

Hemodiafiltration and dialysate bicarbonate concentration

There is limited data on the impact of different dialysate bicarbonate concentrations specifically in the setting of hemodiafiltration.

There is a randomized trial that examined the impact of a higher vs. lower concentration of dialysate bicarbonate (34 vs. 30 mmol/L) on the pre-dialysis and post-dialysis serum bicarbonate concentration in patients receiving **hemodiafiltration** (Viegas et al, results summarized in the table below; <https://pubmed.ncbi.nlm.nih.gov/27761981/>). Albeit the highest dialysate bicarbonate concentration used in this trial was 34 mmol/L.

In comparison, a randomized trial (Hefzollah et al., results summarized in the table below; <https://onlinelibrary.wiley.com/doi/abs/10.1111/hdi.12842>) examined the impact on the pre-dialysis serum bicarbonate concentration of similar higher vs. lower concentrations of dialysate bicarbonate (36 vs. 30 mmol/L) in patients receiving **hemodialysis**. Di Iorio et al (results summarized in table below; <https://pubmed.ncbi.nlm.nih.gov/21983985/>) examined the impact on the post-dialysis serum bicarbonate concentration of higher vs lower dialysate bicarbonate concentration (34 vs. 30 mmol/L) in patients receiving **hemodialysis**.

Overall, higher dialysate bicarbonate concentrations with both hemodialysis and hemodiafiltration appear to have similar impacts on the pre- and post-dialysis serum bicarbonate concentrations. There is a greater impact on the post-dialysis concentration, inducing more post-dialysis alkalosis with higher dialysate bicarbonate concentrations. This forms the rationale for the Dial-Bicarb trial, and why we hypothesize that a higher dialysate bicarbonate concentration may lead to worse outcomes for patients.

Study, year	Intervention	Follow up time	Number of patients	Pre-dialysis serum bicarbonate concentration results	Post-dialysis serum bicarbonate concentration results
Hefzollah, 2020	Dialysate bicarbonate 36 vs 30 mmol/L	6 months	56 (26: 36 mmol/L, 30: 30 mmol/L)	<ul style="list-style-type: none"> • 20.1 ± 2.5 mmol/L at end of study compared to 20.3 ± 4.3 mmol/L at beginning of study, p=0.8 (dialysate bicarbonate 30 mEq/L). • 20.4 ± 2.3 mmol/L at end of study compared to 20.0 ± 3.3 mmol/L at beginning of study, p=0.7 (dialysate bicarbonate 36 mmol/L). 	<ul style="list-style-type: none"> • Not reported
Di Iorio, 2012	Dialysate bicarbonate 34 vs 30 mmol/L	4 hours	22	<ul style="list-style-type: none"> • Not reported 	<ul style="list-style-type: none"> • 33 ± 1.0 mmol/L (34 mmol/L dialysate bicarbonate) vs 29 ± 0.7 mmol/L (30 mmol/L dialysate bicarbonate)

Viegas, 2017	Dialysate bicarbonate 34 vs 30 mmol/L	9 months	93 (46 34 mmol/L, 47 30 mmol/L)	<ul style="list-style-type: none"> 22.7, 95% CI 20.9-24.4 mmol/L with dialysate bicarbonate 34 mmol/L vs 21.1, 95% CI 19.7-22.7 mmol/L with dialysate bicarbonate 30 mmol/L (p<0.001). 	<ul style="list-style-type: none"> 28.0 (IQR 26.9 to 29.1) mmol/L with bicarbonate 34 mmol/L vs 25.3 (IQR 24.0 to 26.5) mmol/L with bicarbonate 30 mmol/L (p<0.001).
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