
Epidural Test Dose Survey Following NAP7 : A National Survey of UK Obstetric Anaesthetists.

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Abstract

Background

Correct confirmation of epidural catheter placement is fundamental to safe labor epidural analgesia. The Royal College of Anaesthetists' Seventh National Audit Project (NAP7) highlighted serious complications associated with neuraxial drug administration and reinforced the importance of safe epidural practice. However, the extent to which these recommendations have influenced routine obstetric anaesthetic practice remains unclear.

Aim

To evaluate current epidural test-dose practices among UK obstetric anaesthetists following publication of NAP7.

Methods

An anonymous electronic cross-sectional survey was distributed to members of the Obstetric Anaesthetists' Association (OAA). Questions examined clinicians' experience, preferred epidural test-dose solutions, timing of administration of subsequent local anaesthetic, loading doses, awareness of NAP7 recommendations, and changes in practice following publication of the report. Data were analyzed descriptively and presented as frequencies and percentages.

Results

A total of **310 clinicians** completed the survey. Most respondents (**67.7%**) had more than 10 years of obstetric anesthesia experience, while 24.8% had 5–10 years and 7.4% had less than 5 years. Five minutes was the most reported interval before administration of additional local anaesthetic following a test dose (55.2%). Levobupivacaine 0.125% was the most frequently selected standardized test-dose solution, although considerable variation existed, with many respondents using locally prepared low-dose epidural mixtures. 10ml was the commonest initial epidural dose for labor analgesia (49.4%). 45 % of respondents were aware of NAP 7 recommendations. 65% of the respondents did not change their practice following NAP 7 recommendations. Free-text responses demonstrated substantial variation in practice and highlighted differences in interpretation of the role of epidural test doses.

Conclusion

This national survey demonstrate considerable heterogeneity in contemporary UK obstetric epidural test-dose practice despite publication of NAP7 recommendatons . National consensus guidance and further research are required to determine optimal practice and improve patient safety.

Keywords: labor epidural, epidural test dose, NAP7, obstetric anesthesia, patient safety, survey.

Introduction

Labor epidural analgesia remains the gold standard for pain relief during childbirth and is among the most frequently performed regional anaesthetic procedures in the United Kingdom. Although generally safe, inadvertent intrathecal or intravascular catheter placement continues to represent an important cause of preventable maternal morbidity.

The Royal College of Anaesthetists' Seventh National Audit Project (NAP7) reviewed perioperative cardiac arrests across the UK and highlighted avoidable complications associated with neuraxial techniques, including unrecognized intrathecal injection of epidural local anaesthetic. NAP7 recommends a test dose of local anaesthetic solution should not exceed the equivalent of 10mg bupivacaine (10ml of 0.1% bupivacaine and 2 mcg / ml fentanyl).

The report emphasized careful confirmation of catheter position before administration of larger doses of local anaesthetic and recommended adoption of safer, standardized practices.

Despite these recommendations, obstetric epidural practice varies between institutions. Previous literature has demonstrated differences in the composition of test doses, timing of administration, and interpretation of clinical signs following injection. The absence of universally accepted guidance has resulted in considerable reliance on local protocols and individual clinician preference.

This survey was undertaken to evaluate current epidural test-dose practice among UK obstetric anaesthetists and to assess the influence of NAP7 recommendations on clinical practice.

Methods

Study design

A national anonymous cross-sectional survey was conducted using the Obstetric Anaesthetists' Association (OAA) electronic survey platform.

Participants

Consultants, Specialty doctors, SAS doctors, fellows and trainees involved in obstetric anaesthesia across the United Kingdom were invited to participate.

Survey design

The questionnaire comprised multiple-choice and free-text questions exploring:

- years of obstetric anaesthesia experience
- preferred local anaesthetic solution for epidural test dosing
- interval before administration of further local anaesthetic
- volume of initial epidural loading dose
- awareness and implementation of NAP7 recommendations
- perceived changes in clinical practice following NAP7.

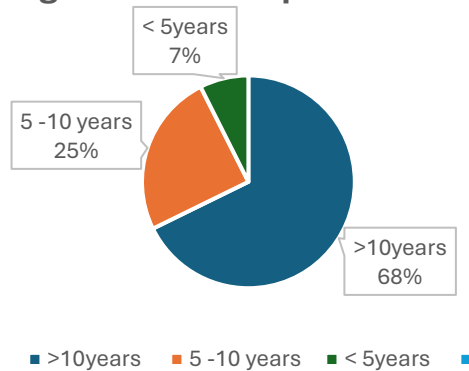
Participation was voluntary and anonymous.

Statistical analysis

Survey data were analyzed using descriptive statistics. Categorical variables are presented as frequencies and percentages. Qualitative free-text comments were reviewed to identify recurring themes.

RESULTS

Fig 1 .Years of experience



Respondent characteristics

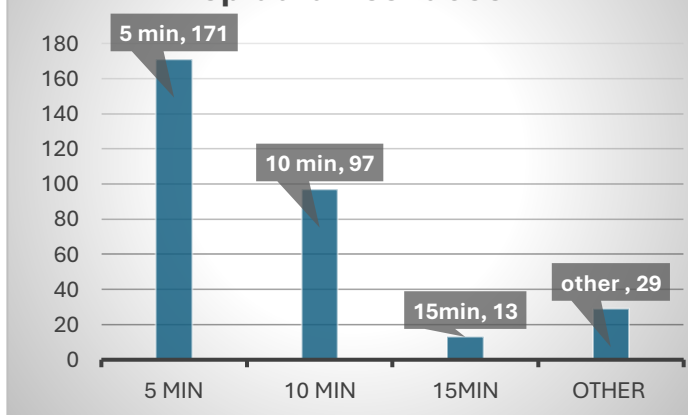
A total of **310 clinicians** completed the survey.

Experience in obstetric anesthesia:

The survey population therefore largely represented experienced obstetric anesthesiologists.

Timing before administration of additional local anaesthetic

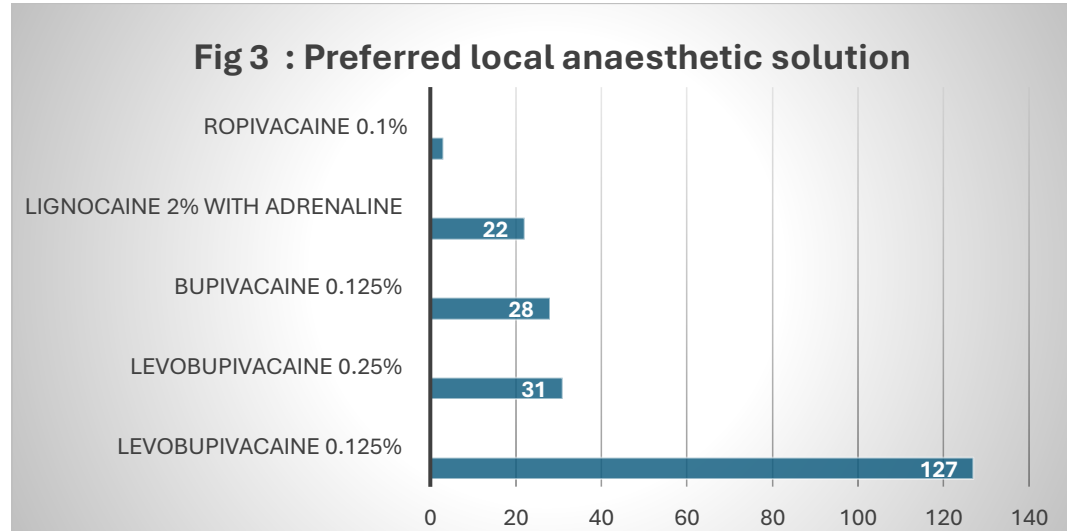
Fig 2 : Interval following epidural test dose



The most reported interval following epidural test dosing was: 5 minutes.

Several respondents commented that no additional waiting period was necessary because the initial loading dose itself constituted the test dose.

Preferred local anaesthetic solution for epidural test dose



Levobupivacaine was the most preferred local anaesthetic for epidural test dosing (223 responses). The most frequently selected concentration was 0.125% (127 responses), followed by 0.25% (31 responses). A further 16 respondents preferred 0.1% levobupivacaine alone, while 25 reported using a low-dose epidural mixture of 0.1% levobupivacaine with fentanyl 2 micrograms/ml.

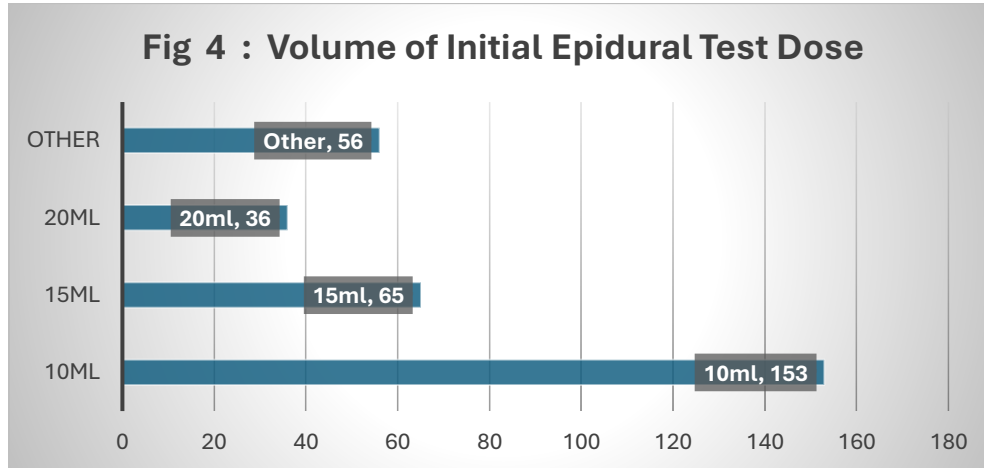
- Levobupivacaine 0.125% (127 responses)

Other commonly reported preparations included:

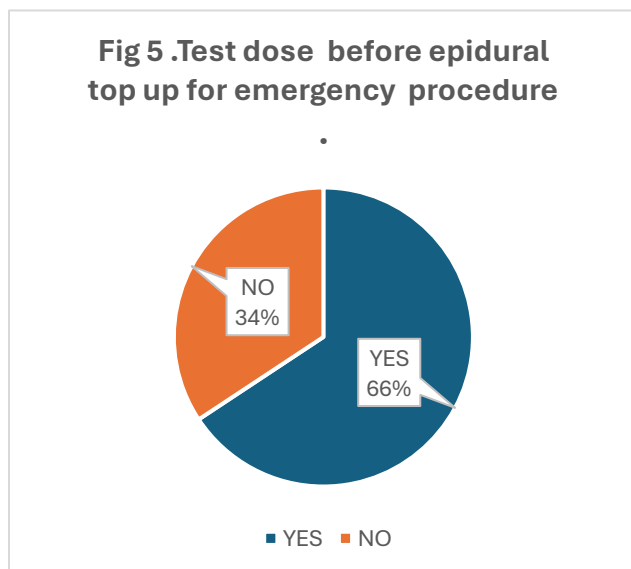
- Levobupivacaine 0.25%
- Bupivacaine 0.125%
- Low-dose premixed levobupivacaine/fentanyl solutions
- Institution-specific "bag mix" preparations

More than one-third of respondents entered free-text answers describing locally prepared low-dose mixtures, demonstrating substantial heterogeneity in practice.

Initial epidural dose volume



10 ml was the most frequently used initial epidural test dose volume, However many respondents explained that their "test dose" and therapeutic dose were identical.



Emergency Epidural Top-up Practice

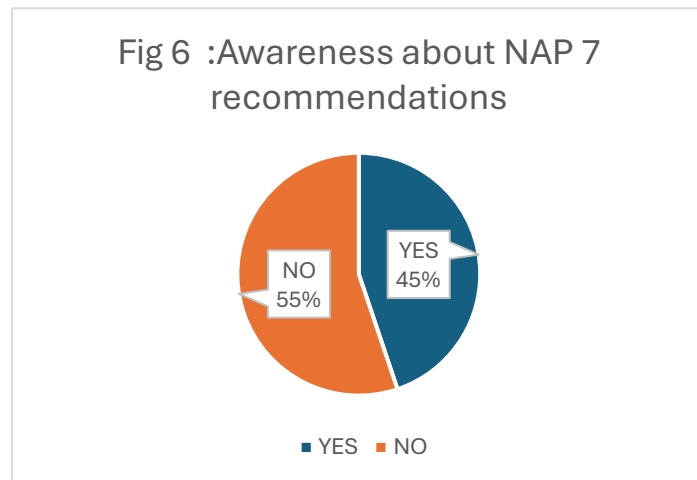
Figure 5 demonstrates practice during emergency Caesarean section.

Most clinicians reported administering an initial small aliquot before full epidural topup.

Awareness of NAP7 recommendations for epidural test dose .

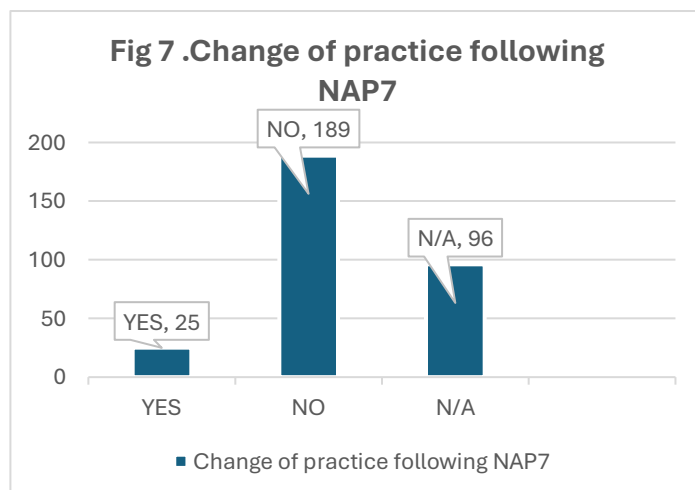
Figure 6 demonstrates awareness of NAP7 recommendations.

Although 45% of respondents were aware of NAP7 recommendations, a notable proportion were either unaware or uncertain)



Change of practice following NAP 7 recommendations.

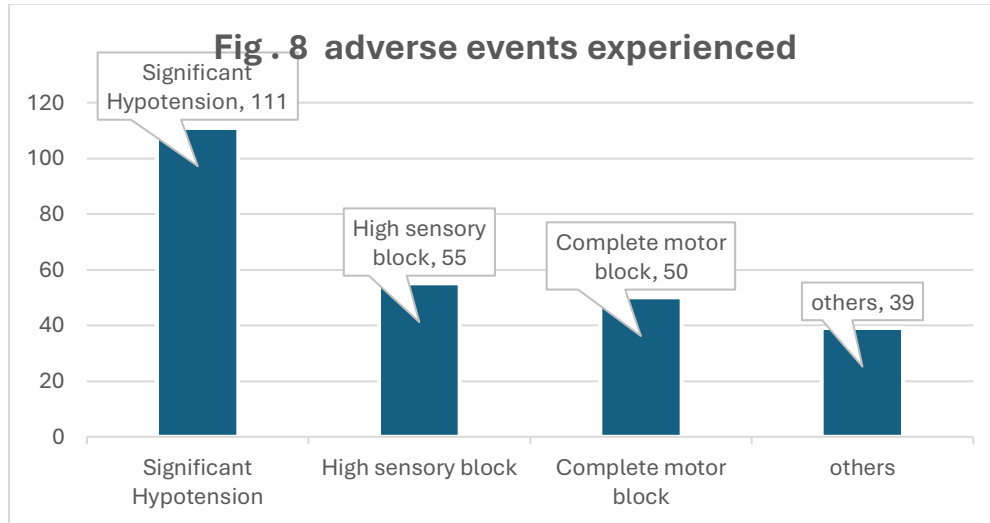
61 % of respondents reported no change of practice following NAP 7 recommendations.



Reported Adverse Events

Figure 8 summarizes reported adverse events.

The majority reported no serious adverse events.



Qualitative findings

Free-text comments identified several recurring themes:

- Many clinicians regard every epidural bolus as a test dose;
- increasing use of low-concentration levobupivacaine with fentanyl rather than traditional lidocaine-based test doses;
- variation in the interpretation of NAP7 recommendations;
- practice influenced predominantly by local departmental protocols;

Discussion

This survey provides a contemporary snapshot of epidural test-dose practice among UK obstetric anesthetists following publication of NAP7. The findings demonstrate substantial variability despite widespread awareness of patient safety principles.

Most respondents had extensive obstetric anesthesia experience, suggesting that the results reflect established clinical practice rather than trainee behavior.

Although 5 minutes was the most frequently reported interval before further epidural dosing, considerable variation was observed, reflecting differences in local protocols and clinician preference.

The survey also demonstrated marked heterogeneity in the choice of local anaesthetic solutions. While levobupivacaine 0.125% was the most frequently selected standardized preparation, many clinicians reported using institution-specific low-dose mixtures containing levobupivacaine with fentanyl. These findings illustrate the lack of national consensus regarding the optimal composition of an obstetric epidural test dose.

Interestingly, numerous respondents stated that the first therapeutic dose itself functions as the epidural test dose. This approach reflects evolving obstetric practice favoring low-concentration local anaesthetic solutions and incremental administration rather than the traditional lidocaine–adrenaline test dose. Although such practice may reduce motor block and improve maternal satisfaction, it relies heavily on careful clinical observation and may not provide a uniform strategy for detecting intrathecal or intravascular catheter placement.

NAP7 recommends a test dose of local anaesthetic solution should not exceed the equivalent of 10mg bupivacaine (10ml of 0.1% bupivacaine and 2 mcg / ml fentanyl).

This dose allows the recognition of intrathecal catheter while minimizing the risk of high neuraxial block. The observed variation suggests that opportunities remain for standardizing practice through national guidance, departmental protocols, and educational initiatives.

Strengths

- National survey of practicing obstetric anesthetists.
- Large sample of experienced clinicians.
- Timely assessment following publication of NAP7.
- Inclusion of qualitative comments providing insight into clinical decision-making.

Limitations

- Voluntary participation may introduce response bias.
- Self-reported practice may differ from observed clinical behavior.
- The survey was not designed to assess patient outcomes or determine whether specific practices influence complication rates.

Conclusion

This national OAA survey demonstrates substantial variation in epidural test-dose practice across UK obstetric units following publication of NAP7. Although many clinicians have adopted low-dose incremental techniques consistent with contemporary obstetric practice, considerable differences remain regarding local anaesthetic selection, timing of dosing, and interpretation of the role of epidural test doses. These findings support further discussion within the obstetric anesthesia community regarding standardization of practice and development of evidence-based national guidance.

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