

PCA3 – Prostate Cancer Biomarker

Indications for Ordering

- Aid in decision for repeat biopsy for men ≥50 years who have had one or more negative prostate biopsies and for whom a repeat biopsy would be recommended by a urologist based on current standard of care
- Collect after digital rectal exam (DRE)

Test Description

Gen-Probe PROGENSA PCA3 Assay, Urine (FDA approved)

- Target capture, qualitative transcription-mediated amplification, and chemiluminescent hybridization of 2 RNA targets
 - Prostate cancer antigen 3 gene (PCA3)
 - PSA
- Quantification determined by comparison to standard curve
- PCA3 ratio calculation
 - $\text{PCA3 ratio} = \frac{[\text{PCA3 RNA}]}{[\text{PSA RNA}] \times 1000}$
- Specimen – first-catch urine following DRE

Tests to Consider

Primary test

[PCA3 – Prostate Cancer Biomarker by Transcription-Mediated Amplification 2010102](#)

- Do not use for initial prostate cancer screening

Related tests

[Prostate Specific Antigen, Total 0070121](#)

- Preferred initial screening test for prostate cancer in conjunction with DRE
- Use to monitor patients for recurrence of cancer

[Prostate Specific Antigen, Free Percentage \(Includes Free PSA and Total PSA\) 0080206](#)

- Percentage of free PSA to total PSA
- May provide additional prostate cancer risk information for patients with mildly elevated total PSA and a negative DRE
- Alternative to PCA3 testing in indeterminate PSA cases (4-10 ng/mL)
- Do not use for initial prostate cancer screening

PSA velocity (PSAV)

- Alternative to free PSA

Disease Overview

Physiology

PCA3 is noncoding RNA

- Overexpressed in >95% of prostate cancer tissue
- Median 66-fold increase in regulation compared with adjacent non-neoplastic tissue

Diagnostic Issues

- Prostate cancer is a common cancer in men
- Most common screening test is PSA
- Indeterminate PSA values (4-10 ng/mL) pose a diagnostic dilemma for the clinician
 - Often reflects benign disease such as BPH, prostatitis
 - May represent malignant disease
 - Prostate biopsy is associated with complications and not indicated in all indeterminate PSA tests, but difficult to choose individuals for biopsy
 - PCA3 may guide prostate biopsy in these individuals

Test Interpretation

Clinical sensitivity/specificity – 77.5% and 57.1% respectively (relative to prostate biopsy outcome), based on a PCA3 ratio cutoff value of 25

Results

- PCA3 ratio 0-17, negative – associated with decreased likelihood of a positive biopsy for prostate cancer
- PCA3 ratio 18-24, negative – ratios in the range of 18-24 should be interpreted with caution
 - Due to normal test variability, specimens with ratios near the cutoff may yield a different overall interpretation upon repeat testing
- PCA3 ratio 25-31, positive – ratios in the range of 25-31 should be interpreted with caution
 - Due to normal test variability, specimens with ratios near the cutoff may yield a different overall interpretation upon repeat testing
- PCA3 ratio >31, positive – associated with increased probability of a positive biopsy for prostate cancer

Limitations

- Sufficient number of prostate cells must be present in urine for analysis
- PCA3 testing should not be used for men with atypical small acinar proliferation (ASAP) on their most recent biopsy