Blood Components

By David Chama

BLOOD PRODUCTS & INDICATIONS FOR USE

PRESENTATION LAYOUT

- **INTRODUCTION**
- **BLOOD PRODUCTS**
- **REPLACEMENT FLUIDS**

INTRODUCTION

- **Definition:**

  Blood Components are defined as those constituents of blood which are prepared using physical means at controlled ;

  - Speed, (Ultra centrifugation)
  -Time
  - Temperature

- **Equipment used**:

1. Refrigerated Centrifuge
2. Blast Freezer
3. Plasma Extractors or Automatic Component extractors
3. Platelet Incubator+ Agitator
4. Refrigerator for red cell storage
5. Plasma Freezers for storage of FFP & Cryoprecipitate

INTRODUCTION (Ctd)

- **Blood to be processed into Components** :
  - Collected from Regular Voluntary Donors
  - Drawn from a donor within 8 minutes.
  - Volume drawn must be 450ml +/- 10%
  - Stored & Transported at appropriate temperature
  - Must be processed within 6 Hours of collection
  - ALL TTI markers (HIV, HBsAg,HCV,RPR) must be Negative

BLOOD PRODUCTS

	WHOLE BLOOD
Description	• 450ml • 63 ml anticoagulant-preservative solution • Haemoglobin approx. 12 g/ml • Haematocrit 35% – 45% • No functional platelets • No labile coagulant factor (V & VIII)
Unit of Issue	1 donation or Unit or Pack
Storage conditions	Between +2^{o}C & +6^{o}C in approved blood bank Refrigerator Transfusion should be started within 30 min of removal from refrigerator
Indication	• Red cell replacement in acute blood loss with hypovolaemia • Exchange transfusion • Patients needing red cell transfusion where red cell concentrates are not available
Administration	• Must be ABO & Rh Compatible with recipients • Never add medication to a unit • Complete transfusion within 4 hrs

	RED CELL CONCENTRATE
Description	●150 – 250 ml red cell from which most of the plasma has been removed ●Haemoglobin approx. 20 g/100ml (not less than 45 g per unit ●Haematocrit 55% - 75%
Unit of Issue	1 donation
Storage conditions	Same as whole blood
●Indication	●Replacement of red cell in anaemic patients ●Use with crystalloid replacement fluids or colloid solution in acute blood loss
●Administration	●Same as whole blood ●To improve transfusion flow, normal saline (50 – 100) may be added using a Y-pattern infusion set

	PLATELET CONCENTRATE
Description	Single donor unit in a volume of 50-60 ml of plasma should contain • At least 55 X 10^9 platelets • <1.2 X 10^9 red cells • <0.12 X 10^9 leucocytes
Unit of Issue	• Single donor unit • Pooled unit: from 4 to 6 donor unit • 1 pack = 240 X 10^9 platelets
Storage conditions	• Up to 72 hrs at 20 to 24^o C with agitation • Do not store at 2 – 6^o C
•Indication	Treatment of bleeding due to: • Thrombocytopenia • Platelet function defect Prevention of Bleeding due to thrombocytopenia such as in bone marrow failure
•Administration	• ABO compatible • After pooling, platelet concentrate must be infused as soon as possible, generally within 4 hrs • Must not be refrigerated before infusion • Should be infused over a period of 30 min • Don't give platelet conc. Prepared from RhD + donors to an RhD – female with child bearing potential

	FROZEN FRESH PLASMA
Description	• Pack containing the plasma separated from one whole blood donation within 6 hrs of collection and then rapidly frozen to -25°C or colder
Unit of Issue	Usual volume of pack is 200-300 ml
Storage conditions	• At -25°C or colder for up to 1 year • Before use, should be thawed in the blood bank in water between 30°C – 37°C. Higher temperatures destroys clotting factor. • Once thawed store at +2 -+6°C
•Indication	• Replacement of multiple coagulation factor deficiencies: e.g. ○ lever disease ○ Warfarin ○ Depletion of coagulation factors in patients receiving large volume transfusions • Disseminated intravascular coagulation (DIC) • Thrombotic thrombocytopenia purpura (TIP)
•Administration	• Must normally be ABO compatible to avoid risk haemolysis in recipient • No compatibility testing required • Infuse using a standard blood administration set as soon

	CRYOPRECIPITATE
Description	• Prepared from freshly frozen plasma by collecting the precipitate formed during controlled thawing at +4°C and re-suspending it in 10-20 ml plasma • Contains about half of the Factor VIII and Fibrinogen in the donated whole blood
Unit of Issue	Usually supplied as a single donor pack or a pack of 6 or more single donor units that have been pooled
Storage conditions	At -25°C or colder for up to 1 year
•Indication	• As an alternative to factor VIII concentrate in the treatment of inherited deficiencies of: • Von Willebrand • Factor VIII-haemophilia A • Factor XIII • As a source of fibrinogen in acquired coagulopathies
•Administration	• If possible use ABO compatible product • No compatibility testing required • After thawing infuse as soon as possible through a standard blood administration set • Must be infused within 6 hrs of thawing

REPLACEMENT FLUIDS

- Replacement fluids are used to replace abnormal losses of blood, plasma or other extracellular fluids by increasing the volume of the vascular compartment, principally in:
  - Treatment of patients with established hypovolaemia: e.g. hemorrhagic shock
  - Maintenance of normovolaemia in patients with ongoing fluid losses: e.g. surgical blood loss.
- Intravenous replacement fluids are the first-line treatment for hypovolaemia. Initial treatment with these fluids may be life-saving and provide some time to control bleeding and obtain blood for transfusion, if it becomes necessary.

REPLACEMENT FLUIDS

- Crystalloid solutions
- NORMAL SALINE (Sodium chloride 0.9%)
- Infection risk Nil
- **Indications** Replacement of blood volume and other extracellular fluid losses
- Precautions _ Caution in situations where local oedema may aggravate pathology: e.g. head injury may precipitate volume overload and heart failure
- **Contraindications**
  - Do not use in patients with established renal failure
  - Side-effects Tissue oedema can develop when large volumes are used
- Dosage At least 3 times the blood volume lost

End of Presentation

Thank you