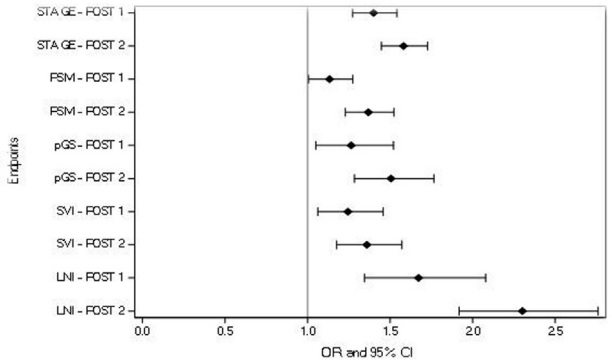
October 2008 through September 2016 to compare men presenting with = Gleason grade 8, seminal vesicle and lymph node invasion pre- and post- recommendation.

RESULTS: Compared to the four-year average pre- (Oct. 2008-Sept. 2012) versus post- (Oct. 2012-Sept. 2016) recommendation, there was a 22.6% reduction in surgical volume, an increase in median PSA (5.1 to 5.8 ng/mL, $p<0.001$) and mean age (60.8 to 62.0 years, $p<0.001$). Expectedly, the proportion of low-grade Gleason 3+3 cancers decreased (30.2% to 17.1%, $p<0.001$) while high-grade Gleason 8+ cancers increased (8.4% to 13.5%, $p<0.001$). In this Gleason 8+ group, we saw a 24% increase in absolute numbers. One year biochemical recurrence rose from 6.2% to 17.5% ($p<0.0001$). To discern whether the increase in high-risk disease was due to referral patterns, propensity score matching was performed. Forest plots of odds ratios adjusted for age and PSA showed a significant increase (and subsequent worsening) in pathologic stage, grade, and lymph node involvement in the propensity matched dataset of 15,758 patients ($p<0.001$).

CONCLUSIONS: All centers experienced a consistent decrease of low-grade disease and an absolute increase in intermediate and high-risk cancer. For any given age and PSA, propensity matching demonstrates that there is now more aggressive disease in the post-recommendation era. As cautioned, decreased PSA-screening could result in an epidemiological shift towards more advanced disease; these centers dispersed throughout the US have witnessed a tripling of BCR and quadrupling of nodal metastasis. The potential of an epidemiological shift towards high-risk disease raises concern for increased PCSM, secondary interventions, and associated side effects.

Figure 1: Odds ratios for Post-USPSTF recommendation era POST 1 period (Oct 2012-2014) and POST 2 period (2014- Sept 2016) relative to Pre-USPSTF era (Oct 2008-Sept 2012) associated with worse tumor characteristics in Age and PSA propensity matched dataset (n=15,758).



	Post-USPSTF Overall Oct. 2012 – Sept. 2016 (N= 7879 per group)		Post-USPSTF Oct. 2008 – Sept. 2012 (N=7879) Period 1: Oct. 2012 – Sept. 2014 (N= 3873 per group)		Period 2: Oct. 2014 – Sept. 2016 (N= 4350 per group)	
	OR	95%CI	OR	95%CI	OR	95%CI
p-Stage T3/T4	1.42	1.33-1.52	1.40	1.27-1.54	1.58	1.44-1.72
pGS ≥ 4+5	1.26	1.16-1.37	1.13	1.01-1.27	1.37	1.22-1.52
SM+	1.32	1.17-1.50	1.26	1.05-1.52	1.50	1.28-1.76
SVI	1.26	1.13-1.41	1.24	1.06-1.45	1.36	1.17-1.57
LNI	2.14	1.84-2.48	1.67	1.34-2.07	2.30	1.91-2.76

Source of Funding: None

MP82-09

THE CHUN NOMOGRAM SIGNIFICANTLY OUTPERFORMS THE PCPT, ERSPC, KAWAKAMI AND KARAKIEWICZ NOMOGRAMS IN THE PREDICTION OF PROSTATE CANCER: A SINGLE CENTER COHORT-STUDY

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INTRODUCTION AND OBJECTIVES: To analyze the performance of five different risk calculators for prostate cancer diagnosis: Prostate Cancer Prevention Trial Risk Calculator (PCPT-RC), European Randomized Study of Screening for Prostate Cancer Risk Calculator (ERSP-RC), Karakiewicz nomogram, Chun nomogram and Kawakami Nomogram

METHODS: From 2004 onwards, we consecutively enrolled, at a single institution in Italy, men undergoing 12 core trans-rectal ultrasound-guided prostate needle biopsy. Demographic, clinical and pathological data were collected. The risk of prostate cancer (PCa) was calculated according to the PCPT-RC, ERSPC-RC, Karakiewicz, Kawakami and Chun nomograms. Calibration and discrimination were assessed using calibration plots and ROC analysis. Additionally, decision curve analyses (DCA) were used to assess the net benefit associated with the adoption of each model.

RESULTS: Overall 1100 patients were evaluated. 438/1100 (39%) presented PCa and out of them 116/438 (26%) presented high grade PCa (defined as Gleason =7). All the models showed good discrimination capacities for PCa on ROC analysis (AUC: 0.59-0.72) however the Chun nomogram showed the best discrimination abilities. On calibration curves the ERSCP, the PCPT and the Chun nomogram underestimated the risk of PC while the Kawakami overestimated it. At DCA, the net benefit associated with the use of the models in the prediction of cancer was observed when the threshold probability was between 40 and 60%.

CONCLUSIONS: In a cohort of Italian men undergoing prostate biopsy, the performance accuracy of these calculators for the prediction prostate cancer is suboptimal. The Chun nomogram outperformed the others calculators for the prediction of prostate cancer diagnosis. According to our experience the use of these calculator in clinical practice should be encouraged

Source of Funding: none

MP82-10

DEVELOPMENT AND EXTERNAL VALIDATION OF MRI-BASED NOMOGRAM TO PREDICT THE PROBABILITY OF PROSTATE CANCER DIAGNOSIS WITH MRI-US FUSION BIOPSY

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INTRODUCTION AND OBJECTIVES: The wide diffusion of multiparametric magnetic resonance imaging (MRI) has dramatically modified the scenario of prostate cancer (PCa) diagnosis. The detection rate of MRI-ultrasound (US) fusion biopsy increased as well as the need for an extended prostate biopsy sampling with saturation biopsy decreased. The aim of this study was to develop, to calibrate and to externally validate a nomogram to predict the probability of detecting a prostate cancer

METHODS: Prospectively collected data from 3 european tertiary referral center series of 478 consecutive patients who underwent MRI-US fusion biopsy using the UroStation™ (Koelis, France) were used to build the nomogram. External validation was performed in 406

patients from a US tertiary referral center. The Mann−Whitney U test and the Chi-square tests were used to evaluate differences in continuous and categorical variables, respectively. A logistic regression model is created to identify predictors of PCa diagnosis with MRI-US fusion biopsy. Predictive accuracy was quantified using the concordance index (CI). Internal validation with 200 bootstrap resampling and calibration plots were generated to explore nomogram performance.

RESULTS: The development and validation cohorts were homogeneous for age (66.3 vs 66 yrs, p=0.57]), PSA levels (9.4 vs 8.8 ng/Ml, p=0.71] and PCa detection rates (57.4 vs 56.7%, p=0.81). Age, PSA serum levels, PIRADS score at MRI report, number of targeted and number of systematic cores taken were included in the model (Figure 1a). The nomogram showed high predictive accuracy (CI 0.82) and was well calibrated (Figure 1b). In the validation cohort the predictive accuracy was 0.77. Limitations include the need for a pre-biopsy mp-MRI and consequent fusion biopsy to reproduce findings.

CONCLUSIONS: This nomogram provides a high accuracy in predicting the probability of PCa diagnosis with MRI-US fusion biopsy. This is an easy to use clinical tool that physicians may use for patients counseling purposes.

FIG 1A

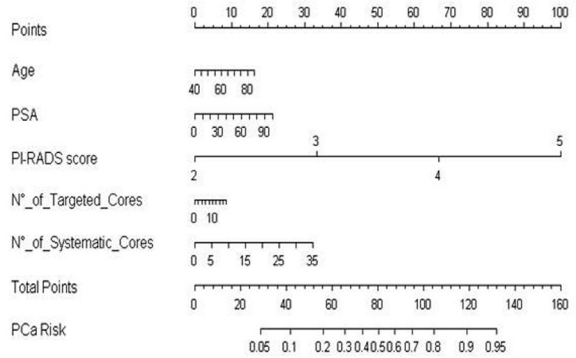
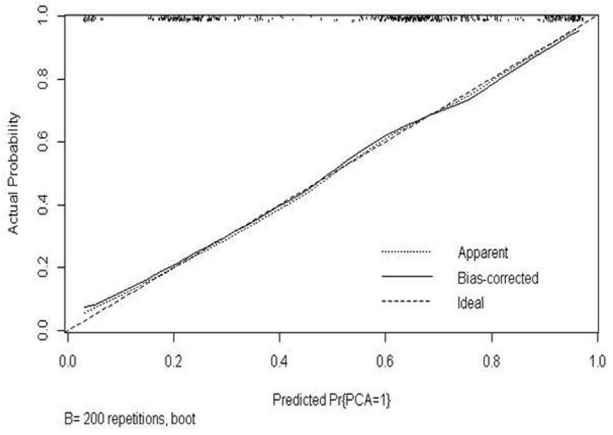


FIG 1B



Source of Funding: none

MP82-11

COMPARATIVE OUTCOMES AFTER 4 DIFFERENT PROSTATE BIOPSY TECHNIQUES: A FOCUS ON STANDARDIZED COMPLICATION REPORTING

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INTRODUCTION AND OBJECTIVES: Given the increased number of choices for performing a prostate biopsy, we recently reported an analysis of the cost implications, with the key findings (compared to reference transrectal ultrasound [TRUS] biopsy under local anesthesia): TRUS/IV sedation = 1.9x more expensive, transperineal (TP)/general anesthesia 2.5x, MRI-Fusion/IV sedation 2.5x, and In-Bore-MRI/IV sedation = 2.3x. In this study, we captured a representative sample of these cases to add the important layer of complication rates, as they add to the total cost.

METHODS: At a single tertiary care center, we retrospectively reviewed prostate biopsies from any of these modalities between 2014 and 2017. Downstream complication reporting was abstracted from hospital (combined inpatient, emergency center, clinic) and patient correspondence for the up to 90 days from procedure. Events were classified using the Clavien system.

RESULTS: Table 1 shows the results from 1,589 biopsies searched. Overall, TP had the highest rate of complications at 14.1% compared to <7 % for TRUS and MRI-Fusion (P <0.05). This was mostly driven by higher rates of urinary retention/catheterization. There was no statistical difference among TRUS, Fusion and In-Bore biopsies. In-Bore MRI had the lowest complication rate. Core counts were different at 24-32 for TP, 15-18 for MRI-Fusion, 12 for TRUS, and 2 for In-Bore. Urosepsis rates (with hospitalization) were 0% for TP, 0.6% for TRUS, 0.56% for MRI-fusion, and 0 for MRI In-Bore.

CONCLUSIONS: In addition to variant cost implications from differential use of anesthesia, number of specimens, and billing codes, complication incidence can affect overall value of a biopsy technique choice. These events can be translated in medicare allowable charges for comparison/inclusion to estimate the cost impact of complications managed in the hospital, emergency center, or clinic.

Table 1: Prostate Biopsy Complications according Clavien-Dindo Classification.

Complications , number (%)	TRUS	TP	Fusion	In-Bore	P value
None	617 (93.8)	152 (85.9)	670 (94.6)	43(93.5)	
Grade 1	9 (1.4)	4 (2.3)	7 (1)	3 (6.9)	
• Hematuria, dysuria, rectal/scrotal pain, rectal/haemorrhoidal bleeding					
Grade 2	16 (2.4)	5 (2.8)	9 (1.3)	0	
• UTI	12	2	7		
• Epididymoorchitis	2				
• Prostatitis			1		
• Bradicardia at biopsy session	1				
• Constipation (drug required)	1				
• Bladder spasm (drug required)		1			
• Voiding difficulties (drug required)					
• Massive liquid diarrhea			1		
Grade 3a	11 (1.7)	11 (6.2)	17 (2.4)	0	
• Retention and catheterization	11	11	17		<0.001
Grade 3b	1	0	0	0	
• Rectal bleeding, days after biopsy and admit to another hospital for sigmoidoscopy	1				
Grade 4a	1 (0.2)	0	1 (0.1)	0	
• Cardiac problem at biopsy session and MERIT team came to OR	1				
• Lyrngo-spasm requiring emergent intubation.			1		
Grade 4b	4 (0.6)	0	4 (0.6)	0	
• Urosepsis	4		4		
Total Biopsies	658	177	708	46	

TRUS, Transrectal Ultrasound Guided Prostate biopsy; **TP,** Transperineal Prostate biopsy; **Fusion,** MRI-TRUS fusion Prostate biopsy; **In-Bore,** In-Bore Prostate biopsy.

Source of Funding: None