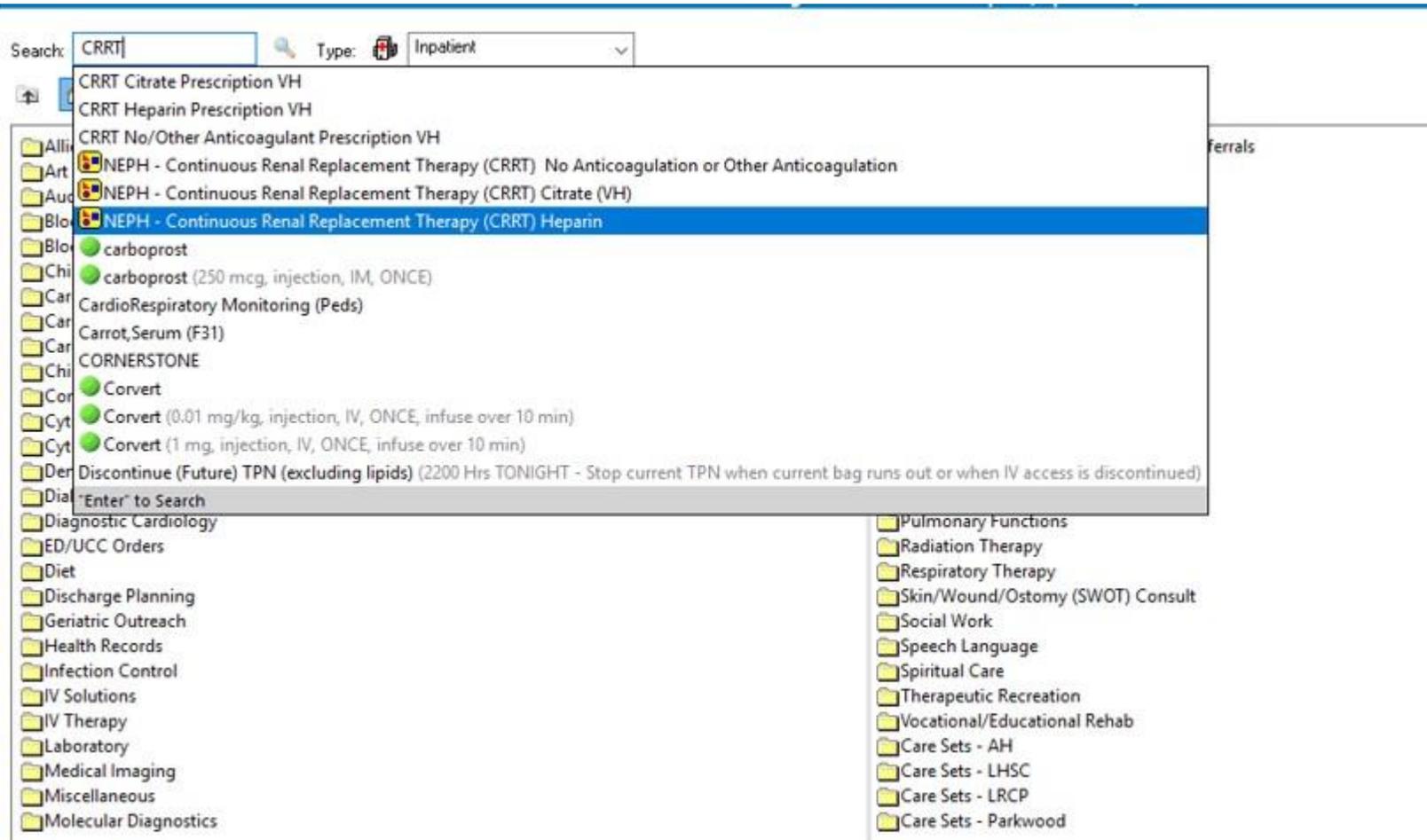


New CRRT Heparin Orders (VH)

January 5, 2022

Have Questions? Contact: brenda.morgan@lhsc.on.ca Pager 19914



For all new CRRT orders or if the method of anticoagulation changes, always order the order set (little yellow box).

The order set provides both the prescription power plan and the required lab orders/citrate flush.

Menu < > Orders

+ Add | Document Medication by Hx | Reconciliation | Check Interactions

Reconciliation Status
✓ Meds History | Admission | Discharge

Orders Medication List Document In Plan

View

Orders for Signature
Plans
Document In Plan
Medical
NEPH - Continuous Renal Replacement Therapy (CRRT) Heparin (Planned Pending)

Related Results

Component Status Dose ... Details

NEPH - Continuous Renal Replacement Therapy (CRRT) Heparin (Planned Pending)

Patient Care

- CRRT Heparin Prescription VH
- Communication Order Change filter if urea ultrafiltrate:serum ratio <0.80
- INR/PTT Nurse Order When daily schedule while on CRRT
- Electrolytes (Na/K/Cl/CO2) Nurse order when q6 hour schedule while on CRRT
- Phosphate, Magnesium Nurse Order When q6 hour schedule while on CRRT
- PTT Nurse order when POST filter PTT q6 hour schedule while on CRRT
- Urea Serum Nurse order when q12 hour schedule while on CRRT
- Creatinine Serum Nurse order when q12 hour schedule while on CRRT
- Urea Fluid Nurse order when q12 hour schedule while on CRRT
- Communication Order Ultrafiltrate Nurse to discontinue CRRT Heparin powerplan when CRRT prescription discontinued

Medications

- sodium citrate (sodium citrate 4% injectable solution) 2.5 mL, injection, BLOCK, as directed, PRN Other: See Comme... Instill 4% sodium citrate solution into each catheter limb (total ...)

Details

Orders For Nurse Review Save as My Favorite Plan for Later **Initiate Now**

Initiate the order first. This will then take you to the prescription power plan and ensure the labs and citrate flush orders are launched.

When finished

*Performed on: 2022/01/05 1404 EST By: Morgan, Brenda

Continuous Renal Replacement Therapy Heparin Prescription VH

CRRT Prescription Status: Start or update prescription Discontinue

Filter Setup: ST 150

Prismaflex Mode: CVVHDF

Blood Flow Rate: Target Blood flow 250-300mL/min; increase to target within first minute of initiation

Priming Solution: 5,000 units of heparin sodium in 1 litre of 0.9% sodium chloride then reprime with 1 litre of 0.9% sodium chloride

Net Fluid Removal Target: 50 mL/hr Start at 0 ml/hr and progress to target as long as MAP is maintained

Dialysate Solution: PrismaSol 4

Dialysate Solution Rate: 2,000 mL/hr Recommended rate is 2000 mL/hr

Pre Replacement Solution via pre blood pump (PBP): 5,000 units Heparin in 1 L 0.9% sodium chloride Other:

Pre Replacement Rate: Set PBP rate to provide desired Heparin dose as ordered in the anticoagulation section

Post Replacement Solution via replacement pump: PrismaSol 4

Post Replacement Rate: 200 mL/hr Recommended minimum rate of 200 mL/hour

Add POTASSIUM CHLORIDE to dialysate and replacement solution according to Potassium Titration Protocol? Yes

Anticoagulation via Prismaflex	Heparin Sodium BOLUS Pre-Filter	5,000 Units	Recommended BOLUS dose 80 units/kg to maximum of 5,000 units. Administer into the access limb of the dialysis catheter prior to the initiation of treatment.
	Heparin Sodium INFUSION Pre-Filter	1,000 unit/hr	Recommended rate 1,000 u/hour
		<input checked="" type="checkbox"/> Heparin 5,000 units in 1000 mL (5 units per mL solution) <input type="checkbox"/> Other:	

Adjust HEPARIN according to Heparin Titration Protocol to maintain post filter PTT of 60-80 seconds? Yes

Special Instructions: Yes No

Set dialysis flow rate to provide entire prescription (no longer have predilution hemofiltration option)

Same as usual ordering

Select 5,000 u/1L heparin. Note: DO NOT order a flow rate for the PBP. The nurse will titrate the flow rate to the desired dose by protocol.

Order heparin bolus and starting dose in units. The dose is the same as by syringe. Only the concentration has changed.

Continue to give initial bolus via the access limb. Administer subsequent boluses via the red sampling port of the filter set (pre blood pump).

Heparin Titration Protocol

Adjust heparin infusion to maintain PTT 60-80 seconds according to protocol below:

If Post Filter PTT	Pre-Filter Heparin Bolus	Infusion Change
greater than 150 seconds	none	* stop infusion for 1 hour * decrease infusion by 200 units/hour * repeat PTT in 6 hours * if repeat PTT > 150, notify Nephrology and Critical Care
greater than 100 seconds	none	* stop infusion for one hour * decrease infusion by 200 units/hour * repeat PTT in 6 hours
80 to 100 seconds	none	* decrease infusion by 200 units/hour
60 to 79 seconds	none	<< NO CHANGE >>
50 to 59 seconds	none	* increase infusion by 200 units/hour
40 to 49 seconds**	1,000 units	* increase infusion by 200 units/hour
30 to 39 seconds**	2,000 units	* increase infusion by 400 units/hour
less than 30 seconds**	5,000 units	* increase infusion by 400 units/hour * if repeat PTT < 30, notify Nephrology and Critical Care

Perform independent double check when administering bolus doses, mixing heparin infusion and adjusting heparin rate (PBP).

Administering initial Heparin bolus into the access limb as per protocol. Administer subsequent Heparin boluses directly into the Prefilter red injection port.

Administer Heparin infusion via the PBP pump with a solution of 5,000 units per 1L normal saline. This provides a 5 unit per mL solution (An infusion rate of 1000 units per hour = 200mL/hour; an increase or decrease by 200 units per = by 40mL/hour).

** If PTT less than 50 seconds, adjust drip as per protocol and recheck 2 hours post increase in the heparin infusion to ensure a rise in PTT has occurred.

If PTT 2 hours post adjustment remains subtherapeutic, treat as per above protocol. Do not decrease heparin infusion for PTT > 80 if sample was obtained sooner than 6 hours post adjustment (unless heparin is being stopped for bleeding complications).

Potassium Titration Protocol

Add KCl to dialysate and all replacement fluids according to the following protocol. Note the amount of baseline KCl in the solutions being used.

Serum Potassium Level	Final KCl Concentration in Dialysate
if less than 3.0 mmol/L	* KCl bolus I.V. as per CRIT CARE - Electrolyte Replacement (Module). * Recheck serum Magnesium and treat as per CRIT CARE - Electrolyte Replacement (Module) * KCl to equal 6 mmol/L * Notify Nephrology and Critical Care if repeat potassium level is < 3.0 mmol/L
if 3.0 - 3.4 mmol/L	KCl to equal 5 mmol/L
if 3.5 - 4.5 mmol/L	KCl to equal 4 mmol/L
if 4.6 - 5.0 mmol/L**	KCl to equal 3 mmol/L
if 5.1 - 6.0 mmol/L**	KCl to equal 2 mmol/L
if greater than 6.0 mmol/L**	Notify Nephrology and Critical Care if repeat potassium level is > 6 mmol/L

** If serum potassium is 4.6 - 5.6 mmol/L at the start of dialysis, the treatment may be started using PrismaSol 4. Repeat the serum potassium 1 hour after treatment is started.

If potassium remains greater than 4.6 mmol/L change solution to PrismaSol 0 and add appropriate KCl as per protocol.

If the serum potassium remains above 5 mmol/L with dialysis KCl 2 mmol/L, notify Nephrology and Critical Care to review possible causes for persistent hyperkalemia.

Order heparin bolus and starting dose. The dose is the same as by syringe pump. Only the concentration has changed.

HEPARIN TITRATION PROTOCOL

Give initial bolus directly into the LIMB BEING USED TO ACCESS BLOOD, immediately prior to starting the blood pump. Administer subsequent boluses directly into the preblood pump sampling port (RED).

Measure systemic PTT daily and post-filter PTT Q6H (blue sampling port). Consider the patient fully anticoagulated regardless of systemic PTT value (e.g. hold heparin and administer Prismsol solution via PBP to maintain filter patency). If patient is receiving heparin via CRRT circuit, continue daily prophylactic anticoagulation as ordered.

Post-Filter PTT	Pre-Filter Heparin Bolus	Preblood Pump Heparin Dose (PBP) 5,000 heparin/1 L NaCl = 5 units per mL A dose change by 200 units per hour = 40 ml/hr 1000 units/hour = 200 mL/hour
Greater than 150 seconds	None	<ul style="list-style-type: none"> Stop infusion for one hour Decrease infusion by 200 units/hour (40 ml/hr) Repeat PTT in 6 hours If repeat PTT > 150, notify provider
Greater than 100 seconds	None	<ul style="list-style-type: none"> Stop infusion for one hour Decrease infusion by 200 units/hour (40 ml/hr) Repeat PTT in 6 hours
80 to 100 seconds	None	Decrease infusion by 200 units/hour (40 ml/hr)
60 to 79 seconds	None	No change
50 to 59 seconds	None	Increase infusion by 200 units/hour (40 ml/hr)
40 to 49 seconds*	1000 units	Increase infusion by 200 units/hours (40 ml/hr)
30 to 39 seconds	2000 units	Increase infusion by 400 units/hour (80 ml/hr)
Less than 30 seconds	5000 units	<ul style="list-style-type: none"> Increase infusion by 400 units/hour (80 ml/hr) If repeat PTT < 30, notify provider

Perform independent double check for all heparin administration/rate adjustments (PBP). Administer heparin infusion via the PBP pump with a solution of 5,000 units per 1 L normal saline. This provides a 5 unit per mL solution (200 units = 40 ml).

POTASSIUM TITRATION PROTOCOL

Add KCl to dialysate and all replacement fluids according to the following protocol. PrismaSOL 0 and PrismaCAL contain zero potassium and zero glucose.

PrismaSOL4 contains 4 mmol/KCl/L and 6.1 mmol/L of glucose. Monitor glucose and insulin doses carefully when switching between solutions.

Serum Potassium	Final KCl Concentration
less than 3.0 mmol/L	<ul style="list-style-type: none"> KCl to equal 6 mmol/L Give KCl bolus IV as per Crit Care Electrolyte order set Correct Magnesium by IV bolus if < 1.0 Notify CCTC and CRRT provider if repeat K remains less than 3.0 mmol/L
3.0-3.4 mmol/L	KCl to equal 5 mmol/L
3.5-4.5 mmol/L	KCl to equal 4 mmol/L
4.6-5.0 mmol/L	KCl to equal 3 mmol/L
5.1-6.0 mmol/L**	KCl to equal 2 mmol/L
If greater than 6.0 mmol/L**	KCl to equal 2 mmol/L

**If the serum potassium remains above 5 mmol/L (not trending down) despite a final concentration of 2 mmol/L, notify CCTC and CRRT provider to review other possible causes for persistent hyperkalemia. (e.g. CK, lactate, DKA, ischemia).

Bedside tools on laminated cards

Dose unchanged, only concentration has been changed to match dose

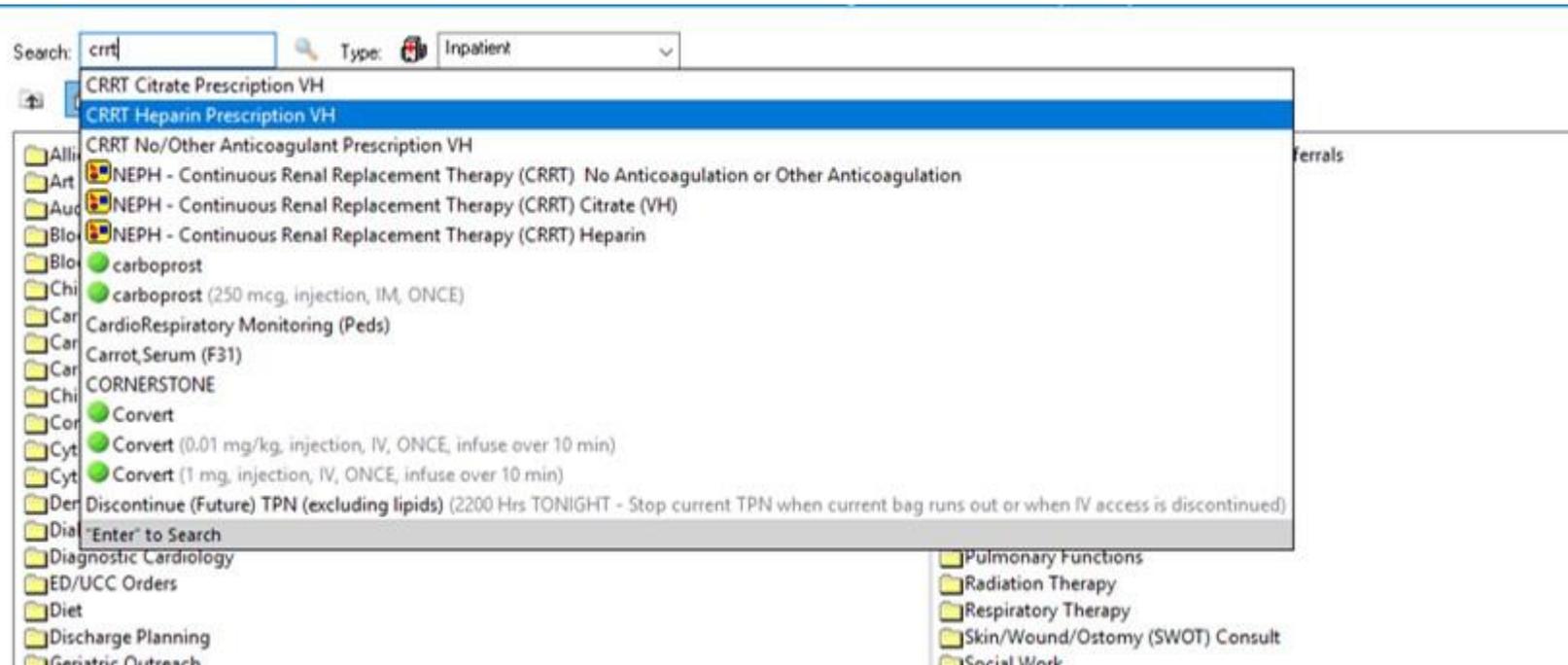
The screenshot displays a medical software interface with the following components:

- Top Bar:** Includes navigation icons, a home button, the text "Orders", and utility icons for "Full screen", "Print", and "1 minutes ago".
- Sub-headers:** "Add", "Document Medication by Hx", "Reconciliation", and "Check Interactions". On the right, "Reconciliation Status" includes "Meds History", "Admission", and "Discharge".
- Order Set Selection:** "Orders", "Medication List", and "Document In Plan".
- Left Pane (View):** A tree view showing "Orders for Signature", "Plans", "Document In Plan", "Medical", and "Orders". The "Orders" section is expanded, listing various categories like "Admission", "Resuscitation Status", "Alerts", "Diet", "Activity", "Vital Signs", "Patient Care", "Respiratory Orders", "Continuous Infusions", "Medications", "Laboratory", "Diagnostic Imaging", "Other Diagnostic Testing/Treatment", and "Consults". A red arrow points to the selected order set: "NEPH - Continuous Renal Replacement Therapy (CRRT) No Anticoagulation or Other Anticoagulation (Completed)".
- Right Pane (Table):** A table with columns "Component", "Status", "Dose ...", and "Details". It lists discontinued orders under "Patient Care" and "Medications". A red arrow points to the "sodium citrate (sodium citrate 4% injectable solution)" entry in the Medications section.

Component	Status	Dose ...	Details
NEPH - Continuous Renal Replacement Therapy (CRRT) No Anticoagulation or Other Anticoagulation (Completed)			
Last updated on: 2021/12/07 02:01 by: System, System			
Patient Care			
CRRT No/Other Anticoagulant Prescription VH	Discontinued		Reason: A on CRF w life threatening cardiac changes
Communication Order	Discontinued		Change filter if urea ultrafiltrate:serum ratio <0.80
Electrolytes (Na/K/Cl/CO2) Nurse order when	Discontinued		q6 hour schedule while on CRRT
Phosphate, Magnesium Nurse Order When	Discontinued		q6 hour schedule while on CRRT
Urea Serum Nurse order when	Discontinued		q12 hour schedule while on CRRT
Creatinine Serum Nurse order when	Discontinued		q12 hour schedule while on CRRT
Urea Fluid Nurse order when	Discontinued		q12 hour schedule while on CRRT
Communication Order	Discontinued		Nurse to discontinue CRRT No anticoagulation powerplan when CRRT prescription discontinued
Medications			
sodium citrate (sodium citrate 4% injectable solution)	Discontinued		2.5 mL, injection, BLOCK, as directed, PRN for Other: See Comments... Instill 4% sodium citrate solution into each catheter limb (total volu...
- Bottom Bar:** Includes "Related Results", "Orders For Nurse Review", "Save as My Favorite", "Initiate Now", and "Orders For Signature".

If you do not see your order set in the order window (left), or the orders for labwork and citrate flush are missing, the order SET was either not used for the initial order (the prescription power plan only was selected) or it was not initiated. It should be placed.

If you have a prescription for heparin but your orders do not include the PTT labs, you likely had a previous order for "No Anticoagulation" that was not discontinued, and only the heparin prescription was ordered. The old order set should be deleted and the heparin order set used to ensure labs are ordered.



To change details of the prescription only (e.g. solutions, fluid removal or potassium orders), without changing the method of anticoagulation, choose the prescription only (no yellow box). This will open up the last prescription to allow you to make changes. If you are switching to a different method of anticoagulation, delete the entire order set and order with initiate a new order set for the desired method.

Please do not make changes to fluid removal or prescription using a communication order. Update the prescription. This will ensure that the left hand prescription when viewed from the dialysis tab will always be the most recent orders.

Menu

Results Review

Results Lab Microbiology Diagnostic Imaging Diagnostic Cardiology Pathology Vitals/Measurements HLA (Transplant Lab)

Situation/Background **Dialysis Treatment Plan**

2021 October 13 13:51 - 2

Navigator

- CRRT No/Other Anticoagulant
- Fluid Removal
- Dialysate
- Replacement Fluid
- Anticoagulation
- Protocols/Adjustments/Instructions
- Patient Treatment Details

Show more results

Dialysis Treatment Plan	2021/12/06 17:11	2021/12/06 08:33	2021/12/06 04:39	2021/12/05 09:37
CRRT No/Other Anticoagulant Details				
Prescription Status				Start or upd
Filter Set Up				ST 150
Prismaflex Mode				CVVHDF
Blood Flow Rate				Target Bloo
Priming Solution				5,000 units l
Fluid Removal				
<input type="checkbox"/> Fluid Removal Target				0 mL/hr
Dialysate				
Dialysate Solution				PrismaSol 4
<input type="checkbox"/> Dialysate Solution Rate				0 mL/hr
Replacement Fluid				
Pre Replacement Solution				PrismaSol 4
<input type="checkbox"/> Pre Replacement Solution Rate				2,000 mL/hr
Post Replacement Solution				PrismaSol 4
<input type="checkbox"/> Post Replacement Solution Rate				500 mL/hr
Use Potassium Titration Protocol?				Yes
Anticoagulation				
Anticoagulation				No anticoag
Protocols/Adjustments/Instructions				
Special Instructions?				No

Choose the Dialysis Treatment Plan tab from the Results Review screen to see your most recent orders. They always appear to the left after refreshing. Reconfirm the most recent orders at the start of each shift or prior to any filter change.

Orders

Document Medication by Hx | Reconciliation | Check Interactions

Reconciliation Status
Meds History | Admission | Discharge

Orders Medication List Document In Plan

View

Orders for Signature

Plans

Document In Plan

Medical

CRIT CARE - Bowel Routine (Module) (Completed)

NEPH - Continuous Renal Replacement Therapy (CRRT) No Anticoagulation or Other Anticoagulation (Completed)

Orders

Admission

Resuscitation Status

Alerts

Diet

Activity

Vital Signs

Patient Care

Respiratory Orders

Continuous Infusions

Medications

Laboratory

Diagnostic Imaging

Other Diagnostic Testing/Treatment

Consults

Related Results

Comments Start: 2021/12/05 09:38 Stop: 2021/12/06 22:36

Component	Status	Dose ...	Details
NEPH - Continuous Renal Replacement Therapy (CRRT) No Anticoagulation or Other Anticoagulation (Completed)			
Last updated on: 2021/12/07 02:01 by: System, System			
Patient Care			
<input type="checkbox"/> <input checked="" type="checkbox"/> CRRT No/Other Anticoagulant Prescription VH	Discontinued		Reason: A on CRF w life threatening cardiac changes
<input type="checkbox"/> <input checked="" type="checkbox"/> Communication Order	Discontinued		Change filter if urea ultrafiltrate:serum ratio <0.80
<input type="checkbox"/> <input checked="" type="checkbox"/> Electrolytes (Na/K/Cl/CO2) Nurse order when	Discontinued		q6 hour schedule while on CRRT
<input type="checkbox"/> <input checked="" type="checkbox"/> Phosphate, Magnesium Nurse Order When	Discontinued		q6 hour schedule while on CRRT
<input type="checkbox"/> <input checked="" type="checkbox"/> Urea Serum Nurse order when	Discontinued		q12 hour schedule while on CRRT
<input type="checkbox"/> <input checked="" type="checkbox"/> Creatinine Serum Nurse order when	Discontinued		q12 hour schedule while on CRRT
<input type="checkbox"/> <input checked="" type="checkbox"/> Urea Fluid Nurse order when	Discontinued		q12 hour schedule while on CRRT
<input type="checkbox"/> <input checked="" type="checkbox"/> Communication Order	Discontinued		Nurse to discontinue CRRT No anticoagulation powerplan when CRRT prescription discontinued
Medications			
<input type="checkbox"/> <input checked="" type="checkbox"/> sodium citrate (sodium citrate 4% injectable solution)	Discontinued		2.5 mL, injection, BLOCK, as directed, PRN for Other: See Comments... Instill 4% sodium citrate solution into each catheter limb (total volu...

Details

Orders For Nurse Review Save as My Favorite Initiate Now Orders For Signature

Right click on the order set from the left orders window to discontinue CRRT or when ordering a different method of anticoagulation. If the patient still has a dialysis line in place and you are not ordering a new anticoagulation strategy, unclick the sodium citrate flush from the right hand window to keep this order active.