

# A 17-Gene Genomic Assay as a Predictor of Outcomes in African Americans with Prostate Cancer

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## INTRODUCTION AND OBJECTIVES

- Tissue-based molecular diagnostic assays have been introduced recently for the purpose of improving risk stratification (identifying high and low genomic risk) for men with newly diagnosed prostate cancer<sup>1</sup>.
- For adoption into clinical practice, there must be a body of evidence to show the test performs well across a full spectrum of patients with the disease from different races/ethnic groups. This is particularly relevant for African American men, given their historically higher incidence of, and higher death rate from, prostate cancer<sup>2</sup>.
- Prior studies have shown differences in molecular profiles observed in African American and Caucasian patients, which include differences in gene expression patterns, for example<sup>3-5</sup>. However, it is unclear if these changes result in differences in clinical outcome. Previous reports on potential sources of disparities in healthcare have been published, however, recent studies have demonstrated that disparities in outcomes are eliminated when men are treated in healthcare systems with more equal access<sup>6-9</sup>.
- Therefore, we sought to determine if the Oncotype DX Genomic Prostate Score<sup>®</sup> (GPS<sup>™</sup>) assay performed similarly in the two racial groups.

## METHODS

- Retrospective comparison of GPS results (scale 0-100) and its four gene group scores in biopsy specimens from 201 African American and 1,144 Caucasian American men with clinically localized prostate cancer in six independent cohorts.
- Formalin-fixed paraffin-embedded diagnostic needle biopsy specimens were tested with GPS assay.
- Racial category was self-reported by the patients. Subgroups were not evaluated.
- Adverse pathology (AP) was defined as high-grade (primary Gleason pattern 4 or any pattern 5) and/or non-organ-confined disease (pT3) on RP tissues.
- Biochemical recurrence (BCR) was defined as two successive PSA levels >0.2 ng/mL or initiation of adjuvant or salvage therapy for detectable PSA after radical prostatectomy.
- Four cohorts had outcome data, including three with AP (CC, CPDR, UCSF) and two with BCR (CPDR, KPNC). CPDR had both AP and BCR outcome data.
- Logistic Regression was used for AP and Cox Proportional Hazards Regression was used for BCR. Hazard ratios and odds ratios for GPS results were calculated per 20 units, which represented the differences between the average GPS value of the highest and lowest quartiles of patients.
- Studies were approved by all institutional review boards at all sites.

Figure 1. Study Design

### GPS Test Results

AP Outcomes	BCR Outcomes	No Outcomes
Cleveland Clinic (CC) University of California, San Francisco (UCSF) Center for Prostate Cancer Disease Research (CPDR)*	Kaiser Permanente Northern California (KPNC) Center for Prostate Cancer Disease Research (CPDR)*	Veterans Healthcare Administration (VA) North Carolina-Louisiana Prostate Cancer Project (PCaP)

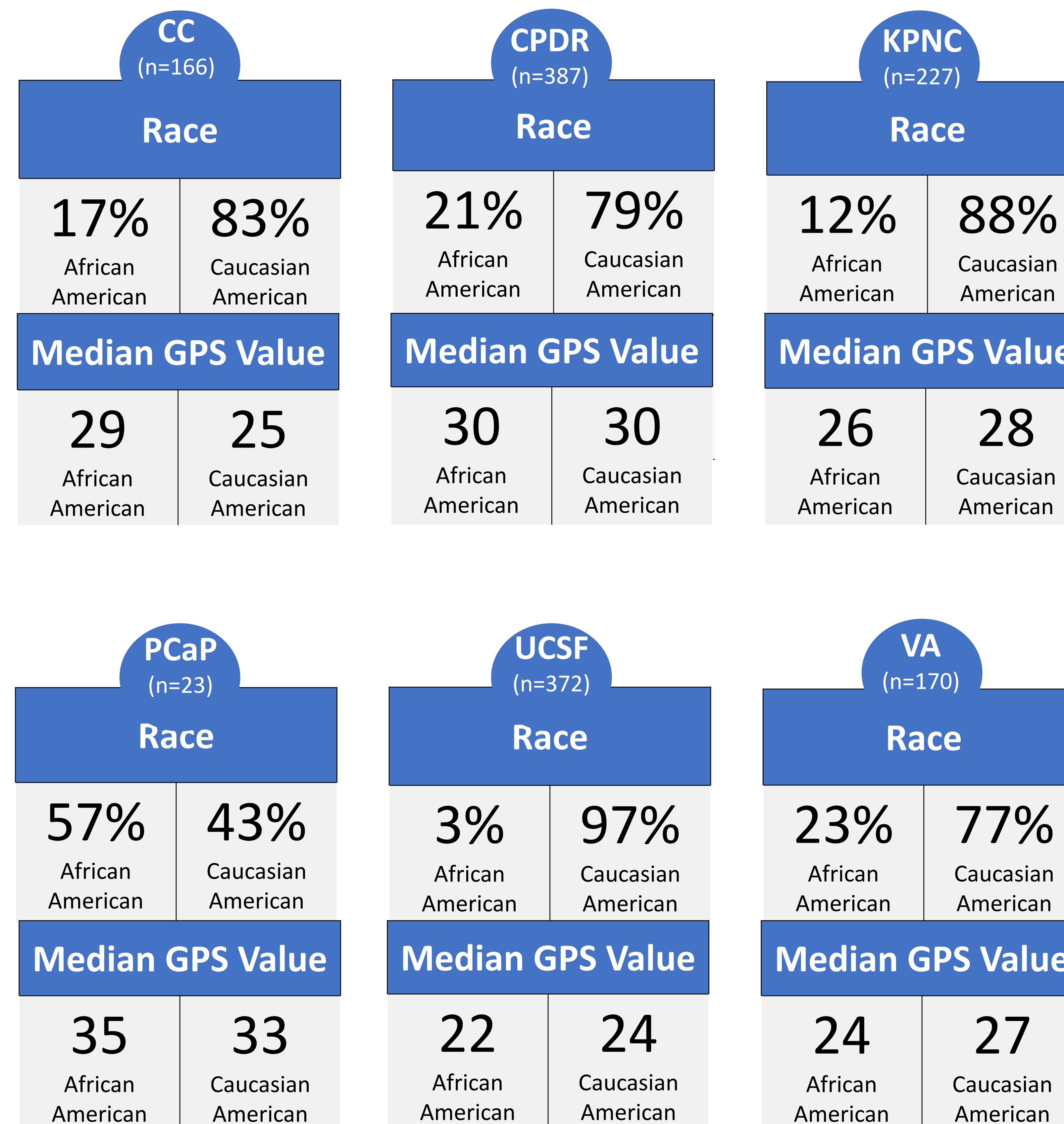
## Conclusions/Take Home Message

### Conclusions:

- The composite analysis of 6 independent cohorts of men with newly diagnosed prostate cancer treated with radical prostatectomy, which included over 200 African American men, showed that tumor biology as measured by the 17-gene Oncotype DX Genomic Prostate Score assay was similar in African American and Caucasian American men.
- The assay was similarly predictive of outcomes (adverse pathology and biochemical recurrence) in both groups.

**Plain Language Summary:** In this study, we compared the performance of a commercially available molecular diagnostic test in African American and Caucasian American men with prostate cancer. We found: 1) the range of GPS test scores were similar and 2) the test was predictive of clinical outcomes in both racial groups. Thus, the test is likely to be appropriate for use in African American or Caucasian American men.

Figure 2. Demographic Data of Study Population and GPS Median Scores



## RESULTS

Figure 3. Distribution of GPS Gene Group Scores by Race

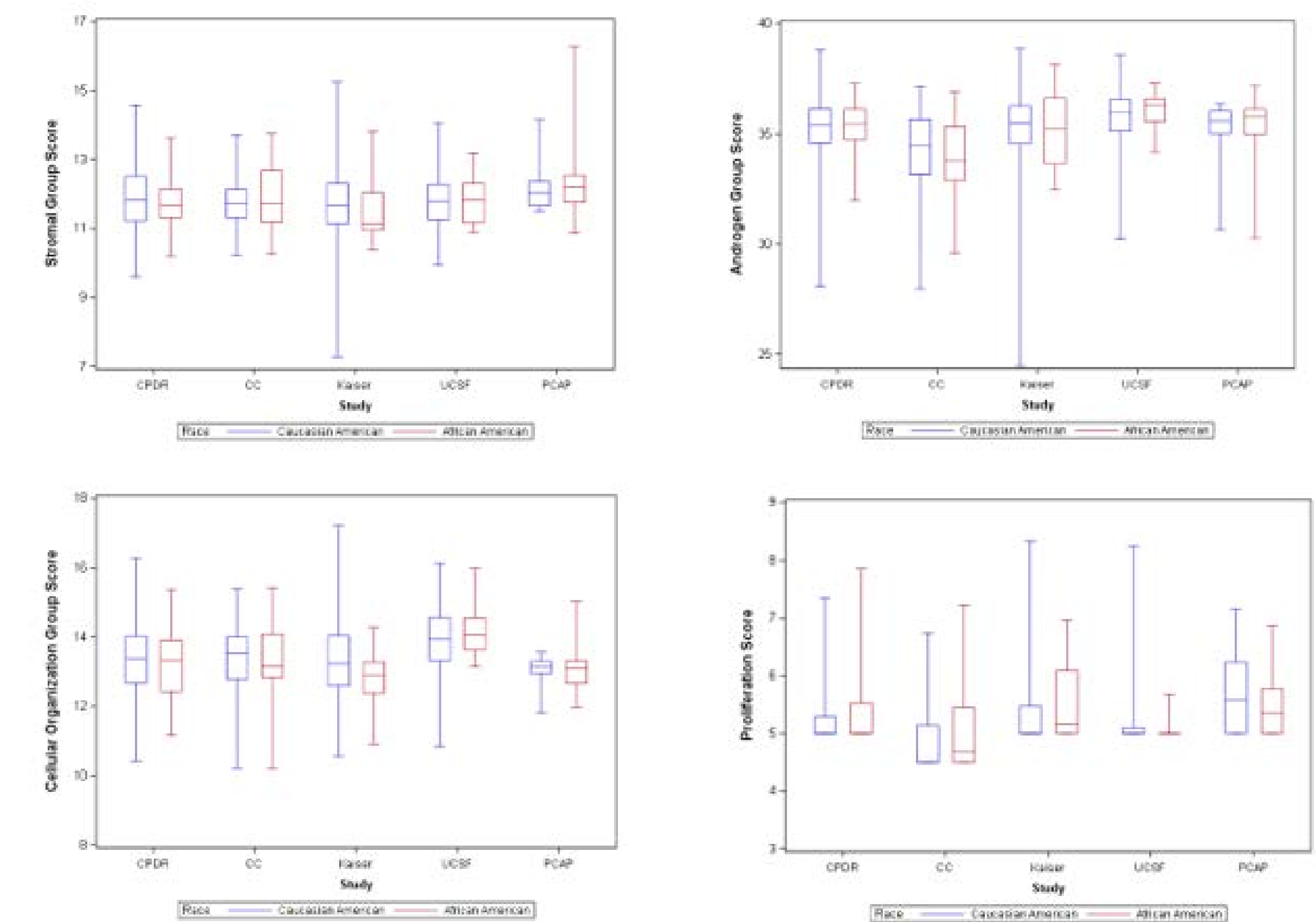
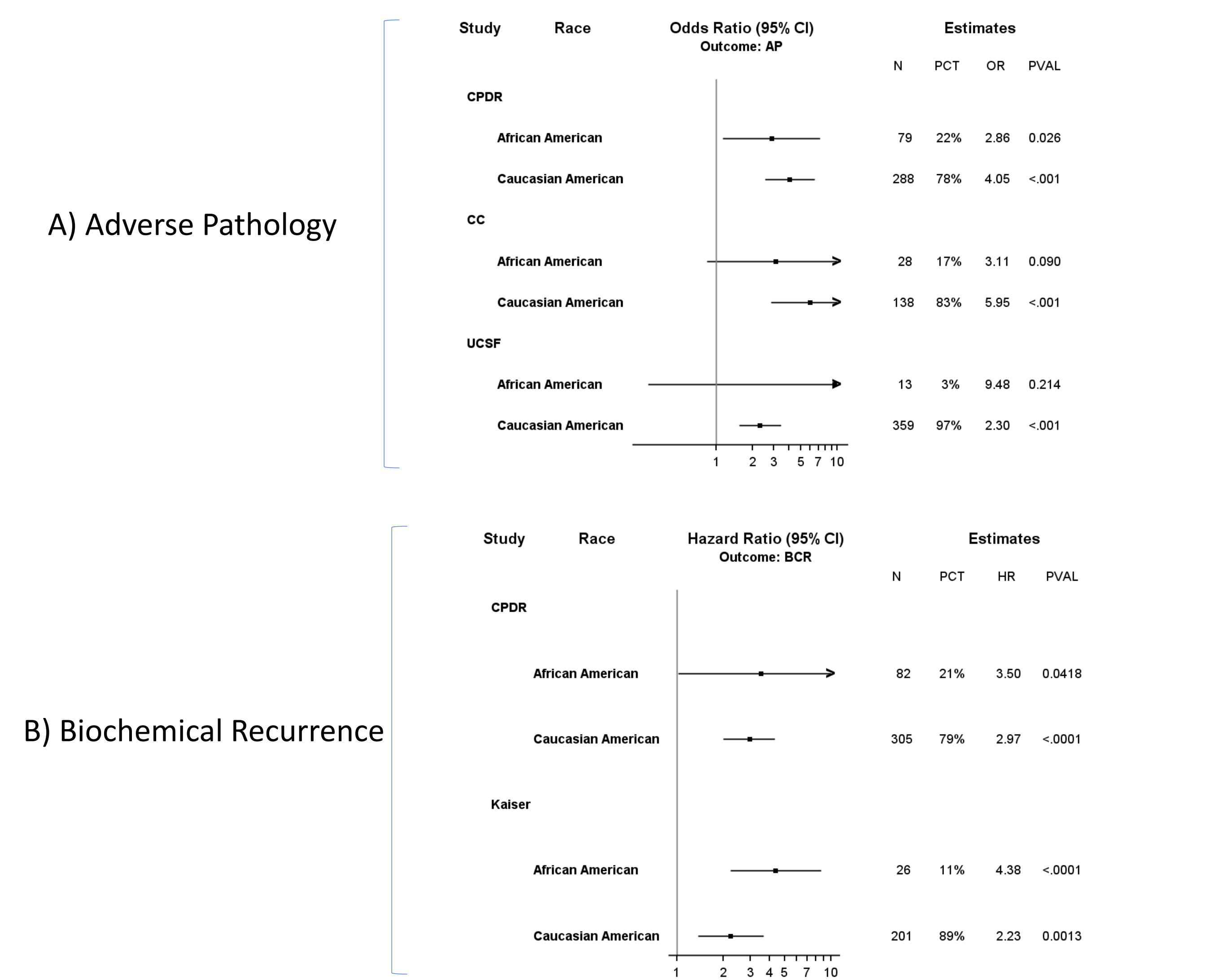


Figure 4. Univariable Analysis for GPS Assay in Predicting A) AP and B) BCR Clinical Outcomes in Racial Groups



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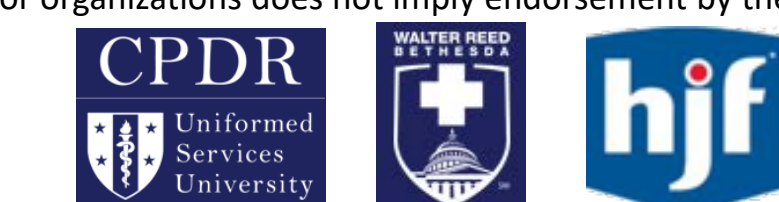
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