

# NO WATER, NO PROBLEM: Using CRRT for Hemodialysis Patients

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## Background

Each dialysis session uses approximately 150 to 200 L of water. While this was an issue discussed by policymakers and environmentalists, the winter storm that swept across the southwest United States in February 2021 made the bedside physician keenly aware of the problem.

The region saw an unprecedented disruption of water and power supplies which put end-stage renal disease (ESRD) patients in jeopardy. Intermittent hemodialysis (IHD) could not be performed due to lack of running water, low water pressures, and unsanitary water conditions.

We present 4 cases when continuous renal replacement therapy (CRRT) was utilized to provide urgent hemodialysis in hemodynamically stable, non-critically ill ESRD patients during this time of water supply crisis.

## Case Series

**Age Range:** 47-62 years old, mostly male  
**Presenting Complaints:** Shortness of breath, and altered mental status

### Indications for Hemodialysis:

- Volume overload with pulmonary edema and respiratory distress
- Hypertensive crisis
- Refractory hyperkalemia
- Uremic Encephalopathy

**CRRT Equipment:** Prisma System for CRRT with M150 Filters

**Mode:** Continuous Venovenous Hemodialysis (CVVHD) was used with a dialysate flow rate of 6L/hr and a blood flow rate of 200ml/hr with calculated urea clearance of 100 ml/min. Fluid removal ranged from 150-500ml/hr. 9-10 bags of dialysate were used per session.

## Results

All patients tolerated the procedure well with the resolution of their acute conditions and normalization of blood pressure and electrolytes. 1 patient developed brief hypotension which resolved with fluid administration. No other adverse events were seen

**Table 1**

	Patient 1	Patient 2	Patient 3	Patient 4
Age (in years)	47	49	66	62
Sex	Male	Female	Male	Male
Weight (in kg)	127.46	81.19	73.6	55.8
Comorbidities	Hypertension, insulin dependent diabetes mellitus, heart failure, anemia	Heart failure, Atrial fibrillation	Pulmonary hypertension	Secundum atrial septal defect, multiple myeloma
Indication	Fluid overload, pulmonary edema	Hyperkalemia	Uremic encephalopathy	Fluid overload, hypertensive crisis, pulmonary edema
Access	Right IJ tunneled dialysis catheter	Right IJ tunneled hemodialysis catheter	LUE AV fistula	RUE AV graft
Mode, blood flow rate, dialysate flow rate (in cc/hr),	CVVHD, 200, 6000	Day 1: CVVHD, 200, 6000 Day 2: CVVHD, 150, 5000	CVVHD, 200, 6000	CVVHD, 200, 6000
Kt/V	1.25	1.97	2.17	2.86
Net fluid removal (in cc/hr)	400	Day 1: 200 Day 2: 130-200	400	500
Duration (in hrs)	8	Day 1: 4 Day 2: 8	8	8

## Discussion

CRRT has typically been used for renal replacement therapy in critically ill patients. Used as a replacement for IHD, the duration of treatment was 8 hours to achieve the target Kt/V of 1.15, comparable to the recommended 1.2 provided by IHD.

## Conclusions

CRRT can be used as an alternative to safely manage ESRD patients needing urgent hemodialysis in the scenario of a natural disaster resulting in a water outage.

