

2021 ANNA NATIONAL SYMPOSIUM

Implementation of Continuous Renal Replacement Therapy (CRRT) with COVID-19, Prismaflex to Prismax, and Citrate Anticoagulation

Isagani I. Marquez, Jr., MSN, RN, QIA

Charilyn Fox, MHA, BSN, RNc

John Gabriel, BSN, RN

Loma Linda Medical Center, Loma Linda, CA

Background / Aim:

Continuation of CRRT (Continuous Renal Replacement Therapy) minimizes patient hemodynamic instability and provides fluid balance. Studies have concluded that limiting disruptions and time off the machines produces the best outcomes for patients on CRRT and decreases the mortality rate.

Fresenius had informed our facility in April of 2018 that they would not be providing support for the Fresenius K machine effective December 2019. The K machine was the machine that was being utilized for 24-hour renal replacement therapy for the adult critical ill patients by the dialysis team. The two machines that were reviewed by our adult Nephrology team to provide CRRT were the NxStage and Prismaflex machines. After evaluating each machine, the Prismaflex was selected which was already being used by our Pediatric Nephrology team.

Plan / Do:

The model to be used is the “Hybrid Model”, which is a collaborative model between dialysis staff and ICU staff. Dialysis staff would be responsible for assisting with setting up the CRRT circuit and circuit changes after 72 hours or as needed and rounding/daily monitoring once in the morning and again in the evening providing CRRT support.

Five ICU units with a total of 108 beds and the training of 101 ICU nurses and 35 dialysis nurses was implemented. A mandatory completion of two online CRRT modules and attending training sessions provided by Baxter was done.

Documentation was on both paper and EPIC (The Electrical, Process, Instrumentation and Control Systems) for the CRRT patient assessment records. A dialysis and ICU staff list were also completed daily tracking the nurse’s rotation working with the CRRT machines. It was decided that no anticoagulation through the Prismaflex was going to be utilized during the initial implementation phase of CRRT.

ACT:

Data was gathered as part of a performance quality project and included the length of days the patients were on CRRT before changing the circuit and the reasons why the circuit was changed. The data was captured through an EPIC drop down box with options on why the filter was changed. Data and daily monitoring included patient assessment, reviewing laboratory results, hemodynamic status, flushing of the system to assess patency of filter as needed and monitoring of patient access lines which was completed every 30 minutes. An MPS extension line was utilized for COVID-19 patients. The MPS

extension is 10 ft long which allowed the Prismaflex to be out of the patient's room. The PrismaMax machine was introduced in phase two of our CRRT hybrid model initiative and training was completed to both the ICU and dialysis team. The PrismaMax and Prismaflex utilized the same filter circuits and were similar in set-up. The two items that differed between the two machines was that the PrismaMax has a patient warmer piece that needed to be attached and an Auto-Effluent drain accessory which eliminated the need to change effluent bags during CRRT which helped with minimizing treatment disruption and the treatment with COVID-19 patients.

Conclusion:

This study demonstrates that continuous CRRT without changing the circuit can lead to good patient outcomes such as transitioning to IHD and assisting with the overall care of the patients. Circuit recirculation was also utilized. After blood is returned to the patient, a CRRT setup can be recirculated for 2 hours per facility policy. Mortality rate on patient on CRRT at LLUMC was 26% in 2019 and the average life of the CRRT circuits was approximately 24 hours. The utilization of citrate anticoagulation will be utilized to assist with the life span of the CRRT circuits. A titration formula will dictate the adjustments of both the citrate anticoagulation and calcium infusion.

Citrate Anticoagulation: 140-180 mL/hr (for a Blood flow rate 100 mL/min) = Maintain Post-Filter Ionized Calcium at 0.25 – 0.3 mmol/L

Calcium Chloride Solution: 8 g Ca Cl in 1000 mL 0.9% Sodium Chloride 40 mL/hr = Maintain Peripheral Ionized Calcium 1.10-1.3 mmol/L.

Abstract selected for presentation at 2021 ANNA National Symposium