Blood and blood products

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Blood is collected from donors who have been previously screened before donating to exclude any donor whose blood may have the potential to harm the patient or to prevent possible harm that donating a unit of blood may have for the donor. In the UK, up to 450 /uni00A0 mL of blood is drawn, a maximum of three times each year. Each unit is tested for evidence of - hepatitis B, hepatitis C, human immunodeficiency virus - (HIV)-1, HIV-2 and syphilis. Donations are leukodepleted as a precaution against variant Creutzfeldt–Jakob disease (this may also reduce the immunogenicity of the transfusion). as the presence of irregular red cell antibodies. The blood is then processed into subcomponents. Whole blood Whole blood is now rarely available in civilian practice because it has been seen as an ine ffi cient use of the limited resource. However, whole blood transfusion has significant advantages over packed cells as it is coagulation factor rich and, if fresh, more metabolically active than stored blood. Packed red cells Packed red blood cells are spun-down and concentrated packs of red blood cells. Each unit is approximately 330 /uni00A0 mL and has a haematocrit of 50–70%. Packed cells are stored in a SAG-M (saline–adenine–glucose–mannitol) solution to increase shelf life to 5 weeks at 2–6°C. (Older storage regimes included storage in CPD [citrate–phosphate–dextrose] solutions, which have a shelf life of 2–3 weeks.) Fresh-frozen plasma Fresh-frozen plasma (FFP) is rich in coagulation factors and is removed from fresh blood and stored at − 40°C to − 50°C with a 2-year shelf life. It is the first-line therapy in the treatment of coagulopathic haemorrhage (see Management of coag ulopathy). Rhesus D-positive FFP may be given to a rhesus D-negative woman, although it is possible for seroconversion to occur with large volumes owing to the presence of red cell fragments and Rh-D immunisa tion should be considered. Cryoprecipitate Cryoprecipitate is a supernatant precipitate of FFP and is rich in fibrinogen, factor VIII and factor XIII. It is stored at − 30°C with a 2-year shelf life. It is given in low-fibrinogen states or factor VIII deficiency . Platelets Platelets are supplied as a pooled platelet concentrate and 9 contain about 250 /uni00A0×/uni00A0 10 /litre. Platelets are stored on a special agitator at 20–24°C and have a shelf life of only 5 days. Plate let transfusions are given to patients with thrombocytopenia or with platelet dysfunction who are bleeding or undergoing surgery . Patients are increasingly presenting on antiplatelet therapy such as aspirin or clopidogrel for reduction of cardiovascu lar risk. Aspirin therapy rarely poses a problem b ut control of haemorrhage on the more potent platelet inhibitors can be extremely di ffi cult. Patients on clopidogrel who are actively bleeding and undergoing major surgery may require almost continuous infusion of platelets during the course of the proce dure. Arginine vasopressin or its analogues (DDA VP) have also been used in this patient group, although with limited success. Prothrombin complex concentrates Prothrombin complex concentrates are highly purified concen trates prepared from pooled plasma. They contain factors II, IX and X. Factor VII may be included or produced separately . It is indicated for the emergency reversal of anticoagulant (warfarin) therapy in uncontrolled haemorrhage. It is possible for patients undergoing elective surgery to pre-donate their own blood up to 3 weeks before surgery for re-transfusion during the operation. Similarly , during surgery blood can be collected in a cell saver, which washes and collects red blood cells that

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