

Urea Clearance Results in Patients Dialyzed Thrice Weekly Using a Dialysate Flow of 300 mL/min

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Background

Conventional in-center hemodialysis is usually prescribed using a dialysate flow of 500 mL/min. Tablo® is a novel hemodialysis system that enables patient-empowered care at a dialysate flow rate of 300 ml/min. Kinetic modeling data and bench top testing predict that the majority of U.S. patients can achieve adequate urea clearances in under 4-hour treatment times on a thrice weekly hemodialysis treatment schedule with Tablo.

Purpose

To measure delivered Kt/V_{urea} in patients dialyzed thrice weekly using the Tablo Hemodialysis System operating with a dialysate flow of 300 mL/min.

Tablo Description

The Tablo Hemodialysis System is an all-in-one device indicated for use in acute and chronic care settings that is designed to expand how, when and where dialysis can be performed.

Unique features include:

- An integrated water purification system
- Ability to produce prescribed dialysate on demand
- Intuitive user interface making it easy to learn and easy to use
- Two-way wireless connectivity to simplify documentation



Methods

29 patients dialyzed on Tablo in two clinics consented to have their dialysis records reviewed. These records were reviewed retrospectively for key clinical data, dialysis prescription and results of routine biochemistry testing including urea reduction ratios and Kt/V_{urea}. The analysis period included the three months prior to using Tablo and all measurements while on Tablo. Kt/V_{urea} was calculated using standard pre and post dialysis urea sampling and calculated using the Daugirdas second-generation formula.



Results

280 Kt/V_{urea} assessments were recorded (192 on Tablo and 88 on the non-Tablo devices) on 11 women and 18 men aged 34–84 years (median = 60).

TABLE 1

Demographics for 29 patients in the study population.

Male	18
Female	11
Black	17%
Hispanic	10%

TABLE 2

Clinical Profile for 29 patients in the study population.

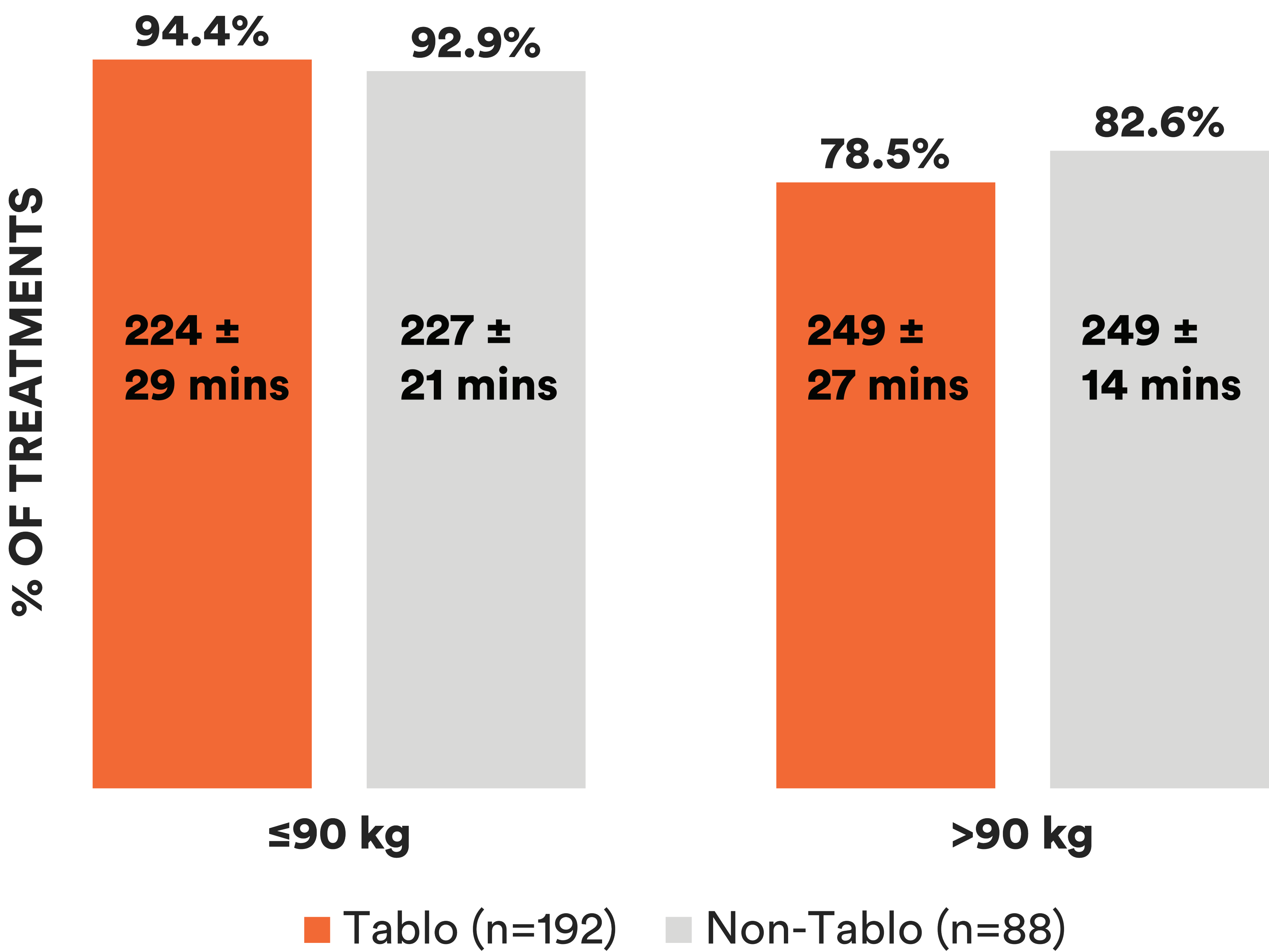
Dry Weight Range (kg)	52–145
Mean Dry Weight (kg)	89 ± 23
Fistula	59%
Graft	28%
Catheter	10%
Not Reported	3%
Diabetes	62%
COPD	7%
CHD	24%
PVD	10%
CHF	14%

TABLE 3

Treatment time, pre-post weight (a surrogate for fluid removal), and Kt/V_{urea} results for the 29 patients on the Tablo (dialysate flow 300 ml/min) and the non-Tablo (dialysate flow 500 ml/min) hemodialysis systems.

FIGURE 1

% treatments reaching the target Kt/V_{urea} (≥ 1.2) in patients with weights above and below 90 kg on Tablo and non-Tablo systems. Average treatments times are also shown.



System	Prescribed Treatment Time, Mean (mins)	Pre-Post Weight (kg)	% Treatments where Post Weight within 10% of Target Weight	Kt/V _{urea} (± sd)
Tablo (n=192)	240 ± 30	2.5 ± 1.4	100%	1.4 ± 0.2
Non-Tablo (n=88)	239 ± 21	2.6 ± 2.2	100%	1.6 ± 0.4

Discussion

In this group of patients who were prescribed similar treatment times on Tablo and non-Tablo dialysis machines, adequacy targets were achieved as predicted by the kinetic modeling previously published.

When the patients were divided based on weights above and below 90 kg, the success rate of achieving adequacy targets was similar on Tablo and non-Tablo devices.

Fluid removal contributes to the Kt/V_{urea}. In this study, fluid removal is extrapolated from the pre-post weights, which is not a precise measurement of actual UF, but it is a reasonable surrogate. The differences in fluid removal represented by changes in pre and post dialysis weight is very small and will not materially change the Kt/V_{urea} result.

Conclusion

Patients across a large weight range achieve adequacy targets at similar frequencies with similar treatment times when comparing treatments on Tablo versus treatments performed with traditional 500 ml/min dialysate flow rates on a thrice weekly hemodialysis treatment schedule.

These results affirm previously reported kinetic models. Conclusions about fluid removal cannot be drawn in this study and further studies need to be conducted.

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