UNIVERSITY of CALIFORNIA, SAN DIEGO
MEDICAL CENTER

PHYSICIAN'S ORDERS
ADULT
CRRT PROTOCOL

Citrate CRRT Orders
Page 1 of 3

Patient Identification

PHYSICIAN: Use ball point pen. Check (√) appropriate orders where given choice. Use the metric system when filling in blanks or writing additional orders. To add additional orders after signing and dating this set, use blank Physician's Orders.

Patient Parameters:

1. Diagnosis_____
2. Indications: ❒ Solute Control ❒ Fluid Management ❒ Acid/Base/Electrolyte Management
   ❒ Immune Modulation ❒ Other_____
3. Allergies: Refer to Medical Record for current list of allergies/reactions
4. Weigh patient before starting CRRT and once daily.
5. Use standard CRRT procedures/protocol of unit.
6. **Access:** ❒ Temporary Catheter ❒ Fistula **Site:** ❒ Left ❒ Right
   ❒ Tunneled Cathether ❒ Graft **Location:** ❒ Femoral ❒ Jugular ❒ Subclavian
   ❒ ECMO Circuit ❒ Other_____ ❒ Arm ❒ Leg ❒ Other _____

Treatment Parameters:

7. Modality: ❒ SCUF ❒ CVVH ❒ CVVHD ❒ CVVHDF ❒ Other_____
8. Machine: ❒ PrismaFlex ❒ Other_____
9. Filter: ❒ PrismaFlex Set HF1000 ❒ Other _____
10. Use fluid warmer to maintain patient's temperature at 37C. Other _____

Solutions and Flow Rate:

11. Blood flow: ❒ 100 mLs/min ❒ Other_____mLs/min (Max: 450 mLs/min)
12. (1B) Dialysate - Base solution: 0.45% NACL

13.

*NaCL	mEq/L
*$NaHCO_3$	mEq/L
KCL	mEq/L
Magnesium Sulfate	mEq/L
Dextrose (0.1-1%)	%
Other 1	
Other 2	

*Total NaCl/HCO3 should equal 40 mEq/L

FLOW RATES	Standard (mLs/hr)	Other (mLs/hr)
(1A) Total Effluent (total of all fluids)	2700	
(1B) Dialysate	1000	
(1C) Post filter (deaereation chamber via replacement pump)	200	
(1D) Pre filter (via Pre Blood Pump)	500	
(3A) Patient fluid removal (Max 2000 mLs/hr)	1000	

( ) refers to form D6037

14. (1C) Post filter: ❒ Normal Saline ❒ Other: _____
15. (1D) Pre filter: ❒ Normal Saline ❒ Other: _____

Physician Signature/PID# Date & Time

Nurse Signature Date & Time

WHITE - Medical Records

YELLOW - Dialysis

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16. Replacement Fluid - Given post filter via venous return line. Choose one scale:

Solution	pH	Serum Bicarb
Normal Saline	>	>
0.45% Normal Saline plus 75mEq/L NaBicarb		
Sterile Water plus 150mEq/L NaBicarb	<	<
Other		

17. Replacement fluid flow rates: Choose **one** method below to maintain net fluid balance:
❒ Set hourly fluid removal rate:
❒ Net negative ___ ___ ___ mL/hour for ___ ___ ___ hours.
❒ Keep even for ___ ___ ___ hours.
❒ Net positive ___ ___ ___ mL/hour for ___ ___ ___ hours.

❒ Sliding scale (below):

Parameters: ❒ MAP ❒ PAWP ❒ CVP ❒ Other _____	Suggested Hourly Fluid Target Parameters	OTHER Hourly Fluid Target Parameters
_____	+ 200 mL	_____
_____	+ 150 mL	_____
_____	+ 100 mL	_____
_____	+ 50 mL	_____
_____	EVEN	_____
_____	- 50 mL	_____
_____	- 100 mL	_____
_____	- 150 mL	_____
_____	- 200 mL	_____

Anticoagulant:

18. Regional CITRATE anticoagulation 0.14 molar citrate to run into 3-WAY STOPCOCK at vascular access exit at ___ ___ ___ mL/hour (usually 2 to 3% of BFR; eg: 140-180 mL/hr for a BFR = 100 mL/min) to maintain POST-FILTER IONIZED CALCIUM at 0.25-0.3 mmol/L.
NOTE: Start at lower rate (120 - 140 mL/hr) for patients with hepatic failure.

19. Check POST-FILTER IONIZED CALCIUM at initiation of CRRT and every 4 hours x 24 hours, then every 8 hours x 24 hours, then every 12 hours. Adjust CITRATE flow rate according to sliding scale below. If changes made to citrate drip, recheck postfilter ionized calcium in 2 hours, then every 4 hours for 24 hours if stable.

Citrate Replacement Sliding Scale

Postfilter Ionized Ca	Citrate Flow Rate
<0.25	Decrease by 10 mL/hour (call Renal MD)
0.25 - 0.3	NO CHANGE
0.31 - 0.4	increase by 5 mL/hour
0.41 - 0.45	increase by 10 mL/hour
>0.45	increase by 15 mL/hour (call Renal MD)

Do not decrease citrate rate below ❒ 120 mL/hour ❒ Other _____
Do not increase citrate rate above ❒ 200 mL/hour ❒ Other _____

Physician Signature/PID# Date & Time
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20. Calcium chloride solution: 8 g $CaCl_2$ in 1000 mL 0.9% sodium chloride (1080 mL total). To run into CENTRAL LINE at ❒ 40 mL/hour ❒ Other _____ to maintain PERIPHERAL IONIZED CALCIUM 1.10-1.2 mmol/L.

21. Check PERIPHERAL IONIZED CALCIUM at initiation of CRRT and every 4 hours x 24 hours, then every 8 hours x 24 hours, then every 12 hours. Adjust calcium chloride according to sliding scale below. If changes made to calcium chloride drip, recheck peripheral ionized calcium in 2 hours, then every 4 hours for 24 hours if stable.
Calcium Chloride Sliding Scale

Peripheral Ionized Ca	Calcium Chloride
0.85 - 0.94	increase by 10 mL/hour + 2 g Ca gluconate (call Renal MD)
0.95 - 1.04	increase by 5 mL/hour + 1 g Ca gluconate
1.05 - 1.09	increase by 5 mL/hour
1.10 - 1.2	NO CHANGE
1.21 - 1.3	decrease by 5 mL/hour
1.31 - 1.45	decrease by 10 mL/hour
>1.45	decrease by 15 mL/hour (call Renal MD)

Do not decrease calcium chloride rate below ❒ 30 mL/hour ❒ Other _____ mL/hour.
Do not increase calcium chloride rate above ❒ 80 mL/hour ❒ Other _____ mL/hour.

Labs:

22. HbsAg, HCV at start of therapy times one.

23. Labs to be drawn IN SEQUENCE at **0200** hours:
    a. Peripheral: CBC, differential, platelet count, Chem 7, Mg, Ca, PO_4, liver panel, & PT, PTT INR
    b. Postfilter: BUN, creatinine.
    c. Prefilter (postpump): BUN, creatinine.
    d. Ultrafiltrate: BUN, creatinine

24. Labs to be drawn at start of every new filter and at 1400 hours. Same sequence as #23 above.
    a. For peripheral labs do: BUN, creatinine, electrolytes, Ca, PO_4.
    b. Filter Labs for post, pre, and ultra filtrate (UF) same as 0200.

Additional Orders: Renal MD pager # _____

25. Check blood pressure and fluid loss every 4 hours and notify Renal MD for systolic blood pressure less than ____ ____ ____ mm Hg.
26. Check for line patency and presence of peripheral pulses every 4 hours. Notify Renal MD of problems prn.
27. Special orders:_____

_____

_____

28. Catheter lock solution: Use 4% citrate to the prime volume printed on each limb of the catheter.

Physician Signature/PID# Date & Time

Nurse Signature Date & Time