ISPD Asia-Pacific Chapter Newsletter, August 2024

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Prepared by Chia-Te Liao and Talerngsak Kanjanabuch

News from the ISPD

ISPD APC 2027 meeting call for bidding

Deadline for bidding

28 February 2025

Submission of application

Eligibility Criteria: Potential bidders must not have hosted ISPD or APCM-ISPD conferences within the last 5 years.

A soft copy of the bid application should be sent to the ISPD APC coordinator:

Professor Talerngsak Kanjanabuch; Email address: golfnephro@hotmail.com

Content of the bid application

- The name of president of the local organizing committee
- Confirmation of support from the national or regional society of nephrology
- The proposed timing and venue of conference
- The convention facilities with preferably a venue hotel in the convention complex.
- The bidders are encouraged to provide information on their previous experience hosting similar conferences to assess their capability
- The strength and experience of the local organizing committee, national or regional society of nephrology in relation to PD practice, development, research, and organization of conferences
- Rationale why Asia Pacific Chapter conference should be hosted in that country
- Transportation information and accommodation details (at different budgetary levels)
- The proposed budget to host the meeting
- Local attractions for visitors

Financial Arrangement

Any profits arising from the Congress will be split 50-50 between the Local Organization Committee and the ISPD. Most of the profit going to ISPD will be used for promotion and development of PD in the Asia Pacific region. Any further financial loss will be the responsibility of the organizing committee.

Proposal Review Process

All applications will be shortlisted and presented at APCM-ISPD 2025 in Kuala Lumpur, Malaysia. Decisions will be announced shortly after the event.

SCAN ME

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International Society of Nephrology - Oceania and South East Asia (OSEA)

Monthly Online Case Discussion (Zoom Meeting)

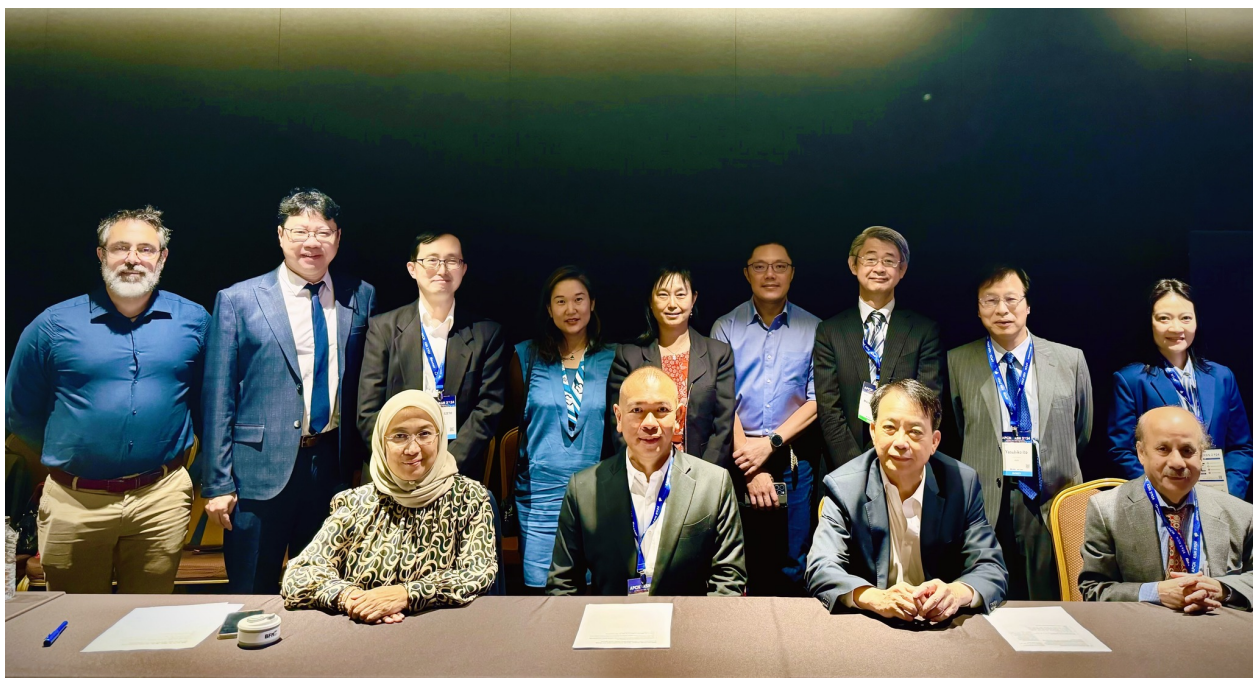
The case presentation will alternate monthly between glomerulonephritis case and peritoneal dialysis case, respectively.

1. Objective: The Case Discussion aims to foster dialogue and facilitate learning among nephrologists and healthcare professionals in the OSEA region.
2. Target Audience: This discussion is open to all nephrologists, nephrology fellows, nurses, and other healthcare professionals interested in PD.
3. Case Submission: We encourage members to submit PD cases for discussion directly via email to Professor Talerngsak Kanjanabuch; Email address: golfnephro@hotmail.com.
4. The information will be disseminated through the regional network one week before the meeting.

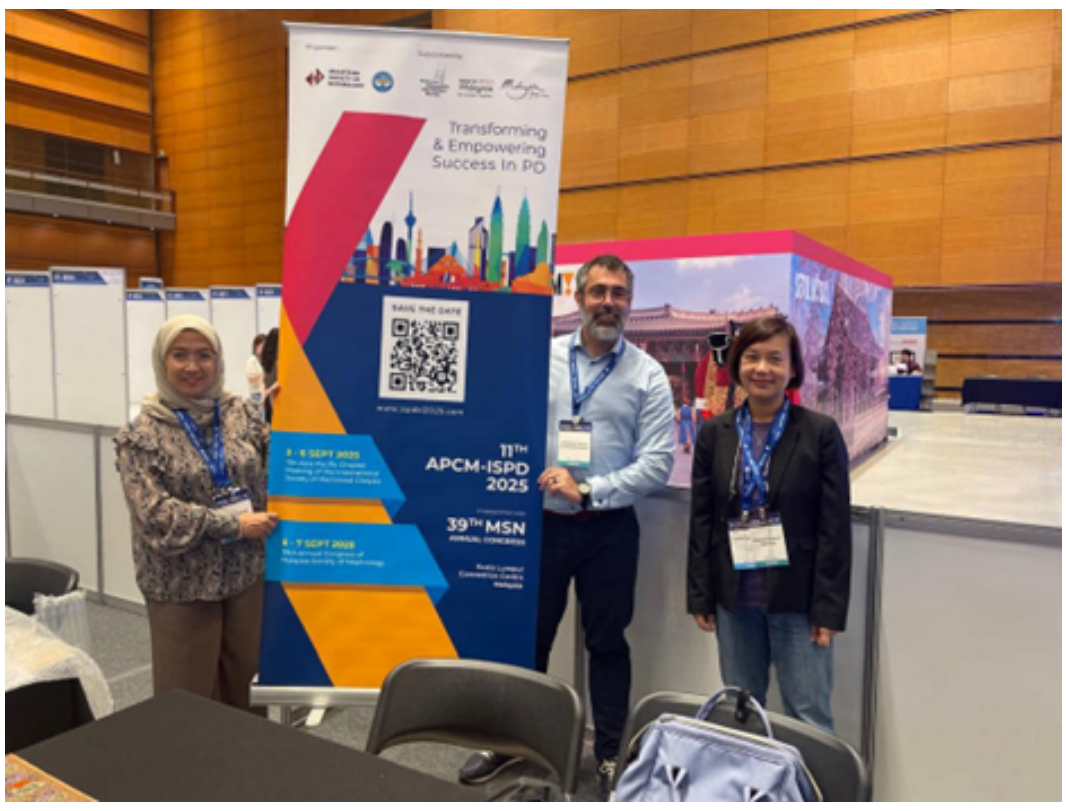
The next PD Case Discussion will be in **September 2024**.

Highlights from APCN-KSN 2024 Congress, Seoul, South Korea

ISPD Asia-Pacific Chapter Council Meeting - 15 June 2024



Malaysian Society of Nephrology - APCM-ISPD 2025 Promotional Booth



APCM-ISPD 2025 Congress President, Dr. Lily Mushahar (left); ISPD Coordinator, Miguel Gallardo (middle); and ISN Oceania and South East Asia Region Chair, Dr. Sunita Bavanandan (right)

Renew your membership!

Visit https://ispd.org/memberships/ to join the ISPD or renew your membership.

Membership benefits of the ISPD include:

- print and/or online subscription to Peritoneal Dialysis International
- Receipt of PD News
- Online access to ISPD Guidelines
- Special registration fees at ISPD Congress, Chapter Meetings and the Annual Dialysis Conference
- Application for ISPD Scholarships and Grants

Membership for developing countries can be done at advantageous rates, by grouping members by institution or region geographical area. Write to admin@ispd.org for more information.

New options to stay engaged with ISPD:https://mailchi.mp/ispd/members-2024

- **ISPD Associate Nurse/AHP:** a new modality for engaging in ISPD activities and obtaining the most relevant membership benefits for these profiles: participation on ISPD Committees, access to information and education resources, travel grants, fellowships, and discounts for events and congresses. To be able to lower the association fee to only $15 USD/year, this modality does not include the right to participate in the ISPD elections (neither being a candidate nor voting for the candidates) and does not include access to the PDI Journal either.This new modality of engagement will allow ISPD to reach many more nurses and allied health professionals, having a positive impact on their work and improving the well-being of many more kidney patients.To join as an Associate Nurse/AHP: CLICK HERE. We encourage all ISPD members to disseminate this new membership option among nurses and allied health professionals within their networks.
- **ISPD Retired Membership:** all membership benefits of a full member, while enjoying a reduced rate of only $80 USD/year, for retired members who can prove their retired status and who have been ISPD members for at least five years. An option to retain the experience and knowledge of valuable professionals who will stay engaged in the PD Community, contributing to the ISPD work through our committees and other activities.To obtain the retired membership, please provide proof of your status as a retired doctor/professor/nurse/AHP by emailing admin@ispd.org. After validation of your status, we will provide you with instructions on how to subscribe.

Other news from ISPD: Please refer to the latest ISPD newsletter: https://mailchi.mp/ispd/newsletter-mar24

Upcoming Meetings

International Society for Peritoneal Dialysis 2024 congress

26-29 September 2024

Dubai World Trade Center, Dubai, UAE

More information: www.ispd.org/dubai2024

11th ISPD Asia Pacific Chapter Meeting 2025

The Malaysian Society of Nephrology (MSN) will be hosting the 11th APCM-ISPD congress in Kuala Lumpur, Malaysia on the 4-7th September 2025.

The conference theme is "*Transforming and Empowering Success in PD*" with an aspiration moving towards home therapies especially in the Asia Pacific region. Together with colleagues from the Asia Pacific Chapter-ISPD core members, the local organizing committee had geared up preparing a varied and attractive scientific programme for the congress.

We would like to announce important dates for the congress:

- Registration open, Early bird: 1 January 2025 to 31 May 2025
- Standard registration: 1 June 2025 to 31 August 2025
- Abstract Submissions: 1 January 2025 to 1 June 2025

Please scan the QR code in the flyer below to register your interest to receive important reminders and exciting updates.

Guideline Update

SUMMARY: "Empowering Patient Choice and Care: The 2024 Assisted Peritoneal Dialysis Position Paper by the ISPD"



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The ISPD's recent Position Statement on Assisted Peritoneal Dialysis (aPD) in PDI 2024 aims to expand home dialysis access and options for vulnerable groups, such as the elderly, frail, or cognitively impaired, specifically **focusing on aPD funded by healthcare sytems—governments, health insurance, and charities.** This includes support from healthcare professionals, trained laypersons, and paid family members, while excluding assistance

from unpaid family members, friends, private caregivers paid by families, or PD provided by long-term care facilities or residential institution staff, unless assistants are visiting these institutions and not employed by them.

Vulnerable patients often face barriers to self-care due to physical and cognitive limitations, leading to the necessity of aPD during initiation and potentially long-term due to frailty or cognitive decline. Supported by healthcare systems, aPD involves trained professionals or paid caregivers assisting patients with home dialysis, enhancing patient satisfaction, reducing caregiver burden, and lowering infection risks, especially evident during events like the COVID-19 pandemic. This approach also benefits younger patients with disabilities relying on family-supported PD, emphasizing the preference for home care over in-centre hemodialysis (HD) due to familiarity and lower infection risks. Assistance with PD is typically needed **during initiation for safety and reassurance, long-term for patients with permanent barriers to self-care without caregivers, and short-term during temporary barriers or acute illnesses such as peritonitis.**

Recommendations-General

1. *Before implementing aPD, thoroughly assess individuals considering PD to identify physical, cognitive, emotional, and social barriers that aPD could help address.*
2. *Assess caregivers for their care burden when patients opt for PD.*
3. *Regularly monitor self-care PD or family-aPD patients for new barriers, promptly considering transition to aPD.*
4. *Monitor caregivers regularly to gauge the need for aPD support.*
5. *Promote aPD to reduce infections by enabling more home-based treatment over in-centre dialysis.*

aPD models vary widely globally due to cultural norms, healthcare policies, funding sources, and the prevalence of different dialysis methods. Government-funded programs in regions like France and Ontario, Canada provide sustainable coverage for both short-term and long-term care, employing registered nurses or licensed practical nurses, and in some cases, family members with government funding, to assist with tasks such as machine setup, connections, and patient assessments. The frequency and number of visits vary based on the level of assistance and funding, with some programs supporting multiple daily visits for comprehensive PD management.

Recommendations-Model

1. *Before implementing aPD models, define key characteristics like geographic coverage, funding sources, types of assistants, tasks performed, and support duration.*

Training PD assistants encompasses comprehensive education on tasks relevant to self-care patients, led by PD nurse educators or experienced nurses versed in various PD modalities. Sessions typically occur at PD centers or in collaboration with home care agencies and educational institutions. Adequate staffing of assistants is crucial to meet patient needs, accounting for travel time and workload, with contingency plans in place for staff absences to ensure consistent care delivery. Effective communication systems, such as regular calls or virtual visits, are essential for monitoring aPD patients, enhancing patient management, and supporting caregivers.

Recommendations-Training and Communication

1. *Train assistants using a standardized curriculum led by nurse educators or experienced PD nurses.*
2. *Ensure assistants are trained appropriately for their tasks.*
3. *Adequately staff aPD programs considering geographic coverage and prepare backup plans for staff absences.*
4. *Establish effective communication between PD programs and assistants.*

Continuous quality improvement (CQI) is vital in PD programs, ensuring high-quality healthcare through monitoring peritonitis rates, catheter-related complications, and transfer to HD for all patients, including those on aPD per ISPD guidelines. Patient-reported outcome measures (PROMs), such as quality of life instruments, are valuable but challenging for vulnerable patients. CQI initiatives have effectively reduced peritonitis rates and improved outcomes in PD overall, with limited specific projects for aPD. Graduation rates from aPD to self-care or family-assisted PD vary, reflecting differences in program approaches to patient selection and support. Standardized definitions, data collection, and evaluation are essential for establishing sustainable quality control in aPD programs, focusing on patient outcomes, staff training, and satisfaction measures.

Recommendations-Quality control

1. *PD programs should monitor outcomes in aPD populations, aligning with ISPD guidelines and considering local requirements.*
2. *Outcome reporting should differentiate between aPD and non-aPD.*

3. *Reports should adjust for differences in assisted patient demographics, such as older age and higher comorbidities.*

Funding for aPD varies widely by region, primarily relying on government support in established programs. For example, in Ontario, Canada, funds from the Provincial Ministry of Health support aPD through home care agencies or kidney programs, covering both short-term and long-term assistance. Similarly, in France, funding covers nurse salaries, transportation, and patient care for aPD, showing cost-effectiveness compared to in-centre HD. However, many regions lack sufficient governmental funding, leading to reliance on private insurance, which can create disparities in access based on socioeconomic status.

Recommendations-Funding

1. *Healthcare systems should fund aPD models to ensure universal access.*
2. *Funding should cover both short-term and long-term aPD assistance.*
3. *Assess the cost benefits of aPD upfront, including savings from reduced healthcare use and complications.*
4. *Some regions impose limits on visits or patient numbers in aPD programs due to cost or staffing constraints.*

aPD has shown associations with increased initiation of PD and reduced HD transfer in various studies, particularly in regions like Canada and France. However, definitive evidence on its impact on overall PD prevalence is lacking due to the absence of controlled trials, varying regional practices, and the complex interplay of patient demographics and healthcare system factors influencing dialysis modality choices.

Recommendations-Impact

1. *Promote aPD for its positive impact on PD initiation and reduced transfer to HD rates.*
2. *Before starting an aPD program, record past PD usage rates and consider establishing a control group to assess adoption impact.*

In summary, aPD, supported by government funding, serves as a robust strategy to expand home dialysis access globally, particularly benefiting elderly and disabled patients who face barriers to self-care PD. These programs vary widely, impacting patient eligibility, outcomes, and costs, necessitating tailored quality metrics within PD programs. Adequate funding from government healthcare systems or private insurers is crucial for sustaining aPD initiatives, which have shown to increase PD utilization and decrease HD transfer, often at a lower cost than in-centre HD or long-term care settings (Figure 1).

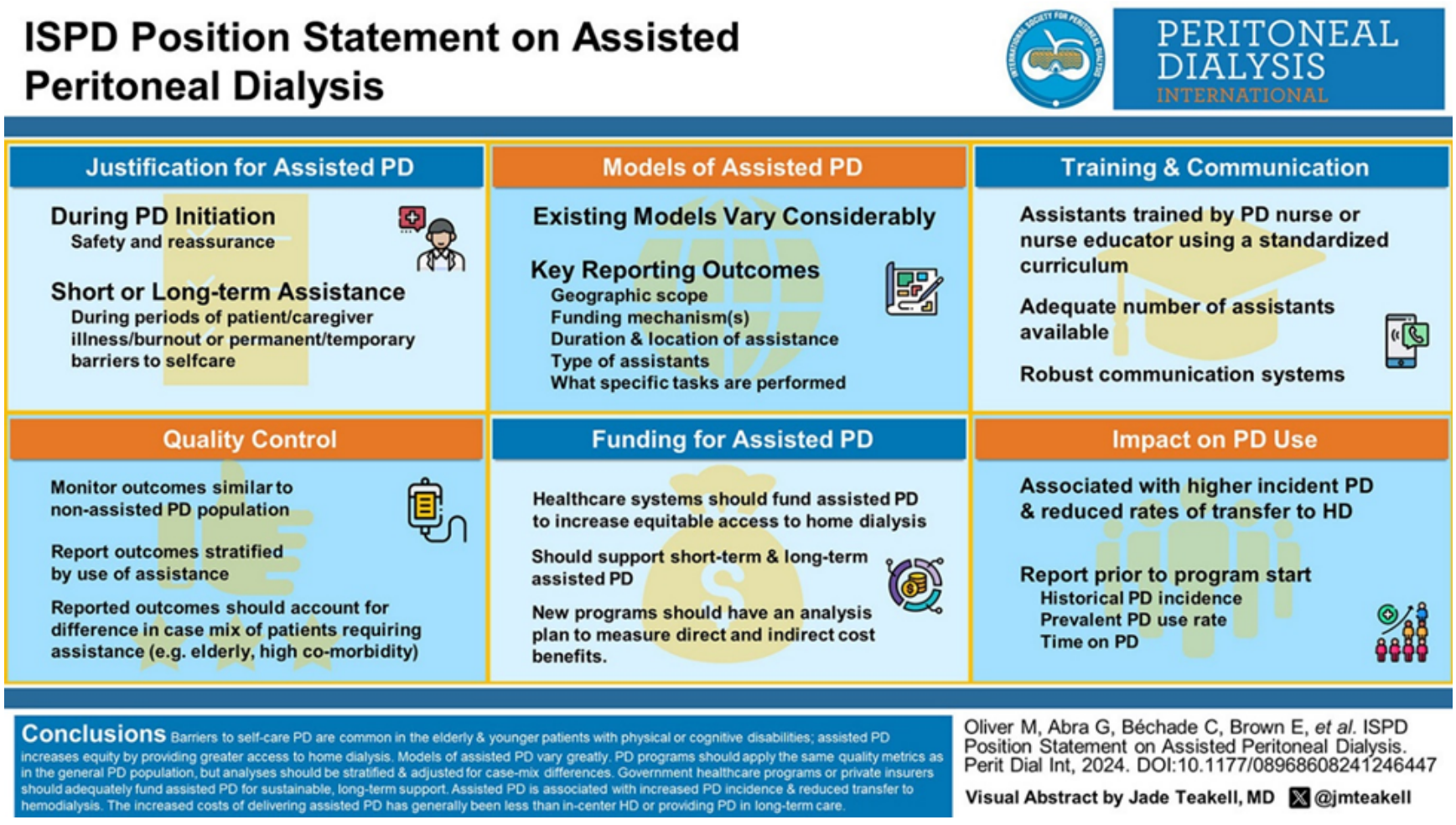

Figure 1. Virtual abstract of the ISPD Position Statement on aPD 2024 [1]

Reference

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Research News from Asia-Pacific Region

The carbon footprint of peritoneal dialysis in Australia

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Climate change has been widely recognised as the greatest health threat facing humanity this century. [1] Paradoxically, healthcare is a major source of carbon emissions, thus contributing to climate change. [2] To enable the development of appropriately targeted mitigation strategies, the healthcare sector must first understand the carbon footprint of common clinical care pathways.

While multiple prior studies have examined carbon footprint of haemodialysis and shown it to be large compared to other health care interventions, [3-5] there is very limited data available on the carbon footprint of peritoneal dialysis (PD). [6] We therefore undertook a study to measure all the carbon emissions associated with the delivery of both continuous ambulatory peritoneal dialysis (CAPD) and automated peritoneal dialysis (APD) using Baxter fluids and consumables in Australia. [7]

Fluid and consumable usage data were collected from a convenience sample of 22 patients undergoing CAPD and 45 patients undergoing APD through four kidney care services in Australia. Manufacturing data and transport routes were obtained from Baxter Healthcare. Attributional process-based life cycle analysis was used to quantify emissions, which is a method that examines the whole life cycle of a product or service, from raw material extraction, through to manufacture, transport, use, and end-of-life. The primary outcome was annual per patient carbon emissions in kilogram carbon dioxide equivalents (kg CO2e).

We found that carbon emissions attributable to PD fluids and consumables were higher for APD compared to CAPD (1,992 kg CO2e and 1,245 kg CO2e, respectively). The difference was largely due to the use of a 15L cycler drainage bag and 4-prong cassette in APD, as well as the electricity needed to run the APD machine. Transport emissions varied depending on the distance between site of manufacture of PD fluids and consumables and the home state of the patient, but in all states were higher for APD compared to CAPD due to the greater mass of APD fluids and consumables. Accordingly, the total impact of providing PD also differed by state, ranging from 2,350-4,503 kg CO2e for APD and from 1,455-2,716 kg CO2e for CAPD.

When considering the impact on emissions of polyvinyl chloride (PVC) plastic PD fluid bag recycling, we found that this was greater in CAPD compared to APD due to higher PVC use in CAPD. Again however, the impact varied based on the distance between the site of PVC waste generation and the recycling centre. The most benefit was observed in Victoria, the state where the recycling plant is located, with total emissions reductions of 14% observed for APD and 30% for CAPD. In contrast, in Queensland, the furthest state from Victoria, total emissions reductions were 8% for APD and 18% for CAPD.

We also investigated the impact of prescribing a lower dose of PD. Removing the icodextrin exchange (i.e. omitting the daytime dwell for APD or using only three glucose exchanges for CAPD) led to reductions in per patient annual emissions of approximately 16%in APD and 26% in CAPD. Substantial reductions in per patient annual emissions were also observed from performing PD five days per week instead of seven (29% reduction for APD and CAPD), using 9L instead of 12 L APD fluid (24-29% reduction depending on the home state of the patient) and performing only a single 2L glucose CAPD exchange per day (70-72% reduction depending on the home state of the patient).

Looking to the practical implications of our study, the lower carbon impact of CAPD compared to APD should factor into decision making about PD modality, particularly at the system level, as do cost considerations. We suggest that one option for addressing the higher consumable impacts in APD might be to utilise a reusable reservoir for fluid drainage rather than a single use cycler drainage bag. For the impact from the power consumption of the APD machine, this should steadily reduce with time as the share of renewable energy in the electricity grid increases. Regarding the considerable contribution of transport emissions to PD's total carbon footprint, in the future, particular opportunity may lie in novel dialysis systems that allow point-of-care dialysate generation instead of requiring movement of fluids. [8-10]

Given the observed positive impact of PVC recycling on PD's carbon footprint, we propose that investing in building medical waste recycling capability and capacity will be critical as healthcare systems transition to net zero emissions. In line with International Society for Peritoneal Dialysis Practice Recommendations, [11] when

deciding on the initial PD prescription for a patient, the aim should be to achieve clinical euvolemia and patient wellbeing using incremental PD where possible, knowing that this will also minimise carbon and financial costs.

In conclusion, our study revealed that APD has a higher carbon footprint compared to CAPD. Transport contributed substantially to emissions, while PVC recycling partially mitigated them. We advocate for the life cycle assessment methods we used to be applied more widely in healthcare, with information obtained integrated with clinical and cost data to inform health care policy and practice. This approach will facilitate the healthcare system's transition to net zero emissions, contributing to a safer climate-health future.

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Point-of-Care Diagnostic Test for Peritonitis in Peritoneal Dialysis Patients

Htay Htay [1,2] (photo), Jason Chon Jun Choo [1,2] , Mathini Jayaballa [1,2], David W Johnson [3,4], Riece Koniman [1,2] , Elizabeth Ley Oei [1,2], Tan Chieh Suai [1,2], Marjorie Wai Yin Foo [1,2]

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Peritonitis is a serious complication of peritoneal dialysis (PD), leading to increased risks of hemodialysis transfer or mortality if diagnosis and treatment are delayed. [1,2] It is also a common cause of unplanned clinic visits and hospitalizations among patients receiving PD. [3] There is a pressing need for rapid, self-administered point-of-care tests to enable early detection of peritonitis. Patients with poor eyesight or experiencing non-specific symptoms, such as fever or abdominal pain, may encounter delays in diagnosing peritonitis. These tests can facilitate early diagnosis and prompt medical intervention.

Periplex® is a point-of-care test that detects peritonitis using the biomarkers, Interleukin 6 (IL-6) and matrix metalloproteinase-8 (MMP-8). [4,5] We conducted a study to evaluate the performance of Periplex® both during the presentation of peritonitis and at recovery, defined as infection resolution post-antibiotic treatment. [6] Additionally, the study examined the effectiveness of individual biomarkers and the use of Periplex® across different PD solutions.

The study was conducted at Singapore General Hospital from September 2019 to December 2022. The study received approval from the Singhealth Centralized Institutional Review Board. Informed consent was obtained from all participants. Adult patients receiving PD who presented with signs or symptoms of peritonitis were included, while those unable to consent or lacking signs or symptoms of peritonitis were excluded. Following the International Society for Peritoneal Dialysis (ISPD) guidelines, [7] PD effluent was sent to the microbiology laboratory for Gram stain, leukocyte count, and microbial culture.

Periplex® tests were administered during peritonitis presentation and post-antibiotic recovery. The test was performed at the bedside. The cap was removed from the Periplex® test strip and the wick was immersed in the PD effluent until a pink wash appeared in the window. Then, the strip was removed from the effluent, the cap was replaced, and the strip was placed on a dry, flat surface. The result was read after 5 minutes. Positive Periplex® results indicated the presence of inflammatory markers IL-6 and/or MMP-8 in the effluent.

The study collected demographic and clinical data, including peritonitis presentation features and PD fluid investigation results. Primary outcomes assessed Periplex® sensitivity and specificity in detecting peritonitis, while secondary outcomes examined its specificity during resolution. Positive and negative predictive values were also evaluated, alongside causative organisms and biomarker effectiveness. Sensitivity, specificity, and predictive values were provided with 95% confidence intervals.

Periplex® testing was conducted on 120 patients receiving PD who presented with signs or symptoms of peritonitis. The mean age of participants was 60.9 years, 53% were male and 47.5% had diabetes mellitus. Common symptoms of presentation for peritonitis included cloudy effluent (95%) and abdominal pain (77%). The Periplex® test was positive in all 117 patients with peritonitis, showing a sensitivity of 100% (95% confidence interval [CI]: 100 – 100%), and negative in all 3 patients without peritonitis. However, it had a specificity of 50% (95% CI: 41.1 – 59.0%) due to 3 false positives from non-infective eosinophilic peritonitis. The test demonstrated an accuracy of 97.5% and had a positive predictive value of 97.4% and a negative predictive value of 100%. During recovery, 81 patients were retested after completing antibiotics, at a median time of 7 days after completion of antibiotics. The test was negative in 74 of 78 cured patients, indicating a specificity of 93.6% (95% CI 88.3 – 98.9%) and a negative predictive value of 98.7%. We found that the MMP-8 biomarker was more sensitive (99% detection) than the IL-6 biomarker (51% detection) in the detection of peritonitis. In addition, we observed that Periplex® was effective across different PD solutions including icodextrin, Dianeal, and Balance solutions, testing positive in all peritonitis episodes regardless of the types of solution used.

Early detection of peritonitis is critical for favorable outcomes, as delays can lead to poor results. Symptoms like abdominal pain and fever are non-specific, and cloudy effluent, a more specific indicator, can be subtle early on, particularly in elderly patients. [8] Reliable home test kits can facilitate early diagnosis and timely medical intervention.

The study demonstrated the high sensitivity of the Periplex® test in detecting peritonitis in patients with suspicious symptoms, although its specificity for peritonitis was low. In previous studies, Periplex® also showed high sensitivity and negative predictive values, with better specificity,(4,5) indicating the present study's higher prevalence of eosinophilic peritonitis affected its specificity. In the recovery phase, Periplex® had high specificity and negative predictive value, supporting its use in home testing to confirm infection resolution, potentially reducing the need for clinic visits and associated costs.

One notable aspect of the study is its unique investigation into the use of Periplex® during the recovery phase of peritonitis. Additionally, the study revealed that MMP-8 outperformed IL-6 as a biomarker for detecting peritonitis, suggesting that future diagnostic approaches may benefit from prioritizing MMP-8. However, the study's single-center design limited its generalizability. Furthermore, the test was administered by healthcare professionals, and was not evaluated for home use feasibility. Future research should address these limitations and explore Periplex®'s potential for home testing.

In conclusion, Periplex® was highly sensitive in detecting peritonitis and confirming recovery, with MMP-8 being a

superior biomarker. Further studies are necessary to validate these findings and assess the test's usability at home.

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Modifiable Physical Factors that Influence Physical Function for People Receiving Peritoneal Dialysis

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Physical function refers to an individual’s capacity to undertake everyday tasks and is influenced by physical, physiological, psychological and environmental factors. [1] People receiving peritoneal dialysis often experience reduced physical function due to the wide-ranging pathological effects of kidney failure, the comorbid conditions associated and the burden of treatment for it. [2,3] Impaired physical function is associated with adverse health outcomes including a reduced quality of life and increased level of dependency, hospitalisations and mortality risk. [4] The ability to undertake everyday tasks was identified by people receiving peritoneal dialysis at an international consensus meeting as one of the top three research priorities. [5] Factors including cardiorespiratory fitness, muscle strength, physical activity and sedentary behaviour are associated with physical function and are independently related to outcomes including morbidity and mortality in dialysis populations. [6,7] Furthermore, they are considered modifiable and can be targeted through movement-based interventions to improve physical function. [8] Therefore, the aims of this study [9] were to 1) explore modifiable physical factors (cardiorespiratory fitness, muscular strength, physical activity and sedentary behaviour) that are associated with physical function,

identifying which has the strongest influence and 2) measure temporal changes of modifiable physical factors and physical function over 12-months.

Participants were assessed at: 1) enrolment (baseline data); 2) follow-up (six months post baseline testing); and 3) study conclusion (12-months post baseline). Adults aged >18 years receiving peritoneal dialysis within a local health network in South Australia were invited to participate. Assessments were performed at the participants choice of a healthcare setting, scheduled to align their routine clinical care appointment at the site, or during a home visit.

Measures of physical function included the self-report Short-Form 36 (Physical Function section) (SF-36 PF) questionnaire and the objective Short Physical Performance Battery (SPPB). Modifiable physical factor measures included the 1) six-minute walk test (6MWT) (cardiorespiratory fitness), 2) hand-grip, quadricep, bicep and abdominal strength (muscle strength) and, 3) physical activity and sedentary behaviour levels. The assessments were selected due to their good to excellent validity and reliability, ease to administer, their field-based nature with future potential to be included as part of routine clinical assessment in this cohort. Pearson correlation tests were used to examine the associations between modifiable physical factors and physical function at baseline. Primary analysis employed multivariate linear mixed modelling with participants as the random intercept to explore the influence of modifiable physical factors on physical function. Secondary analysis employed linear mixed modelling to explore the effect of time on each of the modifiable physical factors and physical function variables.

Eighty-two participants (mean age 61.4yrs ; median vintage 9-months) underwent baseline assessment and 27/82 (33%) underwent assessments at all three timepoints. Independent samples t-test identified no difference in demographic variables between those who underwent assessments at all three time points and those who did not. No adverse events related to the study protocol were reported throughout the study. At baseline, all modifiable physical factors had predominantly moderate to strong significant associations with physical function with correlation coefficients ranging from r = 0.35-0.79. In primary analysis including all data from all timepoints, the 6MWT was the strongest influence in the final model (SF-36 PF the dependant variable) with every metre conferring a 0.08-unit increase in SF-36 PF score (p <0.01). With the SPPB as the dependant variable, the 6MWT was again the strongest influence with every metre conferring a 0.01-unit increase in SPPB score (p <0.05). No other modifiable physical factors met the level of conventional significance. Mixed model analysis with time as the fixed factor found significant declines in cardiorespiratory fitness (−9.8%), quadricep strength (−5%), moderate-to-vigorous (−25.9%) and total (−16.2%) physical activity, and increased sedentary behaviour (+7.1%) over the 12-month period. Both objective (-4%) and self-report (-7.4%) physical function measures reported temporal declines but this did not meet statistical significance.

Our study was the first to report that for people receiving peritoneal dialysis, of the three modifiable physical factors explored (cardiorespiratory fitness, muscle strength, physical activity), the 6MWT (cardiorespiratory fitness) appears to have the strongest influence on physical function. In addition, this study found a significant decline in 6MWT distance over 12-months with the estimated mean change (-30.8m or -9.7% relative to baseline). This is of concern, as declining 6MWT distance associates with an exponential risk of all-cause mortality. [10] People receiving peritoneal dialysis suffer from negative alterations in cardiac function and/or structure as a result of kidney failure and dialysis that would invariably affect performance of the 6MWT. [11] Results of the current study indicate that continual declines in cardiorespiratory fitness would likely contribute to reduced distances in the 6MWT and moreover, physical function decline. This highlights that both monitoring and intervention should be an important consideration as part of routine care in this cohort. Physical decline and increased sedentary levels that we observed have been independently documented in studies involving people receiving peritoneal dialysis. [7] The reductions in muscle strength are a likely contributor to reports that <50% of people receiving peritoneal dialysis complete adequate physical activity (i.e. 150 minutes of moderate intensity activity, per week). [2] Consequently in addition to reduced physical function, declining strength and activity levels increase the risk for poor health outcomes, enhancing the clinical urgency for routine monitoring and intervention.

This study also reported associations between cardiorespiratory fitness, muscle strength, physical activity and sedentary behaviour in people receiving peritoneal dialysis, suggesting an inter-relationship exists in addition to each outcome being independently related to physical function. Literature supports that movement-based interventions (e.g. exercise therapy) targeting these factors can enhance physical function. Whilst the results of the current study suggest interventions targeting cardiorespiratory fitness may result in greater improvements in physical function, literature supports that targeting improvements in muscle strength and physical activity levels may also confer benefit and should be considered when developing programs. [8] Whilst further interventional data are required to explore the efficacy of exercise therapy on physical function in this population group, it should be considered as a management option due to the numerous health benefits that can be induced by participation.

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Association between beta-blocker utilization and heart failure mortality in the peritoneal dialysis population: a cohort study



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Peritoneal dialysis (PD) serves as a pivotal therapeutic intervention utilized by approximately 11% of the global populace afflicted with end-stage kidney disease (ESKD). [1] Within the cohort of PD recipients, the prevalence of heart failure (HF) is conjectured to hover around 35% or conceivably higher. This notable comorbidity, prominently encountered in prolonged PD scenarios, is associated with an increased risk of adverse clinical outcomes. [2] In the pharmacological management of HF, β-blockers play a pivotal role. [3] Studies have consistently highlighted their beneficial effects across various stages of chronic kidney disease (CKD), encompassing patients undergoing hemodialysis. [4, 5] However, research specifically examining the impact of β-

blockers on HF-related mortality in PD patients remains scarce. In our recent study, we endeavored to fill this knowledge gap by conducting a retrospective analysis of incident PD cases. Our investigation primarily focused on elucidating the association between β-blocker therapy and HF-related mortality within the PD population. Additionally, we examined the clinical features of HF among PD patients treated at our center. Through this inquiry, we sought to enhance our understanding of the prognostic implications of β-blocker utilization in PD, thereby informing clinical decision-making in this patient cohort.

This study was a cohort analysis involving 608 incident PD patients who met the inclusion criteria from 2007/09/01 to 2019/03/31, and were followed until death, cessation of PD, or 2020/12/31. Recorded data encompassed clinical characteristics, medication utilization, patient outcomes, and detailed PD session information. We used a time-dependent Cox model to estimate the β-blocker prescription impact on HF-related mortality and all-cause mortality. To mitigate treatment allocation bias and confounding effects, 1:1 propensity score (PS) matching was conducted to estimate the association between β-blocker use and outcomes by Cox regression through inverse probability weighting model. we employed Fine and Gray's subdistribution hazards regression model to examine the possible influence of competing events on the association between β-blockers and HF-related mortality. Finally, subgroup analysis was carried out to further elucidate the correlation.

A total of 608 subjects over 16822 patient-months were enrolled in this study. Among them, 341 subjects (56.1%) received β-blocker therapy, and 136 (22.4%) subjects had a history of heart failure before PD treament. Over a median follow-up duration of 36.5 months, a total of 200 patients (32.9%) experienced mortality, with 94 deaths attributed to HF. HF episodes occurred in 264 patients (43.4%) within the cohort, aligning with previous reports of a 44% incidence in hemodialysis patients. [6] Among these patients, 152 individuals (57.6%) experienced de novo HF, while 112 individuals (42.4%) had recurrent episodes.

The time-dependent Cox model revealed that β-blocker use was associated with a decreased hazard ratio (HR) for HF-related mortality, with an estimated HR of 0.57 (95% CI: 0.36–0.89, P = 0.013). Following propensity score matching, Cox regression indicated a significantly reduced HR of 0.61 (95% CI: 0.38-0.97, P = 0.038). Subsequently, inverse probability of treatment weighting maintained a lower HR of 0.64 (95% CI: 0.43-0.97, P = 0.016). Even after accounting for competing risk events, β-blocker use remained associated with a significant reduction in HF-related mortality (HR = 0.58, 95% CI: 0.38-0.86, P = 0.008). Subgroup analysis, stratified by age, sex, diabetes, coronary heart disease, hypertension, and smoking, yielded consistent results without significant interactions. However, β-blocker use did not exhibit statistical significance in association with all-cause mortality (HR=0.88, 95% CI: 0.65-1.18, P = 0.39) in this study. K-M survival curves suggested a higher survival rate in β-blockers group (P = 0.0064). The cumulative incidence function curve shows that, even after adjusting for competing risk events, patients in the β-blocker group had a significantly lower cumulative risk of heart failure-related mortality compared to patients not on β-blockers (P = 0.007).

Heart failure with preserved ejection fraction (HFpEF), characterized by concentric myocardial hypertrophy, diastolic dysfunction, and left ventricular ejection fraction (LVEF) ≥50%, affects approximately one-third of HF patients, with a higher prevalence observed among PD patients. [7] In our study, 72.5% of patients with HF exhibited left ventricular (LV) hypertrophy, 13.1% had LV diastolic insufficiency, and 10.6% had LV systolic insufficiency. 89.4% of HF patients presented with HFpEF. Although previous research has primarily focused on the beneficial effects of β-blocker therapy in HF patients with CKD who exhibit reduced ejection fraction (HFrEF), β-blockers are commonly prescribed to PD patients for various indications, including hypertension and atrial fibrillation. However, caution is warranted due to prior studies suggesting potential adverse effects of β-blockers in PD, such as sclerosing encapsulating peritonitis and reduced peritoneal ultrafiltration. [8, 9] Despite these concerns, our evaluation of HF patients in this study revealed no statistically significant differences in ultrafiltration and urine output between β-blocker users and non-users. While earlier studies hinted at the risk of sclerosing encapsulating peritonitis associated with β-blocker use in PD, subsequent research has suggested potential protective effects, including anti-inflammatory and anti-fibrotic properties that mitigate peritoneal membrane damage. [10] Notably, we observed no instances of encapsulated peritonitis among β-blocker users in our study.

In summary, the utilization of β-blockers demonstrated a significant correlation with reduced heart failure-related mortality within the PD population. It is noteworthy that HFpEF manifests prominently within the PD demographic. These results emphasize the potential therapeutic advantages of β-blockers in managing HF within the context of PD. Furthermore, they warrant further investigation through randomized clinical trials to substantiate and extend these initial findings.

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