Patient NCCN Risk Classification Based on Combined Clinical Cell Cycle Risk (CCR) Score

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Disclosures

Introduction

- Improved prognostic tools for newly diagnosed prostate cancer are needed to more appropriately match treatment to a patient's risk of progression.

- The combines clinical cell-cycle risk (CCR) score incorporates a prognostic molecular risk score based on the expression of 31 cell-cycle progression (CCP) genes with clinicopathologic risk from CAPRA.
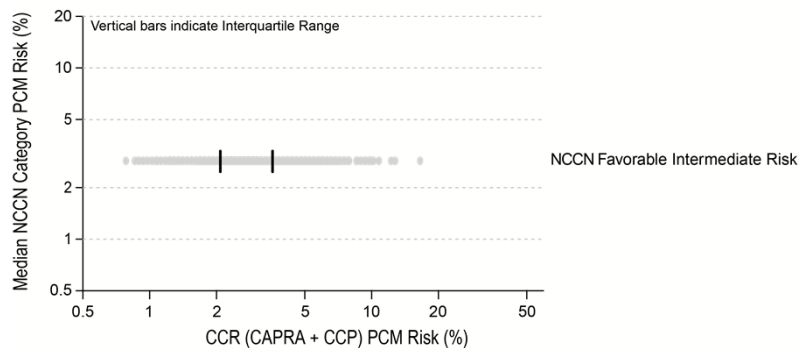
Objective

- Here, we evaluate how the prognostic information from CCR can reclassify a patient's risk compared to their initial assignment to an NCCN risk category based on clinicopathologic features alone.

Methods

- Formalin-fixed paraffin embedded biopsy samples were analyzed from 16,442 patients submitted for commercial testing.
- The CCP score is an unweighted average of 31 CCP genes normalized by the average expression of 15 housekeeping genes.
- The CCR score is calculated as a linear combination of CAPRA and CCP score (0.39 x CAPRA + 0.57 x CCP).
- Prostate cancer-specific mortality (PCM) risk and NCCN risk category were assigned

Method of Reclassification

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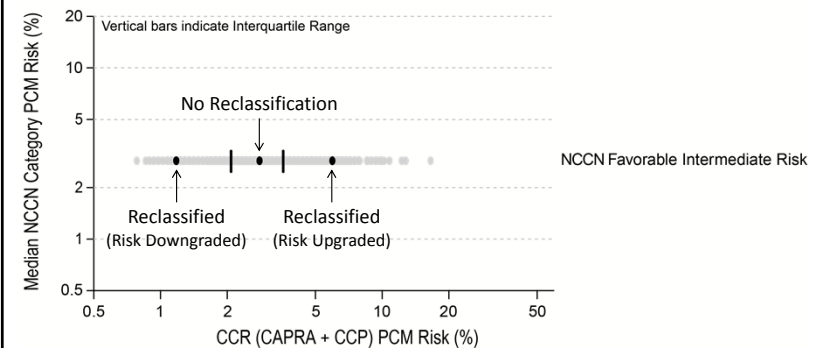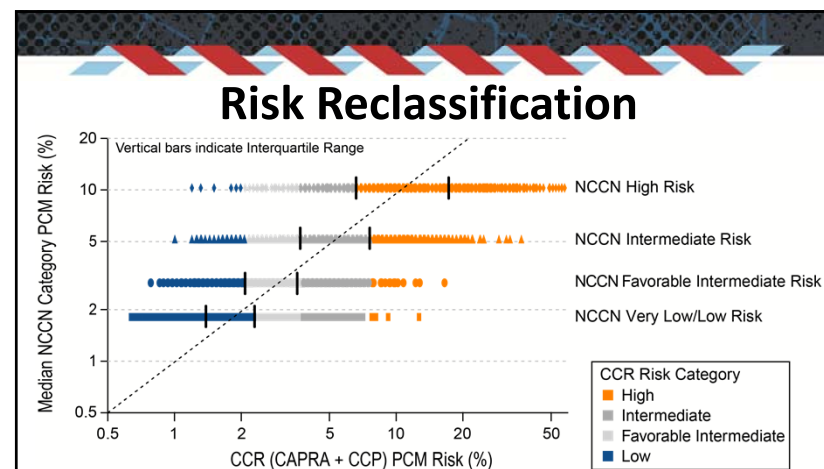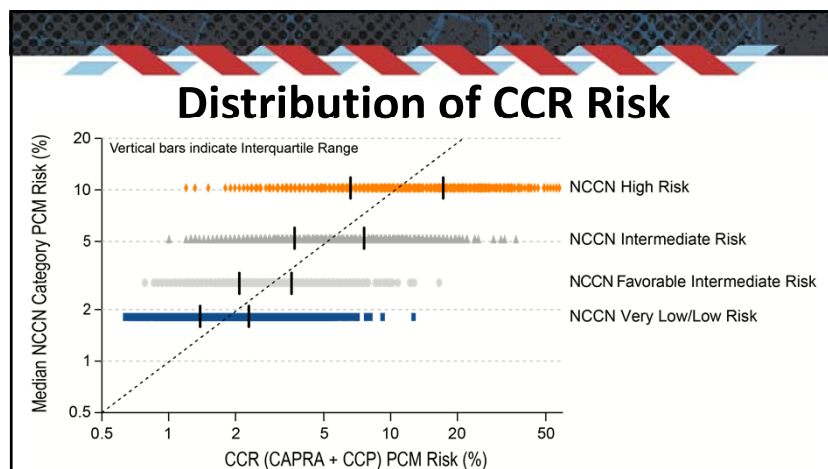
Distribution of CCR Risk

Risk Reclassification

Risk Reclassification

NCCN Risk Category	CCR Risk Category			
	LOW	FAVORABLE INT.	INT.	HIGH
Very Low/Low (n=8695)	6544 (75%)	1820 (21%)	325 (4%)	6 (<1%)
Favorable Int. (n=3437)	808 (24%)	1833 (53%)	772 (22%)	24 (1%)
Intermediate (n=3086)	106 (3%)	647 (21%)	1569 (51%)	764 (25%)
High (n=1224)	6 (<1%)	46 (4%)	251 (21%)	921 (75%)

- 34.0% of all men were reclassified to a different risk category based on their CCR score (11.4% downgraded and 22.6% upgraded).

Reclassification in Men with Long-Term Outcomes

- Patients diagnosed with localized prostate cancer treated at the Ochsner Clinic (New Orleans , LA) from 2006-2011 (N = 767).
    - **Evaluating the Prognostic Utility of the CCP Score for Predicting Prostate Cancer Aggressiveness in African American Men** (Moderated Poster MP28 – Presented Saturday) Daniel Canter, Stephen Bardot, Julia Reid, Maria Latsis, Margaret Variano, Shams Halat, Daniel Canter, Zaina Sangale, Michael Brawer, Steven Stone

- Progression to metastatic disease was confirmed by imaging (39 events, 5.1%). Outcome data was censored at 10-years.

- Risk reclassification based on interquartile ranges from the commercial cohort.

Risk Reclassification

NCCN Risk Category	CCR Risk Category			
	LOW	FAVORABLE INT.	INT.	HIGH
Very Low/Low (n=322)	89 (27.6%)	138 (42.9%)	85 (26.4%)	10 (3.1%)
Favorable Int. (n=29)	1 (3.4%)	10 (34.5%)	17 (58.6%)	1 (3.4%)
Intermediate (n=239)	3 (1.3%)	36 (15.1%)	96 (40.2%)	104 (43.5%)
High (n=177)	0 (0%)	1 (0.6%)	18 (10.2%)	158 (89.3%)

- 54.0% of all men were reclassified to a different risk category based on their CCR score (7.7% downgraded and 46.3% upgraded).

Metastases by Risk Group

NCCN Risk Category	CCR Risk Category			
	LOW	FAVORABLE INT.	INT.	HIGH
Very Low/Low (n=2/322)	0/89	1/138 (0.7%)	1/85 (1.2%)	0/10
Favorable Int. (n=0/29)	0/1	0/10	0/17	0/10
Intermediate (n=9/239)	0/3	0/36	2/96 (2.1%)	7/104 (6.7%)
High (n=28/177)	0/0	0/1	0/18	28/158 (17.7%)

- All metastases occurred in men who were upgraded to a higher risk group based on their CCR score (9/39, 23%) or who were not reclassified (30/39, 77%).

Conclusions

- The CCR score results in significantly improved risk stratification (personalized medicine) relative to NCCN risk categories among men with localized prostate cancer.

- Using molecular markers to reclassify men improved risk discrimination in men with long-term clinical outcomes relative to clinical criteria alone.