
REVIEW

The Elderly Patient with End-stage Renal Disease: Is Dialysis the Best and Only Option?

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ABSTRACT

Singapore is facing an ageing population. This is reflected in the growing number of patients needing to consider starting dialysis in their golden years. In our review, we have found that there is a survival benefit for starting dialysis in our geriatric end-stage renal disease (ESRD) patient with low comorbidity. However, this comes at an expense of reduced quality of life, increased hospitalisation and reduced functional status. The decision to start or withhold dialysis in an elderly patient is a complex one and has to be considered on an individual basis with continuous discussions with the patient and loved ones. Advance Care Planning is a useful tool that can assist in this process.

Keywords: Chronic kidney disease, Haemodialysis, Peritoneal dialysis

INTRODUCTION

Singapore is facing an ageing population. In 2000, 10.5% of our 3.27 million resident population were over the age of 60¹. This increased to 14.1% of our 3.77 million resident population in 2010². In addition, our average life expectancy at birth has increased from 73.1 years for males and 77.6 years for females in 1990 to 79.3 and 84.1, respectively in 2010².

This is reflected in our patients with end-stage renal disease (ESRD). In 2006, Singapore had 728 incident patients started on dialysis. Of these, 52.1% of them were over the age of 60 and 5.1% were over the age of 80. This is an increase compared to the 1999 figures of 42.2% and 2.8%, respectively³. These are but a crude correlation to the number of elderly patients with ESRD, as a proportion of them may decline dialysis based on medical or personal grounds.

Hence, with the challenges of advancing medical science and higher life expectancy, is renal replacement therapy the best option for our elderly patients with ESRD? In addition, regardless of our

patient's decision, are there other non-dialysis treatments we can offer to optimise their care?

CHRONIC KIDNEY DISEASE IN THE ELDERLY

Older patients lose renal function at slower rates compared to their younger counterparts. This was demonstrated in a retrospective cohort study by Conway et al. The median decline in estimated glomerular filtration rate (eGFR) was 2.25, 1.38 and 0.86 ml/min/1.73m²/year in those aged less than 65 years, 65 to 74 years and those greater than 74 years of age, respectively ($P < 0.0001$)⁴. These findings were similar to Eriksen et al, who found a mean estimated change in eGFR of -1.03ml/min/1.73m²/year in their population⁵.

In addition, a larger proportion of older chronic kidney disease (CKD) patients die before requiring dialysis. One of the earlier studies is by Eriksen et al. They conducted a longitudinal observational study of 3074 Norwegian patients over a 10-year period, with a baseline median eGFR of 75ml/min/1.73m². They demonstrated that increasing age (per 10 year increment) led to a higher mortality (HR 2.28, $P < 0.0001$), but lower cumulative incidence

of renal failure (HR 0.75, $P=0.0009$)⁵. O'Hare et al had similar findings in their cohort of 209,622 US Veterans with CKD stages 3 to 5 followed for a mean of 3.2 years. For patients aged 65 to 84 years, the risk of ESRD exceeded that of death only when the baseline eGFR is less than 15ml/min per 1.73m². Among those aged 85 and over, the risk of death always exceeded the risk of ESRD. They postulated that this may be due to the higher prevalence of comorbidities in the older cohort — Charlson comorbidity index of 4 for those aged above 75 versus 2 or those aged below 45⁶. Cardiovascular cause account for nearly half of all-cause mortality in their cohort of elderly CKD patients⁷. This highlights the importance of managing the cardiovascular risk factors in our geriatric CKD population.

Possible prognostic factors for ESRD and death were explored in a retrospective cohort study conducted by El-Ghoul et al, with 177 CKD patients (initial mean eGFR of 31.8ml/min/1.73m²) over the age of 80 years followed-up for a median of 47 months. eGFR <30ml/min/1.73m² (HR 13.33, $P<0.001$), haemoglobin less than 11g/dL (HR 2.05, $P=0.02$) and proteinuria greater than 1g/24hours (HR 2.88, $P<0.001$) are associated with increased risk of requiring dialysis. Risk factors for death are progressive CKD (HR 3.59, $P=0.001$), older age (HR 1.09 for every 1 year, $P=0.03$), males (HR 2.80, $P=0.03$) and baseline haemoglobin less than 11g/dL (HR 2.78, $P=0.004$). Interestingly, the presence of hypertension and cardiovascular comorbidities did not have a significant effect on risk of ESRD or death⁸.

RENAL REPLACEMENT THERAPY IN THE ELDERLY

As a Nephrology community, we are now more aware about the lack of guidelines and studies tailored specifically for the elderly. Hence, over the last decade, the interest and knowledge in Geriatric Nephrology has been growing. Nephrologists are now increasingly looking after older patients with ESRD. However, when reviewing the evidence available it is important to be aware of a few limitations. Firstly, the definition of "elderly" varies, from "over 60 years" to "over 80 years" of age. Secondly, survival data coming from different communities and countries cannot be compared without knowing the sociodemographic and clinical characteristics of the patient populations. Finally, randomised controlled trials in certain

areas of this field are not possible. Therefore, we rely heavily on retrospective and prospective cohort studies for supporting evidence. Patients in this older age group are more likely to have multiple comorbidities and therefore dialysis decisions in elderly patients must incorporate geriatric principles with emphasis on assessment of function, disabilities, comorbidities and other "geriatric" syndromes.

HAEMODIALYSIS VERSUS PERITONEAL DIALYSIS

To determine the optimal mode of dialysis therapy in the elderly, it is necessary to consider the characteristics, advantages and disadvantages for haemodialysis (HD) and peritoneal dialysis (PD)⁹.

The advantages of HD in the elderly are as follows. Adequacy is easily manipulated and the time spent on the dialysis alone is relatively shorter. It is conducted at a dialysis centre which means it is not dependent on the patients' or caregivers' ability to provide the therapy. The constant contact with the HD centre provides a means of social support for the regular HD patient. The biggest disadvantage is the requirement of a functioning vascular access. The elderly have a higher rate of non-maturing fistulas compared to their younger counterparts^{10,11}. There is also an increased risk of hypotension and the need for transportation of the patient to and from the dialysis centre. In an immobile individual, this travelling may prove challenging.

PD on the other hand does not require vascular access, it has a lower risk of hypotension, maintains residual renal function longer and it is a home-based therapy which negates the need for regular transportation to the HD centre. PD patients also get to enjoy a slightly more relaxed dietary restriction compared to HD. It does, however, require the patient or a dedicated caregiver to perform the dialysis daily. Next, the patient will need to store some of the PD solutions at home. This may be a problem if there are many family members crowding under one roof. In view of the above mentioned, it is not surprising that ESRD patients were more likely to choose PD if they were older (>85 years), had congestive heart failure and severe behavioural disorder¹².

Currently there are no studies conducted in the elderly to determine which characteristics are important to the patient and their caregiver when deciding on a dialysis modality. Hence, we refer to

studies conducted in the general CKD population. Morten et al conducted a survey of 34 Australian CKD stage 4 and 5 patients and caregivers to rank 28 characteristics of dialysis which are important to them. Patients agreed that the most important characteristics were survival, convenience of dialysis at home and presence of dialysis-free days. For caregivers, the most important were convenience of dialysis at home, respite and the ability to travel¹³.

SURVIVAL

This survival benefit with dialysis in the elderly is less compared to their younger counterparts. Kurella et al showed a decreasing mean survival after dialysis initiation in the older dialysis population — 24.9 months in those aged 65 to 79 years, 15.6 months in those aged 80 to 84 years, 11.6 months for those 85 to 89 years and 8.4 months in those aged 90 years and older¹⁴. They also demonstrated that the dialysis population had a substantially lower average life expectancy, of 48 to 89 months, than that of the age-matched general population.

As expected, our local data demonstrated that patients aged below 60 years, have a better survival than patients aged 60 and above on both PD and HD. The five-year survival for peritoneal dialysis is 39.6% in those younger than 60 versus 16.2% for those above the age of 60 years ($P < 0.001$)³. HD was 70.7% versus 44.0%, respectively ($P < 0.001$)³. Unfortunately, we currently do not have local data comparing the survival of our local patients who choose dialysis versus those who choose conservative management. Thus we take our reference from overseas data.

Comparing dialysis versus conservative management, dialysis has a survival benefit. One of the earlier papers on this topic was by Joly et al in 2003¹⁵. This single centre cohort study included 146 consecutive pre-ESRD French octogenarians who were referred to their centre over a 12-year period. Patients who were not recommended dialysis (25.6%) were more socially isolated (defined as living alone), had lower functional status (mean Karnofsky score 55) and had higher prevalence of diabetes mellitus. The median survival was 28.9 months in the dialysis groups and 8.9 months in the conservative group ($P < 0.0001$). Looking at the dialysis group, patients who were females (HR 2.56), older age (HR 1.13), using central venous catheter for dialysis (HR 2.87) and functionally dependent

(Karnofsky < 40) (HR 2.34) had a higher one-year mortality. First-year survival was better in patients with a higher body mass index (BMI) (HR 0.83 for every BMI 1-point increase). Thus emphasising the importance of optimising nutrition in our pre-dialysis CKD population. Beyond the first year, the presence of peripheral vascular disease (HR 5.67) or the presence of more than three comorbid conditions (HR 3.73) conferred a higher risk of mortality.

Dialysis may not confer a survival benefit in elderly patients with significant comorbidities. A study in London by Murtagh et al in 2007 also demonstrated survival benefit with dialysis in the elderly (> 75 years)¹⁶. However, in those with ischaemic heart disease or significant comorbidity (score = 2 in a comorbidity scoring system by Davies et al¹⁷) there was no survival benefit with dialysis. A study by Shahid et al in 2009 shared similar findings¹⁸. A French team in 2009 proposed an objective clinical scoring system which assisted in predicting six-month prognosis in the elderly patient starting dialysis for ESRD. Their scoring system included body mass index < 18.5 kg/m² (2 points), diabetes (1), congestive heart failure stages III to IV (2), peripheral vascular disease stages III to IV (2), dysrhythmia (1), active malignancy (1), severe behavioural disorder (2), total dependency for transfers (3) and unplanned dialysis (2). Mortality rates ranged from 8% in the lowest risk group (0 point) to 70% in the highest risk group (≥ 9 points)¹⁹.

When comparing survival in the elderly started on HD versus PD, there is paucity of data. The NDTs group in London, demonstrated similar 12-month mortality (26.1 versus 26.4 deaths/100 person-years) and hospitalisation rates (1.9 versus 2.0 admissions/person-year) in elderly (> 70 years) PD and HD patients²⁰. Couchoud also demonstrated no significant difference in survival between the elderly patients (> 75 years) initiated on HD versus PD. However, they did show that those started on unplanned HD was associated with a 50% higher risk of mortality compared to planned HD¹². Hence, it is important to ensure that we adequately prepare our elderly patients for dialysis if they choose to undertake this therapy.

QUALITY OF LIFE

The symptom burden in patients with ESRD is

high²¹. Together with their increased comorbidity, elderly ESRD patients have a reduced quality of life and higher prevalence of depression²². Locally, only 40.7% of our prevalent dialysis patients over the age of 60 years are capable of normal or near normal activity. This is lower in comparison to our younger dialysis population with 76.5% who have normal or near normal activity³.

Dialysis in the elderly is related to higher hospitalisation and complication rate. A recent study by Carson et al showed that the median survival for elderly patients (>75 years) on dialysis was 37.8 months, compared to 13.9 months for those on conservative management ($P < 0.01$). The dialysis cohort had a higher rate of hospitalisation and a lower chance of dying in a hospice or at home with their loved ones (OR 4.15). Thus, although patients on dialysis survived three times longer, 47.5% of their time was spent in hospital or in a dialysis centre. On the other hand, those who were on conservative management only spent 4.3% of their surviving days in hospital²³. Munshi et al showed that the elderly (>75 years) dialysis population spent 20% of their time in hospital. In addition, they demonstrated that the elderly had a 26% rate of complications whilst on dialysis. These included dialysis related infections, PD related hernias and arteriovenous fistula related problems²⁴.

The functional status of our elderly patients will decline after the initiation of dialysis. An United States cohort of nursing home residents with a mean age of 73.4 years were reviewed with regards to their functional status prior and after starting dialysis. At 12 months after the initiation of dialysis, 58% had died and pre-dialysis functional status had been maintained in only 13%²⁵. This holds true as well for independent elderly patients (>80 years) initiated on dialysis. After six months, Jassal et al found that more than 30% of these patients had functional loss requiring caregiver support or transfer into a nursing home²⁶. These findings were attributed to a few possible factors. Firstly there is a high prevalence of baseline disability and comorbidities in this population. Secondly, the functional decline may be due to hospitalisation during the initiation of dialysis. Thirdly, the psychosocial burden of dialysis and its side-effects — hypotension, cramping or fatigue, may interfere with the rehabilitation process. Finally, the ESRD may be a part of a terminal multi-organ dysfunction

for which dialysis alone may not be able to prevent further overall decline.

When comparing dialysis modality, the quality of life in the elderly PD and HD population are similar²⁰. The recent BOLDE study also supports this, as there is no significant difference in the Quality of Life assessment scores (SF-12 PCS & MCS) of their elderly (>65 years) PD and HD patients. On the other hand, there is greater depression (HADS) and illness intrusion felt by patients on HD (IIRS)²⁷.

TIME LIMITED TRIALS AND WITHDRAWAL OF DIALYSIS

It is worth mentioning that if patients or families remain undecided about dialysis, a time limited trial of dialysis can sometimes be considered. In addition, as the clinical condition of the patient changes over time, it is reasonable to consider withdrawal of dialysis when the burdens of therapy substantially outweigh the benefits²⁸. Guidelines have been introduced to assist physicians when trying to make and carry out these difficult decisions^{29,30}.

NON-DIALYSIS MANAGEMENT

Both the Canadian and United Kingdom Renal Associations have guidelines on the non-dialysis treatment of ESRF patients. The goals are to prolong survival if possible and optimise quality of life. It should include a clear treatment plan and the management of anaemia, bone disease, fluid balance, acidosis and blood pressure^{31,32}.

Patients, family and even physicians are rarely aware of the poor prognosis ESRD confers to our elderly patient. For those aged over 65 years, the prognosis with dialysis treatment is similar to that of colorectal cancer and only marginally better than that of lung cancer³³. In addition, as previously mentioned, our ESRD patients have a high symptom burden. Thus there is a growing recognition that Advance Care Planning and palliative care should not only be considered towards the end of our patient's life. Rather, a simultaneous care model should be implemented early in our CKD care.

ADVANCE CARE PLANNING

Advance Care Planning (ACP) is a process of ongoing communication among patients, families and healthcare providers about the patient's wishes for end-of-life care. It should include continuous update of prognosis, goals of care and

patient's preferences as the trajectory of decline progresses and end of life issues become more prominent³⁴. This is to allow patients to achieve control over their future healthcare, relieve potential burdens on loved ones and strengthen interfamily relationships. Completing written advance directives and documenting a healthcare proxy or surrogate decision-maker, is only a small part of the entire process³⁵. The social benefit of patients having had end-of-life discussions with healthcare providers is that they accrued fewer healthcare costs, used less invasive or burdensome procedures and entered hospice care earlier and more frequently³⁶.

The complexities of ACP for patients with CKD are formidable in magnitude. The unique aspect is that there is the availability of replacement therapy for a failing organ and the opportunity to accept or refuse its implementation.

Firstly, patients may not be fully informed or understand their available healthcare options. In a cohort of 584 American CKD stage 4 and 5 patients, they have reported poor self-reported knowledge of their illness trajectory and palliative care options. On starting dialysis, 61% of patients regretted their decision. When asked why dialysis had been chosen over conservative care, 51.9% reported it was their physician's wish and 13.9% chose dialysis because it was their family's wish³⁷.

Secondly, it is acknowledged that patients will change their preferences over time. In a cohort of elderly patients (>60 years) with advanced cancer, heart failure or chronic obstructive pulmonary disease, 35% had an inconsistent preference trajectory when asked their willingness to undergo high-burden therapy for a chance to avoid death. These inconsistent trajectories increased to 48% and 49% when asked their willingness to risk physical or cognitive disability, respectively, to avoid death³⁸.

Thirdly, healthcare providers may be reluctant to engage in end-of-life discussions for fear of destroying patients' hope³⁹. On the contrary, 65.6% of patients are comfortable with having end-of-life discussions with their healthcare provider and 69.7% with their family³⁷. In fact, more information earlier in the course of their illness helped patients to imagine possibilities for the future that were consistent with their values and hopes.

Finally, physicians may feel ill prepared to assist in making end-of-life decisions. In a survey conducted on American and Canadian Nephrologists, only 39% of the 360 respondents perceived themselves as well prepared to make end-of-life decisions⁴⁰. Age over 46 years, six or more patients withdrawn from dialysis in the preceding year and awareness of the Renal Physicians Association (RPA)/American Society of Nephrology (ASN) guideline on dialysis decision-making³⁰ were independently associated with the highest level of self-reported preparedness. Nephrologists who reported being very well prepared were more likely to use time-limited trials of dialysis and stop dialysis of a patient with permanent and severe dementia⁴⁰.

A local survey by Yee et al explored the perception of ACP in our local Nephrology community, where 562 renal healthcare workers responded to the survey. Medical social workers and physicians had higher knowledge scores. Doctors (82.4%) and medical social workers (100%) considered ACP discussions as part of their role. In comparison, only 37.1% of nurses and 38.1% of other allied healthcare professionals thought likewise. Medical social workers were the most confident in conducting ACP discussions. Physicians reported that the main barriers for ACP discussions appeared to be the lack of time, concerns regarding family backlash and the perception that patients were not prepared to discuss ACP⁴¹.

PALLIATIVE CARE

As previously mentioned, the symptom burden in our dialysis patients is high. Common reported symptoms are fatigue/tiredness 71%, pruritus 55%, constipation 53%, anorexia 49%, pain 47%, sleep disturbance 44%, anxiety 38%, dyspnea 35%, nausea 33%, restless legs 30% and depression 27%²¹. Patients with CK Stage 5 on conservative management, had similar symptoms which had a marked increase in the severity during the last two months of life⁴². Nephrologists must recognise that death and dying is inevitable particularly in our elderly ESRD patients. Thus we should aim to alleviate these symptoms burden throughout their course of CKD. In addition, the psychosocial and spiritual needs of our patients should be met³⁶. Once again, position papers from the various Nephrology Associations on the quality care at the end of life are available⁴³.

CONCLUSION

The decision to start dialysis in the elderly patient is a difficult and personal one. It is guided by one's medical condition and motivated by one's desire to continue or prolong life^{44,45}. In addition, the individual has to accept the inherent risks and burdens associated with dialysis. In the coming years, our department and Singapore General Hospital will embark on this journey to implement ACP into our clinical practice. We hope this will prove to be an additional powerful tool to provide better care for our elderly patients with advance chronic kidney disease.

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REFERENCES

1. Leow BG. Singapore Department of Statistics. Census of Population 2000 — Demographic Characteristics.
2. Wong WK. Singapore Department of Statistics. Census of Population 2010 — Demographic Characteristics.
3. Choong HL. Seventh report of the Singapore Renal Registry 2007/2008.
4. Conway B, Webster A, Ramsay G, Morgan N, Neary J, Whitworth C, et al. Predicting mortality and uptake of renal replacement therapy in patients with stage 4 chronic kidney disease. *Nephrol Dial Transplant* 2009;24(6):1930–7.
5. BO Eriksen, OC Ingebretsen. The progression of chronic kidney disease: a 10-year population-based study of the effects of gender and age. *Kidney Int* 2006;69(2):375–82.
6. O'Hare AM, Choi AI, Bertenthal D, Bacchetti P, Garg AX, Kaufman JS, et al. Age affects outcome in chronic kidney disease. *J Am Soc Nephrol* 2007;18(10):2758–65.
7. Dalrymple LS, Katz R, Kestenbaum B, Shlipak MG, Sarnak MJ, Stehman-Breen C, et al. Chronic kidney disease and the risk of end-stage renal disease versus death. *J Gen Intern Med* 2011;26(4):379–85.
8. El-Ghoul B, Elie C, Squali T, Jungers P, Daudon M, Grünfeld JP, et al. Nonprogressive kidney dysfunction and outcomes in older adults with chronic kidney disease. *J Am Geriatr Soc* 2009;57(12):2217–23.
9. Brown EA. Peritoneal dialysis versus hemodialysis in the elderly. *Perit Dial Int* 1999;19(4):311–2.
10. Lok CE, Oliver MJ, Su J, Bhola C, Hannigan N, Jassal SV. Arteriovenous fistula outcomes in the era of the elderly dialysis population. *Kidney Int* 2005;67(6):2462–9.
11. Lazarides MK, Georgiadis GS, Antoniou GA, Staramos DN. A meta-analysis of dialysis access outcome in elderly patients. *J Vasc Surg* 2007;45(2):420–6.
12. Couchoud C, Moranne O, Frimat L, Labeeuw M, Allot V, Stengel B. Associations between comorbidities, treatment choice and outcome in the elderly with end-stage renal disease. *Nephrol Dial Transplant* 2007;22(11):3246–54.
13. Morton RL, Tong A, Webster AC, Snelling P, Howard K. Characteristics of dialysis important to patients and family caregivers: a mixed methods approach. *Nephrol Dial Transplant* 2011;26(12):4038–46.
14. Kurella M, Covinsky KE, Collins AJ, Chertow GM. Octogenarians and nonagenarians starting dialysis in the United States. *Ann Intern Med* 2007;146(3):177–83.
15. Joly D, Anglicheau D, Alberti C, Nguyen AT, Touam M, Grünfeld JP, et al. Octogenarians reaching end-stage renal disease: cohort study of decision-making and clinical outcomes. *J Am Soc Nephrol* 2003;14(4):1012–21.
16. Murtagh FE, Marsh JE, Donohoe P, Ekbil NJ, Sheerin NS, Harris FE. Dialysis or not? A comparative survival study of patients over 75 years with chronic kidney disease stage 5. *Nephrol Dial Transplant* 2007;22(7):1955–62.
17. Davies SJ, Phillips L, Naish PF, Russell GI. Quantifying comorbidity in peritoneal dialysis patients and its relationship to other predictors of survival. *Nephrol Dial Transplant* 2002;17(6):1085–92.
18. Chandna SM, Da Silva-Gane M, Marshall C, Warwicker P, Greenwood RN, Farrington K. Survival of elderly patients with stage 5 CKD: comparison of conservative management and renal replacement therapy. *Nephrol Dial Transplant* 2011;26(5):1608–14.
19. Couchoud C, Labeeuw M, Moranne O, Allot V, Esnault V, Frimat L, et al. A clinical score to predict 6-month prognosis in elderly patients starting dialysis for end-stage renal disease. *Nephrol Dial Transplant* 2009;24(5):1553–61.
20. Harris SA, Lamping DL, Brown EA, Constantinovici N; North Thames Dialysis Study (NTDS) Group. Clinical outcomes and quality of life in elderly patients on peritoneal dialysis versus hemodialysis. *Perit Dial Int* 2002;22(4):463–70.
21. Murtagh FE, Addington-Hall J, Higginson IJ. The prevalence of symptoms in end-stage renal disease: a systematic review. *Adv Chronic Kidney Dis* 2007;14(1):82–99.
22. Weisbord SD, McGill JB, Kimmel PL. Psychosocial factors in patients with chronic kidney disease. *Adv Chronic Kidney Dis* 2007;14(4):316–8.
23. Carson RC, Juszczak M, Davenport A, Burns A. Is maximum conservative management an equivalent treatment option to dialysis for elderly patients with significant comorbid disease? *Clin J Am Soc Nephrol* 2009;4(10):1611–9.
24. Munshi SK, Vijayakumar N, Taub NA, Bhullar H, Lo TC, Warwick G. Outcome of renal replacement therapy in the very elderly. *Nephrol Dial Transplant* 2001;16(1):128–33.
25. Kurella Tamura M, Covinsky KE, Chertow GM, Yaffe K, Landefeld CS, McCulloch CE. Functional status of elderly adults before and after initiation of dialysis. *N Engl J Med* 2009;361(16):1539–47.
26. Jassal SV, Chiu E, Hladunewich M. Loss of independence in patients starting dialysis at 80 years of age or older. *N Engl J Med* 2009;361(16):1612–3.
27. Brown EA, Johansson L, Farrington K, Gallagher H, Sensky T, Gordon F, et al. Broadening Options for Long-term Dialysis in the Elderly (BOLDE): differences in quality of life on peritoneal dialysis compared to haemodialysis for older patients. *Nephrol Dial Transplant* 2010;25(11):3755–63.
28. Cohen LM, Germain MJ, Poppel DM. Practical considerations in dialysis withdrawal: "to have that option is a blessing". *JAMA* 2003;289(16):2113–9.
29. Galla JH. Clinical practice guideline on shared decision-making in the appropriate initiation of and withdrawal from dialysis. The Renal Physicians Association and the American Society of Nephrology. *J Am Soc Nephrol* 2000;11(7):1340–2.

30. Renal Physicians Association & American Society of Nephrology. Clinical Practice Guideline on Shared Decision-Making in the Appropriate Initiation of and Withdrawal from Dialysis. Nov 1999.
31. Renal Physicians Association. Shared Decision Making in the Appropriate Initiation of and Withdrawal from dialysis. 2nd edition 2010.
32. M Taal, C Tomson. Clinical Practice Guidelines for the Care of Patients with Chronic Kidney Disease. UK Renal Association Clinical Practice Guidelines. 4th Edition 2007.
33. Jassal SV, Watson D. Dialysis in late life: benefit or burden. *Clin J Am Soc Nephrol* 2009;4(12):2008–12.
34. Davison SN. Facilitating advance care planning for patients with end-stage renal disease: the patient perspective. *Clin J Am Soc Nephrol* 2006;1(5):1023–8.
35. Holley JL. Palliative care in end-stage renal disease: focus on advance care planning, hospice referral, and bereavement. *Semin Dial* 2005;18(2):154–6.
36. Kurella Tamura M, Cohen LM. Should there be an expanded role for palliative care in end-stage renal disease? *Curr Opin Nephrol Hypertens* 2010;19(6):556–60.
37. Davison SN. End-of-life care preferences and needs: perceptions of patients with chronic kidney disease. *Clin J Am Soc Nephrol* 2010;5(2):195–204.
38. Fried TR, O'Leary J, Van Ness P, Fraenkel L. Inconsistency over time in the preferences of older persons with advanced illness for life-sustaining treatment. *J Am Geriatr Soc* 2007;55(7):1007–14.
39. Davison SN, Simpson C. Hope and advance care planning in patients with end stage renal disease: qualitative interview study. *BMJ* 2006;333(7574):886.
40. Davison SN, Jhangri GS, Holley JL, Moss AH. Nephrologists' reported preparedness for end-of-life decision-making. *Clin J Am Soc Nephrol* 2006;1(6):1256–62.
41. Yee A, Seow YY, Tan SH, Goh C, Qu L, Lee G. What do renal health-care professionals in Singapore think of advance care planning for patients with end-stage renal disease? *Nephrology (Carlton)* 2011;16(2):232–8.
42. Murtagh FE, Sheerin NS, Addington-Hall J, Higginson IJ. Trajectories of illness in stage 5 chronic kidney disease: a longitudinal study of patient symptoms and concerns in the last year of life. *Clin J Am Soc Nephrol* 2011;6(7):1580–90.
43. Renal Physicians Association & American Society of Nephrology. RPA/ASN Position on Quality Care at the End of Life. 2002.
44. Schmidt RJ. Informing our elders about dialysis: is an age-attuned approach warranted? *Clin J Am Soc Nephrol* 2012;7(1):185–91.
45. Dasgupta I, Rayner HC. Dialysis versus conservative management of elderly patients with advanced chronic kidney disease. *Nat Clin Pract Nephrol* 2007;3(9):480–1.