

# Rectal MRI: Optimising Imaging for Patient Benefit

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# The Problem

- Rectal cancer accounts for 8% of annual cancer diagnoses in the USA<sup>1</sup>.
- MRI is the investigation of choice for local staging<sup>2</sup>.
- Poor quality MRI limits confidence in staging and decision-making for treatment in MDT meetings, impacting patient outcomes<sup>3-4</sup>.
- **Subjectively:** In our hospital, the rectal cancer protocol was limited by issues with bowel wall motion, poor resolution and scanning technique.

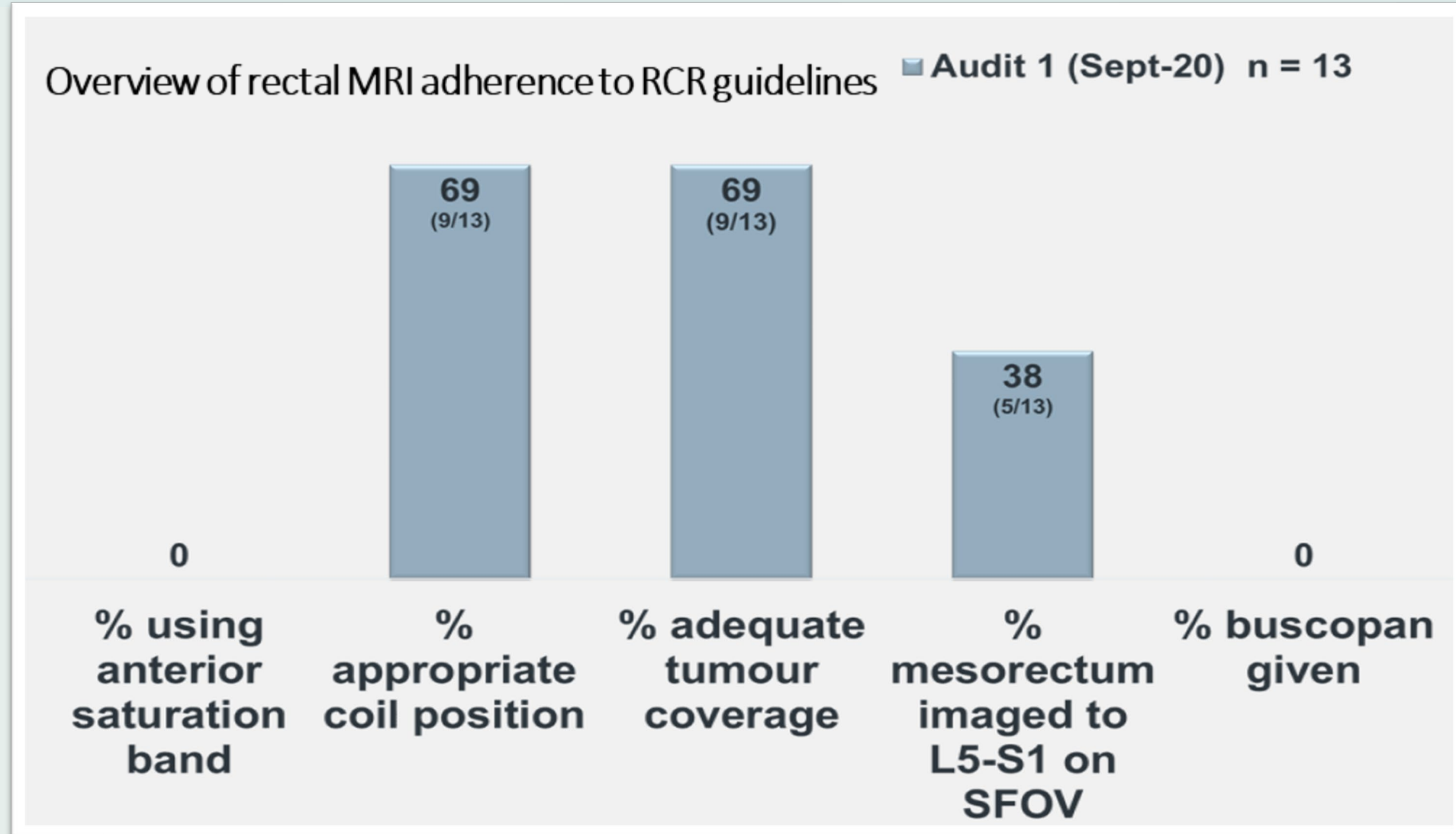
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# Results – Audit 1



# Intervention 1: Protocol Development

## Old protocol

Scan	Voxel Size
T2 Propeller Sag LFOV	2.5 mm <sup>3</sup>
T2 Ax LFOV	4.7 mm <sup>3</sup>
T2 Ax Oblique SFOV	1.6 mm <sup>3</sup>
T2 Cor Oblique SFOV	1.4 mm <sup>3</sup>
Total Protocol Time	~21 mins



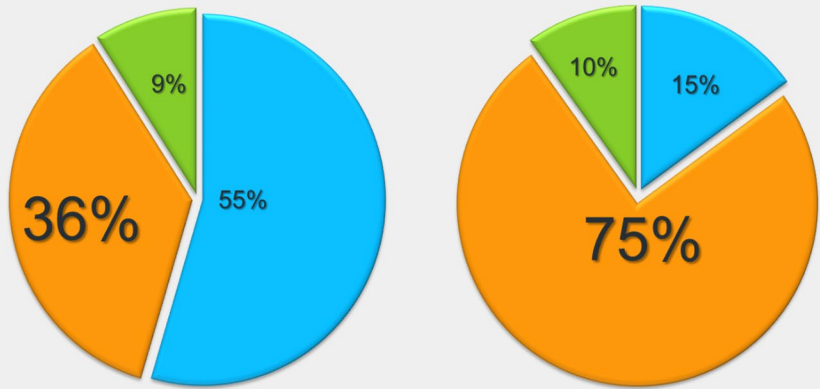
## New protocol

Scan	Voxel Size
T2 Sag LFOV	1.25 mm <sup>3</sup>
T2 Ax LFOV	3.95 mm <sup>3</sup>
T2 Ax Oblique SFOV	1.2 mm <sup>3</sup>
T2 Cor Oblique SFOV	1.2 mm <sup>3</sup>
Total Protocol Time	~27 mins



# Intervention 2: Radiology Personnel Training

Ideally how should small field of view imaging be angled?



2020 pre-training answers (n = 11)

2021 post-training answers (n = 20)

■ a) Axial and coronal oblique imaging angled perpendicular to the entire rectum

■ b) Axial and coronal oblique imaging angled perpendicular and parallel to the rectal tumour which may require multiple stacks.

■ c) Axial and coronal oblique imaging angled perpendicular to the anus.

How high should the small field of view imaging go?



2020 pre-training answers (n = 11)

2021 post-training answers (n = 20)

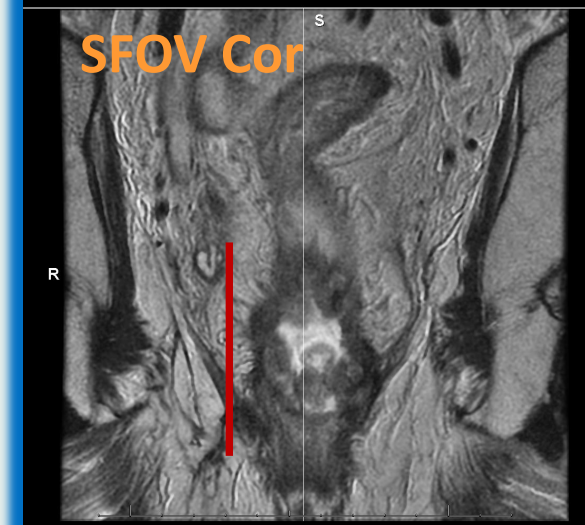
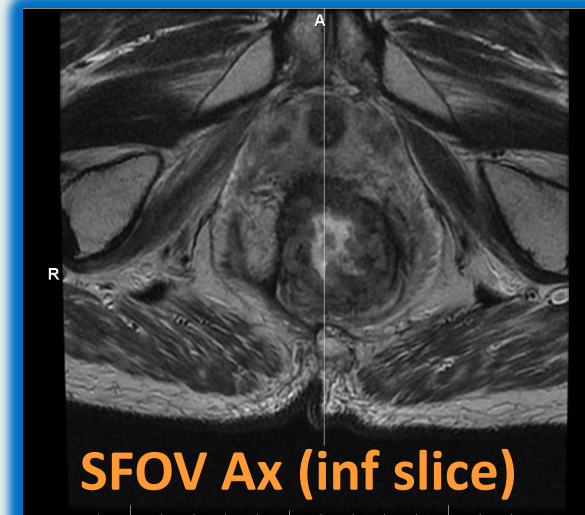
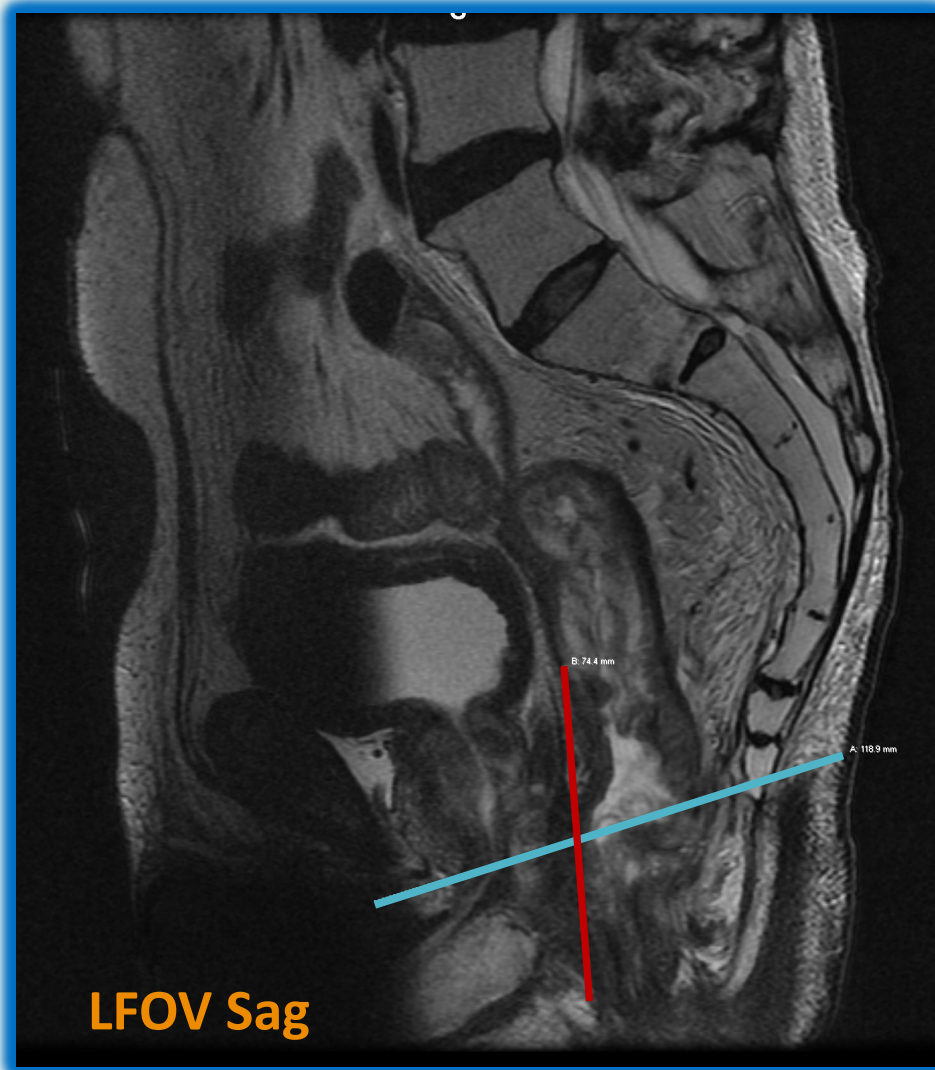
■ a) To L4/L5

■ b) To L5/S1

■ c) To S1/2

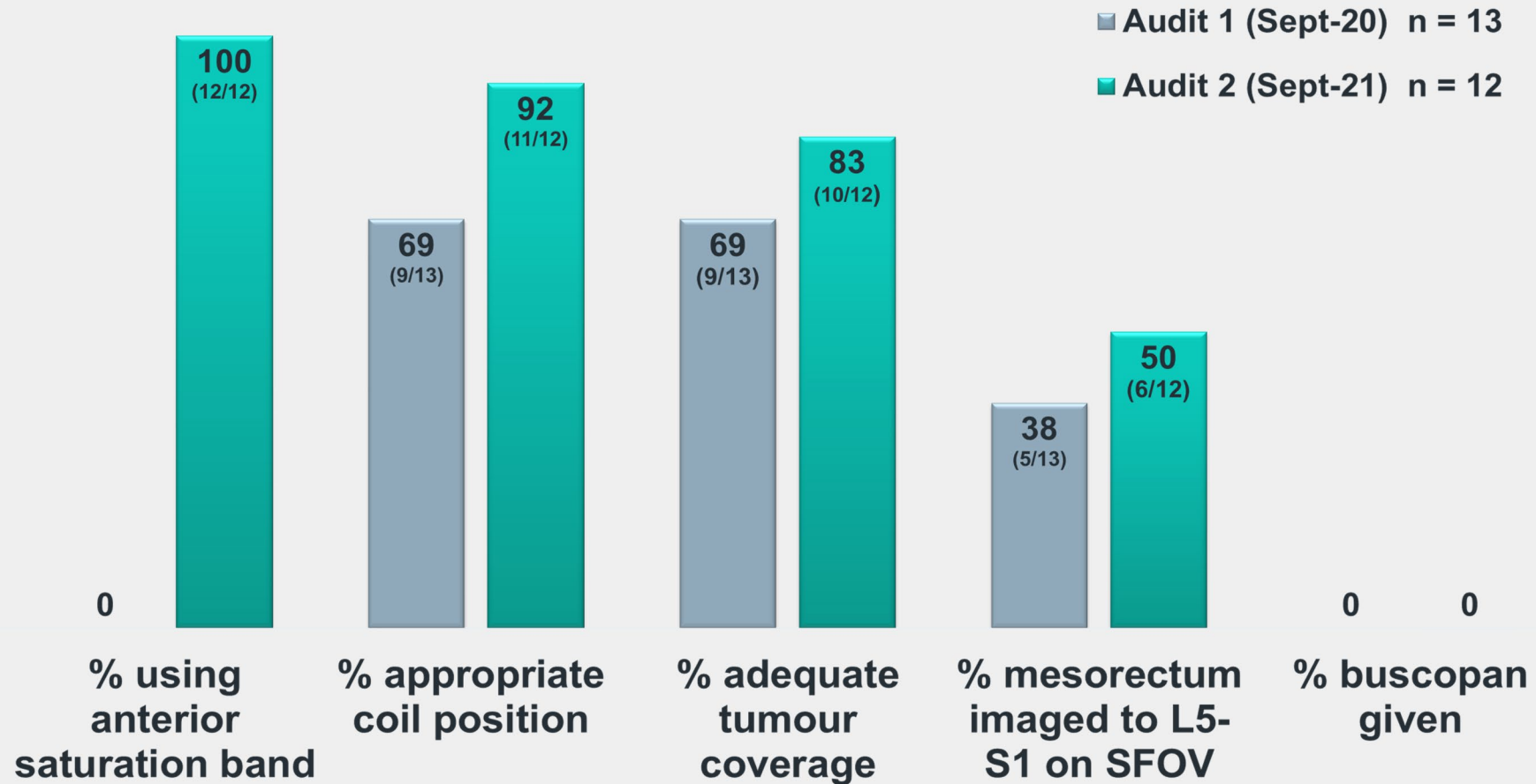


# Case review

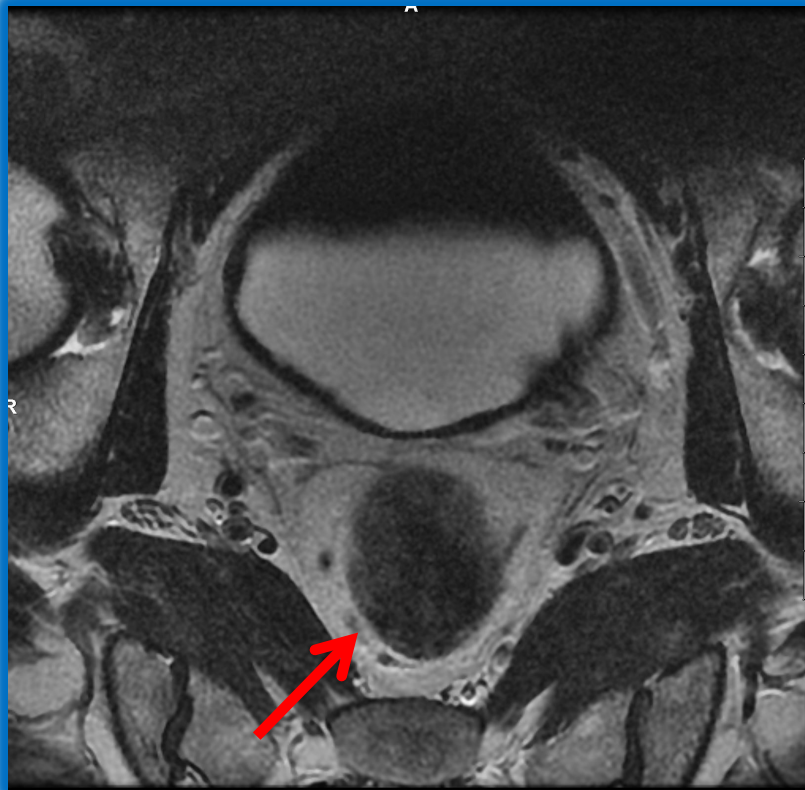


## Results – Audit 2

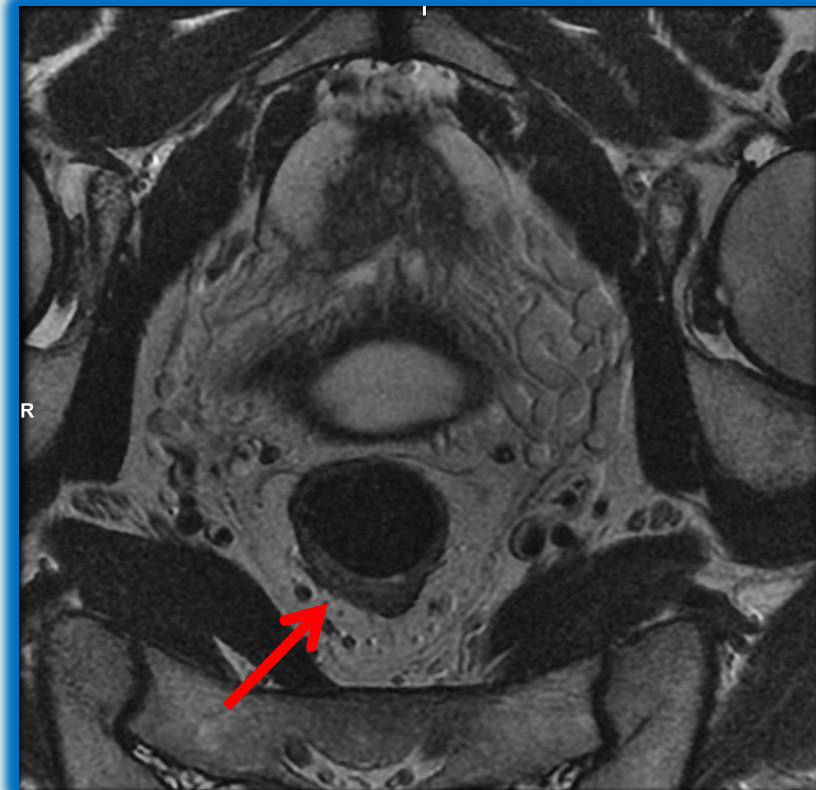
### Overview of rectal MRI adherence to RCR guidelines



## Intervention 3: Use of antispasmodics



**SFOV, no buscopan,  
24/09/2021**

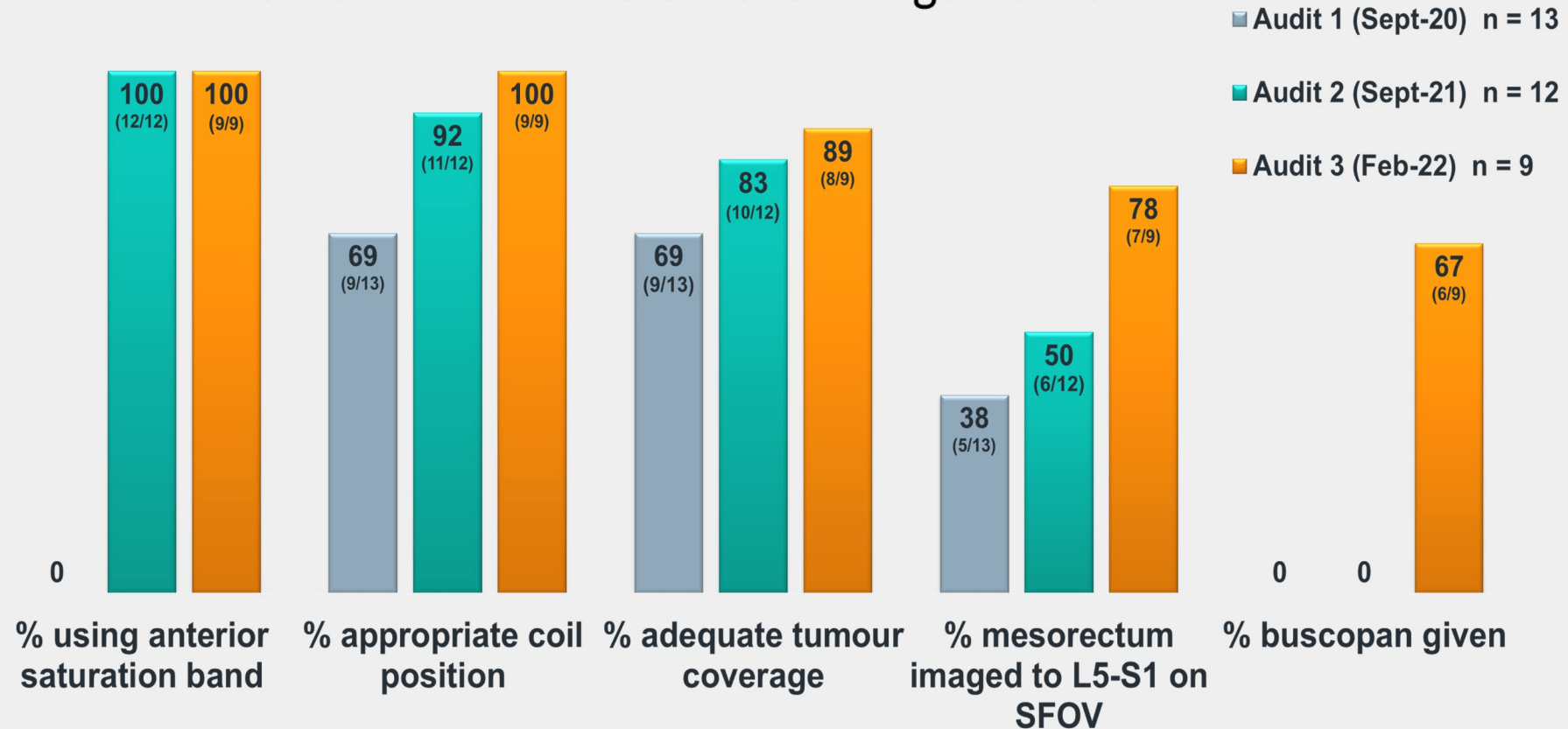


**SFOV, repeat with  
buscopan, 01/10/2021**



# Results – Audit 3

## Overview of rectal MRI adherence to RCR guidelines



# Conclusion

- Following our interventions there has been significant improvements to the quality of our rectal MRI scans and our team's technical performance.
- It has optimised the staging of rectal cancer in our department, and led to increased confidence in multidisciplinary decision making.
- Since this project IM training for radiographers and initial sequence optimisation on new MRI scanners has been completed.
- Future directions include radiographers to attend lower GI MDTs.