

CLINICAL PRACTICE GUIDELINES

2016

1.0

GUIDELINES FOR MASSIVE BLOOD TRANSFUSION



Statement Of Intent

This clinical practice guideline is based on the best available evidence at the time of development. All health care providers are responsible for the management of their patients based on the clinical picture. The management depends on the options available locally.

Review Of Guidelines

This guideline was issued in 2013 and will be reviewed in 2018 if new evidence becomes available.

Department of Anaesthesiology and Intensive Care,
UKM Medical Centre,
Jalan Yaacob Latif,
56000 Cheras,
Kuala Lumpur.

GUIDELINES DEVELOPMENT COMMITTEE

Chairperson

PM DATIN DR NORSIDAH ABD MANAP

Committee Members

PROF DR LEE CHOON YEE

PROF DR JAAFAR MD ZAIN

PM DR ADNAN DAN

PM DR CHOY YIN CHOY

PROF DR JOANNA OOI SU MIN

PM DR NURLIA YAHYA

PM DR RAHA ABDUL RAHMAN

DR NADIA MD NOR

DR MUHAMMAD MAAYA

DR AZARINAH IZAHAM

DR ESA KAMARUZAMAN

DR LIU CHIAN YONG

DR KAMAL BASHAR ABU BAKAR

DR WAN RAHIZA WAN MAT

DR ALIZA MOHAMAD YUSOF

DR SHEREEN TANG SUET PING

DR RUFINAH TEO

DR AZLINA MASDAR

REVIEWED BY,

HOSPITAL MASSIVE BLOOD TRANSFUSION PROTOCOL WORKING GROUP

1. Prof Datin Dr Noor Hamidah Hussin
2. Prof Dr Felician Lim
3. AP Dr Leong Chooi Fun
4. AP Dr Ani Amelia Zainuddin
5. AP Dr Goh Eng Hong
6. Dr Muhammad Maaya
7. Dr Ruffinah Teo
8. Dr Nurasyikin Yusof
9. Dr Suria Abdul Aziz
10. Dr Fadzlon Mohd Yatim
11. Dr Loh C-Khai
12. Dr Kamalanathan A/L Palaniandy
13. Dr Nor Rafeah Tumian
14. Dr Ahmad Farihan Mohd Don
15. Dr Rabeya Yousuf
16. Puan Maryana Razali
17. Encik Herman Mohd Mobin

INTRODUCTION

The management of massive haemorrhage may be part of a component of treating a critically unwell patient and is often challenging. The definition of massive haemorrhage varies and has been described as one of the following:

1. Adult :
 - a. A loss of one blood volume (70mls/kg or ~ 5 litres) within a 24 hours period
 - b. A loss of 50% blood volume within 3 hours
 - c. A rate of loss of 150 ml/min
2. Children :
 - a. A loss of ≥ 80 mls/kg within a 24 hours period
 - b. A loss of ≥ 40 mls/kg within 3 hours

However, these definitions have limited value as blood may need to be transfused before such blood loss has occurred.

1. TEAMWORK AND ROLES

A multi-disciplinary team comprised of adequate personnel is paramount to handle this taxing event. Once massive haemorrhage or the need to transfuse is recognised, a capable team leader calls for help and assign roles:

- 1.1 Appropriate surgical team(s) to arrest the bleeding
- 1.2 Collection of blood samples
- 1.3 Secure large bore intravenous access and blood/blood product transfusion
- 1.4 Alert the haematology laboratory doctor and blood bank regarding the case and also for urgent processing of samples and transfusion products
- 1.5 Blood sample dispatch to the laboratory
- 1.6 Blood and blood product collection from the blood bank
- 1.7 Technician skilled in utilising cell salvage auto-transfusion if this is deemed to be a viable method
- 1.8 For certain cases, radiological stenting or embolisation may be considered

2. IMMEDIATE ACTION

- 2.1 Control obvious bleeding points
- 2.2 Administer high F_iO₂
- 2.3 Secure large bore intravenous access
- 2.4 Obtain baseline blood sample, which include:
 - 2.4.1 Full blood count
 - 2.4.2 Coagulation profile
 - 2.4.3 Cross-match (2 x 6mls EDTA tubes), if this has not been done previously.

For the MTP protocol of blood product support, please refer to appendix 1

2.5 Volume resuscitation

Cross-matched blood may be readily available for certain surgical procedures. If not, in terms of time of availability, blood O is the quickest, followed by group specific, then cross-matched blood. Other fluids (crystalloid and colloid) can be given whilst awaiting for blood.

2.6 Warm the patient and all transfused fluids

Blood and blood products must be warmed and administered only using devices which were manufactured specifically for such tasks.

3. BLOOD CHECKING AND DELIVERY

- 3.1 The blood, blood products and documents issued by the blood bank must be cross-checked with the patient's details by two medical personnel to verify that they match.
- 3.2 Blood can be warmed using specially manufactured warm water bath prior to transfusion and/or transfused using devices designed for warming the intravenous line.
- 3.3 Blood administration set (with 170um filter) must be used, which may require change to a new set due to deposits of aggregate following multiple transfusions.

- 3.4 The blood bag can be pressurised to generate a higher a flow rate with automated pressurised infuser or pressurised bag upto a maximum of 300mmHg.

Some devices (e.g Level 1®) incorporate both warming and pressurisation. This can be utilised early when the need for massive blood transfusion is recognised.

4. FURTHER MANAGEMENT

- 4.1 Regarding surgery,

4.1.1 If not yet commenced, this must be an early consideration

4.1.2 If ongoing, it may have to be limited to “damage control”

- 4.2 In order to optimise oxygen delivery to the tissues, maintain good oxygenation and cardiac output.

- 4.3 If there is continuous bleeding, , obtain blood sample every 60 minutes to monitor the:

4.3.1 Full blood count/Haemoglobin

4.3.2 Coagulation profile

4.3.3 Arterial blood gases

4.3.4 Ionised calcium

- 4.4 If further units of blood are required, a repeat sample must be taken for cross-matching. Inform the haematology doctor and blood bank to avoid delay.

- 4.5 Aggressively treat and aim for the following (these are easier to achieve once the bleeding is controlled):

4.5.1 Temperature > 35°C

4.5.2 pH > 7.2

4.5.3 Base excess < -6

4.5.4 Lactate < 4 mmol/L

4.5.5 Ca^{2+} > 1.1 mmol/L

4.5.6 Platelets > 50 x 10⁹/L

4.5.7 PT/APTT < 1.5 x normal

4.5.8 Hb > 8.0g/dl

4.5.9 Fibrinogen > 1.0 g/L

- 4.6 Repeat transfusion of blood and blood products transfusion as required. The target for haemoglobin level varies based on clinical judgement and individually based on the patient's pre-existing medical status.

5. PHARMACOLOGICAL INTERVENTION

- 5.1 Recombinant factor VIIa, is not routinely recommended, but can be considered as an off-label intervention for massive haemorrhage in:
Uncontrollable haemorrhage in salvageable patient AND
failed surgical or radiological intervention to arrest bleeding AND
adequate blood component replacement.

Following agreement with the patient's family members regarding the financial implication related to this drug, the pharmacy (for out of hours, the on-call pharmacist) must be alerted and the drug is prescribed online.

- 5.2 The patient must be transferred to a ward or area with a level of high dependency care for further management and correction of physiological status. Additional transfusion may be required

6. CLINICAL CASE REVIEW

- 6.1 A clinical review will be conducted within two weeks following each activation of MTP, this is to monitor and ensure the judicious use of the blood products and also to identify the weaknesses of the protocol for continuous improvement.

ADAPTED FROM

1. Guidelines on the Management of Massive Blood Loss. *British Journal of Haematology* 2006; **135**: 634-41.
2. Association of Anaesthetists of Great Britain and Ireland. Guidelines: Blood Transfusion and the Anaesthetist: Management of Massive Haemorrhage 2010.
3. National Blood Authority, Australia. Patient Blood Management Guidelines: Module 1- Critical Bleeding Massive Transfusion 2012.

Appendix 1

1. Blood Product Support

- The MTP is designed to ensure that when a patient has received or likely to receive large volumes of red cells, adjunct support with fresh frozen plasma (FFP) and platelets are also provided to manage coagulopathy and to reduce the likelihood of dilutional coagulopathy.

MTP 1	≤ 20 KG (A)	> 40KG (B)
Red Cells	2 units	4 units
FFP	2 units	4 units
Following the release of the MTP 1 products, Blood Bank staff will automatically start to prepare for the MTP 2 products UNLESS INFORMED NOT TO CONTINUE BY THE WARD STAFF AT TIME OF COLLECTION OF MTP1 PRODUCTS		
MTP 2	≤ 20 KG (A)	> 40KG (B)
Red Cells	2 units	4 units
FFP	2 units	4 units
Platelets – random	2 units	4 units
Cryoprecipitate	2 units	4 units
Following the released MTP 2 products, MTP will be TERMINATED AUTOMATICALLY unless requested by the treating doctor ** MTP 3 requires new samples (2x6mls EDTA) for subsequent request**		
MTP 3	Blood products as in MTP 2	

