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Contact: Liz Gardner  
703-286-1600  
[liz.gardner@astro.org](mailto:liz.gardner@astro.org)

Nancy Mayes  
Mayes Communications  
703-772-2510  
[nancy@mayescommunications.com](mailto:nancy@mayescommunications.com)

## **Widespread adoption of SBRT has improved survival rates for elderly patients with early stage lung cancer**

*SEER database study finds dramatic rise in overall and lung cancer-specific survival following SBRT for patients age 60 and older with stage I NSCLC*

BOSTON, September 26, 2016 -- Survival rates for elderly patients who received stereotactic body radiation therapy (SBRT) for early stage non-small cell lung cancer (NSCLC) rose from roughly 40 to 60 percent over the past decade, concurrent with the increasing adoption of SBRT, according to research presented today at the 58<sup>th</sup> Annual Meeting of the American Society for Radiation Oncology (ASTRO).

In recent years, SBRT has become the standard of care for patients with inoperable early stage NSCLC. Compared to the conventional radiation therapy (RT) approach of small doses given daily over several weeks, SBRT delivers a highly targeted, escalated dose of radiation in a single session or as many as five of treatments, usually between one and five fractions. Widespread adoption of SBRT in community-based practices has increased its use as the primary definitive treatment for elderly patients, who often have multiple medical problems that limit surgical options.

For this study, researchers examined records from the nation's largest cancer patient database to determine how rates of overall and disease-specific survival have changed as use of SBRT has increased, as well as to draw population-based comparisons between SBRT and surgery alone for elderly patients.

Records for the 62,213 patients age 60 and above who were diagnosed with stage I NSCLC between 2004 and 2012 were extracted from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database. Patients with squamous, adenocarcinoma and adenosquamous histologies and those with definite records defining local therapy were eligible for inclusion.

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Overall survival (OS) and lung cancer-specific survival (CSS) rates were calculated for patients grouped into five-year subsets (i.e., 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, and 90 and older). Researchers analyzed OS and CSS change over time based on type of therapy and age using Kaplan-Meier, logarithmic ranking and Cox multivariate hazard ratio (HR) methods as well as comparative analysis with Fisher test.

Over the study period, survival rates for SBRT rose dramatically among this large, nationally-representative population of elderly stage I NSCLC patients. From 2004 to 2012 -- the years in which adoption of SBRT in community practice became widespread -- the overall survival rate at 23 months following SBRT alone rose nearly 20 percentage points, from 39 to 58 percent ( $p < 0.001$ ). OS rates for surgery alone rose five percentage points, from 79 to 84 percent ( $p < 0.001$ ). There was no improvement for patients who received neither RT nor surgery (from 28 to 33 percent,  $p = 0.29$ ).

In the same time period, CSS increased from 48 to 72 percent of patients who received SBRT alone ( $p < 0.001$ ) and from 87 to 91 percent of patients receiving surgery alone ( $p < 0.001$ ). CSS rates remained stable for patients who received neither surgery nor radiation, although the difference approached statistical significance (38 to 45 percent,  $p = 0.06$ ).

“Our findings indicate that physicians should feel confident recommending radiation therapy to patients who are too sick to undergo surgery or who choose not to undergo surgery for other reasons,” said Andrew M. Farach, MD, a radiation oncologist at Houston Methodist Hospital and lead author on the study. “With continued adoption of SBRT in community cancer centers, it is our hope that more patients will receive curative SBRT and the number of patients left untreated based on age or medical comorbidity will continue to fall.”

The use of surgery to treat stage I NSCLC declined with age ( $p < 0.001$ ). While 81 percent of patients age 60-64 underwent surgery, only 47 percent of patients age 80 or older were able to undergo surgery. The use of RT, conversely, rose with increasing age, ranging from 11 percent of patients age 60-64 to 39 percent of patients age 90 or above ( $p < 0.001$ ). The number of patient receiving no treatment also increased from 7 to 40 percent for the youngest and oldest elderly patient cohorts in the study.

Despite improvements in OS and CSS, survival rates following RT remained lower than those for elderly patients who received surgery. Researchers explained that this difference may be due, in part, to a selection bias where healthier patients were treated with surgery, and they underscored the need for a controlled clinical trial with matched patients receiving each treatment first-line to compare the efficacy of these therapies. Instances of palliative SBRT or conventional RT also may have skewed results in favor of surgical outcomes.

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“While survival rates remain highest for surgical candidates, this study demonstrates both clear benefits from SBRT for nonsurgical NSCLC patients and that outcomes following radiation therapy have improved at a more accelerated pace over the past decade than those for any other therapeutic approach,” said Dr. Farach. “With increased access to this potentially life-saving treatment, we can continue to improve outcomes for the growing population of elderly patients fighting early stage cancer.”

The abstract, “Outcomes in Elderly Stage I Non-Small Cell Lung Cancer in the SBRT Era: A SEER Analysis,” will be presented in detail during a scientific session at ASTRO’s 58th Annual Meeting at 7:45 a.m. Eastern time on Tuesday, September 27, 2016. To speak with Dr. Farach, please contact ASTRO’s media relations team on-site at the Boston Convention and Exhibition Center September 25 through 28, by phone at 703-286-1600 or by email at [press@astro.org](mailto:press@astro.org).

**ATTRIBUTION TO THE AMERICAN SOCIETY OF RADIATION ONCOLOGY (ASTRO) ANNUAL MEETING REQUESTED IN ALL COVERAGE.**

Full study abstract available on the final page of this release.

**ABOUT ASTRO’S ANNUAL MEETING**

*ASTRO’s 58th Annual Meeting, the nation’s premier scientific meeting in radiation oncology, will be held September 25-28, 2016, at the Boston Convention and Exhibition Center in Boston. The 2016 Annual Meeting is expected to attract more than 11,000 attendees from across the globe, including oncologists from all disciplines and members of the entire radiation oncology team. Led by ASTRO president David C. Beyer, MD, FASTRO, the 2016 meeting will feature keynote addresses from Kathleen Sebelius, former U.S. Secretary of Health and Human Services; Thomas James Lynch Jr., MD, Chair and CEO, Massachusetts General Physicians Organization; and Jason Ragogna, general manager, SMS and Safety Alliances, Corporate Safety, Security, and Compliance, Delta Air Lines, Inc. The Presidential Symposium, “Prostate Cancer: Defining Value and Delivering It,” highlights the meeting’s theme of “Enhancing Value, Improving Outcomes” and will feature recent practice-changing studies and current developments in value-based care for prostate cancer. ASTRO’s four-day scientific meeting will feature a record number of abstracts, including 368 oral presentations, 1,760 posters and 180 digital posters in more than 50 educational sessions and 20 scientific panels for 20 disease-site tracks. For more information about ASTRO’s 58th Annual Meeting, visit [www.astro.org/AnnualMeeting](http://www.astro.org/AnnualMeeting). For press registration and news briefing information for ASTRO’s 58th Annual Meeting, visit [www.astro.org/AMPress](http://www.astro.org/AMPress).*

**ABOUT ASTRO**

*ASTRO is the premier radiation oncology society in the world, with more than 10,000 members who are physicians, nurses, biologists, physicists, radiation therapists, dosimetrists and other health care professionals who specialize in treating patients with radiation therapies. As the leading organization in radiation oncology, the Society is dedicated to improving patient care through professional education and training, support for clinical practice and health policy standards, advancement of science and research, and advocacy. ASTRO publishes three medical journals, International Journal of Radiation Oncology • Biology • Physics ([www.redjournal.org](http://www.redjournal.org)), Practical Radiation Oncology ([www.practicalradonc.org](http://www.practicalradonc.org)) and Advances in Radiation Oncology ([www.advancesradonc.org](http://www.advancesradonc.org)); developed and maintains an extensive patient website, RT Answers ([www.rtanswers.org](http://www.rtanswers.org)); and created the Radiation Oncology Institute ([www.roinstitute.org](http://www.roinstitute.org)), a nonprofit foundation to support research and education efforts around the world*

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*that enhance and confirm the critical role of radiation therapy in improving cancer treatment. To learn more about ASTRO, visit [www.astro.org](http://www.astro.org).*

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### **Outcomes in Elderly Stage I Non-Small Cell Lung Cancer in the SBRT Era: A SEER Analysis**

S. M. Dalwadi<sup>1</sup>, S. Szeja<sup>2</sup>, B. S. Teh<sup>3</sup>, E. B. Butler<sup>4</sup>, and A. M. Farach<sup>4</sup>; <sup>1</sup>Texas A&M College of Medicine/Scott and White Memorial Hospital, Temple, TX, <sup>2</sup>University of Texas Medical Branch at Galveston, Galveston, TX, <sup>3</sup>Houston Methodist Hospital, Houston, TX, <sup>4</sup>Houston Methodist, Houston, TX

**Purpose/Objective(s):** Stereotactic body radiation therapy (SBRT) is now considered the standard of care for patients with inoperable stage I non-small cell lung cancer (NSCLC). For elderly patients, competing comorbidities limit operability. With widespread adoption of SBRT in community practice, an increasing number of elderly patients are receiving definitive SBRT. The purpose of this study is to review population-based outcomes based on treatment modality using the Surveillance, Epidemiology, and End Result (SEER) database for stage I NSCLC patients treated between 2004-2012 in the SBRT era.

**Materials/Methods:** The national SEER database was used to draw NSCLC patients age 60 and above between 2004 and 2012 with squamous, adenocarcinoma, and adenosquamous histologies. Only patients with definite records defining local therapy were included. Survival analysis included Kaplan-Meier, log-rank, cox-multivariate hazard ratio (HR), and comparative analysis with Fisher test. Patients were grouped in 5-year bins: 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, and 90 and older for survival based on local therapy. Temporal trends in survival based on local therapy and age were also analyzed.

**Results:** For the 62,213 patients meeting criteria for analysis, the distribution by histology was comparable across all age groups. The use of surgery declined with age as patients aged 60 to 64 had surgical rates of 81% compared to 21% for ages 90 and over ( $p < 0.001$ ). Radiation use increased from 11 to 39% ( $p < 0.001$ ), as did the percentage of patients receiving neither surgery or radiation treatment from 7 to 40% ( $p < 0.001$ ) for the same age groups. Multivariate analysis demonstrated HR of treatment types compared to surgery at baseline as radiation only = 3.1, surgery and radiation = 2.3, and neither surgery or radiation = 5.9 (all  $p < 0.01$ ). From 2004 to 2011, overall survival (OS) at 23 months improved dramatically for patients treated with radiation only (39 to 58%,  $p < 0.001$ ) and more subtly for those receiving surgery only (79 to 84%,  $p < 0.001$ ), while it was stable for those having neither surgery nor radiation (28 to 33%,  $p = 0.29$ ). Similarly, lung cancer specific survival (CSS) at 23 months improved significantly for patients treated with radiation only (48 to 72%,  $p < 0.001$ ), and less so for those receiving surgery only (87 to 91%,  $p < 0.001$ ), while it was stable for those having neither surgery nor radiation (38 to 45%,  $p = 0.06$ ).

**Conclusion:** With advancing age, radiation replaces surgery as the most appropriate modality for early stage NSCLC. Concurrent with the adoption of SBRT as a community standard, both OS and CSS have improved significantly for elderly stage I NSCLC patients treated with radiation alone.