

Chapter 37: Dialysis Decisions in the Elderly Patient With Advanced CKD and the Role of Nondialytic Therapy

Mark Swidler

Renal Division, Mount Sinai School of Medicine, New York, New York

THE GERIATRIC PERSPECTIVE ON MEDICAL DECISION MAKING

What is most important to older adults is maintaining independence and quality of life (QOL) through optimal mental capacity and physical functioning. Dialysis decisions in elderly persons must move beyond the traditional GFR-related indications for dialysis initiation and incorporate geriatric principles that focus on assessment of function, disabilities, comorbidities, and geriatric syndromes (*e.g.*, frailty, dementia, delirium, depression, falls, malnutrition, polypharmacy). These geriatric syndromes are powerful predictors of adverse outcomes including mortality, hospitalization, nursing home placement, and hip fractures. Chronic kidney disease (CKD), uremia, and dialysis accelerate these outcomes, especially the expression and progression of frailty in predisposed patients. Chronological age alone should not be a factor in the dialysis decision tree, although it is associated with an increased risk of death. Each elderly patient must be approached individually.

Geriatricians use validated standardized tools for staging the functional age of their patient and look for signs that increase risk for disability and affect morbidity and mortality. A comprehensive geriatric assessment (CGA) obtained at baseline to define overall health status forms the basis for individualized diagnostic and therapeutic interventions and allows for both a general and prognostic categorization.¹ A CGA can be followed serially and used in medical decision-making as elderly patients and their families are faced with challenges such as treatment for cancer, surgery, percutaneous gastrostomy tube insertion, nursing home placement, withdrawal of intensive care unit (ICU) care, and dialysis decisions. Geriatric assessment tools^{2,3} include evaluations of comorbidity (Charlson Comorbidity Index), functional status (Karnofsky scale, Katz and

Barthel Index), physical performance (Timed Get up and Go test; timed walking speed), frailty testing (Frailty Phenotype⁴), cognition (MMSE, mini-cog), psychologic status (Geriatric Depression Scale), nutrition, medication review, urinary incontinence, visual/hearing impairment, and social support. These can be used to generate prognostic models for mortality, hospitalization, and loss of functional independence.^{5–9}

The presence of combinations of functional impairments and geriatric syndromes will influence prognosis, shared decision-making, and the ability to tolerate renal replacement therapy. As a person ages, functional status becomes as useful as comorbidity in risk assessment. It can improve mortality prediction in patients >80 yr and lead to more accurate risk adjustment.^{6,7} Functional data and the documentation of limitations are essential to dialysis decision analysis.

Categorization of elderly patients based on estimated life expectancy and functional level is helpful to use as a starting framework for informed discussions about medical decisions. One model (Clinical Glidepaths^{10,11}) uses the following four categories: robust older people (life expectancy \geq 5 yr, functionally independent, and not needing help from caregivers); frail older people (life expectancy > 5 yr, significant functional impairment requiring help from caregivers); moderately demented older people (life expectancy 2 to 10 yr, may or may not be functionally impaired); and end-of-life older people (life expectancy of <2 yr).

Other models developed in geriatric oncology^{1,12–15} use modified geriatric assessment paradigms to evaluate the risks and benefits of therapy

Correspondence: Mark Swidler, Renal Division, Mount Sinai School of Medicine, 1 Gustave L. Levy Place, New York, NY 10029. E-mail: mark.swidler@mssm.edu

Copyright © 2009 by the American Society of Nephrology

in elderly cancer patients. This has not been formally studied in CKD/ESRD but the concept is similar. Dialysis has been compared with cancer in terms of mortality, adverse effects, and symptom burden. Classification of a prospective elderly dialysis patient into one of the following general “functional age” categories begins the dialysis decision process (Table 1).

- Healthy/usual: this is the most optimal dialysis patient who might also be a transplant candidate.
- Vulnerable: this is a more typical dialysis candidate. Geriatric assessment and intervention plans (e.g., rehabilitation, pain control, treatment of cognitive deficits and depression, limiting polypharmacy, preventing falls, instituting home services) may slow the progression of geriatric susceptibility factors that will adversely affect prognosis, QOL, and the dialysis experience.
- Frail: This is a suboptimal dialysis candidate and should be considered for a nondialytic treatment plan or a time-limited dialysis trial. Final decisions will hinge on patient preferences, QOL, and contextual issues (see Method for Evaluating Dialysis Decisions).

Epidemiology of CKD/Dialysis in the Elderly

Although dialysis is life-sustaining therapy and extends life, it may also create, increase, or prolong suffering while not restoring or maintaining function in selected subgroups of geriatric patients. Recent studies suggest that dialysis may not offer a survival advantage in patients over the age of 75 with multiple comorbidities and cardiac ischemia.¹⁷

Dialysis has the attributes of a serious and progressive chronic illness including (1) reduced lifespan *versus* age-matched nondialysis patients; (2) progressive disability; (3) repeated hospitalizations; (4) significant comorbidity; (5) high symptom burden; and (6) caregiver stress.

ESRD exemplifies the disease trajectory characterized by long-term complications punctuated by acute medical episodes (Figure 1).¹⁸ Renal replacement may correct uremia but the disease trajectory continues.

CKD and dialysis are risk factors for adverse geriatric outcomes. Decreasing GFR and dialysis are associated with stepwise increases in rates of the following: functional limitations,²¹ which, independent of the cause, are associated with increased mortality, hospitalization, and long-term care²²; frailty syndrome,²³ which predicts falls, mobility/activities of daily living (ADL) disability, hospitalization, and death among community elders⁴ and ESRD patients²⁴; cognitive dysfunction²⁵ (hemodialysis patients with dementia have a survival probability of 30% at 2 yr *versus* 60% in their nondemented counterparts, a 50% reduction in life expectancy)²⁶; falls and falls-related injury (including hip fracture), which are significant predictors of mortality²⁷; hospitalization,²⁸ which in older adults is associated with a high incidence of multiple adverse outcomes, including functional decline, delirium, and falls²⁹; nursing home complications, where the yearly death rate is two times that of the general >65-yr-old ESRD population [cognitive/physical impairment is significant, with approximately 60% showing moderate to severely impaired decision-making skills, with no advanced directives in 60 to 65%, and do not resuscitate (DNR) in 25 to 30%]³⁰; and increasing symptom burden.^{31,32}

CKD, uremia, and dialysis will accelerate these geriatric outcomes in predisposed patients. The elderly CKD stage 4 to 5 patient who presents with “geriatric susceptibility factors”

Table 1. Functional age (stages of aging¹) categories with clinical measures

| | ACOVE Stage* | | |
|--|---------------|------------|-------------|
| | Healthy/Usual | Vulnerable | Frail |
| VES-13 score [†] | 0–2 | 3–6 | 7+ |
| Walking speed (m/s) [‡] | >0.77 | | <0.42 |
| Chair stand time [¶] (sec) [§] | <11.2 | | Unable, >60 |
| Frailty score [¶] | 0 | 1–2 | 3–5 |
| Syndromes** | 0 | 1 | 2+ |
| Remaining life expectancy ^{††} | High | Middle | Low |
| Common geriatric assessment measures | | | |
| ADLs | 0 | 1 | 2+ |
| Instrumental ADLs | 0 | 1 | 2+ |
| Mini Mental State Examination | >26 | 23–26 | <23 |
| Geriatric Depression Scale | 0 | 5 | 6+ |
| Polypharmacy (no. of medications per day) | <5 | 5–8 | 9+ |
| Comorbidity | None limiting | Slight | Severe |

Adapted from reference 1. Reprinted with permission. © 2008 American Society of Clinical Oncology. All rights reserved.

*ACOVE (Assessing Care of Vulnerable Elders) is a project that uses quality indicators to identify and treat noninstitutionalized vulnerable elders (<http://www.rand.org/health/projects/acove/acove3/>).

[†]The Vulnerable Elders Survey (VES-13) (<http://www.rand.org/health/projects/acove/survey.html>) is a self-administered brief function-based tool for screening community-dwelling populations to identify older persons at risk for adverse outcomes and has been studied in cancer patients. A score of ≥ 3 identifies vulnerable adults at risk for geriatric deficits, functional decline, and death¹⁶

[‡]Walking speed-distance 4 m/15 ft at patient’s usual speed.

[§]Time it takes for patient to rise from a straight chair five times as quickly as possible.

[¶]Validated frailty screening tool with five frailty components: (1) >10-lb weight loss in last year; (2) poor endurance (self-report tool); (3) low physical activity (self-report tool); (4) slow walking time (s/15 ft); (5) weak grip strength (hand dynamometer); ≥ 3 criteria present = positive for frailty phenotype.⁴

**Dementia, delirium, depression, falls.

^{††}See reference 1, Table 2, p. 1938 and reference 15.

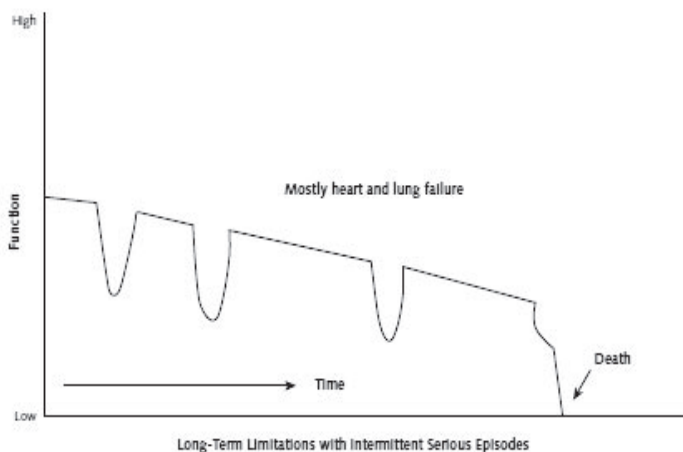


Figure 1. Dialysis patient disease trajectory. Adapted from ref. 18 (reprinted with permission).

Characterized by:

- functional decline months to years
- episodes of acute (serious) complications
- 1 year probability death .24 /hospitalization .66 general dialysis population¹⁹
- 1 year mortality rate 46% octogenarians and nonagenarians starting dialysis²⁰
- un-certain course for individual dialysis patient

such as frailty, functional disability, and serious comorbidity (at least three to four conditions) is a suboptimal dialysis candidate because these factors are already significant determinants of mortality in patients on dialysis. Conversely, those patients who are more independent, less frail, and more cognitively intact will have a better prognosis, although still compromised in the long term (Tables 2–4).

METHOD FOR EVALUATING DIALYSIS DECISIONS IN THE ELDERLY

The elderly patient with CKD being evaluated for dialysis may range from a “healthy” cognitively intact and interactive person who can verbalize his or her preferences to a “frail” nursing home patient with multiple chronic conditions, functional im-

pairments and geriatric syndromes, decisional incapacity, and no stated prior wishes, health care proxy, or surrogates.

The reader is referred to the Renal Physicians Association—American Society of Nephrology (RPA-ASN) shared decision-making guidelines for the accepted nephrology community standard of care format in dialysis decision making.³⁴ Because geriatric patients with CKD are a heterogeneous group, the patient should be stratified into healthy, vulnerable, or frail based on a geriatric assessment to define and document the functional status, presence of geriatric syndromes, comorbidity, psycho-social status, and home support system, because these will impact on prognosis and the ability to process information. The “Stages of Aging”¹ paradigm described above is comprehensive. For the nongeriatric nephrologist meeting the patient for the first time, the Get Up And Go Test (from a sitting position, stand without using arms for support and walk 10 ft/3 m and back as quickly as possible) and the Rapid Chair Rise (stand up from a seated position in a hardback chair with arms folded) can be considered. In this case, physical frailty is defined as scoring >10 s for the go test and/or an inability to rise from the chair without using the arms. A moderately frail patient would be unable to complete either test, whereas severely frail is defined as the inability to complete both.³⁵ The optimal situation would be a CGA done by the geriatric team and reviewed with the nephrologist.

The four topics method summarized below is a useful template to address the main components of a dialysis discussion in the elderly (Tables 5 and 6). Each topic is framed by underlying ethical principles and their associated clinical counterparts. Although topic 2 takes precedence, the more topics that can be fully explored and discussed, the better informed and shared decisions will be. Two starter questions to help direct the initial flow of information are as follows: (1) what does the patient/family need to know from the nephrologist to facilitate decision making (topics 1 and 3) and (2) what does the neph-

Table 2. Geriatric susceptibility factors associated with death in the general dialysis population

| | Diabetic | Nondiabetic |
|--------------------------|-------------------|-------------------|
| Age (yr) | | |
| 45–64 | 1.43 (1.28,1.59)* | 1.55 (1.40,1.72)* |
| 65–74 | 2.23 (2.00,2.48)* | 2.65 (2.39,2.93)* |
| 75+ | 3.10 (2.77,3.47)* | 3.91 (3.54,4.32)* |
| Frailty | | |
| BMI (kg/m ²) | | |
| <20 | 1.38 (1.27,1.49)* | 1.30 (1.23,1.38)* |
| 25 to <30 | 0.85 (0.80,0.90)* | 0.84 (0.79,0.89)* |
| 30+ | 0.80 (0.75,0.85)* | 0.81 (0.75,0.87)* |
| Albumin | 0.81 (0.78,0.84)* | 0.77(0.75,0.80)* |
| Functional disability | | |
| Inability to ambulate | 1.36 (1.22,1.52)* | 1.53 (1.36,1.72)* |
| Inability to transfer | 1.46 (1.23,1.74)* | 1.15 (0.95, 1.39) |

Relative risk with 95% confidence interval).

Adapted from USRDS 2002.³³

*P < 0.001.

Table 3. Geriatric susceptibility factors associated with death in octogenarians and nonagenarians on dialysis (relative risk)²⁰

| | |
|--|--|
| • Older age c/w 80–84 yr 85–89 yr: RR 1.22 [CI, 1.20 to 1.24] >90 yr: RR 1.56 [CI, 1.51 to 1.61] | • CHF RR 1.21 [CI, 1.19 to 1.23] |
| • Nonambulatory status RR 1.54 [CI, 1.49 to 1.58] | • Underweight RR 1.20 [CI, 1.18 to 1.23] |
| • Serum albumin concentration <35 g/L RR 1.28 [CI, 1.25 to 1.30] | • # comorbid conditions* c/w 0–1 2–3: RR, 1.31 [CI, 1.28 to 1.33] ≥ 4: RR, 1.68 [CI, 1.64 to 1.72] |

*Comorbid conditions: albumin concentration <35 g/L, anemia, underweight, CHF, diabetes, ischemic heart disease, COPD, cancer, cerebrovascular disease, and PVD.

rologist need to know from the patient/family to frame possible scenarios (topics 2–4)?

NONDIALYTIC TREATMENT/RENAL PALLIATIVE CARE

A conceptual understanding of extending life *versus* prolonging the dying process and the ability to explore this with the elderly patient or decision maker(s) is important for shared decision making. This is the palliative care concept of the “big picture.” There is a growing literature on nondialytic treatment (NDT),^{17,37–39} suggesting that survival may not be significantly different in selected subgroups between those on chronic dialysis compared with patients with stage 5 CKD treated without renal replacement therapy. Less hospitalizations and more patient deaths at home may be possible in those treated medically and using a multidisciplinary team approach.³⁷ This may provide a more humane and dignified end of life experience for the frail geriatric patient and their family. In an important retrospective study, two groups of elderly patients with CKD stage 5 predicted to need dialysis within 18 mo were followed in a multidisciplinary predialysis care clinic with one group initiating renal replacement (RRT) and the other treated medically. Although the RRT group had a longer overall survival, when the groups were stratified into those with high comorbidity (more than three comorbid conditions) or ischemic heart disease *versus* not, the survival curves were comparable.¹⁷

If through shared decision making using the principles of the RPA-ASN guidelines framed within the four topics

method, it is decided to forego renal replacement therapy, a detailed and consistent plan of action must be implemented. This approach will minimize feelings of abandonment and hopelessness and foster a safe environment. Families must feel supported, especially if their loved ones are cognitively impaired. The decision to forego life-sustaining therapy has powerful symbolic meaning. Although it might make sense medically, families may still struggle as the uremic process unfolds. Consistent demonstration of caring, respect, and concern by the team will soften this challenging process and allow an acceptable end of life experience. The medically treated patient with ESRD will require increasing home services and transition into a hospice system (home, nursing home with hospice, or inpatient hospice depending on goals of care and adequacy of symptom control). This is best accomplished through a palliative care plan whose philosophy incorporates a patient- and family-oriented approach that helps achieve their goals.

Renal palliative care^{40–43} is an agreed on management plan to optimize QOL and relieve suffering (pain and symptom management); offered simultaneously with all other appropriate medical therapy; not synonymous with end-of-life or hospice care; not just the absence of dialysis provision; suitable in dialysis patients also; appropriate in all patients with serious illness (high symptom burden, shortened survival, significant comorbidity) and includes the following: advance care planning (ACP), a process of ongoing communication to update prognosis/goals of care/preferences as trajectory of decline progresses and end-of-life issues become more prominent; pa-

Table 4. Survival of octogenarians and nonagenarians starting dialysis²⁰

| Average life expectancy | |
|--|---|
| One-year mortality rate 46% | |
| Median survival after dialysis initiation | General population versus age-matched patient initiating dialysis |
| 65–79 yr 24.9 mo (interquartile range: 8.3–51.8 mo) | |
| 80–84 yr 15.6 mo (interquartile range: 4.8–35.5 mo) | 80–84 yr: 105 or 89 mo/6.7 times longer |
| 85–89 yr 11.6 mo (interquartile range, 3.7–28.5 mo) | 85–89 yr: 78 or 66 mo/6.7 times longer |
| 90 yr 8.4 mo (interquartile range: 2.8–21.3 mo) | 90–94 yr: 57 or 48 mo/6.8 times longer |

Table 5. Four topics method³⁶ for analysis of a ethical problem in clinical medicine adapted to the geriatric patient with CKD/ESRD

| | |
|---|--|
| <p>1. Medical Indications for Intervention Beneficence and nonmalfeasance Prognosis/benefits versus burdens What is the functional age of this patient? Is this patient frail? What are the geriatric susceptibility factors and survival data? What are the potential adverse geriatric outcomes ? Based on the above is the patient a candidate for dialysis? is the patient a candidate for nondialytic treatment?</p> <p>3. Quality of Life Beneficence and nonmalfeasance; respect for autonomy There is no universal metric for QOL QOL is a value judgment and personal There are some objective criteria (end-stage dementia, cachexia, advanced cancer) but families may not see it that way There is a significant symptom burden^{31,32} A defined time-limited trial to assess if QOL acceptable on dialysis is an important option to explore</p> | <p>2. Patient Preferences Respect for autonomy Establish general “big picture” goals and outcomes (What is important to you when you imagine the future? e.g., stay at home, no discomfort, live as long as possible). Explore patient’s personal narrative Because higher prevalence of cognitive dysfunction and inability to make decisions, substituted judgment will be more common. Engage the family. Be prepared that Preferences may change over time and with new events Some patients will not able to decide or express their preferences Some may want to receive limited or no information and delegate to others</p> <p>4. Contextual Features Loyalty and fairness Health resources; family dynamics; health care team Is the family supportive of the patient’s decision? Are there conflicts between family members? Are the descriptions of patient wishes consistent? What is the cultural, ethnic, or religious belief system and background? Is there conflict among the healthcare providers or between them and the family?</p> |
|---|--|

tient and family support to create a sense of control over patient’s healthcare, relieve potential burdens on loved ones, and strengthen interfamily relationships; and hospice referral when appropriate (<6 mo estimated survival).

Renal palliative care incorporates geriatric principles of the interdisciplinary team and holistic approach. Active medical treatment of renal complications (e.g., fluid/electrolyte disorders, renal anemia, fluid overload, CKD mineral bone disease) is continued simultaneously with evaluation and treatment of geriatric syndromes and symptoms (e.g., pain, depression, fatigue, insomnia, pruritus, constipation) to maximize function and QOL, avoid unnecessary hospitalizations, and hopefully allow a dignified death at home.

CONCLUSION

An effective dialysis decision-making approach involves not only the process leading up to and including the decision (yes, no, maybe, time-limited) but also a clear postdecision plan

regardless of which decision is taken. If the family decides on dialysis, time-limited or otherwise, ongoing geriatric assessment and palliative care protocols must be put in place. If an NDT approach is taken, follow-up for meticulous renal medical management and geriatric-palliative care is imperative. In both cases, given the disease trajectory, cooperation among the renal and geriatric-palliative teams is essential for the best patient and family outcomes. A geriatric CKD action plan provides a framework for evaluation and management (Table 6).

TAKE HOME POINTS

- ESRD/dialysis can be viewed as a form of accelerated aging and has the attributes of a serious progressive illness
- The elderly patient with CKD facing dialysis decisions should have a geriatric assessment to stage the functional age and geriatric syndrome burden
- In patients with serious comorbidity, functional impairment, and frailty, dialysis may not prolong life but might increase symptom burden and ultimately suffering

Table 6. Geriatric CKD dialysis decision action plan

| CKD Stage 4 | CKD Stage 5 |
|--|--|
| Baseline comprehensive or modified geriatric assessment to stage the functional age and assess for frailty | Review and update geriatric assessment/functional age stage and 4 topics content especially if new acute events/hospitalizations |
| Initiate dialysis decision discussions in context of “big picture” goals using the RPA/ASN guidelines and four topics method | Renal replacement therapy (including “Time-limited trial”) or |
| Evaluate and treat CKD geriatric susceptibility factors | Nondialytic treatment |
| Renal palliative care assessment and treatment plan | Continue renal palliative care Hospice when estimated prognosis <6 mo |

- Renal palliative care that incorporates geriatric principles is part of both dialytic and nondialytic treatment plans; it requires not only a targeted program of renal specific therapy, but ongoing symptom assessment and intervention, and psychosocial support of patient and family, which is best accomplished thru an interdisciplinary team approach

DISCLOSURES

None.

REFERENCES

*Key References

- Rodin MB, Mohile SG: A practical approach to geriatric assessment in oncology. *J Clin Oncol* 25: 1936–1944, 2007*
- Gallo JJ: *Handbook of Geriatric Assessment*, 4th Ed., Sudbury, MA, Jones and Bartlett, 2006
- Gupta A: *Measurement Scales Used in Elderly Care*. Oxford, UK, Radcliffe, 2008
- Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, Seeman T, Tracy R, Kop WJ, Burke G, McBurnie MA; Cardiovascular Health Study Collaborative Research Group: Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci* 56: M146–M156, 2001*
- Inouye SK, Peduzzi PN, Robison JT, Hughes JS, Horwitz RI, Concato J: Importance of functional measures in predicting mortality among older hospitalized patients. *JAMA* 279: 1187–1193, 1998*
- Lee SJ, Go AS, Lindquist K, Bertenthal D, Covinsky KE: Chronic conditions and mortality among the oldest old. *Am J Public Health* 98: 1209–1214, 2008
- Lee SJ, Lindquist K, Segal MR, Covinsky KE: Development and validation of a prognostic index for 4-year mortality in older adults. *JAMA* 295: 801–808, 2006*
- Reuben DB, Rubenstein LV, Hirsch SH, Hays RD: Value of functional status as a predictor of mortality: results of a prospective study. *Am J Med* 93: 663–669, 1992
- Walter LC, Brand RJ, Counsell SR, Palmer RM, Landefeld CS, Fortinsky RH, Covinsky KE: Development and validation of a prognostic index for 1-year mortality in older adults after hospitalization. *JAMA* 285: 2987–2994, 2001*
- Flaherty JH, Morley JE, Murphy DJ, Wasserman MR: The development of outpatient Clinical Glidepaths. *J Am Geriatr Soc* 50: 1886–1901, 2002*
- Reuben DB: Guidelines, evidence-based medicine, and Glidepaths: talking the talk. *J Am Geriatr Soc* 50: 1905–1906, 2002
- Basso U, Monfardini S: Multidimensional geriatric evaluation in elderly cancer patients: a practical approach. *Eur J Cancer Care (Engl)* 13: 424–433, 2004
- Balducci L, Yates J: General guidelines for the management of older patients with cancer. *Oncology (Williston Park)* 14: 221–227, 2000
- Balducci L, Extermann M, Carreca I: Management of breast cancer in the older woman. *Cancer Control* 8: 431–441, 2001
- Walter LC, Covinsky KE: Cancer screening in elderly patients: a framework for individualized decision making. *JAMA* 285: 2750–2756, 2001
- Mohile SG, Bylow K, Dale W, Dignam J, Martin K, Petrylak DP, Stadler WM, Rodin M: A pilot study of the vulnerable elders survey-13 compared with the comprehensive geriatric assessment for identifying disability in older patients with prostate cancer who receive androgen ablation. *Cancer* 109: 802–810, 2007
- Murtagh FE, Marsh JE, Donohoe P, Ekbal 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* 22: 1955–1962, 2007*
- Lorenz KA, Lynn J, Dy SM, Shugarman LR, Wilkinson A, Mularski RA, Morton SC, Hughes RG, Hilton LK, Maglione M, Rhodes SL, Rolon C, Sun VC, Shekelle PG: Evidence for improving palliative care at the end of life: a systematic review. *Ann Intern Med* 148: 147–159, 2008*
- US Renal Data System: *USRDS 2007 Annual Data Report: Atlas of End-Stage Renal Disease in the United States*. Bethesda, MD, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, 2007
- Kurella M, Covinsky KE, Collins AJ, Chertow GM: Octogenarians and nonagenarians starting dialysis in the United States. *Ann Intern Med* 146: 177–183, 2007*
- Fried LF, Lee JS, Shlipak M, Chertow GM, Green C, Ding J, Harris T, Newman AB: Chronic kidney disease and functional limitation in older people: health, aging and body composition study. *J Am Geriatr Soc* 54: 750–756, 2006
- Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G: Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. *J Gerontol A Biol Sci Med Sci* 59: 255–263, 2004*
- Shlipak MG, Stehman-Breen C, Fried LF, Song X, Siscovick D, Fried LP, Psaty BM, Newman AB: The presence of frailty in elderly persons with chronic renal insufficiency. *Am J Kidney Dis* 43: 861–867, 2004
- Johansen KL, Chertow GM, Jin C, Kutner NG: Significance of frailty among dialysis patients. *J Am Soc Nephrol* 18: 2960–2967, 2007*
- Kurella M, Chertow GM, Fried LF, Cummings SR, Harris T, Simonsick E, Satterfield S, Ayonayon H, Yaffe K: Chronic kidney disease and cognitive impairment in the elderly: the health, aging, and body composition study. *J Am Soc Nephrol* 16: 2127–2133, 2005
- US Renal Data System: *2008 Annual Data Report: Atlas of End-Stage Renal Disease in the United States*. Bethesda, MD, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Figure 6.91, 2005
- Li M, Tomlinson G, Naglie G, Cook WL, Jassal SV: Geriatric comorbidities, such as falls, confer an independent mortality risk to elderly dialysis patients. *Nephrol Dial Transplant* 23: 1396–1400, 2008
- Go AS, Chertow GM, Fan D, McCulloch CE, Hsu CY: Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization. *N Engl J Med* 351: 1296–1305, 2004
- Covinsky KE, Palmer RM, Fortinsky RH, Counsell SR, Stewart AL, Kresevic D, Burant CJ, Landefeld CS: Loss of independence in activities of daily living in older adults hospitalized with medical illnesses: increased vulnerability with age. *J Am Geriatr Soc* 51: 451–458, 2003
- US Renal Data System: *2004 Annual Data Report: Atlas of End-Stage Renal Disease in the United States*. Bethesda, MD, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Figure 3.40–3.42, 2004
- Murtagh FE, Addington-Hall J, Higginson IJ: The prevalence of symptoms in end-stage renal disease: a systematic review. *Adv Chronic Kidney Dis* 14: 82–99, 2007*
- Weisbord SD, Carmody SS, Bruns FJ, Rotondi AJ, Cohen LM, Zeidel ML, Arnold RM: Symptom burden, quality of life, advance care planning and the potential value of palliative care in severely ill haemodialysis patients. *Nephrol Dial Transplant* 18: 1345–1352, 2003
- US Renal Data System: *2002 Annual Data Report: Atlas of End-Stage Renal Disease in the United States*. Bethesda, MD, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Figure 9A, 2002
- Moss AH: Shared decision-making in dialysis: the new RPA/ASN guideline on appropriate initiation and withdrawal of treatment. *Am J Kidney Dis* 37: 1081–1091, 2001*
- Gill TM, Baker DI, Gottschalk M, Peduzzi PN, Allore H, Byers A: A program to prevent functional decline in physically frail, elderly persons who live at home. *N Engl J Med* 347: 1068–1074, 2002
- Jonsen AR, Seigler M, Winslade WJ: *Clinical Ethics*, 6th Ed., New York, McGraw Hill, 2006*
- De Biase V, Tobaldini O, Boaretti C, Abaterusso C, Pertica N, Los-

- chiavo C, Trabucco G, Lupo A, Gambaro G: Prolonged conservative treatment for frail elderly patients with end-stage renal disease: the Verona experience. *Nephrol Dial Transplant* 23: 1313–1317, 2008*
38. Wong CF, McCarthy M, Howse ML, Williams PS: Factors affecting survival in advanced chronic kidney disease patients who choose not to receive dialysis. *Ren Fail* 29: 653–659, 2007
39. Smith C, Da Silva-Gane M, Chandna S, Warwicker P, Greenwood R, Farrington K: Choosing not to dialyze: evaluation of planned non-dialytic management in a cohort of patients with end-stage renal failure. *Nephron Clin Pract* 95: c40–c46, 2003*
40. Holley JL: Palliative care in end-stage renal disease: illness trajectories, communication, and hospice use. *Adv Chronic Kidney Dis* 14: 402–408, 2007*
41. Brown EA, Chambers EJ, Eggeling C: Palliative care in nephrology. *Nephrol Dial Transplant* 23: 789–791, 2008
42. Holley JL: Palliative care in end-stage renal disease: focus on advance care planning, hospice referral, and bereavement. *Semin Dial* 18: 154–156, 2005
43. Moss AH, Holley JL, Davison SN, Dart RA, Germain MJ, Cohen L, Swartz RD: Palliative care. *Am J Kidney Dis* 43: 172–173, 2004

REVIEW QUESTIONS: DIALYSIS DECISIONS IN THE ELDERLY PATIENT WITH ADVANCED CKD AND THE ROLE OF NONDIALYTIC THERAPY

1. The order of most important *versus* less important prognostic factors for ≥ 80 -yr-old dialysis patients associated with death at 1 yr would be:
 - a. ≥ 4 comorbid, poor functional status, low BMI, CHF
 - b. Poor functional status, ≥ 4 comorbid CHF, low BMI
 - c. Low BMI, poor functional status ≥ 4 comorbid, CHF
 - d. CHF, low BMI, poor functional status ≥ 4 co-morbid
2. In dialysis discussions, a patient's age is used primarily to:
 - a. Make the final decision
 - b. Frame prognosis
 - c. Decide if palliative care assessment is appropriate
 - d. Exclude renal replacement therapy as an option
3. The life expectancy of an elderly dialysis versus an age matched general population is decreased by approximately:
 - a. 30%
 - b. 50%
 - c. 70%
 - d. 80%
4. Potential geriatric adverse outcomes associated with CKD/ESRD include
 - a. Frailty
 - b. Cognitive dysfunction
 - c. Falls
 - d. Pain
 - e. All of the above
5. A renal palliative care assessment is appropriate if:
 - a. Patient decides to try a time-limited trial
 - b. Patient opts for nondialytic treatment
 - c. Patient has been on dialysis for 1 yr
 - d. b and c
 - e. a, b, and c