DPM-PD Sampling, Study Design, and Calculation Methods

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The Dialysis Outcomes and Practice Patterns Study (DOPPS) Practice Monitor on peritoneal dialysis (DPM-PD) aims to report nationally representative trends in US peritoneal dialysis (PD) care using a complex sample design. Details of the PDOPPS study design have been published[1]. Selected aspects of the DPM-PD study design and calculation methods are summarized below for readers of the DPM-PD.

Although efforts are made to provide nationally representative statistics in the DPM-PD, it is important to note that sampling variability, the use of survey weights, and calculation methods may produce results that differ slightly from other national data sources. However, comparisons on selected measures with the national USRDS annual data report in the table below show remarkable concordance with the DPM-PD population after weighting.

Comparisons to US hemodialysis patient profiles and clinical practices can be made at the DOPPS Practice Monitor (DPM-HD) site (www.DOPPS.org/DPM-HD).

Facility Sample Frame

The DPM-PD is based upon study patients from 150+ US PD facilities contributed by three different organizations: DaVita, Inc., Fresenius Medical Care of North America (FMCNA), and Visonex®. DaVita and FMCNA are large dialysis organizations (LDO) which collectively care for the majority of all US PD patients. Visonex receives data from free-standing and hospital-based dialysis clinics and small dialysis chains that use Visonex's Clarity electronic health record (EHR)

system. The DPM-PD includes all PD units using the Visonex Clarity EHR that treat at least 5 PD patients, plus approximately 55-75 PD units each from DaVita and FMCNA which are randomly selected for study participation to represent facilities in 10 different US geographic regions and 3 different facility size groups (13-20, 21-59, and 60+ PD patients/facility).

Sampling Weights

Facility sampling weights and patient-level post-stratification weights are applied to report data that are representative at the national level. The facility weights are calculated based on the fraction of US PD facilities within each geographical region (east, north, south, west) and dialysis organization size (LDO vs. non-LDO) stratum based on a list of US PD facilities from CMS with at least 5 new PD patients in 2017. Within each stratum, the weight is based on the proportion of national facilities to PDOPPS sampled facilities (i.e., the reciprocal of the facility sampling fraction). The patient-level post-stratification weights are computed for each patient/dataset to correct for disproportionate data availability using multiple regression models conditional on basic demographic variables.

How Data are Reported in the DPM-PD

Demographic data and prescription of various cardioprotective and anti-hypertensive agents are reported every four months. Anemia and mineral bone disorder medication use are reported monthly as a reflection of medication use either in the given study month and/or during the prior three months. Routinely measured laboratory data are reported as the three month mean (based on the last 2 to 3 monthly values). Less frequently measured laboratory data (e.g., PTH, ferritin) are reported as the three month mean of the last 1 to 3 monthly values. Process measures, such as the proportion of patients with non-missing lab values, are also reported for three-month periods.

Continuous variables (e.g., hemoglobin levels) are presented as simplified box plots showing the median (50th percentile) value as a large dot, with auxiliary lines indicating the 10th-25th and 75th-90th percentiles. Categorical variables are presented as column (two levels) or stacked column charts with clinically meaningful cut-points. Annotated examples of these types of charts are available on the DPM-PD website: http://www.dopps.org/DPM-PD/Understanding.pdf.

Data Entry and Software

Anonymous raw data are collected from the US PDOPPS study sites via electronic data transfer from databases. Range and consistency checks are performed on all data. Statistical analyses are performed using SAS 9.4 (SAS Institute, Cary, NC).

Table: Comparison of measures reported for US PD patients in year 2019 in the USRDS Annual Data Report versus in the DPM-PD

Measure	USRDS ADR (2019)[2]	DPM-PD (2019)[3]
Patient age, yrs		61.0
18-34 yrs	7%	6%
35-54 yrs	28%	28%
55-74 yrs	49%	48%
75+ yrs	16%	19%
Male	57%	55%
Black race	23%	24%
Diabetes, as primary ESKF cause	41%	44%
Serum Albumin, g/dL		3.6
<3.5 g/dL	33%	31%
3.5-<4.0 g/dL g/dL	45%	44%
4.0+ g/dL	22%	25%
Serum Phosphorus, mg/dL		5.6
<3.5 mg/dL	5%	6%
3.5-<4.5 mg/dL	20%	19%
4.5-<5.5 mg/dL	29%	29%
5.5-<6.5 mg/dL	21%	22%
6.5+ mg/dL	25%	24%
Mean Hemoglobin, g/dL	10.9	10.9
<9 g/dL	8%	8%
9- <10 g/dL	16%	16%
10- <11 g/dL	31%	29%
11- <12 g/dL	25%	26%
≥12 g/dL	20%	22%
Use of automated peritoneal dialysis (APD)	86%	87%
Weekly standard Kt/V ≥1.7	93%	91%

Results displayed as average of 4 quarterly means for USRDS or the median of each month for the DPM-PD

References

1. Perl J, Davies SJ, Lambie M, Pisoni RL, McCullough K, Johnson DW, Sloand JA, Prichard S, Kawanishi H, Tentori F, Robinson BM. (2016) "The Peritoneal Dialysis Outcomes and Practice Patterns Study (PDOPPS): Unifying efforts to inform practice and improve global outcomes in peritoneal dialysis." Perit Dial Int. 36(3), pp. 297-307.
2. United States Renal Data System. 2021 USRDS Annual Data Report: Epidemiology of kidney disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2021. End Stage Renal Disease – Chapters 2 and 3, and Volume 2 Reference Table D.
3. DOPPS Practice Monitor-Peritoneal Dialysis. https://www.dopps.org/DPM-PD Accessed January 11, 2022.