



TITLE: Using a Modified CPD Blood Bag to Store Blood from either ECMO or RRT Circuit Blood in Pediatric Patients

Name: James Neal, CCP FPP

Affiliation: Assistant Professor of Surgery Mayo Clinic, Pediatric Perfusionist

Country: United States of America

Email ID: neal.james@mayo.edu

ABSTRACT

By adapting a citrate phosphate dextrose (CPD) whole blood storage bag, residual blood from a renal replacement therapy (RRT) circuit can be saved in pediatric patients, decreasing in donor exposure later. The techniques used for autologous preoperative blood storage are the basis of storing the RRT circuit blood. The CPD anticoagulant has a benefit of having a commonly used reversal agent for its anticoagulant properties, i.e., calcium. Also, unlike the traditional anticoagulants used in extracorporeal membrane oxygenation (ECMO), i.e., heparin, and direct thrombin inhibitors, i.e., bivalirudin, there is no increase in anticoagulation laboratory parameters after administration. The CPD volume in the bag is reduced but keeps the original ratio the same between CPD and blood. This is accomplished by removing all CPD from the bag, adding back only the exact amount of CPD needed for the smaller amount of blood being transferred from the circuit. The RRT circuit managed at

our institution uses 23 mL of CPD for 165 mL of circuit blood when stored with this technique. This calculation assumes a normal patient calcium level. This technique has been used successfully multiple times in more than 30 pediatric patients without incident for 7 years at our center. The CPD bag can also be used to store the residual blood from ECMO circuits after removal of ECMO to allow the blood to be given back to the patient at a later time by keeping the same citrate-to-blood ratio.



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BIOGRAPHY

James Neal completed his perfusion training at Ohio State University. James has 21 years of perfusion experience in both adult and pediatric practice of ECMO and cardiopulmonary bypass surgeries. James is a pediatric perfusionist at Mayo Clinic in Rochester, Minnesota, USA. He previously held the position of program director for the Perfusion Clinical Rotation at the Mayo Clinic School of

Health Science. Additionally, he has published 14 peer reviewed articles. James also serves on the editorial board of the Journal of Extracorporeal Technology (JECT), and is a Fellow in Pediatric Perfusion (FPP) in the American Society of Extracorporeal Technology (AMSECT)

Presenter Name: James Neal.
Mode of Presentation: Webinar.
Contact number: +1 507-993-0630

