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# Are nurses the key to the increased uptake of frequent nocturnal home haemodialysis in Australia?

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## Abstract

**Background:** Although there are significant benefits to frequent nocturnal home haemodialysis (NHHD) there has been a low acceptance of this therapy in Australia.

**Aim:** The aim of this paper is to explore and discuss the literature relating to the nursing barriers to frequent nocturnal home haemodialysis.

**Methods:** A search of nursing, medical, social work and psychological literature was performed.

**Results:** Nurses are key contributors to the increase of NHHD within the dialysis population. Knowledge, culture and nurse satisfaction are key areas to address to increase NHHD uptake.

**Conclusion:** Nurses need to challenge the cultural and organisational barriers that are preventing further uptake of NHHD. If nurses do not we cannot claim to be helping patients attain their best possible outcome.

## Key Words

haemodialysis, nursing, frequent nocturnal dialysis, power, culture, end stage renal disease

## Background

End stage renal failure is the loss of kidney function required to sustain life (Mowatt et al., 2003). At end stage, renal replacement therapy (RRT) is required to support life. Haemodialysis, peritoneal dialysis and kidney transplantation are all forms of RRT. Haemodialysis can be undertaken either in hospital (in-centre unit), a specialised dialysis clinic (satellite unit), or at home.

Home dialysis has been demonstrated to improve clinical outcomes (Chan, 2002; Geary et al., 2005; Lynn & Buttimore, 2005; Pierratos, 2004), improve quality of life (McFarlane, Bayoumi, Pierratos, & Redelmeier, 2003; Mohr et al., 2001; Polaschek, 2005), and save money

(Kroeker et al., 2003; McFarlane et al., 2003; Mohr et al., 2001; Mowatt et al., 2003).

Frequent nocturnal home haemodialysis (NHHD) can be seen as a logical development of home haemodialysis as it combines the convenience of dialysis when sleeping with the potential to come closer to emulating the hours that a healthy kidney would perform (i.e. closer to 24 hours 7 days per week).

NHHD allows patients to achieve a greater level of self-care and improve their chances for vocational rehabilitation opportunities (Agar et al., 2003; Mowatt et al., 2003; Polaschek, 2005), free them from rigid dietary and fluid restrictions and reduce the need for their current

level of phosphate binder and blood pressure medication (Agar, 2005a; Chan, 2002; Kroeker et al., 2003; Locatelli et al., 2004; Pierratos, 2004). In addition, NHHD may reduce the workload on stretched nursing resources (Geary et al., 2005; Priester-Coary, 2004). Authors in the field of NHHD consider that this treatment option might be utilised more extensively than is used currently (Agar, 2005a; Agar et al., 2003; Blagg, 2005; Chan, 2002; George, 2005; Heidenheim, Leitch, Kortas, & Lindsay, 2003; Jester, 2002; Kroeker et al., 2003; Leitch et al., 2003; Locatelli et al., 2004; Lynn & Buttimore, 2005; McFarlane et al., 2003; Mowatt et al., 2003; Pierratos, 2004).

Nurses play a major role in the provision of dialysis care. They have been described as "therapists who have a special relationship with their patients" (Morehouse, Colvin, & Maykut, 2001 p. 299). It is a major responsibility of the therapist dialysis nurse to provide the best therapy to the patient.

The nurse can hold great power in the provision of services to the dialysis patient and it is clear that the choice of the best therapy, NHHD, is not being provided to all Australian dialysis patients who may benefit from NHHD. This paper will address the nursing-related

## Authors

Paul N Bennett, Wendy Oppermann

## Correspondence to:

Mr Paul N Bennett, GPO Box 2100, Adelaide, South Australia 5001.

Email: paul.bennett@flinders.edu.au

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barriers that may be preventing this and argue that education, culture and nurse satisfaction may be the key to the increased uptake of NHHD.

### Review of the Literature

A literature study was undertaken by searching internet databases: CINAHL, Ovid, Cochrane Library, Expanded Academic ASAP, Science Direct, Blackwell Science via Synergy, EBSCOhost and Google Scholar. Keywords used were 'haemodialysis', 'home dialysis', 'home-based haemodialysis', 'nocturnal haemodialysis', 'end stage renal failure', 'ESRF', 'end stage renal disease', 'ESRD', 'end stage kidney failure', 'ESKF' and the search was narrowed to define only those articles that were relevant to the focus of this review, i.e. link to NHHD. When 'haemodialysis' was employed in a search, it was re-entered as 'hemodialysis' to ensure misses could not occur because of the spelling variation. Further investigation was sought via keywords: 'dialysis nursing', 'renal nursing' and 'nephrology nursing' and selection narrowed to ensure a link with home-based dialysis.

Limitations were also applied to authors who had concentrated their studies and opinion to include the experience of home dialysis in countries that could compare with Australian patient situations (typically Canada, England, Europe and the United States of America), so that common outcomes clinical, nursing, patient quality of life, safety and cost issues would be most likely to have a more meaningful association with the Australian literature. Examination of bibliography and reference lists of relevant articles brought about selection of noteworthy authors and these names were entered into databases for the purpose of locating further suitable documents.

### Home Dialysis in Australia

Home dialysis was introduced into Australia in 1968 and became popular through the 1970s with 35% of Australian dialysis patients on dialysis at home (George, 2005). The introduction of continuous ambulatory peritoneal dialysis (CAPD) in 1978 impacted on further development of home haemodialysis programs because CAPD was believed to be a satisfactory and effective alternative, while also being less complicated for patients (Agar, 2005a). Along with satellite haemodialysis, CAPD flourished, to the point that home haemodialysis numbers fell to 11% in Australia in 2004 (ANZDATA, 2004). Funding changes, as well as an increasingly ageing, more dependent, ESRD patient population have also contributed to the downturn (Lynn & Buttimore, 2005). In addition, fewer staff have had training in an environment that positively endorses home haemodialysis and this is likely to have had a negative impact (George, 2005).

### Dialysis Frequency

Conventional haemodialysis performed in hospital and at satellite units is typically performed three times per week and can be associated with fluctuations of health status (Locatelli et al., 2004). NHHD occurs at night during sleep and can be performed six or seven times per week, which allows for one night off treatment each week. Some units in Australia are now advocating and have instituted programs of alternate night dialysis. These regimes mirror more closely normal renal function, thereby minimising the adverse symptoms resulting from the peaks and troughs typically experienced by patients who undergo haemodialysis in-centre thrice weekly (Kjellstrand, 1999; Locatelli et al., 2004).

The intermittent treatment of conventional haemodialysis is responsible

for solute toxicity that can be "harmful in the medium to long-run but can also be lethal in the short term" (Locatelli et al., 2004 p.290). It is frequently associated with problems including hypotension secondary to hypovolaemia, muscle cramps, blood loss, infection and disequilibrium syndrome (Chan, 2002).

More frequent dialysis than the conventional thrice weekly regime was reported to have first been undertaken in 1959 with benefits of improved survival (O'Brien, Baxter, & Teschan, 1959). Further programs ensued and have reported clinical and quality of life improvements (Bonomini, Mioli, Albertazzi, & Scolari, 1972; Buoncristiani et al., 1983; DePalma, Pecker, & Maxwell, 1969; Snyder, Louis, Gorfien, & Mordujovich, 1975) leading to a recent renewed interest in increased frequency haemodialysis (Kjellstrand, 1999).

### NHHD in Australia

NHHD was pioneered in Toronto, Canada in the early 1990s (Uldall, Ouwendyk, Francoeur, & et al., 1996). The first structured NHHD program in Australia was piloted in Geelong in 2001 (Agar, Somerville, Simmonds, Boddington, & Waldron, 2002). The other major Australasian program that has maintained the profile of home haemodialysis throughout its decline through the 1980s and 1990s has been in New Zealand's South Island where the majority of patients are dialysed at home (Lynn & Buttimore, 2005).

The number of patients receiving NHHD in Australia and New Zealand by March 2005 has been reported at 150 (Agar, 2005b). Agar's belief that there has been a reigniting of enthusiasm of NHHD in Australia (Agar, 2005a) is supported to a certain extent; however, the uptake has been sporadic. In certain states there has been a great increase but in others a limited

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uptake of home haemodialysis let alone NHHd. With the clear benefits of NHHd of decreased symptoms, improved cardiac performance, improved nutrition, improved sleep, improved quality of life, decreased medication requirements, decreased costs and reduced hospitalisation (Agar, 2005a) it is disappointing that there are only 150 patients on NHHd in Australia and New Zealand. What are the barriers and are nurses the key to overcoming the barriers to NHHd therapy?

### **The Key Role of the Nurse in Increasing NHHd**

We believe that key strategies to enhance the uptake of NHHd involve education, culture and nurse satisfaction. We are not attempting to address the technical issues associated with a successful NHHd program (refer to Priester-Coary, 2004). One way to address the key issues relating to education and culture is to respond to commonly heard barriers to the choice of NHHd for a particular patient or a particular organisation.

#### **‘The patient will not want it’**

Isolation from the dialysis centre and the ability to self-care (including needling and operation of equipment) have been considered obstacles to NHHd, however, training and early referral have generally addressed these concerns (Blagg, 2005; Freitas, 2002; Lynn & Buttimore, 2005; Mowatt et al., 2003; Priester-Coary, 2004). Indeed, home haemodialysis might be offered to all (suitable) haemodialysis patients where the ideal dialysis unit would consist of 100% of patients contributing 50% towards their own care, with 50% of patients performing 100% of their care (Blagg, 2005). Patients gain independence by participating as much as possible in their own care and can be supported by mentoring from established NHHd patients who can assist with this transition (Lynn & Buttimore, 2005; Priester-Coary, 2004).

Major reasons for patient non-selection of self-care dialysis is lack of knowledge, concerns about lack of supervision, fear of failure to perform self-care dialysis adequately, fear of social isolation, lack of space and a fear of needling (McLaughlin, Manns, Mortis, Hons, & Taub, 2003). Each of these patient barriers can be overcome with appropriate nursing interventions. For example, the fear of social isolation could be overcome by implementing an appropriate visiting and support network of dialysis professionals with general practitioner support (Lynn & Buttimore, 2005). Variables associated with negative attitudes towards self-care dialysis, such as fear of change, worrying about staying awake and needle phobias could be addressed with an individualised educational intervention (Leitch et al., 2003; McLaughlin et al., 2003; Ouwendyk, Leitch, & Freitas, 2001).

#### **‘The patient will miss the social dialysis unit’**

Separation anxiety (Freitas, 2002) and fear of social isolation (McLaughlin et al., 2003) have been identified as being strongly associated with a negative attitude towards self-care dialysis. “Isolation from the security of the dialysis unit can provoke unacceptable anxiety” (Agar et al., 2003 p.281). The nurse is in the best position to provide support to address these fears. The nurse can actively encourage and assist the patient to undertake social activities not related to the dialysis unit that may be more healthy and less costly (McLaughlin et al., 2003). This may increase independence from the restrictions of the in-centre dialysis unit (Bevan, 1998; Faber, 2000; Hagren, Pettersen, Severinsson, Leutzen, & Clyne, 2001; Nagle, 1998) by providing the time to engage in the patient’s own preferred activities (Polaschek, 2005). Nurses can promote this as an advantage of NHHd by consistently adopting a “home first” approach (Agar, 2005b).

George suggests that limited care (and in-centre) dialysis “relieves the [renal] physician of having to grapple with complex and time-consuming social difficulties” (George, 2005). He further suggests that renal physicians may not have the personal skills to resolve the challenges of individuals faced with the prospect of home dialysis. Similarly, we believe that nurses require those skills to assist the patient to overcome the fears of social isolation and dialysis independence.

#### **‘It is quicker to do it myself’**

The rise of satellite haemodialysis and the constancy of in-centre haemodialysis patient numbers (ANZDATA, 2004) may reflect a preference towards a therapy that is mainly undertaken by the nurse rather than patients. The whole philosophy of self care is based on the ethical principle of autonomy and allows the patient responsibility providing the potential for more flexible solutions to individual patients (Lynn & Buttimore, 2005).

Techniques involved in training patients do not always come intuitively to nurses, which may lead to a lack of understanding necessary to support NHHd (George, 2005). Many staff have not been exposed to teaching dialysis patients (Lynn & Buttimore, 2005) and furthermore, it is simpler to increase the number of stations rather than set up or increase an NHHd programme (Blagg, 2005). Renal nurses can provide a lead in this area by promoting the self-care philosophy.

#### **‘The patient will be unsafe without a partner’**

Dialysing without a partner is no longer seen as a barrier to NHHd (Agar, 2005a). Some units advise that monitoring is essential for the first three months of NHHd to ensure stability and compliance, and to provide useful information to the monitoring team (Heidenheim et al., 2003). For a new NHHd program this may be appropriate

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to allay patient and nursing fears. Units with experience in NHHHD believe remote monitoring is not required (Lynn & Buttimore, 2005) and patients are capable of dialysing by themselves (Priester-Coary, 2004).

### 'It is not safe to dialyse overnight'

Historically home dialysis has not been performed overnight. There are increasing reports that it is safe to dialyse at night (Agar et al., 2003; Lynn & Buttimore, 2005; Pipkin, Craft, Spencer, & Lockridge, 2004) and in fact may even improve sleep patterns (Agar et al., 2003). One program has recommended that remote monitoring for the first three months of NHHHD (Heidenheim et al., 2003; Leitch et al., 2003), however other programs do not monitor remotely (Lynn & Buttimore, 2005). Recommendations to improve patient safety overnight include patient selection (Priester-Coary, 2004), patient training (Leitch et al., 2003; Priester-Coary, 2004), interlink systems (Leitch et al., 2003; Pierratos, 2004) and moisture sensors (Leitch et al., 2003; Pierratos, 2004). There is clear and increasing evidence that patients can safely dialyse overnight whether partnered or un-partnered.

### 'The patient is too old'

Age is not necessarily a limiting factor to NHHHD. In fact, many elderly patients can often be more pedantic and may follow procedures far more closely than some younger patients. This is supported by the experience of Australasian dialysis units (Agar, 2005a; Lynn & Buttimore, 2005; McDonald, McPhee, & Walker, 1995). Importantly, a thorough assessment is required to contribute to correct patient selection (Priester-Coary, 2004) as patients with severe co-morbidities may be better served by daily in-centre dialysis (Agar, 2005a).

### 'The patient is non-compliant'

Non-compliance (also termed non-adherence, non-concordance) and ESRD is a complex concept that requires greater analysis than this paper allows. However, the issue of patients being denied NHHHD because of non-compliance may actually be to the detriment of the patient because the reason for their non-compliance may be related to the lack of freedom and independence that the dialysis program can offer. One long-term program warns against discounting of seemingly non-compliant patients, because their non-compliance may result from the burdens imposed by inflexible conventional thrice weekly haemodialysis treatment schedules (Priester-Coary, 2004). Thus, by not offering NHHHD we may be actually exacerbating the patient's non-compliant behaviour.

### 'The initial costs of an NHHHD program will be too much'

A commonly raised barrier to NHHHD is the increased costs associated with doubling disposable materials required, treatment preparation time and available infrastructure. The literature consistently reports the cost savings by demonstrating the cost benefits of NHHHD and other more frequent dialysis regimes.

Pierratos (2004) reported on the cost savings of increased frequency against conventional haemodialysis therapy per person per year of US\$6400 in-centre short daily haemodialysis and about US\$9500 for home daily haemodialysis.

Costs savings are attributed to reduced labour, fewer hospitalisations and less medication use and the conclusion drawn is that daily home haemodialysis afforded improved outcomes at less cost (Pierratos, 2004). This is supported in the New Zealand (Lynn & Buttimore, 2005) and Australian environment (Agar et al., 2003).

Locatelli (2004) reported that allowing for initial set-up costs, NHHHD would negate increased disposable costs and allow more frequent in-centre dialysis for those patients who require close monitoring. Start-up cost recovery was reported by Mowatt et. al. (2003) to occur after about fourteen months and by Agar (2003) as being repaid over a number of years. The initial expense is balanced favourably by expected future costs associated with increasing patient numbers and the requirement for more dialysis places.

Kroeker et.al. (2003) examined and compared costs of conventional haemodialysis and NHHHD patients and determined that a saving of about 13% occurred by changing a patient from conventional haemodialysis to home haemodialysis, while NHHHD and conventional haemodialysis had similar costs. Significant cost reductions were noted in hospitalisations, consults, emergency room visits and laboratory tests (Table 1).

**Table 1. Consultation costs associated with conventional, daily and nocturnal home haemodialysis (Adapted from Kroeker et al. 2003, p.S51)**

Treatment modality	Consultations	Associated Costs
Conventional haemodialysis	+28%	+16%
Home-based haemodialysis	-27%	-20%
Nocturnal home-based haemodialysis	-22%	-63%

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A frequently cited barrier to the establishment of home-based programs is the limitations on funding reimbursement, while the recognised savings of these programs are not typically acknowledged (Blagg, 2005; Freitas, 2002; Jester, 2002; Kroeker et al., 2003; Mohr et al., 2001). George wrote of the caution that exists within Australia's dialysis society, to wait until others have demonstrated benefits. Undoubtedly this also reflects limits that con-strain Australia's health budget, as well as a desire to use discretion before impulsively making changes to treatment regimes that will impact on patients and staff.

“Government[s] must be willing to accept that the increased supply costs can be offset by the reduction in costs associated with fewer hospitalizations and hospital days” (Blagg, 2005, p.212)

### **‘We do not have the staff to train and support an NHHH program’**

A fully integrated and efficient NHHH program will require fewer nursing staff to run than in-centre or satellite programs. Paralleling benefits for NHHH patients has the potential for alleviation of nursing shortages given the inevitable increasing numbers of ESRD patients (Leitch et al., 2003). In addition, the ‘direct nursing time’ resulting from NHHH treatment is a key cost saving (Kroeker et al., 2003). These estimations might be a basis for alarm, suggesting potential to reduce nurse numbers employed by the renal sector. Rather, it is intended to point towards an improvement in the utilisation of limited nursing resources, particularly with the impact of increasing numbers of ESRD patients anticipated (Agar et al., 2003; Kroeker et al., 2003; Locatelli et al., 2004; McFarlane et al., 2003). The challenge for the nursing fraternity is changing the structure and culture to prioritise NHHH.

### **‘There is not enough evidence that it will be right for my patient’**

With any new therapy there will always be obstacles in gaining the best evidence. These may include patient selection biases, small subject numbers and the scarcity of random control trials (RCTs) leading to non-random analyses (Chan, 2002; Jester, 2002; Lynn & Buttimore, 2005; Mowatt et al., 2003; Pierratos, 2004). In saying this, the literature presented reflects an increased clinical interest in NHHH.

In 2004, two 150 to 300 patient trials commenced, each comparing outcomes of conventional haemodialysis with short daily dialysis on six days per week and NHHH. Results are expected in 2008. The studies are intended to investigate issues of safety, costs and patient acceptance (Nesrallah et al., 2004). Until then, the wait for absolute proof of the benefits of NHHH may be too late for some of our patients.

Overall, the dilemma is similar to that experienced when pioneering any new therapy. Many researchers have found that when searching for strong evidence the major lesson learnt is that in many areas of nephrology practice there is a dearth of randomised control trials to guide our everyday clinical practice (Snelling, 2002). NHHH is no exception to this challenge.

### **Nurse Education**

A major barrier to the increased uptake of NHHH as a renal replacement modality is a lack of knowledge and experience by medical and nursing professionals (George, 2005; Lynn & Buttimore, 2005; Pierratos, 2004). Increased knowledge can improve compliance with treatment and medication and help promote better lifestyle and health choices, all crucial for the haemodialysis patient. Ensuring patients are effectively informed about treatment options incorporates the advocacy role; however, it would be

difficult for nurses to understand and discuss benefits and risks of alternative treatment regimes such as NHHH if they have little or no knowledge or experience of such practices (Anglin, 2000).

Patient education must be preceded by nurse education. Non-dissemination of knowledge, which is necessary for others to successfully perform their duty, is a frequently abused power (Anglin, 2000). Patients are generally poorly advised about NHHH (Blagg, 2005). Training or experience in NHHH would provide nephrology nurses with current information about this modality, so that patients are provided with relevant information. This would enable them to make more informed decisions about their treatment. Enthusiasm and commitment to establishing an NHHH program, along with willingness to undertake further training and the initial increased workload are essential steps for ongoing success (Priester-Coary, 2004).

Dissemination of information about NHHH seems inadequate given the lack of accurate knowledge and experience that currently exists. Journals aimed at other members of the health-care team will also improve knowledge and dissemination, as will information to professional organisations' websites and those of kidney health organisations, to which patients also have access.

### **Nurse culture and leadership**

The successful implementation of an NHHH program may require significant change to an already busy nephrology program. Change is inevitable, but resistance results when it is perceived as a threat, when there is insufficient understanding or preconceptions that can undermine attempts to move forward, poor coping strategies, or fear of outcomes and conflict about any possible advantages. Integrating change (of education and practice) successfully into any environment or system requires

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understanding the challenges and accepting the time for adjustment and transition (Anglin, 2000; Priester-Coary, 2004). It requires changing knowledge, attitudes and then skills (Prochaska & Diclemente, 1983).

Change of established nursing routines involves questioning and challenging the dominant organisational culture. This is challenging, particularly when establishing a place within that culture and in workplaces where hierarchy (hospital hierarchy) is apparent and rewards (e.g. promotion) result from preserving the status quo. This dominant misuse of power is a form of oppression and ultimately affects all within the team, particularly those with least power, i.e. our patients (Giddings, 2005).

Culture change requires a total "home-first" approach from all staff. These changes may not happen overnight given that the culture of the dialysis unit may not encourage or support this. Education provided by current successful NHHHD patients, successful leaders in NHHHD and a commitment from the health organisation may also be required. Ultimately the NHHHD option requires energy and commitment to undergo this change but is worth it for the patient's sake (Agar, 2005a).

## Nurse Satisfaction

A primary nursing objective is to assist patients who require dialysis to recover (or preserve) their positive self-esteem and autonomy while continuing to be productive members of society (Breiterman White, 2004). Accounting for the gravity of ESRD, its causes, co-morbidities and consequences of treatment regimes, achieving a high quality of life remains a challenge for each patient. It has been found that positive outcomes noted as a result of more frequent dialysis, particularly NHHHD, contribute to increased nursing satisfaction (Freitas, 2002; Leitch et al., 2003).

There are beneficial effects on nurses and haemodialysis staff when their patients enjoy a return to improved health and associated independence (Leitch et al., 2003). Lu, While and Barriball (2005) using Nolan's Job Satisfaction Questionnaire reported that the perceived ability to deliver good patient care represented significant positive satisfaction and improved morale, along with good collegiate relationships with co-workers (Lu et al., 2005). Personal satisfaction gained from helping others and appreciative feedback from patients and families was one theme that resulted in nurses remaining with their current employer (Gurley, Spence, Briner, & Edwards, 2003).

Freitas's (2002) study of patients who were converted from conventional haemodialysis to short daily haemodialysis six times a week (either at home or in-centre), reported on patient wellbeing and stability and the resulting influence on nursing care. Patients who are feeling well and doing well by being able to participate in typical daily activities are on their way to achieving their fullest potential. They are better equipped to cope with the stresses of a chronic illness, increase their activity level and improve their compliance to dietary and fluid restrictions. These improvements in patient quality of life may afford nurses with a feeling of achievement (Freitas, 2002).

## Conclusion

Nurses in the dialysis setting are in a privileged position to assess and support those patients who might be suitable candidates for NHHHD and ultimately enjoy the gains experienced by their patients of improved clinical outcomes and quality of life. Institution of a successful NHHHD program requires cultural changes within the entire dialysis program. A fundamental requirement exists for positive, flexible attitudes and an ability to modify resources to allow

for adjustments that come with any change in regime (Priester-Coary, 2004). Studies suggest that enthusiastic dialysis team members with current knowledge of equipment and technique, as well as careful patient selection, contribute to the success of NHHHD programs (Agar et al., 2003; Priester-Coary, 2004).

A decline in home haemodialysis has been attributed to a number of reasons including the advent of peritoneal dialysis, success with transplantation, lack of complete patient information or sufficiently early referral. There are suggestions that this might result from doctors and nurses who have not had the opportunity to work alongside those with knowledge in home haemodialysis, particularly as training for renal nurses or renal physicians is not reported to insist on such experience. Moreover, the need to address the range of issues associated with home haemodialysis (e.g. assessment of home suitability, patient learning styles and capacity for self-care, compliance and technical ability) might be outside the breadth of skills that renal physicians and nurse typically possess (George, 2005; Pierratos, 2004).

Nurses are caregivers, teachers, advocates, managers, colleagues [and] experts and responsibilities include endorsing practices that will help patients attain their best possible outcome, and contributing where possible to reducing unnecessary costs to the health budget (Anglin, 2000; Zerwekh, 2000). As an effective patient advocate, nurses can seek information, training or experience about NHHHD so that patients can rely on their health providers to be fully informed and share up to date relevant knowledge. We need to challenge the cultural and organisational barriers that are preventing further uptake of NHHHD. If we do not we cannot claim to be helping patients attain their best possible outcome.

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