

# Attitudes toward Peritoneal Dialysis among Peritoneal Dialysis and Hemodialysis Medical Directors

## Are We Preaching to the Right Choir?

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Worldwide, only 10% of the approximately 1.7 million patients on dialysis are treated with home-based peritoneal dialysis (PD); the majority receive facility-based hemodialysis (HD), although most patients prefer PD when educated about their options (1). There is substantial geographic variation in PD utilization. Between-country variation may result from cost of treatments; cultural, educational, and health care system differences; or reimbursement policies that incentivize the use of one therapy. Within-country variation may reflect regional differences in facility infrastructure, expertise, resources, and home dialysis education.

Physician education, training, and experience with home PD remain limited. A recent survey identified home dialysis training as the leading educational gap among United States nephrologists in training (2). Although few absolute contraindications to PD exist, recommendations to more challenging patients can vary. This may stem from a lack of comfort with PD as a therapy or an inherent negative perception regarding its suitability.

We compared differences in attitudes of the medical directors of both PD and in-center HD units toward patient eligibility and the barriers to PD utilization. We hypothesized that, regardless of country and by virtue of limited exposure, the leaders of HD facilities may use more restrictive and varied eligibility criteria and perceive different barriers to PD use compared with their PD counterparts.

We examined 2014–2018 data from the Dialysis Outcomes and Practice Patterns Study (DOPPS) Phases 5 and 6 and the Peritoneal Dialysis Outcomes and Practice Patterns Study (PDOPPS) Phase 1. The DOPPS and the PDOPPS are ongoing, international prospective cohort studies of dialysis facility practices and patient outcomes for adult in-center HD and PD participants. Study participants are  $\geq 18$  years old and selected randomly from a national sample of patients at dialysis facilities (<http://www.dopps.org>) (3,4). A central institutional review board approved each study phase; we obtained additional approvals and informed patient consents as required by national and local regulations.

The DOPPS asked medical directors of PD and HD facilities in Canada, Japan, the United Kingdom, and the United States (1) to rate the level of PD training and support in their units, (2) whether certain patient factors would influence PD recommendations, and (3) about potential reasons why PD was not more widely used in their program.

One hundred eighty-five (73% response rate) HD and 116 (66% response rate) PD directors responded. PD directors perceived greater PD training and enthusiasm among their nephrologists and nursing staff (72%–97% versus 69%–84%, respectively). HD directors were much less likely to recommend PD for patients across a host of conditions and patient characteristics (Figure 1A).

HD and PD directors held different opinions about the reasons for low PD use in their programs (Figure 1B). HD directors were more likely to cite patient factors, such as low interest, social support, and capability to use PD, as the cause of lower use. Nearly 40% of HD medical directors compared to only 10% of PD medical directors indicated the perception of HD's superior quality impeding PD growth at their unit. The only major intercountry variation that we noted was in Japan—staff members in these HD units were generally the least enthusiastic about PD (35%–40% versus 61%–100% in other countries).

It is troubling that these beliefs translate into strikingly wide gaps in recommending PD for incident patients with common comorbid conditions. One half of United States patients starting dialysis have diabetes, one quarter are age 75 years old or older, and one third are obese. Choosing not to consider PD for these patients will restrict their choice of modality, a decision more appropriately made on the basis of broader clinical and patient-centered outcomes, such as quality of life.

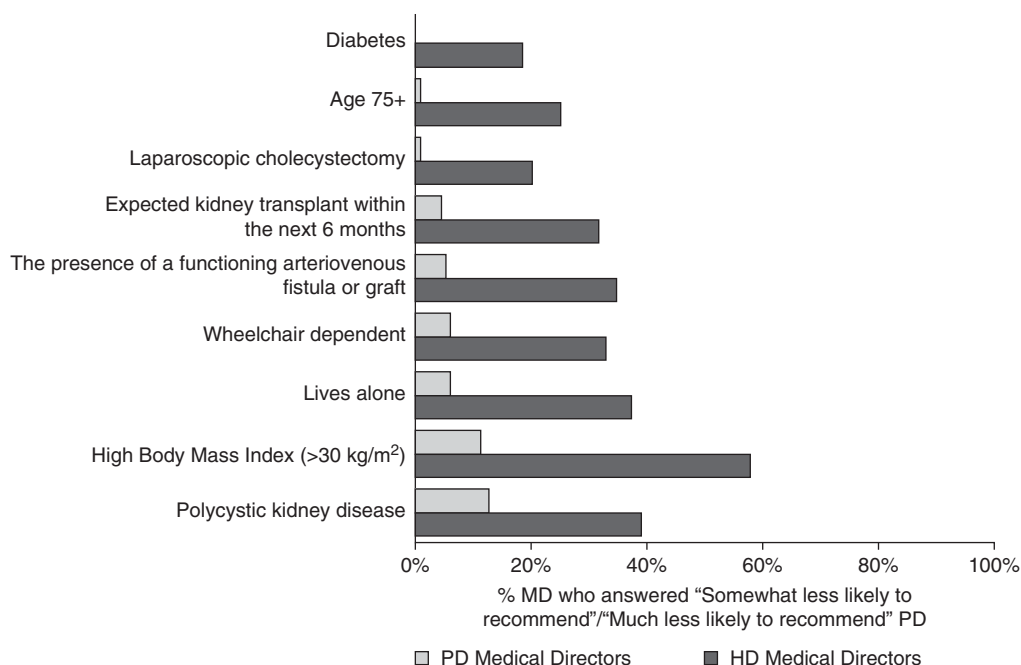
HD medical directors' responses also indicated misconceptions about PD eligibility. They may have been unfamiliar with the option of assisted PD for patients traditionally viewed as poor candidates or less current with literature that has refuted the myths that minor surgeries, polycystic kidney disease, or

Due to the number of contributing authors, the affiliations are listed at the end of this article.

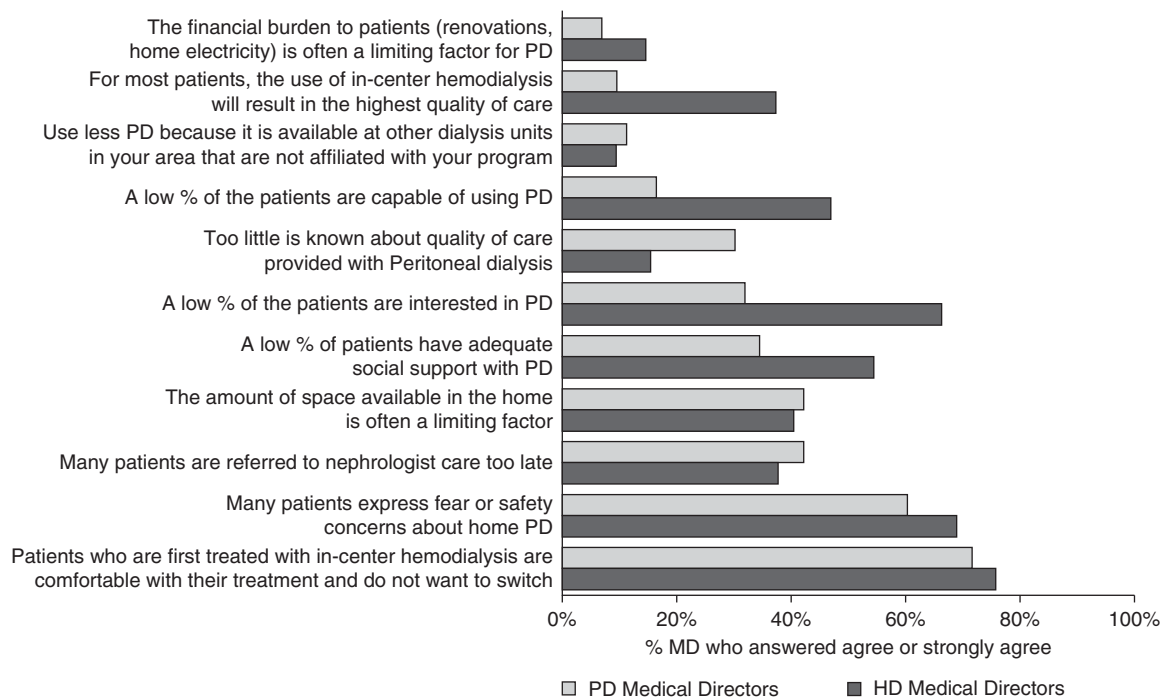
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A



B



**Figure 1. | Hemodialysis (HD) medical directors were less likely to recommend peritoneal dialysis (PD) and had different opinions about the reasons for low PD use than PD medical directors.** (A) The survey question was as follows: “How likely are you to discourage the use of peritoneal dialysis based on the following conditions alone?” In total, 116 medical directors (MDs) in PD facilities (Canada, 15; Japan, 25; the United Kingdom, 34; and the United States, 42) and 185 MDs in HD facilities (Canada, 25; Japan, 61; the United Kingdom, 20; and the United States, 79) responded. Answer choices for HD MDs were much more likely to recommend, somewhat more likely to recommend, remain neutral, somewhat less likely to recommend, and much less likely to recommend, whereas for PD MDs, answer choices were strongly encourage, encourage, remain neutral, discourage, and strongly discourage. (B) The survey question was: “The following questions refer to the reasons PD is not more widely used at your program. Answer your level of agreement with the following.” In total, 116 MDs in PD facilities (Canada, 15; Japan, 25; the United Kingdom, 34; and the United States, 42) and 185 MDs in HD facilities (Canada, 25; Japan, 61; the United Kingdom, 20; and the United States, 79) responded. Answer choices were the same for both groups: strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

impending transplant are contraindications to PD. Physicians may also steer patients with a functioning fistula or graft toward HD.

HD medical directors were more likely to cite patient preferences as a barrier to PD use, a view potentially influenced by interaction with patients who have chosen HD over PD. Physicians' belief that patients prefer HD may consciously or unconsciously alter their approach to presenting PD as a treatment option.

Improved personnel education has the potential to reduce bias against home dialysis in HD units. A 3-hour education initiative improved the attitudes of in-center HD nurses toward home dialysis (5). Similar interventions for HD-focused physicians may catalyze PD growth.

Another solution involves creation of dedicated transitional care units that provide incident patients on dialysis with the comprehensive support and unbiased education that they need to make an informed modality choice (6). This is especially salient among patients urgently starting dialysis. Many "crash start" patients initiate HD by default without the opportunity to be adequately informed. Almost 80% of both HD and PD directors agreed that the preference of patients on in-center HD not to switch modalities was a major barrier to PD growth. After patients are established in traditional HD centers, education about treatment options may be limited and delivered by personnel who may strongly favor HD (5).

Study limitations include that physician opinions may not reflect actual practice and that results may not be generalizable to the excluded directors who practice in units with <20 patients on PD or HD and countries not included in the survey. We also did not quantify PD exposure and expertise among respondents and surveyed on select barriers, which did not include physician reimbursement policies.

Notwithstanding these limitations, HD medical directors had staff members with less training in and enthusiasm for PD, were less likely to recommend PD, and were more likely to cite patient preference as a barrier to PD growth. Educating physicians and staff, particularly about PD feasibility among various patients, may lead to greater utilization. The addition of transitional care units to ensure complete and unbiased patient education would help support informed modality decision making, particularly for those unexpectedly starting dialysis. Only through a multipronged solution that engages a range of practitioners can we expect to see major gains in PD use.

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### References

1. Devoe DJ, Wong B, James MT, Ravani P, Oliver MJ, Barnieh L, Roberts DJ, Pauly R, Manns BJ, Kappel J, Quinn RR: Patient education and peritoneal dialysis modality selection: A systematic review and meta-analysis. *Am J Kidney Dis* 68: 422–433, 2016
2. Rope RW, Pivert KA, Parker MG, Sozio SM, Merell SB: Education in nephrology fellowship: A survey-based needs assessment. *J Am Soc Nephrol* 28: 1983–1990, 2017
3. Perl J, Davies SJ, Lambie M, Pisoni RL, McCullough K, Johnson DW, Sloand JA, Prichard S, Kawanishi H, Tentori F, Robinson BM: 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: 297–307, 2016
4. Pisoni RL, Gillespie BW, Dickinson DM, Chen K, Kutner MH, Wolfe RA: The Dialysis Outcomes and Practice Patterns Study (DOPPS): Design, data elements, and methodology. *Am J Kidney Dis* 44 [Suppl 2]: 7–15, 2004
5. Phillips M, Wile C, Bartol C, Stockman C, Dhir M, Soroka SD, Hingwala J, Bargman JM, Chan CT, Tennankore KK: An education initiative modifies opinions of hemodialysis nurses towards home dialysis. *Can J Kidney Health Dis* 2: 16, 2015
6. Bowman B, Zheng S, Yang A, Schiller B, Morfin JA, Seek M, Lockridge RS: Improving incident ESRD care via a transitional care unit. *Am J Kidney Dis* 72: 278–283, 2018

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