

ALIGNING JETS SEDATION KEY PERFORMANCE INDICATOR MEASUREMENTS WITH CURRENT UK STANDARDS – DOES THIS AFFECT TRAINEE OUTCOME?

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INTRODUCTION

- Key performance indicators (KPIs) are applied during UK endoscopy training to determine quality and safety of endoscopy.
- However, the measurement of sedation KPIs differed between JETS certification criteria and UK colonoscopy guidelines (**Table 1**).
- To align standards, 2 changes were made to JETS:
 - Median vs. mean for averaging doses of sedation (when used)
 - Reducing average midazolam threshold (when used) in patients aged 70+ from a mean of 2.5mg to a median of 2mg.
- We aimed to assess the potential impact of these changes on trainee certification.

Averaging method	JETS		UK / NED	
	Mean	Median	Mean	Median
Patient Age	<70	70+	<70	70+
Midazolam	≤5mg	≤2.5mg	≤5mg	≤2mg
Fentanyl	≤100mcg	≤50mcg	≤100mcg	≤50mcg
Pethidine	≤50mg	≤25mg	≤50mg	≤25mg

Table 1: Differences between JETS and NED KPIs

METHODS

- A validation cohort was selected, comprising trainees awarded provisional colonoscopy certification (PCC) between June 2011-2016.
- Calculations were applied to JETS entries in the 50 procedures before PCC to determine impact on PCC.
- Normality testing was performed using the Shapiro-Wilk method, where $p < 0.05$ was suggestive against a normal distribution, which would favour use of median over mean as the averaging method.
- KPI data calculated from means and medians were compared using Wilcoxon and McNemar's tests.

RESULTS

- 36650 procedures were analysed for 733 trainees.
- Midazolam was used in 76%, fentanyl in 50% and pethidine in 25%.
- At trainee-level, the change from mean to median resulted in a significant reduction in average doses of midazolam, fentanyl and pethidine (**Figure 1**), with lower estimates in 42%.
- Use of median was supported by normality testing, which indicated the skewed distribution of sedation doses (Shapiro-Wilk: $p < 0.001$).
- Less trainees exceeded the 2.5mg midazolam JETS criterion in patients aged 70+ (**Table 2**) when averaged with median (4.4%) vs. mean (8.1%) [$p < 0.001$].
- The proportion of trainees who exceeded sedation thresholds increased from 8.1% (JETS criteria) to 10.7% (UK/NED criteria), suggesting that the alignment may impact certification in 1 out of 38 trainees.

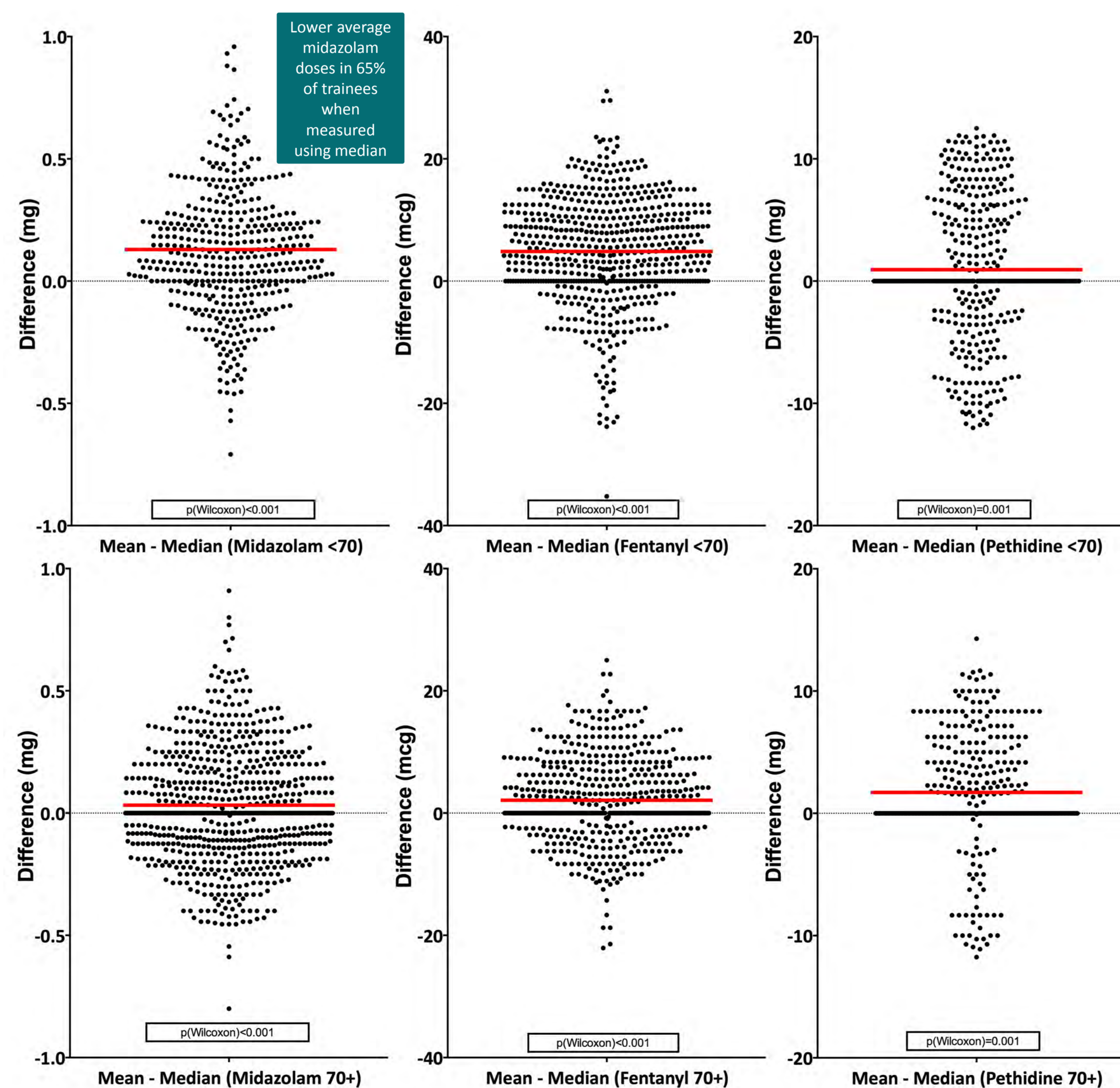


Figure 1: Differences between mean and median KPI calculations

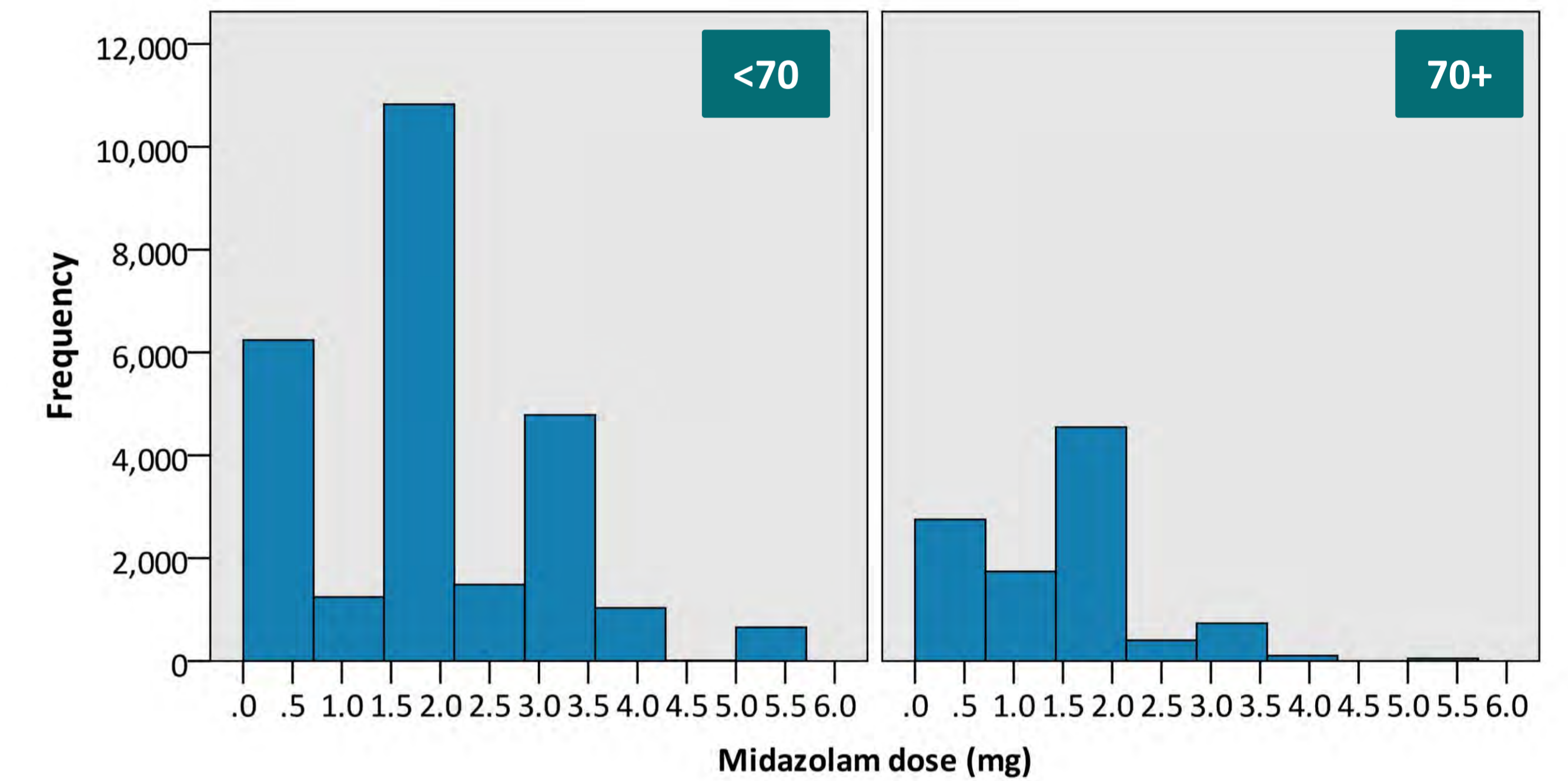


Figure 2: Distribution of sedation dosages (midazolam)

	Midazolam		Fentanyl		Pethidine	
	<70	70+	<70	70+	<70	70+
Patient Age	<70	70+	<70	70+	<70	70+
Eligible Trainees	732	729	607	579	392	346
KPI based on mean (mg)	2.3	1.9	59.3	50.0	37.5	29.2
KPI based on median (mg)	2.0	2.0	50.0	50.0	37.5	25.0
Trainees > mean dose	1 (0.1%)	59 (8.1%)	1 (0.2%)	1 (0.2%)	0	3 (0.9%)
Trainees > median dose	0	32 (4.4%)	0	0	0	1 (0.3%)
Trainees > median of 2mg midazolam in 70+ yrs	-	78 (10.7%)	-	-	-	-

Table 2: Impact of sedation KPI calculations on trainee metrics

CONCLUSION

- As sedation doses follow a skewed distribution, sedation KPIs should be calculated using medians.
- Endoscopists are more likely to exceed sedation KPI thresholds when averaged using means.
- Measurements of JETS sedation KPIs have aligned with 2016 UK guidelines, which may impact on colonoscopy certification.
- All endoscopy trainees and trainers should be aware of this alignment, particularly with midazolam use in patients aged 70+.