PROCEDURE

Plasmapheresis

Plasmapheresis filters your blood to remove plasma containing harmful substances and replaces it with another fluid.

PURPOSE
Remove harmful plasma substances or replace missing plasma proteins

PROCEDURE TYPE
Therapeutic, bedside blood-separation treatment through intravenous lines

WHERE IT IS DONE
Outpatient apheresis clinic or hospital bedside

ANAESTHESIA
None; local anaesthetic for central line placement

HOW LONG IT TAKES
Usually two to four hours per session

PREPARATION
Blood tests, medication review, food and fluids unless restricted

RECOVERY
Usually same day; no driving if dizzy or sedated

MAIN RISKS
Low blood pressure, low calcium, reactions, line complications

RESULTS
Response assessed during treatment and across planned sessions

Overview

Plasmapheresis is a treatment that separates the liquid part of your blood, called plasma, from your blood cells. The removed plasma is replaced with albumin solution, saline, donated plasma, or a combination of fluids. Your blood cells are then returned to you.

The treatment is often more precisely called therapeutic plasma exchange . Strictly speaking, plasmapheresis means removing plasma, while plasma exchange includes replacing it. The terms are often used interchangeably in healthcare.

Plasma contains antibodies, clotting proteins, and other substances. Some illnesses cause harmful antibodies or abnormal proteins to build up in plasma. Removing plasma can lower their levels quickly. Replacement with donated plasma can also provide proteins that your body is missing.

Plasmapheresis is not the same as dialysis. Dialysis mainly removes waste and excess fluid when the kidneys are not working well. Plasmapheresis removes and replaces plasma.

Why the procedure is performed

Plasmapheresis may be used when a harmful substance is mainly found in plasma and needs to be removed quickly. It may also be used when donated plasma can replace important missing proteins.

Conditions for which it may be considered include:

Its role is different for each condition. For some illnesses it is an urgent, established part of treatment. For others, it is used only in selected situations or when other treatments have not worked.

Plasmapheresis often controls a disease temporarily rather than curing its cause. You may also need medicines that reduce antibody production or treat the underlying condition.

- Thrombotic thrombocytopenic purpura, or TTP, a serious blood-clotting disorder
- Guillain-Barré syndrome and selected other immune-related nerve disorders
- Severe myasthenia gravis, which causes muscle weakness
- Anti-GBM disease, in which antibodies can damage the kidneys and lungs
- Certain illnesses that make the blood unusually thick
- Some complications involving antibodies after an organ transplant
- Selected medication overdoses or abnormal blood-protein disorders

Who should and should not have it

You may be offered plasmapheresis when removing plasma substances is expected to work faster or more effectively than medication alone. Your team should explain the treatment goal, the likely number of sessions, and how success will be measured.

It is not useful for every immune, blood, kidney, or nerve condition. It may not be appropriate when the substance causing harm is mainly inside cells or tissues rather than circulating in plasma.

Treatment may be avoided, modified, or delayed if:

Pregnancy does not automatically rule out plasmapheresis. Its benefits, access needs, and replacement fluids require individual assessment.

- Safe access to your bloodstream cannot be obtained
- Your blood pressure or circulation is too unstable for the procedure
- You have an untreated infection where a central line would be placed
- Bleeding risk makes central line placement unsafe
- You previously had a severe reaction to the required replacement fluid
- A medicine you take could interact with the procedure

How to prepare

Your treating facility's own instructions take priority because preparation can differ according to your condition, medicines, and type of intravenous access.

Blood tests may check your blood-cell counts, calcium and other minerals, clotting, and fibrinogen, a protein needed to form clots.

Give the team a complete list of your medicines and supplements. Blood-pressure medicines, blood thinners like warfarin or apixaban , and medicines called ACE inhibitors may need special planning. Do not stop any prescribed medicine unless your treating team tells you to.

Fasting is not usually required. Eating a light meal and drinking enough fluid may help you tolerate treatment, unless you have been told to fast or restrict fluids. Wear comfortable clothing that allows access to your arms.

Ask whether you should arrange transport. This may be advised for your first session, after central line placement, or if you have previously felt weak or dizzy afterward.

What happens during the procedure

A nurse or other trained professional checks your identity, blood pressure, pulse, and temperature. You are usually awake and can speak, read, or watch something during treatment.

Blood may be taken through needles in one or both arms. If your veins are not suitable or you need repeated urgent treatments, a central venous catheter may be inserted into a large vein in your neck, chest, or groin. Local anaesthetic numbs the skin for line placement.

Your blood travels through sterile tubing into an apheresis machine. The machine separates plasma from blood cells using spinning or filtration. The plasma is discarded, while your cells are mixed with replacement fluid and returned to you.

An anticoagulant prevents blood from clotting in the tubing. Citrate is commonly used and can temporarily lower the active calcium in your blood. Tell the team immediately if you notice tingling around your mouth or fingers, chills, cramping, nausea, or light-headedness. The machine can be adjusted, and calcium may be given if needed.

Your vital signs are checked throughout. A session usually takes two to four hours, although the exchanged volume and type of access affect the timing.

Recovery and what to expect afterward

Pain: Your arms may feel bruised or tender where needles were inserted. A central line site may also feel sore. Severe or increasing pain is not expected.

Eating: You can usually eat and drink normally afterward. Follow any fluid or diet limits related to your underlying condition.

Activity: Fatigue or light-headedness can occur, so take it easy for the rest of the day if needed. Follow specific instructions for protecting a central line. Avoid pulling, soaking, or contaminating its dressing.

Driving: If you feel well and received no sedating medicine, you may be allowed to drive. Do not drive if you are dizzy, weak, or were sedated for line placement. Follow the facility's discharge rules.

Work: Many people can return to usual activities the next day. You may need more time away if your illness is severe, your work is physically demanding, or you are having frequent sessions.

Risks and possible complications

Temporary low blood pressure can cause weakness, nausea, blurred vision, or faintness. Citrate-related low calcium may cause tingling, shaking, cramps, or an abnormal heartbeat.

Albumin and donated plasma can cause allergic or transfusion reactions. Symptoms may include itching, hives, flushing, wheezing, fever, or chills. Severe reactions are possible but are less common.

Needles and central lines can cause bleeding, bruising, infection, blockage, or a blood clot. Central line placement also carries procedure-specific risks, including accidental injury to nearby structures.

Plasma exchange can remove useful substances as well as harmful ones. This may lower clotting proteins, antibodies that help fight infection, and the levels of some medicines.

Repeated treatment may increase these effects.

Your team monitors you during treatment and may use blood tests to guide the replacement fluid and timing of later sessions.

Results and follow up

The machine removes plasma substances during each session, but symptom improvement may take hours, days, or several treatments. Some conditions respond quickly; others require a planned series of exchanges.

Follow-up may include blood counts, calcium, clotting tests, antibody or abnormal-protein levels, kidney tests, and an assessment of your symptoms and physical function.

Plasmapheresis does not always prevent the harmful substance from returning. Medicines or other treatments may be needed to slow its production. Keep routine appointments even if you feel better, especially if you have a central line that requires dressing changes and monitoring.

Alternatives

The realistic alternatives depend on why plasmapheresis was offered.

Condition-specific medicines may include corticosteroids like prednisone or hydrocortisone , immune-suppressing medicines, or treatments aimed at particular antibodies. These may control ongoing production better than plasma exchange, but they can act more slowly and have their own side effects.

Intravenous immunoglobulin , or IVIG, changes immune activity without removing plasma. It is an alternative for some nerve and immune conditions. It is not interchangeable with plasma exchange for every illness.

Plasma infusion replaces missing plasma proteins but does not remove harmful antibodies or abnormal proteins. It may therefore be inadequate when removal is the main treatment goal.

Immunoadsorption passes plasma through a column designed to remove selected antibodies before returning the plasma. It may preserve more useful plasma proteins, but it is not suitable for every condition and is not widely available.

Supportive care or observation may be reasonable when illness is mild and expected to improve. The trade-off is that it does not rapidly remove a harmful circulating substance. For urgent conditions such as TTP, delaying effective treatment can carry substantial risk.

When to call your healthcare team

For routine questions, contact your treatment unit during normal hours about scheduling, medication instructions, mild fatigue, or expected bruising.

Contact the team promptly for:

Seek emergency medical help for trouble breathing, facial or throat swelling, chest pain, fainting, severe bleeding, sudden confusion, or new severe weakness. These symptoms need urgent assessment rather than waiting for a routine follow-up visit.

- Increasing redness, warmth, swelling, drainage, or pain at a line site
- Fever or chills after treatment
- Ongoing vomiting, dizziness, tingling, or muscle cramps
- Bleeding that does not stop with firm pressure
- New swelling of the arm, neck, or leg near a catheter

Common questions

Will I be asleep?

Usually not. You are normally awake throughout plasmapheresis. Local anaesthetic may be used if a central line is inserted. Sedation is not routinely needed.

Can I drive home?

You may be able to drive if you feel well and received no sedating medicine. Arrange another driver if your facility advises it, you had a line inserted, or you feel dizzy or weak.

How painful is it?

The needle insertion can sting, much like a blood test or blood donation. You may feel pressure during central line placement, but the skin is numbed. The blood-separation process itself should not hurt.

How many treatments will I need?

Some conditions need only a few sessions, while others require repeated treatment over days or weeks. The plan is based on your diagnosis, laboratory results, symptoms, and response.

When will I know whether it worked?

Changes in blood-test results may appear immediately after an exchange. Improvement in symptoms may take several sessions. Your team should explain which specific result or

symptom they are following.

Does the machine remove all my blood at once?

No. Only a portion of your blood is in the tubing and machine at any one time. Blood cells are continuously returned to your body with replacement fluid.

Sources

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