The Walton Centre NHS
NHS Foundation Trust

Excellence in Neuroscience

Management of Massive Transfusion Guidelines

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Think of the environment…Do you have to print this out this document? **You can always view the most up to date version electronically on the Trust intranet.**

1. Introduction

This guideline is to be followed for the management of all patients undergoing a massive blood transfusion.

2. Scope

All clinical and laboratory staff managing a patient with a massive blood transfusion.

This document is intended to be used in conjunction with "The Northwest Regional Toolkit for the Management of Massive Haemorrhage."

3. Clinical activation of the guidelines

The Massive Haemorrhage guidelines will be activated for a patient requiring a massive blood transfusion. This can be defined as patients with:

- 1 Blood Volume loss per 24 hours
- Or > 50% blood volume loss in 3 hours
- Or ongoing blood losses > 150mls per hour

(Definition from The British Committee for Standards in Haematology)

The transfusion laboratory will not issue Major Haemorrhage Packs (MHP) for the *anticipation* of a massive haemorrhage for a patient in whom there is currently no active major bleeding as defined above. The only exception to this is in cases of ***ruptured*** abdominal aortic aneurysms who are to undergo surgery imminently, in which case one MHP may be ordered by a consultant only.

Where there is an anticipation of MHPs being required, and it is possible the Massive Haemorrhage Guidelines will be activated, it is advisable to alert the laboratory to this possibility at the earliest opportunity. This enables resources to be put in place in the laboratory to facilitate timely and expeditious issue of MHPs should the need then subsequently arise.

3.1. Documents for Use at The Walton Centre:

- Transfusion Management of Massive Haemorrhage in Adults
- Laboratory Algorithm
- "Seven Steps For Successful Coordination Of Massive Haemorrhage: Walton Centre / Aintree"
- Transfusion Management of Massive Haemorrhage in children (See Appendix 1)

4. References

"The Northwest Regional Toolkit for the Management of Massive Haemorrhage."

Transfusion Management of Massive Haemorrhage in Adults

Activation Tel Number

[redacted]

Emergency O red cells*
- location of supply:
Collect from Transfusion Lab
***Estimated time to receive at this clinical area: 5 min**

•Group specific red cells:
20 min from receipt of sample
• XM red cells:
45 min from receipt of sample

[redacted]
Consultant Haematologist
☎ via switchboard

Patient bleeding / collapses
Ongoing severe bleeding eg:150 mls/min and Clinical shock
Administer Tranexamic Acid – esp in trauma and ideally within 1 hour
(1g bolus followed by 1g infusion over 8 hours)

Airtree University Hospitals NHS
NHS Foundation Trust
NHS
North West Regional Transfusion Committee incorporating North Wales

Activate Massive Haemorrhage Pathway

Call for help
'Massive Haemorrhage, Location, Specialty'
Alert: Outreach (if appropriate), on call consultant and patient's consultant, blood transfusion laboratory.
Consultant involvement is essential

RESUSCITATE
Airway
Breathing
Circulation

Take bloods and send to lab:
XM, FBC, PT, APTT, fibrinogen, U+E, Adjusted Ca
NPT: ABG,
and
Order MHP 1
Red cells* 4 units
FFP 4 units
(*Emergency O blood, group specific blood, XM blood depending on availability)

Continuous cardiac monitoring

Prevent Hypothermia
Use fluid warming device
Used forced air warming blanket

Consider 10 mls Calcium chloride 10% over 10 mins

2 packs cryoprecipitate if fibrinogen < 1.5g/l (<2g/l in obstetric haemorrhage) or as guided by TEG / Rotem

STOP THE BLEEDING

Haemorrhage Control
Direct pressure / tourniquet if appropriate
Stabilise fractures
Surgical intervention –consider damage control surgery
Interventional radiology
Endoscopic techniques
Obstetric techniques

Haemostatic Drugs
Vit K and Prothrombin complex concentrate for warfarinised patients and
Other haemostatic agents and reversal of new anticoagulants: discuss with Consultant Haematologist

Cell salvage if available and appropriate
Consider ratios of other components:
1 unit of red cells = c.250 mls salvaged blood

Give MHP 1

Reassess
Suspected continuing haemorrhage requiring further transfusion
Take bloods and send to lab:
FBC, PT, APTT, fibrinogen, U+E, Adjusted Ca
NPT: ABG, TEG / ROTEM if available

Aims for therapy
Aim for:

Hb	8-10g/dl
Platelets	>75 x 10^9/l
PT ratio	< 1.5
APTT ratio	<1.5
Fibrinogen	>1.5g/l
Adjusted Ca	>2 mmol/l
Temp	> 36°C
pH	> 7.35 (on ABG)
Monitor for hyperkalaemia	

Order MHP 2
Red cells 4 units
FFP 4 units
Platelets 1 dose (ATD)
and subsequently
request Cryoprecipitate 2 packs if fibrinogen <1.5g/l (or < 2g/l in obstetric haemorrhage) or according to TEG / ROTEM

Give MHP 2

Once MHP 2 administered, repeat bloods:
FBC, PT, APTT, fibrinogen, U+E,
NPT: ABG, TEG / Rotem if available.
To inform further blood component requesting

STAND DOWN
Inform lab
Return unused components
Complete traceability tags & documentation
Including audit proforma

Thromboprophylaxis should be considered when patient stable

ABG – Arterial Blood Gas
FFP- Fresh Frozen plasma
PT- Prothrombin Time
APTT – Activated partial thromboplastin time
MHP – Massive Haemorrhage Pack
XM - Crossmatch
ATD- Adult Therapeutic Dose
NPT – Near Patient Testing

Laboratory Management of Massive Haemorrhage

Massive Haemorrhage Pathway Activated

Transfusion receives Call
'Massive Haemorrhage, Location, Specialty'
On standby

Receive call from designated communication lead in clinical area:
'This relates to massive haemorrhage situation'

The caller will state:

- Name and contact telephone number, name of consultant responsible
- Patient's ID (surname, forename, hospital number, DOB or minimum acceptable patient identifiers if unknown)
- Requirements:
  - State if O Neg is required as part of 1st pack (normally up to 2 packs)
  - Order massive haemorrhage pack 1
  - Clarify urgency of requirements to decide on need for further emergency group O , or time to wait for group specific or crossmatched red cells (issue as part of pack 1)
  - U+E, FBC, PT, APTT, Fibrinogen, ABG*, Adjusted Calcium, lactate*

*may be near patient test

Receive samples and request forms

Haematology
Perform FBC, PT, APTT, Fibrinogen

Ring results to communication lead when available

Transfusion
Perform Group, antibody screen and crossmatch

Prepare MHP 1

Red cells*	4 units

(*emergency group O blood, group specific blood, XM'd blood depending on urgency)
FFP (group specific) 4 units
(lab staff to ensure stock platelets available or order 2ATD on blue light from blood centre)

Receive further calls from communication lead in clinical area:
Repeat investigations
Order for MHP 2
Liaise with on call haematologist (consultant / SpR)
Order for further components dependent on ongoing results
Stand down

Ring clinical area (communication lead) when blood / components ready

Prepare MHP 2

Red cells	4 units
FFP	4 units
Platelets	1 ATD
Cryoprecipitate	2Packs (if requested)

Restock Emergency Group O blood if used
Complete traceability audit trail

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Seven Steps for Successful Coordination in Massive Haemorrhage: Aintree

1. Recognise trigger and activate pathway for management of massive haemorrhage; assemble the emergency response team

Phone [redacted] and request Outreach (if applicable). Call consultant responsible for care of patient (if out-of-hours on call cons)

2. Allocate team roles

i. Team leader
ii. Communication lead– dedicated person for communication with other teams, especially the transfusion laboratory and support services
iii. Sample taker / investigation organiser / documenter
iv. Transporter - HCA, or other transfusion-trained member of team from clinical area)

3. Complete request forms / take blood samples, label samples correctly / recheck labelling

U+E, FBC, Crossmatch, PT, APTT, Fibrinogen, ABG, Calcium, lactate

Form should be an addressograph (preferable) otherwise handwritten with 4 identifiers (full name, DOB, hosp/NHS No) **Sample**: Pink EDTA tube **must be handwritten**, (full name, DOB, hosp/NHS No) if emergency unknown patient then 2 identifiers are accepted (e.g. 'unknown 006785').

4. Request blood / blood components

Team leader should decide on use of:

i. Emergency O Neg (immediate)

O neg blood available from transfusion laboratory (5 mins). 2 units O neg blood available in Recovery Fridge

ii. Group specific 20 mins from receipt of sample
iii. Full Crossmatch 45 mins from receipt of sample

Communication lead to contact laboratory:

Hotline: ☎ [redacted] out-of-hours if no response on hotline

and inform the BMS of the following:

i. Your name, location and ext number
ii. 'this relates to the massive haemorrhage situation'
iii. The patient's details: ideally surname, forename, hospital number, DOB (if unknown casualty: the hospital number and the unknown person number)
iv. Whether O Neg will be required and how many units (usually 2)
v. Order massive haemorrhage pack(s)
vi. Contact lab if blood has been transferred with patient from another Trust (transferred blood must be sent in a box to the laboratory at Aintree prior to use) or patient is being transferred to another Trust

5. The clinical / laboratory interface

i. Communication lead to arrange for transport of samples / request form to the laboratory
ii. BMS to ring communication lead with results of urgent investigations
iii. BMS to ring communication lead when blood / blood components are ready
iv. Communication lead to arrange to collect blood and blood components from the laboratory

Designate HCA or other suitable staff member to transport samples to the laboratory. The HCA must alert laboratory reception staff of the urgency of the request when delivered.

6. Communicate stand down of pathway and let lab know which products have been used

7. Ensure documentation is complete

i. Clinical area: monitoring of vital signs, timings of blood samples and communications (lab and cons haematologist), transfusion documentation in patient casenote record, return traceability information to laboratory.
ii. Laboratory: keep record of communications / telephone requests in patient laboratory record

Appendix 1 - Transfusion Management of Massive Haemorrhage in children