

Can we do more by doing less in CRRT?

Revisiting the balance between dose-intensity and harm

The 2012 KDIGO Clinical Practice Guidelines for AKI

recommend delivering a CRRT dose-intensity of 20-25 mL/kg/hr.¹ Yet published protocols using citrate anticoagulation are not always compliant when it comes to prescribed and delivered dose.

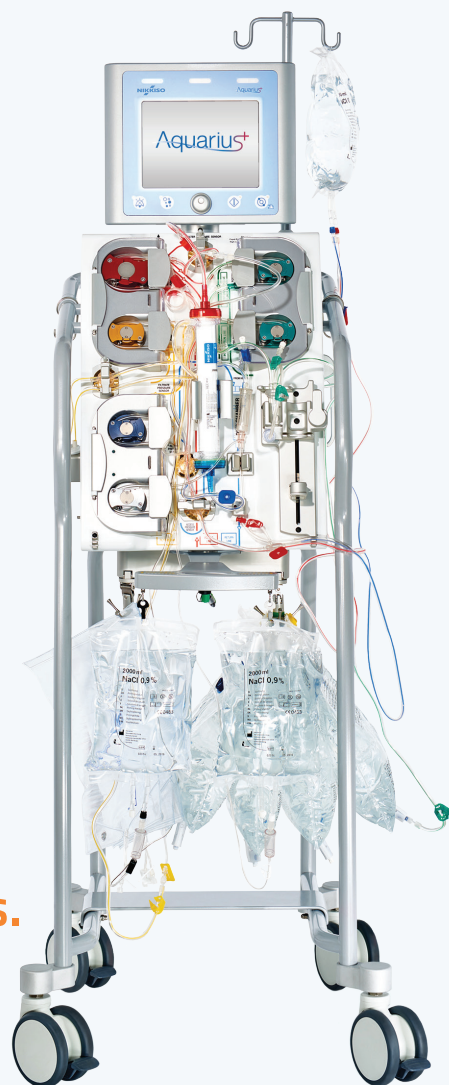
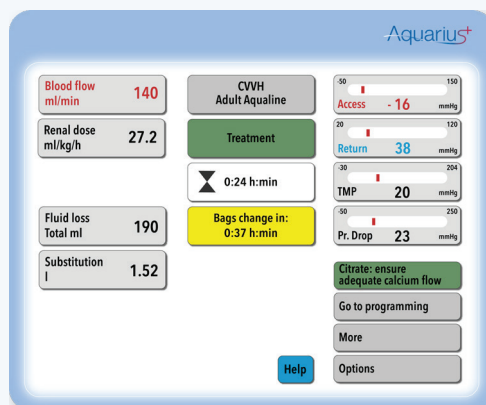
Studies show doses >25 mL/kg/hr provide no survival benefit, but due to potential dialytrauma may cause:

- Prolonged oliguria⁵
- Delayed kidney recovery⁶
- Delayed ventilator weaning⁷

Environmental harm is the new frontier in "Do No Harm" medicine:⁸

- ICU patients on average receive 5.0 kg of medication daily, generating **1.7 kg of packaging waste**
- Patients on CRRT receive an additional 51.5 kg of fluids daily and generate an **additional 4.3 kg of packaging waste**
- "The substantial contribution of CRRT to ICU waste necessitates targeted strategies that could include **exploring alternative CRRT modalities** that minimise fluid and material use."

Parameter 70 kg patient	CVVH (Kirwan ²)	CVVHDF (Kalmar ³)	CVVHD (Morgera ⁴)
Dose (ml/kg/h) - prescribed	27	41	29
Total Fluid (l/24 h) - prescribed	46	70	48
KDIGO Guideline Compliance	Yes	No	Yes



Every CRRT dose decision has consequences. Learn how to minimise both patient and environmental harm.

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 3. Borgstrom et al. Continuous Renal Replacement Therapy (CRRT) with citrate anticoagulation; The Kalmar protocol
 4. Morgera et al. A safe citrate anticoagulation protocol with variable treatment efficacy and excellent control of the acid-base status. Crit Care Med. 2009 Jun;37(6):2018–24.
 5. Mc Causland et al. Comparison of Urine Output among Patients Treated with More Intensive Versus Less Intensive RRT: Results from the Acute Renal Failure Trial Network Study. Clin J Am Soc Nephrol 2016, 11(8):1335–1342.
 6. Wang et al. Renal replacement therapy intensity for acute kidney injury and recovery to dialysis independence: a systematic review and individual patient data meta-analysis. Nephrol Dial Transplant 2018, 33(6):1017–1024.
 7. Sharma et al. Intensity of Renal Replacement Therapy and Duration of Mechanical Ventilation: Secondary Analysis of the Acute Renal Failure Trial Network Study. Chest 2020, 158(4):1473–1481.
 8. Klasen et al. Circular material flow of medication in the intensive care unit. Crit Care. 2025 May 20;29(1):205.