CALCIUM CHLORIDE TITRATION PROTOCOL

Administer calcium chloride 7 gm in 500 ml via a central line (do not use the return side of the dialysis catheter). Maintain UNCORRECTED systemic ionized calcium of 1.0 – 1.2 mmol/L during citrate administration. Normalize the systemic ionized calcium and start calcium chloride infusion 15 minutes before citrate initiation. Always consider hypocalcemia as potential cause for sudden/profound hypotension or bradycardia. Monitor systemic total calcium:ionized systemic calcium ratio. Total calcium is measured in chemistry. A ratio greater than 2.5 or increased citrate and calcium chloride infusion requirements in a previously stable patient may indicate citrate toxicity. Citrate toxicity risk is increased with liver dysfunction.

The patient requires an arterial line for systemic IONIZED calcium monitoring (do not measure from a central line that is being used for calcium chloride administration). Measure the systemic IONIZED calcium on the GEM 1 hour after initiation, then Q3H until 2 consecutive ionized calcium levels within target, then Q6H. Adjust the calcium chloride infusion as follows:

SYSTEMIC (ARTERIAL) Uncorrected IONIZED CA++	**CALCIUM CHLORIDE INFUSION ADJUSTMENT**
Less than 0.80 mmol/L	• Administer 1 gm bolus of calcium chloride (see order set) • Increase infusion by 20 ml/hour • Repeat ionized calcium in one hour*
0.81 – 0.95 mmol/L	• Administer 500 mg bolus of calcium chloride (see order set) • Increase infusion by 10 ml/hour • Repeat ionized calcium in one hour*
0.95 – less than 1.0 mmol/L	Increase infusion by 10 ml/hr (no bolus required)
1.0 – 1.2 mmol/L	No change
Greater than 1.2 mmol/L	Decrease infusion by 10 ml/hr

Administer calcium chloride bolus as per Citrate Order set. *Notify CCTC and CRRT Provider if second bolus of calcium chloride is required.

CITRATE TITRATION PROTOCOL

Pre-filter Citrate binds with ionized calcium to make it unavailable for clot formation. Low pre-filter ionized calcium levels provide regional anticoagulation of the filter. The citrate must be immediately reversed systemically by a calcium chloride infusion to prevent systemic hypocalcemia.

Titrate citrate infusion to post-filter IONIZED calcium (from blue sampling port) and measured on the GEM. Titrate to UNCORRECTED ionized calcium

Measure the systemic ionized calcium on the GEM 1 hour after initiation, then Q3H until 2 consecutive ionized calcium levels are within ordered target (usually 0.35-0.45), then Q6H. Measure liver function tests daily.

Initiate citrate AFTER ensuring baseline systemic ionized calcium has been normalized.

Post-Filter Uncorrected Ionized Ca++	**Citrate Infusion Adjustment**
Less than target range	Decrease by 10 ml/hour.
Target	NO CHANGE
Above target range	Increase by 10 ml/hour

Notify CCTC and CRRT provider if Citrate infusion greater than 350 ml/hour. Assess for citrate toxicity and consider higher target range for post filter ionized calcium.

Avoid over correction of citrate and calcium for a single ionized calcium that is very close to range.