Purpose/Objective(s): Large (≥5 cm) node-negative non−small cell lung cancer (NSCLC) is relatively uncommon, and both efficacy and toxicities of stereotactic body radiation therapy (SBRT) in this unique patient population have been largely under-evaluated in research studies.
Materials/Methods: We surveyed United States academic thoracic radiation oncologists regarding practice patterns for SBRT in node-negative ≥5 cm NSCLC and assessed what parameters would lead providers to change their SBRT treatment plan. A 25-question survey of demographics and practice patterns, including 5 clinical cases, was sent to 107 radiation oncologists who self-identified as thoracic/lung cancer specialists.
Results: Response rate was 34% (36/107). Among respondents, two-thirds had at least 6 years of work experience following residency; 67% and 67% annually treated >60 lung cancer and >25 lung SBRT cases, respectively. Nearly all (97%) routinely offered SBRT for ≥5 cm NSCLC, and 55% used an SBRT treatment of 50-60 Gy in 5 fractions, with fractions delivered every other day in 60%. Dosing and fractionation was most commonly altered for central tumor location (77%). Sixty percent would offer chemotherapy in addition to definitive SBRT treatment, and chemotherapy was strongly considered for patients with good performance status (74%), younger age (69%), and larger tumor size (68%). The 5 clinical cases revealed significant practice variability in dose, fractionation, treatment timing, and chemotherapy use among respondents.
Conclusion: Practice patterns of SBRT for ≥5 cm NSCLC lesions displays substantial heterogeneity. Five fraction regimens with BED ≥100 Gy were most commonly recommended, and many respondents recommend every other day delivery and consideration for chemotherapy. Further data on dose/fractionation and use of chemotherapy in this population are warranted.
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A Review of Non−Small Cell Lung Cancer Post-Treatment Follow-up Imaging Procedures with PET/CT Scans Versus CT Scans and the Effect on Patient Survival

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Purpose/Objective(s): For non−small cell lung cancer patients (NSCLC), the NCCN guidelines do not currently recommend positron emission tomography (PET) scan imaging for routine surveillance after curative treatment. PET scans are proven to detect recurrences earlier than CT scans alone. This has prompted many physicians to begin to incorporate PET scans into routine surveillance imaging after definitive treatment. It is unclear whether early PET scan recurrence detection affects patient survival. PET scans are significantly more expensive than CT scans. Thus, it is important to make sure that scarce healthcare dollars are not wasted on an imaging study that does not improve patient outcomes over CT scan surveillance imaging. This study examines 91 non−small cell lung cancer patients, stages I-III, diagnosed and treated at one institution in 2012, to evaluate the effect of PET scans surveillance imaging versus CT scan alone imaging on patient overall survival.
Materials/Methods: A retrospective chart review of 91 stage I-III NSCLC patients treated at a single institution in 2012 with curative intent was performed to determine which patients received a PET scan during surveillance imaging after their curative treatment versus patients who only received CT scans for surveillance imaging. *Disease* progression was determined by either a CT or PET scan report indicating recurrent/progressive disease or a physician clinical note indicating recurrent/progressive disease. Overall survival was determined from date of diagnosis to date of death. Cox regression was used to compare the survival between the two groups for overall survival (OS), progression-free survival (PFS), or cancer specific survival (CSS).
Results: There were no statistically significant differences in OS, PFS, or CSS between patients who received a PET scan during surveillance imaging versus patients who only received CT scans. The OS hazard ratio was 1.309 with a 95% confidence interval from 0.751 to 2.284 (*P*-value is .336), indicating no significant difference in overall survival. For PFS, the hazard ratio is 0.429 with a 95% confidence interval from 0.224 to 0.820 (*P*-value .011), indicating no significant difference in progression-free survival. For CSS, the hazard ratio was 0.714 with a 95% confidence interval from 0.376 to 1.354 (*P*-value .306), indicating no significant difference in cancer-specific survival.
Conclusion: There is no evidence from this study to suggest that implementation of PET scan imaging for lung cancer surveillance after curative treatment for patients with stage I-III NSCLC improves patient overall survival, progression-free survival, or cancer-specific survival. PET scans can detect recurrence at an earlier point in lung cancer patients, but this does not appear to improve survival.
Author Disclosure: **J.R. Mansueti**: None. **S. Maillie**: None.

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Outcome with Stereotactic Body Radiation Therapy for Stage I Non−Small Cell Lung Cancer Using 5 Fractions: Single Institution Experience of 106 Consecutive Patients

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Purpose/Objective(s): Stereotactic body radiation therapy (SBRT) has been developed as a novel modality for early stage non−small cell lung cancer (NSCLC) and has emerged as a standard treatment option for medically inoperable patients. We report here our institutional experience with SBRT for stage I NSCLC.
Materials/Methods: We retrospectively analyzed 106 consecutive stage I (T1a, T1b, T2a N0) NSCLC patients treated at an institution from January 2008 through December 2012 with a 5-fraction SBRT regimen. Patients were treated using the ExacTrac® system on a Novalis LINAC. Survival and loco-regional control were calculated from the date of completion of SBRT to last date of follow-up/death.
Results: There were 58 males and 48 females with median age of 76.5 years (range 50-91 years). Pulmonary and/or cardiac co-morbidity was the most common reason for patients not undergoing surgery. Eighty-seven percent (n=93) had a pathologic diagnosis whereas 13 refused biopsy. Adenocarcinoma (51%) was the most common histology followed by squamous cell (19.8%), BAC, and large cell. Sixty-nine percent (n=74) were 11-20 mm in size, 20.8% (n=22) were 21-30 mm, 2.8% (n=3) were 31-40 mm, and 6.6% (n=7) were <10 mm. Ninety-eight percent (n=104) of tumors were peripherally located whereas 1.9% (n=2) were central or para-spinal in location. The 1-, 2-, and 5-year local control (LC) rates were 98%, 90%, and 88% with all local failures (LF) occurring within 2 years. Age, gender, tumor size, tumor histology, prescribed dose, patient age, prior RT, or surgery had no significant impact on LC rates. The overall survival (OS) rates and cause specific survival (CSS) were 95%, 85%, 73%, and 41% (median survival of 42.7 months) and 98%, 91%, 81%, and 58% (median survival was not reached) at 6 months, 1 year, 2 year, and 5 years, respectively. On univariate analysis, age, gender, prescribed dose, size of tumor, and prior treatment were not significant; progression of disease was the only significant factor for OS ($P<.0004$) and CSS ($P<.00001$). Six of 106 developed LF and 13 developed distant failure (of whom 5 also developed LF). Five died from NSCLC and 2 died from causes other than NSCLC. All patients tolerated SBRT well: 21% (n=19) patients developed grade II radiation changes on follow-up CT and 12% (n=12) patients developed symptomatic radiation pneumonitis requiring medical treatment. No patient died from treatment-related toxicity.