

Plasma Exchange/Plasmapheresis

What is this procedure?

Plasma is the liquid part of the blood containing proteins, electrolytes, vitamins, hormones, antibodies, fats, but without the large cells (red blood cells, white blood cells and platelets). Plasmapheresis is the process of separation of cells from the plasma. Plasma exchange is the process that after the plasma component have been removed from the blood, the patient is given an albumin-electrolyte solution or fresh frozen plasma as replacement.

Why is there a need to do it?

Some of the components in this liquid portion called plasma could be the cause of the disease condition. Common examples are autoimmune antibodies (i.e. antibodies produced by the body but attack oneself) and chylomicrons (fats which cause acute pancreas inflammation). Their removal by plasmapheresis may control the disease process.

How is it done?

There are two methods to separate the cells from the plasma:

1. Centrifugal cell separator (Figure 1);
2. Plasmafiltration (Figure 2)



Figure 1. Centrifugal cell separator



Figure 2. Plasmafiltration

The whole procedure usually takes around two to four hours per session each day, and is usually repeated for several days or more, and the total duration depends on the clinical situation. The steps of the procedure are as follows:

1. A catheter will be inserted into one of the major veins, either at the neck or in the groin.
2. When the situation is considered suitable, a medication called an anticoagulant (blood thinner) is added to the blood to prevent the machine system from clotting.

3. Blood will then be drawn out through the catheter to the machine where some plasma components are removed. The remaining part of the blood will be returned to the body through another channel of the same catheter.
4. Replacement fluid is added to substitute the volume of plasma that has been removed. This fluid can be saline albumin, or plasma.

When to stop?

Each procedure lasts for few hours, and is usually repeated for several days as a course, depending on the clinical situation.

Risks and complications

General risks: General risks of catheter insertion include bleeding and blood vessels injury during insertion, which in very rare conditions may cause compression on the airway and impair breathing, and/or trauma to internal organs, depending on the site of catheter of insertion. In very rare situation, the bleeding can be so severe to be life-threatening that require surgical repair.

Specific risks: Side effects are generally mild. There can be occasionally a drop in blood pressure and dizziness. Serious risks are uncommon, but include bleeding from the catheter insertion site, or bleeding in internal organs because of the blood thinner and removal of clotting factors in the plasma. Convulsion, abdominal cramps, or tingling in the limbs have been reported. It could also lead to suppression of overall immunity and result in severe and life-threatening infection in rare situation.

Possibility that the procedure cannot be carried out

There is a possibility that we are unable to perform the procedure, for example, if a catheter cannot be successfully inserted, or the occurrence of side effects during the procedure which necessitate cessation of the procedure.

Other treatment options

If the patient chooses not to perform this procedure, it will affect the overall condition. The change of the condition is affected by a variety of clinical factors, including the individual patient's physical condition before the onset of illness, the type of disease, the response to treatment and the progress, etc. Your doctor will explain other suitable options to you.

Disclaimer

The information provided in this booklet is for general reference only. The risks and complications listed above are not exhaustive. Please consult your attending doctor for details.