**Androgen Deprivation Therapy (ADT) and Radiation Therapy (RT) Alone As Compared With Trimodality Therapy With ADT, RT, and Surgery in Men With High Risk, Nonmetastatic Adenocarcinoma of the Prostate**

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**Purpose/Objective(s):** Radiation therapy (RT) combined with long-term androgen deprivation therapy (ADT) represents a current standard of care for high risk prostate cancer patients. Despite this, men with high risk prostate cancer often undergo surgical resection before RT and ADT. It remains un- known if the addition of surgery to RT and ADT improves outcomes for men with high risk disease. Given the added cost and morbidity associated with the addition of surgical resection, the potential benefits of surgery seem prudent to explore. We conducted an analysis of men with high risk prostate cancer intended to examine the benefit, if any, to trimodality therapy consisting of surgery, RT, and ADT in high risk patients.

**Materials/Methods:** The National Cancer Database was queried for men with adenocarcinoma of the prostate, treated from the years of 2004 to 2010, with one high risk feature (PSA>20, ≥T3a, or Gleason score of 8-10). Patients were included if they received dose escalated RT (≥75.6 Gy) with ADT, or trimodality therapy consisting of surgery, RT, and ADT. Propensity scores were determined for patients receiving RT and ADT, and patients receiving surgery, RT and ADT. Patient characteristics were compared using t-tests, Wilcoxon Rank-Sum test, and Chi-square tests. Propensity score matching was used to balance between baseline characteristics. Overall survival (OS) was measured beginning at a landmark time of 10 months from diagnosis. OS was assessed with multivariable pro- portional hazards regression, propensity weighted for average treatment effect for the treated.

**Results:** A total of 25,035 patients met inclusion criteria for this analysis. A total of 24,062 men were treated with RT and ADT alone, and 973 men were treated with surgery, RT, and ADT. The mean age was 69.8 years in the whole cohort. Patients who received trimodality therapy, including RT, ADT, and surgical resection, were more likely to be younger (mean age of 61.5 years in the ADT, RT and Surgery groups versus 70.2 years in ADT and RT alone cohort, P <0.001). On propensity weighted multivariate analysis non-white race, increasing age, higher Charlson-Deyo comorbidity index, and increasing PSA were all associated with worse overall survival. As compared with a reference group of dose escalated RT and ADT, the patients treated with surgery, RT and ADT had no statistically significant improvement in OS, HR 0.866 (95% CI, 0.743 - 1.009, P = 0.066).

**Conclusion:** No statistically significant OS benefit was seen for the use of trimodality therapy including surgery, RT and ADT when compared with dose escalated RT and ADT alone in men with high risk prostate cancer. It remains unknown if more narrowly defined subsets of high risk patients selectively benefit from trimodality therapy. Given the added cost and morbidity of surgery, men who are likely to require RT and ADT after surgery may be best suited by treatment with dose escalated RT and ADT alone.