

# ASIA-PACIFIC CHAPTER NEWSLETTER

## INTERNATIONAL SOCIETY FOR PERITONEAL DIALYSIS (ISPD)

### VOLUME 11, ISSUE 2, SUMMER 2013



Dear All,

In this issue, we are delighted to have Dr. Josephine Chow from Australia to outline the experience on home dialysis in Australia, and Dr. TY Zhu of Shanghai to share their view on the relation between insulin resistance and peritoneal dialysis.

The ISPD Asia-Pacific Chapter meeting 2013 is coming this September. We look forward to seeing you at Taipei.

You are most welcome to distribute this newsletter electronically or in printed form to your colleagues or other people interested. If you or your colleagues want to receive this newsletter directly from our editorial office, please send your e-mail address to me.

Sincerely,  
 Dr. Cheuk-Chun SZETO  
 Editor, Asia-Pacific Chapter Newsletter  
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FROM THE EDITORIAL OFFICE



### THE HOME NETWORK: AN AUSTRALIAN NATIONAL INITIATIVE FOR HOME THERAPIES

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The HOME Network is a national initiative to engage healthcare professionals in the field of home dialysis, empowering these individuals to develop solutions to overcome the barriers that currently inhibit the uptake of home therapies in Australia.

In Australia, the incidence of end-stage kidney disease (ESKD) and prevalence of dialysis are increasing. The proportions of people with ESKD requiring regular dialysis rose from 9,260 (per million populations) in 2006 to 10,590 in 2010 (Australia and New Zealand Dialysis and Transplant Registry, 2011) and project to reach 30,293 by 2020 and the cost of treating all current and new cases of ESKD is estimated at \$12 billion (Kidney Health Australia, 2012). Home Haemodialysis in Australia is used by approximately 9% of those on dialysis and

peritoneal dialysis by 19% of those on dialysis. The estimated annual cost of dialysis at home was AUD\$49,137 compared to \$79,072 for in-center dialysis (Kidney Health Australia, 2010).

Despite the considerable advantages such as a return to work, flexibility in dialysis schedules, improving the individual's satisfaction and quality of life, the use of home dialysis has been diminishing worldwide. A gradual reduction of home dialysis (home HD and PD) has been observed in Australia, in which the rates decreased from 50% in 1990 to 39% in 2000, 32% in 2005, and 29% in 2010 (Australia and New Zealand Dialysis and Transplant Registry, 2011; Kidney Health Australia, 2012). Although the nocturnal home HD regimens have been implemented in Australia since 2000, the rate of home HD remains unchanged. The rates of PD continue to drop (24% in 2003, 22% in 2007 and 19% in 2010) and there has been a significant alteration to preferred PD modality of automated peritoneal dialysis

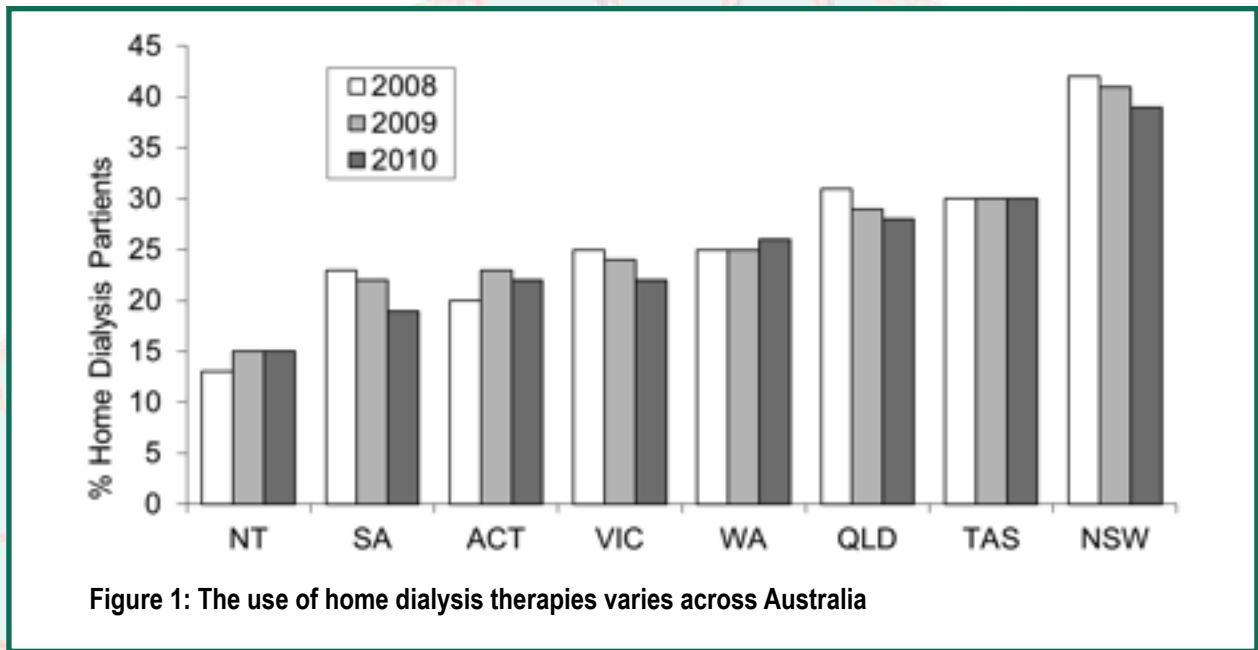
**Table 1: Uptake of Home Therapies by States**

State	2008	2009	2010
NT	13%	15%	15%
SA	23%	22%	19%
ACT	20%	23%	22%
VIC	25%	24%	22%
WA	25%	25%	26%
QLD	31%	29%	28%
TAS	30%	30%	30%
NWS	42%	41%	39%

Adapted from ANZDATA report. Available at <http://www.anzdata.org.au>

(APD) rather than continuous ambulatory peritoneal dialysis (CAPD). The use of home dialysis therapies varies across jurisdictions (Table 1 and Figure 1) in Australia.

The decline of home dialysis is associated with a growth of satellite dialysis units staffed by dialysis nurses (Agar, et al., 2010), and increasing age and comorbidity of dialysis population (MacGregor, et al., 2006). Additional reasons from a patient's perspective include fears of and low level of motivation for HHD, lack of self-care ability and family supports, and inadequate resources available such as respite care and financial incentives (Agar, et al., 2010; Lauder et al., 2010; Ludlow et al., 2011; Sinclair, 2008). From health professionals' perspectives, insufficient resources in dialysis units to provide support and education to dialysis patients, a lack of culture and advocacy for home dialysis are contributing to the under-growth of home dialysis (Lauder, et al., 2010; Ludlow, et al., 2011). It has been reported that medical staff are willing to recommend home dialysis for patients if patient-specific barriers are identified and dealt with (Lauder, et al., 2010).



**Figure 1: The use of home dialysis therapies varies across Australia**

Recognising the need for action to reverse the decline of home dialysis availability as the preferred option for those requiring dialysis treatments, senior renal nurses and allied health professionals from each state and territory of Australia, determined the potential role of a working group. The HOME Network was initially conceived in late 2009 as a national initiative to engage and empower healthcare professionals working in home dialysis to develop solutions to tackle the low uptake of HHD. PD was incorporated into the scope of the HOME Network subsequently. The workshop focused on the identification of specific barriers to the uptake of home dialysis therapies. Many key factors identified include inadequate levels of knowledge and competence among dialysis nursing staff; a lack of education about home dialysis treatment options provided to patients at commencement of their regular dialysis and limited access to assessment, support and counselling services; insufficient medical advocacy for home dialysis therapies; and financial burden on the patient due to set-up and on-going costs of home dialysis therapies. Following these events, the HOME Network was officially established in February 2010. The Network mission is "Through education and advocacy, The HOME Network aims to enable patients and healthcare professionals to use their knowledge and the practical resources developed by the Network to empower patients to embrace the freedom of home therapies". The governance framework of the HOME Network includes an elected Chair, an Advisory Committee, and four nominated Taskforce Coordinators.

HOME Network projects include:

- Bi-annual workshops among the Network members
- Establishment of 4 taskforces targeting the four key barriers were formed
- Financial Support Fact Sheets for all states
- Home Haemodialysis patients DVD
- Nurse perception survey
- Patient resource survey
- Major consultative partner for the development of educational materials that promote home dialysis
- Input into pre dialysis educational resources

In conclusion, the HOME Network is established as a national initiative to engage and empower healthcare professionals working in home therapies specialty to develop solutions to advocate for and ultimately increase the use of home therapies. The model of the HOME Network can be easily transferred to other professional bodies nationally and internationally. The experience at the HOME Network presented here highlights the importance of a vision and thorough stakeholder engagement by senior clinicians who are passionate about home therapies.

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8. Sinclair P. M. (2008). Home haemodialysis: a literature review. *Renal Society of Australasia Journal*, 5(1), 9-15.



## THE ROLE OF INSULIN RESISTANCE IN SURVIVAL OF PERITONEAL DIALYSIS PATIENTS

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Glucose and insulin homeostasis are altered even in the early stage of chronic kidney disease (CKD) patients, leading to insulin resistance (IR). The early study in 1980 revealed that the site of insulin resistance in CKD is likely to be peripheral.<sup>(1)</sup> Numerous factors related to CKD have been implicated in the pathogenesis of IR occurring before dialysis. These include retained uremic toxin, anemia, hyperparathyroidism and vitamin D deficiency, accumulation of free fatty acid, metabolic acidosis, oxidative stress, inflammation, malnutrition, as well as exercise intolerance. Even though after initiation of dialysis insulin resistance could be partially improved, when accompanied with the correction of these disturbances, the long-term use of glucose peritoneal dialysis (PD) solutions could even worsen the state of IR. In our longitudinal study for non-diabetic patients (n=121), the IR level was increased after two years of PD therapy (HOMA-IR (median (quartile range)), baseline vs. 2 years: 1.62(2.15) vs. 2.15(2.58), p=0.000). Two recent studies investigated the association between insulin resistance and cardiovascular morbidity in PD patients.<sup>(2,3)</sup> There has been no prospective study has evaluated the effects of insulin resistance level on cardiovascular mortality in patients on PD.

We conducted a prospective observational cohort study in non-diabetic patients on PD to evaluate the effect of insulin resistance on cardiovascular morbidity and mortality.<sup>(4)</sup> Using the median value of the HOMA-IR (2.78) as the cut-off point for insulin resistance, patients were divided into two groups: a high HOMA-IR (IR-H) group, with HOMA-IR values  $\geq 2.78$ ; and a low HOMA-IR (IR-L) group. The primary endpoint was cardiovascular mortality. The secondary endpoint was a cardiovascular event.

The study enrolled 66 PD patients. The median follow-up was 41.3 months. The key findings observed in the study included:

- 1. Differences in baseline patient characteristics:** A higher average BMI in the IR-H group was the only difference observed ( $24.6 \pm 3.17$  vs.  $22.9 \pm 3.53$ ,  $p=0.04$ ). Serum glucose and triglycerides were higher and HDL levels were relatively lower in the IR-H group [Glu (mmol/L) :  $6.50 \pm 0.41$  vs.  $5.41 \pm 0.63$ ,  $p=0.01$ ; TG3 (mmol/L):  $2.68$  (2.43) vs.  $1.53$  (1.52),  $p=0.01$ ; HDL (mmol/L):  $0.91$  (0.28) vs.  $1.07$  (0.43),  $p=0.05$ ]. The IR-H group had significantly higher CRP and ferritin levels than did the IR-L group. The serum leptin levels were also relatively higher in the IR-H group.
- 2. Significantly more cardiovascular events and death occurrences in IR-H group:** In the IR-H group, 13 patients experienced 14 cardiovascular events, and 10 patients died, including 8 from fatal cardiovascular events. However, in the IR-L group, only 1 patient experienced a single cardiovascular event and 4 patients died, with only 1 from fatal cardiovascular event.

- 3. The IR-H group had a significantly higher risk of cardiovascular morbidity, even after adjustment for sex, age, and dialysis duration** [relative risk: 17.7; 95% confidence interval (CI): 2.10 to 149.5;  $p=0.008$ ].
- 4. Univariate association between cardiovascular mortality and covariates:** Patients in the IR-H group had a significantly higher risk of cardiovascular mortality [hazard ratio (HR): 9.02; 95% CI: 1.13 to 72.2;  $p=0.04$ ]. Elevated leptin and resistin were significant univariate predictors of cardiovascular mortality.
- 5. Multivariate analysis for cardiovascular mortality and HOMA-IR:** HOMA-IR remained an independent predictor of cardiovascular mortality after adjustment for resistin and leptin (HR: 11.02; 95% CI: 1.15 to 105.4;  $p=0.04$ ). Even after adjustment for age, BMI, systolic blood pressure, CRP, and triglyceride, HOMA-IR remained an independent predictor of cardiovascular mortality (HR: 14.80; 95% CI: 1.22 to 179.1;  $p=0.03$ ).

Even if peritoneal dialysis maintains hemodynamic stability, PD is not superior for preventing cardiovascular disease.<sup>(5-6)</sup> Therefore the risk factors for cardiovascular morbidity and mortality in PD patients require close examination. Although the patients in the IR-H group had higher BMI levels, more lipid disturbances, and higher inflammation levels, HOMA-IR was an independent predictor of cardiovascular mortality after adjustment for those factors in this cohort of patients. Shinohara et al. found the similar results in non-diabetic HD patients.<sup>(7)</sup> This information is of potential clinical value because it might encourage the use of therapeutic options including glucose-sparing dialysate, drugs, and physical activity to improve insulin sensitivity in patients on PD and to reduce cardiovascular risk.

In conclusion, our study revealed that insulin resistance, as assessed by HOMA-IR, was an independent predictor of cardiovascular mortality in a cohort of non-diabetic patients on PD. Insulin resistance is a modifiable risk factor; reduction of insulin resistance may lower cardiovascular risk and improve survival in this group of patients.

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## A Stable Monday

It is well reported that hemodialysis patients have an increased risk of cardiac death immediately after weekends, presumably due to the increased frequency of hyperkalemia and fluid overload in this period. Nonetheless, it remains unknown whether PD patients have the same problem. A recent observational cohort study using the ANZDATA Registry data reviewed all dialysis patients in Australia and New Zealand who died between 1999 and 2008. Similar to previous ones, this study shows that cardiac death was significantly more likely to occur on Mondays in in-center HD patients receiving 3 or fewer dialysis sessions per week. In contrast, this daily variation in cardiac death was not seen in PD patients, in-center HD patients receiving more than 3 sessions per week, or home HD patients. The results strongly support the hypothesis that PD provides a stable internal milieu, which is of clinical relevance.

## Comments

This study, as well as all others in this field, does not tell us which component of the internal milieu needs to be stable. Although it is often presumed that hyperkalemia after weekend plays the key role, other uremic toxins may be involved.

1. Krishnasamy R, et al. Daily variation in death in patients treated by long-term dialysis: comparison of in-center hemodialysis to peritoneal and home hemodialysis. *Am J Kidney Dis* 2013; 61: 96-103.

## Modality, Mortality, and Modeling

There are conflicting published literatures about the survival differences between HD and PD, and study in this area has been difficult. Randomized trials are generally not feasible. On the other hand, analysis and interpretation of observational study are challenging because of modality switch, transplantation, and time-varying confounding in cohort data. A recent cohort study of nearly 24,000 incident dialysis patients attempted to get around this difficulty by using the causal modeling technique of marginal structural models to examine the survival differ-

ences between PD and HD over the first 24 months of dialysis. In short, after adjusting for modality change, difference in baseline comorbidity load and time-dependent laboratory parameters, PD was associated with 48% lower mortality than HD over the first 2 years of dialysis.

## Comments

The true "advance" of this study is the sophisticated statistical method for the control of confounding and time-dependent variables. This type of analysis would probably become more widely used in epidemiological study of all topics.

1. Lukowsky LR, et al. Comparing mortality of peritoneal and hemodialysis patients in the first 2 years of dialysis therapy: a marginal structural model analysis. *Clin J Am Soc Nephrol* 2013; 8: 619-628.

## Failure Is Not Expensive

Although there is a strong economic consideration in favor of PD over HD, it is generally believed that PD technique failure is expensive and possibly offset any monetary advantage of PD. A recent study attempts to answer this question by reviewing incident dialysis patients, who were categorized by initial and subsequent modality changes during the first year of dialysis, and then tracked for inpatient and outpatient costs, physician claims, and medication costs for 3 years using merged administrative data sets. In short, the investigators found that patients experiencing PD technique failure had costs similar and not in excess of HD-only patients at 3 years, strongly supporting the economic rationale for a PD-first policy in all eligible patients.

## Comments

The result of this study is reassurance to policy makers and argues strongly for PD as the cost-effective mode of dialysis. However, it is important to note that this study analyzed the perspective of health payer. Costs that are outside the health care system are not measured.

1. Chui BK, et al. Health care costs of peritoneal dialysis technique failure and dialysis modality switching. *Am J Kidney Dis* 2013; 61: 104-111.

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## Asian Chapter Scholarship

This is a scholarship to support up to 3 months of training in clinical PD for doctors and nurses from Asia. Application deadlines for each round are twice each year (June 30th or December 31st). The next deadline is **March 31, 2013**. Details and application procedures can be found on the ISPD website ([www.ispd.org](http://www.ispd.org)) under the Regional Chapters: Asia-Pacific Chapter.

## Upcoming Meetings

### 6th ISPD Asia-Pacific Chapter Meeting

September 27 - 29, 2013

Taipei City, Taiwan

Website: [www.2013isped-apcm.org](http://www.2013isped-apcm.org)

Important dates:

Early Registration Deadline: August 30th, 2013

Regular Registration Deadline: September 20th, 2013

### EuroPD Meeting

October 11 - 14, 2013

Maastricht, The Netherlands

Website: [www.europd.com](http://www.europd.com)

### 15th Congress of the International Society for Peritoneal Dialysis

September 7 - 10, 2014

Madrid, Spain

Website: [www.ispdmadrid2014.com](http://www.ispdmadrid2014.com)

Important dates:

Abstract submission opening: November 4, 2013

Early Bird Registration opening: September 6, 2013