



Pre-hospital Care Standard Operating Procedure

Pre-hospital blood transfusion

REVIEW:	January 2014	
APPROVAL/ ADOPTED:	LAA Policy Board	
DISTRIBUTION:	LAA Doctors LAA Paramedics Barts Health Trust Transfusion committee London Trauma Haematology Group	
RELATED DOCUMENTS:	Code Red SOP Haemorrhage control, vascular access and fluids SOP Packaging SOP Equipment resource folder – Golden Hour box™, Belmont buddy lite™ fluid warming system Barts Health Code RED flow chart	
THIS DOCUMENT REFERS TO:	<input checked="" type="checkbox"/> PHC Clinical Practice <input type="checkbox"/> PHC Non-clinical Practice <input type="checkbox"/> PHC Operational Procedure	Ref: CP-8

Aim:

To provide pre-hospital blood transfusion to trauma patients whilst complying with local and national legislation and avoiding wastage of blood products.

Objectives:

- Describe the arrangements for the availability of emergency blood for pre-hospital teams.
- Describe the indications for pre-hospital blood transfusion.
- Describe the process for pre-hospital blood transfusion.

Background:

Approximately 10% of London HEMS patients will trigger the Code RED protocol. These patients require early administration of blood products and rapid vascular control if they are to survive. In addition, patients in traumatic cardiac arrest may benefit from blood transfusion if hypovolaemia is considered to be a contributing factor.

Principles:

- Emergency blood is a precious and limited resource.
- Blood transfusion is not a replacement for careful packaging and splintage.
- LAA teams will ensure all efforts to preserve blood volume are maximised prior to and during emergency blood transfusion.
- LAA carries blood in accordance with NHSBT policies and guidance.

- The duty PHC Consultant on-call should be contacted prior to pre-hospital transfusion in all cases.
- All units of blood must be fully traceable via documentation and database records.
- All Code RED patients should be given warmed blood.
- Tranexamic Acid 1g bolus should be given as per Code RED protocol.
- LAA teams will avoid wastage of blood.

Policy:

Indications to transfuse pre-hospital emergency blood

- Traumatic cardiac arrest where hypovolaemia is judged to be a contributing factor.
- Code RED patients (see SOP Code RED) where volume resuscitation is deemed necessary prior to arrival at hospital.

Storage of pre-hospital emergency blood:

- Emergency blood is packed into the Golden Hour box™ and sealed with a tag by Barts Health transfusion staff.
- Each box contains 4 units of O negative emergency blood and a data logger.
- The outer carry bag contains transfusion paperwork and a pre-labelled blood bag from the pre-transfusion sample.
- The outer carry bag should be sealed by the transfusion staff with a tag to indicate that the contents are complete and unused.
- Golden hour boxes™ can maintain a steady state temperature of 2-4C for 48-72 hrs.
- Golden hour boxes™ should be returned to the transfusion lab every 24 hours for repacking.
- All boxes must remain sealed until the LAA doctor declares “Code RED and intention to transfuse”.

Location of Golden Hour boxes:

- Pre-packed Golden hour boxes™ are available to all operational teams. Boxes are kept in the aircraft and in the boot of operational trauma response vehicles.
- Spare pre-packed Golden Hour boxes™ are available from the transfusion department.

In-flight decision-making:

- The medical team should make a decision based on information available whether to take the blood to scene as a primary action. They should consider the information from EOC, the mission run sheet and the overhead view of the incident.

On scene:

- If blood transfusion is deemed necessary and the blood box is in the aircraft, the team should either ask the pilots to bring the blood box to scene or a member of the emergency services may be dispatched to retrieve the blood box from the aircraft.
- Obtain pre-transfusion blood sample in a Group & Screen (cross match) bottle (BD purple long tube) and a clotting sample (blue bottle) for ROTEM analysis at RLH. Paediatric bottles (red top) are available for infants. These bottles are acceptable to all London MTC transfusion laboratories.
- The pre-transfusion blood sample should be drawn from an unflushed cannula or a femoral stab sample if IV access has already been obtained and flushed with saline.
- The doctor must sign, date and time the sample immediately. This blood sample should be kept in a safe place (doctor’s pocket) to be handed over at the MTC.

The Golden Hour box™ must only be opened when the decision has been made to transfuse blood.

- Break the seal and open the Golden Hour™ box.
- Keep the enclosed paperwork safe.
- Remove required no of units and close box immediately. This will avoid wastage of unused units. Unused units can be returned to the lab and reallocated for use within Barts Health NHS trust.
- Check units of blood using challenge and response: perform visual inspection of unit (look for discolouration, haemolysis, large clots), confirm blood type (O neg) and expiry date. At least one member of the LAA team must perform the visual blood inspection
- Transfuse emergency blood via Belmont buddy lite™ warming system at an appropriate rate based on patient physiology and to allow blood to be heated.
- Contact MTC and place pre-alert call stating HEMS team call sign, CAD no, gender, and mechanism of injury. State that patient meets Code RED criteria and pre-hospital blood transfusion is ongoing.

Patient labelling:

- A “pre-hospital blood transfusion” patient wristband must be placed on the patient at the time of transfusion.
- Each wristband has a unique number, which can be recorded on the transfusion record sheet along with the LAS CAD number and patient details.

Blood unit labelling:

- Each unit of blood has two labels to identify the unit
 - Paper tear off tag
 - Main label on front of unit
- The “tear off tag” must be completed, signed and placed in the Golden Hour box™ when the unit is transfused and returned to the Royal London Hospital transfusion laboratory with the original transfusion record sheet.
- The main label remains on the unit of blood and the empty blood bag can be disposed of in a yellow incineration bin by hospital staff when transfusion has finished.

Transfusion record sheet:

- The transfusion record sheet is an A4 form, which is found inside a plastic pouch inside the blood box carry bag.
- The completion of this form is mandatory to ensure 100% traceability for every unit of blood.
- Transfusion staff will complete part of the form with the unique ID for each unit of blood when the box is packed.
- LAA staff must complete the remaining fields after transfusion has occurred.
- **Please check carefully that the unit number on the label and stickers matches the unit number on the blood bag and also correlates with the paperwork – there is potential for human error at every step of the labelling process.**

- This form must be photocopied at the MTC and handed over directly to the Trauma Team Leader along with the photocopied mission record sheet and observations.
- The original transfusion record form must be returned in the Golden Hour box to Barts Health transfusion lab with the tear off labels.
- The date, time, CAD number and patient destination (e.g. St Mary's MTC, King's MTC, mortuary) must be recorded on this form. This form must be signed by the LAA doctor.

Handover at MTC:

- The verbal handover must explicitly state that pre-hospital transfusion has occurred.
- Ensure the patient wristband is still attached to the patient.
- The doctor must complete and sign the cross match form at the MTC and transcribe the MTC patient details on to the blood bottle.
- The cross match request form sent to the MTC laboratory should be annotated to indicate that this sample has been taken prior to pre-hospital transfusion.
- The LAA transfusion record sheet, cross match bottle and request form must be handed to the Trauma Team Leader in the pre-labelled bag. It is their responsibility to check the details and take responsibility to send the sample to the lab.
- The MTC should repeat the Group & Screen on arrival as per MTC protocol.
- Unused units of blood must not be left with the MTC but must be returned in the blood box to RLH.

HEMS Database:

- The HEMS database must be completed using the drop down intervention menu. Include as many of the following as are relevant:
 - Code Red
 - Blood (state no of units given)
 - Tranexamic Acid 1g
 - Buddy lite fluid warmer
- The free text section should include the unique unit numbers of the units transfused.
- Documentation must be complete in order to provide 100% traceability for all units of blood.

Incident reporting:

- Any incidents arising from Pre-hospital emergency blood transfusion must be reported via the Barts Health Datix system in addition to the local helipad reporting system.

How to arrange resupply of pre-hospital emergency blood:

When a Golden Hour box™ has been opened it must be returned to Barts Health transfusion laboratory as soon as possible. The transfusion record sheet and tear off tags must be returned in the same box.

- The transfusion lab should be informed when the mission is complete via ext 61117 or bleep 1422 out of hours.
- State which number box has been opened and request a replacement.
- A spare Golden Hour box™ may be available on the helipad.
- RLH porters will return and collect Golden Hour boxes™. Porters can be contacted on ext 40839 or bleep no 1213 / 1316 / 1613. You should state the number and location of the used box, which needs to be returned to the lab. You should also state where the replacement box should be taken to ie helipad.

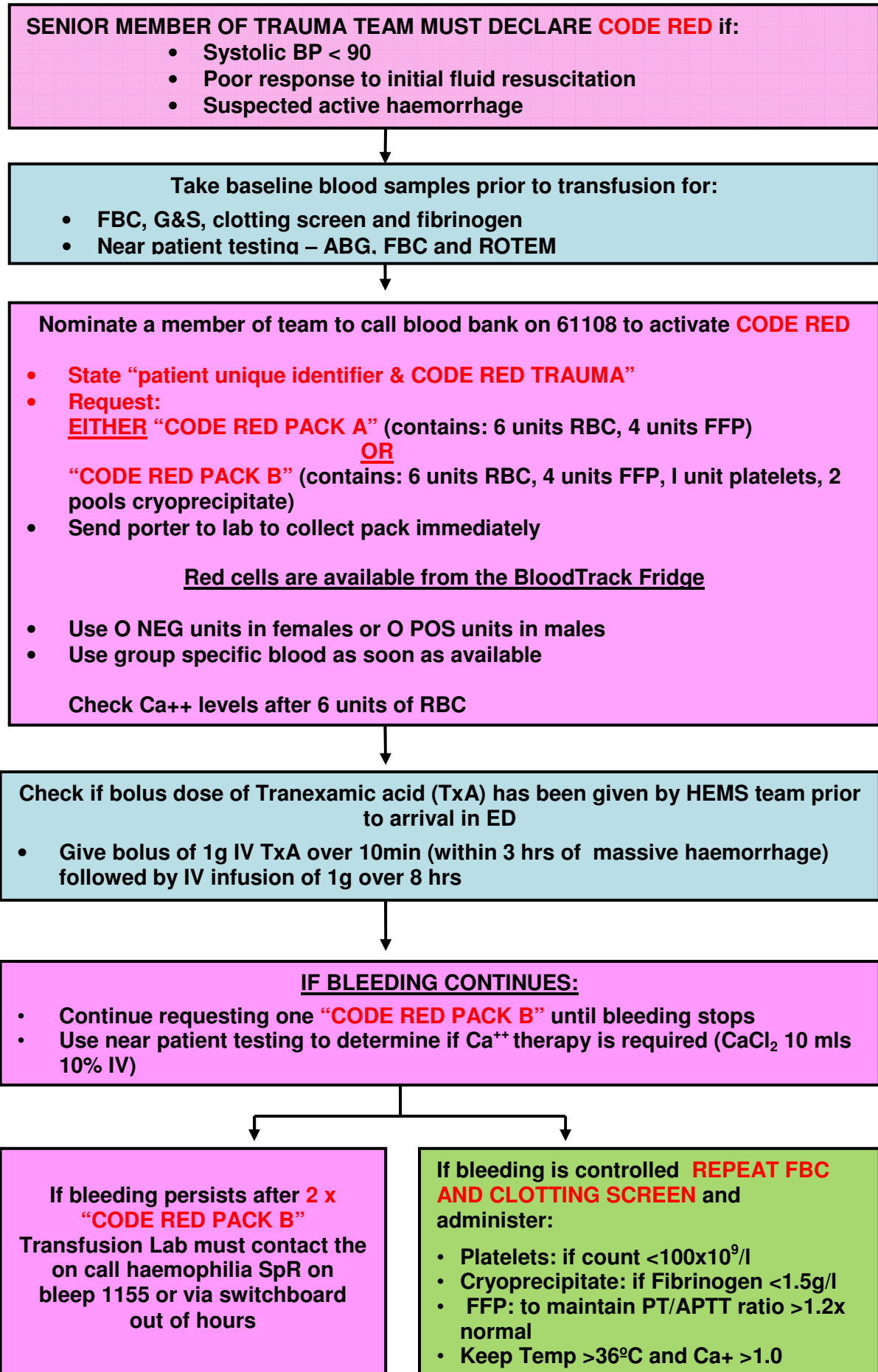
References:

1. The Blood Safety and Quality Regulations 2005 no .50 (MHRA)
<http://www.legislation.gov.uk/uksi/2005/50/contents/made>
2. Barts Health NHS Trust. Blood Transfusion Policy. BLT/POL/11109/N&Q
<http://bltintranet/Policiesandguidelines/Blood%20Transfusion%20Policy.pdf>
3. Barts Health NHS Trust Code Red Adult flow chart.

Appendix:

1. Validation graph for Golden Hour box
2. LAA Transfusion record sheet
3. Blood box changeover record sheet
4. Label for pre-transfusion sample bag

CODE RED TRAUMA - MASSIVE HAEMORRHAGE



CODE RED TRAUMA – guidance notes July 2011

Only a senior member of the Trauma Team who has undergone induction training can trigger CODE RED TRAUMA

Tranexamic acid

Tranexamic acid is an antifibrinolytic agent that inhibits activation of plasminogen to plasmin; the latter is responsible for fibrin degradation

In trauma-induced massive haemorrhage a bolus of Tranexamic acid (1g, iv over 10 min) should be started within 3 hours of injury followed by continuous infusion (1g, iv) over 8 hours

Blood Transfusion – Emergency Group O Stock

- Group O Neg (use in females) and O Pos (use in males) blood available in blood track fridge for CODE RED use
- MUST INFORM Blood Bank when units used so that stocks can be replaced
- Switch from Group O to patient's group as soon as possible to minimize use of Gp O

CODE RED PACK A contains: 6 units Red Cells and 4units FFP.

CODE RED PACK B contains: 6 units RBC; 4units FFP; 1 unit Platelets; and 2 pools cryoprecipitate.

Fresh Frozen Plasma

- FFP needs defrosting before issue – this takes around 30mins (allow time for transit)
- Each dose should contain ~15ml/kg of FFP – around 4units for average adult

Cryoprecipitate

- Cryoprecipitate needs defrosting before issue – this takes around 30mins (plus allow for time transit) Do not put cryo in fridge after defrosting since can precipitate
- Each dose should contain 2 pools cryoprecipitate for average adult

Platelets

- Stored at ambient temperature DO NOT REFRIGERATE
- Since platelets have short shelf life of 5 days only the blood bank has limited supplies of platelets and has to order additional units from the Blood centre as needed.

Laboratory testing

- Must request fibrinogen as well as coagulation screen and Full Blood count for all patients with massive haemorrhage
- Repeat testing of Coagulation screen including fibrinogen and platelet count needed after transfusion of components to guide further replacement.

Near Patient Testing

- Any near patient testing device used MUST comply with the Trust Point of Care Testing policy.

Recombinant FVIIa:

Discuss with Haemophilia Registrar (Bleep 1155 or via switchboard on call) regarding use of rFVIIa in patient who continues to bleed despite replacement therapy with FFP, platelets and cryoprecipitate.

TRACEABILITY IS ESSENTIAL FOR ALL UNITS TRANSFUSED

Supplementary Table 1. Blood Stream Infections (BSI)

Organism	Number
<i>Acinetobacter baumannii</i>	4
<i>Bacillus cereus</i>	1
<i>Bacteroides fragilis</i>	1
<i>Candida albicans</i>	2
<i>Enterobacter cloacae</i>	2
<i>Escherichia coli</i>	3
<i>Klebsiella pneumonia</i>	1
<i>Moraxella catarrhalis</i>	1
<i>Pseudomonas aeruginosa</i>	2
<i>Staphylococcus aureus</i>	3

All positive blood cultures were reviewed in conjunction with the microbiology department and likely contaminants were excluded from the subsequent analysis. BSI, blood stream infection encompassing bacteraemias and fungaemias. Patients recorded multiple BSIs as a result all infective organisms cultured have been recorded.
