Purpose/Objective(s): Recent, high impact randomized trials have led to decreasing use of axillary lymph node dissection (ALND) in early stage breast cancer patients with a positive sentinel lymph node (SLN), leading to controversy surrounding radiation therapy (RT) coverage of the axilla. We investigate practice pattern variation among radiation oncologists in regional nodal coverage in different clinicopathologic scenarios and evaluate and use of prediction tools.

Materials/Methods: A customized, web-based questionnaire was emailed to 983 community (n = 617) and academic (n = 366) radiation oncologists with breast cancer subspecialty practicing in the United States. The survey consisted of 18 multiple-choice questions evaluating general clinical preferences surrounding RT field design for patients with early stage breast cancer with a positive SLN and 7 case scenarios designed to investigate field design in the setting of specific clinical and pathologic risk factors. Nodal coverage was classified as standard tangents (ST), high tangents (HT), tangents and a supraclavicular field (TSC), or tangents and full axillary coverage (TFA).

Results: One hundred forty-seven evaluable responses were received and analyzed, with a response rate of 15.0%. 12 (8.3%) of respondents report using completion ALND for patients with 1-3 positive SLN without extra capsular extension (ECE) and 66 (45.5%) perform ALND with 1-3 positive SLN with ECE. In cases with micro metastatic SLN, with no lympho-vascular system invasion (LVSI), 115 (87.1%) report using online predictive nomograms to predict further axillary involvement, with no difference between academic and community radiation oncologists (p = 0.95).

Conclusion: There is significant practice variation in RT field design for SNL positive patients when omitting a completion ALND, although most respondents cover the full axilla for high-risk pathologic features. Online prediction nomograms are used by a minority of practitioners to assist in clinical decision-making in this setting.

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Socioeconomic Factors Impact Probability of Receiving Radiation As Part of Breast Conserving Therapy for Early-Stage Breast Cancer

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Purpose/Objective(s): To analyze the potential impact of socioeconomic factors on the probability of patients receiving radiation therapy (RT) as part of breast conserving therapy (BCT) for low-risk early stage breast cancer.

Materials/Methods: Data were extracted from the survival, epidemiology, and end result (SEER) database from 2000-2011 to include early stage breast cancer patients who met suitable criteria according to ASTRO accelerated partial breast irradiation (APBI) consensus guidelines. This included female patients with a history of breast cancer who underwent a lumpectomy, were at least 60y, and had a tumor 0-20 mm in size without positive lymph nodes. Patients were to be estrogen receptor positive and have had at least one regional lymph node removed. Multiple socioeconomic/demographic factors, including insurance status, age, race, degree of education, median family or household income and marital status, were analyzed with patients either receiving or not receiving RT using T-test or ANOVA. Survival was estimated using the Kaplan Meier method.

Results: A total of 8620 patients fit the inclusion criteria. The median tumor size was 10 mm (2-20); a median of 2 nodes were examined. All cases were stage I, and 100% were ER+ while 86% were PR+ and 11% were HER2+ or unknown. 52% were age 60-69y; 34.5% 70-79y and 13.5% at least 80y. 86.5% were white; 6.3% were black, 6.5% other; and 0.7% of unknown race. A majority of the data were from CA (38.4%), NJ (10.8%), and GA (10.4%). 97.4% of patients had insurance; 0.7% were uninsured; and 1.9% insurance status was unknown. Median family income was $73,230 ($27,660-125,584). 6446 (75%) received some form of RT. 87% had external beam while 13% underwent APBI. Having health insurance had no impact on probability of RT receipt (p = 0.30). Age significantly impacted treatment with no RT given to 17%, 20%, 27%, 31%, 41% and 61% of those ages 60-64, 65-74, 75-79, 80-84, and >85 respectively (p < 0.001). Marital status significantly impacted RT receipt with single, never married (28% no RT) and widowed (33% no RT) patients least likely to receive it (v married, divorced or separated 21% no RT, p < 0.001). Patients with at least a high school degree were more likely to receive RT (p < 0.0001) and having a bachelor’s degree increased probability of APBI (p = 0.013). The median family income was higher in those receiving RT ($73,770 v $72,830, p = 0.037). Race was associated with RT receipt where 25% of whites, 30% of blacks and 22% of those with other races had no RT (p < 0.001). Race was predictive of APBI receipt with 14% of whites, 14% of blacks, and 6% of those with other races having APBI (p < 0.001).

Conclusion: Multiple socioeconomic factors are associated with the probability of patients with early stage low-risk breast cancer receiving RT as part of BCT including income, age, educational level, and race. APBI was more likely given to highly educated patients.


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Accelerated Partial-Breast Irradiation Utilizing an On-board Magnetic Resonance Image Guided Radiation Therapy System: Evaluation of Intrafraction Motion of the Lumpectomy Cavity

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Purpose/Objective(s): To evaluate intra-fraction lumpectomy cavity motion in patients undergoing accelerated partial breast irradiation (APBI) utilizing an on-board magnetic resonance image-guided radiation therapy (MR-IGRT) system with continuous MRI acquisition during treatment delivery.

Materials/Methods: 10 patients with DCIS or early-stage breast cancer were treated with APBI using a Co-60 MR-IGRT system. PTV was defined as a 1 cm isotropic expansion around the lumpectomy cavity, with subtraction off the chest wall and 5 mm from the skin. Prescription dose to the PTV was 38.5 Gy in 10 fractions, twice daily. Continuous cine MR images were acquired in the sagittal plane with an acquisition rate of 4 frames/second for the duration of each fraction. To assess intra-fraction cavity motion, 4 tracking points were placed on the edge of the lumpectomy cavity for each cine MR scan and analyzed for displacement in the