

[Test Your Knowledge: Plasma Exchange](#)

[NephMadness 2019](#) featured the [Plasma Exchange](#) region. Plasmapheresis, simply removal of plasma, or as it's currently performed, therapeutic plasma exchange (TPE), is used for a myriad of diseases in the realm of nephrology. What are the potential renal indications for TPE? Test your knowledge on this topic with the quiz* below.

1. A 57-year-old female presents with AKI and on kidney biopsy is found to have ANCA-associated vasculitis. True or False: Pathogenicity of ANCA in this disease has been demonstrated by anti-MPO antibodies being transmitted transplacentally, resulting in transient neonatal pulmonary-renal syndrome?
 - A. True
 - B. False

2. In studies looking at extracorporeal removal of free light chains in multiple myeloma cast nephropathy, which of the following statements is true?
 - A. Patients who are dialysis-dependent at the time of diagnosis are unlikely to recover
 - B. Plasma exchange is more efficient than high cutoff dialysis in removing free light chains
 - C. The decision to plasma exchange should not defer early initiation of prompt chemotherapy
 - D. Patients who achieve free light chain reduction of 30% or greater are more likely to recover kidney function

3. A 45-year-old woman with history of IgA nephropathy and deceased donor kidney transplant 6 months ago presents for routine clinic follow-up and is found to have acute kidney injury with a creatinine 2.3 mg/dL up from her post-transplant nadir of 1.2 mg/dL. She undergoes a kidney biopsy and is found to have acute antibody-mediated rejection. Which of the following treatment regimens should be initiated?
 - A. Plasmapheresis and intravenous immunoglobulin (IVIG)
 - B. High dose intravenous immunoglobulin (IVIG)
 - C. Bortezomib
 - D. Plasmapheresis and bortezomib

4. A 35-year-old African American man with history of ESKD from focal segmental glomerulosclerosis (FSGS) undergoes a living unrelated kidney transplant. He has been anuric for 6 months prior to the transplant. He has immediate graft function after the transplant with excellent urine output. On the second postoperative day he is found to have 6 grams/24 hours of proteinuria. A kidney biopsy is done and shows diffuse foot process effacement and no other abnormalities. He is immediately initiated on plasmapheresis therapy. Which of the following increases his likelihood of remission with plasmapheresis treatment?
- A. Initiating treatment within 2 weeks of the diagnosis
 - B. Age less than 40 years
 - C. Presence of a living unrelated kidney transplant

- Quiz prepared by [Anna Burgner](#). Follow her [@anna_burgner](#).

To view the full [Plasma Exchange](#) region (FREE), please visit [AJKDBlog.org](#).

Title: [NephMadness 2019: Plasma Exchange](#)

Writer: [Paul Phelan @paulphel](#)

Expert: Andre Kaplan

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[Answers to Test Your Knowledge: Plasma Exchange](#)

1. A. True

The pathogenicity of ANCA has been demonstrated in 3 ways:

1. Animal models showing that T & B cell deficient mice & MPO-knockout mice injected with anti-MPO develop a pauci-immune glomerulonephritis.
2. A case report of placental transmission of anti-MPO resulting in transient neonatal pulmonary-renal syndrome.
3. A large GWAS demonstrating that patients with ANCA-MPO & PR3-ANCA segregate genetically. Moreover, polymorphisms in the gene encoding Proteinase 3 were associated with PR3-ANCA.

Reference: Schlieben, DJ., Korbet, S. M., Kimura, R. E., Schwartz, M. M., and Lewis, E. J. Pulmonary-renal syndrome in a newborn with placental transmission of ANCA. *Am J Kidney Dis* 2005; 45(4): 758-761.

2. C. The decision to plasma exchange should not defer early initiation of prompt chemotherapy

Evidence suggests that achieving at least a 60% light chain reduction by day 21 improves renal outcomes; in one study, this reduction led to 80% of patients recovering renal function. Plasma exchange has not been shown to be more efficient than high cutoff dialysis at removing light chains. Early effective chemotherapy is critical in management to prevent further light chain production.

Reference: Hutchison, C. A., Cockwell, P., Stringer, et al. Early reduction of serum-free light chains associates with renal recovery in myeloma kidney. *J Am Soc Nephrol* 2011; 22(6): 1129-36.

3. A. Plasmapheresis and intravenous immunoglobulin (IVIG)

While studies are small and heterogeneous, the current appraisal of the data has led to TPE/IVIG becoming the gold standard for treatment of acute antibody-mediated rejection.

Reference: Wan, S.S., Ying, T.D., Wyburn, K., Roberts, D.M., Wyld, M., and Chadban, S.J. The treatment of antibody-mediated rejection in kidney transplantation: an updated systematic review and meta-analysis. *Transplantation* 2018; 102(4): 557-568.

4. A. Initiating treatment within 2 weeks of the diagnosis

Patients who initiated plasmapheresis within 2 weeks of the diagnosis of recurrent FSGS post-transplant in this meta-analysis were more likely to achieve remission. Age and type of transplant did not affect the likelihood of remission.

Reference: Kashgary, A., Sontrop, J.M., Li, L., Al-Jaishi, A.A., Habibullah, Z.N., Alsolaimani, R., and Clark, W.F. The role of plasma exchange in treating post-transplant focal segmental glomerulosclerosis: A systematic review and meta-analysis of 77 case-reports and case-series. *BMC Neph* 2016; 17(1): 104.

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