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Prostate

Mechanisms, mitigation, and management of urinary toxicity from prostate radiotherapy

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Review

Urinary toxicity is common following pelvic radiotherapy and can have a substantial negative effect on survivorship. Due to its prevalence and the increasing number of related clinical trials, localised prostate cancer radiotherapy is a useful illustrative tool to explore urinary toxicity. A good understanding of the interplay between anatomy, radiation-sensitive cell populations, and treatment sequencing is necessary for optimal outcomes. Emerging evidence suggests that the prostatic urethra is a radiation-sensitive structure, not only for stricture development, but also chronic irritative symptoms. Tools now exist not only to identify the urethra, but also to direct radiation dose away from the urethra, with early data suggesting that this reduces moderate-to-severe late urinary toxicity. Coupled with new evidence supporting dominant nodule microboosting and ultrahypofractionation as emerging standards of care, urethral sparing radiotherapy is a powerful tool against radiation induced urinary toxicity while also maximising disease control.