Blood transfusion is an essential part of critical care medicine. Blood transfusion can save life but it involves the risk as can cause fatal blood transfusion reaction. It is like a tissue transplant.

There is a wide gap between the blood demand and supply especially in our country. Demand varies from state to state, city to city. In our country there is a significant demand of blood. It is also transfused but blood quality and safety is not satisfactory.

The aim is to expose the clinicians for judicious use of blood and blood component. Clinicians must use blood products on National guidelines. Avoid single unit blood transfusion from clinical practice; as patient is not at all benefited. One unit blood improves Hb% 1gm and hematocrit by 3% only. Transfuse in place of whole blood, fraction of blood (component) which is basically required to save life and for the well being of the patient.

There are Two hundred fifty different antigens and many diseases are transmitted through blood and blood products, some are fatal in nature. 30% of the total blood transfusion in clinical practice are not required and must be avoided. Approx 700ml blood loss can be well managed by transfusing crystalloids and oxygen. Asymptomatic chronic anemia must be treated by supplementing B12, Folic acid, Protein & recombinant Erythropoietin without blood transfusion.

Blood transfusion services can be provided after procuring due license from Food and drug administration. FDA allots a unique Blood bank license number to blood bank. License Number has to be displayed. Clinicians, Gynecologist, Surgeon, and Pediatrician should accept blood from FDA approved license blood banks for transfusion.
Judicious use of blood and blood products can be followed in clinical condition i.e.

**Anemia**
Transfuse Red cells in patient with anemia caused by acute massive blood loss, if there is an evidence of cardiac de-compensation, such as tachycardia, tachypnoea, pallor. In such condition more than one unit blood required for transfusion. In compensated chronic anemia cases, blood transfusion must be avoided. Blood transfusion should be decided not on Hb% status, but also on clinical signs and symptoms. No top up blood transfusion is indicated in any planned surgical cases. Top up blood transfusion is accepted in emergency critical situations.

**Bone marrow failure**.-
Blood transfusion is indicated in such situations. Bone marrow failure may be due to any cause. Transfuse blood using leuco-depleted filter.

**Malaria**-
Malaria is a very common in India. In P. falciparum infection there is hemolysis of RBCs hence transfusion is indicated as per clinical presentation of a case.

**Sickle cell disease**-
Blood transfusion is indicated in decompensate cases. Blood transfusion causes hem concentration, resulting into further episode of sickle cell crisis. In India, Sickle cell disease cases are invariably Iron deficient. Evaluate patient for Iron levels, if found deficient, Iron supplementation helps the patient to improve Hb Gm% and thus avoids the risk of Blood transfusion.

**Thalassaemia major**-
Blood transfusion is an absolute indication. Hb% maintained above 10gm%. This improves the growth and well being of the patient. The duration between two Blood transfusions can be enhanced by keeping Hb. above10gm%.

**Pregnancy**-
Blood transfusion is indicated if Hb. is less than 8gm% in third trimester to prevent Maternal Mortality rate. Blood transfusion is also indicated if there is an evidence of cardiac failure, hypoxia, severe infection, Malaria or high risk pregnancy.

**Autologous Blood Transfusion**-
Autologous blood transfusion means donating multiple units of your blood for your own use during surgery. Five units of autologous blood can be collected from the donor patient in 28days time. Autologous blood transfusion has many
benefits to allogenic blood transfusion. It avoids the risk of Transfusion transmitted infections. It avoids the risk of Allo- sensitization and blood incompatibility. It prevents febrile and allergic reactions. Autologous blood transfusion can be adopted if patient refusing blood on religious ground. Autologous Blood can be collected on the basis of Voluntary Blood donor criteria’s. Such blood can be transfused to any other recipient as allogenic blood.

First relation donor blood transfusion-
First relation blood donor transfusion must be debarred from clinical practice as it sometime causes fatal GVHD.

Use of Blood Components-
Whole blood transfusion practice is obsolete through out the world. It is wise to transfuse specific blood component to specific deficient recipient. Component therapy reduces the demand of blood, it is economical. This prevents the overload of other component which is not required.

Red blood cell concentrate-(RCC, Washed Red cells)
Blood component therapy should only be given when the expected benefits to the patient are likely to outweigh the potential hazards. The decision to transfuse red blood cells should be based on clinical assessment of the patient and his or her response to any previous transfusion as well as the Hemoglobin level. Use of red blood cells is likely to be inappropriate when Hb.>10g%, unless there are specific indications. Reason for blood transfusion must be recorded. If red blood cells are given at this haemoglobin level, reasons should be well documented. Use of red blood cells may be appropriate when Hb is in the range 7–10g%. In such cases, the decision to transfuse should be supported by the need to relieve clinical signs and symptoms and to prevent significant morbidity and mortality. Use of red blood cells is likely to be appropriate, when Hb.<7g%. In some patients who are asymptomatic lower threshold levels may be acceptable. Blood loss of greater than 30% of blood volume causes significant clinical symptoms but resuscitation with crystalloids alone. Crystalloid therapy is usually successful in young healthy patient with blood loss of up to 40%( ie 2litre)

Platelets-(Platelet rich plasma single donor or pooled donor)
Platelets is likely to be appropriate as prophylaxis in bone marrow failure when the platelet count <10thousand/cumm without other risk factor. Platelet transfusion is indicated to maintain the platelet count >50thousand/cumm in patients undergoing surgery or invasive procedures. In inherited or acquired qualitative platelet function disorders cases, platelet count is not a reliable indicator for platelet transfusion. Use of platelets is likely to be appropriate therapy in any patient who is bleeding in whom thrombocytopenia is considered a major contributory factor; Platelets is not generally considered appropriate in the
treatment of immune-mediated platelet destruction, thrombotic thrombocytopenic purpura cases.

Fresh frozen plasma (FFP)
FFP is indicated in replacement of single factor deficiencies where a specific or combined factor concentrate is not available. It is most useful for immediate reversal of warfarin effect in the presence of potentially life-threatening bleeding, treatment of the multiple coagulation deficiencies associated with acute disseminated intravascular coagulation, thrombotic thrombocytopenic purpura in the presence of bleeding. FFP helps in abnormal coagulation parameters following massive transfusion. One unit FFP transfusion is indicated after every two unit of Red cell concentrate transfusion. Used in patients with liver disease. FFP should not be used as plasma volume expander, protein supplement and in immunodeficiency states.

Cryoprecipitate-
Cryoprecipitate may be considered appropriate in patients with fibrinogen deficiency with clinical bleeding, invasive procedures and trauma or in disseminated intravascular coagulation. Cryoprecipitate is not considered appropriate in the treatment of haemophilia, von Willebrand’s disease. In Hemophilia recombinant Factor VIII is recommended.

Conclusion-
Blood transfusion is an essential part of critical care medicine. Blood transfusion can save life, but equally dangerous as cause deaths due to blood transfusion reaction. Clinicians should judiciously use blood and blood component on National guidelines. 30% of the total blood transfused is not required. Blood should be procured and accepted from FDA approved license blood banks. In anemia correction Blood Transfusion should be decided not on Hb% but on clinical signs and symptoms also. No top up blood transfusion is indicated in any planned surgical case. Autologous blood transfusion has many benefits to allogenic blood. It avoids the risk of Transfusion transmitted infections. Whole blood transfusion is obsolete through out the world. Component can reduce the demand of blood and is economical. Use of red blood cells is likely to be appropriate, when Hb.<7g%. Platelet transfusion is indicated to maintain the platelet count >50thousand/cumm in patients undergoing surgery or invasive procedures. Platelets are not generally considered appropriate in the treatment of immune-mediated platelet destruction, thrombotic thrombocytopenic purpura cases. FFP is most useful for immediate reversal of warfarin effect in the presence of potentially life-threatening bleeding, acute disseminated intravascular coagulation. FFP should not be used as plasma volume expander. Cryoprecipitate may be considered appropriate in invasive procedures, trauma or disseminated intravascular coagulation. Cryoprecipitate is not considered appropriate in the treatment of hemophilia.