**Albumin**

Blood plasma contain at least 125 individual proteins. The major component of plasma proteins: 1- albumin, 2- globulin, 3- fibrinogen

Serum protein includes albumin and globulin but most of the fibrinogen is removed in the clotting processes.

Serum albumin is the most abundant blood plasma protein and is produce in the liver and form a large proportion of plasma protein. Human serum albumin constitute about 50% of human plasma protein

Serum albumin has important functions:

1. In the regulation of the osmotic pressure of the plasma and in distribution of water between blood plasma and the tissue.
2. Albumin is important transport for: unconjugated bilirubin, drug, antibiotics, various ions (such as Ca+2,Na+and K+), amino acids and hormones (ex, thyroxin).

**Cases of hypoalbuimaenia**

1. **Decrease synthesis (**Malabsorption, Malnutrition, Liver disease (cirrhosis)**)**
2. **Increase volume of distribution (** over- hydration, increase capillary permability)
3. **Increase excretion/ degradation (**Nephrotic syndrome, Protein losing enteropathy, Burns , Haemorrhage, Fever, trauma, malignancy**)**

**Causes of hyperalbuminaemia** is almost caused by dehydration and high protein diet.

* Plasma albumin concentration is also used as a test of liver function test, because of its relatively long half-life in the plasma (about 20 days), albumin concentration is usually normal in **acute hepatitis**.
* Low concentration is characteristic of **chronic liver disease** due to both decreased synthesis and an increase in the volume of distribution as a result of fluid retention and the formation of ascites.
* In **obstructive jaundice** normal value is the rule because the obstruction jaundice is not associated with liver cell damage.
* Albumin binds unconjugated bilirubin and hypoalbuminaemia increase the risk of kernicterus in infant with unconjugated hyperbilirubinaemia.

**Prothrombin time (PT)**

Prothrombin is formed in the liver from inactive (pre-prothrombin) in the presence of vitamin K. prothrombin activity is measured as prothrombin time (PT).

The term prothrombin time was given a time required for clotting to take place in the plasma to which optimum amount of thromboplastin and Ca+2 have been added.

PT measured the rate of which prothrombin is converted to thrombin in the presence of thromboplastin, Ca+2, fibrinogen, and other coagulation factors (Vǁ, ǀX, and X), in turn the thrombin leads to the conversion of fibrinogen to fibrin. Prothrombin and factors (Vǁ, ǀX, and X), all required Vit K to become active.

Normal value of PT is 14 sec, range (10-16) sec.

* There are two reasons why patient with liver disease may have a prolong PT.

1. **In hepatitis**, liver may be so damaged that it cannot adequately synthesis the clotting factors that required Vit K for their activation.
2. Since Vit K is a fat soluble Vit. It may be deficient because of impaired fat absorption when there is **obstructive jaundice**.