



Renal Health Network

Framework to Improve Home Dialysis Therapy in Western Australia

September 2011

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Abbreviations

ABF	Activity Based Funding
ANZDATA	Australian New Zealand Dialysis and Transplant Registry
APD	Automated peritoneal dialysis
CAPD	Continuous ambulatory peritoneal dialysis
CKD	Chronic kidney disease
ESKD	End stage kidney disease
ESKF	End stage kidney failure
ESRD	End stage renal disease
ESRF	End stage renal failure
FH	Fremantle Hospital
HD	Haemodialysis
HHD	Home haemodialysis
HPD	Home peritoneal dialysis
HT	Home therapies
HTS	Home therapy services
ISPD	International Society of Peritoneal Dialysis
KHA	Kidney Health Australia
PD	Peritoneal dialysis
PMH	Princess Margaret Hospital
PPT	Price per treatment
RC	Reference cost
RDRG	Renal Dialysis Reference Group
RHN	Renal Health Network
RPH	Royal Perth Hospital
SCGH	Sir Charles Gairdner Hospital
SHD	Satellite haemodialysis
WA	Western Australia
WACHS	West Australian Country Health Service
WAHDiP	Western Australian Home Dialysis Program

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Executive summary

This report provides a framework to increase the uptake, maintenance and quality of home dialysis therapies in Western Australia (WA). The recommended strategies reflect the WA Health Strategic Intent 2010 - 2015 of making the best use of funds and resources. In addition, the 2007 Renal Health Network Stakeholder Forum identified promotion and expansion of home dialysis therapy services as a priority.

Pressures on dialysis services are unrelenting because of the continued increase in patient intake of 7% per annum. In 2009, approximately 1000 patients received dialysis in WA. Dialysis is a high cost and high volume therapy that requires a significant resource allocation. Increasing dialysis activity within the general constraints of the overall health resource allocation requires optimal use of existing services in conjunction with cost-effective expansion of services.

Dialysis can be performed in the hospital, in a satellite unit or at home. The two modes of dialysis treatment are haemodialysis (HD) or peritoneal dialysis (PD). PD delivery can be either continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD).

In WA, the wide geographical dispersion of patients and the centralisation of tertiary services in Perth mandate the optimal use of home or community-based therapies. Dialysis services provided in the home (home dialysis) provide greater flexibility for patients and the potential for superior patient and system outcomes. Home dialysis also allows the use of enhanced and novel dialysis therapy, for example nocturnal dialysis reduces travel issues and can result in improved quality of life for patients and their families by providing the “**right** care at the **right** place and at the **right** time by the **right** team.”

WA has a privatised “Home Therapies Program”, providing services to all Area Health Services under a seven year contract from 2007 - 2014. Approximately 270 patients receive home therapies at an annual cost of approximately \$8 million.

The WA Dialysis Plan 2008-2013 nominated a target of 33% of dialysis to be delivered by home therapies by 2013. Similarly, the WACHS Renal Dialysis Plan 2010 to 2021 has a target of 35%. Currently, 25.2% of dialysis patients undertake dialysis in the home and of these patients 3.4% receive HD and 21.8% receive PD. The majority of dialysis patients receive care in satellite haemodialysis units (60%). In comparison to national figures, the proportion of people who receive home dialysis is lower in WA.

Home therapies represent the most cost-effective dialysis therapy with the best outcomes. The expansion of home dialysis services across the State therefore has the potential to offer significant financial benefits to the health care system and considerable clinical and social benefits for consumers. Using an averaged metropolitan satellite haemodialysis price-per-treatment (PPT) as the reference cost of \$1, (RC \$=1), home therapies are cheaper in annualised PPT costs. The reference cost for home HD is \$0.46. For PD, costs are split: continuous CAPD \$0.57 to \$0.62 and APD \$0.83 to \$0.99. APD is more socially favourable and accounts for 50% of PD but more expensive due to additional consumable costs.

Potentially, increasing the proportion of patients receiving home therapies from 25% to 33% over three years, assuming 7% growth, translates to approximately 80 patients who do not require facility based therapy.

The framework also focuses on improving service quality, especially related to PD. Although PD dialysis prevalence in WA is consistent with the national average, outcomes in WA are significantly below both the national and international benchmarks. This therapeutic failure impacts patient morbidity and mortality *and* the health system with increased hospitalisations and cost burden. These negate home dialysis expansion in PD demonstrated by the unchanged PD numbers in the last three years.

Recommendations for executive action

1. Implement a sustained, system-wide, and resourced education strategy for patients, nursing and medical staff to improve the uptake of home therapies.
2. Implement a *direct clinical governance* framework for home dialysis which defines, via the contract, the responsibility for clinical oversight and outcomes by a state-wide Medical and Nursing Director of Home Therapies, reporting to the Renal Dialysis Reference Group.
3. Provide support to reconfigure vascular and surgical access in order to optimise the patient journey and ensure retention within the pathway.
4. Implement state-wide electronic capture and linkage of dialysis modality use with Activity Based Funding, including contractual (consumable) and system (hospitalisations) costs. It is essential to better understand optimal modality selection and home versus satellite selection, with accurate costings in order to improve outcomes and monitor patient and system benefits.
5. Undertake an external review of current WA practice in alignment with the National Standards for PD practice. This review should focus on patient and technique *outcomes* in WA.

Key clinical recommendations to improve uptake of home therapies

Recommendation 1: Increase pre dialysis education to eligible patients:

- Increase availability of pre-dialysis educators targeting one FTE educator per 50 new End Stage Renal Disease (ESRD) patients per year. This equates to 200 pre-dialysis patients assessed and educated assuming 25% progression per year, and 25% of 200 progress to new ESRD, which equals 50 patients.
- Educate and train patients on the importance of hand hygiene and aseptic technique to prevent infection.
- Increase availability of culturally and linguistically diverse written and visual information.
- Promote a visible and uniform culture of “Home Therapies First Approach” via staff and patient education and home therapy site-based champions or practitioners.

Recommendation 2: Train and educate nephrologists and nurses to support home therapy:

- Educate and adequately resource nephrologists and nephrology trainees (registrars) to promote, support and research home dialysis.
- Support and encourage nurse practitioners and hospital nephrologists to be home therapies champions.
- Develop a structured training package for nurses and enrolled nurses on home dialysis options.
- Integrate home dialysis into all orientation programmes for nephrology nurses.
- Integrate home dialysis as a renal therapy into registered and enrolled nurse training curriculum.

Recommendation 3: Commence patients suitable and prepared for home therapies in non-hospital based facilities:

- Ensure early placement of peritoneal dialysis catheters and vascular access.
- Conduct regular and comprehensive review of current patients receiving facility based therapies to identify and promote change to home based care.
- Implement “First Start” haemodialysis directly at the home training facility.
- Appoint a lead clinician and nurse to promote haemodialysis and co-ordinate supervision of these patients.
- Provide on-site medical supervision by nephrologists, advanced trainees and GPs with special interests for patients commencing home training in non-hospital facilities in the metropolitan and remote areas.
- Promote patient autonomy for all in-centre patients, including self-needling and machine set up where possible.
- Develop region-based training and support for regional areas that have sufficient demand for home therapies.

Recommendation 4: Remove barriers and disincentives to home therapies:

- Reward and provide incentive payments to hospitals to maximise home dialysis and thereby minimise in-centre and satellite dialysis with a funding model such as practised in Victoria.
- Provide dedicated resources to improve timely surgical vascular access and timely PD catheter placement.
- Educate GPs in ESKD detection and CKD management as per the CKD Model of Care algorithm¹ to reduce late referrals.
- Establish community based self-care dialysis centres for regional locations, to accommodate three to five dialysis patients at a time.
- Develop a remote area health care workforce to provide local support and training for home dialysis patients and their carers within their own communities.
- Provide cost-neutral accommodation for regional and remote patients and their families who have to relocate to Perth or regional centres during the home training period.
- Provide opportunities for patient and carer respite.
- Remove patient cost disincentives to the uptake of home therapies, for example waste removal, additional water and power expenses by partial or full reimbursement.

Recommendation 5: Increase the retention of patients on home therapies:

- Implement evidence-based patient care therapies to maximise technique survival of home dialysis patients.
- Implement and support novel home based treatments, including enhanced dialysis frequency or hours.
- Participate in national and international clinical trials for home based-therapies to promote excellence of care and allow access to novel clinical treatments.
- Standardise peritonitis prevention strategies and reduce infection rates to at or above the minimal acceptable international standard of one event in eighteen months (1:18 months) which is 0.67 events per year.
- Adhere rigorously to evidence based guidelines for prevention of PD and HD infections.
- Promote elective transfer from peritoneal dialysis to home haemodialysis by early identification of at risk patients and planned transition.
- Initiate a Multidisciplinary Peritonitis Prevention and Treatment Taskforce to urgently review the high PD failure incidence caused by the unacceptably high statewide peritonitis rates. This situation has been a major impediment of home peritoneal dialysis expansion.
- Implement patient selection criteria to avoid “high-risk” patients with potential adverse outcomes.

Recommendation 6: Provide clinical governance and operational reporting:

- Implement clinical governance by appointment of a state-wide medical and nursing director of home therapies directly responsible for clinical oversight, standards, research and outcomes reporting to the AHS's via the Renal Dialysis Reference Group.
- Improve communication between the contract service provider and healthcare professionals via regular meetings.
- Reconsider the requirement for expansion of satellite facilities, which can reduce the incentives for home therapies, in conjunction with Area Health Services via the Renal Dialysis Reference Group.
- Link activity of all dialysis modality, including home therapies, to Activity Based Funding and clinical outcomes for determining optimal cost-efficacy modality usage and cost benefits.
- Determine the "true-cost" of home dialysis by incorporating hospitalisations (system costs) with consumable (contract) costs to more accurately model the cost-efficacy of individual modalities.
- Remedy the "whole of health" issue of the lack of medical indemnity insurance for junior medical staff visiting extramural and private healthcare facilities.

Introduction and methodology

This report was developed in collaboration with a working group of multidisciplinary health professionals with diverse expertise and experience identified at the Renal Health Network (RHN) March 2007 and May 2008 Stakeholders Forums.

The group was chaired by Ms Julie Edmonds, Executive Advisory Group (EAG) member and representative of the non-government organisation sector Kidney Health Australia until June 2009 (KHA). The working group also included representatives from the Health Consumers' Council, Office of Aboriginal Health, renal nurses, nephrologists, allied health and community health practitioners.

The *WA Plan for Dialysis 2008-13* noted the under utilisation of home therapies in WA. The number of patients on home dialysis currently is 25%. The target is to increase it to 33% by 2013. The recently released WACHS Renal Dialysis Plan 2010 – 2021 has nominated a target of 35% within the Plan's ten year period.

The principal goal of the working group was to review practices and develop strategies to promote and expand home therapy services in support of the recommendations in The WA Renal Dialysis Plan 2008-2013 as indicated below:

Recommendation 6: "That the expansion of home based renal dialysis services and novel community based dialysis facilities in rural and remote regions are integrated with regional satellite services to benefit Aboriginal and remote patients".

Recommendation 7: "That those resources for remote and rural regions are supported by a formal funded arrangement between metropolitan Area Health Services (AHSs) and WA Country Health Service (WACHS) in line with other clinical services according to needs".

Recommendation 12: "That home dialysis services in metropolitan and rural locations continue to be expanded under the direction of the Renal Dialysis Reference Group (RDRG)".

Recommendation 13: "That a full-time director of home therapies and additional nephrologists be appointed specifically for promoting, supporting, researching and developing home therapies".

The working group task was therefore directed to examine:

1. The current and future uptake of home therapy.
2. The current availability of home therapies and whether all available options for home therapy are being accessed.
3. The barriers for patients and staff to access home therapies.
4. Strategies to improve patient access to home therapy.
5. New approaches to achieve the recommended target of 33% by 2013.
6. Identify the changes required to the health system to improve home therapy uptake.
7. Responsibilities and timelines to achieve the recommended outcomes.

The working group reviewed current literature, analysed the current service delivery, activity, outcomes and barriers in order to identify methods to improve the availability and sustainability of home therapy dialysis services.

Data is obtained primarily from the Australian New Zealand Dialysis and Transplant (ANZDATA) Registry Reports and where appropriate from the contracted home dialysis provider.

1. Current provision of services

A patient's decision to choose dialysis and the choice of dialysis modality depends on the availability of resources and a number of personal factors including medical conditions, age, family support, overall health, lifestyle and place of residence. Ideally this involves a multidisciplinary team discussion with the patient and their carers and the appropriate clinical framework from their supervising nephrologist.

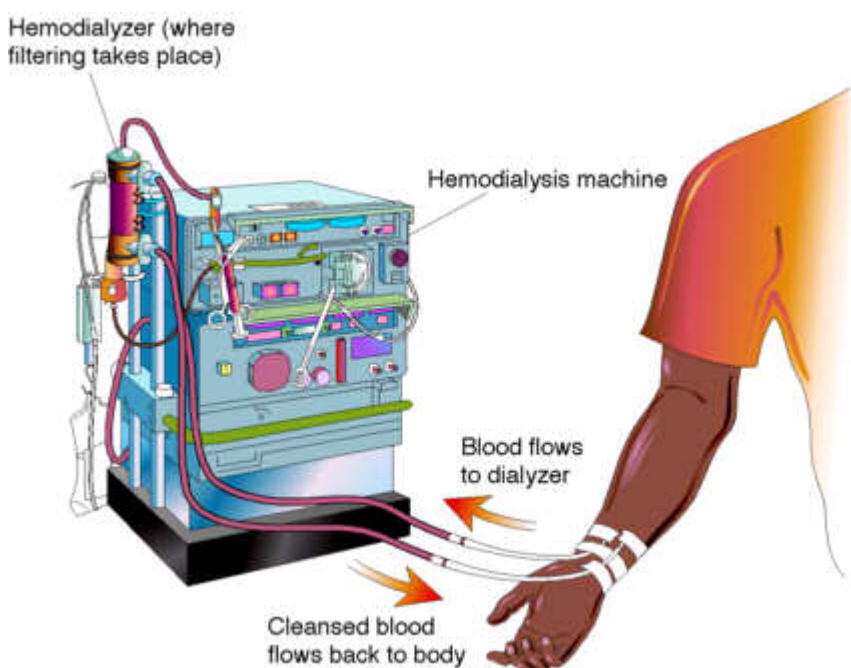
2. Dialysis modalities

There are two dialysis treatment modalities: haemodialysis and peritoneal dialysis. These therapies can be delivered by different methods:

1. In-centre (hospital) haemodialysis (HD)
2. Satellite haemodialysis (SHD)
3. Home haemodialysis (HHD)
4. Home peritoneal dialysis (PD) either continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD)

HD requires a dialysis machine to circulate blood from the patient's body through an artificial kidney or dialyzer for purification and then return it to the patient (Fig 1). Generally, HD is performed three times a week for four to five hours, although in some cases it can be performed daily or overnight for extended hours to improve efficiency.

Figure 1: Haemodialysis



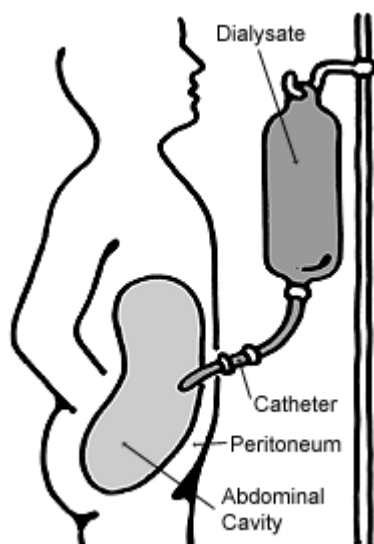
Source: Electronic Illustrators Group

PD (Fig 2) involves filling the peritoneal cavity with dialysis solution through a catheter. Waste and extra fluid are exchanged across the membrane and then transferred to the dialysis solution. After a predetermined period, the solution is then drained out of the body and replaced with a fresh solution. Each repetition of this cycle is called an exchange.

CAPD is usually performed four times a day taking about 30 minutes to complete each exchange.

APD involves the use of an automated cycler to perform fluid exchanges. The patient is attached to the machine at night before going to sleep, and performs six to eight overnight exchanges. During the day, dialysis solution can be left in the peritoneal cavity to optimize dialysis.

Figure 2: Peritoneal dialysis



Source: National Institute of Health, USA

2.1 In-centre haemodialysis unit

In-centres provide HD in a tertiary hospital setting. These units serve a broad purpose for patients with acute renal failure, hospitalised end stage kidney disease (ESKD) or chronic ESKD patients with high levels of dependency. These patients need a higher-level of specialised care by nephrologists, renal nurses and the availability of facilities and personnel that a tertiary hospital can offer.

In-centre units are located at Fremantle Hospital (FH), Royal Perth Hospital (RPH), Sir Charles Gairdner Hospital (SCGH) and Princess Margaret Hospital (PMH).

2.2 Satellite haemodialysis

This refers to a “free-standing” service, at a site other than a tertiary hospital. This treatment is for medically stable, relatively independent ESKD patients on HD. A satellite can be provided in a *non-teaching hospital* or in a *community-based* setting and operates within a cooperative relationship with a teaching hospital’s renal service facility to ensure ongoing clinical management of patients. There is a regular exchange of patients between satellite and in-centres depending on the patient’s medical needs.

Metropolitan satellites are based at Armadale, Cannington, Joondalup, Midland, Peel, Spearwood, Rockingham and Stirling.

Rural and regional satellites are located at Albany, Broome, Bunbury, Busselton, Derby, Geraldton, Kalgoorlie and Port Hedland.

2.3 Home haemodialysis

Home HD is preferred for independent medically stable and motivated patients with adequate social support and suitable accommodation providing adequate power, water, sewage and security. This treatment modality requires support from HD trained nurses and

technicians and in general a trained partner or support person(s).² Medical supervision is via a tertiary hospital.

2.4 Peritoneal dialysis

Independent, stable patients, who can be trained with some supervision provided by peritoneal dialysis nurses, undertake this procedure at home, and sometimes in supported care environments such as nursing homes.

3. Choice of modality

Currently, in WA 70% of all patients diagnosed with ESKD begin haemodialysis treatment at in-centre units. Only 5% of patients commence HD at a satellite directly and no patients commence home HD directly via the home training facility. Once the patient has commenced HD they may be transferred to a satellite service closer to home (60% of patients receive satellite based dialysis). Around 25% of patients are treated at home using either HD (3%) or PD (22%) and 15% are treated permanently in an in-centre unit. Patients who start HD in hospital are less likely to transfer to home based therapies when compared with those who directly commence home based therapies.

4. Demand for dialysis services

There is increasing demand and pressures on in-centre and satellite dialysis services caused by the increasing incidence of ESKD.² The projected annual increase of 6.3% of ESKD prevalence¹ indicates that demand for dialysis services will outstrip capacity unless more patients adopt home dialysis.

5. Rural and remote issues

Aboriginal patients experience significantly poorer health than non-Aboriginal Australians, with their life expectancy around 17 years less. Aboriginal people from remote areas have an incidence rate of ESKD up to 30 times higher than non-Aboriginal Western Australians.³ The incidence of ESKD is highest in the Kimberley, followed by the Pilbara and Midwest regions.

The remoteness of rural Western Australian communities makes home or self-care community based dialysis especially relevant in order to reduce the social impact of relocation to urban areas or regional satellite facilities. Satellite dialysis facilities cannot be provided to all communities with ESKD patients.

Socio-economic standards of housing and environmental health seriously impact upon the ability to safely provide home therapies. Home dialysis therapies are only justified when best clinical practice and outcomes can be sustained. Home therapies should not be used as a “dumping ground” or soft option for return to country solely due to an absence of satellite haemodialysis or other options. Careful patient selection and community support is required to ensure Aboriginal patients are not further disadvantaged by poor technique or patient survival.

Many Aboriginal people with chronic kidney disease (CKD) are currently residing in Perth because of limited satellite dialysis units and accommodation in regional areas.

The WACHS Renal Dialysis Plan 2010-2021 proposes an innovative Community Supported Home Haemodialysis (CSHD) model to overcome the problem of unsuitable homes and lack of reliable carers by having the patients’ dialysis machine set up in a community facility such as an Aboriginal Medical Service (page 34). The facility will be funded to provide trained

staff to support these patients. The support role is not a clinical one but similar to what a volunteer carer would undertake such as providing company, refreshments, helping to administer saline and contacting the home dialysis provider if necessary.

Most training for home dialysis occurs in Perth. Aboriginal patients are often referred late and commence dialysis urgently. Waiting times are compromised by a lack of vascular access, prolonged surgical waiting times, inadequate education and social planning. The relocation of traditional Aboriginals from their country causes stress and disruption for the patients and their communities. Non-Aboriginal remote patients may face similar hardships.

There is a limited range of culturally appropriate accommodation in Perth. The Autumn Centre in Bayswater, managed by Derbarl Yerrigan Health Service, is the only Aboriginal hostel which caters uniquely for renal patients from the country.

The provision of co-located accommodation for patients desiring home training would promote the self-care option and remove a significant barrier to accessing home therapies. Kidney Health Australia currently offers two houses for patients undergoing kidney transplantation. The use of these houses for home training is recommended.

Initiatives to train home dialysis patients within their communities should be considered. The development of a remote area health care workforce to provide local support and training for patients and carers is essential.⁴

6. Benefits of home dialysis therapies

There are many benefits to home dialysis:

- Home dialysis provides patients with autonomy, flexibility and reduced travel expenses.
- Home dialysis patients have proven improvement in quality of life and have more family engagement.⁵
- Patients residing in remote locations are able to stay in their own homes.⁶
- Patients receiving HHD are more likely to work, have lower mortality rates, experience less hospitalisation and have less dialysis-related complications than satellite or hospital based HD patients.⁷
- Home dialysis patients can perform more frequent or extended-hours dialysis which may have improved medical outcomes.^{6, 8, 9}
- Home dialysis patients are often reluctant to return to hospital-based therapies because of the autonomy and flexibility of home-based therapies.
- Home dialysis is less expensive than hospital and satellite based therapies in terms of direct costs, reduced admissions and complications^{5, 8} (see Table 1 for WA relative costs and weightings). For example, HHD is 54% cheaper than Satellite HD and CAPD is approximately 40% cheaper. Cost benefits from APD are less robust due to the contracted pricing mechanisms which require additional consumable costs such as drain bags and other items. Hospital HD is approximately 70% more expensive than satellite. Total costs are driven by the satellite and hospital HD (74% of patients and 82% of the weighted costs) compared with home therapies (24% of patients and 18% of total weighted costs). A shift in these modalities of as little as 5% sustains significant accrued cost savings, provided that additional hospitalisation costs are equivalent.

Table 1: Comparative purchased cost of the different dialysis modalities in WA

	Satellite HD	Hospital HD	HHD	CAPD	APD
Relative Unit Dollar Costs by PPT	\$1	1.7	0.46	0.57-0.62	0.83-0.99
Proportion of patients treated 2009	60	14	2.8	9.5	13.3
Total weighted costs	60	23.8	1.3	5.7	12

- The cost of PD in particular is also very dependent on clinical outcomes and hospitalisations because a high technique failure or infection rate with additional hospitalisations that may offset any upfront consumable savings. The high rates of peritonitis and technique failure in WA suggest that cost savings may indeed be reduced. Improving the infectious complications would mitigate technique failure and reduce costs.

7. Existing home dialysis program

7.1 The establishment of a corporatised home dialysis program

Prior to 2007, each tertiary hospital provided training and support for peritoneal dialysis with Royal Perth Hospital providing training and support for home haemodialysis. The Renal Dialysis Reference Group recognised that one reason for the extremely low proportion of patients on home haemodialysis in WA was the lack of access to training due to insufficient funding for staff and equipment. In order to improve the availability of home haemodialysis a decision to move to a competitive tendered price-per-treatment (PPT) approach was made.

WA was the first State to award a corporatised “Home Dialysis Program”. A private contractor assumed control of all home dialysis therapies in WA with new training facilities in the North and South Metropolitan Area Health Services. The Western Australian Home Dialysis Program (WAHDiP) provides support to these home therapy centres for metropolitan and remote home HD and PD. Limited support for metropolitan, rural and remote PD is still provided by the tertiary hospitals RPH, SCGH and FH. These hospitals still maintain a small PD unit for pre-dialysis inpatients. Princess Margaret Hospital (PMH) provides paediatric HD and PD services on a clinical needs basis.

Home therapy services include modality training, equipment installation, and transition to home, assessment visits, and ongoing clinical, consumables and technical support. WAHDiP has the potential to consolidate existing training methodologies, establish consistent learning outcomes for patients and more importantly enhance sustainability of home dialysis across WA.

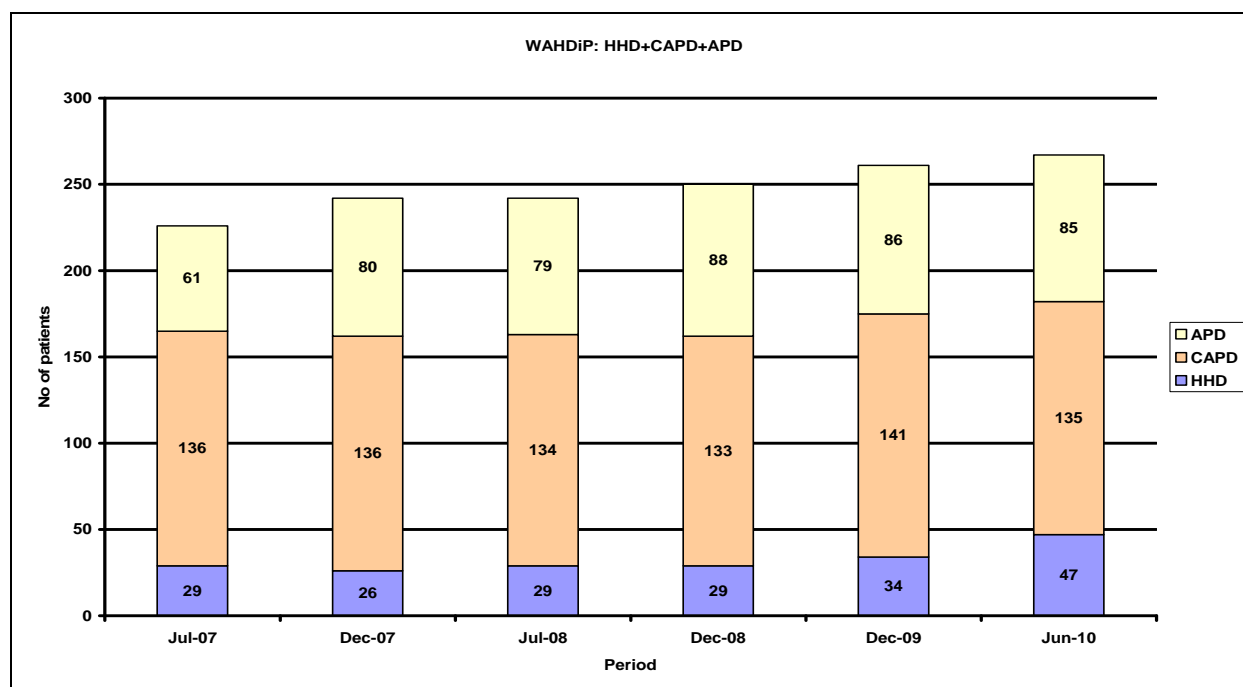
Despite a negotiated agreement to fund a statewide medical and nursing director to oversee the service funded by the cost-savings from corporatisation, this component of the service was never implemented. The lack of dedicated clinical leadership has restricted the clinical benefits anticipated from this model.

7.2 Current uptake of home dialysis

The ANZDATA showed that in 2007 approximately 26.4% of the WA dialysis patient population were on home dialysis compared with the national average of 32%. New Zealand home dialysis patient uptake was nearly 55%. At the end of 2008, WA had the **lowest** rate of home haemodialysis of 2.7% compared to 14% in New South Wales and 9% nationally. WA also has one of the lowest in-centre numbers in Australia which reflects the strong

practice of de-centralisation to satellite facilities over the last 5 years. WA has the **highest** use of satellite haemodialysis (60%) with NSW at 32% and Australia averaging 45%.

Graph 1: Prevalence HHD, CAPD and APD July 2007 – June 2010 in WA



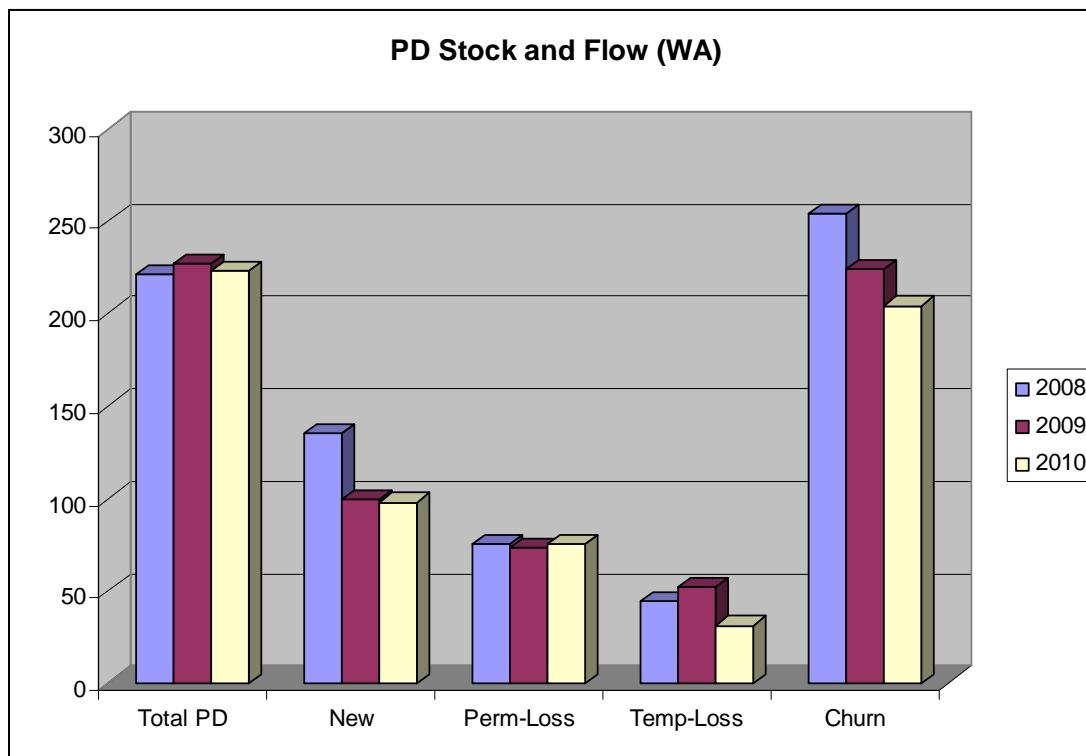
Data source: ANZDATA 2010 reports (2009 data) RHN Dec 2008 hepatitis survey and contractor monthly reports June 2010.

The latest available WA data (Graph 1) showed that on 31 December 2009 there were **989** patients on dialysis; with **250 (25.2%)** home dialysis patients (216 PD, 34 HHD) and 135 hospital (14%) and 604 (61%) satellite dialysis patients.¹⁰

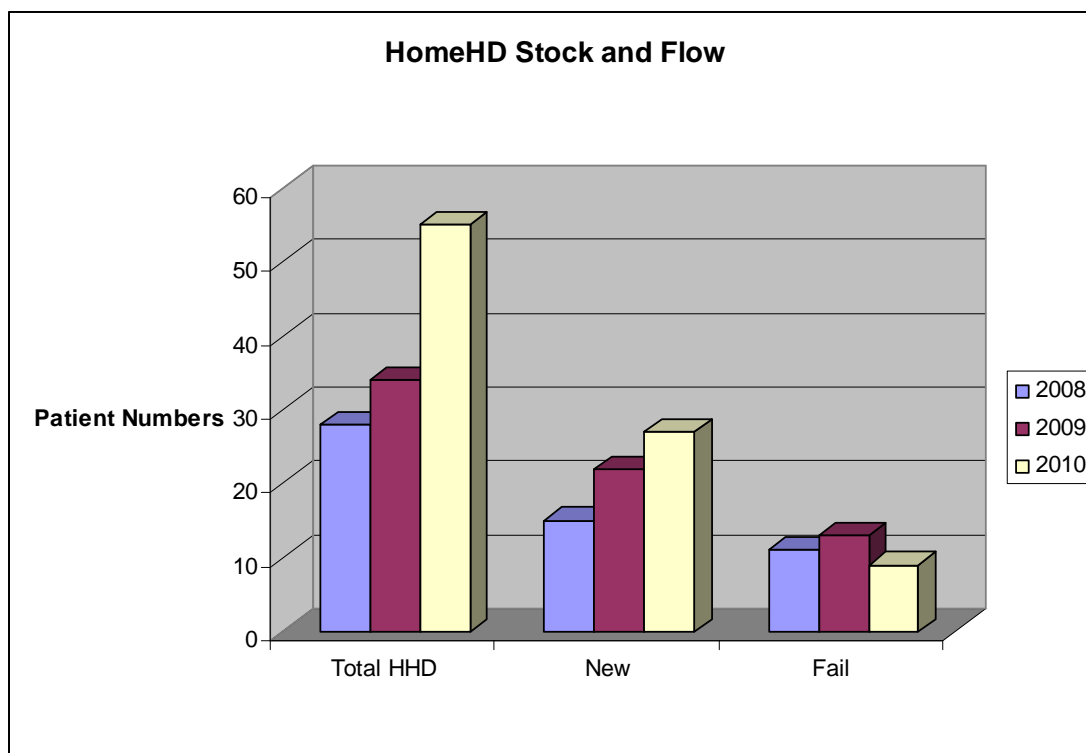
The contractor data indicated a decrease in PD numbers in June 2010 and a growth in HHD to 47 patients (Graph 1).

Graph 2a shows the continued growth in Home HD reflecting increasing uptake and training with stable drop-outs. This growth suggests that the target of 8% HHD by 2013 is feasible. In contrast, the figures for PD reveal the “hidden” activity required to maintain even a stable PD patient group due to the large “churn” relating to accommodating new patients and managing exiting or failing patients. In order to grow the PD numbers the ‘fail’ or drop out rate needs to be reduced. This implies targeting strategies to improve retention by reducing infection, reducing the intake of high-risk patients, that is those highly likely to fail, and other specific measures as recommended in the national “Call to Action” by Jose et al.¹¹ This responsibility requires the appointment of a specific medical and nursing director to oversee this state-wide service (see Section 10 page 25).

Graph 2: Stock and flow of home PD and home HD for WA 2008-2010



Graph 2a: Home HD stock & flow



Data source: Contractor monthly cumulative reports

8. Barriers to uptake of home dialysis therapy

The proportion of patients on home therapies has steadily declined since 1998, both nationally and in WA. Barriers to the uptake of home therapies have included timely access to training and the inertia that develops once patients are established in a hospital or satellite-based system. Furthermore, there has been inadequate recognition of the key importance of early education and funding for pre-dialysis education to encourage the use of home therapies. Three other barriers should also be considered.

8.1 Clinician factors

- The rapid expansion of satellite haemodialysis since 2008 may have reduced the clinicians' and patients' incentive to refer patients for home dialysis because patients are easily accommodated within existing structures and there is reduced incentive for self-care.
- Initially, the introduction of a corporatised and geographically separate model of home dialysis care in 2007 may also have reduced physician referral. This may relate to concern about patient safety and unknown clinical outcomes as well as the impact of service delivery caused by the logistic delays involved in setting up a new facility in the home.
- Nephrologists have a key role in influencing patients' choices and physician bias plays a significant part in the selection of dialysis modality.¹²⁻¹⁴ Nephrologists opinion of home dialysis is related to their experience and training.¹² An American study found that if patients received unbiased education regarding treatment options in a timely fashion that up to 45% of patients chose to initiate therapy on PD.¹³ A de-centralised corporate model of home dialysis services carries the risk of WA-trained nephrologists and physicians having little or no exposure to home-based therapies. To mitigate this risk, there should be provision for registrars to work in the home dialysis environment with each hospital having dedicated and experienced home therapy clinicians to provide leadership and teaching. Any medico-legal barriers preventing junior staff visiting these units need to be remedied as a "whole of health issue" as off-site training is also applicable to other clinical areas.

8.2 System-based factors

System based factors that reduce patient acceptance of home therapies include:

- Late referral and a lack of resources for pre-dialysis education of patients.¹³⁻¹⁵ Compared to other States, the proportion of late referrals in WA is very high (approximately a third of patients).
- The inability to achieve timely dialysis access placement due to late referral and/or long surgical wait times results in patients being unable to commence home therapy. WA has the lowest rate of functioning vascular access at the start of dialysis in Australia (Draft Renal Health Network Vascular Access Report 2011).
- Inadequate number of staff trained in home HD and nurses not aware of home dialysis benefits.¹⁶
- Dialysis machines remain relatively complex.
- Inadequate housing is a significant barrier and structural changes to adapt accommodation and refund of power and water costs are inconsistently or inadequately funded.
- Operating costs, including power and water, are a disincentive for community organisations and need to be funded.¹⁷

- Insufficient manpower to adequately supervise the large number of home dialysis patients.
- Difficulties in providing timely and locally accessible training.

8.3 Patient factors

- An increase in the numbers of elderly patients with significant comorbidities or social issues may restrict the uptake of home therapies.¹³
- Failure to commence home therapy directly at the start of dialysis. Once a patient begins a facility-based therapy, they are less likely to shift to a home therapy when compared with patients who have a planned start on the modality of their choice.^{6, 14} De-motivation and reinforcement of the complexity of dialysis makes them reluctant to accept responsibility for care, a factor that is often reinforced by the availability of nursing and medical staff on site.
- Insufficient patient education and misinformation also contribute to patients not choosing home therapies.^{12, 13 14} Lack of timely education early in the process before dialysis promotes dependency and reduces the chances of patients accepting home based-therapy.
- Social circumstances are also known to be a barrier to home therapies through inadequate housing or infrastructure¹⁸ although this may be overcome through the use of community facilities.
- Many patients who are suitable for home dialysis are dialysing at community based facilities due to lack of suitable and reliable voluntary carers. The WACHS Dialysis Plan 2010-2021¹⁷ seeks to address this barrier by providing trained health workers paid by the facilities.
- Community expectations are changing with patients and their relatives being less willing to dialyse themselves or to support relatives and prefer intermittent treatment in a safe and expert clinical environment.
- Power and water costs are a disincentive to some patients.⁶
- Potential expenses associated with setting up home dialysis for someone whose situation may change suddenly, for example receiving a transplant, can be a disincentive.
- Patients may be concerned about their clinical stability and the lack of immediate back-up when managing their dialysis in the home.

9. Reasons for dropout from home therapy

9.1 Transplant

The most frequent cause for dropout from home haemodialysis is transplantation, reflecting the superior clinical status of this group.¹⁸ In the PD population, however, transplantation is not a common reason for drop-out.

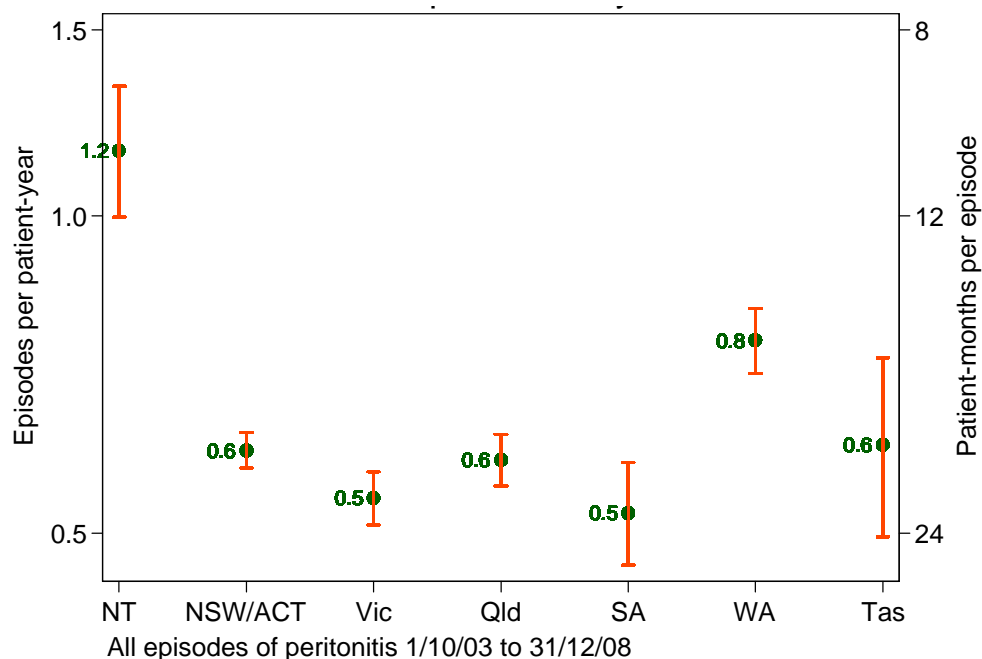
9.2 Technique failure (PD)

Membrane failure and ultrafiltration failure remain a significant cause of transfer from PD to haemodialysis. Ultrafiltration failure is the inability to remove excess fluid which is a common complication usually occurring after three years of treatment. Techniques to prolong and improve survival can be effective and are routinely trialled before elective transfer to HD. The ANZDATA 2010 showed that the WA rate for PD technique failure in 2009 was 42%, which was double the national PD failure rate..

9.3 Infections

Peritonitis remains the leading cause and contributor to technique failure for patients receiving PD.^{13, 19} Australian peritonitis rates remain higher than those of many other countries¹¹ with particularly high rates of hospitalisation and tube removal. Patients who lose their tube are significantly less likely to resume PD.²⁰ Compared with other mainland states WA has the highest overall peritonitis rates, exceeded only by Northern Territory (Graph 3) over the last five years (2003-2008).

Graph 3: Variation in peritonitis rates by Australian states



West Australian peritonitis rates, particularly in certain high-risk patient groups are even higher than Australian rates (refer to graph 3).¹⁸

Table 2: Peritonitis rates in Western Australian tertiary hospitals

	ISPD	Australia#	RPH*	SCGH	Fremantle	Kimberley
Events per patient months	>1:18	1:22	1:13	1:22	1:17	1:6
Events per year	<0.67	0.63	0.93	0.55	0.7	1.9

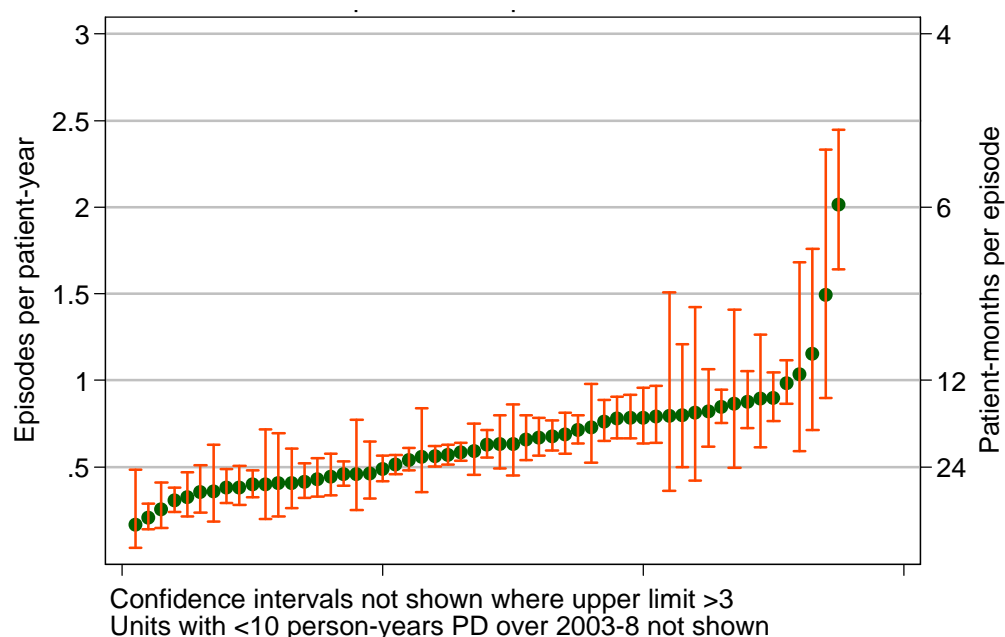
*excludes Kimberley patients. # Australian Data is from 2008

ISPD – International Society for Peritoneal dialysis²¹

Significant inter-hospital variation also occurs (Table 2) and only one WA site achieves rates comparable to national and international standards (1:18 months. Note the International Society for Peritoneal Dialysis (ISPD) benchmark is to increase to **1:30 months**). This hospital variation is also evident across Australia with high intra-unit variability (Graph 4). There is extreme variation in peritonitis rates around Australia that cannot be explained only by variation in patient selection and are considered to reflect variation in clinical practice.

In many cases, poor peritonitis outcomes reflect significant deviations from the ISPD recommendations.¹¹

Graph 4: Variability in peritonitis rates by Australian PD units.



In addition, the time to first peritonitis and the proportion of patients without peritonitis in any one year supply additional information regarding the success of PD therapies.

In WA two thirds (2/3) of all peritonitis occurs within 12 months of starting treatment. It is particularly concerning that the infection rates in the North-West are extremely high, which raises significant concern about the validity of further promotion of PD in this high-risk group. Additional research and review of this is urgently needed. Strategies to reduce peritonitis rates would reduce technique failure and further research should be strongly expanded.

9.4 Carer or patient fatigue

Carer or patient fatigue is recognised as a significant factor in influencing patient retention in home therapy, especially with an ageing population and a trend for reduced family support in the dialysis population.^{12,14} The availability of regular respite care has been recommended as a means of reducing carer fatigue and the use of nursing homes providing PD for residents to remove the burden from the family or primary carer.¹⁴ In Australia, unlike France for example, nursing homes do not currently receive additional funding for the provision of PD.¹³

9.5 Non-dialysis related factors

A patient's other health issues or intercurrent illnesses may cause a temporary or permanent return to facility-based dialysis, even though the home dialysis was otherwise feasible.

10. Clinical governance

Existing clinical governance of the home therapy program is loosely defined. Although there is a clinical director employed for two sessions and funded by the North Metropolitan Area Health Service (NMAHS), the duties, lines of responsibility and accountability to purchasers and providers are not explicit.

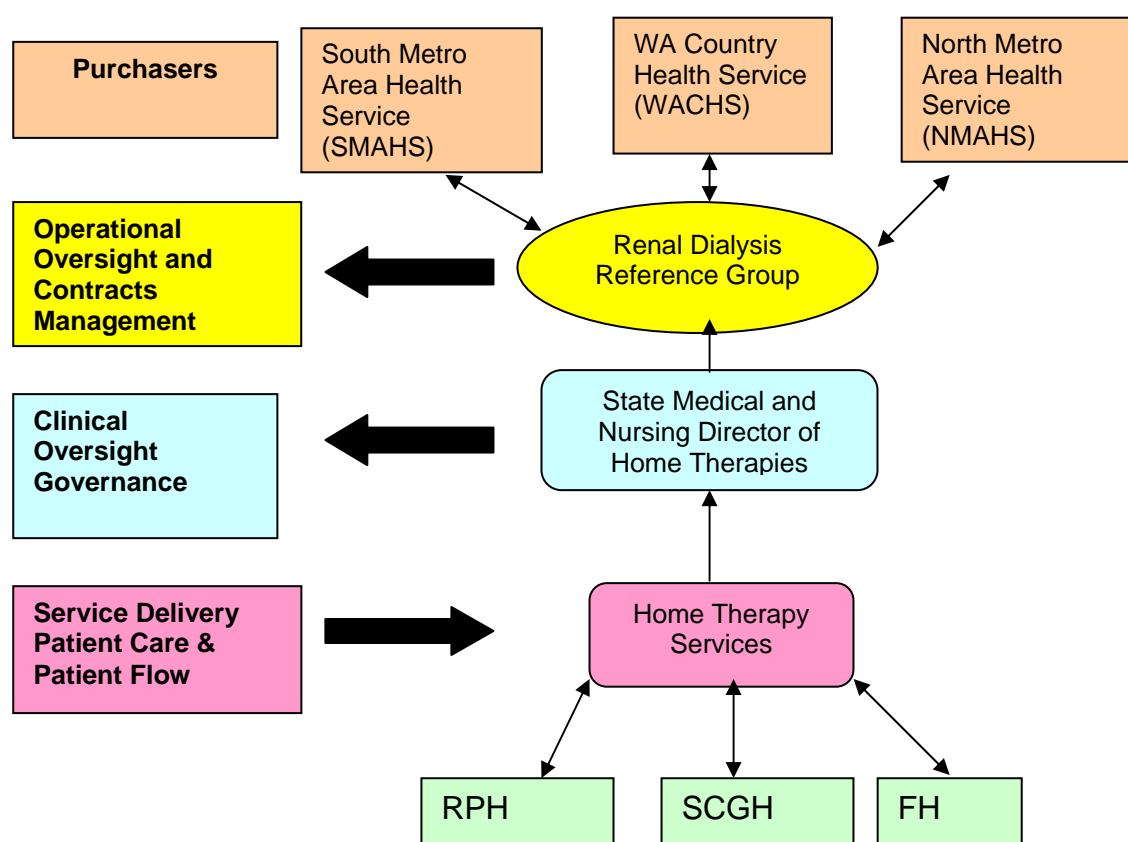
A Clinical Advisory Committee (CAC) representing the three tertiary hospitals is in existence, but its responsibility and accountability are also not defined but consist of reviewing outcomes and some input into policy in an advisory role.

The line of responsibility and accounting of clinical outcomes and cost-efficiency in meeting the contractual responsibilities to the purchasers, Area Health Services and clinicians is unclear.

Clinical oversight is necessary to ensure quality and outcomes and compliance to standards and benchmarking. The appointment of a statewide medical and nursing director of home therapies reporting to the Renal Dialysis Reference Group (RDRG) that represents the Area Health Services, is highly recommended. In order to improve governance and provide clarity to the purchaser, provider and clinicians. A suggested clinical governance pathway is depicted in figure 3.

Note: The application of this model may require broader review and legal opinion as to its implication within existing contracts held between the provider and the Area Health Services.

Figure 3: Suggested clinical governance of home dialysis services



11. Home therapies patient assessment protocols

The use of PD in high risk groups should be re-examined to consider whether introducing additional patient selection criteria will avoid selecting patients at high risk of early failure. Patients in remote locations have very high infection and fail rates, in part due to isolation, environmental conditions and delayed access to treatment. The morbidity and mortality associated with these high risk patients warrants reconsideration of PD as a suitable therapy. In many instances the choice of PD is driven by expediency to return patients to remote locations and the absence of alternative options for haemodialysis. This aim is ultimately futile if early failure results in prolonged hospitalisation and delayed haemodialysis access, with attendant financial, social and medical penalty.

Unfortunately the poor outcomes of PD and a high technique failure rate in WA remain the largest modifiable factors that restrict growth and reduce sustainability of the PD program. Criteria that promote better patient selection¹¹, reduce infection, increase timely treatment of infection, reduce tube loss and promote retention on PD are the core actions to improve cost-effective growth in this important modality.

Practical improvement for peritoneal dialysis practice also include rigorous adherence to guideline based protocols for peritonitis prevention and management and development of centralised patient-specific training programs¹¹ (see Appendix 1). In addition to the strategies listed in the summary of Jose et al paper in Appendix 1, other infection prevention measures should include standard practice such as:

- Patient education on adherence to hand hygiene and aseptic technique.
- Additional precautions and management of carriage with multi-resistant organisms.

WAHDiP and the home dialysis contracted provider have developed a PD Patient Risk Assessment tool to assist in suitable PD patient selection that is under trial (Appendix 2).

The PD and HHD Suitability Assessment Criteria developed by the Medical Education Institute in the US and made available by the Home Dialysis Central online portal are examples of protocols that can be used here in WA (Appendices 3 and 4) which can further increase home dialysis expansion. The link to the portal is:

<http://www.homedialysis.org/about> .

12. References

1. Department of Health Western Australia. Chronic Kidney Disease Model of Care. Perth: Health Networks Branch, Department of Health Western Australia; 2008.
2. Department of Health Western Australia. WA Plan for Renal Dialysis Services 2008-2013. Perth: Health Networks Branch. Department of Health, Western Australia; 2007.
3. Cass A, et al. End-Stage Renal Disease in Indigenous Australians: A Disease of Disadvantage. *Ethn Dis* 2002;12(3):373-8.
4. Cross-Jurisdictional Governmental Working Group. The National Service Guidelines for the Management of Dialysis and Kidney Transplantation in Remote Australia. Australian Health Ministers Conference (AHMAC); July 2006.
5. Sinclair P. Home haemodialysis: a literature review. *Ren Soc Aust J* 2008;5(1):9-15.
6. Ludlow MJ, George CRP, Hawley CM, Mathew TH, Agar JW, Kerr PG, et al. How Australian nephrologists view home dialysis: Results of a national survey. *Nephrology* 2011;16:446-52.
7. Mowatt G, Vale L, MacLeod A. Systematic review of the effectiveness of home versus hospital or satellite unit haemodialysis for people with endstage renal failure. *International Journal of Technology Assessment in Health Care* 2004;20(3):258-68.
8. Agar JW, Hawley CM, George CR, Mathew TH, McDonald SP, Kerr PG. Home haemodialysis in Australia - is the wheel turning full circle? *Medical Journal of Australia* 2010;192(7):403-6.
9. Ecran O, Soner D, Gulay A, Murat T, Ozen O, Meral K, et al. Comparison of 4-h and 8-h dialysis sessions in thrice-weekly in-centre haemodialysis. *Nephrol Dial Transplant* 2011;26:1287-96.
10. Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry. Summary 01 Jan 2009 to 31 Dec 2009: Adelaide, South Australia; October 2010.
11. Jose MD, Johnson DW, Mudge DW, Tranaeus A, Voss D, Walker R, et al. Peritoneal dialysis practice in Australia and New Zealand: A call to action. *Nephrology* 2011;16:19-29.
12. Bouvier N, Durand P, Testa A, Albert C, Planquois V, Ryckelynck J, et al. Regional discrepancies in peritoneal dialysis utilization in France. *Nephrology Dialysis Transplantation* 2008;24(4):1293-7.
13. Gokal R. What is the Evidence That Peritoneal dialysis is Underutilized as an ESRD Therapy. *Seminars in Dialysis* 2002;15(3):149-50.
14. Gokal R. Peritoneal Dialysis in the 21st Century: An Analysis of Current Problems and Future Developments. *Journal of the American Society of Nephrology* 2002;13(Supplement 1).
15. Mendelssohn D, et al. A Prospective Evaluation of Renal Replacement Therapy Modality Eligibility. *Nephrology Dialysis Transplantation* 2009;24:555-61.
16. Lauder LA, Ludlow MJ, Hawley CM, Richardson EP, Mathew TH, Munro CE. Australian Nephrology Nurses views on home dialysis: A national survey. *Renal Society of Australian Journal* March 2011;7(No 1):6-12.
17. Department of Health, Western Australia. WACHS Renal Dialysis Plan 2010 to 2021. Perth, Western Australia; October 2010.
18. Western Australia Home Dialysis Programme. Western Australian Home Dialysis Program Annual Reporting Jan-Dec 2008. Perth: Department of Health Western Australia; 2008.

19. Jaar BG, Plantinga LC, Crews DC, Fink NE, Hebah N, Coresh J, et al. Timing, causes, predictors and prognosis of switching from peritoneal dialysis to haemodialysis: a prospective study. *BMC Nephrology* 2009;10(3):1471-2369.
20. Johnson DW, Dent H, Hawley CM, McDonald SP, Rosman JB, Brown FG, et al. Associations of Dialysis Modality and Infectious Mortality in Incident Dialysis Patients in Australia and New Zealand. *American Journal of Kidney Diseases* 2009;53(2).
21. Li PK-T, Szeto CK, Piraino B, Figueiredo AE, Gupta A, Johnson DW, et al. ISPD Guidelines - Peritoneal Dialysis-Related Infections Recommendations: 2010 Update. *Peritoneal Dialysis International* 2010;30:393-423.

Appendices

Appendix 1: Practical improvement of peritoneal dialysis (PD) practice in ANZ

Jose MD, Johnson DW, Mudge DW, Tranaeus A, Voss D, Walker R, et al. Peritoneal dialysis practice in Australia and New Zealand: A call to action. *Nephrology* **16** (2011) 19-21

Summary source: Baxter Healthcare, Asia Pacific Shanghai and China

Peritoneal dialysis practice in Australia and New Zealand: A Call to Action

Summary: Bridging the Gap: Practical improvement of peritoneal dialysis (PD) practice in ANZ

- PD technique survival in Australia and New Zealand is lower than in other parts of the world.
- More than two-thirds of technique failures are related to infective complications (predominantly peritonitis) and 'social reasons'.¹
- Peritonitis rates in ANZ are significantly higher than those reported in most other countries. Australia is only marginally above the minimum acceptable peritonitis rate recommended by the International Society of Peritoneal Dialysis (ISPD) (i.e. 1 episode per 18 patient-months).²
- Subsequently, more than one-third of Australian PD units and the majority of NZ units do not satisfy the ISPD minimum accepted peritonitis rate.^{1,2}
- Peritonitis outcomes are also generally inferior to those reported in other world regions.³⁻⁹ Moreover, PD-associated peritonitis episodes in Australia are associated with high rates of relapse (14%), hospitalisation (70%), catheter removal (22%) and permanent haemodialysis transfer (18%).³⁻⁹
- In many cases, poor peritonitis outcomes reflect significant deviations from ISPD recommendations.²⁻⁹

This paper proposes a series of practical recommendations to improve outcomes in PD patients through:

1. Appropriate patient selection,
2. Prophylaxis and treatment of infectious complications,
3. Investigation of social causes of technique failure,
4. Patient education and continuous support
5. Clinical governance and professional standards

Peritoneal dialysis practice in Australia and New Zealand: A Call to Action

1. Patient Selection

- i. Encourage patient choice in relation to the mode of dialysis treatment
- ii. Patients <60 years without co-morbidity should be considered for PD
- iii. Select motivated patients with support (if required) from a family member or friend.

Patient Factors that Impact on Peritoneal Dialysis (PD) Success	
Patient preference for PD	Absence of medical and surgical contraindications e.g. previous abdominal surgery with adhesions
Body weight (usually BMI 20-30 kg/m ²) Abdominal obesity may preclude	Time commitment for PD
Motivation to perform home self-care treatment	Desire to travel – Easier with PD compared to HD
Training – Ability to retain and recall information	Social worker assessment – Finance, work, family, community
Language/need for an interpreter may be a barrier	Support person availability – Demand on other members of household may be a barrier
Adequate manual dexterity for bag changes	Clean and clear area for bag changes
Sufficient strength to handle bags (especially APD)	Adequate storage area with access for supply & delivery
Visual acuity – The visually impaired may need training	Good access between storage and bag change area

2. Prophylaxis & timely treatment of infectious complications

i. All PD units must establish a protocol for PD catheter insertion

- a) Eradicate Staphylococcus aureus (S. aureus) to reduce exit site infection
- b) Catheter insertion performed by an appropriately trained and experienced operator (physician or surgeon)
- c) Prepare the bowel and avoid constipation
- d) Place catheter with a downward facing exit site
- e) Administer a single dose of prophylactic antibiotic at the time of catheter insertion
- f) Keep the catheter exit site clean and apply topical antimicrobial

ii. All PD units must establish infection control protocols

- a) Educate patients on aseptic technique and administer antibiotics early in the case of touch contamination
- b) Regularly assess exit site
- c) Screen for causative intra-abdominal pathology
- d) Culture-negative peritonitis must be <20% of all peritonitis episodes

iii. All PD units must establish their own peritonitis treatment protocols

- a) Administer appropriate antibiotic(s) for the organism being treated
- b) Adhere to ISPD recommended route and duration of treatment
- c) Administer antifungal prophylaxis in centres with high rates of fungal peritonitis
- d) Remove PD catheter early in the event of inadequate response to treatment

iv. All PD units must record infection rates and outcomes for benchmarking against national and international registries and guidelines

3. Investigation of ‘social causes’ of technique failure

The most common cause of technique failure in ANZ is due to ‘social reasons’. Nearly half of all technique failures in Australia are reported to be due to ‘patients unable to manage self-care’ (16%) or ‘patient preference’ (84%).

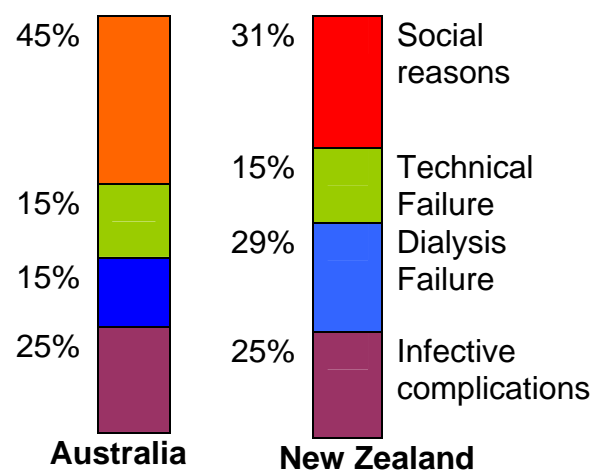
However, there is a scant data regarding the specific factors that contribute to ‘patient preference’ for discontinuation of PD and some technique failures coded as ‘social reasons’ are likely to be partly related to peritonitis complications.

Further research and more specific coding in ANZDATA is needed to elucidate the factors underlying ‘social reasons’ for technique failure, so that improvement programs can be implemented.

4. Patient education & continuous support

The content and delivery of PD training in ANZ is not uniform and may contribute to variable treatment outcomes. Recommendations for improving PD training include:

- i. Support the patient’s decision to use PD from the time of modality choice through to the start of dialysis
- ii. Establish centralized training practices based upon adult learning principles
- iii. Retrain patients at regular intervals, preferably in the home environment
- iv. Provide 24-hour-a-day patient/carer access to experienced PD staff
- v. Provision of home-assisted PD.



5. Clinical governance & professional standards

The content and delivery of PD training in ANZ is not uniform and may contribute to variable treatment outcomes.

Recommendations for improving PD:

- i. Establish clinical oversight in every unit with clear lines of responsibility and mandatory continuous quality assurance process
- ii. Develop a unified, co-ordinated approach to clinical governance across ANZ.

Conclusion

Bridging the gap: Practical improvement of peritoneal dialysis (PD) practice in ANZ

- PD technique survival rates in many units in ANZ are unacceptably low.
- Reducing peritonitis rates and overcoming social causes of technique failure requires:
 - a) Improved patient selection.
 - b) Rigorous adherence to guideline based protocols for peritonitis prevention.
 - c) Management and development of centralized and patient-specific training programs.
- A concerted unified approach to clinical governance with strong leadership in each unit is imperative to improve PD outcomes in ANZ.
- The cooperation and assistance of professional bodies and state and federal governments are needed to promote PD research, develop professional PD education standards and oversee continuous quality improvement programs.

1. Johnson DW, et al. Peritoneal dialysis. In: McDonald SP. (ed.) ANZDATA Registry Report 2008. ANZDATA Registry, Adelaide, South Australia, 2008.
2. Piraino B, et al. Perit Dial Int 2005 25:107-31.
3. Barraclough K, et al. AM J Kidney Dis 2010; 55: 121-31.
4. Barraclough K, et al. Nephrol Dial Transplant 2009; 24; 3834-39.
5. Govindarajulu S, et al. [In Press] Perit Dial Int 2010.
6. Miles R, et al. Kidney Int 2009; 76: 622-28.
7. Siva B, et al Clin J Am Soc Nephrol 2009; 4: 957-64.
8. O'Shea S, et al. BMC Nephrol 2009; 10: 1-9.
9. Edey M, et al. [In Press] Nephrol Dial Transplant 2009.

Appendix 2: WAHDip PD patient risk assessment



Fresenius Medical Care



WEST AUSTRALIAN HOME DIALYSIS PROGRAM (WAHDiP) PD PATIENT RISK ASSESSMENT

Pt label

	Assessment	Score	A	B	C	D
1	Dialysis Technique		2	1	-1	N/A
2	Exit Site		2	1	-1	N/A
3	PD Record Book		2	1	0	N/A
4	Fluid Status		2	1	-1	N/A
5	Medications		2	1	-1	N/A
6	Ongoing Self Management		2	1	-1	N/A
7	Maintenance of House Dialysis Area & Supplies		2	1	-1	N/A
8	Ethnicity		2	1	0	-1
9	Community Clinic Services		2	1	-1	N/A
10	Nutrition		2	1	-1	N/A
11	Psychological		2	1	-1	N/A
12	Family Support		2	1	-1	N/A
13	Physical		2	1	-1	N/A
TOTAL						

<10 – High Risk

11-17 – Moderate Risk

18-26 – Low Risk

Comments:

Name: _____ **Signature:** _____

**Score 1 – Dialysis technique**

2	A	Competent dialysis technique: follows set-up procedure and can troubleshoot mechanical problems
1	B	Satisfactory dialysis technique: set-up procedure changed, requires assistance to troubleshoot mechanical problems
-1	C	Poor Dialysis technique: does not follow set up procedure, unable to troubleshoot mechanical problems

Score 2 – Exit Site

2	A	Perfect/Good
1	B	Equivocal
-1	C	Acute or Chronic Infection

Score 3 – PD Record Book

2	A	Completed – Daily weight, BP and UFV recorded
1	B	Completed – not including daily weight or BP or UFV
0	C	Incomplete

Score 4 – Fluid Status

2	A	Achieves IBW – correct bag strength selected, understands fluid management concepts
1	B	Difficulty achieving IBW – occasional incorrect bag strength selected, satisfactory understanding of fluid management concepts
-1	C	Unable to achieve IBW – incorrect bag strength selected, poor understanding of fluid management concepts

Score 5 - Medications

2	A	Correct medications being taken. Good understanding of drug action and dose
1	B	Majority of correct medications being taken, satisfactory understanding of drug action and dose
-1	C	In correct/no medication being taken, no understanding of drug action and dose

Score 6 – Ongoing self management

2	A	Demonstrates commitment to monitoring care including correct fistula care
1	B	Intermittent commitment to monitoring care including correct fistula care
-1	C	No commitment to ongoing monitoring, incorrect fistula care

**Score 7 – Maintenance of House, Dialysis Area and Supplies**

2	A	House, Dialysis area and supplies all maintained in good condition
1	B	House satisfactory, dialysis area clean, supplies maintained in good condition
-1	C	House, Dialysis area and supplies poorly maintained

Score 8 - Ethnicity

2	A	English is first language, Eurasian descent
1	B	English second language, Eurasian descent
0	C	English first language, Indigenous descent
-1	D	English second language, Indigenous descent

Score 9 – Community Clinic Services

2	A	Requires no community support
1	B	Requires community support that is available
-1	C	Requires continuous community support that is unavailable

Score 10 - Nutrition

2	A	Serum albumin 35-50 g/L
1	B	Serum albumin 30-35 g/L
-1	C	Serum albumin less than 30 g/L

Score 11 - Psychological

2	A	Appears to be coping with renal failure, dialysis and everyday life
1	B	Appears to be experiencing minor problems coping with renal failure or dialysis or everyday life
-1	C	Appears not to be coping with renal failure, dialysis or everyday life

Score 12 – Family Support

2	A	Family situation very good with supportive systems
1	B	Family situation good with good supportive systems
-1	C	Social situation poor with poor supportive systems

Score 13 - Physical

2	A	Independent with ADL including dialysis
1	B	Requires assistance with ADL, independent with dialysis
-1	C	Requires assistance with ADL and dialysis



WEST AUSTRALIAN HOME DIALYSIS PROGRAM (WAHDiP)

PD PATIENT RISK ASSESSMENT

Pt label

	Assessment Date					
		Score	Score	Score	Score	Score
1	Dialysis Technique					
2	Exit Site					
3	PD Record Book					
4	Fluid Status					
5	Medications					
6	Ongoing Self Management					
7	Maintenance of House Dialysis Area & Supplies					
8	Ethnicity					
9	Community Clinic Services					
10	Nutrition					
11	Psychological					
12	Family Support					
13	Physical					
TOTAL						
SIGN						

Score 18-26	Score 11-17	Score <10
Low Risk	Moderate Risk	High Risk
Competent Technique	Borderline Technique	Poor Technique
Home Visit 2 per annum	Home Visit 3 or more	Home Visit 3 or more

Home visit approval required from parent hospital for 3 or more home visits

Appendix 3: Method to access treatment choices for home dialysis

Method to assess treatment choices for home dialysis (MATCH-D)

www.homedialysis.org/match-d

Criteria for Suitability for Self Peritoneal Dialysis: CAPD, APD¹

Strongly Encourage PD
Any patient who <i>wants</i> to do PD or has no barriers to it
Employed full- or part-time
Student – grade school to grad school
Caregiver for child, elder, or person with disability
New to dialysis or has had transplant rejection
Lives far from clinic and/or has unreliable transportation
Needs/wants to travel for work or enjoyment
Has needle fear or no remaining HD access sites
BP not controlled with drugs
Can't or won't limit fluids or follow in-center diet
No (required) partner for HHD
Wants control; unhappy in center

Encourage PD after Assessing & Eliminating Barriers
Minority – <i>not a barrier to PD</i>
Unemployed, low income, no HS diploma – <i>not barriers to PD</i>
Simple abdominal surgeries (eg appendectomy, hernia repair, kidney transplant) – <i>not barriers to PD</i>
Has pet(s)/houseplants (carry bacteria) – bar from room at least during PD connections
Hernia risk or recurrence after mesh repair – use low daytime volume or dry days on cyclor
Blind, has no use of one hand, or neuropath in both hands – train with assist device(s) as needed
Frail or can't walk/stand – assess lifting, offer PT, offer CAPD, use 3L instead of larger bags for cyclor*
Illiterate –use pictures to train, return demonstrations to verify learning, tape recorders for patient reports
Hearing impaired – use light/vibration for alarms
Depressed, angry, or disruptive – increased personal control with PD may be useful
Unkempt – provide hygiene education; assess results
Anuric with BSA >2 sqm – assess PD adequacy††
Swimmer – ostomy dressings, chlorinated pool, ocean
Limited supply space – visit home, 2x/mo. delivery
Large polycystic kidneys or back pain – use low daytime volume or dry days on cyclor††
Obese – consider presternal PD catheter
RX drugs impair function - consider drug change

May Not be Able to Do PD (or will Require a Helper)
Homeless and no supply storage available
Can't maintain personal hygiene even after education
Home is unclean/health hazard; patient/family won't correct
No/unreliable electricity for CCPD; unable to do CAPD
Multiple or complex abdominal surgeries; negative physician evaluation††
Brain damage, dementia, or poor short-term memory*
Reduced awareness/ ability to report body symptoms
Malnutrition after PD trial leads to peritonitis††
Uncontrolled anxiety/psychosis*

* May be able to do with a helper

† Consider daily HHD

‡ Consider daily HHD

¹ ©Medical Education Institute, Inc. | Version 1:11/2/07 | For questions, call (608) 833-8033 or email schatell@meiresearch.org. Developed by Dori Schatell, MS, and Beth Witten, MSW, ACSW, LSCSW for Home Dialysis Central (www.homedialysis.org).

Appendix 4: Method to assess treatment choices for home dialysis

Method to assess treatment choices for home dialysis (MATCH-D) www.homedialysis.org/match-d

Criteria for Suitability for Self Home Haemodialysis: Conventional, Daily, Nocturnal²

Strongly Encourage HD (HHD)
Any patient who <i>wants</i> to do HHD <i>or</i> has no barriers to it
Employed full- or part-time
Drives a car – skill set is very similar to learning HHD
Caregiver for child, elder, or person with disability
Lives far from clinic and/or has unreliable transportation
Student – grade school to grad school
Needs/wants to travel for work or enjoyment
Wants a flexible schedule for any reason
Has rejected a transplant
Has neuropathy, amyloidosis, LVH, uncontrollable BP†‡
Obese/large; conventional HD or PD are not adequate†‡
Can't/won't follow in-center diet & fluid limits†‡
Is pregnant or wants to be
Frail/elderly with involved, caring helper who wants HHD*
Wants control; unhappy in-center
No longer able to do PD

Encourage HHD after Assessing & Eliminating Barriers
No employer insurance – not a barrier to nocturnal 3x/week HHD, which Medicare & Medicaid cover
Unkempt – provide hygiene education; assess results
Has pet(s)/houseplants (carry bacteria) – bar from room at least while cannulating/connecting access
Frail or can't walk/stand – assess lifting ability, offer PT*
Illiterate – use pictures to train, return demonstrations to verify learning, tape recorders for patient reports
Hearing impaired – use light/vibration for alarms
Depressed, angry, or disruptive – increased control with HHD may be useful
No helper & clinic requires one – reconsider policy, monitor remotely, use LifeLine device to call for help
Rents – check with landlord if home changes needed
Can't/won't self-cannulate – use patient mentor, practice arm, local anesthetic cream, desensitization*
No running water, poor water quality, low water pressure – assess machine & water treatment options
Limited supply space – visit home, 2x/mo. Delivery, consider machine with fewer supply needs
Drug or alcohol abuse – consider HHD after rehab
Bedridden and/or has tracheostomy/ventilator – assess self-care and helper ability*
RX drugs impair function - consider drug change

May Not be Able to Do HHD (or Helper Must Do More)
Homeless and no supply storage available
Can't maintain personal hygiene
Home is health hazard, will not correct
No or unreliable electricity
Brain damage, dementia, or poor short-term memory*
No use of either hand*
Uncontrolled psychosis or anxiety *
Blind or severely visually impaired – consider PD
Uncontrolled seizure disorder*
No remaining HD access sites – consider PD
Reduced awareness/ability to report bodily symptoms
Has living donor, transplant is imminent – consider PD

* May be able to do with a helper

† Consider daily HHD

‡ Consider daily HHD

² ©Medical Education Institute, Inc. | Version 1:11/2/07 | For questions, call (608) 833-8033 or email schatell@meiresearch.org.
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Delivering a **Healthy WA**

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