

Exploring Preconceptions as Barriers to Peritoneal Dialysis Eligibility: A Global Scenario-Based Survey of Kidney Care Physicians



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Introduction: Despite the growing number of patients requiring kidney replacement therapy (KRT), peritoneal dialysis (PD) is underutilized globally. A contributory factor may be clinician myths about its use. The aim of this study was to explore perceptions about PD initiation by clinicians according to various physical, social, and clinical characteristics of patients.

Methods: An online global survey (in English and Thai) was administered to ascertain nephrologists' and nephrology trainees' decisions on recommending PD as a treatment modality.

Results: A total of 645 participants (522 nephrologists and 123 trainees; 56% male) from 54 countries (66% from high-income countries [HICs], 22% from upper middle-income countries [UMICs], 12% from lower middle-income countries, and 1% from low-income countries [LICs]) completed the survey. Of the respondents, 81% identified as attending physicians or consultants, and 19% identified as trainees or other. PD was recommended for most scenarios, including repeated exposures to heavy lifting, swimming (especially in a private pool and ocean), among patients with cirrhosis or cognitive impairment with available support, and those living with a pet if a physical separation can be achieved during PD. Certain abdominal surgeries were more acceptable to proceed with PD (hysterectomy, 90%) compared to others (hemicolectomy, 45%). Similar variation was noted for different types of stomas (nephrostomies, 74%; suprapubic catheters, 53%; and ileostomies, 27%).

Conclusion: The probability of recommending PD in various scenarios was greater among clinicians from HICs, larger units, and consultants with more clinical experience. There is a disparity in recommending PD across various clinical scenarios driven by experience, unit-level characteristics, and region of practice. Globally, evidence-informed education is warranted to rectify misconceptions to enable greater PD uptake.

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KEYWORDS: kidney failure; nephrologist; patient selection; peritoneal dialysis; survey

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People living with kidney failure require KRT to maintain life. Globally, KRT is provided through kidney transplantation (22%); and dialysis (78%), of which 11% is performed using PD.^{1,2} PD remains an effective, technically simple, and relatively inexpensive modality for most people with kidney failure.³ Although PD provides an effective therapy for

kidney failure, its application is still limited in many countries except those with PD-first policy such as Thailand⁴ and Hong Kong.^{3,5} This limited uptake is despite PD being more cost effective and less technically complicated.⁶

Internationally, many clinicians and patients agree to promote the use of home dialysis given its association with improved quality of life.^{7,8} However, in the majority of countries, including the United States, in-center hemodialysis is the current dominant KRT.^{9,10} In the United States, the Advancing American Kidney Health Initiative has presented an immediate opportunity to increase PD utilization.^{9,11} However, despite the

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increased PD focus and initiatives to increase its use, PD still remains underutilized in the United States and elsewhere.¹²⁻¹⁵

A major barrier to increasing the uptake of PD is the clinician perception of patient's suitability and capacity to safely perform this dialysis modality.¹⁶ Common myths still persist in this era of evidence.^{17,18} Some of these have become mistaken for evidence because they have been shared routinely and ritualistically, gaining credence with repetition and reiteration until they have settled comfortably into the gaps of medical thinking and teaching.¹⁸ Some myths have unwittingly been propagated through a tendency to simplify the complex, to generalize the specific, or to fail to represent the context in which problems are identified.¹⁷ We therefore sought to examine the extent to which these myths about the use of PD exist among kidney care physicians. We aimed to explore perceptions about PD initiation by clinicians according to various physical (e.g., obesity), social (e.g., the presence of pets) and clinical characteristics (e.g., previous surgery).

METHODS

The content of the survey instrument was initially conceived through 2020 and 2021 Twitter meetings through a network of international nephrologists and trainees who have embraced responsive technology to discuss the research, guidelines, and editorials that drive nephrology practice.¹⁹ A team of like-minded individuals was convened, and a survey devised on the group's experiences of myths they had commonly encountered in practice. Survey items were chosen based on the investigator's experience with common misconceptions about PD eligibility. These were the suitability of PD for patients with specific comorbidities such as obesity, cirrhosis, polycystic kidney disease (PKD), cognitive impairment, and immunosuppression. The uptake of PD was also evaluated in controversial areas such as patients with previous abdominal surgeries; stomas; and those requiring urgent-start PD, defined as PD within 2 weeks of catheter insertion. We examined whether PD would be recommended for a patient planning future pregnancy, for a patient with pets, and for a patient who likes swimming. The English version of the survey can be found in [Supplementary Figure S1](#). The survey was translated into Thai by TK using the backtranslation method.²⁰

The survey used a Likert scale that specifically requested the participant to indicate whether they would "always," "probably," "probably not," or "definitely not" provide PD to the patient in the

specific scenario. There was an option to indicate that they were "not sure." A favorable response to a question was indicated by the selection of "always" or "probably," whereas an unfavorable response was indicated by the selection of "probably not" or "definitely not."

The Likert scale has limitations in that for less-frequent scenarios, it is difficult to score a response with great certainty. Demographic data collected in the survey comprised age, gender, and country of practice. The countries were categorized by income according to the World Bank classification as either a LIC, lower middle-income country, UMIC, or HIC.²¹ This distinction, although not ideal, was made knowing that no single approach to income by country fully captures the complexities of a country's economic conditions and that this definition remains a recognized method of dividing countries.¹

The survey obtained information about the respondents' professional experience, including the number of years of practice, profession, size of PD unit, participation in specific home dialysis training, and experience in an ambulatory PD unit.

Initially, survey participants were solicited through the International Society for Peritoneal Dialysis (ISPD), Canadian Society of Nephrology, the United Kingdom Kidney Association, the Australian and New Zealand Society of Nephrology, Nephrology Society of Thailand, the Indian Society of Nephrology, the African Society of Nephrology, a non-profit dialysis provider in the United States focused on home dialysis, and an international network of contacts supplied by the authors. Approval was received by these Societies who disseminated the survey on behalf of the study team. The survey was also disseminated via various social media channels, including Twitter and Facebook after obtaining clearance from ethics.

The electronic survey was hosted at the University of Alberta and study data were collected and managed using Research Electronic Data Capture tools.²² Research Electronic Data Capture is a secure, web-based software platform designed to support data capture for research studies, providing an interface for validated data capture and automated export procedures for data download. Data from survey responses were analyzed using a descriptive statistical approach and through chi-square analyses using the statistical software Stata V17 (College Station, TX)²³ A *P* value of <0.05 denotes statistical significance.

Survey participants provided informed consent on the first page of the survey. The study was approved by the Human Research Ethics Board, University of Alberta, Canada: Pro00110087.

RESULTS

Between September 2021 and January 2022, the survey was opened by 717 participants, of which 72 (10%) did not respond to any questions and 645 (81% nephrologists, 18% trainees, 1% other) from 54 countries completed at least 1 question. Of the participants, 574 (89%) completed all items in the survey. All responses were included in the analysis and no data imputation was performed. Two-thirds of participants came from HICs, with the majority of participants (84%) coming from units that offered ambulatory or outpatient PD services. Of the participants, 22% had undertaken specific home dialysis training (Table 1). The full

Table 1. Participant characteristics

Characteristic	Group	Total: 645 (%)
Gender	Female	275 (43)
	Male	362 (56)
	Other	8 (1)
Age group (yr)	Less than 25	1 (1)
	26–35	151 (23)
	36–45	232 (36)
	46–55	157 (24)
	56–65	79 (12)
	More than 66	25 (4)
Profession	Attending physician/consultant	522 (81)
	Nephrology trainee (post core internal medicine training)	114 (18)
	Other	9 (1)
Years in Practice (yr)	0–5	252 (39)
	6–10	103 (16)
	11–15	115 (18)
	More than 16	175 (27)
Practice Type	Public sector (NHS, Veterans Affairs, National Healthcare)	383 (59)
	Private sector (LDO, non-profit organization, private practice)	103 (16)
	Mixed (private + public sector)	36 (6)
	Other	123 (19)
Size of Peritoneal Dialysis Service	0–10 patients	134 (10)
	11–50 patients	169 (26)
	51–100 patients	13 (22)
	101–200 patients	81 (13)
	201–300 patients	48 (7)
	More than 301 patients	70 (11)
Region	Africa	25 (4)
	Eastern & Central Europe	8 (1)
	Latin America & the Caribbean	16 (3)
	Middle East	16 (3)
	North America	184 (29)
	Oceania & South-East Asia	217 (34)
	South Asia	58 (9)
	Western Europe	104 (1)
	North and East Asia	17(3)
Country Income Classification	Low-income	5 (1)
	Lower middle-income	75 (12)
	Upper middle-income	142 (22)
	High-income	423 (66)

LDO, large dialysis organization; NHS, National Health Service.

numbers of participants by country are displayed in [Supplementary Table S1](#).

Lifting and Carrying Children

For a woman who has small children and requires to frequently lift and carry them, most participants (94%) were comfortable to offer PD. However, this proportion of favorable responses decreased to 49% if the situation was changed to consider PD in a professional weightlifter.

Swimming

Participants were mostly in favor of patients swimming in private pools (72%) and the sea or ocean (50%). However, the percentage of participants answering favorably decreased progressively for community pools (39%), freshwater water bodies (26%), and hot tubs or saunas (24%) (Figure 1). Participants from HICs and UMICs responded more favorably to swimming in community pools (43% and 40%, respectively), than those from lower middle-income countries and LICs (24% and 0%, respectively; $P = 0.004$). Nephrologists were more likely to allow swimming in the sea and ocean compared with trainees (53% vs. 39%; $P = 0.008$). Participants indicated the use of a colostomy bag (47%) or a waterproof dressing (37%) to protect the exit site during water-based activities (Figure 2). There was evidence of regional variation with predominant use of a colostomy bag in HICs (51%) and UMICs (48%), whereas a waterproof dressing was most commonly used in lower middle-income countries (55%; $P = 0.04$). Participants who worked in an outpatient PD service were more likely to suggest a colostomy bag over a waterproof dressing (49% vs. 36%; $P = 0.05$).

Obesity

Of the participants, 59% would offer PD to a patient with a body mass index (BMI) greater than 40 kg/m². The regions with the highest proportion of unfavorable responses were the Middle East (63%) and Africa

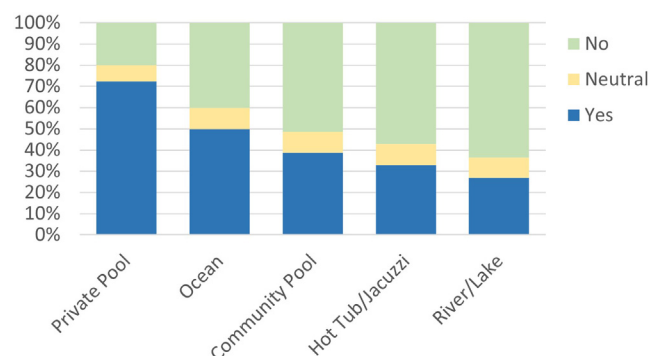


Figure 1. Physicians' recommendations for swimming in bodies of water.

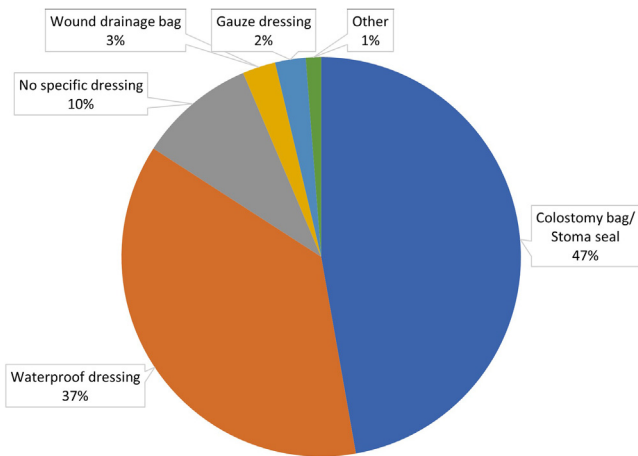


Figure 2. Physicians recommended peritoneal dialysis catheter exit site covering for water activities illustrating the colostomy bag as the main exit site covering.

(55%). In comparison, PD was more likely to be offered among obese patients living in North America (76%), Latin America (64%), South Asia (64%), and Western Europe (62%; $P < 0.001$) (Figure 3). By income status of the country, 75% of participants from LICs would not offer PD compared with 21% of participants from HIC ($P < 0.001$). Participants from units with ambulatory PD services were more likely to offer PD compared with other participants (62% vs. 44%; $P = 0.004$). Among the participants who would recommend PD for patients with a BMI greater than 40 kg/m², 86% indicated that they would still offer PD even for a potential transplant candidate needing to achieve a BMI <32 kg/m², and 88% would offer PD to a patient with concurrent diabetes mellitus.

Pets

For a person living with multiple animals in a small apartment, 44% of participants would offer PD. A higher percentage of Latin American participants (29%) would always allow this practice, whereas it was less likely in other regions (range 0%–12%; $P <$

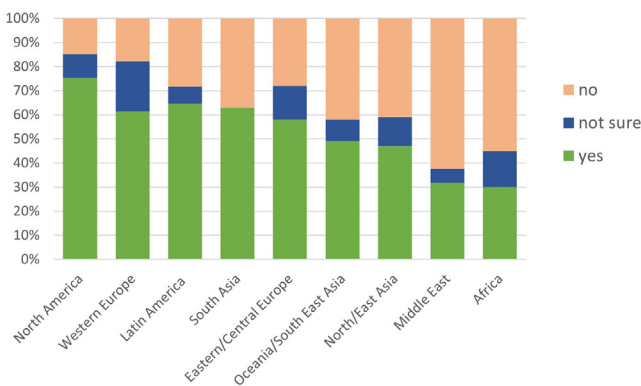


Figure 3. Regional differences in kidney physicians offering peritoneal dialysis to a person with a body mass index of greater than 40 kg/m².

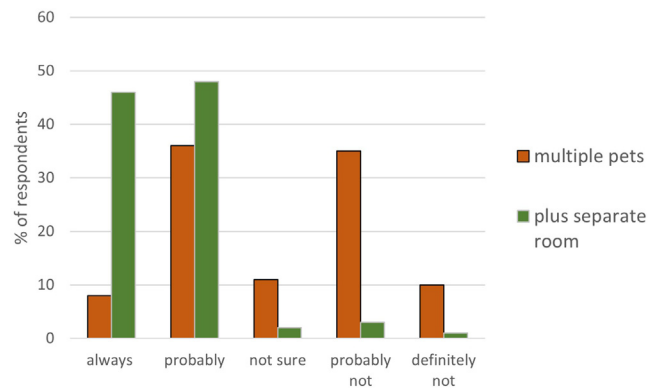


Figure 4. Responses by physicians to whether peritoneal dialysis would be offered to a person with multiple animals in a small apartment compared to if there was a separate dedicated peritoneal dialysis treatment room in the apartment.

0.001). Of the participants from LICs, 75% would offer PD compared with 49% of participants from HIC ($P < 0.001$). Nephrologists were more confident to offer PD in these situations compared with trainees (47% vs. 33%; $P = 0.04$). If the patient had a separate room to perform PD, 94% of participants indicated that they would offer PD (Figure 4).

Major Abdominal Surgery

The majority of participants would offer PD to a patient who had undergone a hysterectomy and/or a laparoscopic gallbladder removal (90%), or a mesh hernia repair (72%). However, participants were far less likely to respond favorably if their patient had a midline scar extending from xiphisternum to pubic symphysis from laparotomy (45%), a hemicolectomy for colon cancer (44%), and radiotherapy for ovarian cancer (35%; Figure 5). Participants from units that managed ambulatory or outpatient PD services were more comfortable offering PD in patients who underwent laparotomy and hemicolectomy (Figure 5). Nephrologists were more likely to offer PD to patients after laparotomy compared with trainees (48% vs. 35%; $P = 0.047$).

Participants were more likely to offer PD to patients with a history of radiotherapy if they came from units of larger size (52% for units with 201–300 patients and 47% for units >301 patients vs. 28%–36% for units with <200 patients; $P = 0.01$). Moreover, participants with home training experience were more likely to offer PD to patients with a history of radiotherapy (47% vs. 32%; $P = 0.02$).

Stomas

Participants were most comfortable offering PD to people with nephrostomies (74%), followed by suprapubic catheters (53%), percutaneous endoscopic

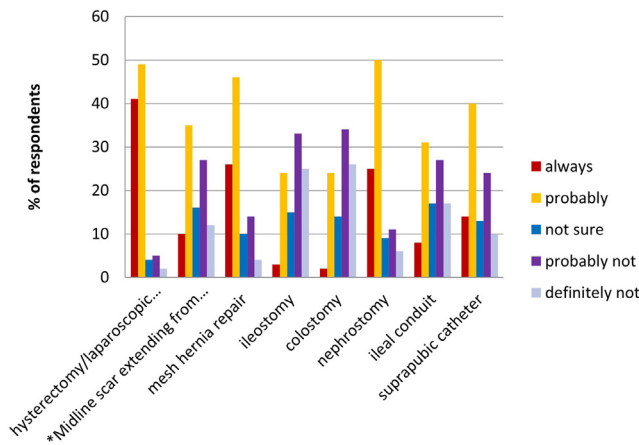


Figure 5. Physicians’ responses to whether a person with the following medical history would be a suitable candidate for peritoneal dialysis.

gastrostomy (PEG) tubes (44%), ileal conduits (39%), ileostomies (27%), and colostomies (26%). For patients with an ileostomy, units with 50 or fewer patients had high uncertainty (20%) compared with large units (5% in participants from units with >301 patients; $P = 0.02$).

Larger units were less likely to offer PD to patients with PEG tubes: 61% of participants from units with greater than 300 patients would not offer PD to patients with a PEG tube, compared to 38% of participants from units with 0 to 10 patients ($P = 0.003$). There was also increased uncertainty (20%) in participants from small units (0–10 patients) compared to participants from large units with greater than 301 patients (3%).

For suprapubic catheters, there was a significant disparity in responses from participants depending on the size of the unit they came from; with the larger the

unit, the less likely the participants were to offer PD ($\chi^2(20), 32.71; P = 0.04$).

Liver Disease

Of the participants, 71% would offer PD to a patient with cirrhosis with ascites (Figure 6); however, this decreased to 47% if the patients had a transjugular intrahepatic portosystemic shunt procedure and 20% if the patient had a ventriculoperitoneal shunt. For patients undergoing a transjugular intrahepatic portosystemic shunt procedure, participants were more likely to offer PD if they came from large units (61% for units with 201–300 patients and 64% for units with greater than 300 patients) compared with small units (36% for units with fewer than 10 patients; $P = 0.001$). The proportion of uncertain participants was higher for those from units with fewer than 200 patients (range 23–34%) compared to those from units with greater than 200 patients (range 12%–16%).

PKD

Of the participants, 87% would offer PD to a patient with PKD (Figure 6).

Immunosuppression and Transplant

Of the participants, 64% would always offer PD to a patient on chronic immunosuppression; and 81% would offer PD to a patient with a failed kidney transplant who was on PD for 5 years before undergoing transplantation (Figure 7).

Frailty and Cognitive Impairment

Of the participants, 47% would offer PD to a frail patient with cognitive impairment. Those who would provide PD were more likely to come from larger PD units (73% for units with 201–300 patients and 56% for units with greater than 300 patients vs. 31% for

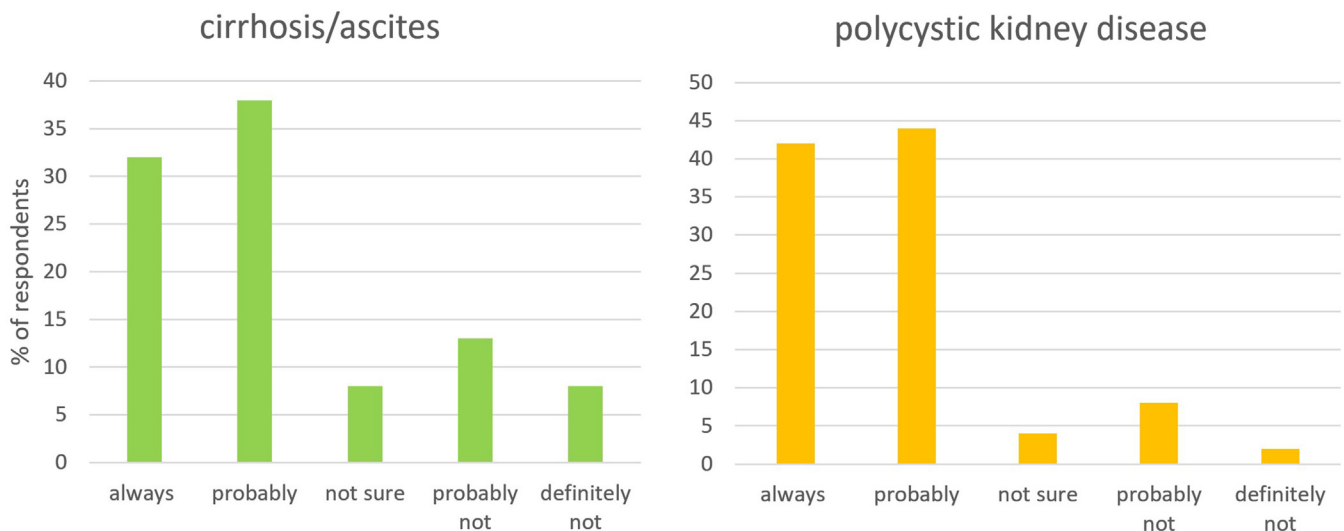


Figure 6. Physicians offering peritoneal dialysis to people with either liver cirrhosis/ascites or polycystic kidney disease.

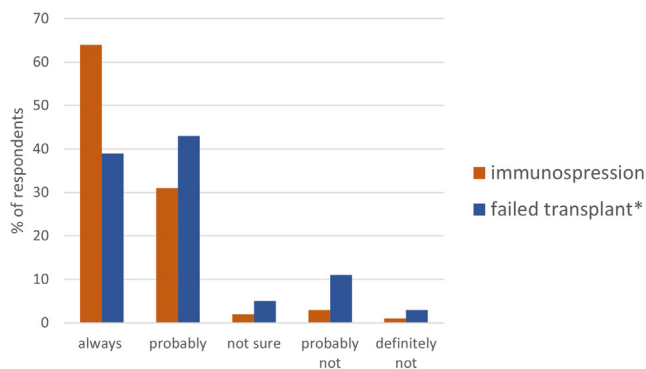


Figure 7. Physicians' responses in recommending peritoneal dialysis for a patient on chronic immunosuppression and a patient who has had a failed transplant*.

units with fewer than 10 patients; $P = 0.002$). The data in Figure 8 demonstrate an increased level of confidence to offer PD to patients with cognitive impairment if there is an option to provide home-based or nursing-home based assistance to deliver PD when compared to a scenario where assistance is unavailable. Respondents who were unsure about recommending PD to patients with cognitive impairment (18%) were more confident when access to an assisted PD service was available with only 4% unsure for home-based and 2% unsure for nursing home-based assistance.

Urgent-Start PD

Urgent-start PD (defined as starting PD within 2 weeks of catheter insertion) was considered acceptable by 95% of participants, with 60% stating they would always and 35% stating they would probably consider this.

DISCUSSION

This study is the first global survey of its kind exploring nephrologists' and nephrology trainees' views on a wide range of clinical scenarios on the suitability of PD for people with lifestyle and health-

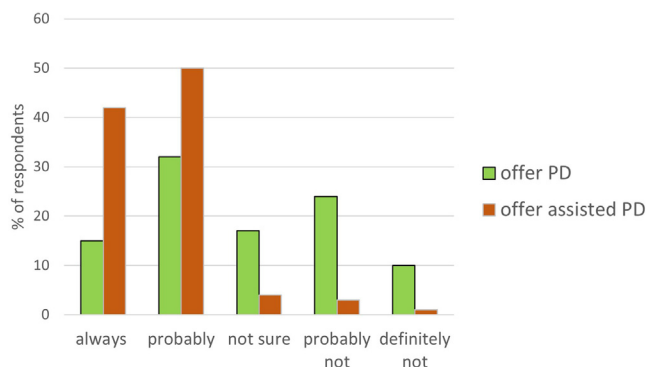


Figure 8. Percentage of physicians who would offer assisted peritoneal dialysis to a frail patient with cognitive impairment compared with unassisted peritoneal dialysis. PD, peritoneal dialysis.

related characteristics that may have traditionally prevented the PD modality being offered. The results of this survey can inform the recent increased focus on life participation core outcome measures,²⁴ providing a snapshot of current worldwide nephrology practice and opinion.

Even though most respondents were comfortable with recommending PD for mothers lifting and carrying their children, there was less enthusiasm when heavier weightlifting was added. Little research into the capacity of people receiving PD to lift heavy weights has been reported even though people receiving PD are required to move heavy supplies as part of the home PD treatment. In PD exercise intervention studies, there have been few reports of hernia during exercise programs, albeit few of these studies have involved core resistance exercises.²⁵

We found that respondent consensus was favorable for people swimming in private pools, followed by the ocean, and community pools, with most not recommending rivers and lakes, jacuzzies, or hot tubs. This reflects historical recommendations,^{26,27} although recent reports reveal that exit-site infections or peritonitis are rarely reported in those who swim.^{28,29} Respondents were more likely to recommend swimming, particularly in community pools, if they were from a HIC, possibly reflecting more confidence in water quality²⁹⁻³¹; although given the low response numbers from LICs, these results need to be interpreted with caution. Recent recommendations suggest swimming, particularly in open water and well-maintained pools (private or community); however, concerns still exist regarding swimming in open water directly after storms.²⁸ Regardless of where the swimming is done, protection with colostomy bag or waterproof dressing and strict post activity exit site care is recommended.^{32,33} This survey confirmed that nephrologists are aware of the importance of activities such as swimming.³⁴

The presence of pets has been seen as a contraindication to PD and although respondents were mixed in their views, they were comfortable with pets if they were in a separate room than where the treatment was occurring. Although the risk of zoonotic peritonitis has been recently reported,^{35,36} the 2022 update by the ISPD on peritonitis do not specify pets as a contraindication. Extra precautions are required to prevent peritonitis if domestic pets are kept and that pets not be allowed in the room where PD exchanges take place, and where dialysis tubing, equipment and the machine are stored.³⁷ We concur with ISPD that people with pets should adhere to stringent hand washing before and after exchanges and handling pets; however, given that pets improve people's quality of life and that many

people receiving PD continue safely with this modality,³⁸ we do not believe that owning pets should be a contraindication.

Our finding that nephrologists are open to starting people with liver cirrhosis on PD is important, given that between 4% and 6% of patients with kidney failure have cirrhosis at the time of initiation of KRT.³⁹ Patients with cirrhosis can pose challenges, including the potential for protein loss with dialysate, increased risk of peritonitis, development of hernias, and fluid leaks.⁴⁰ However, PD in patients with cirrhosis are associated with a lower all-cause mortality than hemodialysis, and can be an effective therapy with a comparable risk of peritonitis and solute clearance in liver cirrhosis patients with kidney failure.⁴¹ Evidence points to the fact that PD may be better tolerated than hemodialysis⁴² and should be considered as a choice for KRT.

In contrast, there has been a concern about an increase in the risk of PD discontinuation in the first year from mechanical complication in patients with PKD. In the present study, most respondents indicated that they would recommend PD for patients with PKD. This decision is supported by findings from a recent systematic review of 9 studies ($n = 7197$; 882 patients with PKD) where outcomes (survival, peritonitis, and overall technique survival) on PD were better or comparable to non-PKD patients.⁴³ Although patients with PKD were at an increased risk of hernia (odds ratio: 2.28, 95% confidence interval: 1.26–4.12), we still believe that PKD should not be a contraindication to commencing PD.⁴³

A retrospective study of 185 patients (39 immunosuppressed, 146 nonimmunosuppressed) observed an increase in the risk of peritonitis from *Staphylococcus aureus* and fungi in those who received concurrent immunosuppression (which did not reach a level of statistical significance due to low event rates).⁴⁴ Others have reported a survival advantage in maintaining patients on long-term immunosuppression after failed kidney transplant to preserve residual kidney function conferring survival advantage and comparable risk of peritonitis compared to nonimmunosuppressed patients.⁴⁵

Self-care with PD requires the cognitive and physical ability to learn a new skill for the procedure to be performed safely and effectively. Given this, it is not surprising that 18% of respondents were unsure if they would offer PD to a person suffering from frailty and cognitive deficits. Responses shifted dramatically in favor of offering PD when either home-based or facility-based care support could be offered. Recent interest in, provision of, and funding for assisted PD^{46–50} is concordant with our findings.

Urgent-start PD is a recognized strategy for quickly beginning dialysis. Our survey results support this with 95% of respondents indicating they would probably or always employ an urgent-start strategy in an appropriate patient. This reflects the increasing use of urgent-start PD as a strategy.⁵¹

Obese patients may not be offered PD due to the assumption that they may not be able to achieve adequate dialysis and may have more complications.⁵² However, growing evidence suggests that there is no difference in outcomes between obese and nonobese patients.⁵³ A large observational cohort,⁵⁴ did show that, whereas patients with higher BMI did have more frequent complications, the survival was no different than patients receiving hemodialysis. We found that regional and program size affected response results, with a higher confidence in American, European, and South Asian respondents; and respondents from larger programs more likely to offer PD to obese patients. In saying that, our survey reflected a changing of opinion, with the majority of respondents comfortable with prescribing PD as a modality for obese people. A limitation of this question was the absence of consideration of those defined as morbidly obese with a BMI of greater than 40 kg/m².⁵⁵

There has been an historical reluctance in placing PD catheters in people with previous abdominal surgeries due to the expectation of adhesions and altered anatomy of the abdominal cavity.⁵⁶ However, there is increasing evidence that there is no difference in catheter survival, mechanical dysfunction, or infectious complications between patients with previous abdominal surgery and those without.^{57,58} Reflecting these findings, the survey respondents were confident in prescribing PD to patients with relatively simple uncomplicated procedures such as hysterectomy, laparoscopic gallbladder removal, or a mesh hernia repair, albeit a reluctance to offer PD to patients with more extensive surgeries. Of note was our finding that those programs with more experience had greater comfort in prescribing PD to patients with previous abdominal surgeries. This may suggest availability of advanced laparoscopic operators to implant PD catheters with possible interventions such as adhesiolysis performed at the time of PD catheter insertion.⁵⁹

Concerns for PD in people with indwelling catheters or stomas are related to cross-contamination and infections. Although this group make up only a small proportion of people requiring dialysis,⁶⁰ evidence is growing suggesting that cross-contamination is not a major issue.⁶¹ ISPD guidelines suggest using advanced laparoscopic techniques to insert catheters in these patients along with the consideration for extended catheters so that exit sites are located far away from the stoma or indwelling tube.^{62,63} Our survey

demonstrated support for PD in patients with nephrostomy and suprapubic catheter but confidence in PD waned when explored for PEG tubes, ileal conduits, ileostomies, etc. Uncertainty related to prevalent practices strongly depends on the size of the program, experience, and overall availability of resources to support PD with the complex abdomen. Given the overall uncertainty of management of PEG tubes and PD,⁶⁴ most respondents, including those from larger centers were reluctant to offer PD in the setting of a PEG tube and suprapubic catheter despite a case series recently suggesting that this is possible.⁶⁵

This study has several limitations. First, the majority of respondents were from HICs and UMICs, where PD is more prevalent. This prevented meaningful comparisons or associations comparing varying country income status. Second, respondents were sourced through the ISPD, the Canadian Society of Nephrology, the United Kingdom Kidney Association, the Australian and New Zealand Society of Nephrology, the Nephrology Society of Thailand, the Indian Society of Nephrology, the African Society of Nephrology, and associated networks. It is possible that some respondents from these organizations have a positive bias toward prescribing PD in challenging populations. In identifying these limitations, it is important to note that strength of this study has been the broad global reach to address some important controversies and questions surrounding commencing PD in traditionally marginal groups. The survey participants were initially solicited through academic societies and various social medical channels and this may have led to an obvious selection bias. For less-frequent clinical scenarios, the Likert scale has obvious limitations for measurement. Considering that this was a survey based on scenarios, it is hypothetical but presents a “shop floor” view of how clinicians manage these scenarios. The strengths of our study are that, it is a first attempt to dispel some of the common myths that may stop patients from being offered PD by clinicians and the fact that there has been a good level of engagement across several countries and resource settings.

In summary, we found that most nephrologists and nephrology trainees will consider commencing dialysis in the presence of historically reported barriers. We found some variations that may be driven by experience, unit-level characteristics, and region of practice. Globally, evidence-informed education is warranted to rectify misconceptions to enable greater PD uptake.

DISCLOSURE

NS reports personal fees from Baxter; and grants from Amgen, outside the submitted work. YC reports research grants and speaker's honoraria received from Baxter

Healthcare, and research grants from Amgen and Fresenius Medical Care. SL reports funding from Baxter, outside the submitted work. TK reports personal fees from Astra Zeneca; personal fees from Baxter Healthcare; and grants from Otsuka, outside the submitted work. GA reports personal fees from Baxter, outside the submitted work. All the other authors declared no competing interests.

SUPPLEMENTARY MATERIAL

Supplementary File (PDF)

Table S1. Participants by country.

Figure S1. Survey Instrument.

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