# Unsuccessful conversion of epidural analgesia to epidural anaesthesia in obstetric patients

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## Introduction and Aims

Regional anaesthesia (RA) is preferable and safer than general anaesthesia (GA) in the obstetric population. The RCoA have audit standards for the rate of Caesarean sections (CS) performed under RA and for conversion of RA to GA.[1] There are no published standards for rates of successful conversion of epidural analgesia to epidural anaesthesia in obstetrics. Studies suggest up to a 26% failure rate.[2] Women are informed of a 5% risk of conversion to GA for CS despite having an intrapartum epidural.[3]

We aimed to:

1) Compare performance at St Helier Hospital, with results from the same audit conducted in 2015, to the RCoA standards for technique and failure rates in CS.
2) Compare the rate of unsuccessful conversion of epidural analgesia to epidural anaesthesia to national and locally proposed standards.

## Results

There were 717 CS during this period, 30 of which were performed under GA. 11 of these were converted from RA.

Table 1 shows the rates of RA and conversion of RA to GA subdivided into category of CS and compared to the national standards and the results from 2015.

| | CS performed under RA | | | RA to GA conversion | | |
|---|---|---|---|---|---|---|
| | Target | 2015 | 2021 | Target | 2015 | 2021 |
| Cat 1 | >50% | 57% | 70% | <15% | 3% | 3% |
| Cat 2 – 3 | >85% | 88% | 97% | <5% | 2% | 2% |
| Cat 4 | >95% | 97% | 99% | <1% | 0.4% | 0.8% |

Table 1: Rates of RA and conversion of RA to GA

261 patients with intrapartum epidurals went to theatre. 60 were not topped up and 16 women had failed top ups, this resulted in 76 unsuccessful conversions of epidural analgesia to anaesthesia. Figure 1 is a patient flow diagram showing an overview of patient outcomes with regards to attempted anaesthetic techniques.

The rate of unsuccessful conversion of epidural analgesia to anaesthesia was **26%**.
The rate of failure of epidural anaesthesia requiring conversion to GA was **3%.**

Table 2 shows a comparison of patients with successful epidural top ups and failed epidural top ups.
There were no differences found in time of day, grade of anaesthetist or choice of epidural drugs when comparing failed and successful top ups. Most block assessments were performed using only cold modality and no lower level was documented across both groups.

| | Failed top ups | Successful top ups |
|---|---|---|
| **Intrapartum epidural assessments** | 20% | 8.5% |
| **Epidural assessment immediately prior to top up** | 53% | 25% |
| **Local anaesthetic volume >20mls** | 33% | 0% |

Table 2: Comparison of failed and successful epidural top-ups

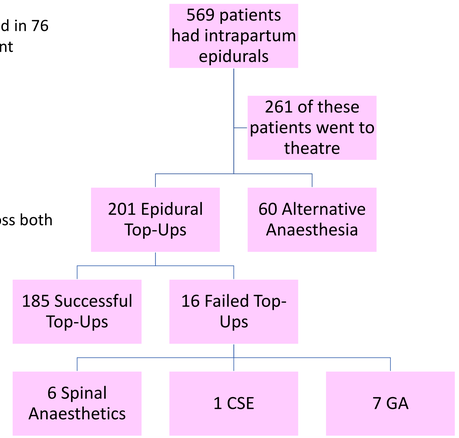



Figure 1: Patient flow diagram

## Methods

Local audit committee approval was given. All women who had a CS from August 2020 to August 2021 at St Helier Hospital were identified from the obstetric anaesthesia database. Data were analysed and compared to the RCoA standards.

Following this, all women who had an intrapartum epidural and then went to theatre from August 2020 to August 2021 were identified.

The rate of GA for obstetric procedures in women with an intrapartum epidural was compared to the OAA quoted risk for CS (<5%). The rate of unsuccessful conversion of epidural analgesia to anaesthesia was compared to a locally proposed target of 25%. Unsuccessful conversion was defined as all women who had an intrapartum epidural but had a secondary regional or general anaesthetic.

The notes of patients with failed epidural top ups (epidurals topped up in theatre with subsequent secondary anaesthetic) was compared to a sample of notes of patients who had successful epidural top ups. Data was collected on the grade of anaesthetist, time of day, epidural top up drugs and volume and assessment of the epidural intrapartum, immediately prior to top up and before to knife to skin.

## Discussion

The rates of RA were above the national standard and rates of conversion for RA to GA below the suggested number. These had largely improved since the previous trust audit.

Whilst the rate of conversion of epidural anaesthesia to GA was within the standard, unsuccessful conversion of epidural analgesia to epidural anaesthesia was above the proposed target. The following suggestions may improve these rates:

- Improved intrapartum **epidural assessments**
- Consideration of the appropriate **volume of LA** required for adequate anaesthesia
- Documentation of efficacy of block using **2 modalities** (including touch) and recognition of failed top up prior to knife to skin
- Use of **ropivicaine** for improved quality of block (only lidocaine and bupivacaine are currently available at the trust)

The main limiting factors of this audit are the small sample size and reliance on documentation of testing.
Further work includes exploring a subset of notes of patients whose epidurals were not topped up and assessment of rate of intraoperative pain in successful epidural top ups.

## References

1. Purva M, Kinsella S Raising the standards: RCoA Quality Improvement Compendium, 2020
2. Orbach-Zinger S et al. Risk factors for failure to extend labour analgesia to epidural anaesthesia for cesarean section. 3. Acta Anaesthesiol Scand 2006; 50: 1014-1018
3. OAA Epidural Information Card 2021 https://www.labourpains.com/Epidural-Information-Card