway obstruction or severe hemoptysis in patients with primary, metastatic, or recurrent tumors.

## **TREATMENT OPTIONS REQUIRING ADDITIONAL CLINICAL REVIEW:**

Intensity-modulated radiation therapy (IMRT) is not indicated as a standard treatment option for lung cancer but may be indicated for selected cases of lung cancer with close proximity to critical structures and by the observed limits of the radiation dose, with the expectation of less late toxicities. A peer review including provider documentation of the clinical rationale will be required to determine the need for performing IMRT rather than conventional or 3D treatment planning and delivery.

Stereotactic Body Radiation Therapy (SBRT) is not considered a standard form of treatment for NSCLC except for inoperable Stage I disease. Other requests for SBRT will require a peer review to make a medical necessity determination. Documentation from the radiation oncologist must include the clinical rationale for performing SBRT rather than 3-D conformal treatment.

Proton beam is not an approved treatment option for NSCLC. Overall, studies have not shown clinical outcomes to be superior to conventional radiation therapy. A request for proton beam therapy will require a peer review. For peer review purposes supporting documentation from the radiation oncologist is required.

Real-time intra-fraction target tracking during radiation therapy to adjust radiation doses or monitor target movement during individual radiation therapy treatment sessions is not considered standard of care. A request for intra-fraction tracking will require a peer review for medical necessity determination. Documentation from the provider must include the clinical rationale for using intra-fraction tracking rather than the placement of interstitial devices (e.g. fiducial markers) and standard image guidance such as CT guidance or stereoscopic x-ray.

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