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|   | **Table S4.** Interaction Analysis of RT by DS  |   |
|   |   | **Invasive Breast Cancer**(IBC, 33 events) |   | **Ipsilateral Breast Event** (IBE, 61 events) |   |   |
|   | (excludes margin positive patients) | HR | 95%CI | p-value |   | HR | 95%CI | p-value |   |   |
|   |   |   |   |   |   |   |   |   |   |   |
|   | DS (per 5 units) | 4.3 | 2.2-8.5 | **< 0.001** |  | 3.0 | 1.9-5.0 | **< 0.001** |   |   |
|   | DS > X & RT† | 0.2 | 0.04-0.9 | **0.037** |   | 0.3 | 0.1-0.9 | **0.032** |   |   |
|   | RT | 1.2 | 0.3-4.8 | 0.800 |  | 0.7 | 0.3-1.7 | 0.454 |   |   |
|   |   |   |   |   |   |   |   |   |   |   |
|   | Interaction analysis of RT and DS, with covariates DS, RT, and (RT & DS>X) in the subset of patients with clear margins. IBC and IBE risk was dependent on DS (prognostic), and RT benefit was dependent on DS for both IBC and IBE risk (predictive). For DS above 2.1 the RT benefit for IBC was substantial and statistically different from the baseline RT benefit, which had a non-significant HR near unity. For DS above 2.7 the RT benefit for IBE was substantial and statistically different from the baseline RT benefit which had a non-significant HR near unity. Abbreviations: 95%CI = 95% Confidence Interval; DS = Decision Score; RT = Radiation therapy; HR = Hazard Ratio.†For IBC, X=2.1; for IBE, X=2.7 |   |
|   |   |   |   |   |   |   |   |   |   |   |