**Randomized Trial Evaluating Radiation following Surgical Excision for “Good Risk” DCIS: 12-Year Report from NRG/RTOG 9804**

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**Purpose/Objective(s):** NRG/RTOG 9804 is the only prospective randomized trial to assess the impact of whole breast radiation (WBRT) versus observation (OBS) in women with “good risk” DCIS, following breast conservation surgery. The primary objective is local recurrence (LR) in the treated breast. Long-term results of this trial are presented here.

**Materials/Methods:** “Good risk” DCIS was defined for this trial as clinically occult DCIS, found by mammogram or incidental finding at surgery, with size ≤2.5 cm, final margins ≥3 mm, with low or intermediate nuclear grade. Consented patients were randomly assigned to WBRT with standard doses or OBS; boosts were not allowed. The use of Tamoxifen (Tam) for 5 years was optional. Cumulative incidence was used to estimate LR, Gray’s test to compare treatments, and Fine-Gray regression for hazard ratios (HRs). Intended accrual was 1790, to detect LR HR=0.58.

**Results:** 636 women were randomized from 1999 - 2006 and initial results were reported in 2013. For this long-term update, in addition to the analyses for the 585 eligible patients with follow-up, sensitivity analyses were also done including all patients with follow-up (n=629). As analyses were

essentially the same, the reported results are based on all patients with follow-up. Median age was 58 years and 76% were post-menopausal. Mean pathologic tumor size was 0.60 cm, 61% ≤ 0.5 cm, and 65% had a margin width ≥1.0 cm or a completely negative re-excision specimen. Highest nuclear grade was 1 in 44% and 2 in 56%. Intention to use Tam was indicated for 69% of patients, equally between treatment arms; however actually receiving Tam was different at 58% WBRT vs. 65% OBS (p=0.05).With a median follow-up time of 12.4 years, the 12-year cumulative incidence of LR was 2.8% (95% CI: 1.1, 5.6) with WBRT and 11.4% (7.7, 15.8) with OBS (p=0.0001; HR=0.26, 95% CI: 0.13, 0.54). The 12-year cumulative incidence of invasive (INV) LR was 1.5% (0.4, 4.0) with WBRT and 5.8% (3.2, 9.5) with OBS (p=0.016; HR=0.34, 95% CI: 0.14, 0.85). On multivariable analysis, only WBRT (HR=0.25, 95% CI: 0.12, 0.53; p=0.0003) and the use of Tamoxifen (HR=0.50,95%CI: 0.27, 0.91; p=0.024) were associated with reduced LR. Age (< 50 vs. ≥ 50) and pathologic tumor size were not significant for all LR, nor INV LR. As expected, no significant differences were observed in survival, disease-free survival or mastectomy use.

**Conclusion:** Whole breast radiation significantly reduced LR and INV LR in this “good risk” DCIS population. The larger than expected WBRT effect has yielded meaningful results despite not meeting targeted accrual. These results should not be presented to the patient as an absolute indication for WBRT in the defined “good risk” group, but rather should inform a meaningful patient-physician discussion that includes risks, benefits and the patient’s own degree of comfort, which can vary greatly, with the differences in LR with and without radiation.