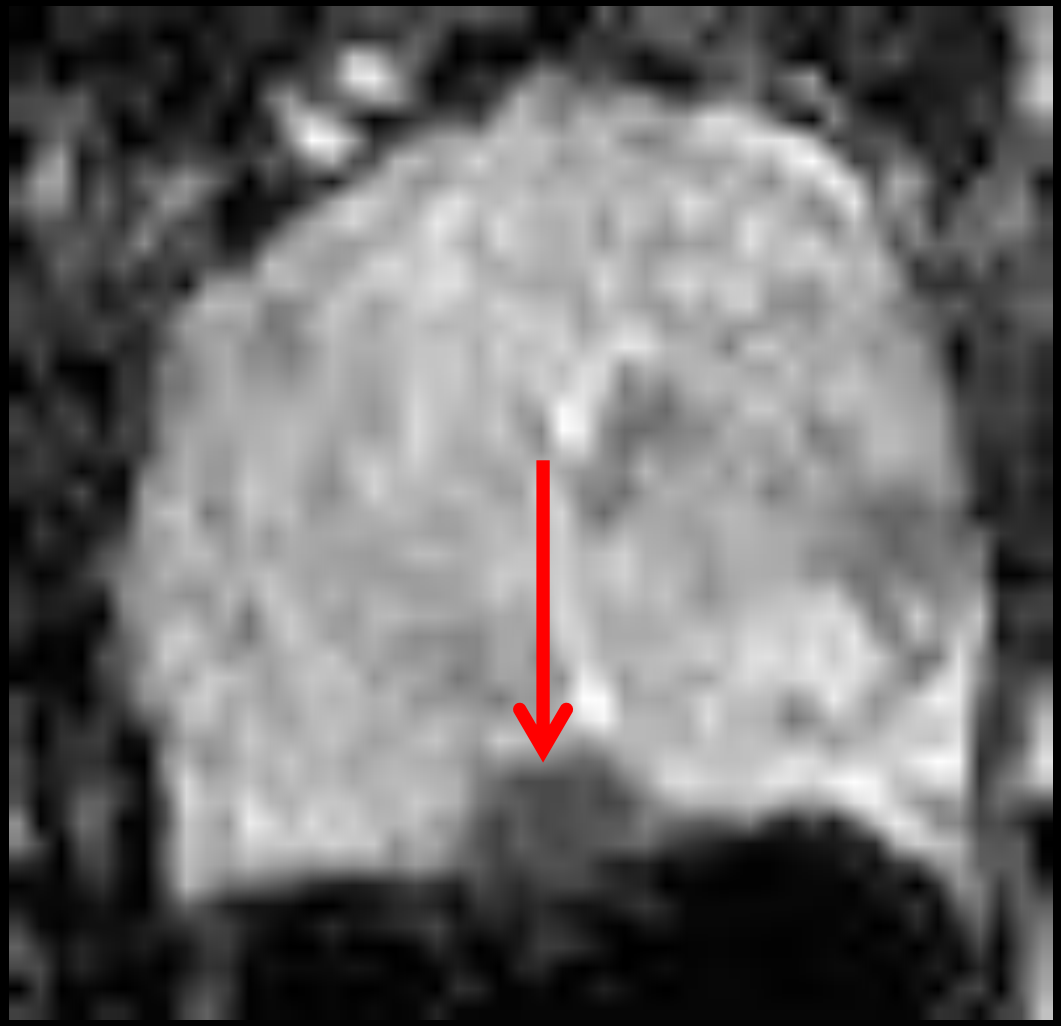
Southwest Prostate MRI Audit

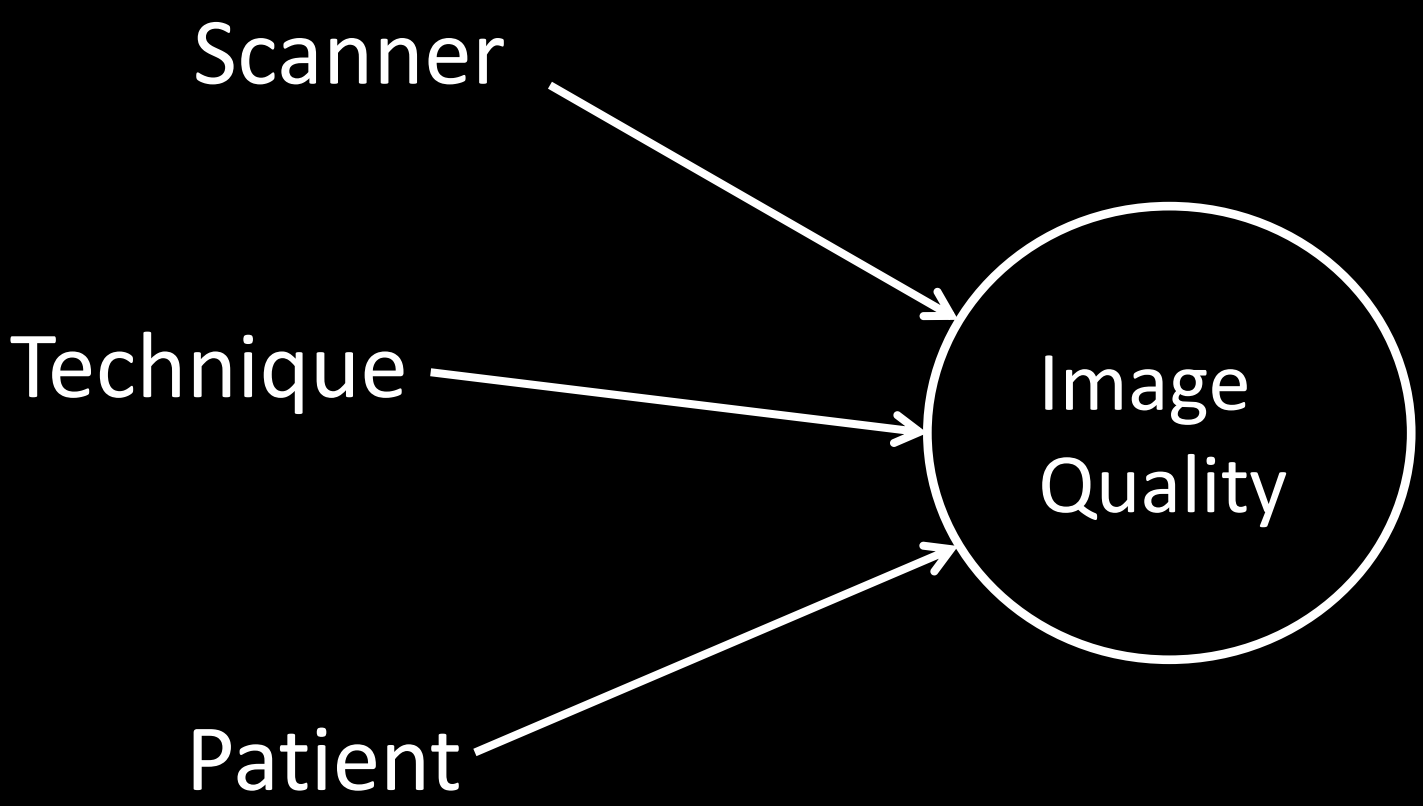
South West Cancer Alliances
Prostate Cancer Diagnostic Pathway Steering Group

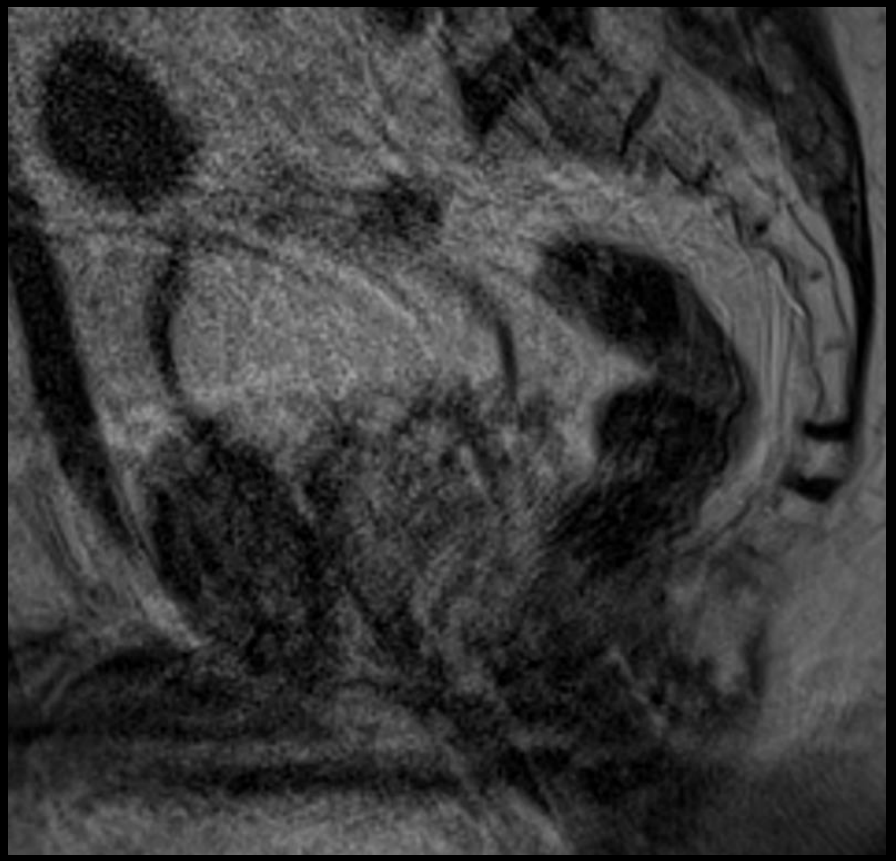
NHS England

Dr Paul Burn
November 2018



Introduction





Aim

- To assess:

  1) Compliance with recognized technical standards

  2) Image quality

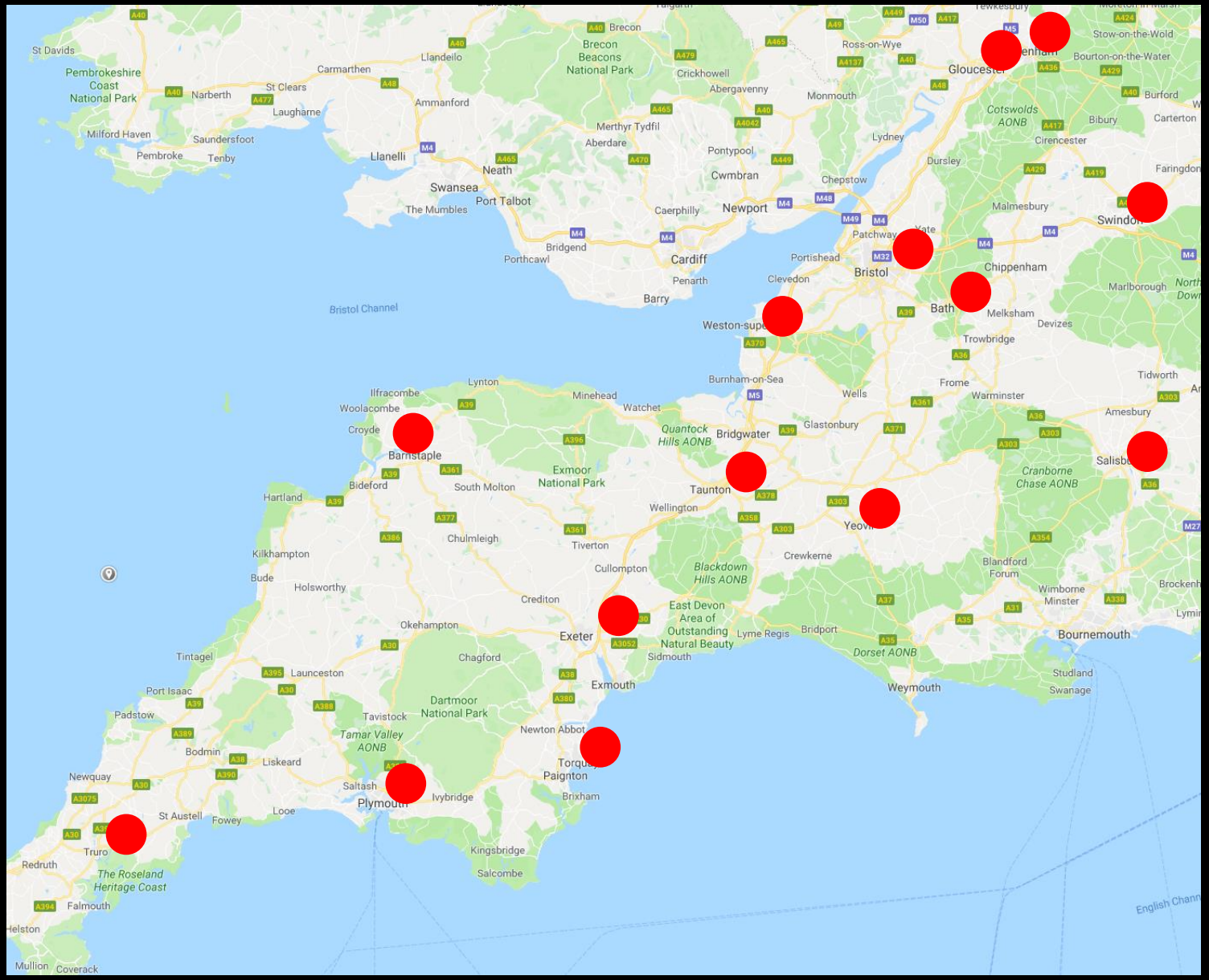
Methods

- Each hospital asked to send first 7 consecutive anonymized scans from 1st July

- Imaging assessed by two radiologists
  one from Cambridge
  blind to hospital and scanner type

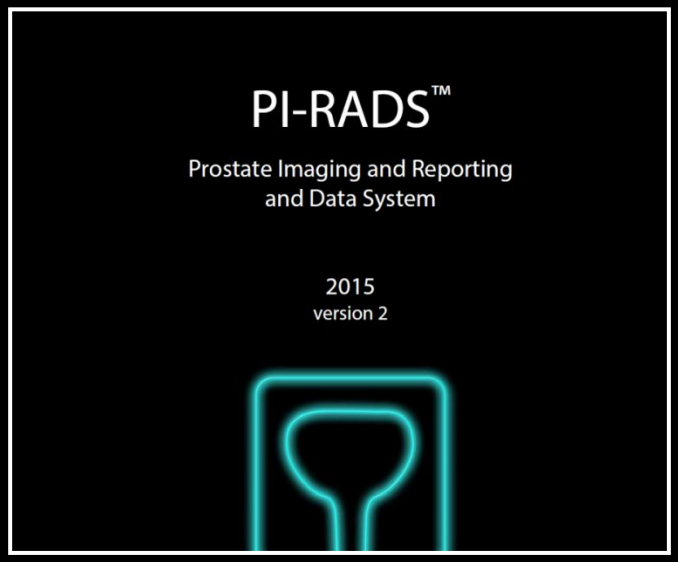
94 scans
from
15 sites

SWAG
and
Peninsular
SSGs



Technical Standards

- PIRADS 2 – 2015
- UK Consensus document - BJUI 2018



BJUI
BJU International

Guidelines

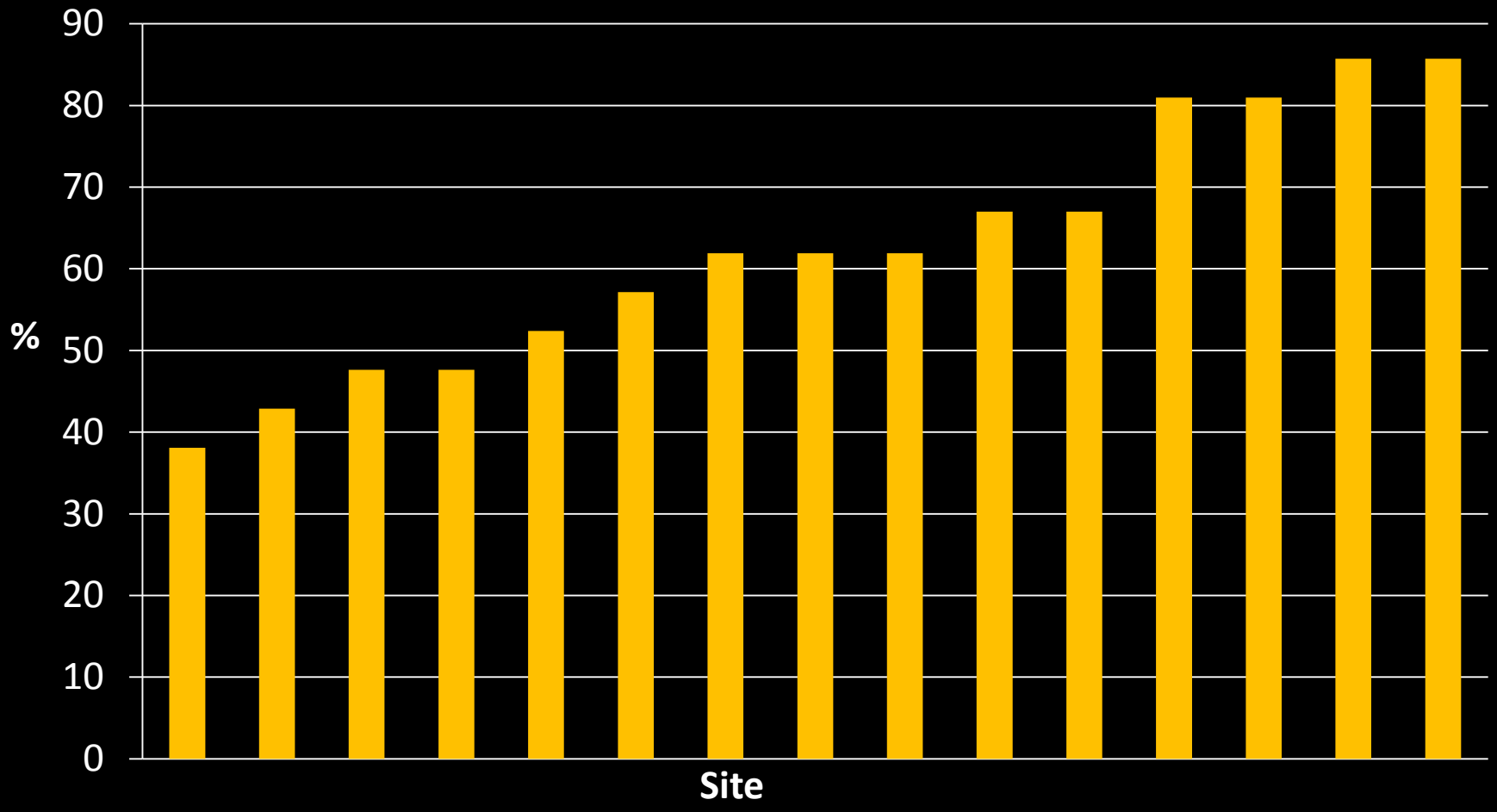
National implementation of multi-parametric magnetic resonance imaging for prostate cancer detection – recommendations from a UK consensus meeting

Mrishta Brizmohun Appayya[1], Jim Adshead[2], Hashim U. Ahmed[3,4], Clare Allen[5], Alan Bainbridge[6], Tristan Barrett[7], Francesco Giganti[3,5], John Graham[8], Phil Haslam[9], Edward W. Johnston[1,5], Christof Kastner[10], Alexander P.S. Kirkham[5], Alexandra Lipton[11], Alan McNeill[12], Larissa Moniz[13], Caroline M. Moore[4,14], Ghulam Nabi[15], Anwar R. Padhani[16], Chris Parker[17], Amit Patel[18], Jacqueline Pursey[19], Jonathan Richenberg[20], John Staffurth[21], Jan van der Meulen[22], Darren Walls[23] and Shonit Punwani[1,5]

Parameter	Standard	Parameter	Standard
T2 Axial Plane	Axial to patient	DWI FOV	16-22cm
DWI Plane	Axial to patient	DWI pixel size	</= 2mm
Gd Plane	Axial to patient	Lowest b value	>/=50
T2W 3 planes small FOV included	Present	Highest b value	>/=1400 for 1.5T, >/= 2000 for 3T
T2W Axial slice thickness	3mm	DCE sequence	Present
T2W Axial gap	No gap	DCE slice thickness	3mm
T2W Axial FOV	12-20cm	DCE slice gap	No gap
T2W Axial Pixel Size	</=0.7mm	DCE pixel size	</=2mm
DWI sequence included	Present	DCE temporal resolution	</=15s
DWI Slice thickness	</=4mm	DCE duration	>/=2mins
DWI slice gap	No gap		

Results – standards

- Compliance with 21 standards – mean 63% (range 38-86%)



Peninsular Standards (in blue)

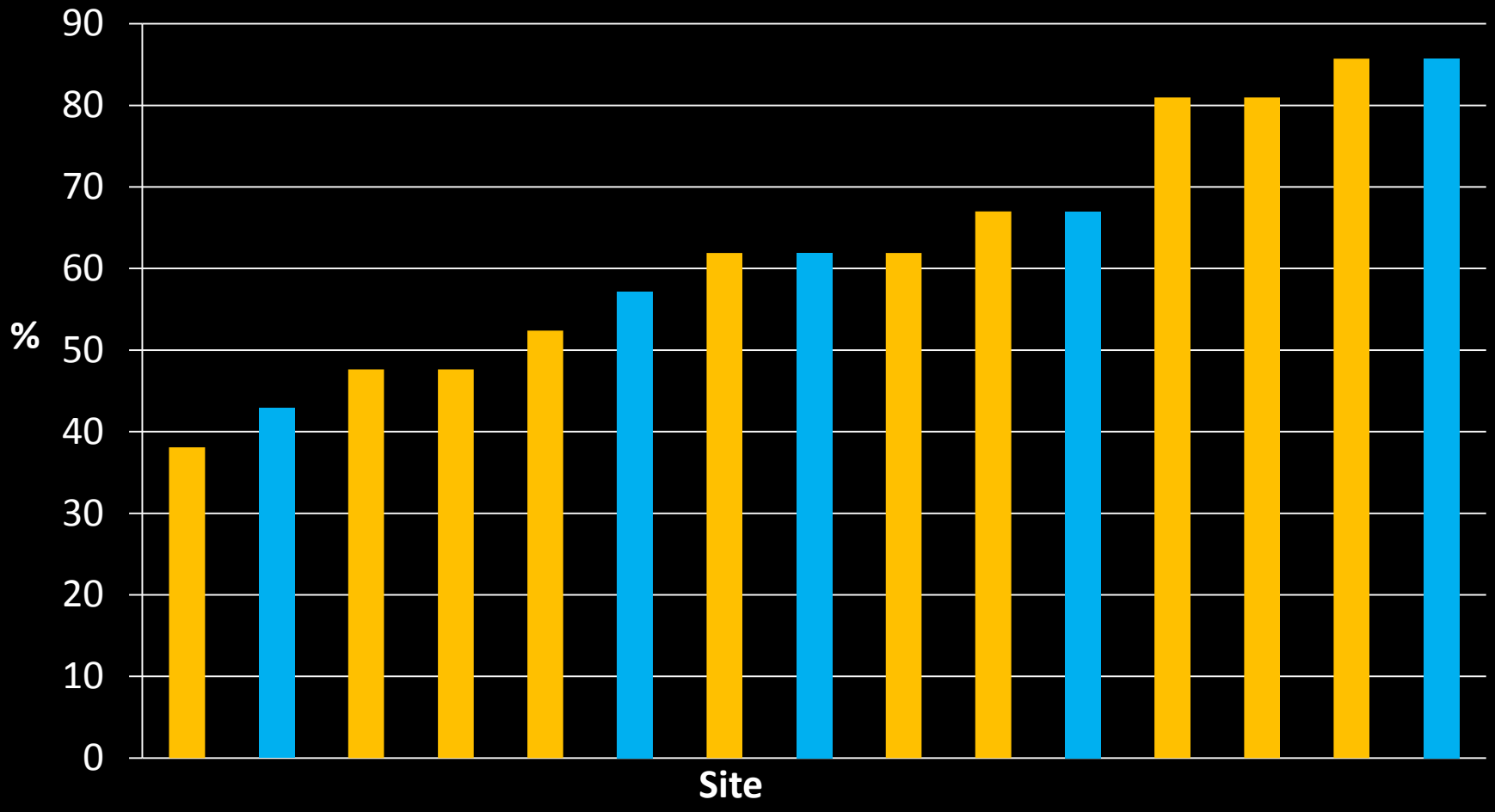


Image Quality

SCORE				
1	2	3	4	5
Very Poor	Poor	Acceptable	Good	Very Good

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Per Patient Results

- Percentage of patients with acceptable or better scans (score 3 or above)

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  Biparametric (T2 and DWI) 59%

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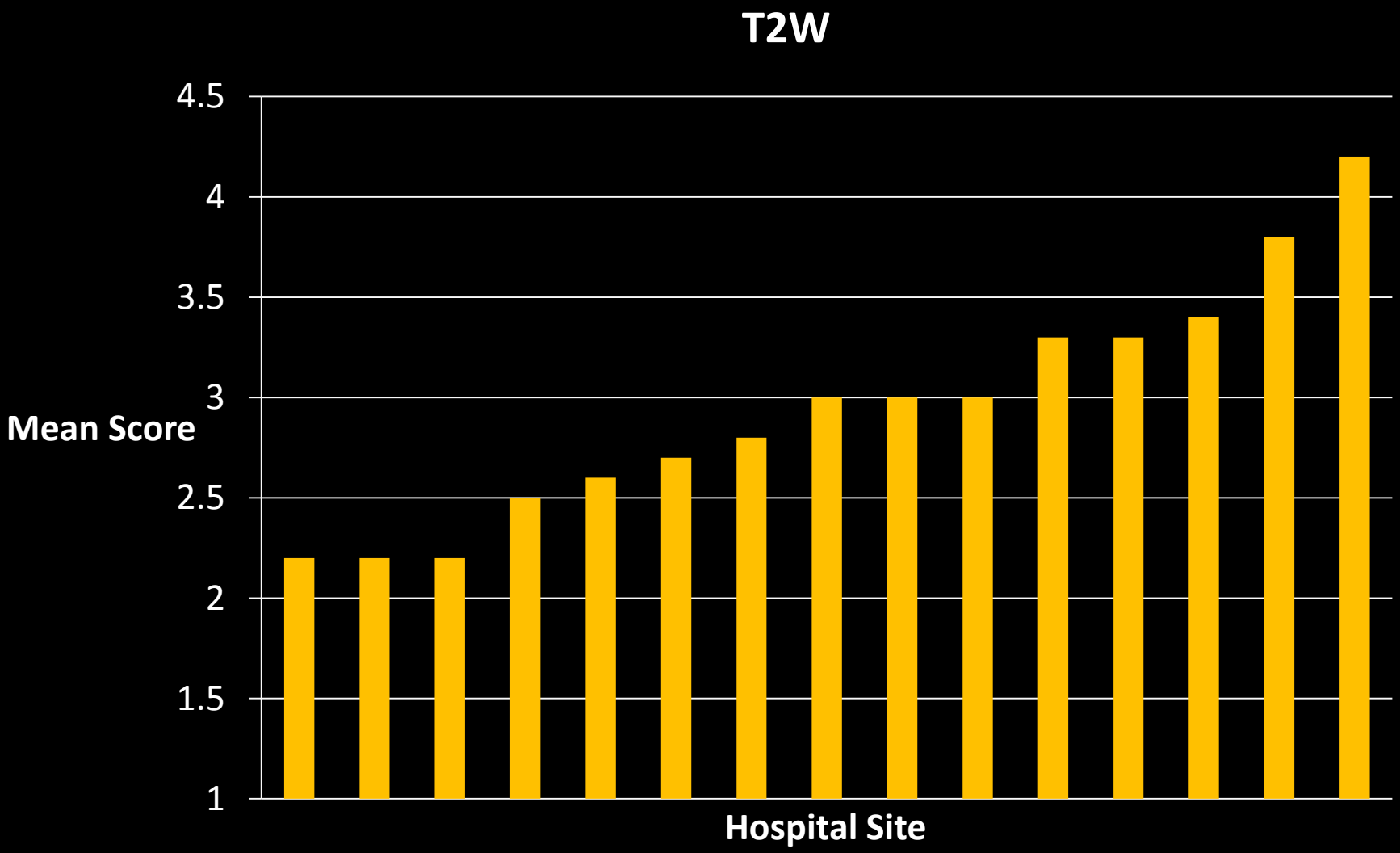
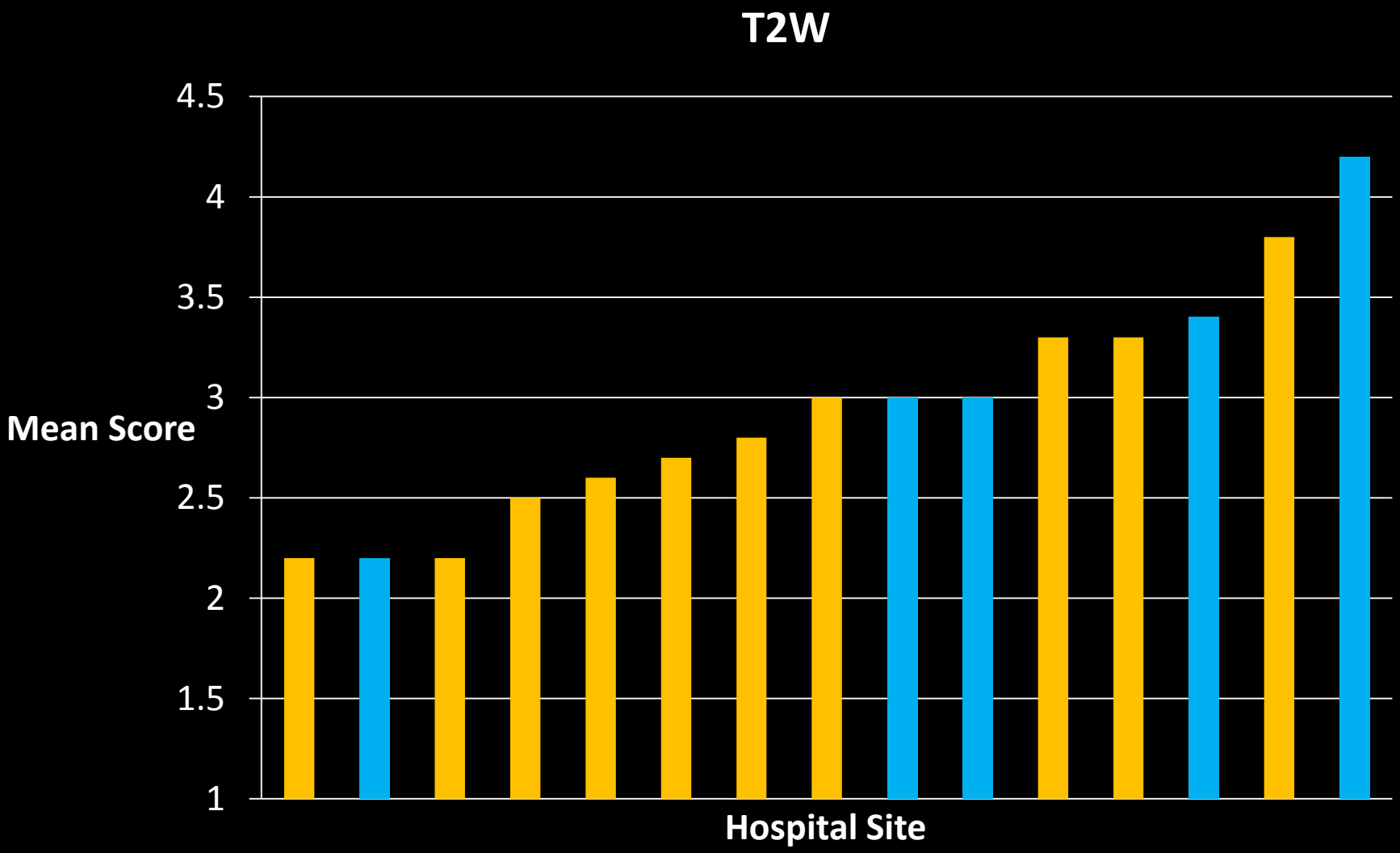
  Multiparametric (T2W, DWI and DCE) 56%

  (26% of all patients)

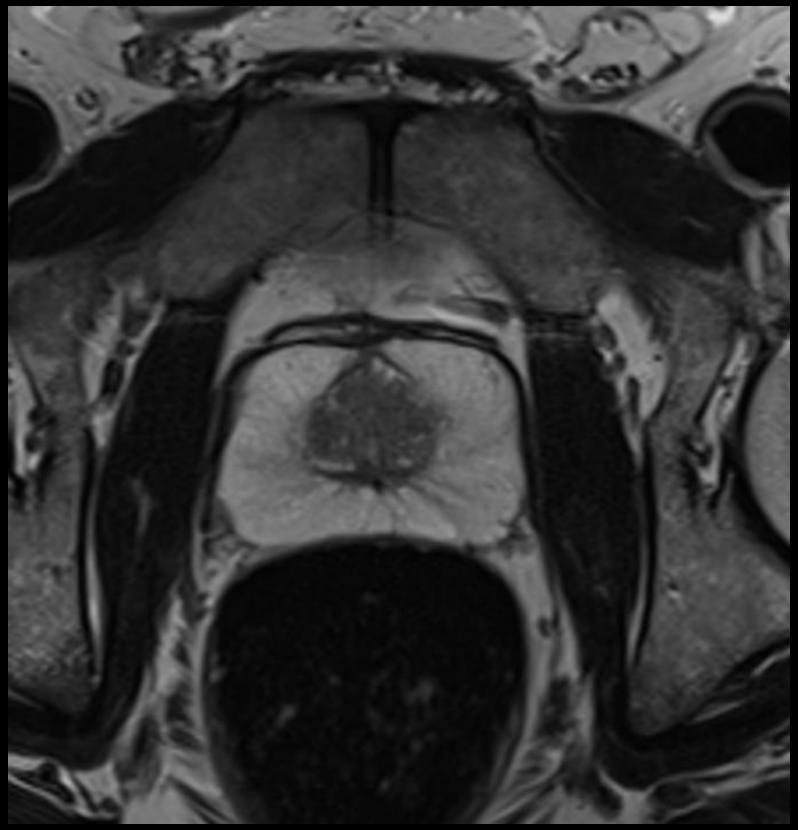
Hospital Site Comparison



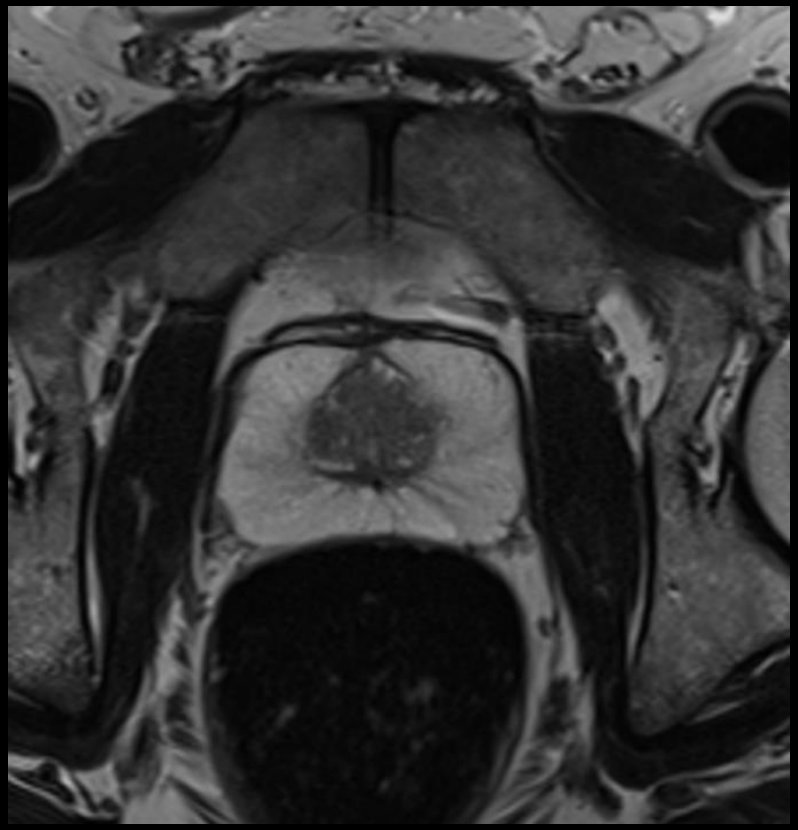
Peninsular Sites (in blue)

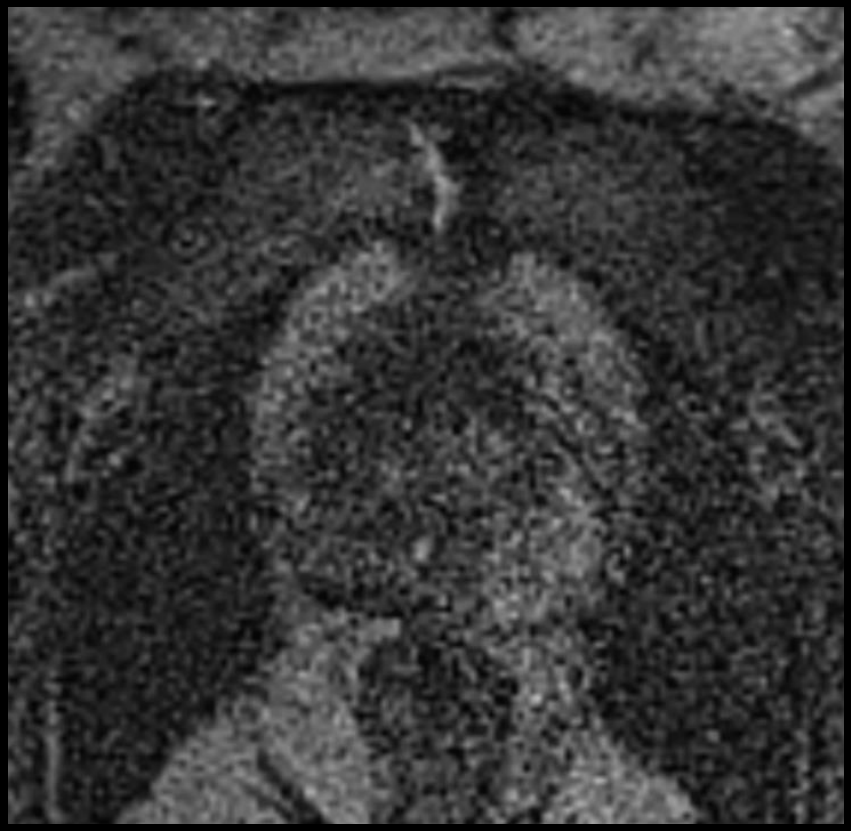


T2W

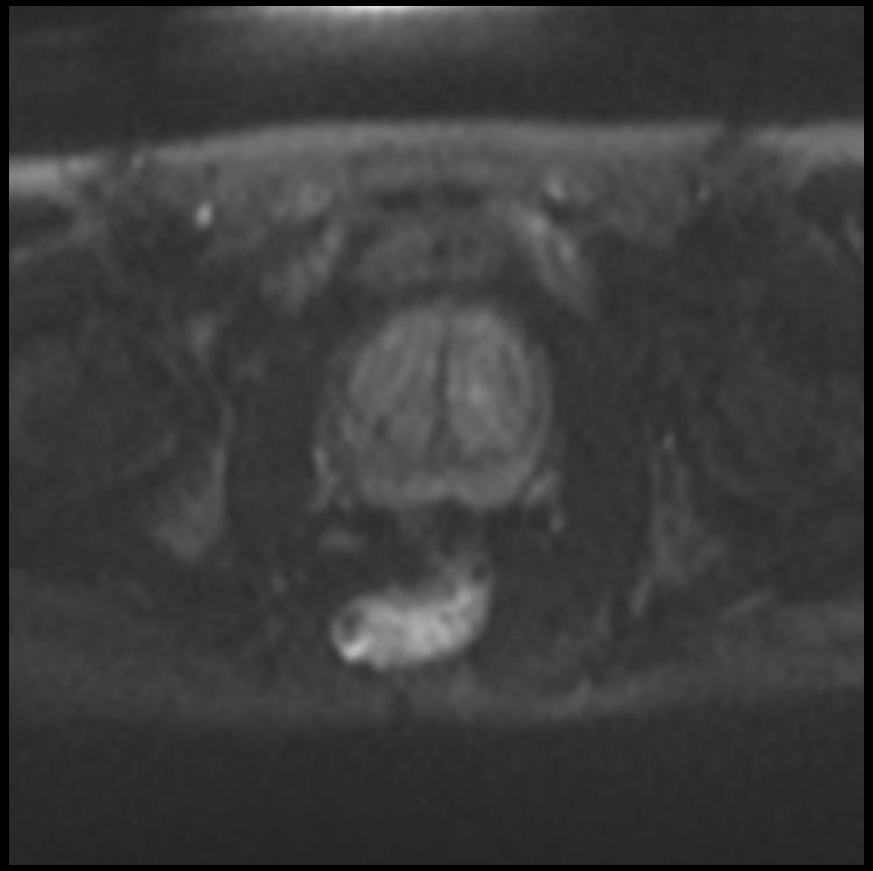


T2W





DWI



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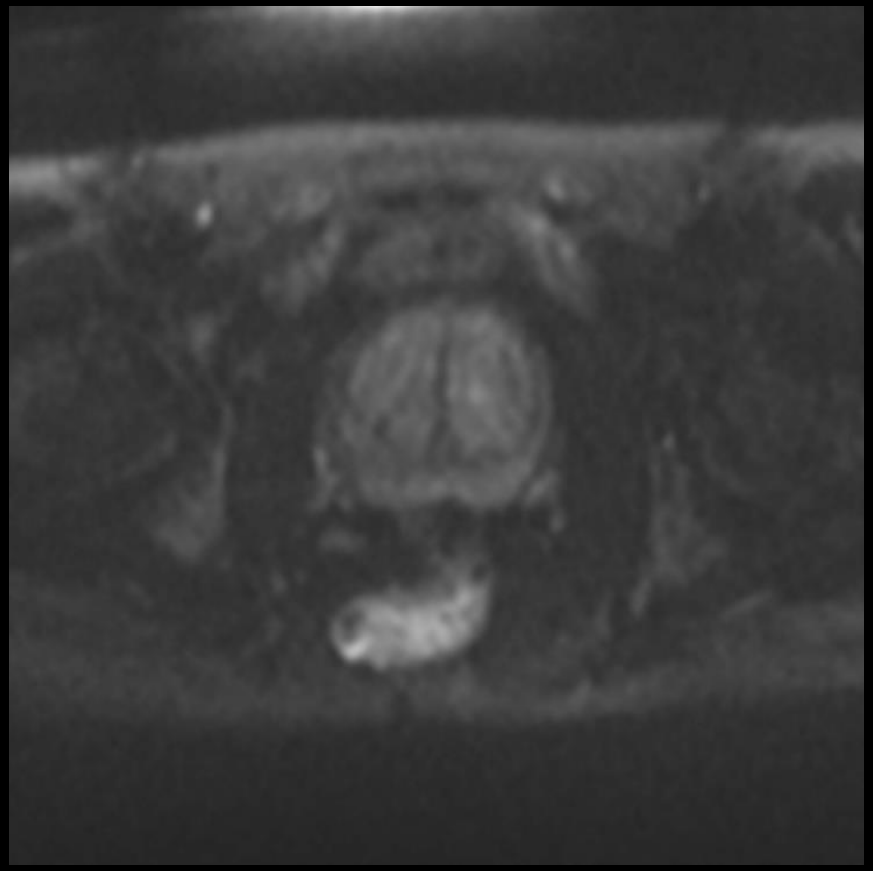
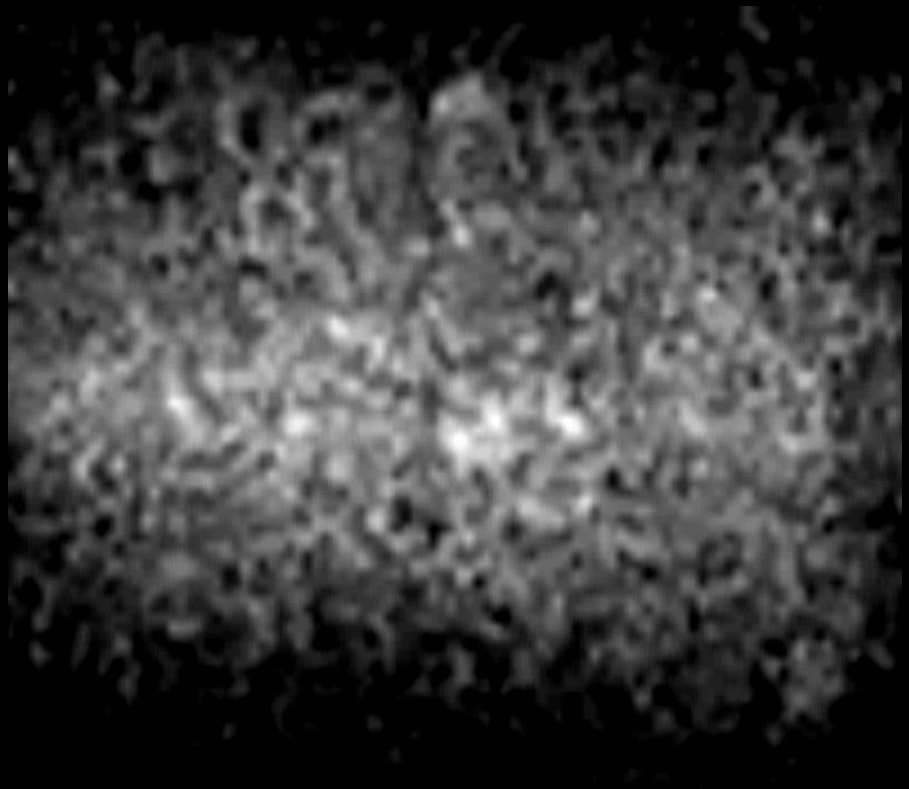
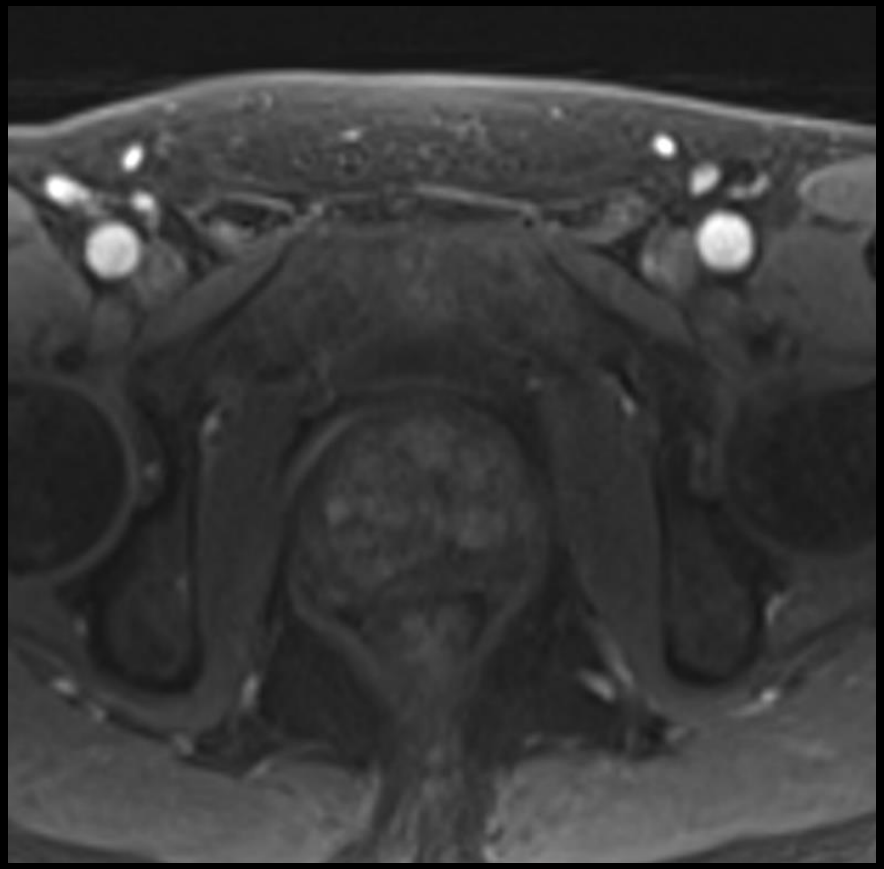




DCE (contrast)



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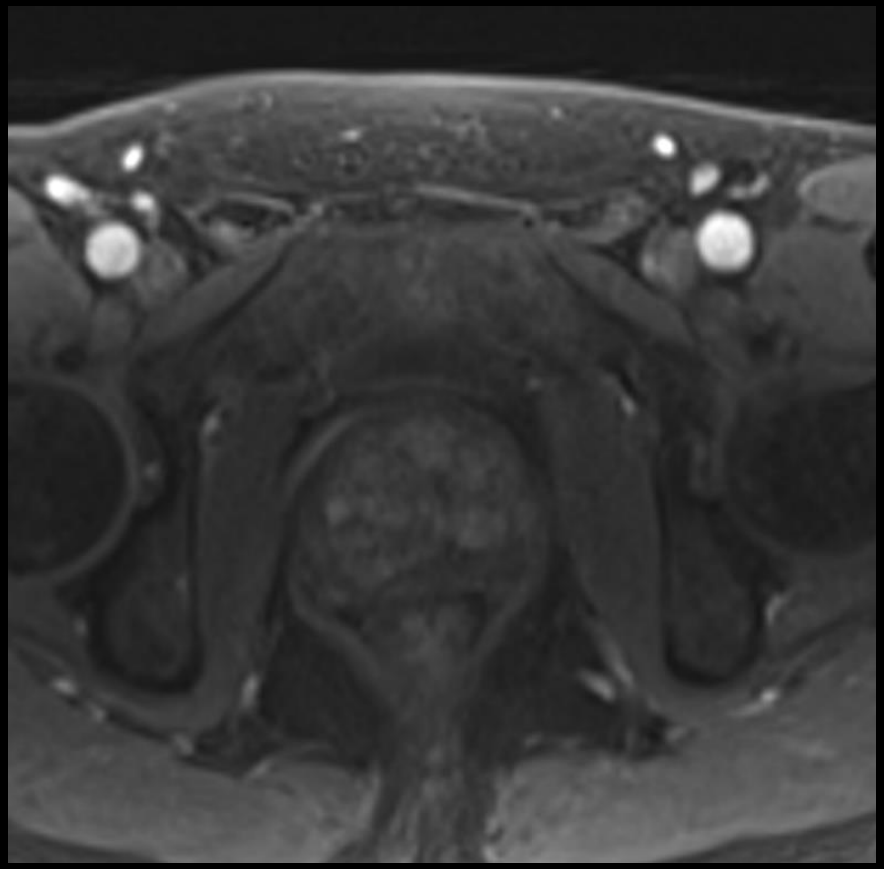
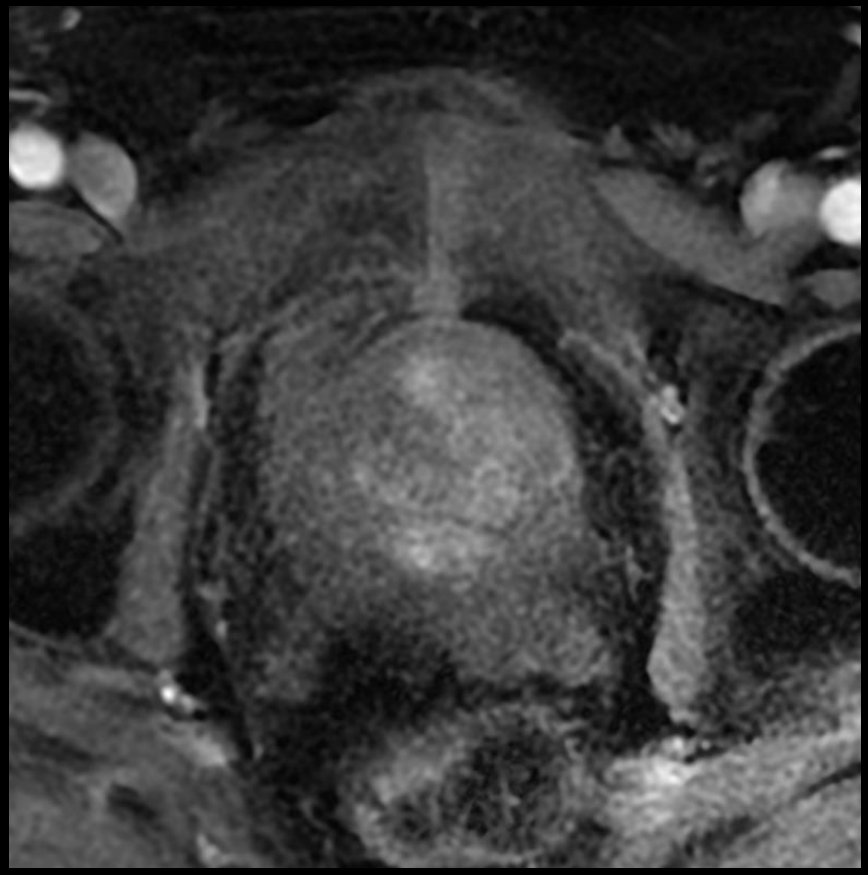


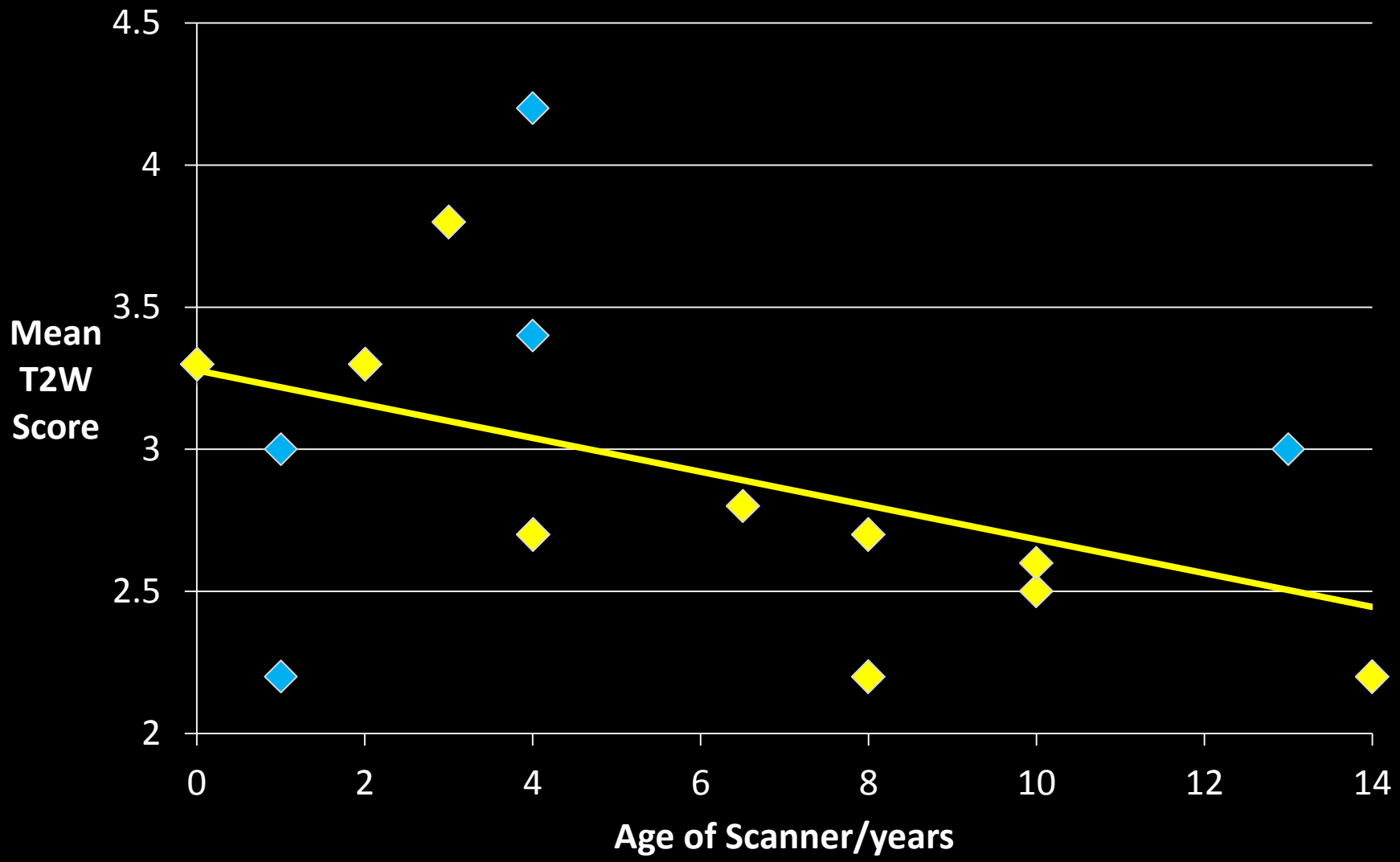


Scanner Age

- Regional Standard *
  - MRI scanner should be <7 years old

*South West Cancer Alliances Prostate Cancer Diagnostic Pathway Steering Group

Scanner Age



Scanner Age

	Oldest 7 Scanners	Newest 7 Scanners
Patients with diagnostic T2W scans (score >/= 3)	55%	84%

Summary

- Over 40% of patients are not having a fully diagnostic quality scan.
- Fairly wide variation in image quality and compliance with standards
- Feedback to depts may help drive improvements
- Older scanners need replacing