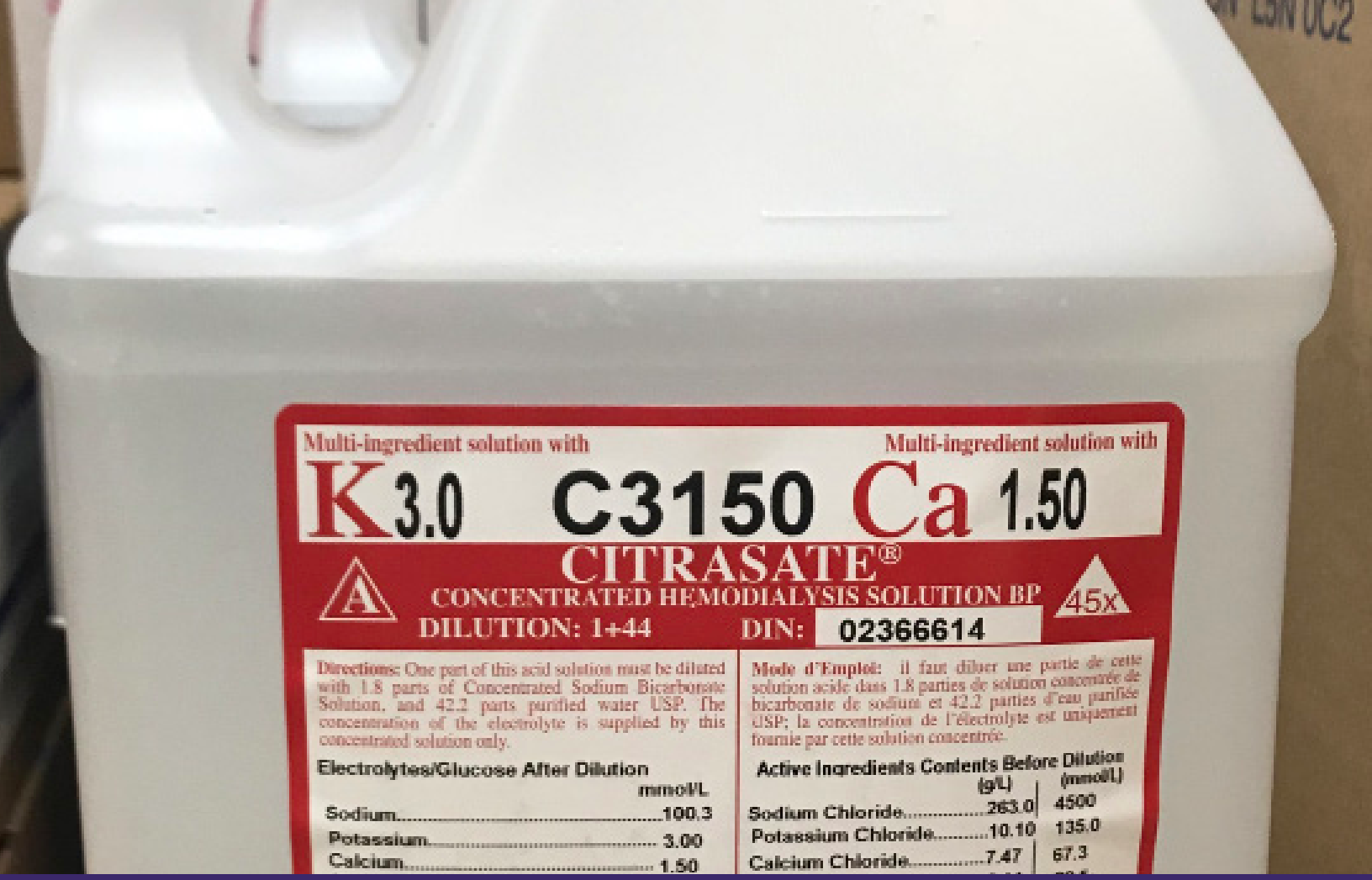

PROVINCIAL STANDARDS & GUIDELINES

BCRenal
Provincial Health Services Authority

Citrasate Management for Patients Receiving Extended Duration Hemodialysis

Created November 2017; Updated March 2018
Approved by the BCR Home Hemodialysis Committee

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Disclaimer: The procedure steps may not epic actual sequence of events. Patient/Client/Resident specifics must be considered in applying Interior Health Clinical Practice Decision Support Tools.

PRINTED copies of Clinical Practice Standards and Procedures may not be the most recent version. The most recent version is located on BC Renal website: www.BCRenal.ca

IMPORTANT INFORMATION

This BCR guideline/resource was developed to support equitable, best practice care for patients with chronic kidney disease living in BC. The guideline/resource promotes standardized practices and is intended to assist renal programs in providing care that is reflected in quality patient outcome measurements. Based on the best information available at the time of publication, this guideline/resource relies on evidence and avoids opinion-based statements where possible; refer to www.bcrenalagency.ca for the most recent version.

For information about the use and referencing of BCR provincial guidelines/resources, refer to http://bit.ly/28SFr4n.

1.0 Practice Standard

To provide guidelines to medical practitioners regarding the use of Citrasate® dialysate for patients receiving extended duration hemodialysis in an independent, self-directed manner. This applies for patients receiving treatments at home or within an existing healthcare facility.

2.0 Definitions and Abbreviations

Extended Duration Hemodialysis is defined as a hemodialysis treatment exceeding 6 hours in duration

Citrasate® dialysate refers to a dialysate preparation available commercially containing 2.4 mEq/L citric acid.

3.0 Equipment

- Citrasate® dialysate

4.0 Procedure and Rationale

Procedure	Rationale
1. Consider use of citric acid containing dialysate in patients receiving chronic hemodialysis as a strategy to eliminate heparin exposure for patients with: a) High heparin requirements (>50000 U/week) b) Documented heparin-induced thrombocytopenia c) Documented heparin allergy	Heparin is associated with multiple complications when used in the long term including acute complications (e.g. bleeding, heparin-induced thrombocytopenia) and chronic complications (e.g. osteoporosis).
2. Does this patient have significant hepatic disease? If so, Citrasate® dialysate should be reconsidered.	Citric acid is converted to bicarbonate by the liver. Patients with significant hepatic dysfunction may not adequately metabolize the citric acid.
3. Does this patient have baseline hypocalcemia (total adjusted serum calcium ≤ 2.1 mmol/L) despite management per "Calcium for Quotidian Dialysis Guideline"?	In the past, Citrasate® was available commercially with only a single calcium concentration. It is now manufactured with Ca++ 1.25 and 1.5 mEq/L formulations and patients with lower blood calcium levels can be managed per "Calcium Additive Guideline".
4. Does this patient have baseline pre-dialysis metabolic alkalosis (pre-dialysis bicarbonate level >25 mmol/L)? If so, Citrasate® dialysate should be reconsidered.	Citric acid is converted to bicarbonate by the liver. In the setting of pre-existing metabolic alkalosis, this may be worsened by citric acid exposure.
5. Does this patient use a potassium bath other than 1 mmol/L?	Previously Citrasate® was manufactured commercially as K bath of 1 mmol/L and the only way to increase the potassium concentration was via 'spiking'. This was felt to be unsafe for home patients due to the life-threatening risk of a supplementation error. This has now changed and a full range (K bath 0 – 4 mmol/L) of commercially manufactured potassium concentrations are available. (see below for formulations).
6. If no contraindications identified and patient meets inclusion criteria, proceed with Citrasate® dialysate.	See table on page 4.
7. Following implementation of Citrasate® dialysate, bloodwork should be obtained at 1 week and then with routine lab testing to reassess calcium and bicarbonate levels. Patients should also be counselling regarding the symptoms of hypocalcemia (perioral tingling or numbness; muscle cramps or spasms).	Opinion-based.

5.0 Document Considerations

1. Document contraindication for heparin (absolute or relative) over time.
2. Document lack of contraindication for the use of Citrasate® at home.
3. Document that patient is stable and maintained persistently on a K1 bath.

6.0 Special Considerations

Anticoagulation plays an important role in the management of a patient receiving chronic hemodialysis. Thrombosis within the extracorporeal circuit and consequent loss of 'Fibre Bundle Volume' within the dialyzer is associated with a reduction of the effective dose of dialysis delivered.

Heparin is the standard medication used to minimize thrombosis within the extracorporeal circuit. For some individuals it is necessary or desirable to eliminate the use of heparin. This can be due to a documented reaction to the heparin (e.g. heparin-induced thrombocytopenia, heparin allergy) or to minimize long term side effects of heparin exposure (e.g. osteoporosis).

Citrasate® dialysate is a commercial preparation containing 2.4 mEq/L citric acid. It exerts a localized anti-coagulant effect via chelation of free calcium, a necessary factor in the coagulation cascade.

Citrasate® is now available in commercially prepared formulations with variability in both potassium and calcium concentrations as shown below. This allows adjustment of Citrasate® baths to meet patient needs and eliminates need to 'spike' with potassium to alter the concentration, which in the past was a barrier to safe use in the home environment.

7.0 References

Concentrate formulations from Chief Medical Supplies website.

Dial Medical Supply. Guidelines for Use of Citrate Dialysate (Citrasate®). Manufacturer's http://www.dialmedsupply.com/images/a2Images_web/citrasate/CitrasateGuidelines.pdf

Polakovic, V. et al. Citrasate® dialysis concentrate: in vitro tests and results of the Citrasate® concentrate use in in vivo bicarbonate haemodialysis and on-line haemodiafiltration.

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10.0 Endorsed by

- BCR Provincial Medical Advisory Committee

Citrasate Formulation List

(in mmole/Litre after standard 1:45 dilution)

Sodium	Potassium	Calcium	Magnesium	Chlorides	Dextrose	Citric Acid	Sodium Acetate
100.00	0.00	1.25	0.50	103.50	5.55	0.80	0.30
100.00	1.00	1.25	0.50	104.50	5.55	0.80	0.30
100.00	1.00	1.50	0.50	105.00	5.55	0.80	0.30
100.00	2.00	1.25	0.50	105.00	5.55	0.80	0.30
100.00	2.00	1.50	0.50	106.00	5.55	0.80	0.30
100.00	3.00	1.25	0.50	106.50	5.55	0.80	0.30
100.00	3.00	1.50	0.50	107.00	5.55	0.80	0.30
100.00	4.00	1.25	0.50	107.50	5.55	0.80	0.30