

Plasma Exchange/Plasmapheresis

What is this procedure?

Plasma is the liquid part of the blood containing proteins, electrolytes, vitamins, hormones, antibodies, fats, excluding cells (red blood cells, white blood cells and platelets). Plasma exchange/plasmapheresis is the process for separation of such cells from the plasma. Afterwards, the patient is given an albumin-electrolyte solution or plasma as replacement.

Why there is a need to do it?

Some plasma components may be disease-causing. 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 Plasma exchange/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 prevent the machine system from clogging.
3. Blood will then be drawn out through the catheter into the machine where some plasma components are removed. The remaining 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.

Risks and complications

General risks:

- Catheter insertion risks: e.g. bleeding and blood vessel injury, in rare conditions may cause compression on the airway and impair breathing, and/or trauma to internal organs, depending on the site of catheter insertion. In very rare situations, severity of bleeding may be life-threatening and requires surgical repair.
- Catheter-related blood infection: Pathogens may be introduced into the body when the catheter is inserted. Additionally, the risk of infection increases as the catheter remains in the body.
- There is a risk of catheter fracture or rupture up to about 4% in certain types of catheter of implanted central venous access devices, which may result in catheter displacement requiring removal or re-insertion.
- Catheter adhesion or fracture along the catheter course under the skin may cause retained segment in the body

Specific risks:

Side effects are generally mild. There can be occasional drop in blood pressure and dizziness. Serious risks are uncommon, but the use of blood thinners in tandem with the removal of clotting factors in plasma may cause bleeding at the catheter insertion site, or in internal organs. Convulsion, abdominal cramps, or tingling in the limbs have been reported. In rare situations, a suppressed immunity may result in a severe and life-threatening infection.

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 may affect their overall condition. A variety of clinical factors can impact the degree of change, 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.