

**Massive Haemorrhage Policy**

Date	Version
November 2015	V2

**Purpose**

Following the National introduction of Regional Major Trauma Networks (MTNs), MTN's are required to have a policy for Massive Transfusion. The purpose of this policy is to provide direction and guidance for actions from key individuals and organisations within the Network. It is also to ensure that individual Trust Massive Transfusion policies are consistent and in line with national standards. The primary aim is to improve the patient pathway and to ensure that patients receive the latest evidence based care as quickly and safely as possible.

**Who should read this document?**

PTN and STN Clinical and Governance Directors  
 TU and MTC Clinical Leads for Major Trauma  
 Trauma Team Leaders  
 Acute Trust Lead Nurses for Major Trauma

**Key messages**

Ensure a safe, appropriate and efficient massive haemorrhage service to all patients. This massive haemorrhage policy is intended to provide overarching guidance for the MTC and all TU's so that their individual trust policies provide the same level of care. That the policy gives up to date and agreed standardisation on triggering a massive haemorrhage response. The massive haemorrhage event is controlled via an agreed algorithm/protocol that guides all parties.

**Accountabilities**

<b>Production</b>	Mrs Caroline Lowe, Specialist Transfusion Practitioner. PHNT Julian Shafee, Co-ordinator, Peninsula Trauma Network.
<b>Review and approval</b>	PTN Clinical Advisory Group
<b>Ratification</b>	PTN Executive Board
<b>Dissemination</b>	All PTN acute Trusts,
<b>Compliance</b>	All Parties

**Links to other policies and procedures**

PTN Trauma Team Activation Policy  
 PTN Safe Transfer of the Critically Ill Patient  
 PTN Secondary Transfer Policy

**Version History**

V1	Mr Iain Grant	Clinical Director, Peninsula Trauma Network
V2	Dr Mark Jadav	Clinical Director, Peninsula Trauma Network

Last Approval	Due for Review
November 2015	November 2017

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## **Glossary**

ED	Emergency Department
MTC	Major Trauma Centre
MTN	Major Trauma Network
MHRA	Medicines and Healthcare products Regulatory Agency
PTN	Peninsula Trauma Network
SHOT	Serious Hazards of Transfusion
STN	Severn Trauma Network
TU	Trauma Unit
TXA	Tranexamic Acid

## 1. Background

When the Peninsula Trauma Network was set up there was extensive discussion about the management of massive haemorrhage and whether a unified Network policy was desirable.

At that stage, each of the trauma units had recently developed their own policy and it was considered that:

- Each Trust blood transfusion service had a different availability of products
- Each Trust Transfusion committee had reviewed and was satisfied with current arrangements
- Change to produce a different policy for trauma was not advisable
- Tranexamic Acid (TXA) administration was well embedded in the Ambulance Service and local ED's

It was therefore agreed, at the time, that each Trust would continue to use their local policy.

It was also agreed that the application of the major haemorrhage policy, availability and use of TXA and blood products would be audited. It is in the governance timetable for audit in 2015-16.

The policy for massive transfusion in children is common across Severn and Peninsula Trauma Networks.

## 2. Aims and objectives

The aims and objectives of this policy are to;

Ensure a safe, appropriate and efficient massive haemorrhage service to all patients. This Trauma Network massive haemorrhage policy is intended to act as overarching guidance for the Major Trauma Centre and Trauma Units development of their own trust massive haemorrhage policies.

The policy should provide up-to-date and agreed standardisation on triggering a massive haemorrhage response.

A massive haemorrhage event is controlled via an agreed algorithm/protocol that guides all parties.

To ensure alternatives to transfusion are considered wherever possible.

### 2.1 Governance

Every massive transfusion event is notified to the appropriate trust blood bank and will need to be audited by that service. These audits will then be subject to oversight by the Trauma Network Clinical Governance Lead.

An audit of Major Trauma Massive Transfusions should be undertaken by each MTC and TU on an annual basis unless the number of transfusions given is insufficient to provide meaningful analysis. In this situation the audit should be carried out every two years.

All transfusion related incidents and 'near misses' are to be reported (locally onto the appropriate trust system and nationally to SHOT and the MHRA) and investigated by the appropriate transfusion team. The Network must be advised using the PTN Governance Issues form which should be sent to the PTN Governance mailbox:

[plh-tr.PTNGovernance@nhs.net](mailto:plh-tr.PTNGovernance@nhs.net)

## **2.2 Never Events**

Any incident that is a 'never event' must be identified as a Serious Untoward Incident (SUI) and reported as per the trusts pathway for SUI/Never Event reporting. The network must be advised if any Never Event should occur.

Any Network investigation would await the outcome of the SUI report – a copy of which must be sent to the Network Manager/Co-ordinator.

## **3. Definitions**

The management of massive haemorrhage is only one component of the management of a critically unwell patient. The massive transfusion policy is intended to supplement current resuscitation guidelines and specialist policies.

### **3.1 Critical bleeding**

This can be a major haemorrhage that is life threatening and is likely to result in the need for a massive transfusion.

This can also be haemorrhage of a smaller volume in a critical area or organ, i.e. intracranial, intraspinal or intraocular.

### **3.2 Massive haemorrhage**

Massive blood loss can be defined as the loss of one blood volume within a 24 hour period, normal adult blood volume being approximately 7% of ideal body weight, 8% to 9% in children.

An alternative definition is 50% blood volume loss within 3 hours, or a rate of loss of 150ml per minute.

Both definitions emphasise the importance of early recognition of major blood loss and the need for effective action to prevent shock and its consequences.

The nature of the injury will usually alert clinical staff to the probability of massive haemorrhage.

In children massive transfusion may be defined as a transfusion of more than 40ml blood/kg. The normal blood volume of a child is approximately 80ml/kg

### 3.3 Therapeutic Goals

The aims of blood transfusion are:

- To restore an adequate blood volume,
- To maintain tissue perfusion and oxygenation.
- To achieve haemodynamic stability.
- Minimise blood loss and achieve haemostasis by;
  - rapid control of bleeding
  - correcting coagulopathy by judicious use of blood component therapy

### 4. Contact Information

It is important that all massive trauma policies and flowcharts include all the necessary contact numbers, including, but not exclusively,

- Blood Bank hotline number for working hours.
- Blood Bank pager number for working hours.
- Blood Bank numbers for outside of working hours and on weekends and bank holidays
- Blood Bank Pager numbers outside of working hours and on weekends and bank holidays

Please note that phone calls to the Blood Banks should be recorded so that retrospective investigations can take place.

#### 4.1 Protocol activation

There should be a clear and unambiguous phrase that activates the major trauma massive transfusion protocol i.e. as per the example below.

- ① Ring **Blood Bank Hotline on 52828 during hours 0800 – 1730**,  
Between 1730 – 0800 bleep 0871, (DO NOT PHONE as staff not necessarily in earshot of laboratory phone)
- ② Say to the laboratory, **“I want to trigger the Massive Transfusion protocol”**.  
You will be asked to state your location and patient name (if known). You will also be requested to provide the name and contact number of your team co-ordinator for the duration of this activation of the protocol
- ③ Any future communication during this time should be preceded by, **“this call relates to the massive transfusion in .....(state clinical area)”**
- ④ Arrange delivery, by hand to the Blood Bank, a blood sample in pink sample tube with Blood Transfusion Request Form.

## 5. Training

Regular training and simulations will improve awareness and confidence and ensure that the massive transfusion process works efficiently.

These need to be carried out regularly due to staff turnover and to be sure to cover as many staff as possible.

## 6 Logistics of blood supply

The policy must address the following logistical issues:

- Patient Identification
- Blood Storage
- Traceability
- Blood shortages
- Collection/delivery from Blood Bank

## 7. Risks of Massive Transfusion

All massive transfusion policies should consider the potential for harm to a patient that a massive transfusion could cause and address the following:

- Incompatible/incorrect blood component administered (Never Event)
- Transfusion Reactions
- Hypocalcaemia
- Hyperkalaemia
- Hypomagnesaemia
- Acid base disturbances
- Disseminated Intravascular Coagulation (DIC)

## 8. Tranexamic acid (TXA)

All massive transfusion policies for major trauma must include information on Tranexamic Acid (TXA).

Tranexamic acid inhibits plasminogen activation, and at high concentration inhibits plasmin, which inhibits fibrinolysis. It should be used in clinical situations where increased fibrinolysis can be anticipated, such as, acute severe trauma.

There is strong evidence that the effect of tranexamic acid on death due to bleeding varied according to the time from injury to treatment. Early treatment (<1 hour from injury) significantly reduced the risk of death due to bleeding events. Treatment between 1 – 3 hours also reduced the risk of death due to bleeding. However treatment with tranexamic acid given after 3 hours may significantly increase the risk of death due to bleeding.

Therefore tranexamic acid should be given as early as possible to bleeding trauma patients.

A loading dose of 1g over 10 minutes followed by 1g over 8 hours is recommended. There are few adverse events or side effects associated with the early use of tranexamic acid in massive haemorrhage.

Repeat doses should be used with caution in patients with renal impairment, as the drug is predominantly excreted unchanged by the kidneys.

Tranexamic acid is contraindicated in patients with subarachnoid haemorrhage, as anecdotal evidence suggests that cerebral oedema and infarction may occur.

This section must include the national major trauma peer review measures.

- T14-2B-123 Administration of Tranexamic Acid (See appendix 1)
- T14-2B-314 Administration of Tranexamic Acid (See appendix 1)

Tranexamic Acid is also a Dashboard measure for both MTC's and TU's and therefore compliance with these measures will be shown on each quarter's dashboard, as demonstrated below:

MTC 05 - MTCs administer Tranexamic Acid within 3 hours of incident to patients that receive blood products within 6 hours of incident (Example in Appendix 4)

TU 04 - TUs administer Tranexamic Acid within 3 hours of incident to patients that receive blood products within 6 hours of incident (Example in Appendix 4)

## **9. Massive Transfusion Flowcharts**

It is suggested that each MTC/TU has their massive transfusion protocol condensed into a clear and concise one page flowchart for paediatric and adult patients, as per appendices' 2 and 3.

As massive transfusion is not a protocol that is enacted frequently, particularly in the Trauma Unit setting, it is suggested that the flowcharts are displayed clearly.

MTP Flowcharts should be reviewed in each area every 6-12 months to ensure they reflect the current recommendations/Guidelines and service user requirements.

## **10. Transferring Blood Products with Patients**

Each Trauma Unit must have a policy for the transferring of blood products between hospitals. This policy must include:

- Blood packaging
- Documentation
- Dispatch of Blood Components
- Blood transfer
- Advice for Clinical Staff
- Clinical considerations
- Transfusion on route
- Procedure for the dispatching hospital

## 11. References

Below are a series of documents and papers for consideration in the writing of the Massive Transfusion policy:

### 11.1 Massive Transfusion

- I. 11.1 Blood Safety and Quality Regulations (BSQR) 2005 (SI 2005/50, 2005/1098 amended 2006/2013).
- II. 11.2 National Patient Safety Agency (NPSA). Rapid Response Report NPSA/2010/RRR017 October 2010.
- III. 11.3 Indication codes for transfusion – an audit tool. NHS Blood and Transplant. June 2009.
- IV. 11.4 Rossaint R et al 2010 Management of bleeding following major trauma; an updated European guideline Critical Care 14;R52.
- V. 11.5 Association of Anaesthetists of Great Britain and Ireland. Blood transfusion and the anaesthetist – management of massive haemorrhage. Anaesthesia 2010; 65: 1153-1161.
- VI. 11.6 CRASH-2 trial collaborators. Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial. Lancet 2010; 376: 23- 32.
- VII. 11.7 CRASH-2 trial collaborators. The importance of early treatment with tranexamic acid in bleeding trauma patients: an exploratory analysis of the CRASH-2 randomised controlled trial. Lancet 2011; 377: 1096- 1101.

### 11.2 Transfer

- I. 11.8 Blood Safety and Quality Regulations (BSQR) 2005 (SI 2005/50, 2005/1098 amended 2006/2013).
- II. 11.9 Guidance for the Emergency Transfer of Blood with Patients between Hospitals. NHSBT Appropriate Use of Blood Group and National Laboratory Manager's Group of CMO's National Blood Transfusion Committee. 24/3/2011.

## Appendix 1

### National Peer Review Measures for Massive Transfusion and Tranexamic Acid

#### Network Measures

##### **T14-1C-106 Network Transfusion Protocols for Trauma Units**

There should be a network agreed massive transfusion protocol covering both adults and children which is used in all trauma units. The protocol should include the administration of Tranexamic Acid and blood products including plasma, cryoprecipitate and platelets in the early stages of transfusion.

#### Pre-Hospital Care Measures

##### **T14-2A-108 Pre-Hospital Administration of Tranexamic Acid for Adult Patients**

There should be a protocol for the administration of Tranexamic Acid in pre-hospital care by trained paramedics.

#### Adult Major Trauma Centre Measures

##### **T14-2B-120 Transfusion Lead Clinician**

There should be a named clinical Lead for transfusion.

##### **T14-2B-121 24/7 Specialist Transfusion Advice**

There should be transfusion advice available 24/7 from a clinical consultant with appropriate experience.

##### **T14-2B-122 Massive Transfusion Protocol for the Major Trauma Centre**

There should be a protocol for the management of massive transfusion in patients with significant haemorrhage.

##### **T14-2B-123 Administration of Tranexamic Acid**

Patients with significant haemorrhage should be administered Tranexamic Acid within 3 hours of injury and receive a second dose according to CRASH-2 protocol.

#### Children's Major Trauma centre Measures

##### **T14-2B-218 Transfusion Lead Clinician**

There should be a named clinical lead for transfusion.

##### **T14-2B-219 24/7 Specialist Transfusion Advice**

There should be transfusion advice available 24/7 from a clinical consultant with appropriate experience.

**T14-2B-220      Massive Transfusion Protocol for the Major Trauma Centre**

There should be a protocol for the management of massive transfusion in children with significant haemorrhage.

**T14-2B-221      Administration of Tranexamic Acid**

Patients with significant haemorrhage should be administered Tranexamic Acid within 3 hours of injury as specified in CRASH-2 protocol.

**Trauma Unit Major Trauma Measures.**

**T14-2B-311      Transfusion Lead Clinician**

There should be a named clinical Lead for transfusion.

**T14-2B-312      24/7 Specialist Transfusion Advice**

There should be transfusion advice available 24/7 from a clinical consultant with appropriate experience.

**T14-2B-313      Network Transfusion Protocol**

The trauma unit should agree the network protocol for the management of massive transfusion in patients with significant haemorrhage as specified in T14-1C-106.

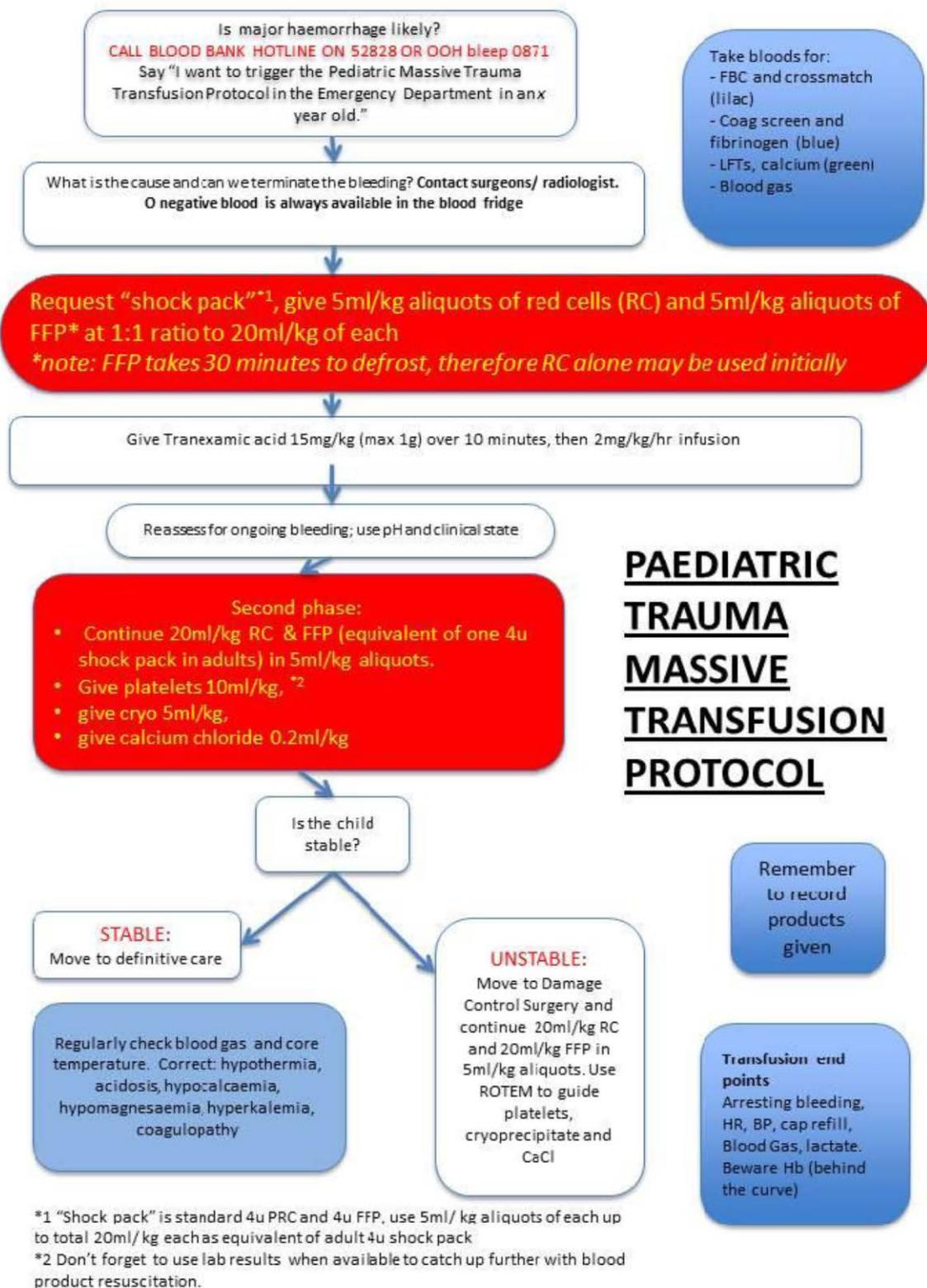
**T14-2B-314      Administration of Tranexamic Acid**

Patients with significant haemorrhage should be administered Tranexamic Acid within 3 hours of injury and receive a second dose according to CRASH-2 protocol.

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## Appendix 2

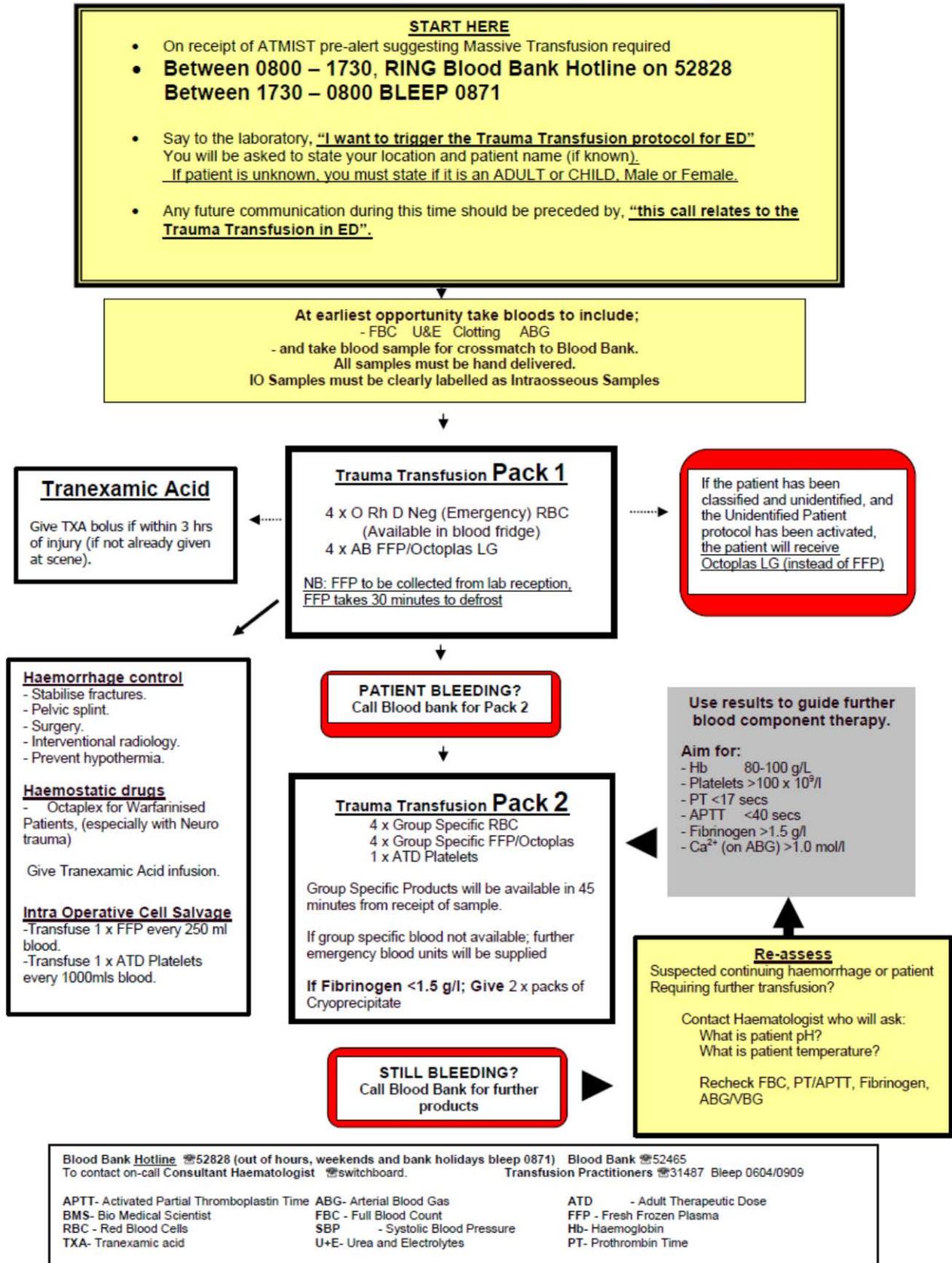
### Example Massive Transfusion Protocol for Paediatric Major Trauma



## Appendix 3

### Example Massive Transfusion Protocol for Adult Major Trauma

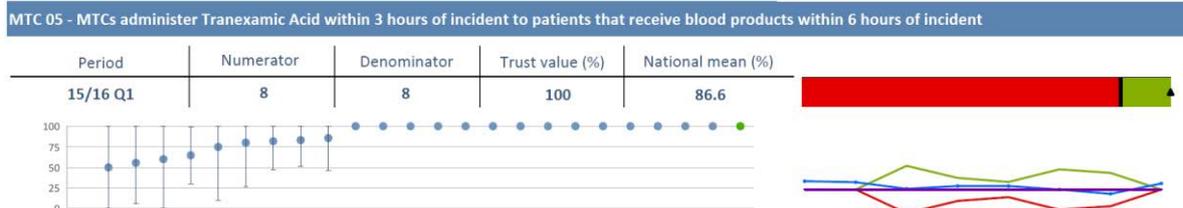
NB: The Trauma Transfusion Protocol applies to the Emergency Department only.



## Appendix 4

### Tranexamic Acid National Dashboards

**MTC 05** - MTCs administer Tranexamic Acid within 3 hours of incident to patients that receive blood products within 6 hours of incident



**TU 04** - TUs administer Tranexamic Acid within 3 hours of incident to patients that receive blood products within 6 hours of incident

