

Kinnaird A, et al. A prostate cancer risk calculator (PCRC-MRI): Use of clinical and magnetic resonance imaging data to predict biopsy outcome in North American men

APPENDIX

Supplementary Fig. 1. Example of online, interactive PCRC-MRI tool for a 64-year-old Caucasian man with PSA 6, normal rectal exam, no previously negative biopsy and a PI-RADS 3 lesion in a 45 cc prostate. **(A)** Variable input. **(B)** Calculated risk of clinically significant prostate cancer. MRI: magnetic resonance imaging; PI-RADS: Prostate Imaging Reporting & Data System; PSA: prostate-specific antigen.

A

What is your Age?

What is your ethnicity?

☐ African American

☐ Asian

☒ Caucasian

☐ Other

☐ Unknown

What is the PSA?

Is the rectal exam abnormal?

Have you previously had a prostate biopsy that did not show any cancer?

What is the prostate volume?

MRI Score

B

Your risk of clinically significant prostate cancer is:

21%

Clinically significant prostate cancer defined as Gleason \geq 3+4.

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Supplementary Table 1. Baseline characteristics of discovery (n=1885) and validation (n=469) cohorts

	Discovery cohort	Validation cohort	p-value
Age, mean (SD)	65.1 (7.8)	65.0 (7.6)	0.97
Ethnicity (%)			
Caucasian	1204 (64)	287 (61)	0.74
African American	112 (6)	29 (6)	
Asian	135 (7)	36 (8)	
Other	88 (5)	28 (6)	
Unknown	346 (18)	89 (19)	
Abnormal DRE (%)			
Yes	173 (9)	58 (12)	0.11
No	1332 (71)	323 (69)	
Unknown	380 (20)	88 (19)	
Previous negative biopsy (%)			
Yes	734 (39)	171 (36)	0.32
No	1151 (61)	298 (64)	
PSA (ng/mL) ^a	6.5 (4.7, 9.5)	6.6 (5.0, 9.5)	0.23 ^b
Prostate volume (cc) ^a	48.9 (36, 68.2)	47 (34, 65)	0.13 ^b
PSA density (ng/mL/cc)			
<0.15	1088 (58)	256 (55)	0.22
≥0.15	797 (42)	213 (45)	
MRI score			
Negative (≤ 2)	372 (20)	80 (17)	0.27
3	546 (29)	128 (27)	
4	580 (31)	150 (32)	
5	384 (20)	111 (24)	

^aMedian (IQR), ^bWilcoxon rank-sum test. Abbreviations: IQR, interquartile range; SD, standard deviation; DRE, digital rectal exam; MRI, magnetic resonance imaging; PSA, prostate-specific antigen

Supplementary Table 2. Unadjusted odds ratio of clinically significant prostate cancer in the discovery cohort (n=1885)

	OR (95% CI)
Age at biopsy	1.05 (1.04, 1.06)
Ethnicity (African American vs Caucasian)	1.34 (0.91, 1.98)
Ethnicity (Asian vs Caucasian)	0.54 (0.36, 0.81)
Ethnicity (Other vs Caucasian)	1.02 (0.66, 1.59)
Ethnicity (Unknown vs Caucasian)	0.96 (0.75, 1.23)
DRE Abnormality (yes vs no/unknown)	3.70 (2.66, 5.15)
Previous Negative Biopsy (yes vs no)	0.46 (0.38, 0.56)
PSA	1.05 (1.04, 1.07)
Prostate Volume	0.98 (0.98, 0.98)
PSA Density (≥0.15 vs <0.15)	4.03 (3.31, 4.91)
MRI score (3 vs Negative)	1.35 (0.96, 1.90)
MRI score (4 vs Negative)	3.73 (2.71, 5.13)
MRI score (5 vs Negative)	22.00 (15.13, 31.99)

Abbreviations: OR, odds ratio; CI, confidence interval; DRE, digital rectal exam; MRI, magnetic resonance imaging; PSA, prostate-specific antigen

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Supplementary Table 3. Parameters of Clinical and Clinical+MRI models at various thresholds for biopsy (n=2354)

	10%		15%		20%	
	Clinical	Clinical+MRI	Clinical	Clinical+MRI	Clinical	Clinical+MRI
Sensitivity	100%	98%	99%	94%	95%	90%
Specificity	2%	28%	7%	42%	17%	54%
False positive	98%	72%	93%	58%	83%	46%
PPV	40%	47%	41%	52%	43%	57%
NPV	96%	94%	87%	91%	83%	89%

Abbreviations: PPV, positive predictive value; NPV, negative predictive value; MRI, magnetic resonance imaging