

PROTOCOL FOR: Continuous Renal Replacement Therapy (CRRT): Care of the Patient

PURPOSE: To describe nursing responsibilities for initial set-up and maintenance of CRRT and related patient care.

SUPPORTIVE DATA: CRRT is a labor intensive nursing procedure which allows a gentle removal of toxins and fluid over a 24 hour period of time in a patient with renal failure whose cardiovascular system may not tolerate other forms of dialysis.

DEFINITIONS: CRRT (continual renal replacement therapy)- involves the use of a highly porous filter and an extracorporeal blood circuit for continuous filtration of intravascular fluid and dissolved waste products 24 hours/day. CRRT is achieved by the following techniques:

CVVHD (Continuous Venovenous Hemodialysis): uses a dialysate to remove toxic waste and fluid through the process of diffusion

CVVH (Continuous Venovenous Hemofiltration): uses replacement fluid to dilute toxins in plasma as the toxins are removed with the ultrafiltrate. Clearance of toxins are through the process of convection.

SCUF (Slow continuous Ultrafiltration): Removal of fluid by filtration. Although toxins are removed in the filtrate, levels of toxins in the plasma are unchanged because there is little or no dilution by replacement solution.

- POLICIES:
1. A formal renal consultation must be obtained prior to initiating CRRT with a signed patient consent form.
 2. CRRT standing orders will be utilized with all patients and desired net loss and/or fluid therapy rate will be indicated in the MD order.
 3. The initial set-up of the CRRT system will be performed by the hemodialysis nurse, in conjunction with the intensive care unit nurse.
 4. The entire system must be set up and maintained utilizing strict aseptic technique.
 5. The hemodialysis nurse will be responsible for consultation during the course of the procedure and for maintaining adequate supplies.
 6. Once therapy is initiated, the Intensive Care Unit nursing staff will be responsible for the maintenance of the CRRT system, patient monitoring during the procedure and possible disconnect from therapy.
 7. TECHNICAL/CLINICAL SUPPORT for CRRT is available 24/7 by calling:
1-866-NXSTAGE (1-866-679-8243)

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DESIRED PATIENT

- OUTCOMES:
1. The patient will maintain hemodynamic stability.
 2. Over a 24 hour period the patient will exhibit benefit from the CVVH procedure as evidenced by a decrease in toxins and an improvement in fluid balance.

CLINICAL ASSESSMENT

AND NURSING CARE:

1. The patient will be weighed at approximately the same time daily.
2. Vital signs and hemodynamics must be monitored at least every hour, and more frequently if indicated by the patient's condition. Record on the ICU flowsheet.
3. Monitor and record patient's temperature every 2-4 hours. Use warm therapy fluid as needed to maintain normothermia.
4. Intake and output will be recorded on an hourly basis on the ICU flowsheet.
5. Hourly totals for non-CRRT intake (includes all IV, IVPB, oral intake, feedings, blood products, anticoagulant) and non-CRRT output (includes urine, NG, JP, chest tube) derived from the ICU flowsheet will then be recorded in the appropriate sections of the CRRT flowsheet. This enables calculation of fluid removal rates and appropriate ultrafiltrate rate to achieve desired effect.
6. Record the following on the CRRT flowsheet at the BEGINNING of each hour:
 - a. Access Pressure, Venous Pressure and Effluent Pressure
 - b. Hourly calculations and Machine Settings, including:
 - i. replacement fluid/dialysate administration rate
 - ii. blood flow rate
 - iii. patient fluid removal rate
 - iv. calculated new hourly filtrate rate
7. Record the following on the CRRT flowsheet at the END of each hour:
 - a. Actual ultrafiltrate volume
 - b. Cumulative total of patient fluid removed. **

** Cumulative totals of patient fluid removed with CRRT (documented on the CRRT flowsheet) will be charted as OUTPUT on the I&O record of the ICU flowsheet.
8. Lab work will be drawn per MD order. Recommendations include:
 - a. CBC with differential daily
 - b. Chemistry profile q 12 hours

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c. PTT/PT q 12 hrs to assess patient's systemic coagulation

ACCESS

- SITE CARE:
1. The access site will be evaluated at least every 12 hours for signs of bleeding and infection.
 2. A central line dressing kit will be used for dressing changes. Usually a gauze is used beneath a transparent dressing, thus routine dressing change is every 48 hours.

REPORTABLE

CONDITIONS: Notify House Officer of the following:

1. Lab and PT/PTT results
2. Signs of clotting in the CRRT system. Signs include:
 - a. High Transmembrane Pressure (TMP) alarm
 - b. High Balance Chamber Pressure (without other explanation)
 - c. High Effluent Pressure
 - d. Low Venous Pressure
3. Any and all blood leaks in the sterile system - this can lead to blood loss and risk for infection.
4. Signs of infection at access site.

PATIENT

- TEACHING:
1. Instruct patient/ significant family members as to rationale, projected outcomes and risks of the procedure.
 2. Instruct patient/significant family members as to rationale and care of venous access.

- DOCUMENTATION:
1. Document assessment and monitoring parameters on the ICU and CRRT flowsheets as previously identified.
 2. Document patient response to CRRT in progress notes using focus/DAR format per unit/department documentation standards.

APPROVAL: Intensive Care Unit Standards Committee
Intensive Care Unit Coordinating Committee
Nursing Standards Committee

EFFECTIVE DATE: 3/95

REVISION DATES: 10/03, 1/06

NOTE protocol title change with 1/06 revision.

Previous title: *Continuous Venovenous Hemofiltration(CVVH):Care of the patient on*