

A retrospective review of Prostate Imaging Reporting and Data System (PI-RADS) 3 and 4 Multiparametric prostate MRI (mpMRI) findings with biopsy correlate in 2016

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Background

- Prostate cancer – increasing incidence, significant cause of morbidity and mortality in older men
- Over diagnosis leading to over treatment?
- What is clinically significant prostate cancer?
 - High volume disease
 - High grade disease
 - Gleason 4+3 or any cancer \geq 6mm (PROMIS)

PI-RADS

- ESUR/ACR
- Structured reporting tool
- 1-5 scoring system based on multi-parametric MRI sequences
 - 1-2 significant cancer unlikely
 - **3 equivocal risk of significant cancer**
 - 4-5 significant cancer likely
- Version 1 and 2 (2015)

Aims

What is the positive predictive value of a PIRADS 3 or 4 MRI result in determining significant prostate cancer amongst biopsy naïve men in Leeds in 2016?

Are there any other factors that could help us to avoid biopsy and therefore morbidity?

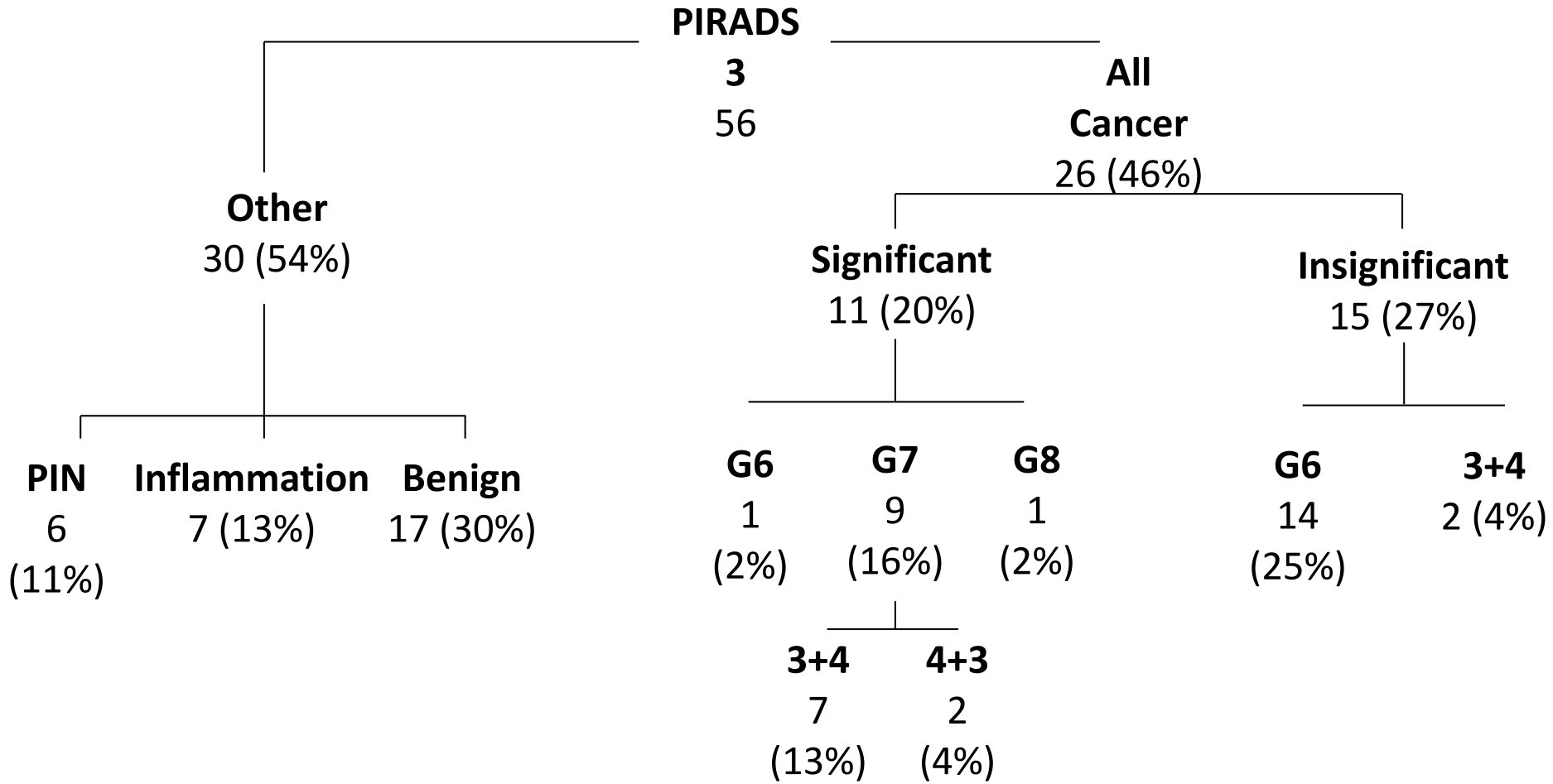
Methods

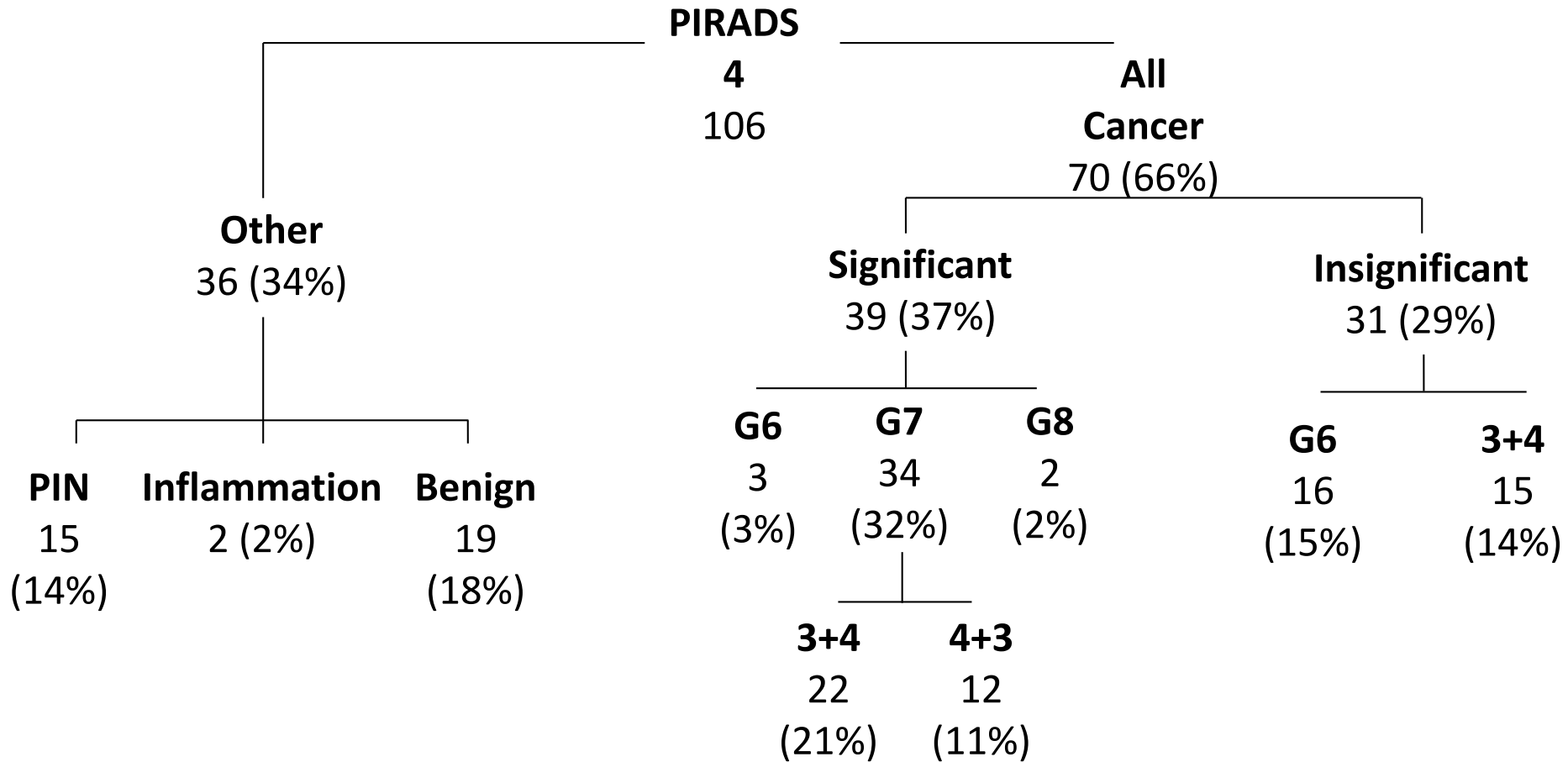
- mpMRI performed in 2016 without prior prostate biopsy or history of prostate cancer and given a score of PIRADS 3 or 4.
- Demographic, clinical, biochemical (PSA), and histopathological data (biopsy result).

Results

- 711 prostate MRIs in 2016
- 168 cases identified

PIRADS	3	4
Cases	56	106
Age (median, IQR)	63 years (58-69)	66 years (60-72)
PSA (median, IQR)	6.05 micrograms/L (4.25-7.5)	7 micrograms/L (4.8-9.05)





PIRADS 3

- DRE findings

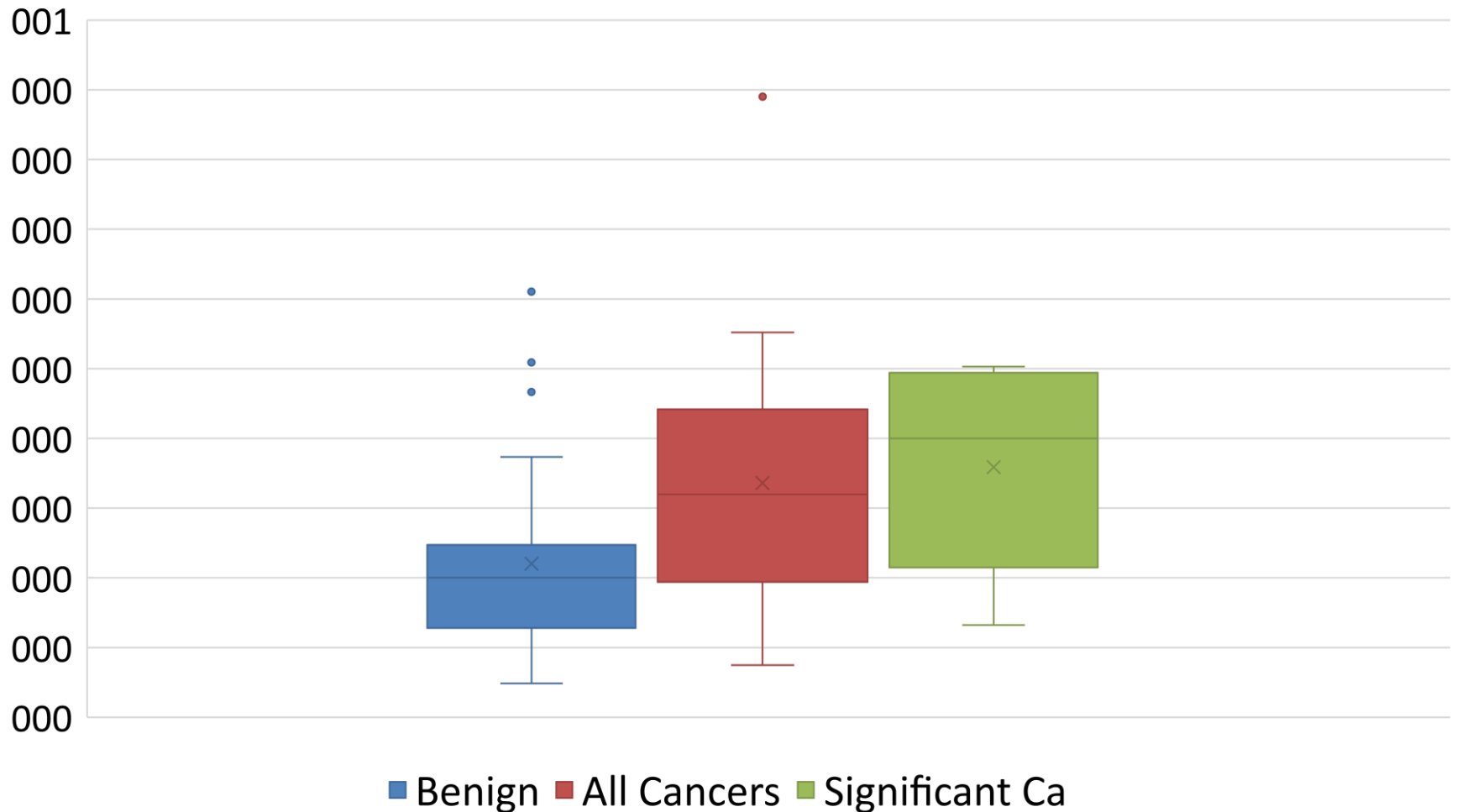
	Suspicious DRE	DRE benign or normal
Significant	3	7
Insignificant	22	20

- PSA density

	Non-cancer	Significant
Median (IQR)	0.1 (0.07-0.12)	0.2* (0.13-0.24)

* $p < 0.01$

Box plot comparing the PSA density distribution for different diagnoses in PIRADS 3



Conclusions

- PIRADS 3 – 1 in 5 chance of significant prostate cancer.
 - Higher chance of significant cancer if PSA density is high
- No threshold value for PSA or PSAD below which we can safely avoid biopsy currently
- PIRADS 4 carries a higher risk of a significant prostate cancer on subsequent biopsy.

Limitations

- Small numbers
- Retrospective
- Difficult to extract PROMIS criteria of clinically significant cancer from pathology reports in 2016
- Inter-observer variation in interpretation of PI-RADS (v2) diagnostic criteria for PI-RADS 2 vs PI-RADS 3 lesions

Discussion

- Small number of cases, particularly of PIRADS 3 – review data from 2017.
- Possible risk stratification based on PSA density and reduction in number of men having biopsies for PIRADS 3 is limited by large fluctuations in PSA.

Thank you

References

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- Liddell H, Jyoti R, Haxhimolla H, Z, mp-MRI Prostate Characterised PIRADS 3 Lesions are Associated with a Low Risk of Clinically Significant Prostate Cancer - A Retrospective Review of 92 Biopsied PIRADS 3 Lesions. *Curr Urol* 2014;8:96-100