



Lactocitrate®

1st lactate buffered dialysis fluid for RCA



Solution characteristics

- **Fluid for application with 4% trisodium citrate (4%TSC), tested with CVVHD, CVVH and CVVHDF**
- **Calcium-free fluid for use with regional citrate anticoagulation (RCA)**
- **Reduced concentration of Na⁺**
- **Lactate buffer**
- **Reduced buffer base to prevent metabolic alkalosis**
- **Magnesium to compensate losses during citrate CRRT**
- **Phosphate for prevention of hypophosphataemia**
- **Single chamber bag guarantees concentration stability**
- **Cheap, reducing cost of CRRT + RCA below the level of CRRT with heparin anticoagulation**

Advantages of Lactocitrate compared to other solutions designed for RCA:

- Outstanding tolerance, no alkalosis nor hypernatremia were detected with dosage of 1500–3000 ml/h, parallel blood flow of 100–150 ml/min and 4%TSC (median 200–300 ml/h) providing postfilter Ca²⁺ < 0.4 mmol/l. Higher blood flow up to 150 ml/min enables higher ultrafiltration and postdilution than blood flow restricted to 100 ml/min.
- Combination of 4%TSC with calcium-free lactate dialysis/substitution fluid = acceptable bioenergetic gain of 1350–2000 kJ/24h, without impact on insuline resistance.
- Up to 2000–3000 ml/h a low plasmatic lactate level (median 1.9 mmol/l) is preserved. Arterial lactate remains a marker of stress metabolism and its level correlates with significant hypovolaemia and/or decreases of cardiac index.
- Magnesium without a need for substitution
- Phosphorus without a need for replenishment
- Single chamber polypropylene bag, concentration stability during storage
- Cost saving, one day expenses (citrate+calcium+monitoring+fluids = median 200 EUR) for RCA + Lactocitrate are lower than for RCA + bicarbonate calcium-free fluid (243 EUR). Citrate anticoagulation with Lactocitrate is cheaper than heparin + bicarbonate fluid (221 EUR).



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Concentration of ion and glucose

Na ⁺	130	mmol/l
K ⁺	2.0	mmol/l
Mg ²⁺	1.5	mmol/l
H ₂ PO ₄ ⁻	1.0	mmol/l
Cl ⁻	116	mmol/l
Lactate ⁻	18	mmol/l
Glucose	5.6	mmol/l
pH	5.6	
theoretical osmolality	274	mosmol/l



detail of holding



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(patent pending)

CRRT + RCA
with Lactocitrate is cost saving

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Application

Lactocitrate is a dialysis fluid designed for continuous renal replacement therapy (CRRT) with regional citrate anticoagulation (RCA). It is administered preferably with 4% trisodium citrate (4%TSC) and parallel substitution of calcium (CaCl₂).

Indication

Indication to Lactocitrate is continuous renal replacement therapy with regional citrate anticoagulation. The elevated arterial lactate level is not a contraindication to lactate buffered fluid if a patient is stabilized and a balance between systemic oxygen delivery and consumption is maintained.

Method setting

If not indicated otherwise the expected efficiency of CRRT is reached with dosage of 1.5 to 2.5 l/h of dialysis fluid in adults, i.e. 20–25 ml/kg.h. Adequate blood flow is between 90–120 ml/min. In case of higher blood flows up to 150 ml/min and related higher dosage of 4%TSC the expected dosage of Lactocitrate is between 2.0 and 3.0 l/h.

Lactocitrate does not possess side effects when correctly administered however, its higher dosage above 2.5 l/h may increase plasmatic lactate concentration which is typically at the upper limit of normal or mildly elevated.

References

- 1) Balik M, Zakharchenko M, Otahal M, et al: Quantification of systemic dose of substrates for intermediate metabolism during citrate anticoagulation of continuous renal replacement therapy. Blood Purif 2012, 33: 80-87.
- 2) Balik M, Zakharchenko M, Leden P, et al.: Bioenergetic gain of citrate anticoagulated continuous hemodiafiltration-a comparison between 2 citrate modalities and unfractionated heparin. J Crit Care 2013, 28(1): 87-95.
- 3) Balik M, Zakharchenko M, Matejovic M: Citrate anticoagulation of renal replacement therapy: Beyond filter life and patient's safety. Yearbook

of Intensive Care Medicine, Springer Verlag, March 2013, pp. 741-754.

GML Health Care portfolio of products for RCA

Product	Volume
Natrium citricum 4 %	250 ml
Natrium citricum 4 %	1000 ml
Natrium citricum 4 %	2000 ml
Natrium citricum 14,7 %	500 ml
Natrium citricum 35,3 %	250 ml
Citralysat K0	5000 ml
Citralysat K2	5000 ml
Citralysat K4	5000 ml
Citralysat PLUS K2	5000 ml
Citralysat PLUS K4	5000 ml
Lactocitrate	5000 ml

- 4) Balik M, Zakharchenko M, Leden P, et al: Tolerance and metabolic effects of a novel lactate buffered dialysis and substitution fluid for citrate anticoagulated continuous renal replacement therapy: Intensive Care Med 2013, 39(S2): 377 (abstract).
- 5) Zakharchenko M, Balik M, Leden P, et al: Citrate anticoagulated continuous haemodiafiltration: Focus on ionised magnesium. Intensive Care Med 2011, 37, S336 (abstract).