Emergencies in Haemostasis and Thrombosis

Oliver Miles, Cheltenham General Hospital
Introduction

- Venous Thromboembolism
- Bleeding in patients receiving antithrombotic drugs
- Low platelets
- BCSH - Guidelines (http://www.bcshguidelines.com/)
Postthrombotic syndrome

- Postthrombotic pigmentation
- Healed skin ulcer and postthrombotic pigmentation
- Chronic (left) leg swelling, skin hardening, and postthrombotic pigmentation
Thrombosis

● 1% Pulmonary hypertension

● 20% post thrombotic syndrome

● Superficial femoral vein (DVT) vs superficial thrombophlebitis (consider 4/52 a/c if >5cm, <5cm near deep veins, or +ve medical r.f.)
VTE - Treatment

DVT

● Anticoagulation
● Massive iliofemoral/proximal femoral with a high risk of limb gangrene - consider thrombolytic therapy, catheter extraction, catheter fragmentation, and surgical thrombectomy. Depending on institution's expertise
VTE - Treatment

DVT
- Anticoagulation
- Massive iliofemoral/proximal femoral with a high risk of limb gangrene - consider thrombolytic therapy, catheter extraction, catheter fragmentation, and surgical thrombectomy. Depending on institution's expertise

PE
- Anticoagulation
- Thrombolysis - hypotension/RV dysfunction
- Thrombectomy

<table>
<thead>
<tr>
<th>PE-related early MORTALITY RISK</th>
<th>RISK MARKERS</th>
<th>Potential treatment implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH &gt;15%</td>
<td>+</td>
<td>Thrombolysis or embolectomy</td>
</tr>
<tr>
<td>Intermediates 3–15%</td>
<td>+</td>
<td>Hospital admission</td>
</tr>
<tr>
<td>Low &lt;1%</td>
<td>-</td>
<td>Early discharge or home treatment</td>
</tr>
</tbody>
</table>

### Principal markers useful for risk stratification in acute pulmonary embolism

- **Clinical markers**: Shock
  - Hypotension

- **Markers of RV dysfunction**: RV dilatation, hypokinesis or pressure overload on echocardiography
  - RV dilatation on spiral computed tomography
  - BNP or NT-proBNP elevation
  - Elevated right heart pressure at RHC

- **Markers of myocardial injury**: Cardiac troponin T or I positive

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*a* based on the degree of RV dysfunction

*b* based on the degree of myocardial injury
Clinical predictors for fatal pulmonary embolism in 15,520 patients with VTE (RIETE registry)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVT</td>
<td>50 / 8958</td>
<td>0.6</td>
</tr>
<tr>
<td>PE (non-massive)</td>
<td>187 / 6073</td>
<td>3.1</td>
</tr>
<tr>
<td>PE(massive)</td>
<td>28 / 228</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Laporte et al, Circulation 2008;117:1711
**IVC Filters**

- IVC filters indicated to prevent PE in patients with VTE who have a contraindication to anticoagulation.
- IVC filter insertion may be considered in selected patients with PE despite therapeutic anticoagulation.
- Consider in pregnant patients with contraindications to anticoagulation or develop extensive VTE shortly before delivery.
- Free floating thrombus is not an indication for insertion.
- Thrombolysis is not an indication.

*BCSH Guidelines Brit J Haematol 2006;134:590*
contact activation

XIa

IX

IXa

VIIa

Xa

VIIIa

Xa

Va

II

IIa

fibrinogen

fibrin
contact activation

IXa

IX

IXa

VIIIa

X

Xa

Va

II

IIa

fibrinogen

fibrin

TF/VIIa
PT prolonged, APTT normal

PT normal, APTT prolonged

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‘underfilled’, deficiency of VII (early VKD/A, early liver disease)

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PT normal, APTT prolonged
deficiency of VIII, IX, XI, (contact factors)
lupus anticoagulant, heparin,

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‘underfilled’, deficiency of VII (early VKD/A, early liver disease)

PT normal, APTT prolonged
deficiency of VIII, IX, XI, (contact factors)
lupus anticoagulant, heparin

PT prolonged, APTT prolonged
deficiency II, V, X
afibrinogenaemia*
VKD/A
heparin#
liver disease
DIC/massive transfusion
Questions

1. Superficial vein thrombosis - 4/52 anticoagulation T/F

2. Imaging reveals free floating thrombus in IVC - ?insert IVC filter T/F
Emergency management of bleeding in patients on anti-thrombotic drugs

BCSH Guideline BJH 2012; 160:35

BCSH Guideline BJH 2010; 154:311
Figure 1. Noncontrast computed tomographic (CT) brain scan 1-
Management of bleeding in patients on antithrombotic drugs

Stop the antithrombotic drug
Document the timing and amount of the last drug dose and presence of pre-existing renal or hepatic impairment
Estimate the half-life and length of functional defect induced by the drug
Assess the source of bleeding
Request full blood count, prothrombin time, activated partial thromboplastin time, thrombin time, fibrinogen concentration, creatinine concentration
If available, request a specific laboratory test to measure the antithrombotic effect of the drug
Correct haemodynamic compromise with intravenous fluids and red cell transfusion
Apply mechanical pressure, if possible
Use endoscopic, radiological or surgical measures

Table II. Pharmacological and blood component pro-haemostatic therapies.

<table>
<thead>
<tr>
<th>Pharmacological or Blood Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranexamic acid</td>
</tr>
<tr>
<td>Desmopressin</td>
</tr>
<tr>
<td>Fresh frozen plasma</td>
</tr>
<tr>
<td>Cryoprecipitate</td>
</tr>
<tr>
<td>Platelet transfusion</td>
</tr>
<tr>
<td>Fibrinogen concentrate</td>
</tr>
<tr>
<td>Prothrombin complex concentrate</td>
</tr>
<tr>
<td>Activated prothrombin complex concentrate</td>
</tr>
<tr>
<td>Recombinant factor VIIa</td>
</tr>
</tbody>
</table>
TF/VIIa
X
IX
IXa
VIIIa
Xa
II
IIa
Va
fibrinogen
fibrin
Warfarin

INR reversal

fibrinogen → fibrin
Emergency Reversal of VKAs

- Emergency reversal with major bleeding should be 25-50u/kg four factor PCC and 5mg IV vit K

- FFP is suboptimal and should only be used if PCC not available.

BCSH Guideline BJH 2010;154:311
● Non major bleeding -
● INR >5 no bleeding,
● INR>8 no bleeding,
● Surgery 6-12 hours
● urgent surgery
- Non major bleeding - 1-3mg IV Vit K
- INR >5 no bleeding,
- INR>8 no bleeding,
- Surgery 6-12 hours
- urgent surgery
• Non major bleeding - 1-3mg IV Vit K
• INR >5 no bleeding, withhold
• INR >8 no bleeding,
• Surgery 6-12 hours
• urgent surgery
• Non major bleeding - 1-3mg IV Vit K
• INR >5 no bleeding, withhold
• INR>8 no bleeding, 1-5mg oral vit K, repeat 24 hours
• Surgery 6-12 hours
• urgent surgery
- Non major bleeding - 1-3mg IV Vit K
- INR >5 no bleeding, withhold
- INR>8 no bleeding, 1-5mg oral vit K, repeat 24 hours
- Surgery 6-12 hours IV Vit K, urgent surgery
• Non major bleeding - 1-3mg IV Vit K
• INR >5 no bleeding, withhold
• INR>8 no bleeding, 1-5mg oral vit K, repeat 24 hours
• Surgery 6-12 hours IV Vit K,
• urgent surgery PCC
Emergency reversal of UFH

- Stopping an UFH infusion and general haemostatic measures are often sufficient to stop or prevent bleeding
- Protamine sulphate (1 mg per 80–100 units UFH) will fully reverse UFH, but should be given slower than 5 mg/min to minimize the risk of adverse reactions
- The maximum recommended dose of 50 mg protamine is sufficient to reverse UHF in most settings.

BCSH Guideline BJH 2012; 160:35
Emergency reversal of LMWH

- Within 8 h - give protamine sulphate (1 mg per 100 anti-Xa units of LMWH). If ineffective, consider further protamine sulphate 0.5 mg per 100 anti-Xa units.
- Greater than 8 h consider smaller doses of protamine (2C).
- Consider rFVIIa if there is continued life-threatening bleeding despite protamine and the time frame suggests there is residual effect from the LMWH.
- *note if >12 hours equivalent to prophylactic dose therefore no need for protamine*
Newer Oral Anticoagulants

- Dabigatran
- Rivaroxaban
- Apixaban

- Increasingly used
  - Prevention of stroke in patients with AF
  - Primary treatment and secondary prevention of VTE
Newer Oral Anticoagulants

• Full activity within 2-3 hours
• No monitoring
  • Little effect on ‘clotting tests’
• Few interactions

• No reversal agents (as yet)
Dabigatran

• Oral agent
• Few interactions
  – Amiodarone and verapamil
  – Azoles, ciclosporin and tacrolimus
• Renally excreted (AKI considerations...)
• No routine monitoring
• Affects aPTT (‘present’ or ‘not present’ only)
• No reversal or antidote (yet...)
**PATIENT RECEIVING DABIGATRAN THERAPY: HAEMORRHAGE PROTOCOL**

**STOP: Dabigatran**

**Request:**
1. Coagulation screen to include APTT (consider thrombin time), +/- DTI assay if available
2. Full blood count and renal function / eGFR

**Important to document time of last dose of dabigatran**

**MAJOR BLEED**

- Maintain BP and urine output (dabigatran 80% renal excretion)
- Optimize tissue oxygenation
- Control hemorrhage
  - Mechanical compression
  - Surgical / radiological intervention
- Tranexamic Acid (1g i.v.)
- Red cell transfusion
  - Aim Hb > 7 g/dl
- Platelet transfusion
  - Aim Plt > 50 x 10^9/l or
  - If CNS bleed aim Plt > 100 x 10^9/l
- Identify bleeding source e.g. surgery, endoscopy, interventional radiology

**LIFE THREATENING BLEED**

- Haemostatic agent
  - FEIBA / rFVIIa / PCC*
  - Consider
  - Haemodialysis

**MILD BLEED**

- Mechanical compression
- Tranexamic Acid
  - oral 25 mg/kg
  - or i.v. 10 mg/kg
- Delay next dabigatran dose or discontinue treatment

**MAJOR BLEED**

- APTT (and TT) normal
- APTT (and TT) prolonged
- NO dabigatran anticoagulant effect present

**MAJOR BLEED**

- Dabigatran anticoagulant effect maybe present (consider oral charcoal if dabigatran ingestion <2 hours)

**MILD BLEED**

- Haemostatic agent
  - FEIBA / rFVIIa / PCC*

**Author:** Dr R Alikhan

*The choice of haemostatic agent is currently based on limited published evidence and will depend on availability as well as advice from haematologist.
Elective surgery discontinuation rules for dabigatran before invasive or surgical procedure

<table>
<thead>
<tr>
<th>Renal function</th>
<th>Estimated half-life</th>
<th>Stop dabigatran before elective surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>CrCL ml/min</td>
<td>Hours</td>
<td>Major surgery or high risk bleeding</td>
</tr>
<tr>
<td>≥80</td>
<td>~ 13</td>
<td>2 days before</td>
</tr>
<tr>
<td>≥50 &lt;80</td>
<td>~ 15</td>
<td>2–3 days before</td>
</tr>
<tr>
<td>≥30 &lt;50</td>
<td>~ 18</td>
<td>4 days before</td>
</tr>
</tbody>
</table>

◊ Examples of major surgery / high bleeding risk: cardiothoracic surgery, neurosurgery, major abdominal or pelvic surgery, major orthopaedic surgery; insertion of cardiac pacemaker / defibrillator

# Examples of non-major surgery / standard risk: uncomplicated laparoscopic procedure, cardiac catheterisation, ablation therapy
Rivaroxaban

- Oral agent
- Few interactions
  - Azoles and some HIV drugs
- Renal and non-renal excretion
  - Still a GFR threshold to consider, when prescribing
- No routine monitoring
- Affects PT ('present' and 'not present' only)
- No antidote or reversal (yet...)
Rivaroxaban and Bleeding

• Much the same as for Dabigatran (but no dialysis)
• Graded approach to severity
• PCC for life-threatening bleeding
  – But discuss with Haematologist
Emergency reversal of thrombolytics

For major bleeding (e.g. intracerebral) within 48 h of administration we recommend:

- Stop infusion of fibrinolytic drugs and other antithrombotic drugs (1C).
- Administer FFP 12 ml/kg (2C).
- Administer intravenous tranexamic acid 1 g tds (2C).
- If there is depletion of fibrinogen, administer cryoprecipitate or fibrinogen concentrate (2C).
- Further therapy should be guided by results of coagulation tests (2C).

Bleeding after thrombolysis due to:

- Clot lysis <30 minutes
- Reduced platelet function
- Reduced factor V
- Reduced fibrinogen
Cases

1. 78 male, hematemsis, hypotensive. On dabigatran for DVT.
2. 35 female, 3rd trimester, leg swelling and femoral DVT confirmed, raised APTT
3. 80 female, PR bleed and hypotension. On warfarin for AF.
Emergency treatment of low platelets

● Normal range 150-400 x10^9/L
● >80-100 for high risk surgery, >50 most procedures (check coag)

● Spontaneous bleeding/bruising <30,
● Mucosal pattern cf. haemophilia
Common causes of low platelets

- Artefactual Clumping/fibrin strands - check film
- ITP/drugs
- HITT
- DIC/TTP - check coag/retic/LDH
- Sepsis/Liver disease - coag, LFTS, CRP
- BM failure (film), other cytopenias
Emergency reversal of antiplatelet drugs

<table>
<thead>
<tr>
<th>Antiplatelet drugs</th>
<th>Time to normal platelet function</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDs</td>
<td>24 h</td>
</tr>
<tr>
<td>Aspirin</td>
<td>5–7 d</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>5–7 d</td>
</tr>
<tr>
<td>Prasugrel</td>
<td>5–7 d</td>
</tr>
<tr>
<td>Ticagrelor</td>
<td>3–5 d</td>
</tr>
<tr>
<td>Tirofiban</td>
<td>4–8 h</td>
</tr>
<tr>
<td>Eptifibatide</td>
<td>4–8 h</td>
</tr>
<tr>
<td>Abciximab</td>
<td>24–48 h</td>
</tr>
<tr>
<td>Dipyridamole</td>
<td>24 h</td>
</tr>
</tbody>
</table>

Time to normal platelet function. No antidote. Normal platelet survival 10 days. 10% of platelets replaced each day, so by 5-7 days approx 50-70% platelet function improved.
Emergency reversal of antiplatelet drugs

1 ATD platelets - $300 \times 10^9$ plts
Blood volume - 5 litres
So after 1 ATD = $60 \times 10^9$/l
After 2ATD = $120 \times 10^9$/l
So if giving any, give 2 ATD

Bleeding in patients during treatment with aspirin, $\text{P}2\text{Y}_{12}$ antagonists or GPIIa/IIIb inhibitors should be managed in the first instance with general haemostatic measures. If necessary, drug cessation and reversal of the effect of co-prescribed anticoagulants should also be considered (2C).
Platelet transfusion (2–3 adult doses) should be considered as an additional measure for critical bleeding or prevention of bleeding before emergency surgery (2C).
Platelet transfusion should be considered to prevent bleeding in severe thrombocytopenia ($<10 \times 10^9$/l) caused by abciximab (2C).
Questions

1. A patient poorly compliant on warfarin is likely to be better off on a NOAC T/F
2. Rivaroxaban typically prolongs the APTT T/F
3. A platelet count of 60x10/9 is safe for a chest drain T/F
4. Dabigatran should be stopped 24 hours before pacemaker insertion T/F
The future….

Factor XI Antisense Oligonucleotide for Prevention of Venous Thrombosis

Büller et al. for the FXI-ASO TKA Investigators

METHODS

300 patients who were undergoing elective primary unilateral total knee arthroplasty to receive one of two doses of FXI-ASO (200 mg or 300 mg) or 40 mg of enoxaparin once daily.

DVT 27% vs 4% vs 30%. Bleeding 3%, 3%, 8%.
Summary

- Venous Thromboembolism
- Bleeding in patients receiving antithrombotic drugs
- Low platelets
- BCSH - Guidelines
  (http://www.bcshguidelines.com/)
Emergency management of HIT

If the platelet count falls by 30% or more and/or the patient develops new thrombosis or skin allergy or any of the other rarer manifestations of heparin-induced thrombocytopenia (HIT) between days 4 and 14 of heparin administration, HIT should be considered and a clinical assessment made (2C). HIT can be excluded by a low pre-test probability score without the need for laboratory investigation (2B). If the pre-test probability of HIT is not low, heparin should be stopped and an alternative anticoagulant started in full dosage whilst laboratory tests are performed (1C).
Table I. 4Ts score.

<table>
<thead>
<tr>
<th>Points (0, 1, or 2 for each of 4 categories: maximum possible score = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Thrombocytopenia</strong></td>
</tr>
<tr>
<td><strong>Timing</strong> of platelet count fall or other sequelae</td>
</tr>
<tr>
<td><strong>Thrombosis or other sequelae (e.g. skin lesions)</strong></td>
</tr>
<tr>
<td><strong>Other cause for thrombocytopenia not evident</strong></td>
</tr>
</tbody>
</table>

Pretest probability score: 6–8 = High; 4–5 = Intermediate; 0–3 = Low.

*First day of immunizing heparin exposure considered day 0; the day the platelet count begins to fall is considered the day of onset of thrombocytopenia (it generally takes 1–3 d more until an arbitrary threshold that defines thrombocytopenia is passed).

Emergency management of HIT

- Normal renal function - fondaparinux (not licensed, long half-life)
- Poor renal function - agatromban (adjust using APTTr)
- Transition to warfarin after platelet recovery

BJH 2012:159;528-540
Case

• 22 year old on ITU after multiple injuries in RTA
• Bleeding from mouth and around cannula sites
Disseminated intravascular coagulation

• Intravascular activation of coagulation and deposition of fibrin within microvasculature.
• Many causes eg sepsis, malignancy, severe ill-health
• Consumption of clotting factors and platelets may cause clinical bleeding (‘consumptive coagulopathy’)
• It is a clinical diagnosis
• Platelet count is low, coagulation results depend on phase, if acute, usually APPT, PTT are prolonged, with increase in fibrin degradation products (D-Dimer)
• Treat with FFP & platelets + treat underlying cause
Emergency management of DIC

Table I. Conditions associated with DIC.

<table>
<thead>
<tr>
<th>Conditions</th>
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</thead>
<tbody>
<tr>
<td>Sepsis and severe infection</td>
</tr>
<tr>
<td>Trauma</td>
</tr>
<tr>
<td>Organ destruction e.g pancreatitis</td>
</tr>
<tr>
<td>Malignancy</td>
</tr>
<tr>
<td>Solid tumours</td>
</tr>
<tr>
<td>Leukaemia</td>
</tr>
<tr>
<td>Obstetric</td>
</tr>
<tr>
<td>Amniotic fluid embolism</td>
</tr>
<tr>
<td>Placental abruption</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
</tr>
<tr>
<td>Vascular abnormalities</td>
</tr>
<tr>
<td>Large haemangiomata</td>
</tr>
<tr>
<td>Vascular aneurysm</td>
</tr>
<tr>
<td>Severe liver failure</td>
</tr>
<tr>
<td>Toxic and immunological insults</td>
</tr>
<tr>
<td>Snake bites</td>
</tr>
<tr>
<td>Recreational drugs</td>
</tr>
<tr>
<td>ABO transfusion incompatibility</td>
</tr>
<tr>
<td>Transplant rejection</td>
</tr>
</tbody>
</table>
Table II. ISTH Diagnostic Scoring System for DIC.

Scoring system for overt DIC

Risk assessment: Does the patient have an underlying disorder known to be associated with overt DIC?
   If yes: proceed
   If no: do not use this algorithm

Order global coagulation tests (PT, platelet count, fibrinogen, fibrin related marker)

Score the test results
   • Platelet count (>100 × 10^9/l = 0, <100 × 10^9/l = 1, <50 × 10^9/l = 2)
   • Elevated fibrin marker (e.g. D-dimer, fibrin degradation products) (no increase = 0, moderate increase = 2, strong increase = 3)
   • Prolonged PT (<3 s = 0, >3 but <6 s = 1, >6 s = 2)
   • Fibrinogen level (>1 g/l = 0, <1 g/l = 1)

Calculate score:
   ≥5 compatible with overt DIC: repeat score daily
   <5 suggestive for non-overt DIC: repeat next 1–2 d
Transfusion of platelets or plasma (components) in patients with DIC should not primarily be based on laboratory results and should in general be reserved for patients that present with bleeding (Grade C, Level IV).

In patients with DIC and bleeding or at high risk of bleeding (e.g. postoperative patients or patients due to undergo an invasive procedure) and a platelet count of $<30 \times 10^9/l$, transfusion of platelets should be considered (Grade C, Level IV).

In non-bleeding patients with DIC, prophylactic platelet transfusion is not given unless it is perceived that there is a high risk of bleeding (Grade C, Level IV).

In bleeding patients with DIC and prolonged PT and aPTT administration of FFP may be useful. It should not however be instituted based on laboratory tests alone but should be considered in those with active bleeding and in those requiring an invasive procedure. There is no evidence that infusion of plasma stimulates the ongoing activation of coagulation (Grade C, Level IV).

If transfusion of FFP is not possible in patients with bleeding because of fluid overload, consider using factor concentrates such as prothrombin complex concentrate, recognising that these will only partially correct the defect because they contain only selected factors, whereas in DIC there is a global deficiency of coagulation factors (Grade C, Level IV).

Severe hypofibrinogenaemia ($<1\ g/l$) that persists despite FFP replacement may be treated with fibrinogen concentrate or cryoprecipitate (Grade C, Level IV).
ITP

- Estimated rate of fatal bleeding <0.04 per adult patient-years at risk
- Prednisolone 1mg/kg +/- IVIG
- Tranexamic acid
- Platelets can increase count by >20 in 40% bleeding ITP patients
This P/U sat at computer - current blurred vision + dysphasia + confused
Now recovered but not quite right
No weakness
PMHT - Anaemia
accompanied by:

Monitor
ECG
RBC +
Blood ++++
MSU sent
HCG Positive
Skin Colour

Time
Temp
Pulse
Investigations

- Bilirubin 60 (other LFTs normal)
- Reticulocytes 370 (normal less than 100)
- Blood film schistocytes
- Coombs test negative
- Clotting normal
- Haemoglobin 67g/l
- Platelets 23 (150-450)
- White cells normal
• **Summary**
• Transient neurology
• Anaemia
• Thrombocytopaenia
• Urine positive for blood
• Jaundice

1. What type of anaemia is present?
2. Suggest a diagnosis/diagnoses
3. Would you transfuse and which products?
Summary

- Transient neurology
- Anaemia
- Thrombocytopenia
- Urine positive for blood
- Jaundice

1. Intravascular haemolysis
2. Thrombotic thrombocytopenic purpura
3. Avoid Platelets
Microangiopathic haemolytic anaemia, microvascular obstruction, thrombocytopenia
Emergency management of massive haemorrhage

- Blood loss >40% of blood volume (2000mls in average adult) is immediately life threatening

- Activate massive transfusion protocol using MBL (Massive Blood Loss) packs 1&2 triggered by transfusion of 4 units RBCS - Massive Transfusion Policy at local hospital
● Restore circulating volume
● Contact key personnel

● Stop bleeding
● Request lab tests (FBC/PT/APTT/(TT/Fgn), ABO RH AB screen)
Blood for Emergencies

May be insufficient time for full compatibility testing. The options include:

1) **Blood required immediately** - use 2 units of O RhD negative blood (*emergency stock*)
2) **Blood required in 10-15 minutes** - use uncrossmatched blood of the same ABO and RhD group as the patient
3) **Blood required in 45-60 minutes** - use fully crossmatched blood
MBL Pack 1 - 5 RBCs, 4 FFP

- Triggered after 4 unit red cells given
- Unknown ABO use O RBCs and AB FFP
- Known ABO use group specific RBCS and FFP

- RHD neg blood for RhD neg females who can potentially have transfusion, or patients regularly transfused.
- If possible K negative as well
MBL Pack 2 - 5 RBCs, 4 FFP, 1 platelets 2 cryo
Unknown ABO use group A platelets and cryo