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Area **Adult Critical
Care**

Applicability **Erlanger Health -
Baroness**

Continuous Renal Replacement Therapy (CRRT)

Policy Statement:

To establish guidelines for the Registered Nurse (RN) in the treatment of patients receiving Continuous Renal Replacement Therapy (CRRT) in the critical care setting. CRRT is reserved for usage in the critical care settings only within the Erlanger Health Systems. A critical care patient's attending may consult nephrology or surgical critical care to determine the need for continuous renal replacement therapy. The nephrologist or surgical critical care provider will obtain the necessary consents for treatment and initiate the CRRT order set.

Reason for Policy:

These guidelines will enable the Registered Nurse to provide safe and consistent monitoring of patients receiving CRRT in an Intensive Care Unit (ICU) setting

Who Should Read this Policy:

All Registered Nurses or critical care providers that care for patients requiring CRRT in the Adult Critical Care setting.

Resources:

- I. Baxter Gambro Prismaflex System and Device controls: See *Erlanger Online Learning (EOL)* for "Baxter Gambro Prismaflex Systems"

Definitions

- I. **CRRT** is an abbreviation for Continuous Renal Replacement Therapy. CRRT is a form of renal

replacement therapy that is used for critically ill patients that is intended to be applied for 24 hours per day in an ICU. It is a continuous mode of dialysis that permits the clearance of blood solutes both by diffusion and convection across a semipermeable membrane.

- a. CRRT is subdivided into the following four therapy modalities:
 - i. **SCUF** is an abbreviation for Slow Continuous Ultrafiltration.
 - ii. **CVVH** is an abbreviation for Continuous Venovenous Hemofiltration.
 - iii. **CVVHD** is an abbreviation for Continuous Venovenous Hemodialysis.
 - iv. **CVVHDF** is an abbreviation for Continuous Venovenous Hemodiafiltration.
- b. Criteria For CRRT:
 - i. Symptomatic acute kidney injury and/or acute renal failure
 - ii. Symptomatic fluid overload
 - iii. Intolerance to intermittent hemodialysis
 - iv. Hemodynamic instability
 - v. Elevated blood urea nitrogen (BUN) and symptomatic uremia with organ involvement (pericarditis, encephalopathy, neuropathy, myopathy)
 - vi. Metabolic acidosis and electrolyte imbalances
 - vii. Toxin ingestion of dialyzable substance
 - viii. Rhabdomyolysis

The Policy

I. CRRT Nurse Education requirements:

- a. Any nurse wishing to care for a patient requiring CRRT must have a minimum of 6 months of critical care experience with 1 year experience preferred.
- b. All nurses must be approved by the unit's clinical leadership team prior to enrollment in the Initial CRRT Course. As part of the nurse's 6 month evaluation with the Clinical Staff Leader, discussion will be had on the nurse's readiness for CRRT as well as personal goals for the nurse to progress to taking CRRT patients.
- c. Educational requirements include completing the Baxter Gambro Prismaflex Systems EOL module in addition to the 8 hour Initial CRRT User Course, and 36 hours or 3 shifts of clinical orientation hours at the bedside with a CRRT experienced RN.
- d. All CRRT nurses must complete 48 hours of CRRT patient management each calendar year to renew competency. Orientation hours are not counted as part of the 48 hour requirement. Any nurse who did not meet the required hours will be required to complete CRRT Refresher education.
- e. Any new hire with one year of prior critical care experience may take the Initial CRRT User Course once off of nursing orientation and approved by their unit's clinical leadership team.
- f. Any new hire with prior CRRT experience using the Baxter Prismaflex, may complete CRRT Refresher education once off orientation and approved by their unit's clinical

leadership team. After completing the CRRT Refresher education at least 12 hours or 1 shift of bedside orientation with a CRRT experienced RN must be completed.

- g. Any new hire with prior CRRT experience using a machine other than the Prismaflex, may go to the Initial CRRT User Course once off orientation and approved by the unit's clinical leadership team. After completing the Initial CRRT User Course, the nurse should complete 36 hours or 3 shifts of bedside orientation with a CRRT experienced RN.

II. Nursing Management of the Patient:

a. Assessment and Management:

(Refer to Elsevier Clinical skills: "Renal Replacement Therapy: Continuous" for principles of diffusion, convection, ultrafiltration, osmosis, oncotic pressure, hydrostatic pressure, absorption, and adsorption as they pertain to fluid and solute management during dialysis.)

- i. The RN performing CRRT will complete physical assessment and perform all standards of care per the [Model of Care - Adult Intensive Care Units \(ICU\)](#)
- ii. Prior to initiation of therapy and at each shift change the RN will verify orders for fluids and flow rates with a second RN. Assure that fluid rates programmed on the pump match the physician's orders.
- iii. Verify all lab orders and flow rate calculations. Follow all orders per the CRRT order set, as they are entered, or changed via the attending. (i.e. Nephrology or Surgical Critical Care)
- iv. It is the responsibility of the nurse to document a CRRT charge (\$) on the patients CRRT flowsheet. This should be done every 24 hours and at the initiation of therapy.
- v. The nurse should document a daily hematocrit and dosing weight into the machine and in Epic. Dosing weight (admission weight) shall be used to set up the machine and should only be changed if it meets the triggers to be modified per the MD and/or critical care pharmacist. The patient's daily weight should be recorded in Epic every 24 hours. Ideally hematocrit values should be updated with each new result.
- vi. Calcium drips, Citrate flow rates, and Heparin drips should be followed according to the table flow charts in epic as they are prescribed.

b. Machine set up and Disconnection:

- i. Prepare and disconnect the CRRT machine per the operators guidelines and per the on-screen instructions (GAMBRO).
- ii. Start machine in the highest treatment modality to prevent unnecessary filter changes that result in waste. This includes the CVVHDF modality and heparin syringe. The machine can be later changed to a lower modality via provider's prescriptions. The RN will set up the machine with a clean saline syringe attached to the heparin syringe port if not actively using.
- iii. Do not set up the machine with additional fluid bags hanging from a scale

that are not prescribed. This is to avoid malfunction of the weight sensor. The scales are programmed with a safety mechanism that leaves 200mL of fluid on the scale, so that they do not entrain air into the filter system.

- iv. Consider changing your filter when the filter pressure reaches 300 (GAMBRO).
- v. Change filter set and fluid bags every 72 hours or PRN. Document reason for filter change (GAMBRO). Discard filters in red biohazard bags
- vi. If blood clotting is present in the blood lines or filter, do not return the blood. Prime and load a new filter.
- vii. Initiate orders as ordered by the nephrology or surgical critical care provider. All order changes regarding CRRT order set should come from these services.

c. Vascular Access for CRRT:

(Refer to Elsevier Clinical skills: "Renal Replacement Therapy: Continuous" for Accessing and De-accessing a Hemodialysis Vascular Catheter)

- i. Any qualified provider responsible for the care of the patient will be responsible for obtaining the necessary large bore multi-lumen venous access, or vascular catheter, for CRRT.
 - 1. After venous access is established, the provider that inserted the line or the RN caring for the patient will instill an anticoagulant (i.e. Heparin or Alteplase) as ordered to fill the lumen size of the vascular catheter inserted.
 - 2. The vascular catheter will be clearly labeled with date, time, initial, and type of anticoagulant instilled.
- ii. Only CRRT trained RN or hemodialysis RNs are credentialed to access and de-access CRRT vascular catheters.
 - 1. Prior to using vascular catheter, RN will withdrawal and waste (Access) the appropriate volume from each anticoagulant packed lumen to avoid systemic anticoagulation of the patient.
 - 2. When the vascular catheter is not in use it needs to be instilled with appropriate amount of ordered anticoagulant (De-accessed) by a certified CRRT or hemodialysis RN.
- iii. RN shall assess blood flow of the vascular catheter prior to connecting CRRT.
- iv. Vascular catheter established for CRRT is not to be used for other fluid or blood product administration except in life threatening emergencies. RN must have an order from the providing service that inserted the line to use it for temporary IV access in non-emergent situations. If a lumen is to remain accessed for IV use, it must have a luer-lock clasp and IV fluids running at least KVO.

d. Documentation:

- i. Document all fluids used with CRRT within the appropriate flowsheet.
- ii. Document per CRRT flow sheet: pressure flow rates and CRRT fluid balances every hour along with other outlined parameters within the flow sheet.
 1. Flow sheet documentation should also include times of fluid changes, flow rate changes, and other interventions.

References:

- I. GAMBRO, PRISMAFLEX Operator's Manual 7.xx. 2015 v7 xx; p1-245, p100
- II. Kellum et al. Continuous Renal Replacement Therapy. Oxford University Press. 2010.
- III. JACHO. Preventing Errors Relating to Commonly Used Anticoagulants. Sentinel Event Alert. Issue 41. 2008. Pg 1-4

Approval Signatures

Step Description	Approver	Date
CNO	Rachel Harris: Exec VP& Chief Nursing Officer	05/2025
Medical Executive Committee	Alisa Bolt: Medical Staff Svcs Manager	05/2025
Clinical Effectiveness	Carrie Burton: Executive Assistant-Chief	01/2025
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Applicability

Erlanger Health - Baroness