

Intradialytic monitoring of blood pressure, oxygen saturation and relative blood volume

Citation for published version (APA):

Rojas, P. P. (2024). *Intradialytic monitoring of blood pressure, oxygen saturation and relative blood volume: Relation with outcomes*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20240530pr>

Document status and date:

Published: 01/01/2024

DOI:

[10.26481/dis.20240530pr](https://doi.org/10.26481/dis.20240530pr)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

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Propositions
accompanying the dissertation

**Intradialytic monitoring of blood pressure, oxygen saturation and relative
blood volume: relation with outcomes**

Priscila Preciado Rojas
Maastricht, 30 May 2024

1. Changes in systolic blood pressure during hemodialysis should not be evaluated as an isolated phenomenon but need to be considered in the context of pre-dialytic blood pressure and other hemodynamic parameters in order to guide dialysis treatment (Chapter 2).
2. Intradialytic relative blood volume curves provide an insight into patient's fluid status. Flat relative blood volume curves are indicative of fluid overload and associated with increased mortality. They can be used to direct fluid removal during treatment (Chapter 3).
3. Identification of favorable relative blood volume ranges measured by the Critline® device in combination with an adaptive ultrafiltration feedback control system can be used to mitigate fluid overload in patients on hemodialysis (Chapter 3).
4. Continuous measurement of central venous oxygen saturation during hemodialysis allows the identification of patients at risk for adverse outcomes and as a guide to treatment prescription (Chapter 4).
5. Changes in central venous oxygen saturation during hemodialysis are an important effect modifier that should be considered when interpreting changes in relative blood volume during hemodialysis. Integration of central venous oxygen saturation measurements into an adaptive ultrafiltration feedback control system can be used to personalize treatment in patients at risk for intradialytic complications (Chapter 4).
6. Intradialytic measurement of arterial oxygen saturation allows for early detection of patients with COVID-19 infection and thus reduce the spread of infection within dialysis clinics. These measurements also hold promise for detection of high-risk patients with other respiratory diseases (Chapter 5).
7. Automated blood pressure measurements, when uploaded in real time to cloud-based algorithms hold great potential in the prevention of intradialytic hypotension (Zhang *et al.*, *Nephrol Dial Transplant.* 2023).

8. Monitoring of intradialytic central venous oxygen saturation and upper body blood flow before and after creation of an arteriovenous fistula is able to track the hemodynamic response to the fistula maturation process and was shown to reduce the time between arteriovenous access creation and removal of central venous catheters (Rosales *et al.*, *Nephrol Dial Transplant*. 2023).
9. Point-of-care ultrasound is a goal-directed, bedside diagnostic tool for objective assessment of volume status with potential for routine use to support fluid management in hemodialysis patients (Koratala *et al.*, *Blood Purif*. 2020).
10. Adoption of healthy lifestyle factors including optimal dietary patterns such as consumption of health-promoting foods and adequate portion control, positively influences overall health and promotes the prevention of common non-communicable diseases (Wang *et al.*, *Nat Med*. 2023).
11. La vida no es la que uno vivió, sino la que uno recuerda y cómo la recuerda para contarla (Life is not what one lived, but what one remembers and how one remembers it to recount it; Gabriel García Márquez, Colombian author, *Living to tell the tale*)