

# The Relationship between Radiation Therapy and Urinary Incontinence in Prostate Cancer Patients

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**Introduction.** Previous studies have examined the urinary side effects of brachytherapy and external beam radiation therapy for prostate cancer. However, there's limited research on urinary outcomes following proton therapy radiation. This study explored differences in urinary incontinence rates among various prostate cancer radiation treatments.

**Methods.** In this single-institution retrospective cohort study 234 patient charts were reviewed, and 188 patients met the inclusion criteria: 97 received intensity-modulated radiation therapy (IMRT), 31 received IMRT with brachytherapy (IMRT+), 47 received stereotactic body radiation therapy (SBRT), and 13 received proton therapy. Patient data were collected from EPIC medical records, and urinary side effects were assessed using the International Prostate Symptoms Score (IPSS). IPSS scores range from 0-35 with a higher score representing more severe urinary symptoms. Descriptive statistics, including mean, standard deviation, median, and the Kruskal-Wallis H test, were used for analysis.

**Results.** Significant differences were observed among treatment groups: rectal spacers were placed in 86% of SBRT patients compared to 34% of IMRT patients, and 97% of IMRT+ patients received adjunctive hormonal therapy compared to 37% of SBRT patients. IPSS scores differed significantly between groups, with IMRT+ patients having the highest median score (10) and proton therapy patients the lowest (5;  $p = 0.025$ ).

**Conclusions.** These findings suggest that proton therapy is associated with the lowest urinary incontinence rates, though the small sample size limits the reliability of this conclusion. IMRT+ patients exhibited the highest urinary incontinence rates, possibly due to hormonal therapy. Future research should further explore the role of hormonal therapy in exacerbating urinary incontinence.