**Introduction:**

- Management of fluid overload is essential in the control of hypertension and the reduction of cardiovascular risk in chronic dialysis patients.
- Intradialytic blood volume monitoring has improved fluid management in our haemodialysis (HD) patients, by giving nursing staff the confidence to remove the excess fluid revealed by the measurements.
- Unfortunately this technology cannot be used for peritoneal dialysis (PD) patients.
- Multipropionat frequency bioimpedance analysis (BIA) can be used to measure extracellular and intracellular water volumes.
- In principle, BIA could be used to assess fluid status in all patients with chronic renal failure.
- Lopot et al suggested using the deviation of the ratio of extracellular to total body water (ECW/TBW) from the ratio in age-matched normal controls to assess the optimal dry weight in HD patients.
- Figure 1 shows the increase in ECW/TBW ratio with age found by Lopot et al in normal healthy volunteers.
- This approach assumes the fluid retained by dialysis patients accumulates in the extracellular space.
- Our study applied the methodology used by Lopot to peritoneal dialysis patients.
- The ECW/TBW dataset for normal subjects used by Lopot et al was expanded in our study to include 50 normal controls, and intradialytic blood volume monitoring has improved fluid management in PD patients, by giving nursing staff the confidence to remove the excess fluid revealed by the measurements.
- Unfortunately, this technology cannot be used for PD patients.
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**Results:**

- The difference between the ECW/TBW ratio measured with the peritoneal cavity filled or drained was 0.2 ± 0.4 %, which is neither statistically nor clinically significant.
- This was expected, since wrist-ankle impedance is dominated by the arm and leg.
- The mean hydration score for the 31 patients was significantly higher than for the controls (±1.3 vs. 0.0, p<0.0001).
- Eleven (35%) of the patients had a hydration score greater than +2.0, compared with only 2.5% of the controls (the percentage expected to lie above 2 standard deviations from the mean of a Gaussian distribution).
- The outcomes for the patients with hydration scores greater than +2.0 is shown in table 1.
- Nursing staff intervened successfully with prescription changes and advice on fluid intake in patients 1, 5, 6, 8 and 11.
- an average weight loss of 3.4 kg (range 1.0 to 7.7 kg) was achieved after 3 months
- two patients (1 and 8) were hypertensive when the bioimpedance measurements were made. After intervention, their mean arterial pressure was reduced by 16 and 21 mmHg respectively.

**Conclusions:**

- Although this study included only a small number of patients, the results suggest that the ECW/TBW ratio can provide a reliable indication of fluid status in peritoneal dialysis patients, if patient data are compared with age and gender matched controls.
- The bioimpedance data did play a similar role to blood volume monitoring in HD, by enabling nursing staff to pursue fluid control more exhaustively and helping to motivate the patients.
- The PD nurses are now monitoring their patients routinely as we expect changes in hydration index to be even more useful.
- Bioimpedance measurements are made on HD patients on indication.
- We are now looking at hydration scores in patients with chronic renal failure.

**References:**