

A comparison between PIEB/PCEA and midwife-delivered epidural bolus for labour analgesia on patient satisfaction, mobility and staff workload

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Introduction

Lumbar epidural remains gold standard for labour analgesia. Modes of epidural maintenance include intermittent epidural bolus (PIEB), continuous epidural infusion (CEI), patient-controlled epidural analgesia (PCEA) or a combination [1]. Until January 2025, we used midwife-led top-ups of 10-20ml of 0.1% bupivacaine + 2mcg/ml fentanyl. When we introduced a PIEB + PCEA regime (7ml/hour autobolus + 6ml demand, lockout 20 minutes), we found minimal published data comparing this regime to midwife top-ups. We surveyed our patients, midwives and anaesthetists on analgesia satisfaction, mobility and anaesthetists and midwives workload and the outcomes for both modes were compared.

Method

We used electronic Yes/No/Maybe questionnaires between October to December 2024 to assess the impact of midwife-led epidural top ups on a) midwife-reported delay in provision of pain relief and impact on workload b) patient-reported delay in receiving analgesic relief, breakthrough pain and inability to mobilise during labour and c) anaesthetist requirement for epidural troubleshooting.

In January 2025, the trust implemented PIEB/PCEA epidural maintenance setting alongside NR fit epidural pumps for labour analgesia. A repeat survey was performed with the same questionnaires between September to November 2025, 9 months after the implementation. Responders were allowed to free text elaborations to their responses at the end of the survey. The outcomes for both modes were analysed using Chi-Square statistical test. The project was registered locally with the Clinical Audit Department.

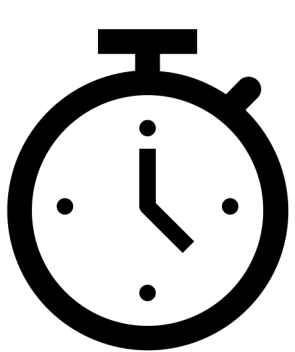
Results

	Midwife-Led Top Up (N=70)	PIEB/PCEA (N=62)
Midwife	21	24
Patient	30	31
Anaesthetist	19	7

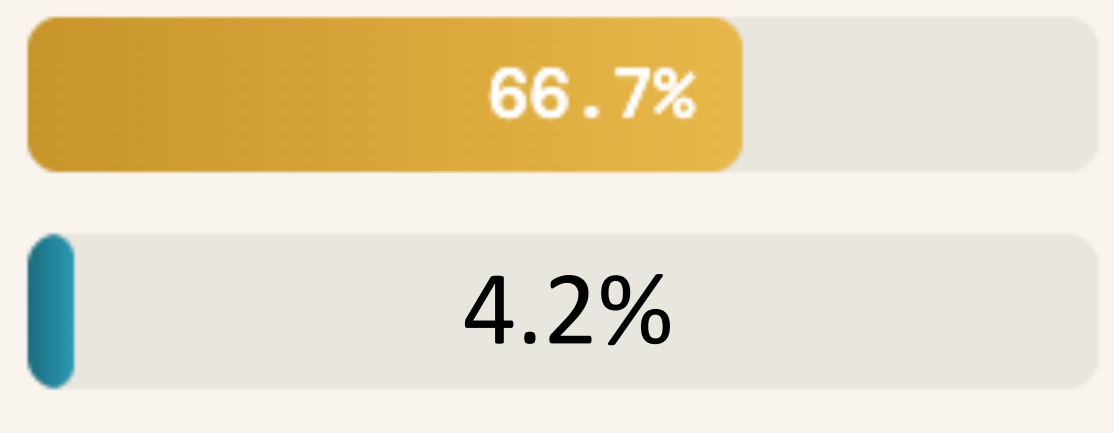
Table 1: Number of responses to questionnaires sent to midwives, patients and anaesthetists in the midwife-led epidural top up and PIEB/PCEA regime group

MIDWIVES

Delay in Pain Relief



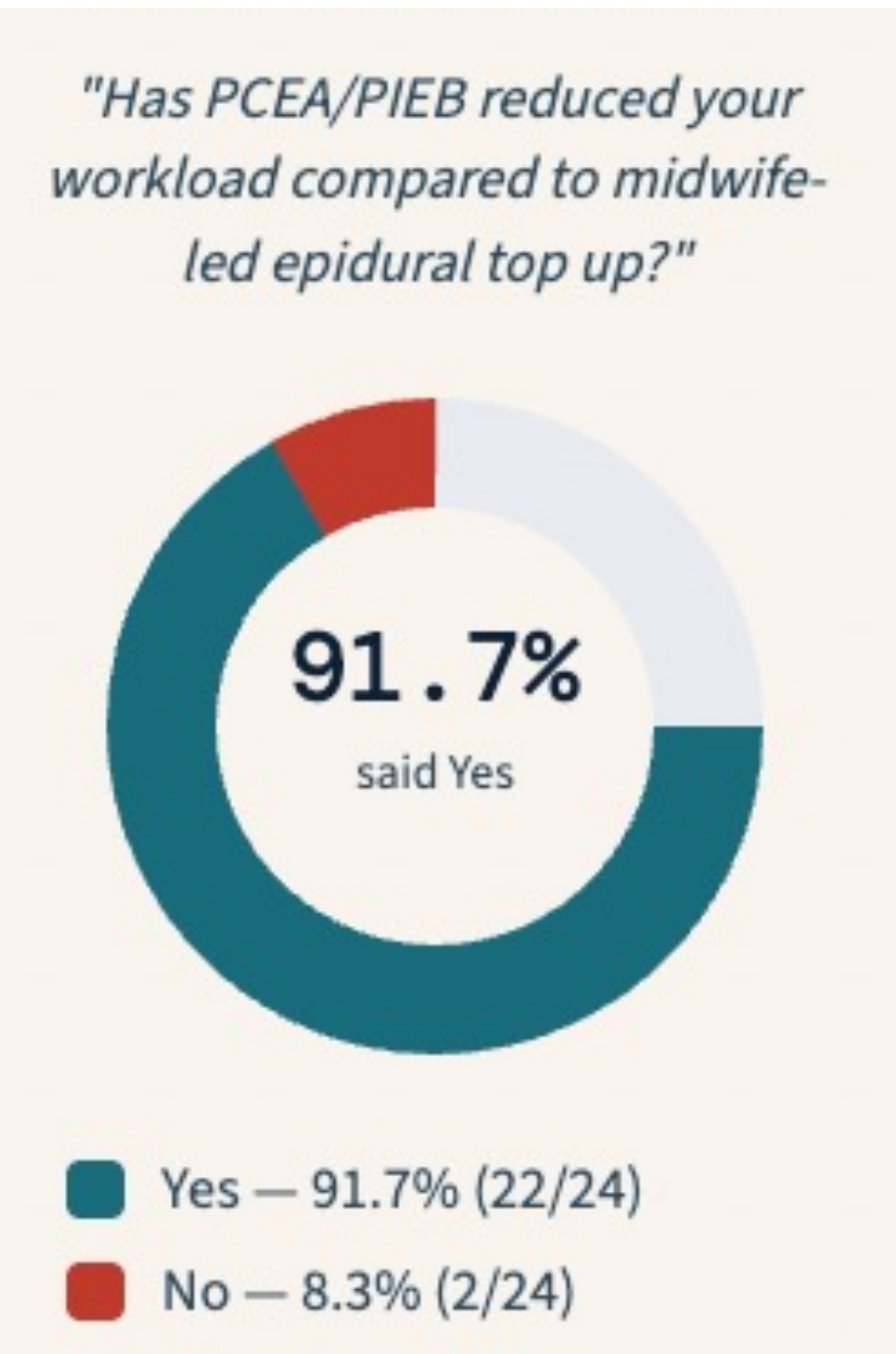
Midwife-led Epidural Top Up



PIEB/PCEA

$\chi^2 = 18.73 \mid \text{df} = 1, p < 0.001$

Impact on Workload

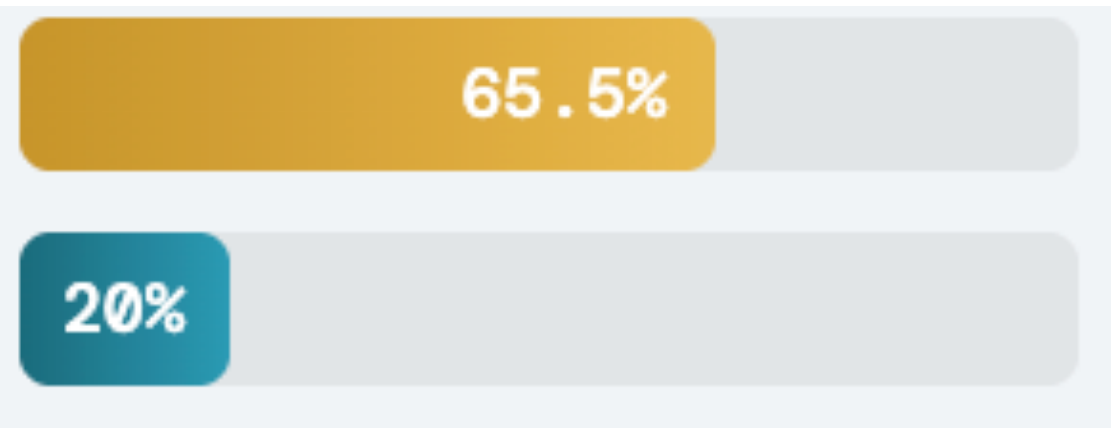


PATIENTS

Breakthrough Pain



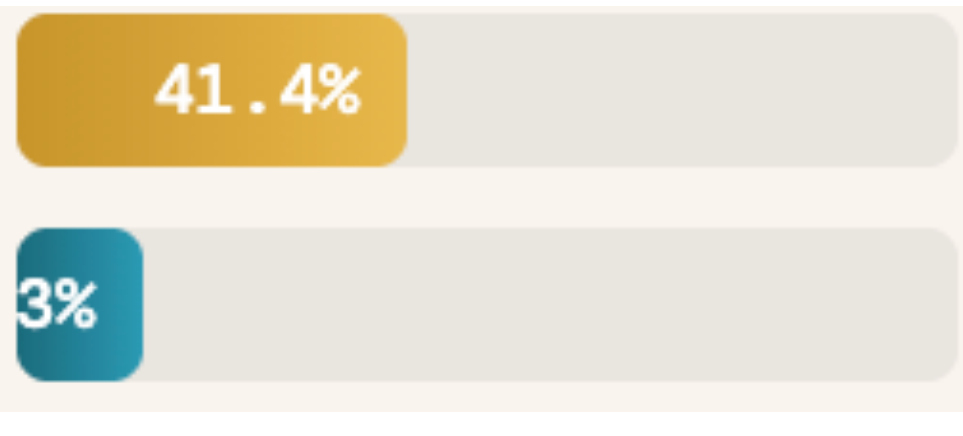
Midwife-led Epidural Top Up



PIEB/PCEA

$\chi^2 = 12.87 \mid \text{df} = 1$
 $p = 0.003$

Delay in Obtaining Top Up



$\chi^2 = 5.88 \mid \text{df} = 1$
 $p = 0.015$

Inability to Mobilise



$\chi^2 = 2.41, \text{df} = 1$
 $p = 0.124$

Free-text responses from midwives regarding impact on workload noted an overall decrease in workload during labour with the PIEB/PCEA regime. However, postnatally, due to a delayed resolution of motor blockade, there was an increase in workload and decrease in discharge to postnatal ward affecting patient flow compared to the older regime.

Discussion

PIEB/PCEA reduced breakthrough pain and delay in obtaining top-ups amongst patients. However, we noted a significant increase in inability to mobilise during labour. Whilst midwives reported a reduction in workload during labour with PIEB/PCEA, they reported an increase in workload postnatally due to delayed resolution of motor blockade and delayed discharged to the postnatal ward.

With a current national shortage of low dose bupivacaine/fentanyl mixtures and stronger solutions being supplied, we have now switched to a PCEA-only mode and continue to monitor levels of satisfaction and motor block. We propose that low dose ropivacaine solutions are made available in the UK to enable satisfactory analgesia with reduced motor blockade.

References

- Sng BL, Sia ATH. Maintenance of epidural labour analgesia: the old, the new and the future. *Best Practice and Research Clinical Anaesthesiology* 2017; **31**: 15–22.