

## Using a biofeedback system to control Ultrafiltration rates – Does this impact treatment and patient outcomes?

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**Background:** Fluid control is an essential clinical goal of maintenance haemodialysis. Failure, may lead to short- and longer-term impact on patient well-being [1]. Often competing, though sometimes associated with fluid control, is intra-dialytic hypotension occurring in up to 20% of sessions, with other patients experiencing symptoms without full hypotensive episode [2]. Clinicians may reduce ultrafiltration (UF) due to clinical symptoms (e.g. hypotension, cramps, nausea, clammy, unwell, sensory impairment, vomiting, loss of consciousness or fitting), possibly failing to achieve the target fluid loss. This service evaluation monitored fluid removal and patient well-being using a biofeedback system (B. Braun Dialog iQ® with BioLogic Fusion®) compared to standard dialysis. This biofeedback system aims to prevent hypotension by monitoring systolic blood pressure and relative blood volume to control ultrafiltration rates.

**Methods:** Candidates were identified based on presence of any symptom of hypotension or failure to achieve 90% of target fluid loss in previous weeks. Fluid loss achieved, minimum UF rate, patient well-being (Likert scale) and symptoms were recorded for n=48 treatments/patient. Patients were aware of machine change.

**Results.** Eight patients were treated 3 times a week with high-flux dialyzers. No change in pre-dialysis patient well-being was observed. Net-UF was not statistically different in the two groups. Minimum UF was activated for 16% of standard and 8% of automated treatments. A total of 383 treatments were available. Systolic blood pressure after each hour of treatment was not statistically different between the two treatments approaches. Dry weight was achieved following 50.3% of the standard sessions and 75.5% using the biofeedback system (p<0.001).

Post-treatment well-being scores were higher using the biofeedback system with scores improving for 30% of monitored treatments compared with 23% standard. Patients felt the same or better following 85% biofeedback treatments versus 65% of standard (p=0.004). For 31% of standard and 15% of biofeedback treatments a lower well-being score was reported. Overall, 3 patients (37.5%) following standard treatment and 6 patients (75%) following biofeedback treatments felt better after treatment.

Frequency of cramps was significantly lower in biofeedback treatments (9.9% vs. 14.66% of standard treatment). Most patients (n=7/8, 88%) experienced cramps during standard treatment compared with half of the patients (n=4/8, 50%) during biofeedback treatments.

**Discussion:** As observed here, biofeedback may benefit patients, increasing ability to achieve post-dialysis dry body weight, while improving well-being scores. However, further larger scale investigations preferably considering severity of symptoms are required.