# Developing an Informatics-Based Algorithm to Capture Patients Qualifying for Germline Testing in Advanced Prostate Cancer

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## INTRODUCTION

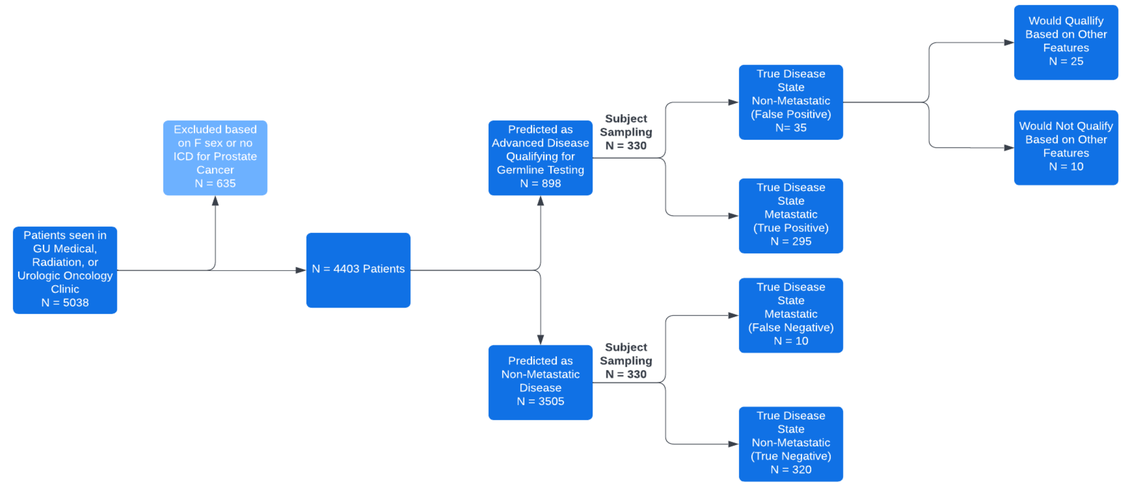
- Great progress has been made in understanding the genetics of metastatic prostate cancer (mPC) and has translated into the development of new precision therapies. Studies in prostate cancer have identified that 12% of patients with mPC have a germline (inherited) pathogenic alteration [1].
- The identification of pathogenic/likely pathogenic variants on germline testing has important treatment implications for patients and potential testing, screening, and prevention implications for their family.
- Thus, germline testing is important to offer to all men that qualify, and is supported in NCCN prostate cancer guidelines for all patients with mPC and also some men with localized disease and high risk features [2].
- Yet, awareness of genetic counseling and testing guidelines, provider referrals, and germline testing rates are low nationally in men with mPC.
- Systematic approaches to offering germline testing can be beneficial for increasing rates of germline testing, however ideally automated processes in the Electronic Medical Record (EMR) could reduce the need for personnel to drive the process.
- For prostate cancer, algorithms for mPC can not simply be based on ICD codes alone, and “Staging” features in EMRs are often inaccurate / underutilized [3].
- Here we explore an algorithm based on ICD codes for secondary neoplasm (ICD9: 198; ICD 10: 79.9), staging, and/or prostate cancer therapies to predict patients with mPC.

## METHOD

- Retrospective, single-center study of an informatics-based algorithm to explore its potential in predicting patients with mPC who qualify for germline testing.
- Inclusion: Males with ICD code for prostate cancer (ICD9: 185; ICD10: C61) in the past 2 years, seen by a GU Medical, Urologic, or Radiation Oncologist at Vanderbilt University Medical Center (VUMC).
- Manual chart review was performed to identify true disease state (TDS) at the time of the retrospective chart review, per electronic medical record notes.
- TDS and Predicted Disease State were compared to assess the positive and negative predictive value of the algorithm.

## FIGURES

Figure 1. Flow Diagram




## DISCUSSION

- This study confirms that the staging system in EMRs are often inaccurate / lacking and may not reflect TDS: 233/4403 men (0.05%) had stage logged.
- This algorithm has strong PPV (0.89) and NPV (0.96) for patients with advanced prostate cancer.
- While this study shows that over 800 men qualify for germline testing, less than half have likely received germline testing, by review of the VUMC germline PCa database, indicating a large gap in care.
- Data from this retrospective study will drive an alert-based Clinical Decision Support Electronic Medical Record Best Practice Advisory pilot study.

## References

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3. Klassen et al. Missing Stage and Grade in Maryland Prostate Cancer Surveillance Data. 1992-1997. Am J Prev Med. 2006; 30:S77-87. doi: 10.1016/j.ampere.2005.09.010

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