

# Computer model for the analysis of pressure response to hemodialysis-induced hypovolemia

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**Abstract:** Acute hypotension is the most frequent intratreatment complication of chronic hemodialysis, with an incidence still reported to be around the 20-30% of treatments [1]. Apart from patient discomfort, acute hypotension also leads to a less effective treatment, especially in terms of body water removal. Sessions complicated by hypotension often end without achieving the correct dry body weight and the repetitive hypotensive episodes yield a chronic hydro-electrolytic derangement that promotes critical cardiovascular side-effects. Several factors have been ascribed to the pathogenesis of this complication. The first determinant of the hypotensive event is the hemodialysis-induced intravascular hypovolemia due to plasma-water ultrafiltration. To prevent excessive hypovolemic stress, the online monitoring of circulatory blood volume reduction is rapidly gaining acceptance in clinical practice [2]. However, for a given hypovolemic stress, a stable pressure response requires the adaptation of cardiovascular functions [1]. To characterize patient's reactivity to hypovolemia, a novel method, based on computer-model simulation has been proposed [3-5]. The model-based method constituted a quantitative framework useful for giving a coherent explanation of the experimental observations. In the lecture, the model will be presented and some relevant applications will be discussed.

## References

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