

In-Situ Simulation to Reduce Time-to-Blood in Major Obstetric Haemorrhage

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INTRODUCTION

- At St George's Hospital, a tertiary obstetric unit within a major trauma centre and regional NHS Blood and Transplant hub, there are ~4000 deliveries a year
- 2.7% of deliveries result in a major obstetric haemorrhage (MOH) with estimated blood loss >1.5L
- In a MOH, rapid access to blood is critical
- Although laboratory-issued haemorrhage packs ("Pack A") are commonly requested, delays were frequently observed before blood was available for transfusion
- Four units of emergency group O RhD negative (O-ve) blood are stored in a theatre fridge near delivery suite and may provide faster access
- In-situ simulation is an excellent way to identify system weaknesses and allows for processes to be improved (1)

AIM

- To compare the time taken to obtain emergency O-ve blood vs laboratory-issued Pack A
- Identify factors contributing to delays

METHODS

We conducted an in-situ MOH simulation together with the midwifery and transfusion laboratory teams. BloodTrack® was used for transfusion checks.

Simulation design

Two midwives were deployed simultaneously:

- Blood runner 1: collected emergency O-ve blood from the theatre blood fridge
- Blood runner 2: collected Pack A from the transfusion laboratory

Outcomes measured

- Time to blood ready for transfusion
- Delays and human factors
- Equipment issues
- Walking distance to blood source using a GPS tracking app



Figure 1. Comparison of emergency blood collection pathways during major obstetric haemorrhage simulation. Following MOH activation, two trained blood runners were deployed simultaneously to collect either emergency O-ve blood from the nearby theatre fridge or laboratory-issued Pack A from the transfusion laboratory. Time from activation to first unit of blood being checked and ready for administration was recorded for both pathways.

RESULTS

Emergency O-ve blood from the theatre fridge was available 6x faster

Time to blood ready for transfusion:
Emergency O-ve blood 2.1 minutes vs Pack A 12.4 minutes

Distance matters

- Emergency blood fridge return journey: ~ 100 metres
- Blood bank return journey: ~ 840 metres
- Proximity was a major contributor to delay reduction.

Additional findings

An initial emergency O-ve collection attempt was discounted because:

- BloodTrack® wristband scanning was started unnecessarily (required for Pack A, not O-ve)
- BloodTrack® device was not charged, and a new device had to be located
- This increased time to emergency O-ve collection to 7.7 minutes

DISCUSSION

In some MOH cases, immediate blood transfusion is essential. Waiting for Pack A may introduce avoidable delay.

Key learning points

- Use emergency O-ve blood earlier when rapid transfusion is required
- Appropriately trained blood runner is allocated
- Rehearse local transfusion pathways
- Educate staff about different requirements for emergency O-ve and Pack A blood
- Keep BloodTrack® devices charged and available
- Crossmatch high-risk patients proactively where appropriate and keep blood products in nearby theatre fridge to avoid delays

CONCLUSION

- When rapid transfusion is required: choose nearest O-ve blood first**
- In-situ simulation is a great tool to highlight modifiable human and system factors that can significantly reduce time-to-blood in MOH