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# Genetic counseling considerations for men with prostate cancer

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*Genetic counseling for men with prostate cancer has unique considerations. While the main components of the genetic counseling session are similar to other indications, specific attention to penetrance differences among hereditary cancer genes for male versus female-*

*related cancer risks and future cancer surveillance among prostate cancer patients should be included. Limitations in discerning the contribution to prostate cancer and risks to relatives dependent on specific gene mutations, or absence of identifiable genetic cause, must be reviewed.*

**Key Words:** genetic counseling, genetic testing, prostate cancer

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## Introduction

Improved knowledge of single-gene hereditary causes for prostate cancer has made genetic counseling (GC) and genetic testing (GT) increasingly prevalent. The major components of a GC session include contracting, collecting personal and family cancer histories, describing hereditary cancer syndromes, conveying genetic risk assessment (GRA), reviewing screening and prevention strategies, and discussing GT options, all to promote informed decision making.<sup>1</sup> Expanding access to GC/GT services requires attention to the necessary components, particularly when developing new GC service delivery models. Recently, a survey of men pursuing multigene testing for inherited prostate cancer through alternative delivery models indicated men receiving GC via pre-test video and post-test phone disclosures were more likely to misunderstand results.<sup>2</sup> Therefore, reviewing considerations in hereditary prostate cancer GC may guide efficacy of future models.

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## Contracting

Initial discussion with an individual presenting for GC involves a mutually agreed upon agenda and goals. In the era of precision medicine, a specific discussion may need to address the differences of somatic and germline GT. Many patients with advanced stage prostate cancer undergo tumor genomic profiling for targeted therapies and may have confusion between tumor specific analysis and germline assessment for hereditary cancer. Defining these forms of GT is beneficial to ensure understanding.

## Collecting personal and family cancer histories

Advanced stage prostate cancer is an indication for GT. Verifying the individual's diagnosis, Gleason Score, cancer stage, and treatment plans guides the appointment to the most relevant information for the patient, including likelihood of a positive result, future screening recommendations, and impact on care. Studies show accuracy of cancer histories in first degree relatives is relatively high but significantly decreases with each further degree of relation.<sup>3</sup> Limitations in family history knowledge, including

confusion between primary site and metastases, female gynecologic cancers, and benign neoplasms versus invasive cancer, may lead to GRA inaccuracies. Relevance in a prostate cancer population should be noted given the proband may be older at the time of assessment due to the later average age of prostate cancer diagnosis and lack knowledge of health histories for extended relatives.

### Hereditary cancer risk assessment

Prostate cancer is highly heritable with many men having positive family history.<sup>4</sup> The GRA is complicated by the limitations in discerning families with germline variants and those with a combination of polygenic and environmental factors. Explaining differences in these underlying causes of prostate cancer to individuals with a familial prostate cancer pattern is important. While multigene testing for rare hereditary prostate cancer genes explains some family histories, a negative genetic test result may not address the elevated risks of prostate cancer for male relatives.

### Cancer syndrome information

Reviewing hereditary breast and ovarian cancer (HBOC) is critical when testing individuals with prostate cancer. Men focused on potential cancer risks for themselves and close male relatives should also be aware of higher breast and ovarian cancer rates among women with HBOC. Conversely, explaining limited evidence of prostate cancer risk associated with moderately penetrant genes, *CHEK2* and *ATM*, helps convey the impact of test results.<sup>5</sup> If multigene panel testing is considered, an explanation of hereditary cancer syndrome diagnoses outside the phenotype present in the personal and family history is warranted.

### Early detection and prevention strategies

Identifying families with hereditary cancer syndromes aims to improve detection of future cancers, both in the individual and family members. Special consideration of disease stage should be given when discussing future cancer risks for early stage patients versus potential interventions and treatment options for those with metastatic prostate cancer. Pre-test GC session should include discussion of predictive familial testing if a germline mutation is identified. Dissemination of this information may occur by direct conversation by the proband with relatives, family letters, social media, or research studies focusing on family outreach efforts.

### Genetic testing options

Multigene testing offers analysis of genes associated with prostate cancer but may also examine cancer syndromes beyond that of hereditary prostate cancer. Initial GC evaluation must explain the potential range of outcomes. Additionally, not all insurance providers cover GT. Consideration of an individual's insurance provider, potential out of pocket costs, research study programs covering GT cost is necessary for test selection. While uptake of GT is reportedly high in this population, an opportunity to decline GT is a critical point of informed consent.<sup>6</sup> Not all individuals will opt to pursue GT for various reasons.

### Conclusion

GC for men with prostate cancer has unique considerations. The older age of the male prostate cancer population will alter particular stage of life concerns and potential impact a positive result will have on both the individual and their family members, such as adult-aged children, who may have independent thoughts on GT. Given most men assessed for hereditary prostate cancer are advanced stage, special consideration should be given to potential therapeutic options and impact on family members. Swiftly evolving guidelines of hereditary prostate cancer reinforces the need to optimize GC and recognize the unique elements in this population.

### Disclosures

Ashley H. Woodson has no disclosures.

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