



SCGH Massive transfusion protocol (MTP)

Actual or anticipated 4 units RBC in < 4 hours, + haemodynamically unstable, +/- anticipated ongoing bleeding
Severe thoracic, abdominal, pelvic or multiple long bone trauma
Major gastrointestinal, surgical or obstetric bleeding

Senior clinician determines that patient meets criteria for MTP activation

Baseline:

Group and screen/cross match, full blood count, coagulation screen (PT, INR, APTT, fibrinogen),
biochemistry, arterial blood gases

Notify transfusion laboratory (83 4018, page 4467.) to:
'Activate MTP'

Send courier to Transfusion Medicine Unit (TMU) (Ground floor, PP block)

Laboratory staff

- Notify haematologist/transfusion specialist
- Prepare and issue blood components as requested
- Anticipate repeat testing and blood component requirements
- Minimise test turnaround times
- Consider staff resources

Haematologist

- Liaise regularly with laboratory and clinical team
- Assist in interpretation of results, and advise on blood component support

Senior clinician

• Request:

- 4 units RBC
- 2 units FFP

• Consider:

- 1 adult therapeutic dose platelets
- tranexamic acid in trauma patients

• Include:

- 8 units cryoprecipitate if fibrinogen < 1 g/L

Bleeding controlled?

YES

NO

Notify transfusion laboratory to:

'Cease MTP'

Return unused product to TMU immediately

OPTIMISE:

- oxygenation
- cardiac output
- tissue perfusion
- metabolic state
- temperature
 - level 1 fluid warmer
 - bair hugger
 - warm blankets
 - minimise exposure)

MONITOR

(every 30–60 mins):

- full blood count
- coagulation screen
- ionised calcium
- arterial blood gases

AIM FOR:

- temperature > 35°C
- pH > 7.2
- base excess > -6
- lactate < 4 mmol/L
- Ca²⁺ > 1.1 mmol/L
- platelets > 50 10⁹/L
- PT/APTT < 1.5 normal
- INR ≤ 1.5
- fibrinogen > 1.0 g/L



SCGH Massive Transfusion Protocol



Initial management of bleeding

- Identify cause
- Initial measures:
 - compression
 - tourniquet
 - packing
- Surgical assessment:
 - early surgery or angiography to stop bleeding

Specific surgical considerations

- If significant physiological derangement, consider damage control surgery or angiography

Cell salvage

- Consider use of cell salvage where appropriate

Dosage

Platelet count < 50 x 10 ⁹ /L	1 adult therapeutic dose
INR > 1.5	FFP 2 units then reassess
Fibrinogen < 1.0 g/L	cryoprecipitate 8 units
Tranexamic acid	1g over 10min, then infusion of 1 g over 8 hrs

Blood product availability

RBC	Immediate	Uncrossmatched O Rh(D) neg
	15 mins	ABO Rh(D) Group Specific
	45 mins	Crossmatched
FFP	Immediate	2 Units pre-thawed Group AB
	30 mins	Further FFP
Platelet Availability		
	Immediate	if on site, otherwise min. 1 hour

Resuscitation

- Avoid hypothermia, institute active warming
- Avoid excessive crystalloid
- Tolerate permissive hypotension (BP 80–100 mmHg systolic) until active bleeding controlled
- Do not use haemoglobin alone as a transfusion trigger

Special clinical situations

- Warfarin:
 - add vitamin K 10mg IV, prothrombinex 25IU/kg
- Other coagulopathy
 - aspirin/anti-platelet agents: give 1 adult dose platelets
 - dabigatran/rivaroxaban/apixaban: contact haematologist
- Obstetric haemorrhage
 - DIC is common, recommend early cryoprecipitate
- Head injury:
 - aim for platelet count > 100 10⁹/L
 - permissive hypotension contraindicated

Considerations for use of rFVIIa

The *routine* use of rFVIIa in trauma patients is not recommended due to its lack of effect on mortality (Grade B) and variable effect on morbidity (Grade C). rFVIIa may be considered where there is:

- uncontrolled haemorrhage in salvageable patient, **and**
- failed surgical or radiological measures to control bleeding, **and**
- adequate blood component replacement, **and**
- Platelet count >50 x10/L
- pH > 7.2, temperature > 34°C.

Discuss with haematologist (dose 100mcg/kg to nearest vial)

^a rFVIIa is not licensed for use in this situation; all use will be reviewed.

ABG arterial blood gas
INR international normalised ratio
DIC disseminated intravascular coagulation
RBC red blood cell

FFP fresh frozen plasma
BP blood pressure
PT prothrombin time
rFVIIa activated recombinant factor VII

APTT activated partial thromboplastin time
MTP massive transfusion protocol
FBC full blood count