



PD54-07 Detection of clinically significant prostate cancer through MRI fusion-guided vs. systematic standard prostate biopsies: A multi-institutional review of outcomes

Dylan Buller, Guy Manetti, Ilene Staff, Tara McLaughlin, Joseph Tortora, Kevin Pinto, Akshay Gangakhedkar, and Joseph Wagner

Disclosures

- Consulting; Genomic Health, Medtronic, and Decipher Biosciences (JRW)

Background

- Urologists and patients rely on prostate biopsy to determine
 - Who has prostate cancer
 - Who should consider definitive therapy
- Prostate cancer is the only cancer in which biopsy for detection has been based on random sampling
- MRI-fusion targets for biopsy have been utilized in an attempt to improve detection rates of clinically significant prostate cancer

Background

- Two recent studies supporting targeted biopsies alone to increase:
 - a) detection rate of clinically significant PCa, and
 - b) decrease detection of clinically insignificant prostate cancer
- PROMIS:
 - mp-MRI more sensitive than systematic random biopsy (93% vs. 48%, $p < .0001$)
 - Recommendation: MRI should be used to triage men prior to prostate biopsy
- PRECISION:
 - 12% more clinically significant PCa detected by MRI-targeted biopsy; 13% fewer clinically insignificant biopsies

Ahmed et al, Lancet, 2017
Kasivisvanathan et al, NEJM, 2018

Background

- Other studies suggest that concurrent systematic and MRI-fusion targeted biopsies provide the greatest diagnostic accuracy
 - NCI: Prospective study in 2,103 men with MRI-visible lesions
 - Out of 918 biopsies positive for GG \geq 2 PCa:
 - Systematic biopsies uniquely identified 123/918 cases (13%)
 - MRI-targeted biopsies uniquely identified 268/918 cases (30%)
 - Combined biopsy associated with lowest rate of cancer upgrade on RP
 - MGH: Retrospective review of 506 patients undergoing concurrent targeted and systematic biopsies
 - 16% of patients with GG \geq 2 were uniquely identified by systematic biopsy
 - Netherlands: Prospective study in patients with PI-RADS \geq 3 lesions
 - Targeted biopsy uniquely identified 13% of men with GG \geq 2 PCa missed on systematic biopsy
 - Systematic biopsy uniquely identified 10% of men with GG \geq 2 PCa missed on targeted biopsy

Ahdoot, NEJM, 2020

Hanna, J Urol, 2019

Mannaerts, Urol Oncol, 2019

Objective: to analyze data from two Connecticut hospitals to determine the current utility and variability of MRI-targeted and systematic random prostate biopsies

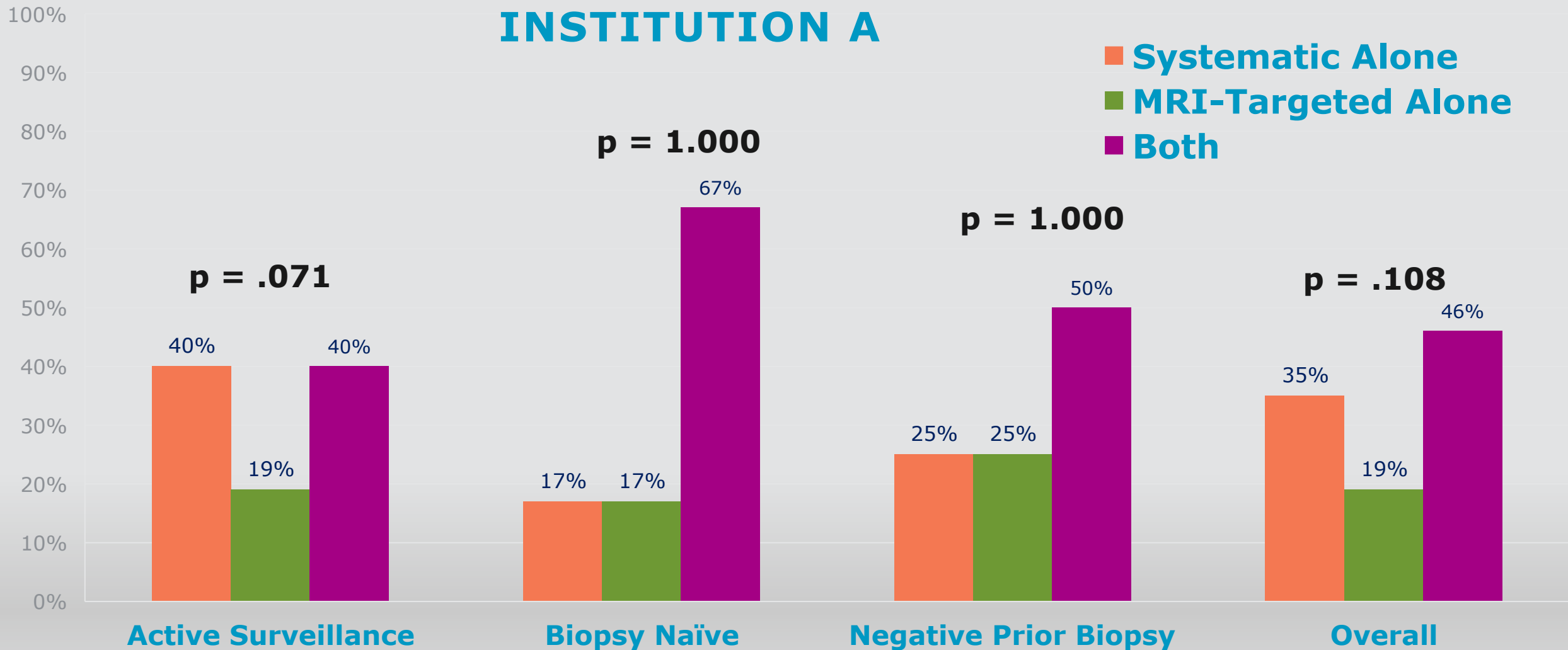
Methods

- Patients receiving concurrent MRI-fusion (UroNav) and systematic biopsies for PI-RADS ≥ 3 lesions were reviewed
- “Clinically significant cancer” considered to be positive biopsy \geq Grade Group 2
- As current NCCN Guidelines list AS as an option for select GG2 cancers, we also examined \geq GG3 as a cut-off for clinical significance

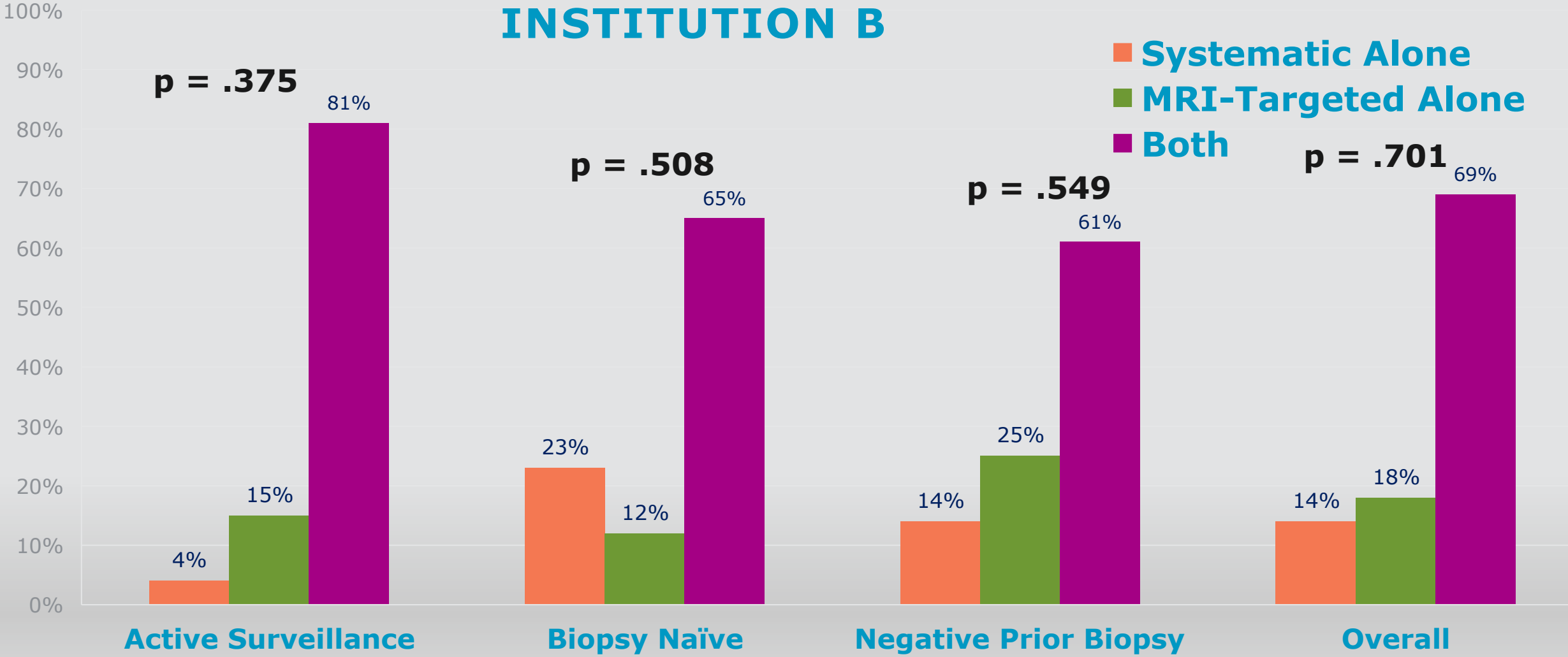
Demographics and cancer detection rates

	Institution A	Institution B	P value	Total
Active				
Surveillance, n (%)	157 (61.6)	63 (31.2)	} <.001	220 (48.1)
Biopsy Naïve, n (%)	55 (21.6)	35 (17.3)		90 (19.7)
Prior Negative Biopsy, n (%)	39 (15.3)	102 (50.5)		141 (30.9)
Prior XRT, n (%)	4 (1.6)	2 (1.0)		6 (1.3)
Total	255	202		457
Positive Biopsies, n (%)	168 (65.9)	134 (66.3)	.92	302 (66.1)
Median age in years (IQR)	65 (59.7,69.1)	67 (62.0,67.0)	<.001	66.0 (60.7,70.0)
Median PSA (IQR)	5.8 (4.3,8.5)	6.05 (4.7,8.9)	.247	5.9 (4.4,8.7)

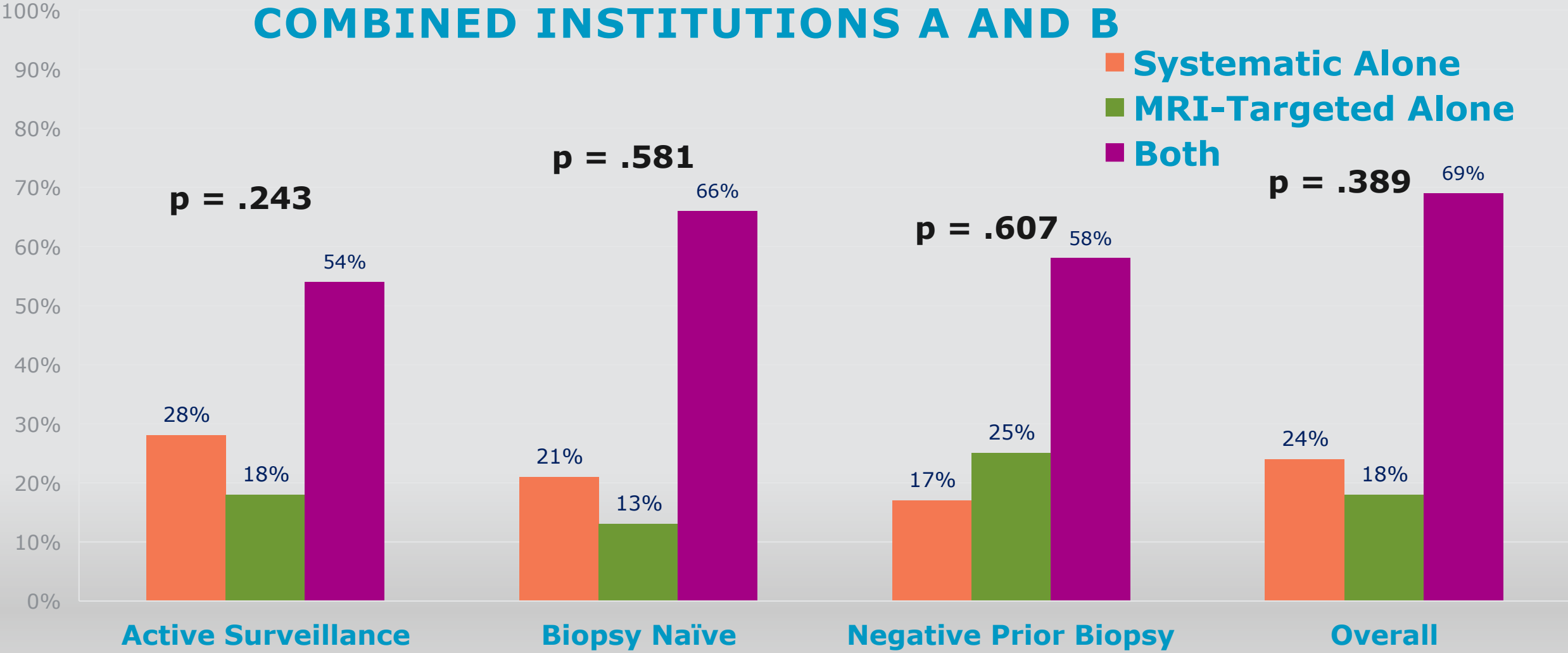
SYSTEMATIC VERSUS MRI-TARGETED BIOPSY: PERCENT OF GG \geq 2 PROSTATE CANCER DETECTED INSTITUTION A



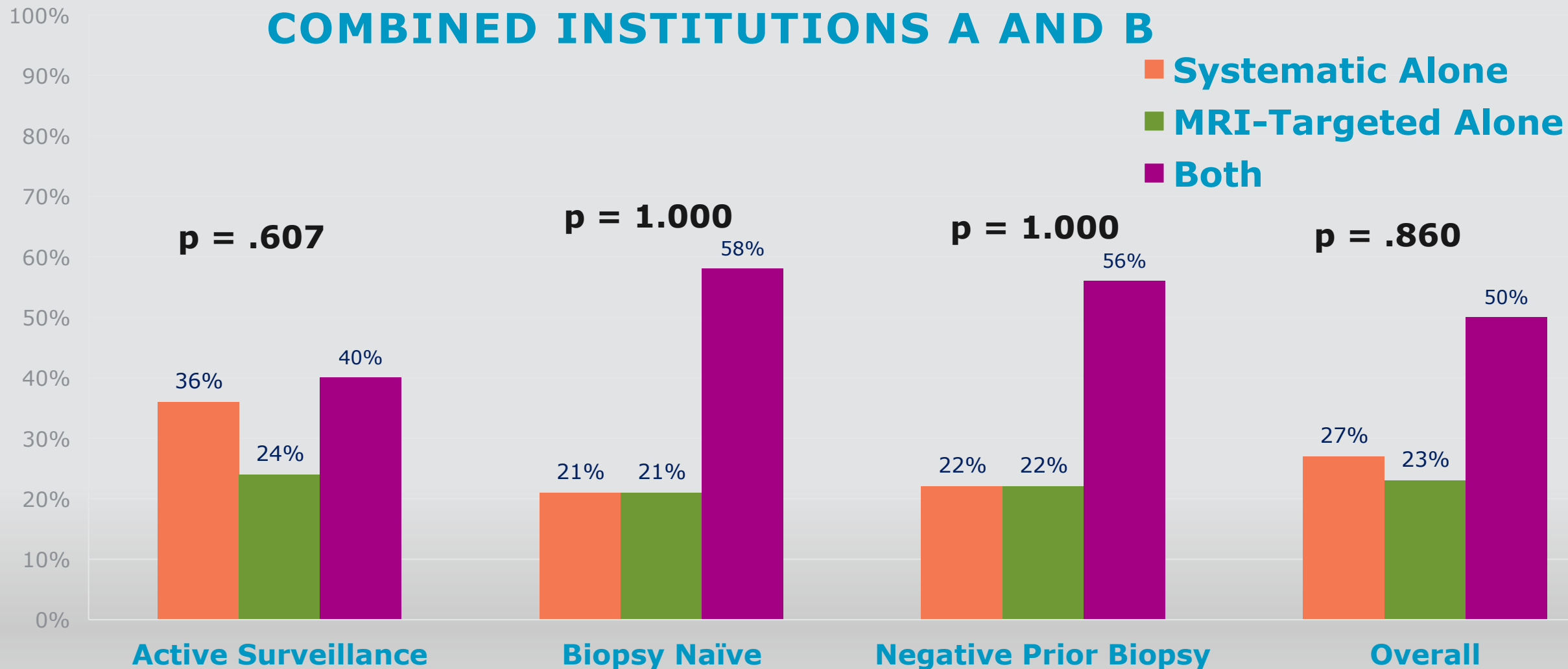
SYSTEMATIC VERSUS MRI-TARGETED BIOPSY: PERCENT OF GG \geq 2 PROSTATE CANCER DETECTED INSTITUTION B



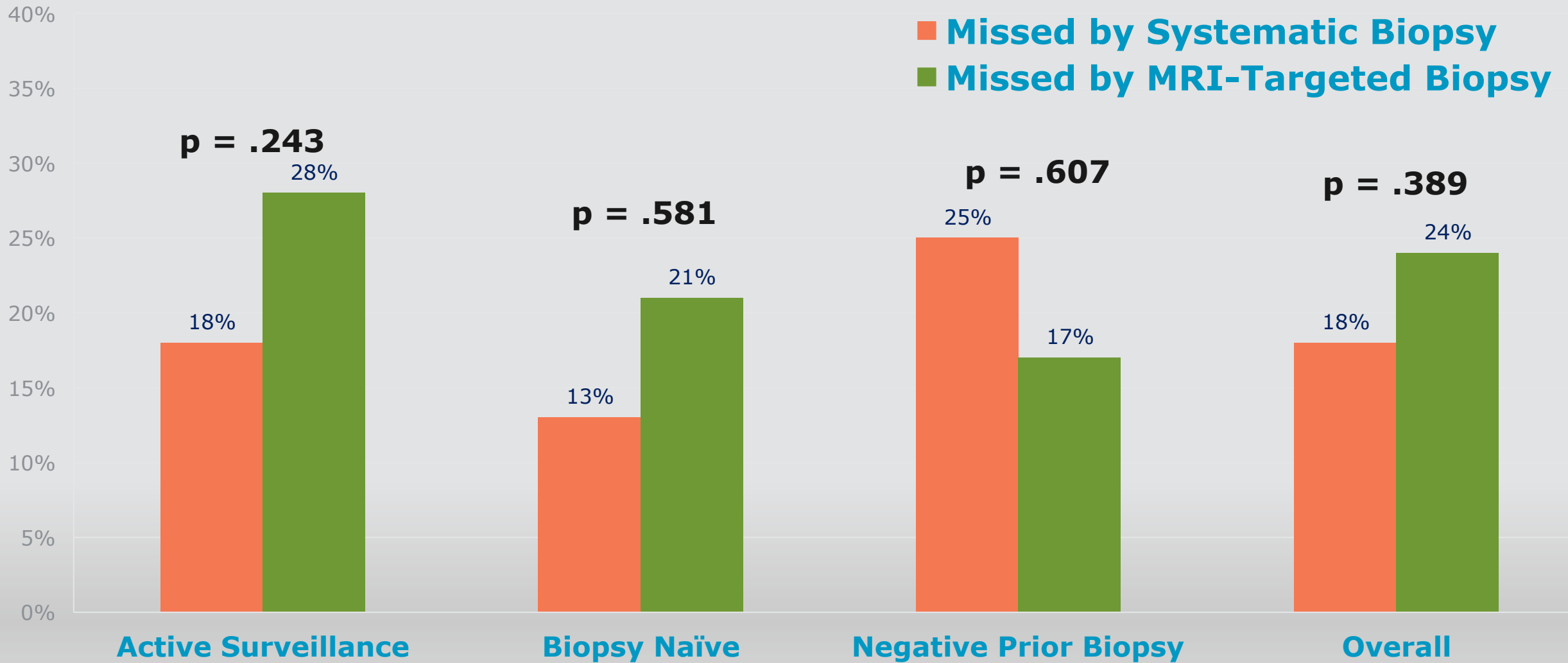
SYSTEMATIC VERSUS MRI-TARGETED BIOPSY: PERCENT OF GG \geq 2 PROSTATE CANCER DETECTED COMBINED INSTITUTIONS A AND B



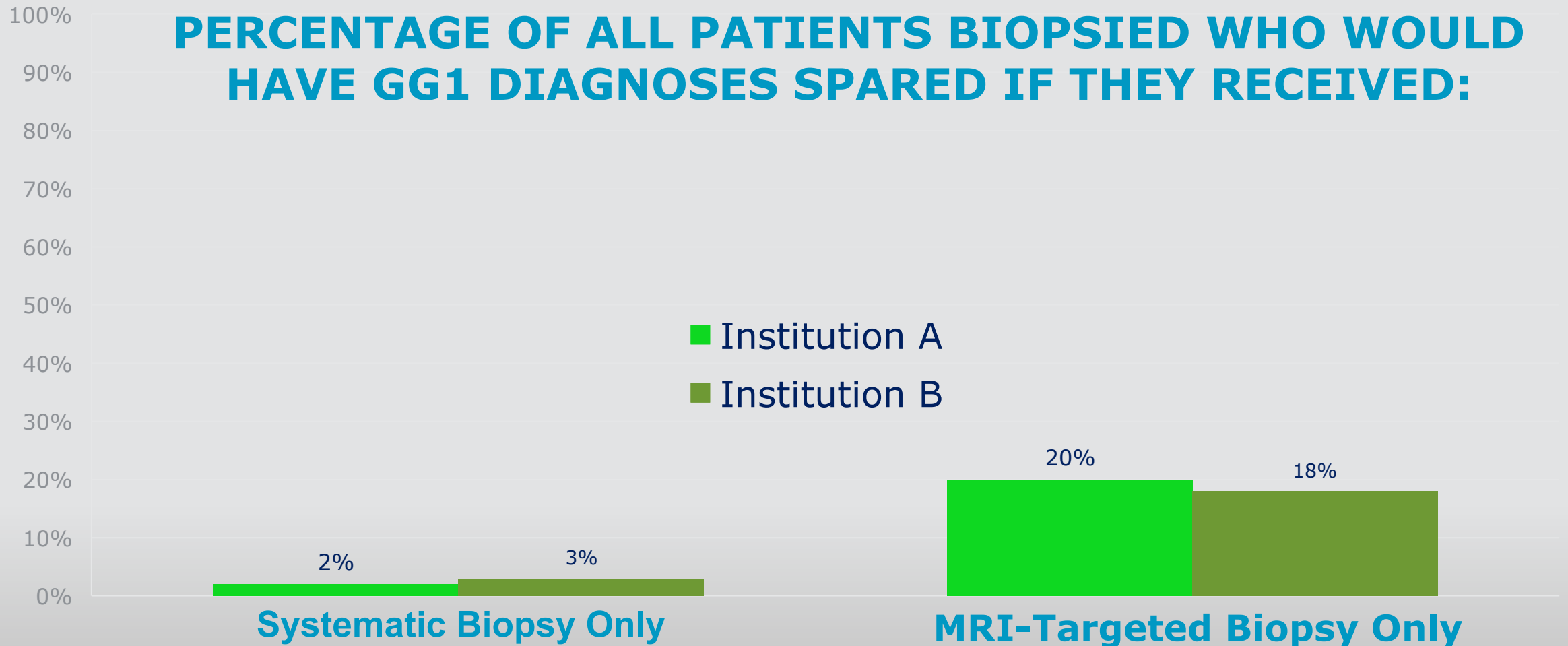
SYSTEMATIC VERSUS MRI-TARGETED BIOPSY: PERCENT OF GG \geq 3 PROSTATE CANCER DETECTED COMBINED INSTITUTIONS A AND B



PERCENT OF GG \geq 2 PROSTATE CANCER MISSED; COMBINED INSTITUTIONS A AND B



PERCENTAGE OF ALL PATIENTS BIOPSIED WHO WOULD HAVE GG1 DIAGNOSES SPARED IF THEY RECEIVED:



Limitations

- Retrospective study
- No centralized pathology or radiology
- Varying sample sizes
- Unequal distribution of patients who are on active surveillance, had a prior negative biopsy, or are biopsy naïve

Sources of Variability

- Radiographic interpretations
- Personnel: full-time urologic ultrasonographer at Institution A with >30 years of experience performing systematic prostate biopsies
- Urologist proficiency

Conclusions and Practice Implications

- Utility of MRI-fusion targeted biopsy can vary across institutions
- Our data suggests that in practice, concurrent MRI-fusion and systematic biopsies yield greater detection rates of clinically significant prostate cancer than either method alone
- Targeted biopsies alone result in lower detection rates of clinically insignificant cancers
- Individual centers should track and evaluate their own data to determine optimal biopsy paradigms

Thank you