SLHD Policy Directive

Adult Massive Transfusion Protocol (MTP)	
TRIM Document No	SD20/18944 (POL/60)
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Related MOH Policy	Blood Management Policy (PD2018_042) Consent to Medical and Healthcare Treatment Manual
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Applies to	All Clinical Staff
Clinical Streams	All Clinical Streams
Tier 2 Sign-off	Dr Andrew Hallahan Executive Director Medical Services, Clinical Governance and Risk SLHD
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Author	SLHD MTP Review Working Group (Contact - Marry Moussa, SLHD Haemovigilance CNC)
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Version History	
Current Version	V.2 – October 2021: Amendments in Section 1 *Introduction* and Section 8 *Procedure* (how to activate, information required, pathway, ordering, collecting, obstetrics, patient management, Tranexamic Acid and dosage for PPH).
Previous Version	V.1 – 31/03/2020

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1. Introduction

Haemorrhage is a medical emergency requiring multidisciplinary care. Transfusion of blood products can be life-saving in conjunction with other interventions. A massive transfusion in an adult patient is defined as the actual or anticipated transfusion of 4 or more units of packed red blood cells in less than 4 hours.

The purpose of this policy is to outline the process and procedures of activating, participating and managing a Massive Transfusion Protocol, in line with current best practice guidelines.

A Massive Transfusion Protocol (MTP) applies to patients with:

Actual or anticipated transfusion of 4 units of Red Blood Cells in less than 4 hrs, +/- haemodynamically unstable, +/- anticipated ongoing bleeding.

Severe thoracic, abdominal, pelvic or multiple long bone trauma.

Major obstetric, gastrointestinal or surgical bleeding.

Or for any other clinical concern of significant bleeding that does not meet the above criteria.

To activate a MTP Dial:

RPAH: 2222 CRGH: 76972 TCH: 70204 BAL: 58033

For Paediatric MTP, refer to the Paediatric Massive Transfusion Protocol (SLHD_PD2017_032)

Massive transfusion is unlikely to achieve haemostasis by itself. An MTP acts as a bridge to definitive haemostatic interventions and to increase their chance of success through improved clotting function. Due to this, early consultation should be made with on-call senior staff (Anaesthetist, Surgeon or Interventional Radiologist, Emergency/Trauma Team, Intensive Care Team, Haematology Team and Blood Bank Staff). This should facilitate a rapid decision on patient disposition (e.g. to Operating Theatres/Radiology or to ICU) or advanced measures of temporary haemostasis (tourniquets, balloon tamponade tubes, Bakri balloons etc.).

While replacement therapy with plasma, platelets, and red blood cells (RBC) should not generally be based upon any set formula, some studies have shown a survival advantage is associated with decreasing the ratio of RBCs to fresh frozen plasma (FFP), platelets and/or cryoprecipitate/ fibrinogen administered to patients undergoing massive transfusion. Patients with haemodynamic instability may benefit from intra-hospital transfer (with a high level of medical escort) to another location for more definitive care, prior to stability being achieved (e.g. major haemorrhage in patients outside of OT/Radiology). Inter-hospital transfer of an unstable patient is difficult and requires early input from senior staff and retrieval services to establish whether it is feasible.

The purpose of this policy is to outline the process and procedures of activating, participating and managing a Massive Transfusion Protocol, in line with current best practice guidelines.

2. The Aims / Expected Outcome of this Policy & Procedure

- Establishing consistent, SLHD wide policy and systems for the use of evidence based best practice for patients requiring massive transfusion.
- To ensure a consistent approach is achieved to provide fast and efficient dispensation of blood products.
- Assist and guide health-care professionals in making clinical decisions when managing patients with critical bleeding who require or are likely to require massive transfusion.

3. Risk Statement

SLHD Enterprise Risk Management System (ERMS) Risk # 158 – Maintain a comprehensive Blood Management Program.

4. Scope

This policy addresses the management of adult patients and paediatric patients above 16 years of age with critical bleeding who require massive transfusion.

This policy applies to all Nurses, Midwives, Medical Officers, Laboratory Staff and other accredited Health Services Staff.

5. Resources

Implementation of this policy is within existing resources.

The BloodSafe training courses listed below are available:

- BloodSafe: Critical Bleeding. This three hour BloodSafe eLearning Australia module is accessible via My Health Learning (MHL). This module supports Medical Practitioners, Nurses and Midwives, Transfusion Laboratory Technicians and other Healthcare Workers involved in critical bleeding situations.
- BloodSafe: Viscoelastic Haemostatic Testing. This course provides you with an introduction to the methodology and clinical use of viscoelastic haemostatic tests - thromboelastography (TEG®) and thromboelastometry (ROTEM®), which are used to assess haemostasis in patients with major bleeding.

6. Implementation

- This policy will be published on the SLHD intranet and accessible to all staff.
- Distribution and notification of this policy to relevant staff within SLHD via usual processes (i.e. Memo, emails, staff meetings).
- Education for midwifery staff, nursing staff, medical officers, including during orientation.
- Re-occurring presentations in key areas including; Critical Care, Haematology, Obstetrics and Blood Bank.

7. Key Performance Indicators and Service Measures

Please refer to the SLHD Blood Management Policy (SLHD_PCP2019_041) Section 13 for all staff blood accreditation requirements.

- Number of adverse outcomes or incidents notified on the incident management system (ims+).
- Staff completion of online education resources is recorded in MHL.
- Managers monitor staff completion of mandatory training requirements.

8. Procedure

8.1 Activation of a Massive Transfusion Protocol (MTP)

8.1.1 Criteria for activation of a MTP

The MTP should be activated for patients with any of the following:

- Actual or anticipated transfusion of 4 units of RBC in less than 4 hrs, +/- haemodynamically unstable, +/- anticipated ongoing bleeding.
- Severe thoracic, abdominal or pelvic trauma or multiple long bone fractures.
- Major obstetric, gastrointestinal or surgical bleeding.

Note: If an MTP is activated in a ward outside of ED, ICU, OT or Interventional Radiology activate a Clinical Emergency Response (CERS) as per local guidelines.

8.1.2 How to activate & discuss a MTP (CRGH, TCH, Balmain)

To activate and continue to manage a MTP a senior clinician or delegate must contact the local Blood Bank:

CRGH: 76972 **TCH: 70204** **BAL: 58033**

8.1.3 How to activate & discuss a MTP (RPAH)

To activate a MTP a senior clinician or delegate must dial:

‘2222’ asking for a ‘MTP’

The clinician/delegate must remain on the phone as the call is transferred to a dedicated Blood Bank emergency phone.

Following the activation of a MTP, for ongoing management the clinician/delegate must contact the Blood Bank on **58033.**

8.1.3.1 Code Crimson Activation (RPAH only)

Trauma patients arriving to RPAH ED with acute life threatening haemorrhage may meet the criteria for activation of the Code Crimson Protocol. For further information please refer to RPA Trauma Service: Trauma Code Crimson Protocol (RPAH_PD2019_007).

8.1.4 Information Required When Activating an MTP

When speaking to Blood Bank, the following information must be available:

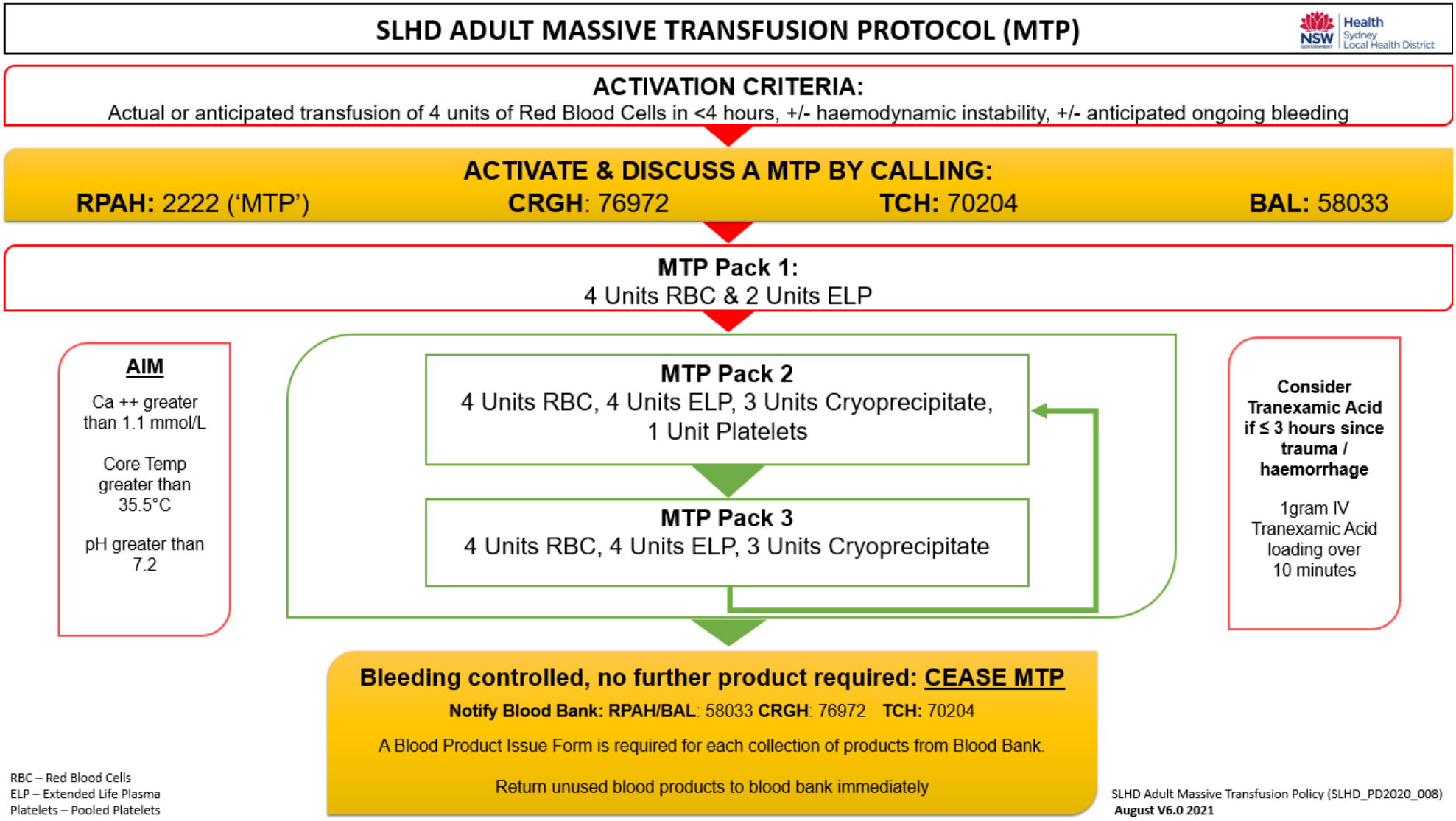
- Patient three core identifiers (MRN, Patient Full Name, DOB)
- Location of the patient
- Name and contact details of a contact person involved in the MTP.

NOTE: Blood Bank may request an urgent Group & Screen collection, please complete this as soon as possible, preferably prior to transfusion.

8.1.5 Blood Bank Initiated MTP

When a 5th unit of Red Blood Cells or large amounts of blood products are being ordered within a 4 hour period, Blood Bank may contact the Medical team to determine whether a MTP should be activated for ongoing bleeding.

8.2 SLHD Adult Massive Transfusion Protocol Pathway



8.2.1 Ordering of Specific Blood Products in Critically Bleeding Patients

- In some instances, in an activated MTP a more directed transfusion strategy may be used e.g. ROTEM/TEG guided. The clinician should call Blood Bank, identify the patient using three core identifiers and request blood products as per their Department's algorithm.
- At any stage, the Blood Bank may inform the Haematology Registrar/Haematologist to obtain more clinical information.
- A separate Blood Product Issue Form must be provided on every occasion. In order to collect blood products from Blood Bank, a Blood Product Issue Form must be completed with the patient three core identifiers (Patient addressograph label is sufficient). Writing 'MTP' on the Blood Product Issue Form is sufficient. Products will be dispensed as per the order via phone call between the Medical team and Blood Bank.

8.2.2 Collecting Blood Products from Blood Bank

In order to collect blood products from Blood Bank, a Blood Product Issue Form must be completed with the patient three core identifiers (Patient addressograph label is sufficient).

A separate Blood Product Issue Form must be provided on every occasion. This ensures Blood Bank staff dispense the correct products for the correct patient (more than one MTP may be activated at any one time). 'MTP' should be written on the Blood Product Issue Form. This is sufficient and will guide the Blood Bank to dispense the next MTP pack.

Blood Bank will <u>NOT</u> dispense blood products without a Blood Product Issue Form.

Clinicians/Porters who arrive without a Blood Product Issue Form with the patient's identification details will be sent back to obtain the appropriate information.

8.3 Administering Blood Products in an MTP

8.3.1 Compatible Transfusion Lines & Fluids

A rapid infusion pump set primed with 0.9% Sodium chloride should be used during massive transfusion where the patient requires rapid blood transfusion administration.

If available use a validated blood warmer.

8.3.2 Patient Consent

Where the patient is unable to provide consent, and the transfusion of blood and/or blood products is necessary to save the patient's life, a blood transfusion is allowed without gaining consent.

In cases, where a patient *has made unequivocal written declaration that they do not want blood in these circumstances,* those wishes must be respected by treating clinicians. (E.g. Advance Care Directive or SLHD Refusal of Blood and/or Blood Product Form).

Exemption to the consent requirement under these circumstances should be documented in the medical record. Once the patient is able to provide consent for administration of blood

and blood products, this must be sought. Refer to SLHD Blood Management Policy (SLHD_PCP2019_041) Section 2.4.

8.3.3 Documentation & Pre-Transfusion Checking Procedures

In a life threatening situation, where a blood transfusion is necessary to save the patient's life, a verbal prescription may be used. This should be immediately documented in the resuscitation clinical record. A retrospective prescription must be documented following completion of the MTP.

In a life threatening situation, as a minimum the two clinicians performing the pre-transfusion checks must complete the following checks independently of each other:

- Ensure the three core identifiers on the following documents are checked and found to be identical
    - Transfusion sheet.
    - Compatibility label.
    - Patient identification band – (Verify the patient identity via the patient or witness).
- Check that the following details are correct and identical on the blood product label, compatibility label and transfusion sheet
    - Donation / batch number,
    - Patient blood group,
    - Unit ABO group & Rh factor (if applicable),
    - Product expiry date (ensuring the product has not expired),
    - Confirm the integrity of the blood product by visual inspection.

If any discrepancies are found DO NOT PROCEED UNDER ANY CIRCUMSTANCES

If a discrepancy is found on the blood product, compatibility tag or transfusion sheet, the blood product and transfusion sheet must be immediately returned to the Blood Bank, Refer to SLHD Blood Management Policy (SLHD_PCP2019_041) Section 9.3.

8.3.4 Patient Management Recommendations

- A multidisciplinary approach involving clinical care team, including Anaesthetist, Surgeons, Emergency/Trauma staff, Haematology team and Blood Bank is recommended.
- Staff should have clearly defined roles. Where possible, at least one staff member should be dedicated to administering blood products and fluids whilst 2 separate staff perform the pre-transfusion identity checking procedures.
- Vascular access: Large bore intravenous access should be obtained (e.g. 18G cannula or larger) to allow sufficient rapid fluid delivery to achieve successful resuscitation.
- To achieve haemorrhage control:
    - Identify bleeding cause;

  - Initial measures to reduce bleeding include: compression, tourniquet, packing;
  - If significant ongoing bleeding continues despite patient management to achieve resuscitative aims, consider damage control surgery or angiography.

- Tolerate permissive hypotension (Systolic BP 80–100 mmHg) until active bleeding is controlled, except in patients with a head injury or who are pregnant.
- Avoid use of crystalloid fluids (due to risk of haemodilution and dilutional coagulopathy).
- Temperature: Detect, prevent and correct hypothermia. Large volumes of intravenous fluid resuscitation (even at room temperature) can rapidly cause hypothermia. Active fluid warming should be used if available. Patient warming is critical and monitoring of core temperature is recommended (e.g. rectal or nasopharyngeal).
- An arterial or venous blood gas should be taken immediately then every 30–60 mins.
- Prevent or correct hypocalcaemia by frequent monitoring of ionised calcium and replacement if level drops below 1.1mmol/L (where possible administer calcium chloride via separate IV access to blood product due to risk of coagulation).
- FBC, Coag Screen, Fibrinogen, Biochemistry should be sent immediately then every 30 – 60 mins.
  - **Do not delay transfusion of blood products whilst waiting for results.**
  - Inform the laboratory that urgent coagulation testing is required with results rung through to the point of care.
- **In RPA**, consider cell-saver if personnel and equipment available.
  - Note: Rh (D) negative maternity patients receiving salvaged blood where the cord blood group is Rh (D) positive require a dose of Rh (D) immunoglobulin, with additional doses based on the result of assessment of fetomaternal haemorrhage test.

8.3.4.1 Obstetric Patients

In maternity patients, major blood loss can develop rapidly around the time of delivery and this is often under-estimated and may be concealed. Profound coagulopathy & DIC may develop rapidly and early, in the absence of haemodynamic compromise.

Close monitoring of all women in the peripartum period, and early recognition and rapid response, are critical. Delay in recognition and response contribute to the severity of haemorrhage and to maternal morbidity and mortality.

To note, on activation of an obstetric MTP at TCH, Blood Bank will commence MTP Pack 1 with the addition of 3 units of Apheresis Cryoprecitate to enable earlier dispensing of cryoprecipitate.

Do not use haemoglobin alone as a transfusion trigger. Haemoglobin results should be interpreted in the context of haemodynamic status, organ perfusion and tissue oxygenation.

8.3.5 Resuscitative Aims for Massive Haemorrhage

Aim for:

- INR ≤ 1.5; PT less than 16 seconds; aPTT less than 42 seconds.
- Fibrinogen greater than 1.0 g/L or greater than 2.0 g/L for obstetric patients.
- Platelets greater than 50 × 10^9/L (greater than 100 × 10^9/L in head injuries).
- pH greater than 7.2
- Base Excess less than -6.0
- Lactate less than 4mmol/L
- Ionised Calcium greater than 1.1mmol/L
- Core Temperature greater than 35.5°C

Note: To optimise haemostasis, ensure patient temperature, pH & calcium is rectified.

8.4 Adjunct Medications

8.4.1 Tranexamic Acid

There is evidence to support tranexamic acid administration in trauma patients with significant haemorrhage, some patients with significant bleeding and women with post-partum haemorrhage.

If tranexamic acid is to be used it should be administered within 3 hours of injury/postpartum haemorrhage.

*8.4.2 Dosage for Significant Bleeding from Trauma**

- 1g infused over 10 minutes.
- If clinically indicated, a second dose of tranexamic acid may be considered. If appropriate this would be infused over 8 hours.

*Use of tranexamic acid in other settings of haemorrhage should be considered on a case-by-case basis in the absence of definitive evidence of efficacy.

8.4.3 Dosage for Postpartum Haemorrhage

- For primary PPH, if bleeding persists after 30 minutes or stops and restarts within 24 hours of the first dose (as per 1st dose used in trauma - 1g tranexamic acid IV over 10 minutes), a second dose of 1g IV tranexamic acid may be administered. Using a syringe driver, inject 1g tranexamic acid IV at the rate of 1mL/minute over 10 minutes (i.e. 100mg / mL / minute).

Refer to SLHD Policy Compliance Procedure- Maternity: Tranexamic Acid in the Treatment of Postpartum Haemorrhage (PPH) SLHD_PCP2021_012 Section 8.3.

8.4.4 Consideration for use of Recombinant Factor VIIa

The routine use of recombinant Factor 7a (rFVIIa) in trauma patients is not recommended due to its lack of effect on mortality and variable effect on morbidity.

Use of rFVIIa may be considered to assist in the management of persistent coagulopathy and ongoing blood loss unresponsive to conventional haemostatic therapy in selected massive transfusion patients. Fibrinogen, PT, APTT, platelets and Ca++ needs to be adequate prior to administration.

To note: rFVIIa is not licensed for use in this situation.

8.4.4.1 Inclusion Criteria

If the patient meets all of the following inclusion criteria, use of rFVIIa may be considered:

- Uncontrolled haemorrhage in a salvageable patient, **and**
- Failed surgical or interventional radiology measures to control bleeding, **and**
- Adequate blood component replacement, **and**
- pH >7.2, temperature >34°C.

8.4.4.2 Approval Process

Approval is required from:

1. The Haematology Registrar or Haematologist on call who will determine whether rFVIIa is clinically indicated, **AND**
2. The Treating Team will need to contact the Pharmacy Department (RPAH/TCH) or Blood Bank (CRGH) via switch for the hospital Drug Committee approval.

It is the treating team's responsibility to source the product from pharmacy in RPA & TCH. To note, in CRGH this is kept in Blood Bank, the aforementioned process applies.

8.4.4.3 Dosage

Advice on the required dose of rFVIIa is to be determined by the approving Haematologist.

- Initial dose of 90µg/kg (1mg for every 11kg body weight) rounded to the nearest whole vial to minimise wastage.
- Administered as an intravenous bolus over 2 to 5 minutes.
- A second dose may be required 2 to 4 hours after the first dose.

8.5 MTP in Balmain Hospital

If a Massive Transfusion Protocol is activated in Balmain Hospital, treating clinicians must ensure Blood Bank is informed of the patient movements/transfer, to allow blood products to be sent to the correct location.

8.6 Deactivation of an MTP

Blood Bank **must** be instructed to discontinue the MTP as soon as massive transfusion is no longer required, to minimise product wastage. Notify Blood Bank when:

- Bleeding is controlled and massive transfusion is no longer required,
- Further resuscitation is deemed futile and transfusion ceased,
- If the patient is being transferred to another facility and products are **NOT** required for transfer.

9. Consultation

- SLHD Blood Management Committee
- SLHD MTP Review Working Group
- Haematology Departments
- SLHD Blood Banks
- Trauma Services
- Anaesthetic Departments
- Intensive Care Services
- Obstetric Services
- Centre for Education and Workforce Development, SLHD

10. Links and tools

- National Blood Authority: Patient Blood Management Guidelines: Module 1 – Critical Bleeding Massive Transfusion
- National Blood Authority: Patient Blood Management Guidelines: Module 5 – Obstetric and Maternity

11. References

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12. National Safety and Quality Standard/s, 2nd edition

Clinical Governance Standard

Communicating for Safety Standard

Blood Management Standard

Recognising and Responding to Acute Deterioration Standard