

# Maternal critical care: room for improvement?

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## Abstract

The requirement for critical care in the lead up to or following delivery is likely to increase as maternal age and comorbidities increase. This audit evaluated the current service offered at a medium sized district general hospital.

The electronic notes of all pregnant (beyond 20 weeks) or recently pregnant (up to 6 weeks postpartum) patients admitted to ICU across the audit period (31 months) were reviewed.

There were 25 such admissions, representing 0.20% of all maternity bookings and 1.37% of total admissions to the ICU across this time. Of these, 80% were postpartum. Most required mechanical ventilation (92%) and vasopressor support (56%). Daily obstetric review occurred for most patients (84%) but midwifery review was only documented for 28% of patients. For those with live infants, only 3 had physical contact with them while in ICU (17%). 28% did not receive appropriate VTE prophylaxis.

This audit demonstrates a small but significant link between our obstetric and intensive care units. These admissions are largely short with prompt discharge back to labour ward but do require a high level of care. The significant psychological distress caused by unexpected ICU admission for these patients has been recognised in the national guidance and we will look at ways our service can be improved to offer the highest level of care for these patients.

## Introduction

Admission of pregnant or recently pregnant women to intensive care is uncommon but can cause significant stress for those involved in their care. The rates of illness in the maternal population are likely to increase as maternal age and comorbidities increase. It can also cause psychological upset for the woman and her family with guidance that all of these women should be offered follow up by the critical care team [1].

The recent MBRRACE report [2] has shown static levels of maternal mortality and continued to highlight the importance of providing equitable critical care for these patients.

Previous audits have looked at the rates of admission and maternal outcomes. The purpose of this audit was to evaluate the critical care provided in our medium sized district general hospital to pregnant or recently pregnant women against those standards set out in national guidance and to identify broad areas for improvement.

## Standards

All standards were taken from the documents published by the Faculty of Intensive Care Medicine, Royal College of Anaesthetists, Royal College of Obstetricians and Gynaecologists and Obstetric Anaesthetists Association [1,3].

The basic standards were:

- Review by Obstetric and Midwifery teams at least every 24 hours
- Appropriate VTE prophylaxis prescribed and administered
- Supported contact between mother and baby if possible
- Record of handover to appropriate medical team on discharge from ICU

The maternal characteristics, level of care received, organ support required, length of stay, admission and discharge location and reason for admissions were also reviewed.

## Materials and Methods

This project was registered with the local Quality and Audit Department (Ref: FH401).

All admissions of pregnant women beyond 20 weeks gestation and recently pregnant women up to 6 weeks postpartum were identified using a prospectively maintained database, the intensive care unit computer system (MetaVision - iMDsoft) and the maternity record system (CMiS - HD Clinical). The electronic hospital records from all admissions to the ICU meeting these criteria from 1st January 2019 to July 31st 2021, were reviewed.

A comprehensive notes review of all consultant ward rounds, daily medical and nursing reviews and specialty documentation was conducted and the observations and drug charts reviewed. Additional information was gathered from the trust electronic data management system and CMIS.

## Results

Across the 31 month audit period, there were 25 admissions meeting the criteria set out above representing 22 unique patients. Of these, 20 admissions were postpartum. The characteristics of these patients are summarised in table 1 and chart 1.

These represented 1.37% of all ICU admissions, 0.24% of all deliveries and 0.20% of all booked pregnancies across this time.

	Median	Mean	Minimum	Maximum
Age at admission	32	31.24	19	42
Parity	2	2.12	1	8

Table 1. Baseline characteristics off all audited admissions

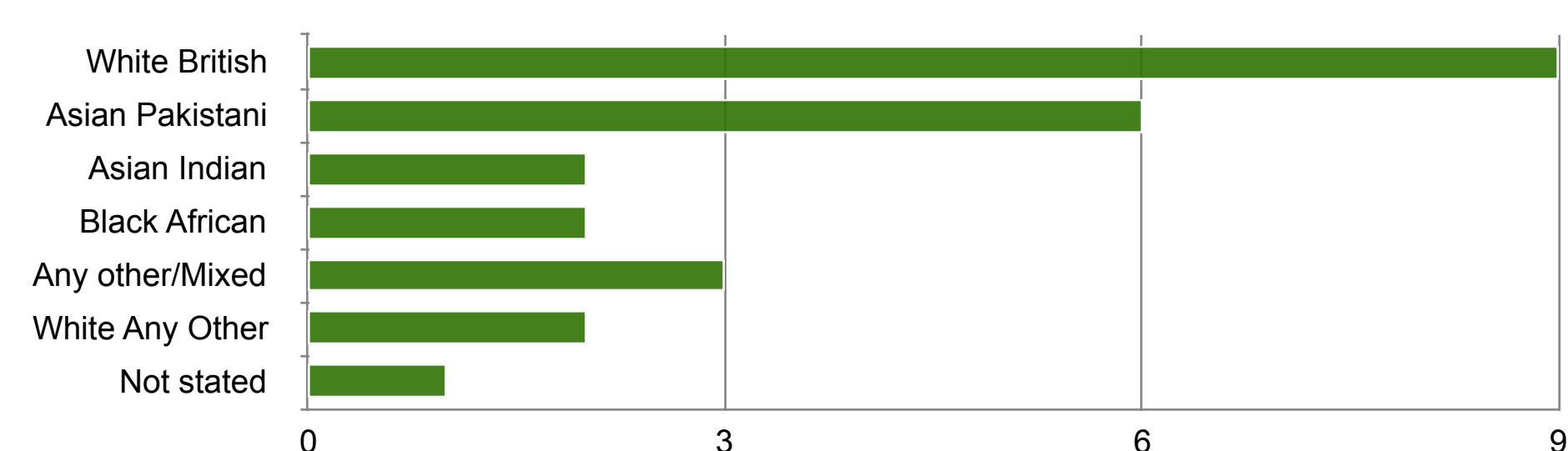


Chart 1. Audited patients in each ethnic group

## Results

Median length of stay was 31 hours and 15 minutes, ranging from 11 hours 38 minutes to 212 hours and 28 minutes. 23 patients required level 3 support with invasive ventilation. Length of organ support is detailed in table 2.

	Median	Mean	Minimum	Maximum
Ventilation	15h 44m	29h 6m	3h 33m	180h 45m
Vasopressors	15h 8m	25h 25m	2h 11m	101h 14m

Table 2. Length of organ support across those patients requiring it in hours and minutes.

The most common reason for admission was due to obstetric pathology and the admission diagnoses are shown in chart 2.

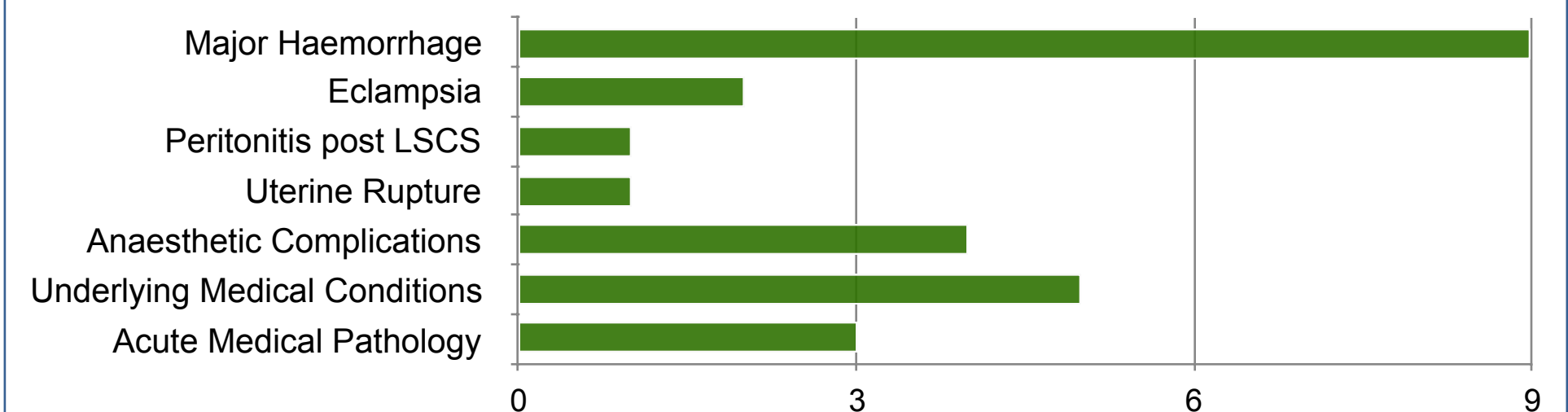


Chart 2. Number of patients with each admission diagnosis

17 patients received chemical and mechanical VTE prophylaxis, the remainder receiving mechanical only, 5 of whom had a rationale for this documented. 4 received delayed on inappropriate chemical prophylaxis. Obstetric & midwifery review and maternal contact with the newborn are shown in chart 3.

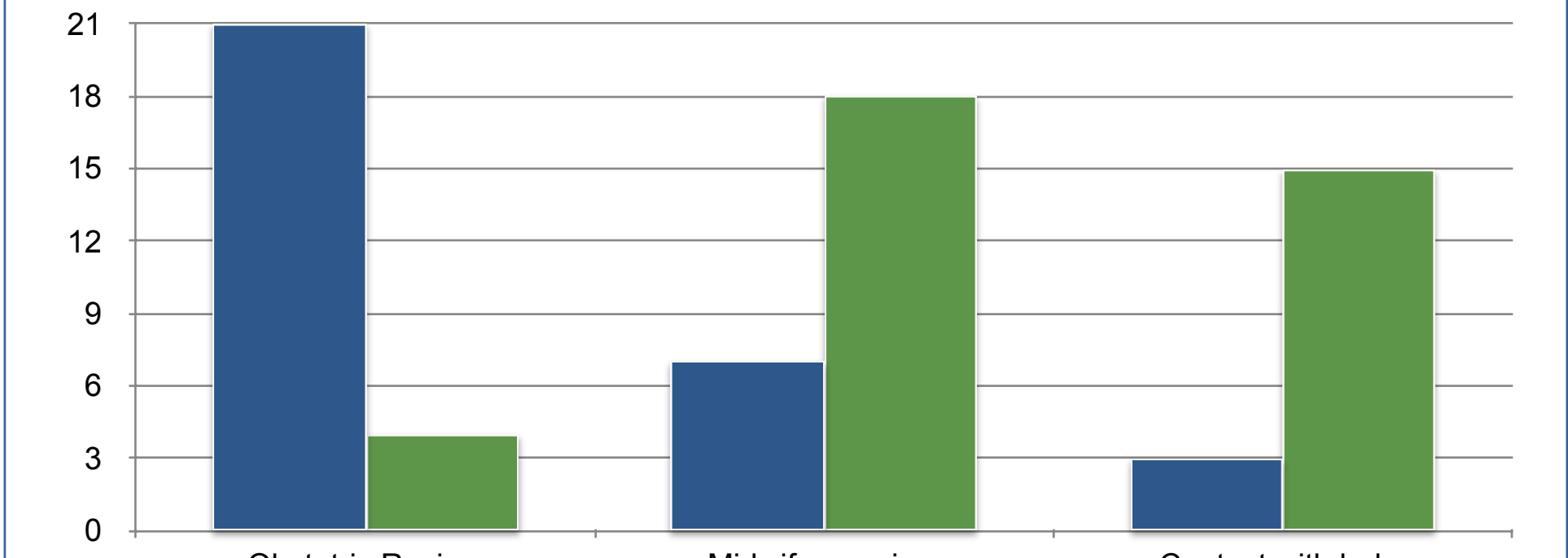


Chart 3. Number of patients receiving (blue) and not receiving (green) daily obstetric review, midwifery review and contact with their baby

The majority of admissions were post-operative as shown in chart 4. 21 patients were discharged to labour ward and 1 each to medical short stay, the postnatal ward, a surgical ward and a tertiary centre.

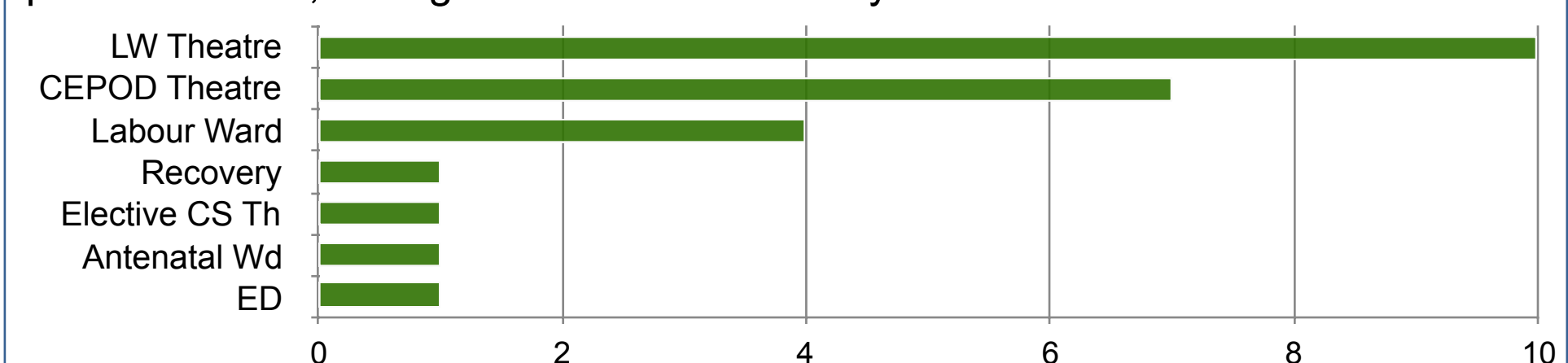


Chart 4. Number of patients admitted from each location across the audit period

14 patients discharged locally had a documented handover to the receiving team, 10 did not.

## Discussion

This audit demonstrates a small but significant link between our intensive care and maternity units. It also demonstrates some significant areas for improvement in the care of these patients. Of note, 28% of patients did not receive appropriate VTE prophylaxis, the majority were not reviewed by the midwifery team and very few had contact with their newborn.

There were a number of areas of good practice. Admission rates were similar to those previously reported in national data [1] and the admissions were generally short and, whilst they required a high level of support, this was only for a relatively short period of time.

The inadequacy of VTE prophylaxis may be explained by the different protocols for the general adult population and the pregnant population leading to inadvertent mistakes. The lack of midwifery review may partially explain the lack of contact between mother and baby and encouraging an increased midwifery presence on ICU when these patients are admitted, may help to facilitate maternal bonding with the newborn.

We are looking at ways to improve the care provided for these patients. The introduction of a checklist for the admissions may be beneficial due to the relative infrequency with which they are encountered. This would offer prompts to review VTE prophylaxis, reminders about obstetric and midwifery reviews as well as providing emergency contact details should they be required. This could also be used as part of the discharge paperwork to make improvements in the handover to the receiving ward team.

Providing supported bonding between the newborn and the critically ill mother is not something that we believe can be approached in a generic way as each case is different in both maternal and potential neonatal pathology. This audit and potential changes made, would offer prompts to ensure that medical and nursing teams on ICU and obstetric and midwifery teams consider how maternal contact with the newborn can be achieved in each case.

With the increase in non-anaesthetists specialising in intensive care, the obstetric anaesthesia team may have a key role to play for these patients having an understanding of the support provided in ICU and of the obstetric considerations that are key in caring for these patients.

## Conclusions

Maternal critical care requirements may increase as maternal age and comorbidities increase. This audit demonstrates that adequate maternal critical care is provided by our hospital. It has also highlighted key areas for improvement and we are working with the ICU, anaesthetic, obstetric and midwifery teams to develop strategies to address these.

Conflicts of interest - None declared

## References

- [1] Quinn et al on behalf of RCOA; Care of the critically ill woman in childbirth; enhanced maternal care. August 2018. <https://www.rcoa.ac.uk/news/enhanced-maternal-care-guidelines-2018>
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