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Evolution of Treatments of Prostate Cancer

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The management of prostate cancer has evolved significantly due to advances in imaging, molecular biology, and therapy. Historically, treatment options were limited to radical prostatectomy and conventional radiotherapy. Today, radiotherapy employs precise image-guided and intensity-modulated techniques, such as IMRT and VMAT, which deliver higher tumor doses with reduced toxicity. Innovations like IGRT and SBRT have improved targeting accuracy, enabling hypofractionated regimens that achieve excellent tumor control. Emerging approaches, including MRI-guided radiotherapy and proton therapy, offer even greater precision.

Focal therapies—such as HIFU, cryotherapy, and irreversible electroporation—target only the cancerous areas of the prostate, aiming to balance oncologic control with preservation of quality of life. Precision medicine is further transforming care through genomic profiling and molecular imaging (e.g., PSMA-PET), enhancing risk stratification and personalizing treatment. Novel systemic therapies, including PARP inhibitors, androgen receptor-targeted agents, and radioligand therapies, provide new options for patients with advanced disease. Overall, the integration of advanced radiotherapy techniques, focal therapies, and precision medicine is reshaping prostate cancer management, improving outcomes and quality of life.

