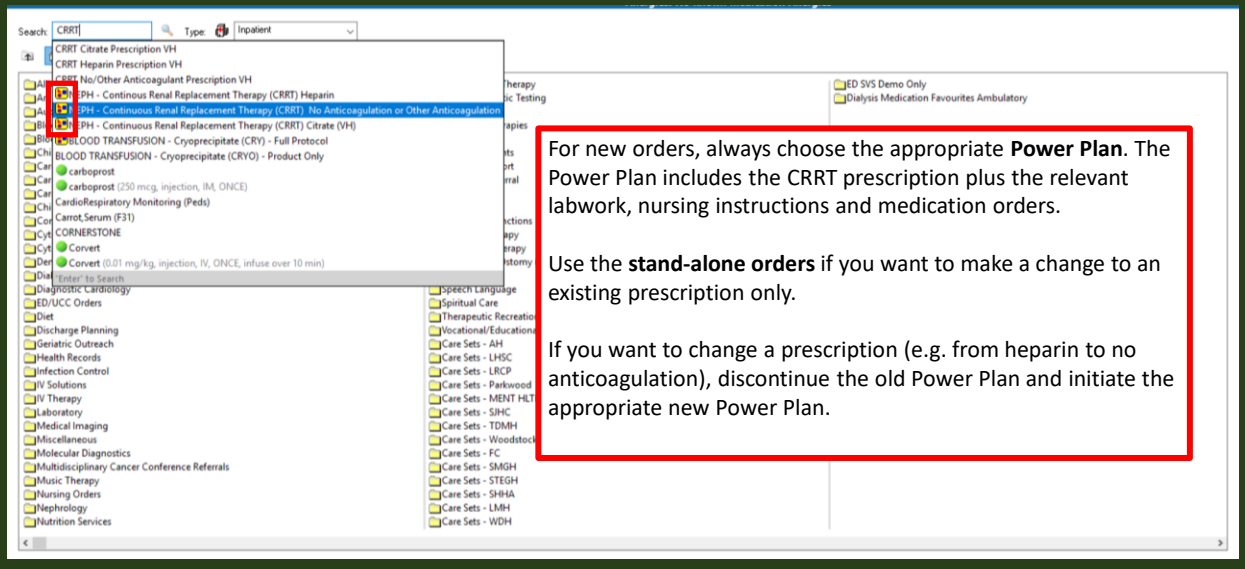
Entering CRRT Orders in Power Chart
No Anticoagulation

Use these orders for no anticoagulation (using predilution for filter anticoagulation).

Use these orders for patients who are receiving therapeutic systemic anticoagulation with no additional heparin via CRRT circuit.

8/23/2020

1



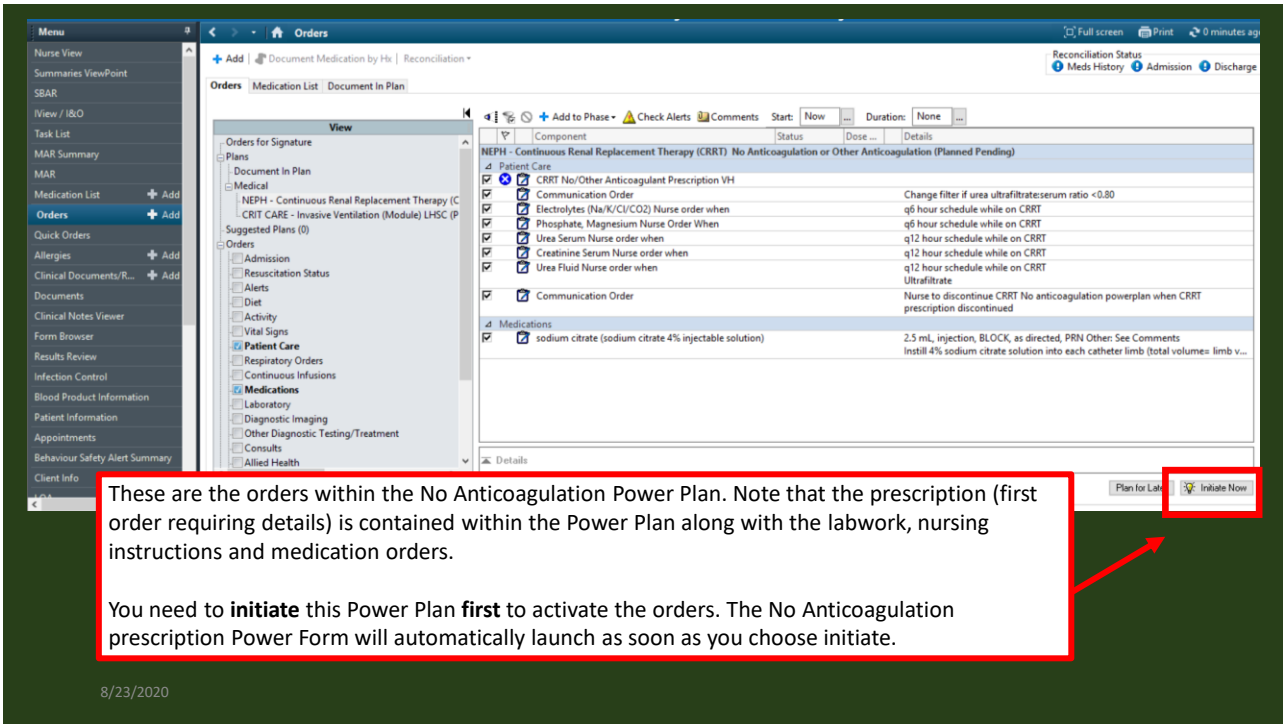
For new orders, always choose the appropriate **Power Plan**. The Power Plan includes the CRRT prescription plus the relevant labwork, nursing instructions and medication orders.

Use the **stand-alone orders** if you want to make a change to an existing prescription only.

If you want to change a prescription (e.g. from heparin to no anticoagulation), discontinue the old Power Plan and initiate the appropriate new Power Plan.

8/23/2020

2



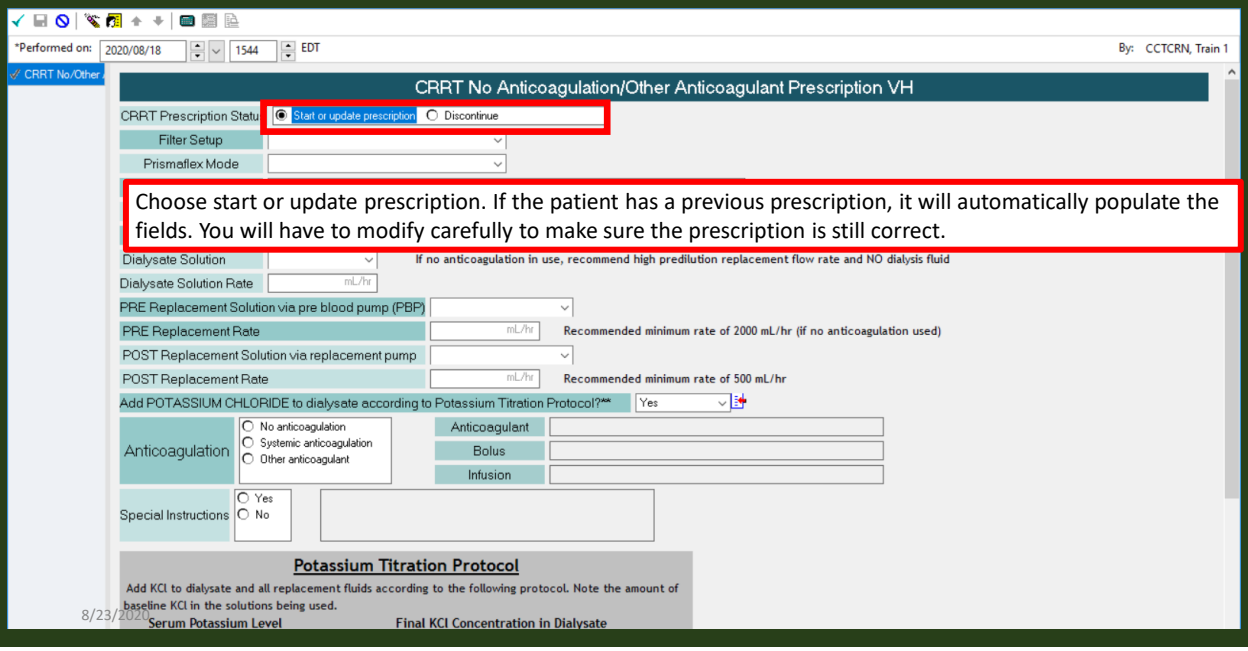
These are the orders within the No Anticoagulation Power Plan. Note that the prescription (first order requiring details) is contained within the Power Plan along with the labwork, nursing instructions and medication orders.

You need to **initiate** this Power Plan **first** to activate the orders. The No Anticoagulation prescription Power Form will automatically launch as soon as you choose initiate.

8/23/2020

3

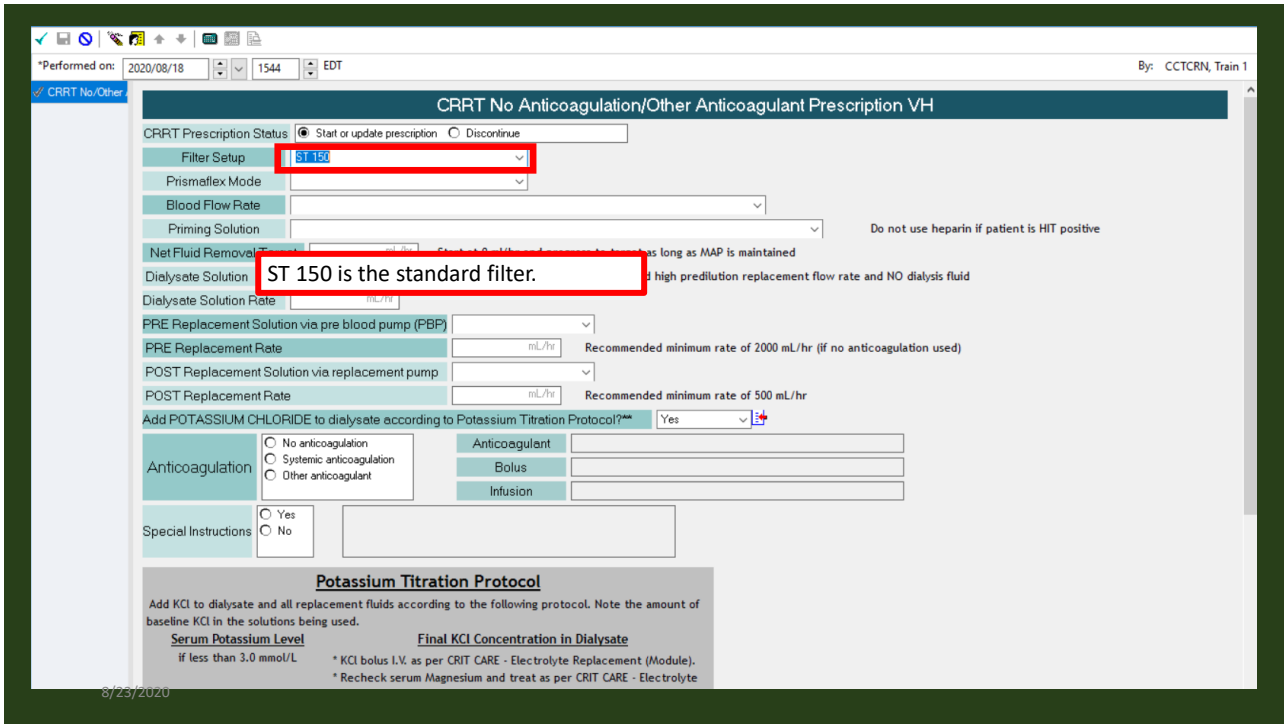
This Power Form launches automatically once you select initiate order.



Choose start or update prescription. If the patient has a previous prescription, it will automatically populate the fields. You will have to modify carefully to make sure the prescription is still correct.

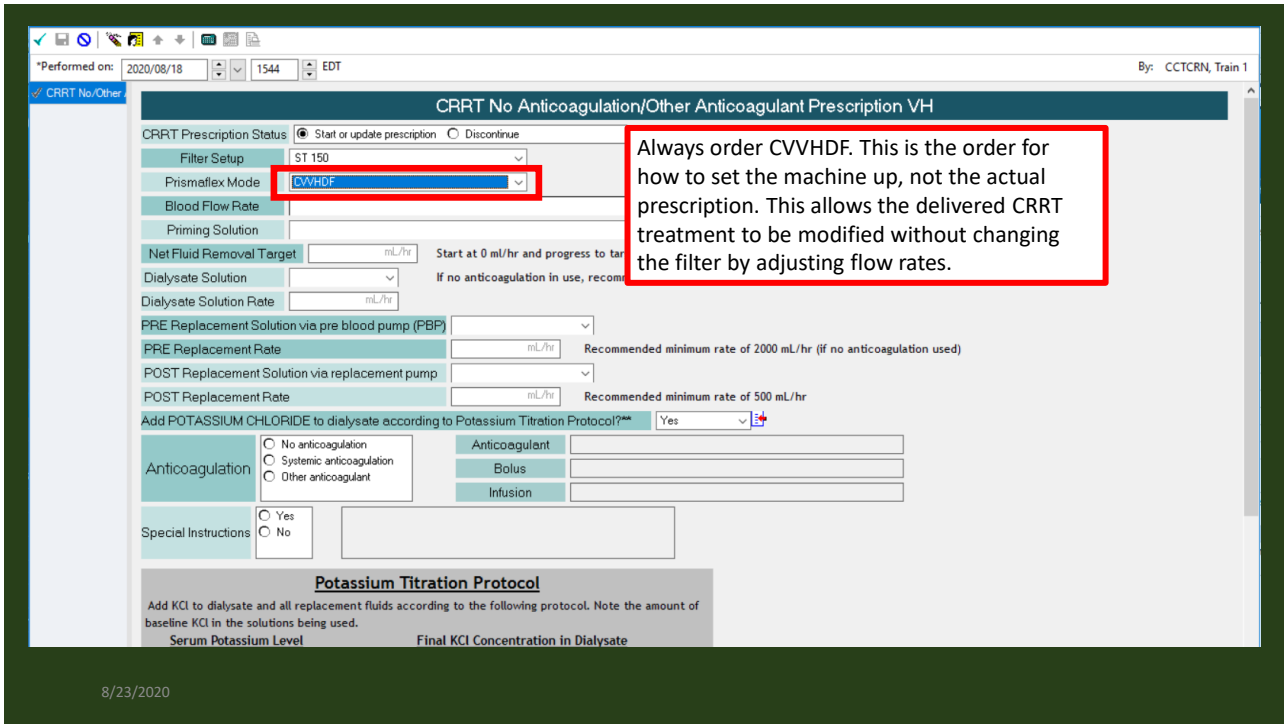
8/23/2020

4



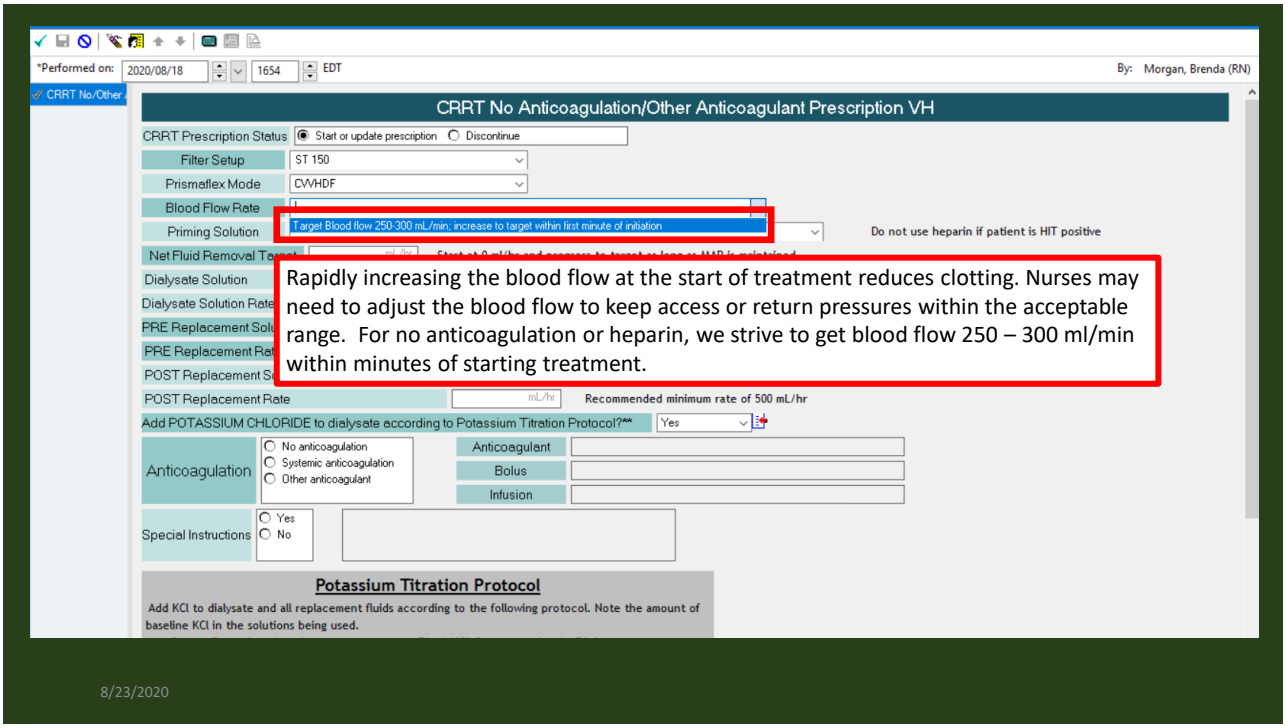
ST 150 is the standard filter.

5

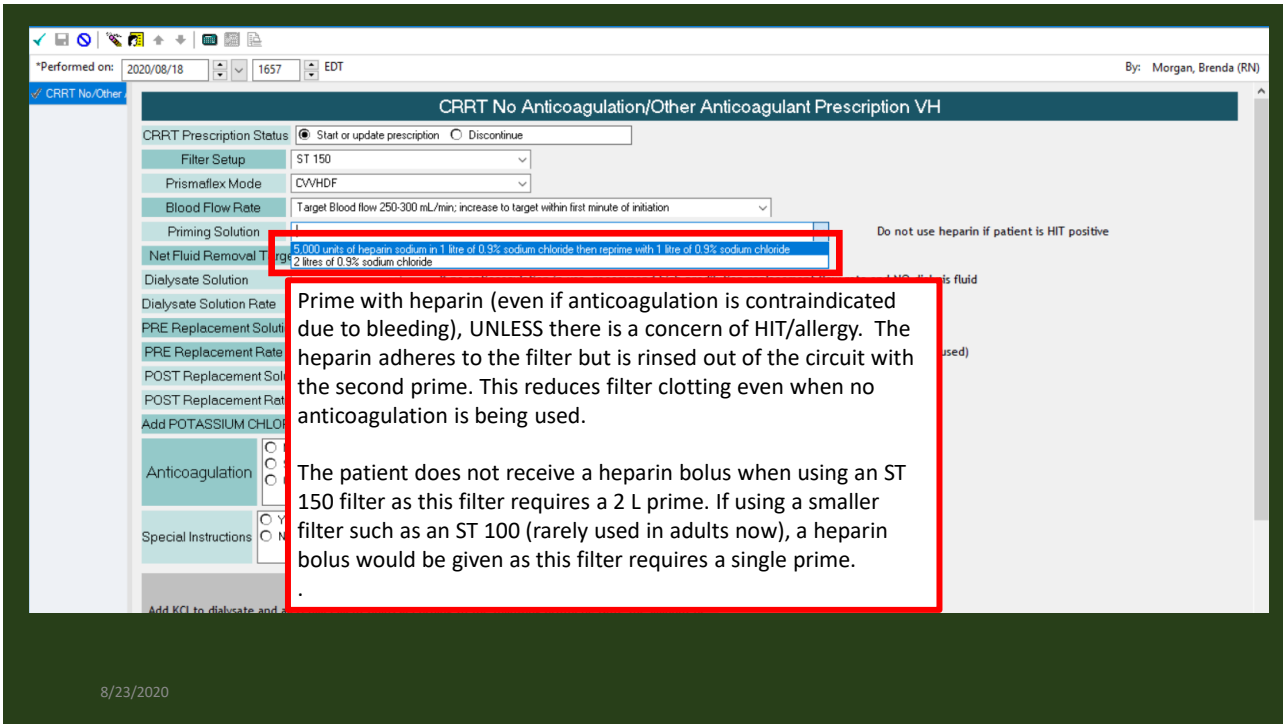


Always order CVVHDF. This is the order for how to set the machine up, not the actual prescription. This allows the delivered CRRT treatment to be modified without changing the filter by adjusting flow rates.

6


*Performed on: 2020/08/18 1654 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/min; increase to target within first minute of initiation
Priming Solution
Do not use heparin if patient is HIT positive
Net Fluid Removal Target
Dialysate Solution
Dialysate Solution Rate
PRE Replacement Solution
PRE Replacement Rate
POST Replacement Solution
POST Replacement Rate
Recommended minimum rate of 500 mL/hr
Add POTASSIUM CHLORIDE to dialysate according to Potassium Titration Protocol?**
Yes
Anticoagulation
No anticoagulation
Systemic anticoagulation
Other anticoagulant
Anticoagulant
Bolus
Infusion
Special Instructions
Yes
No
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.
Rapidly increasing the blood flow at the start of treatment reduces clotting. Nurses may need to adjust the blood flow to keep access or return pressures within the acceptable range. For no anticoagulation or heparin, we strive to get blood flow 250 – 300 ml/min within minutes of starting treatment.
8/23/2020

7


*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/min; increase to target within first minute of initiation
Priming Solution
Do not use heparin if patient is HIT positive
5,000 units of heparin sodium in 1 litre of 0.9% sodium chloride then reprime with 1 litre of 0.9% sodium chloride
2 litres of 0.9% sodium chloride
Net Fluid Removal Target
Dialysate Solution
Dialysate Solution Rate
PRE Replacement Solution
PRE Replacement Rate
POST Replacement Solution
POST Replacement Rate
Anticoagulation
Special Instructions
Prime with heparin (even if anticoagulation is contraindicated due to bleeding), UNLESS there is a concern of HIT/allergy. The heparin adheres to the filter but is rinsed out of the circuit with the second prime. This reduces filter clotting even when no anticoagulation is being used.
The patient does not receive a heparin bolus when using an ST 150 filter as this filter requires a 2 L prime. If using a smaller filter such as an ST 100 (rarely used in adults now), a heparin bolus would be given as this filter requires a single prime.
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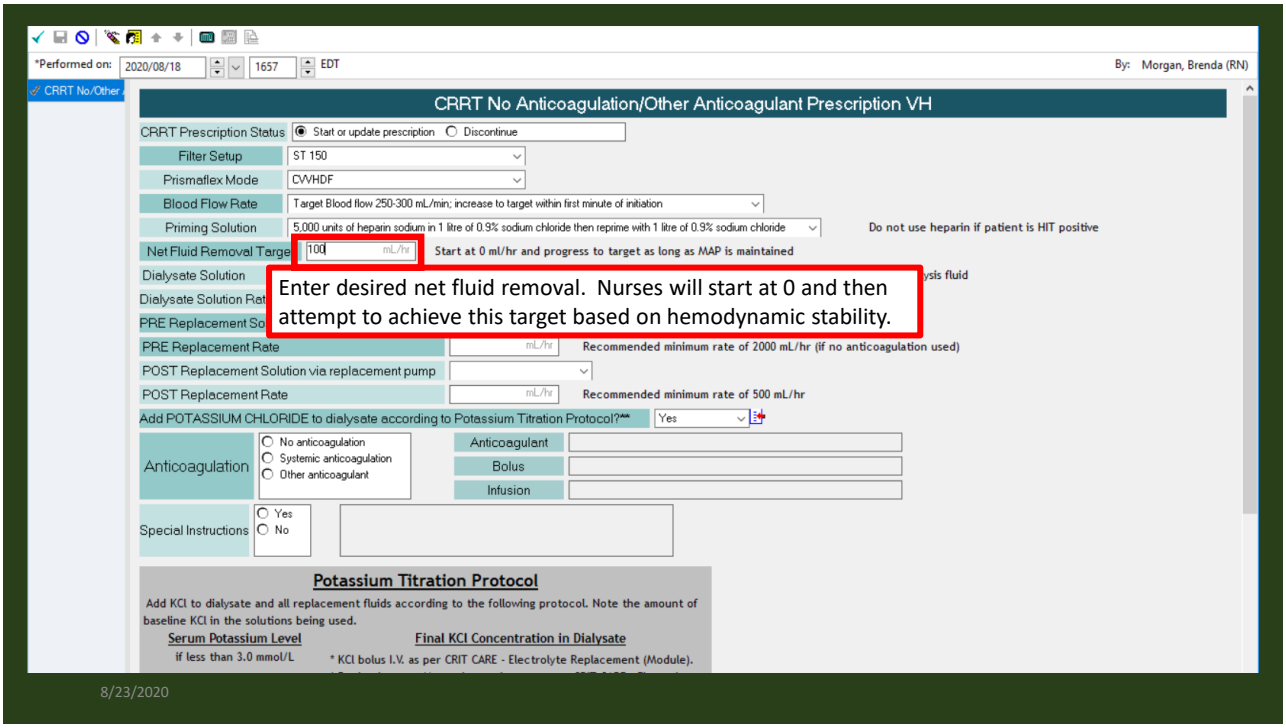
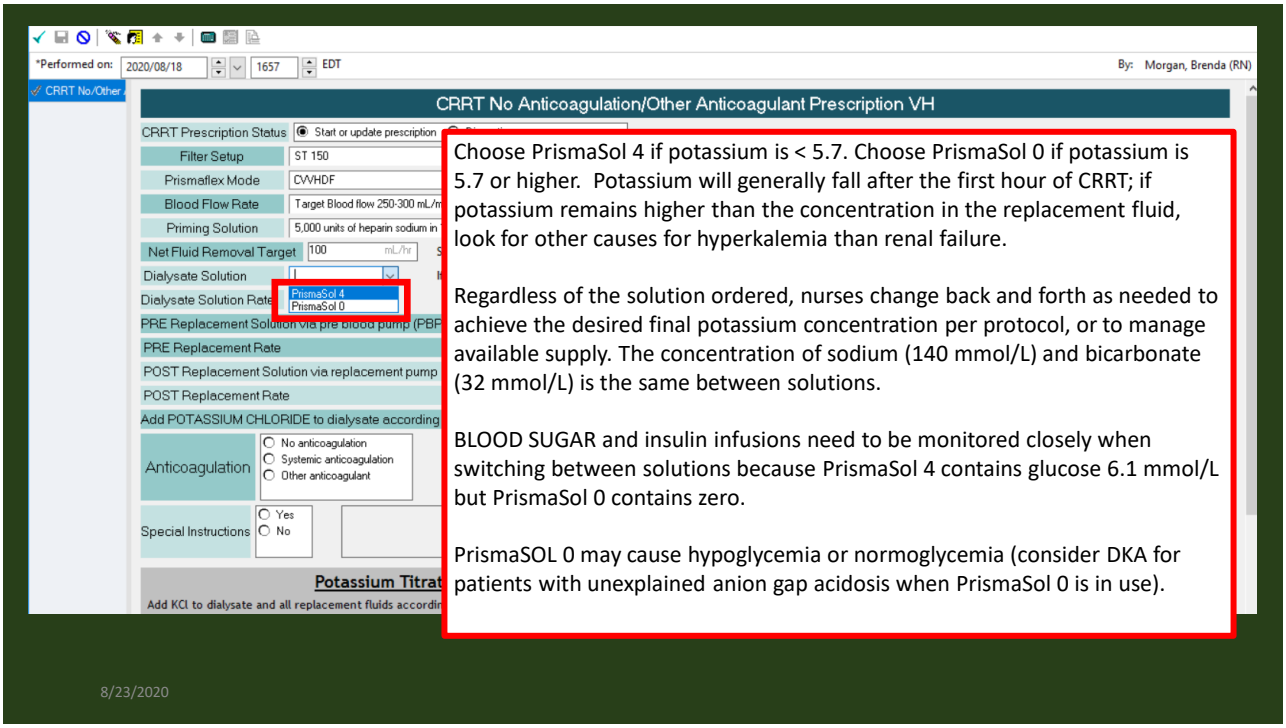
8/23/2020

8


*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/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
Do not use heparin if patient is HIT positive
Net Fluid Removal Target
100
mL/hr
Start at 0 ml/hr and progress to target as long as MAP is maintained
Dialysate Solution
Enter desired net fluid removal. Nurses will start at 0 and then attempt to achieve this target based on hemodynamic stability.
PRE Replacement Rate
Recommended minimum rate of 2000 mL/hr (if no anticoagulation used)
POST Replacement Solution via replacement pump
POST Replacement Rate
Recommended minimum rate of 500 mL/hr
Add POTASSIUM CHLORIDE to dialysate according to Potassium Titration Protocol?
Yes
Anticoagulation
No anticoagulation
Systemic anticoagulation
Other anticoagulant
Anticoagulant
Bolus
Infusion
Special Instructions
Yes
No
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).
8/23/2020

9


*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Priming Solution
Net Fluid Removal Target
100
Dialysate Solution
Dialysate Solution Rate
PrismaSol 4
PrismaSol 0
PRE Replacement Rate
POST Replacement Solution via replacement pump
POST Replacement Rate
Anticoagulation
No anticoagulation
Systemic anticoagulation
Other anticoagulant
Special Instructions
Yes
No
Choose PrismaSol 4 if potassium is < 5.7. Choose PrismaSol 0 if potassium is 5.7 or higher. Potassium will generally fall after the first hour of CRRT; if potassium remains higher than the concentration in the replacement fluid, look for other causes for hyperkalemia than renal failure.
Regardless of the solution ordered, nurses change back and forth as needed to achieve the desired final potassium concentration per protocol, or to manage available supply. The concentration of sodium (140 mmol/L) and bicarbonate (32 mmol/L) is the same between solutions.
BLOOD SUGAR and insulin infusions need to be monitored closely when switching between solutions because PrismaSol 4 contains glucose 6.1 mmol/L but PrismaSol 0 contains zero.
PrismaSOL 0 may cause hypoglycemia or normoglycemia (consider DKA for patients with unexplained anion gap acidosis when PrismaSol 0 is in use).
8/23/2020

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BEFORE RECONSTITUTION Each 1000 mL contains	Prisma SOL 0	Prisma SOL 4	Prism OCAL
Compartment A			
Sodium bicarbonate			58.8 g
Magnesium chloride, hexahydrate	2.033 g	2.036 g	
Lactic acid	5.4 g	5.4 g	
Calcium chloride dihydrate	5.145 g	5.148 g	
Glucose anhydrous		24.2 g	
Compartment B			
Lactic acid			0.284 g
Magnesium chloride, hexahydrate			0.108 g
Sodium chloride	6.45 g	6.45 g	6.449 g
Sodium bicarbonate	3.09 g	3.09 g	
Potassium chloride		0.314 g	

AFTER RECONSTITUTION		Prisma SOL 0		Prisma SOL 4		Prism OCAL	
		mmol/L	mEq/L	mmol/L	mEq/L	mmol/L	mEq/L
Calcium	Ca^{2+}	1.75	3.50	1.75	3.50		
Magnesium	Mg^{2+}	0.5	1.0	0.5	1.0	0.5	1.0
Sodium	Na^{+}	140	140	140	140	140	140
Chloride	Cl^{-}	109.5	109.5	113.5	113.5	106	106
Lactate		3.0	3.0	3.0	3.0	3.0	3.0
Bicarbonate	HCO_3^{-}	32	32	32	32	32	32
Potassium	K^{+}	0	0	4.0	4.0	0	0
Glucose		0	0	6.1		0	0

8/23/2020

These are the 3 solutions that are stocked in CCTC. The two used for No Anticoagulation or Heparin are highlighted.

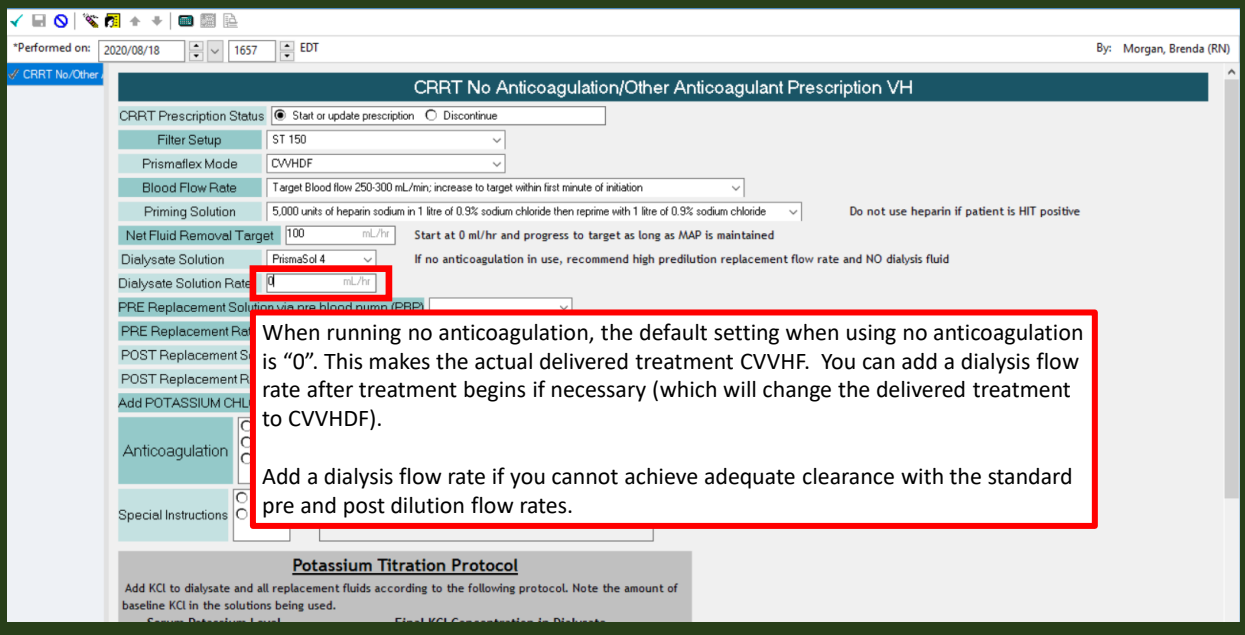
Prism OCAL is a calcium free product used only with citrate. Note that all 3 solutions contain the same final concentration of bicarbonate and sodium. They all contain 3 mmol/L of lactate which is added for pH adjustment; the lactate is metabolized to bicarbonate. Potassium is added by the nurse to achieve a minimum concentration of 2 mmol/L by protocol.

Each 5 L bag is divided into 2 compartments (250 mL upper and 4750 lower compartments). These must be mixed together at the time the solution is hung (stability is only 24 hours once mixed).

Refer to the "AFTER RECONSTITUTION" for the final concentration of electrolytes.

Failure to break the seal between the bags will change the concentration to that of the lower compartment only. The machine will also enter an alarm mode, potentially drawing in air from the bag as it assumes there is 5 L on the scale (but only 4750 is accessible).

11



When running no anticoagulation, the default setting when using no anticoagulation is "0". This makes the actual delivered treatment CVVHF. You can add a dialysis flow rate after treatment begins if necessary (which will change the delivered treatment to CVVHDF).

Add a dialysis flow rate if you cannot achieve adequate clearance with the standard pre and post dilution flow rates.

8/23/2020

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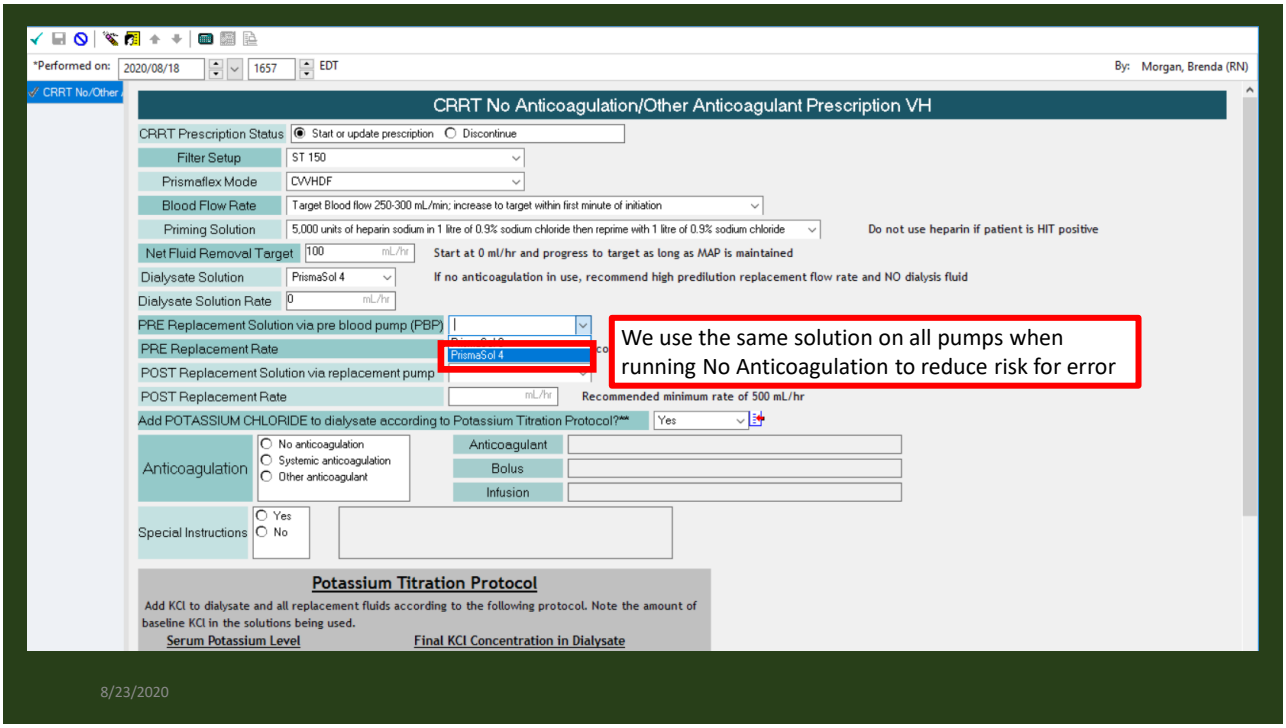
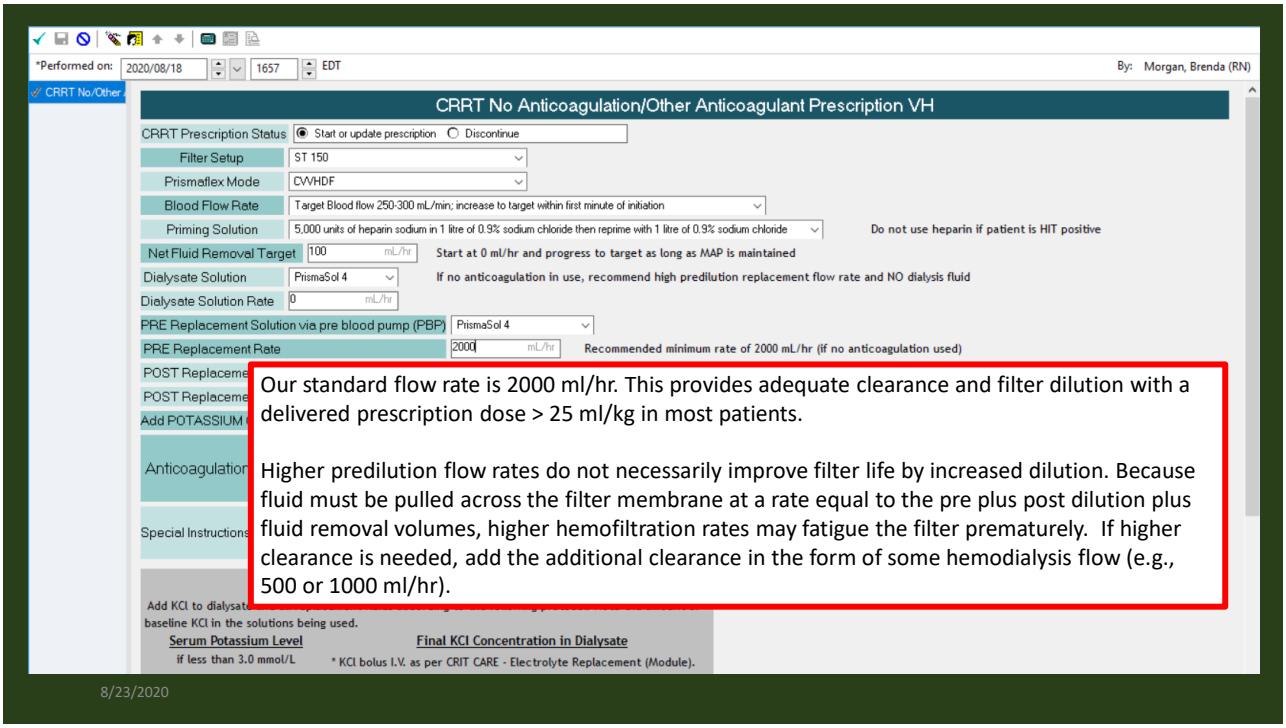
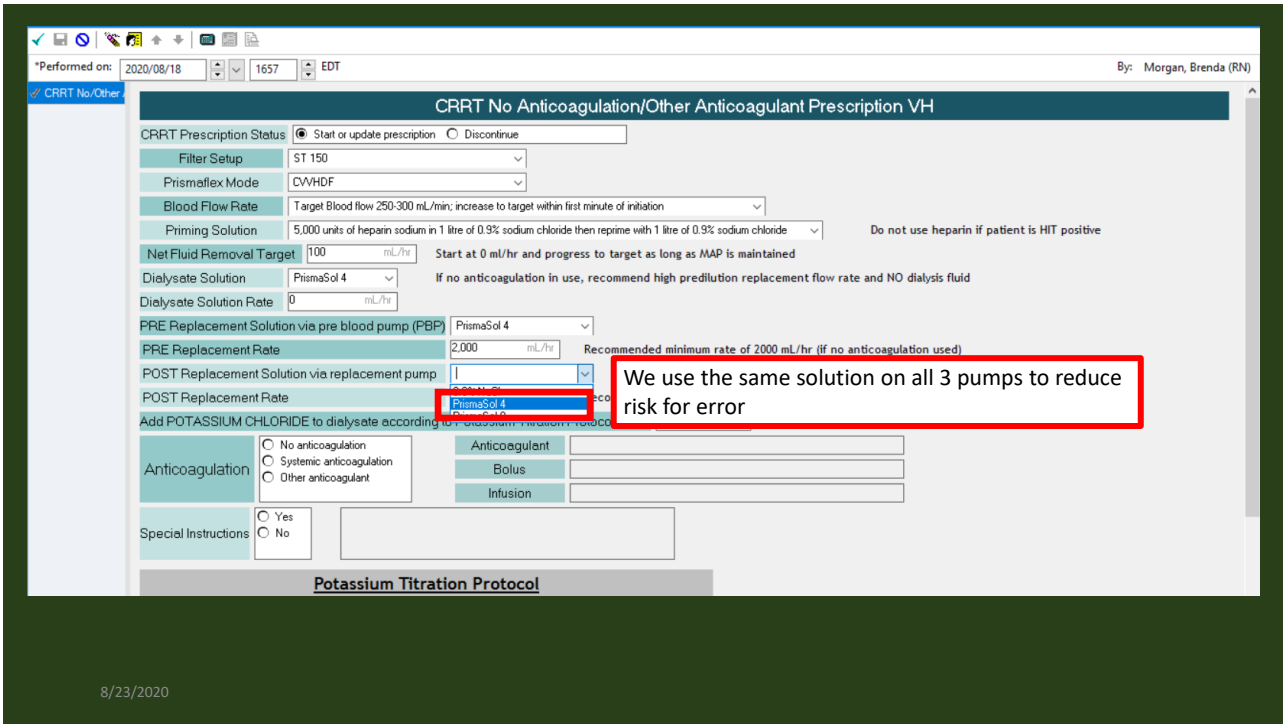

*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/min; increase 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
Do not use heparin if patient is HIT positive
Net Fluid Removal Target
100 mL/hr
Start at 0 ml/hr and progress to target as long as MAP is maintained
Dialysate Solution
PrismaSol 4
If no anticoagulation in use, recommend high predilution replacement flow rate and NO dialysis fluid
Dialysate Solution Rate
0 mL/hr
PRE Replacement Solution via pre blood pump (PBP)
PRE Replacement Rate
PrismaSol 4
POST Replacement Solution via replacement pump
POST Replacement Rate
mL/hr
Recommended minimum rate of 500 mL/hr
Add POTASSIUM CHLORIDE to dialysate according to Potassium Titration Protocol?**
Yes
Anticoagulation
No anticoagulation
Systemic anticoagulation
Other anticoagulant
Anticoagulant
Bolus
Infusion
Special Instructions
Yes
No
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
We use the same solution on all pumps when running No Anticoagulation to reduce risk for error
8/23/2020

13

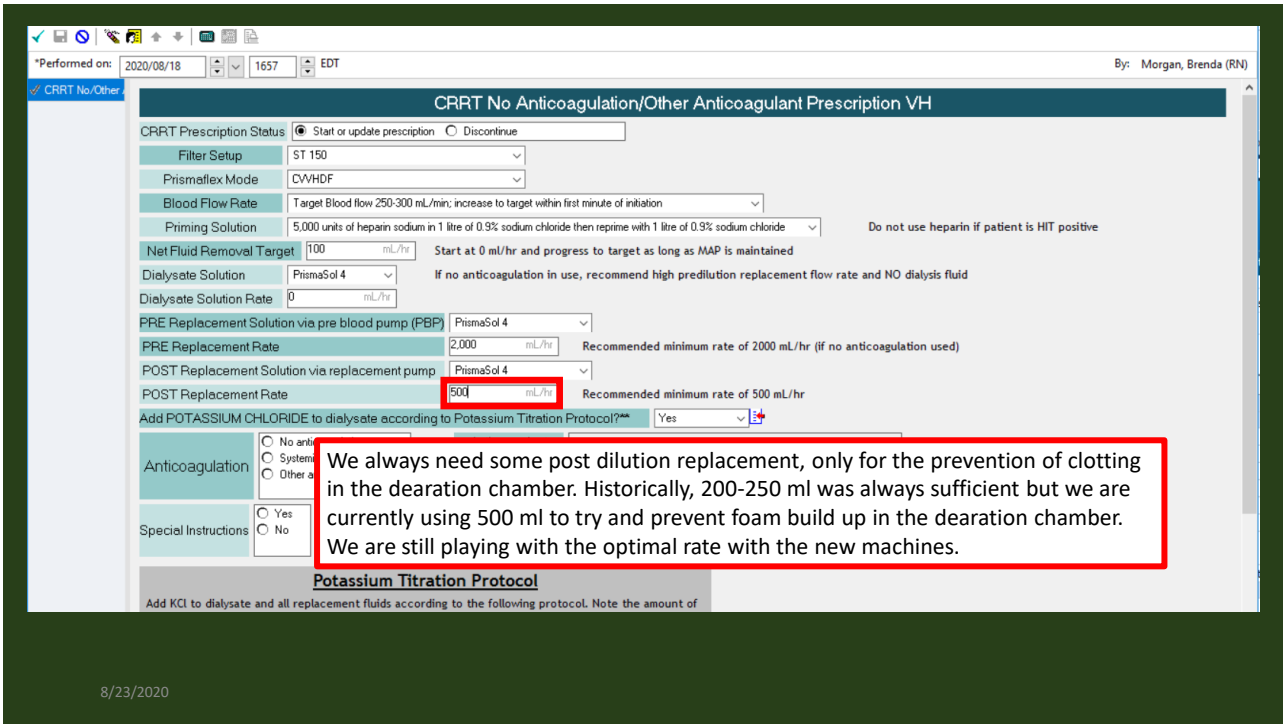

*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/min; increase 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
Do not use heparin if patient is HIT positive
Net Fluid Removal Target
100 mL/hr
Start at 0 ml/hr and progress to target as long as MAP is maintained
Dialysate Solution
PrismaSol 4
If no anticoagulation in use, recommend high predilution replacement flow rate and NO dialysis fluid
Dialysate Solution Rate
0 mL/hr
PRE Replacement Solution via pre blood pump (PBP)
PrismaSol 4
PRE Replacement Rate
2000 mL/hr
Recommended minimum rate of 2000 mL/hr (if no anticoagulation used)
Anticoagulation
Special Instructions
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).
Our standard flow rate is 2000 ml/hr. This provides adequate clearance and filter dilution with a delivered prescription dose > 25 ml/kg in most patients.
Higher predilution flow rates do not necessarily improve filter life by increased dilution. Because fluid must be pulled across the filter membrane at a rate equal to the pre plus post dilution plus fluid removal volumes, higher hemofiltration rates may fatigue the filter prematurely. If higher clearance is needed, add the additional clearance in the form of some hemodialysis flow (e.g., 500 or 1000 ml/hr).
8/23/2020

14



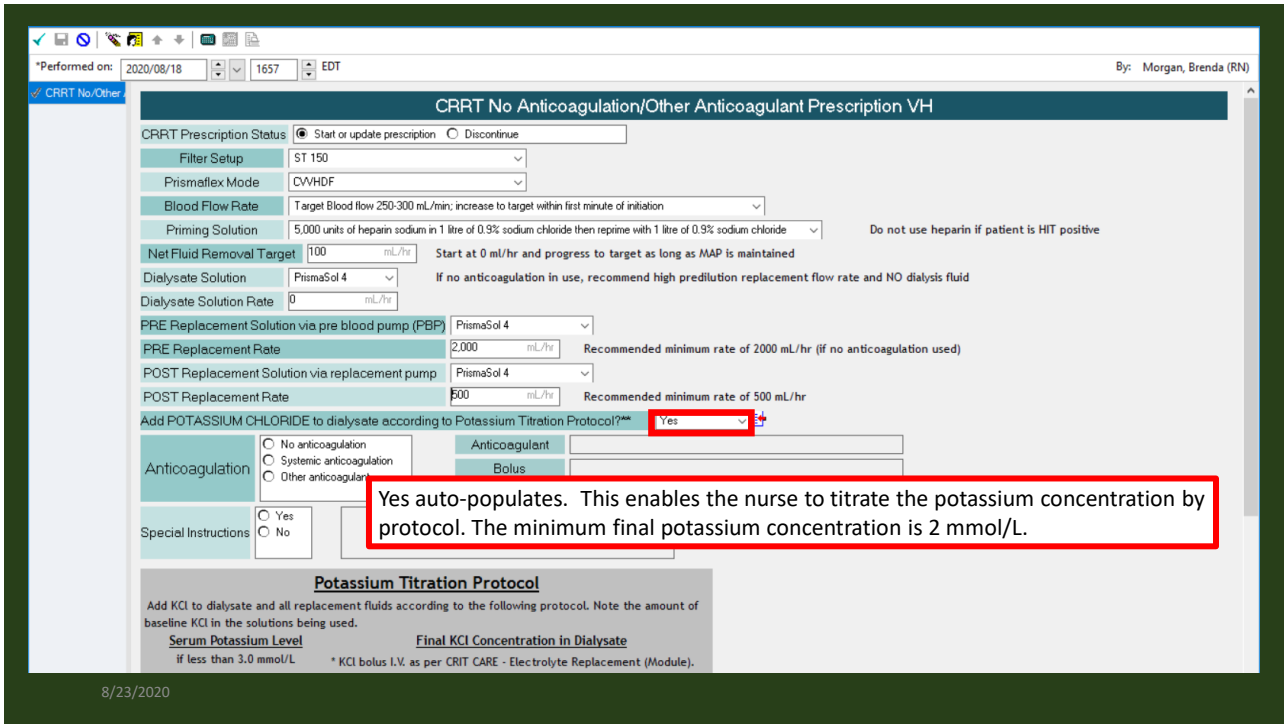
8/23/2020

15

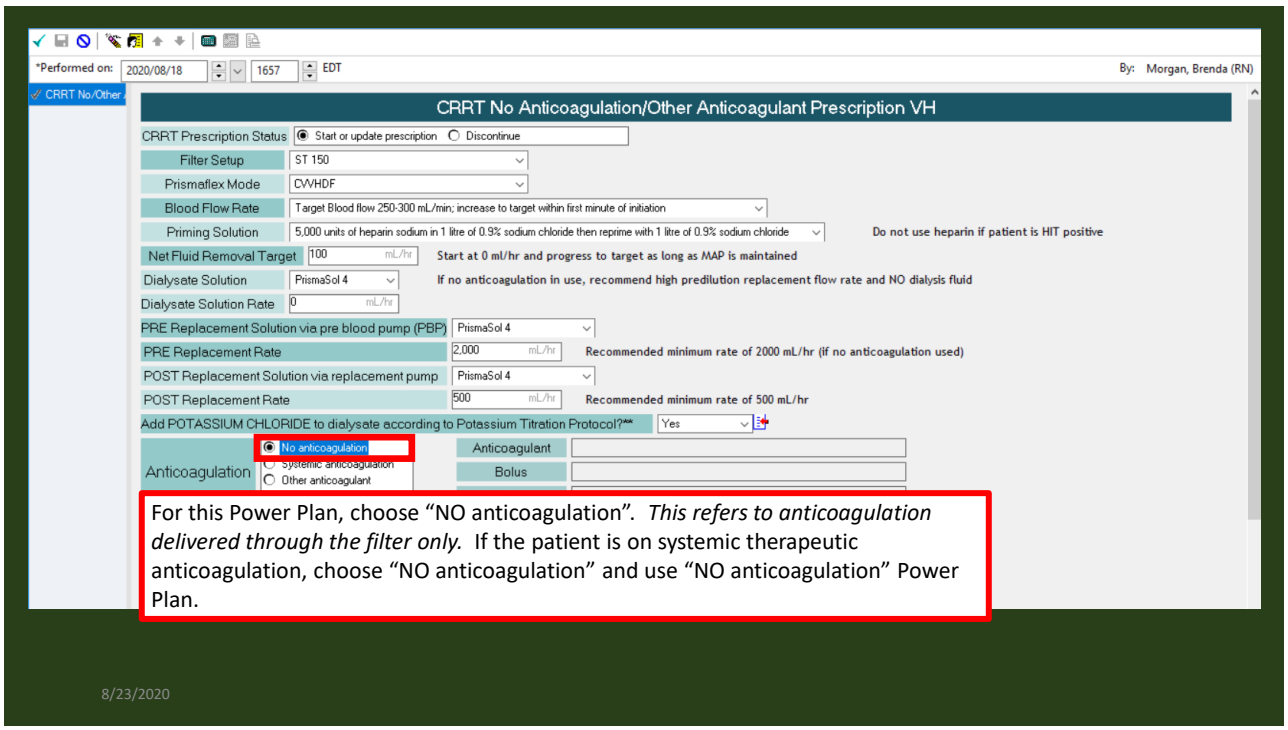


8/23/2020

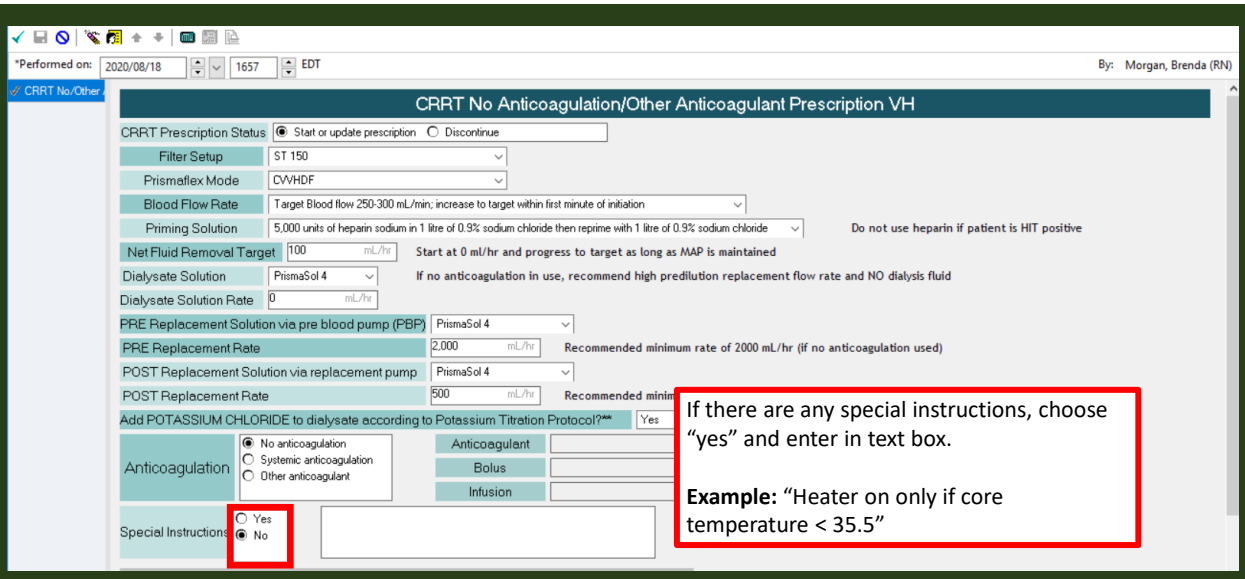
16


*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/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
Do not use heparin if patient is HIT positive
Net Fluid Removal Target
100 mL/hr
Start at 0 ml/hr and progress to target as long as MAP is maintained
Dialysate Solution
PrismaSol 4
If no anticoagulation in use, recommend high predilution replacement flow rate and NO dialysis fluid
Dialysate Solution Rate
0 mL/hr
PRE Replacement Solution via pre blood pump (PBP)
PrismaSol 4
PRE Replacement Rate
2,000 mL/hr
Recommended minimum rate of 2000 mL/hr (if no anticoagulation used)
POST Replacement Solution via replacement pump
PrismaSol 4
POST Replacement Rate
500 mL/hr
Recommended minimum rate of 500 mL/hr
Add POTASSIUM CHLORIDE to dialysate according to Potassium Titration Protocol?**
Yes
Anticoagulation
No anticoagulation
Systemic anticoagulation
Other anticoagulant
Anticoagulant
Bolus
Special Instructions
Yes
No
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).
Yes auto-populates. This enables the nurse to titrate the potassium concentration by protocol. The minimum final potassium concentration is 2 mmol/L.
8/23/2020

17


*Performed on: 2020/08/18 1657 EDT
By: Morgan, Brenda (RN)
CRRT No/Other
CRRT No Anticoagulation/Other Anticoagulant Prescription VH
CRRT Prescription Status
Start or update prescription
Discontinue
Filter Setup
ST 150
Prismaflex Mode
CVVHDF
Blood Flow Rate
Target Blood flow 250-300 mL/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
Do not use heparin if patient is HIT positive
Net Fluid Removal Target
100 mL/hr
Start at 0 ml/hr and progress to target as long as MAP is maintained
Dialysate Solution
PrismaSol 4
If no anticoagulation in use, recommend high predilution replacement flow rate and NO dialysis fluid
Dialysate Solution Rate
0 mL/hr
PRE Replacement Solution via pre blood pump (PBP)
PrismaSol 4
PRE Replacement Rate
2,000 mL/hr
Recommended minimum rate of 2000 mL/hr (if no anticoagulation used)
POST Replacement Solution via replacement pump
PrismaSol 4
POST Replacement Rate
500 mL/hr
Recommended minimum rate of 500 mL/hr
Add POTASSIUM CHLORIDE to dialysate according to Potassium Titration Protocol?**
Yes
Anticoagulation
No anticoagulation
Other anticoagulant
Anticoagulant
Bolus
For this Power Plan, choose “NO anticoagulation”. This refers to anticoagulation delivered through the filter only. If the patient is on systemic therapeutic anticoagulation, choose “NO anticoagulation” and use “NO anticoagulation” Power Plan.
8/23/2020

18



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All titration protocols appear at the end of the Power Form. These are also available on the CCTC website and are printed by nurses for ease of use.

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 Potasium 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.

8/23/2020

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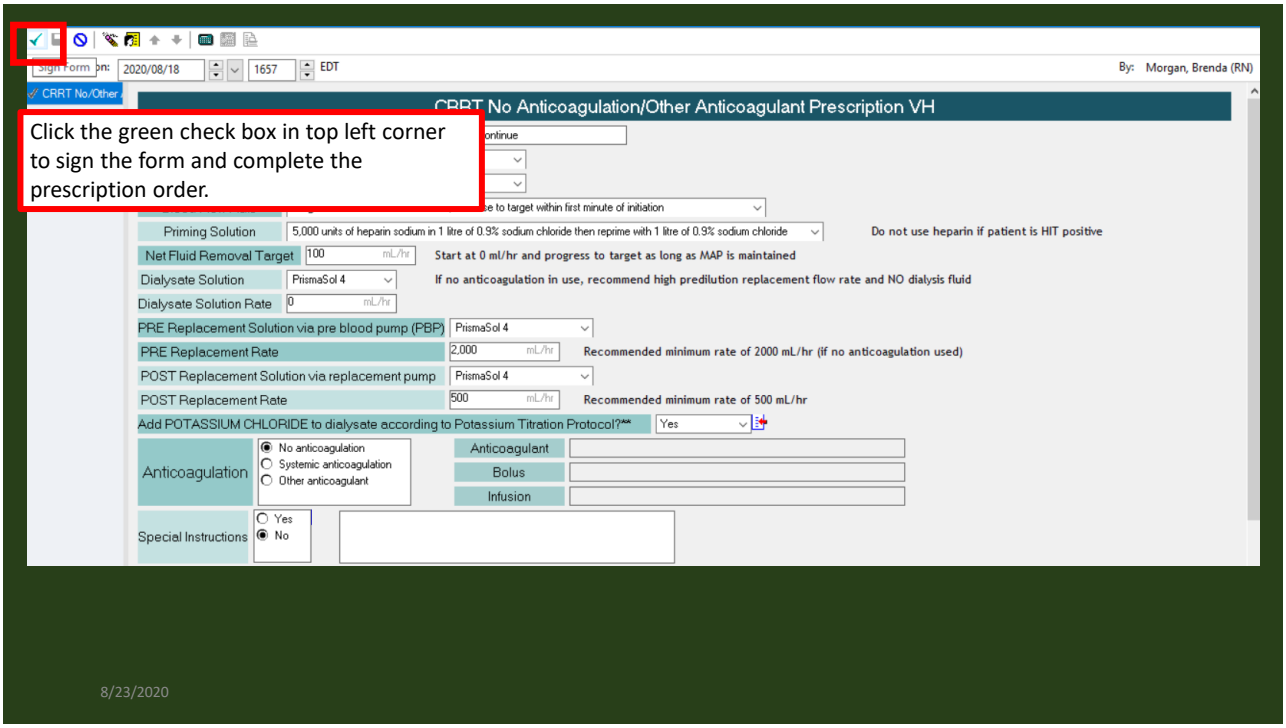
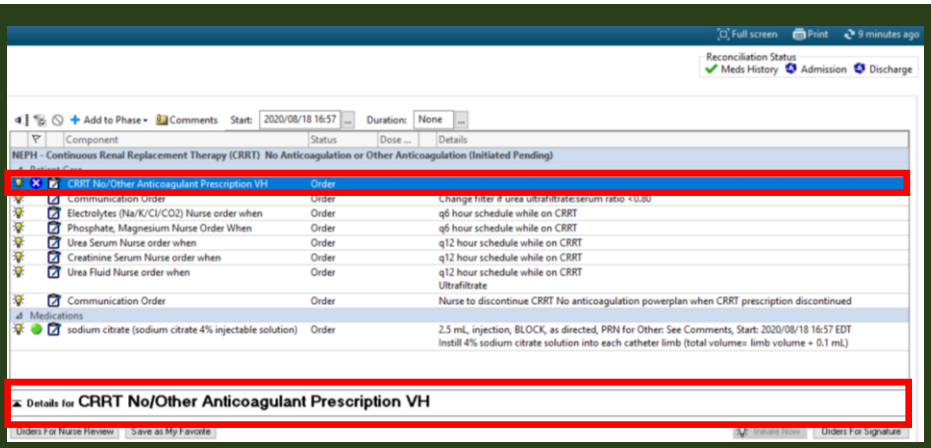


8/23/2020

21



You will be brought back to this page to sign the orders You will not be able to sign until you enter a reason for initiation of CRRT in the details section. If the highlighted Reason/Clinical History box does not appear, click on the CRRT No Anticoagulation Prescription at the top.

8/23/2020

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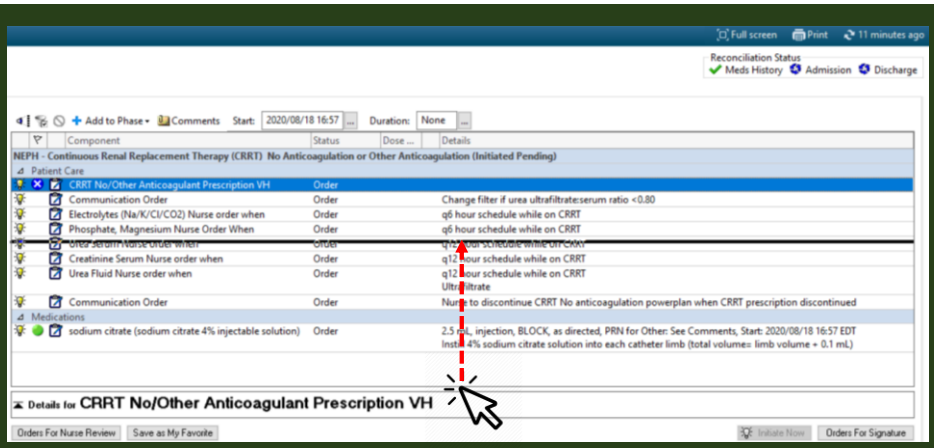
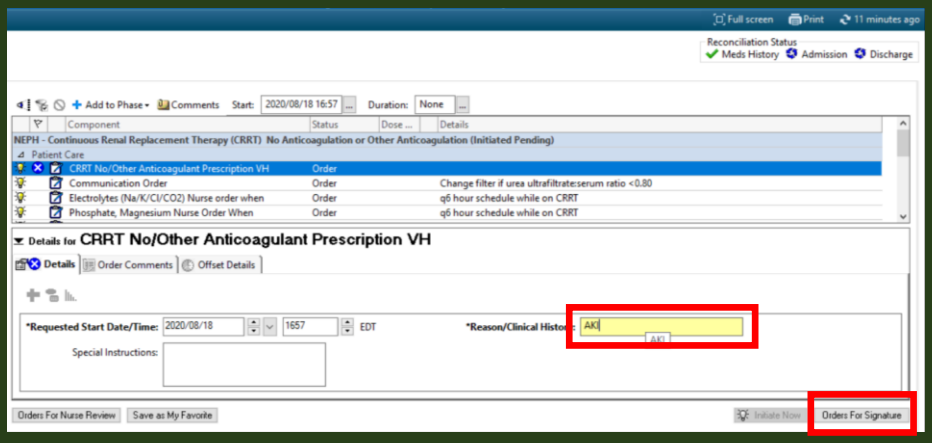
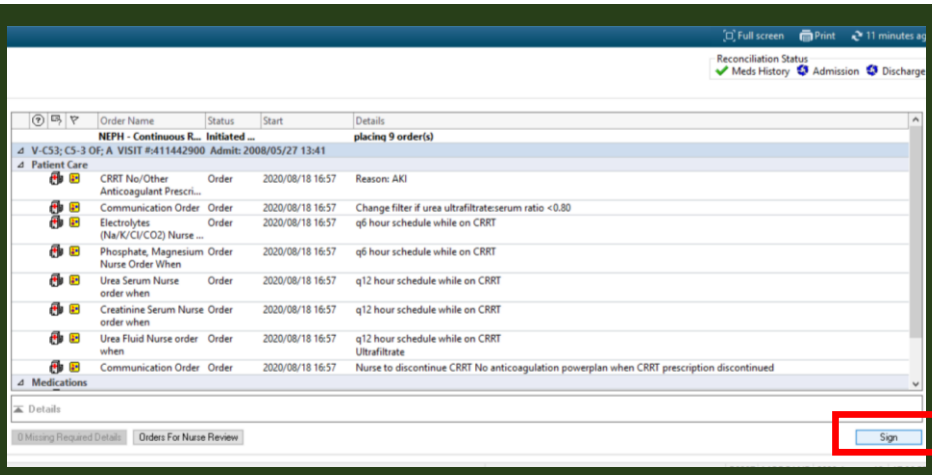


The detail box may be difficult to view. If you cannot see the details, drag the box up to make it visible.



Enter a reason for starting CRRT then choose “order for signature”.



Sign the Order

8/23/2020

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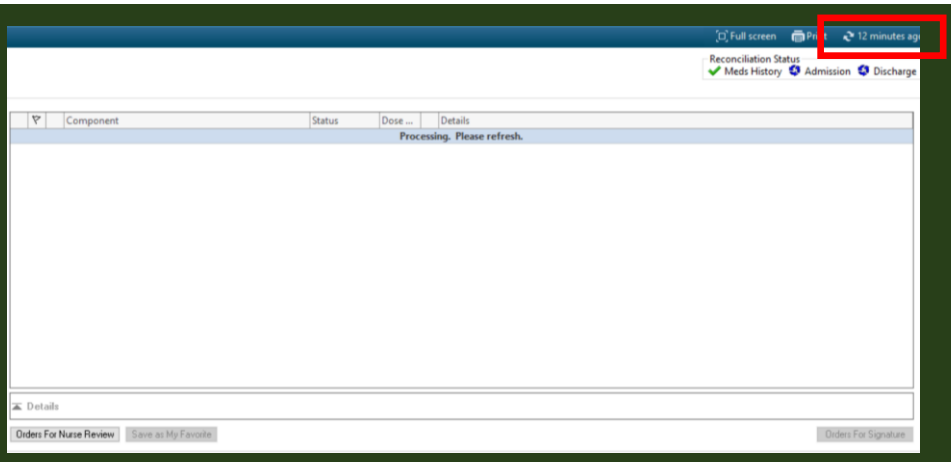

Refresh

8/23/2020

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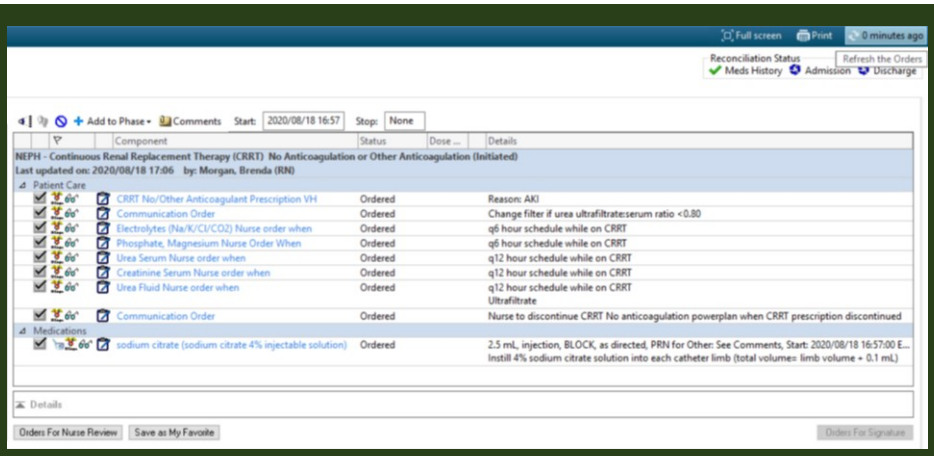

Orders have been completed

8/23/2020

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