

# Compliance with the Massive Transfusion Protocol in Adults

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## Background

- Major haemorrhage threatens the survival of patients and challenges stretched transfusion resources.
- Delay in blood provision in emergency situations results in unacceptable morbidity and mortality.<sup>1</sup>
- All hospitals should have effective local major haemorrhage protocols to improve patient safety and survival.<sup>2</sup>
- The Massive Transfusion Protocol (MTP) facilitates the rapid delivery of blood products.
- The MTP guides the correct use of blood components and medications to help reduce the risk of transfusion complications.<sup>3</sup>

## Aims

- Analyse MTP activations to determine compliance with local protocol in a busy Emergency Care Hospital
- Identify areas of non-compliance to target improvement in patient outcomes and reduce product waste

## Methods

- MTP activations from January 2018 to December 2018 were analysed.
- Information was extracted from forms that were completed each time the MTP was activated, including:
  - reason for activation
  - place of activation
  - age and sex of patient
  - specialty and grade of activator
  - total time protocol activated
  - blood products used
  - blood products wasted
  - use of Tranexamic acid
  - whether specialist haematologist advice was sought and whether activation was appropriate
- Each patient's blood results were then looked up on ICE to see if appropriate bloods were taken before and during the MTP.

## Results

**Demographics:** The MTP was activated **48 times** in 2018 in Northumbria Trust. 48% of activations were for female patients and **52% male**. The mean age of patients for whom the MTP was activated was **55 years**.

**Where:** The most common place of activation was the **Emergency Department** where 25 (52.1%) of activations took place.

**Why:** The most common reason for activation was **gastrointestinal bleed**, which led to 17 activations (35.4%). Other causes of activation were; post-partum haemorrhage (25%), probable abdominal aortic aneurysm rupture (10.4%), cardiac arrest (4.2%), groin bleed/laceration (4.2%), vaginal bleed (4.2%).

**Grade of activator:** **18 (37.5%)** of the MTP activations were by **initiated by consultants**. There was **consultant involvement in 97.4% of activations**.

**Appropriate activation:** This project found that **all activations** of the MTP were deemed **'appropriate'** on review by a consultant haematologist.

**Blood products:** *Figure 1: Which blood products were used:*

Blood product	Total Amount used	Ratio to platelets	Ideal ratio to platelets
Red Blood Cells (RBC)	174 units	7.9	4
Fresh Frozen Plasma (FFP)	107 units	4.8	4
Platelets	22 pools	1	1

**Wasted FFP:**

- Average time of activation was 44 minutes where no FFP was given and 2 hours and 1 minute where FFP was given.

**Blood tests:**

**81.3%** of activating teams **took baseline bloods prior to product administration**.

*Figure 3: Type of bloods taken as the first set of bloods in each MTP activation:*

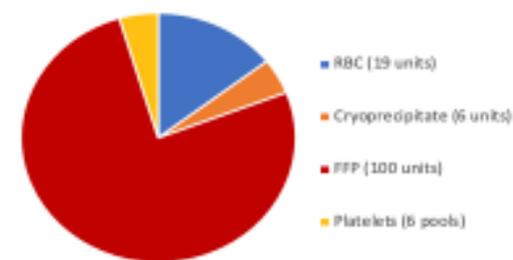
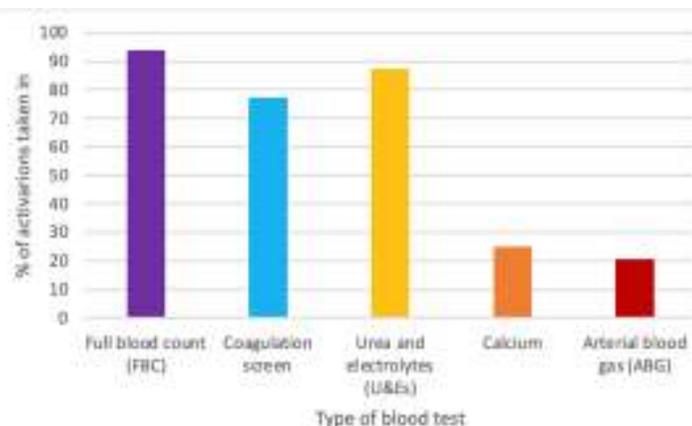


Figure 2: Blood product wastage

## Discussion/Conclusion

- Areas of good MTP compliance included: appropriate activation (100%), consultant involvement (97.4%) and the obtaining of baseline blood tests (81.3%).
- Current advice is that adult trauma patients with, or at risk of, massive haemorrhage should initially be transfused empirically with a 1:1 ratio of FFP to red blood cells.<sup>2,4,5</sup> The Northumbria MTP recommends a ratio of RBC 4:FFP 4:Platelets 1. RBC were given in preference to other blood products with the ratio of RBC:FFP:Platelets being 8:5:1 rather than the suggested 4:4:1. This puts patients at risk of transfusion related coagulopathy and is an area of required review.
- There was significant waste of FFP. Seniority did not appear to increase likelihood of using FFP. However, FFP was less likely to be administered in shorter activations. To administer FFP in line with BSH guidance, pre-thawed FFP could be made available. The recommended shelf-life of pre-thawed standard FFP has been recently increased to 120 hours by the British Society for Haematology (BSH) to enable the rapid provision in unexpected major haemorrhage.<sup>6</sup> This would need to be considered carefully and further studies are required to look at shorter MTP activations in more detail.
- Baseline calcium and ABG testing was lower than expected and the reasons for this need to be investigated to reduce the risk of complications such as acidosis and hypocalcaemia.<sup>3</sup>
- Education around the use of the MTP may improve compliance and reduce transfusion related complications and wasting of blood products. We aim to provide education to Emergency Department staff on the use of FFP and required baseline blood tests (including ABG and calcium) and re-audit.