

# Immunological reactions of blood transfusion

Component	Transfusion reaction	Pathophysiology
<b>RBC</b>	<b>Acute intravascular haemolysis</b>	ABO incompatible donor RBCs → destruction of donor cells by patient ABO antibodies.
	<b>Delayed extra-vascular haemolysis</b>	Patient form antibodies to several different blood group systems such as Kell and MSN.
	<b>Iron overload</b>	Frequent transfusions → accumulation of free iron in the body → tissue damage.
<b>WBC</b>	<b>None-haemolytic febrile transfusion reactions (NHFTTR)</b>	Patient anti-leucocytes antibodies destroy donor's WBC and release cytokines & granules.
	<b>Allo-immunization</b>	Patient produce anti-HLA antibodies which destroy donor's platelets → Patient becomes <b>refractory</b> to platelets transfusion.
	<b>Postransfusion purpura (PTP)</b>	Microaggregates → patient form platelets alloantibodies which destroy both donor & patient's platelets → thrombocytopenia.
	<b>Adult respiratory distress syndrome (ARDS)</b>	Microaggregates blockage of pulmonary blood vessels → free radicals & compliment activation → lung damage.
	<b>Graft-versus-host disease (GVHD)</b>	The donor WBC (graft) transfused to immunocompromised patient → WBC proliferate in patient blood and reject the (patient) tissues.
<b>platelets</b>	<b>Allo-immunization</b>	Production of anti-platelets antibodies to platelets antigens on donor platelets..
	<b>Postransfusion purpura (PTP)</b>	Same as above.
	<b>Release of histamine and serotonin</b>	Allo-immunization or Postransfusion purpura (PTP) → donor platelets damage → release of histamine and serotonin.
	<b>Acute haemolysis</b>	RBCs in platelet pack → ABO incompatible donor RBCs → destruction of donor cells by patient ABO antibodies.
<b>Plasma</b>	<b>Anaphylactic shock</b>	IgA deficient patient has anti IgA → react against IgA from donor plasma → severe allergic reaction.
	<b>Transfusion Related Acute Lung Injury (TRALI)</b>	Anti granulocytes from donor plasma → destroy patient granulocytes in the lung capillaries → lung oedema & infiltration.
	<ul style="list-style-type: none"> <li>- Mild allergic reactions</li> <li>- Febrile reactions</li> <li>- Acute haemolysis</li> <li>- Alloimmunization to RBCs</li> </ul>	<ul style="list-style-type: none"> <li>- Allergy against allergens in the donor plasma.</li> <li>- due to cytokines released from damaged WBC</li> <li>- Caused by donor ABO antibodies in the plasma</li> <li>- presence of small amount of red cells in plasma pack</li> </ul>