

# PANDAS Physicians Network

## Plasmapheresis (therapeutic apheresis)



Plasmapheresis or therapeutic apheresis is a “blood cleaning” procedure in which the child’s blood is removed through an intravenous catheter and processed by a plasmapheresis machine, which spins it to separate the formed elements (red blood cells, white blood cells and platelets) from the plasma (liquid portion of the blood which contains proteins, including antibodies and other immune components). The plasma is removed and replaced with equal volumes of albumin. The albumin is mixed with the child’s blood components and returned to his body through a second intravenous catheter. Because the blood volume to be processed is relatively large, and multiple procedures are needed, plasmapheresis often requires insertion of a central line (to ensure adequate venous access for both egress and ingress of the blood). In older children or those with superior antecubital veins, the procedure can be accomplished peripherally.

**Plasmapheresis should always be administered with long term prophylaxis antibiotic treatment. For further discussion on prophylaxis, see the Antibiotic section of Treatment Options.**

Because plasmapheresis is an invasive procedure that carries significant, but manageable risks, it should be done only in pediatric apheresis centers. Therefore, details of the plasma exchange procedures are not provided here. Expected adverse events are mild and include vasovagal episodes related to needle insertion (<1% of cases) and cutaneous paresthesias related to citrate-induced hypocalcemia. The former reaction is handled by postural manipulation and fluid administration; the latter is usually relieved by slowing the rate of, or temporarily interrupting, the anticoagulant infusion. Rarely, a machine malfunction will result in loss of the blood in the apheresis device, which could produce anemia or temporary neutropenia. Repetitive plasma exchanges may lower serum fibrinogen by 60-80% and platelet concentration by 30-40%. Fibrinogen and platelet levels return to normal within 2-3 days, and clinical bleeding is extremely rare. Immunoglobulin decreases (50-60% for IgG and IgM) are more sustained but have not been associated with an increased susceptibility to infection.

**In a small, randomized-controlled trial, plasmapheresis was strikingly and significantly superior to placebo.** (Perlmutter et al, 1999). On average, patients improved by 65% with several children experiencing nearly complete symptom resolution – often within a week or two of completing the series of plasma exchanges. That trial utilized five single-volume treatments over a 10 day period (total of 5 blood volumes processed), which is reported to reduce circulating antibodies by 85-95%.

More recently, **Dr. Beth Latimer has reportedly seen therapeutic benefits with just three 1.5-volume exchanges performed over the course of 4 – 6 days (total of 4.5 blood volumes).** The latter method not only reduces the number of procedures (and related risks), but it also increases the probability that the procedures can be done using peripheral catheters, rather than requiring insertion of a central line.

## I. Additional Resources

### Antibiotics

[www.pandasppn.org/treatment-of-panspandas-with-antibiotics](http://www.pandasppn.org/treatment-of-panspandas-with-antibiotics)