

PDOPPS Association between Diuretic Use and Residual Kidney Function in Peritoneal Dialysis Patients: Early Comparisons from the International Peritoneal Dialysis Outcomes and Practice Patterns Study



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Background / Goal

Background

- Preservation of residual kidney function (RKF), as determined by urine volume or mean urea and creatinine clearances (GFR), is strongly associated with better survival on dialysis
- Modest sized trials have demonstrated that diuretics can maintain urine volume and that renin angiotensin system inhibitors (RASi) might preserve RKF in PD patients

Goal:

- Report patient characteristics and clinical practices associated with markers of RKF in the international PDOPPS cohort

Methods

Sample:

- N=2832 patients enrolled in PDOPPS from Australia, Canada, Japan, the United Kingdom, and the United States; Thailand excluded due to limited data returns as of the presentation date
- N=1917 patients whose first non-missing 24 hour urine volume (at baseline or during follow-up) was > 0 L were included in figure 2 and tables 1 and 2

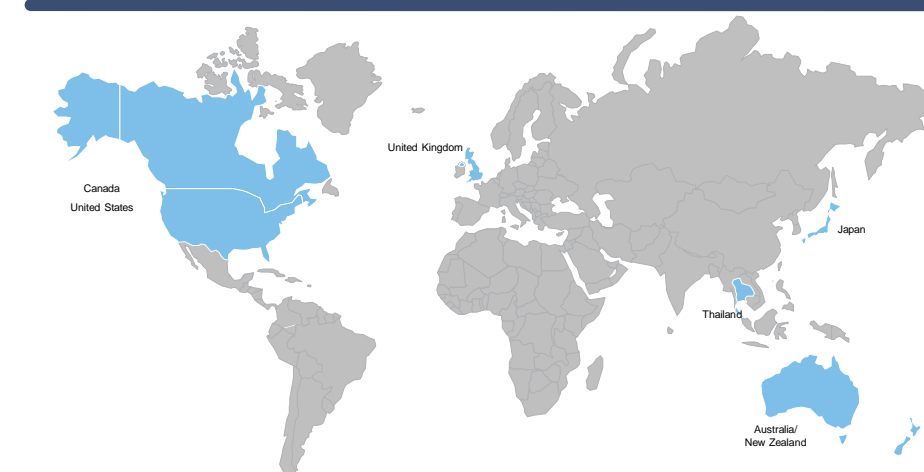
Analysis:

- **Model:** Cross-sectional linear mixed models accounting for facility clustering
- **Outcomes:** 24 hour urine volume and GFR; see footnote for log transformation details
- **Exposures:** Diuretic, RASi, ARB prescription, time on peritoneal dialysis, patient age, black race, gender, diabetes, country, PD modality (APD vs. CAPD)

Definitions and abbreviations:

- GFR = average of creatinine and urea nitrogen clearances based on 24 hour urine collection adjusted to a standard body surface area of 1.73 m²
- A/NZ=Australia-New Zealand, UK = United Kingdom, US = United States
- ACEi = angiotensin converting enzyme inhibitor, ARB = angiotensin receptor blockers
- APD=automated peritoneal dialysis, CAPD=continuous ambulatory peritoneal dialysis

PDOPPS The Peritoneal Dialysis Outcomes and Practice Patterns Study



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The DOPPS Program is coordinated by Arbor Research Collaborative for Health, Ann Arbor, MI USA.

The PDOPPS is an international prospective cohort study of peritoneal dialysis treatment and patient outcomes in **Australia, Canada, Japan, New Zealand, Thailand, the United Kingdom and the United States**. Data collection (beginning in 2014) is ongoing and will include up to 3 years of follow-up for > 5,000 patients in > 175 practices. Additional countries may join the study depending on funding and data availability. More details regarding study design can be found in Perl et al (2015) Perit Dial Int.

Results

Figure 1: Measurement of 24-hour urine, by country during PDOPPS (at baseline or during follow-up); only patients with volume > 0 L included in subsequent analyses

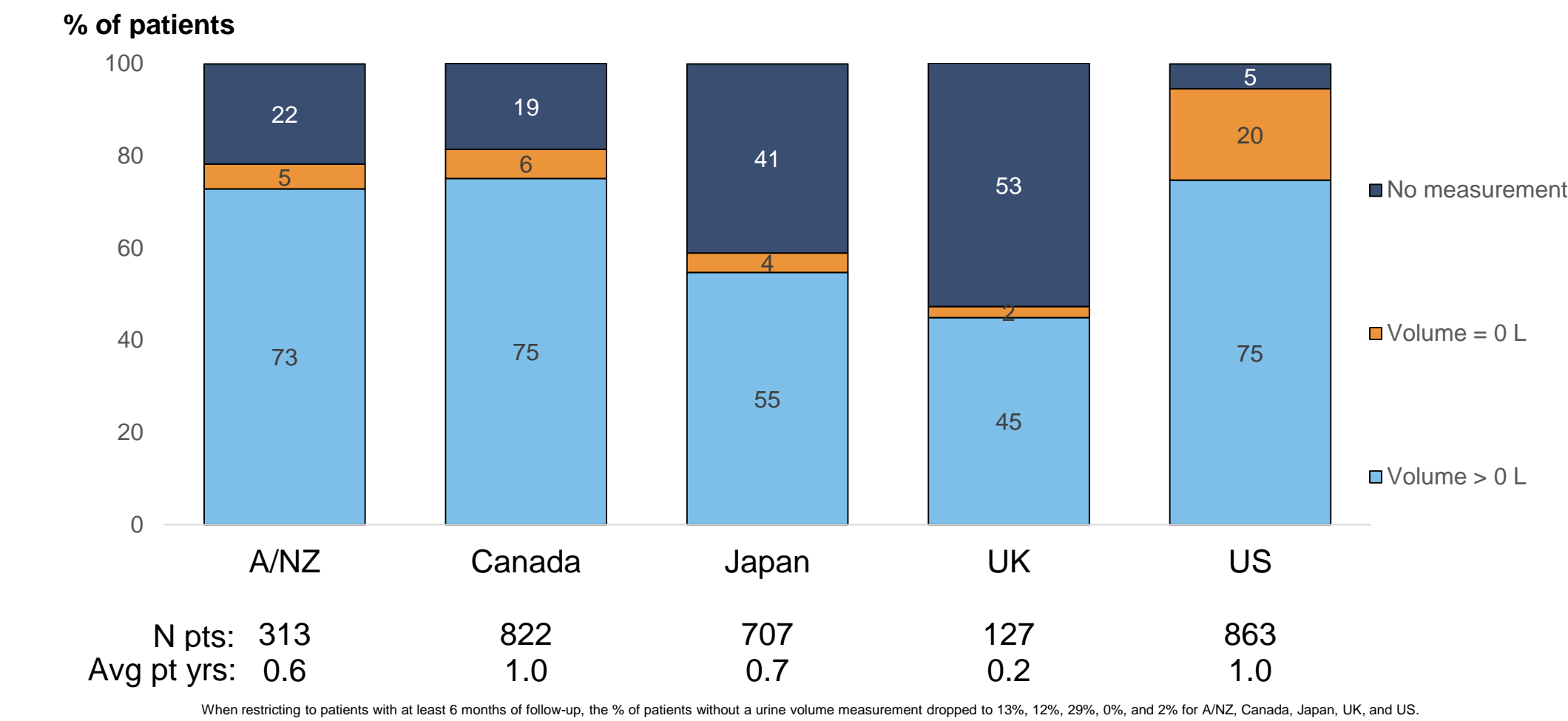


Table 1: Patient characteristics, by country among patients with urine output

	A/NZ (n=227)	Canada (n=616)	Japan (n=380)	UK (n=56)	US (n=638)
Demographics					
Age, years	64(13)	61(15)	64(13)	58(17)	59(15)
Male	67%	63%	68%	54%	58%
Black race	0%	4%	0%	2%	23%
PD vintage, years	1.8(1.9)	1.4(2.1)	2.2(2.0)	1.6(2.5)	1.3(1.5)
Diabetes	42%	48%	37%	21%	49%
Prior hemodialysis	24%	26%	20%	23%	33%
Weight, kg	81(19)	79(18)	62(13)	76(19)	83(22)
Residual kidney function					
Urine volume (24 hrs), L	0.90[0.45,1.49]	1.00[0.50,1.45]	0.74[0.39,1.20]	1.04[0.55,1.58]	0.80[0.45,1.30]
GFR, mL/min/1.73m ²	4.50[2.10,7.99]	4.78[2.68,7.25]	0.80[0.30,3.39]	6.16[3.13,8.85]	3.81[1.39,6.84]
Prescriptions and PD type					
Diuretic	45%	63%	68%	36%	54%
ACEi	21%	28%	4%	11%	23%
ARB	20%	27%	59%	19%	21%
APD (vs. CAPD)	69%	72%	33%	66%	80%

Results shown as prevalence, mean (standard deviation) or median [interquartile range]; data from patients first round of data collection with a 24 hour urine measurement; A/NZ = Australia/New Zealand, GFR=glomerular filtration rate, ACEi = angiotensin converting enzyme inhibitor, ARB = angiotensin receptor blockers; APD = automated peritoneal dialysis, CAPD = continuous ambulatory peritoneal dialysis

Summary / Conclusions

- Among patients with RKF, diuretic use was highest in Japan (68%) and lowest in the United Kingdom (36%) and Australia/New Zealand (45%).
- ACEi use was highest in Canada (28%) and ARB use was highest in Japan (59%)
- In adjusted models, greater urine volume and higher GFR were associated (cross-sectionally) with shorter PD vintage and APD (vs. CAPD), but not with diuretic, ACEi, or ARB use
- **As the study accrues follow-up time, PDOPPS will provide important longitudinal data on practice variation and outcomes to evaluate the role that diuretics and other practice patterns (including PD solution type) may play in preserving residual kidney function among PD patients**

Figure 2: Facility % of patients prescribed ACEi, ARB, diuretics

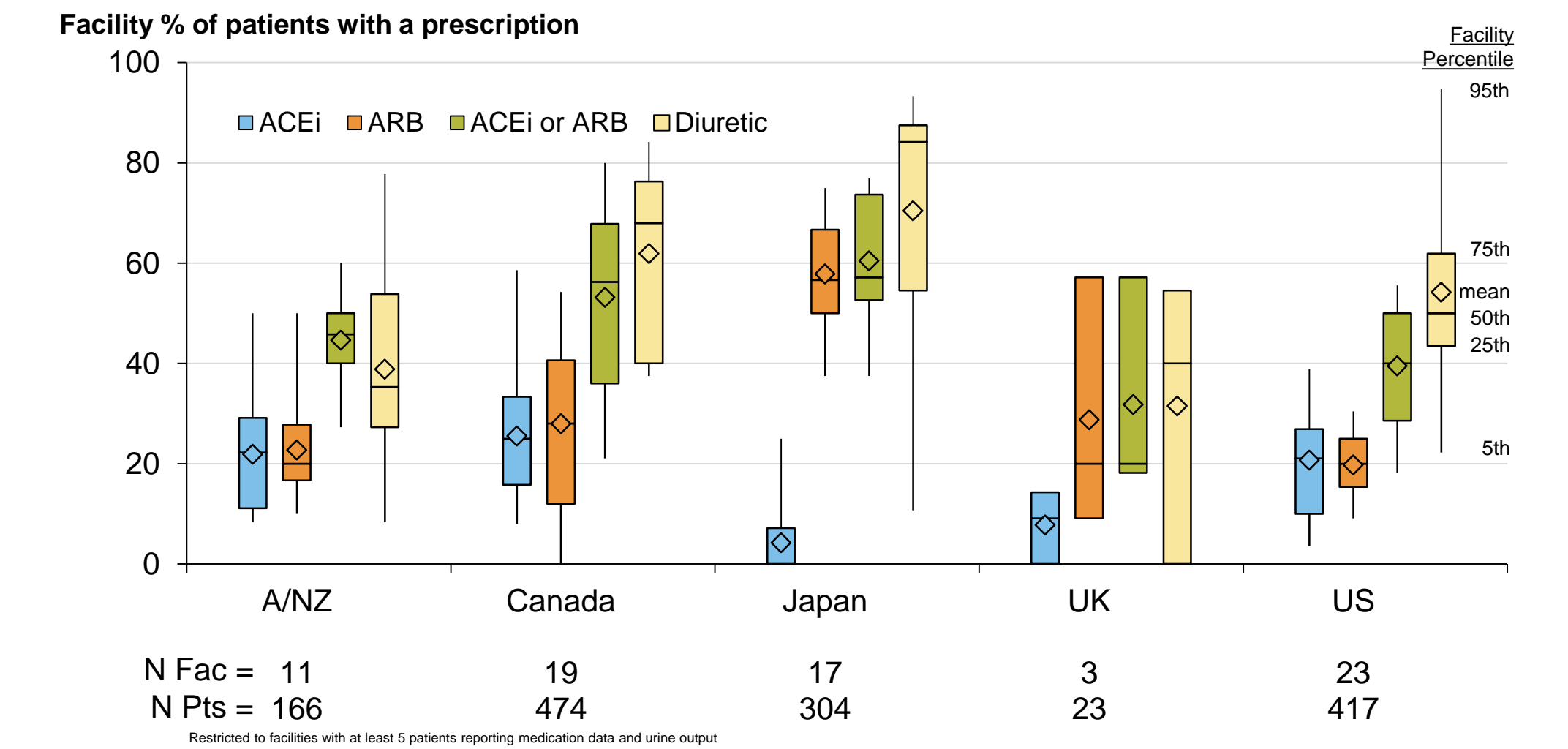


Table 2: Patient characteristics and treatments associated with (a) 24-hour urine volume and (b) GFR among patients with urine output

Demographics	Model Outcomes ^a estimate (95% confidence interval)	
	(a) 24-hour Urine Volume/Weight ^b	(b) GFR ^c
Age, per 10 years	-0.01(-0.03,0.00)*	0.02(-0.01,0.05)
Male	-0.02(-0.06,0.02)	0.06(-0.02,0.14)
Black race	-0.13(-0.21,-0.05)*	-0.08(-0.22,0.05)
PD vintage, years	-0.05(-0.06,-0.03)*	-0.07(-0.09,-0.05)*
Diabetes	-0.11(-0.15,-0.07)*	-0.01(-0.09,0.07)
Prescriptions and PD type		
ACEi	-0.01(-0.07,0.05)	-0.01(-0.13,0.10)
ARB	0.01(-0.04,0.06)	-0.04(-0.14,0.07)
Diuretic	0.01(-0.03,0.06)	0.06(-0.03,0.15)
APD (vs CAPD)	-0.07(-0.11,-0.02)*	-0.11(-0.21,-0.02)*
Country		
Australia/New Zealand	0.01(-0.10,0.12)	0.09(-0.18,0.37)
Canada	0.04(-0.06,0.13)	0.13(-0.10,0.36)
Japan	0.10(0.00,0.20)	-0.71(-0.97,-0.44)*
United Kingdom	0.07(-0.09,0.23)	0.22(-0.16,0.61)
United States	0.00 (ref)	0.00 (ref)

a. Adjusted for all variables in the table and accounting for facility clustering; among patients with reported urine volume > 0
 b. Modeled outcome is log(24-hour Urine Volume+1)/Weight(kg)*100; 0.08 unit decrease in log transformed/weight normalized outcome corresponds to ~ 50 mL decrease in urine volume for a 70 kg individual; n = 1902 patients (15 patients with missing weight)
 c. Modeled outcome is log(GFR+1); 0.7 unit decrease in log transformed outcome corresponds to 0.5 mL/min/1.73m² decrease in GFR; n=995 patients (with 24 hour creatinine and urea values available)
 * p < 0.05