The Challenges and Management of Geriatric Nephrology

University of Rochester Medical Center

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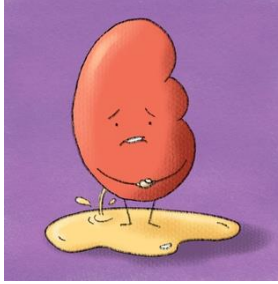
Learning Objectives

- Chronic Kidney Disease: Criteria to refer to a Nephrologist
- ESRD in Older Adults and the variety of treatments offered
- Comorbidities associated with Dialysis
- Acute Kidney Failure in Older Adults: Diagnostic and Etiologies
- Older Patients' Perspectives on CKD Self-Management
- Palliative Care

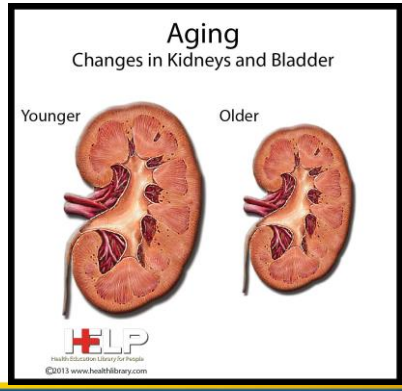
Kidney Disease in Older Adults



- Aging population has been growing because of mortality decline.
- Increased prevalence risk factors for kidney disease (eg, hypertension and diabetes).
- Increase in CKD and end-stage kidney disease numbers.
- Older adults lose their renal function more slowly.
- Delayed nephrology care has been associated with several unfavorable outcomes.

Changes of the Older Adult Kidney

- The kidney undergoes structural changes in older patients.
- A decline in GFR of about 0.75 mL/min/year occurs in many adults.
- May not have significant implications unless superimposed on acute/chronic illness.
- Age-related changes in tubular function can decrease urinary excretion.



Chronic Kidney Disease

- At least 1/3 of chronic kidney disease patients are aged above 65 years.
- Age-related kidney function decline vs intrinsic renal disease.
- The combination of high prevalence and often subclinical disease can be controversial.
- CKD is an underrecognized vs CKD standardized definitions exaggerate the prevalence.

Staging of CKD in Older Adults

Table 1
Stages of CKD in KDOQI

	eGFR (mL/min/1.73 m^2)		Marker of Kidney Damage[a]
Stage 1	>90	Normal to high	Present
Stage 2	60–89	Mild	Present
Stage 3	30–59	Moderate	Not required
Stage 4	15–29	Severe	Not required
Stage 5	<15 or dialysis	Kidney failure	Not required

- CKD is classified in 5 stages, with 1 being evidence of kidney damage without a decrease in eGFR and stage 5 being ESRD.
- Distribution of normal creatinine values is lower in older individuals, owing to muscle mass.

Table 3
KDIGO classification of CKD

GFR Stages	GFR (mL/min/1.73 m^2)	Terms
G1	>90	Normal or high
G2	60–89	Mildly decreased
G3a	45–59	Mildly to moderately decreased
G3b	30–44	Moderately to severely decreased
G4	15–29	Severely decreased
G5	<15	Kidney failure

Albuminuria Stages	AER or ACR (mg/24 h or mg/g)	Terms
A1	<30	Normal to mildly increased
A2	30–299	Moderately increased
A3	≥300	Severely increased

Box 1
Criteria for referral to nephrology for CKD

Nephrotic syndrome

Proteinuria >1 g in nondiabetic individuals

Nonurologic hematuria

Recurrent hyperkalemia

Rapid progression of CKD (decline in eGFR >5 mL/min/y)

eGFR <30 mL/min/1.73 m^2

- Nephrology referrals are recommended for patients with estimated glomerulofiltration rate (eGFR) 300 mg/gm. or rapid progression of renal failure, as defined by a sustained decline in renal function of >5 ml/min/1.73 m2 /year.

Cystatin C

- The misclassification tends to be in the stage 3a range of eGFR.
- Use of cystatin C as a confirmation measure.
- Cystatin C levels correlate better with GFR than does serum creatinine alone, especially at higher levels of GFR.
- Not dependent on muscle mass and is less affected than creatinine by race, gender, and age.

Cognitive and Physical Function in CKD Patients

- Advanced CKD have a high prevalence of cognitive impairment.
- Among stage 3 to 4 CKD patients had impaired executive function and 28% scored poorly on delayed memory.
- Cardiovascular RFs may explain some association.
- CKD patients have poorer physical function on tests of balance and gait speed.

ESRD Treatment in Older Adults

- Patients are usually prepared for renal replacement therapy.
- Most older adult patients are either treated with intermittent hemodialysis (HD) or peritoneal dialysis (PD).
- The patient level of dependency on caregiver to be taken into consideration.
- Nephrologists have multiple approaches to reach a decision to consider a trial of dialysis.

ESRD Treatment in Older Adults

- CVD accounts for the majority of deaths among dialysis patients.
- Goals is to prevent medical complications.
- Clinical perturbations of advanced renal failure create special challenges.
- Management of anemia, metabolic bone disorders, and blood pressure control can be overwhelming.
- Many reside in long term care facilities, which adds to their challenges.

ESRD Treatment in Older Adults

Pathways include:

1. Nondialytic care pathway (conservative therapy)

2. Dialytic care (renal replacement therapy)

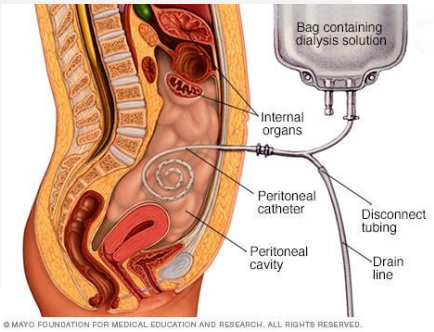
A) In-center HD/hospital based dialysis

B) Home HD

C) PD

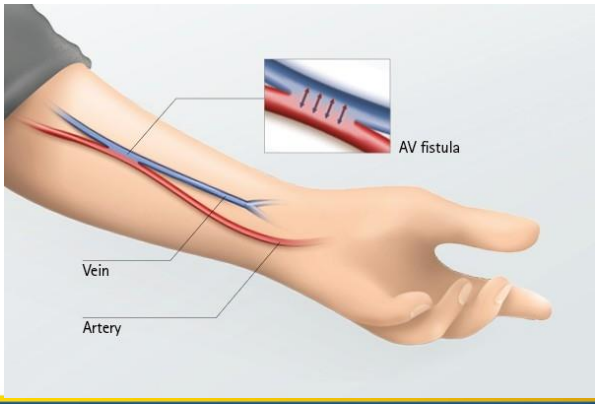
D) Hybrid therapy consisting of both HD and PD

E) Renal transplantation



HD Treatment in ESRD

- Shorter dialysis treatment times.
- Despite the shorter sessions, found to be more likely to meet clinical targets for dialysis dose and phosphate levels.
- Method of vascular access used, is different in older adults.
- Older adults have higher rate of adverse events related to the procedure.



HD Treatment in ESRD

- The risks and benefits of each vascular access must be evaluated and access planning customized for the individual.
- Recommendations to consider the fistula as the access of choice, and for when their eGFR is less than 15 mL/min/1.73 m^2.
- Fistula use is lower in older individuals, particularly those 75 years or older.

Home Dialysis

- Able to integrate their own dialysis treatment schedule into their own lifestyle.
- Offer caregivers flexibility to adapt the treatment routines to their circumstances and lifestyle.
- Challenges:
- A) Increased support to manage their own care
- B) Infection risk; older patients are at 2-fold higher risk of death in the period after peritonitis compared with younger patients.

Non-Dialysis Care

- May offer a satisfactory and comparable QoL, although survival without dialysis may be shorter.
- An alternative care pathway of "maximum conservative management" (MCM).
- MCM patients who elected never to start dialysis commonly survived greater than 1 year.
- Multiple needs must be addressed, encompassing physical, intellectual, emotional, and social domains.

Comorbidities associated with Dialysis Treatment

- Dialysis initiation may exacerbate, or cause, functional and/or cognitive decline.
- Initiated dialysis when aged 80 years or older found that more than 30% of patients experienced functional loss within 6 months.
- Early functional decline is reflected in the high rates of functional disability and frailty in dialysis patients.
- Postdialysis recovery period characterized by a profound fatigue.

Comorbidities associated with Dialysis Treatment

- Forced immobility.
- Dialysis itself may affect the risk of falls.
- Cognitive impairment is underrecognized.
- 3702 nursing home residents in the US who were starting treatment with dialysis between June 1998 and October 2000 and for whom at least one measurement of functional status was available before the initiation of dialysis.

ORIGINAL ARTICLE

Functional Status of Elderly Adults before and after Initiation of Dialysis

Manjula Kurella Tamura, M.D., M.P.H., Kenneth E. Covinsky, M.D., M.P.H., Glenn M. Chertow, M.D., M.P.H., Kristine Yaffe, M.D., C. Seth Landefeld, M.D., and Charles E. McCulloch, Ph.D.

ABSTRACT

BACKGROUND

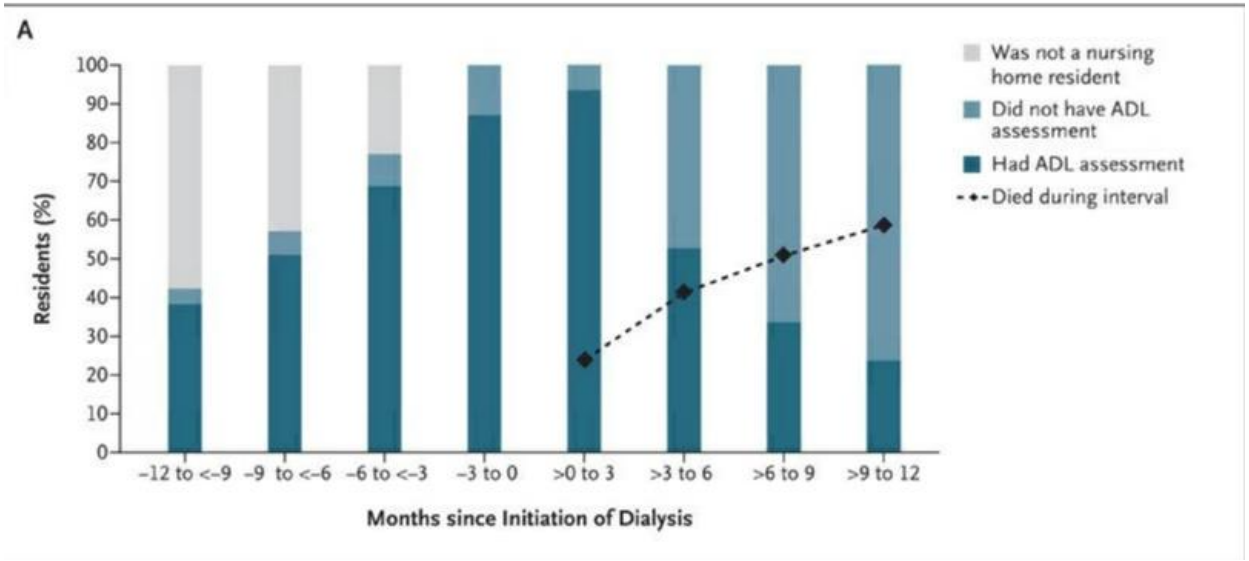
It is unclear whether functional status before dialysis is maintained after the initiation of this therapy in elderly patients with end-stage renal disease (ESRD).

METHODS

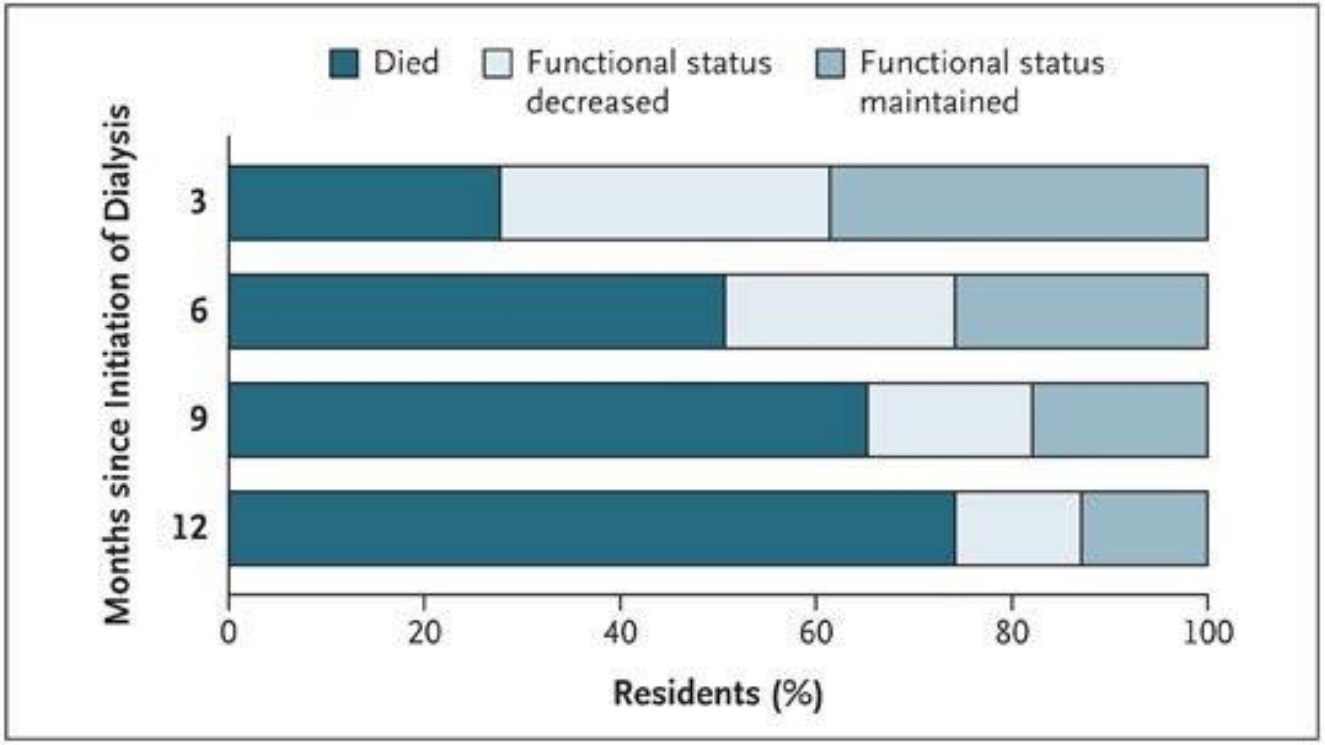
Using a national registry of patients undergoing dialysis, which was linked to a national registry of nursing home residents, we identified all 3702 nursing home residents in the United States who were starting treatment with dialysis between June 1998 and October 2000 and for whom at least one measurement of functional status was available before the initiation of dialysis. Functional status was measured by assessing the degree of dependence in seven activities of daily living (on the Minimum Data Set–Activities of Daily Living [MDS–ADL] scale of 0 to 28 points, with higher scores indicating greater functional difficulty).

RESULTS

The median MDS–ADL score increased from 12 during the 3 months before the initiation of dialysis to 16 during the 3 months after the initiation of dialysis. Three months after the initiation of dialysis, functional status had been maintained in 39% of nursing home residents, but by 12 months after the initiation of dialysis, 58% had died and predialysis functional status had been maintained in only 13%. In a random-effects model, the initiation of dialysis was associated with a sharp decline in functional status, indicated by an increase of 2.8 points in the MDS–ADL score (95% confidence interval [CI], 2.5 to 3.0); this decline was independent of age, sex, race, and functional-status trajectory before the initiation of dialysis. The decline in functional status associated with the initiation of dialysis remained substantial (1.7 points; 95% CI, 1.4 to 2.1), even after adjustment for the presence or absence of an accelerated functional decline during the 3-month period before the initiation of dialysis.



Panel A shows the percentage of 3702 nursing home residents who underwent assessments of activities of daily living (ADL) during 3-month intervals before and after the initiation of dialysis. The cumulative mortality rates were 24% at 3 months, 41% at 6 months, 51% at 9 months, and 58% at 12 months after the initiation of dialysis.



- Within 3 months after the start of dialysis, 61% of the nursing home residents had died or had a decrease in functional status as compared with their functional status before dialysis, and 39% had the same functional status that they had before dialysis. By 12 months, 87% of residents had died or had a decrease in functional status; in other words, only one of eight residents had a functional status that was maintained after the initiation of dialysis.

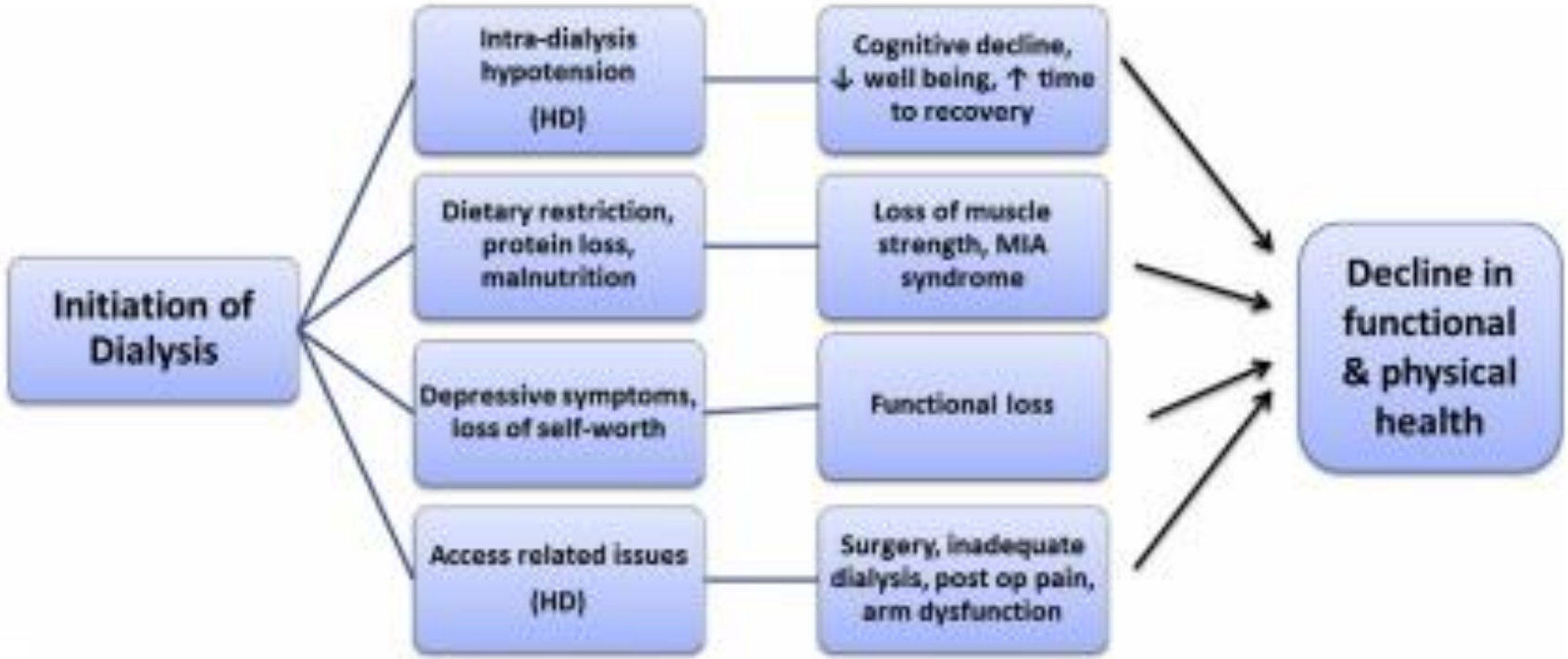


Fig. 3. Effect of dialysis initiation on a variety of health issues. Collectively these may accentuate worsening of geriatric morbidity. MIA, malnutrition, inflammation, and atherosclerosis.

Specific Solutions For ESRD in Older Adults

- Regular comprehensive geriatric assessment.
- Multidisciplinary teams.
- Geriatric rehabilitation may help patients who have experienced a recent decline in functional independence or cognitive function.
- Consultation with various allied health specialists.

Acute Kidney Failure and Older Adults

- Patients with AKI are at increased risk for death and CKD.
- There is a 20% greater rate of AKI among older adults in critical care.
- Cannot rule out other causes (sepsis, polypharmacy) in which older adults are more susceptible.
- Polypharmacy is a significant contributor to poor health outcomes in older adults.

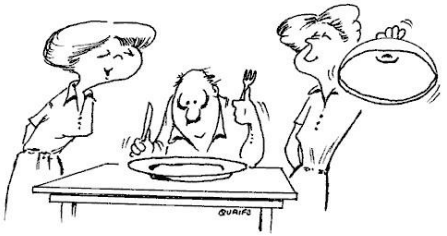
Acute Kidney Failure and Older Adults

- The higher incidence of AKI can be attributed to:

A) comorbidities that accumulate with age

B) comorbidities may necessitate procedures, drugs or surgery that function as kidney stressors

C) Kidney undergoes age-dependent structural and functional alterations over time



...and this dish is totally potassium-free!

Diagnostic Workup for Acute Kidney Failure

- Thorough history and physical examination.
- Renal ultrasonogram, bladder catheterization, and examination of the urinalysis.
- Urine electrolytes can help in the diagnosis of prerenal causes.
- Many patients may have impaired sodium- and water-conserving ability or may be taking diuretics.

Treatment for Acute Kidney Failure

- Management largely supportive in older adults.
- HD in the older adult with AKI may be poorly tolerated owing to numerous factors.
- Decisions about dialysis initiation must be individualized and account for numerous factors.
- A time-limited trial of dialysis for those with an uncertain prognosis may be warranted.

Older Patients' Perspectives on Managing Complexity in CKD Self-Management

C. Barrett Bowling,† Ann E. Vandenberg,*† Lawrence S. Phillips,† William M. McClellan,‡ Theodore M. Johnson II,*† and Katharina V. Echt*†

Abstract

Background and objectives Patients with CKD are asked to perform self-management tasks including dietary changes, adhering to medications, avoiding nephrotoxic drugs, and self-monitoring hypertension and diabetes. Given the effect of aging on functional capacity, self-management may be especially challenging for older patients. However, little is known about the specific challenges older adults face maintaining CKD self-management regimens.

Design, setting, participants, & measurements We conducted an exploratory qualitative study designed to understand the relationship among factors facilitating or impeding CKD self-management in older adults. Six focus groups (n=30) were held in August and September of 2014 with veterans≥70 years old with moderate-to-severe CKD receiving nephrology care at the Atlanta Veterans Affairs Medical Center. Grounded theory with a constant comparative method was used to collect, code, and analyze data.

Results Participants had a mean age (range) of 75.1 (70.1–90.7) years, 60% were black, and 96.7% were men. The central organizing concept that emerged from these data were managing complexity. Participants typically did not have just one chronic condition, CKD, but a number of commonly co-occurring conditions. Recommendations for CKD self-management therefore occurred within a complex regimen of recommendations for managing other diseases. Participants identified overtly discordant treatment recommendations across chronic conditions (*e.g.*, arthritis and CKD). Prioritization emerged as one effective strategy for managing complexity (*e.g.*, focusing on BP control). Some patients arrived at the conclusion that they could group concordant recommendations to simplify their regimens (*e.g.*, protein restriction for both gout and CKD).

Conclusions Among older veterans with moderate-to-severe CKD, multimorbidity presents a major challenge for CKD self-management. Because virtually all older adults with CKD have multimorbidity, an integrated treatment approach that supports self-management across commonly occurring conditions may be necessary to meet the needs of these patients.

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Older Adult Patients' Perspectives on CKD Self-Management

- Multiple challenges to perform self-management tasks including dietary changes and adhering to meds.
- Must negotiate the complexity to adhere to discordant treatment recommendations.
- Providers to recognize the possible effect of discordant recommendations.
- PCPs could help patients prioritize treatments on the basis of their preferences and health goals.

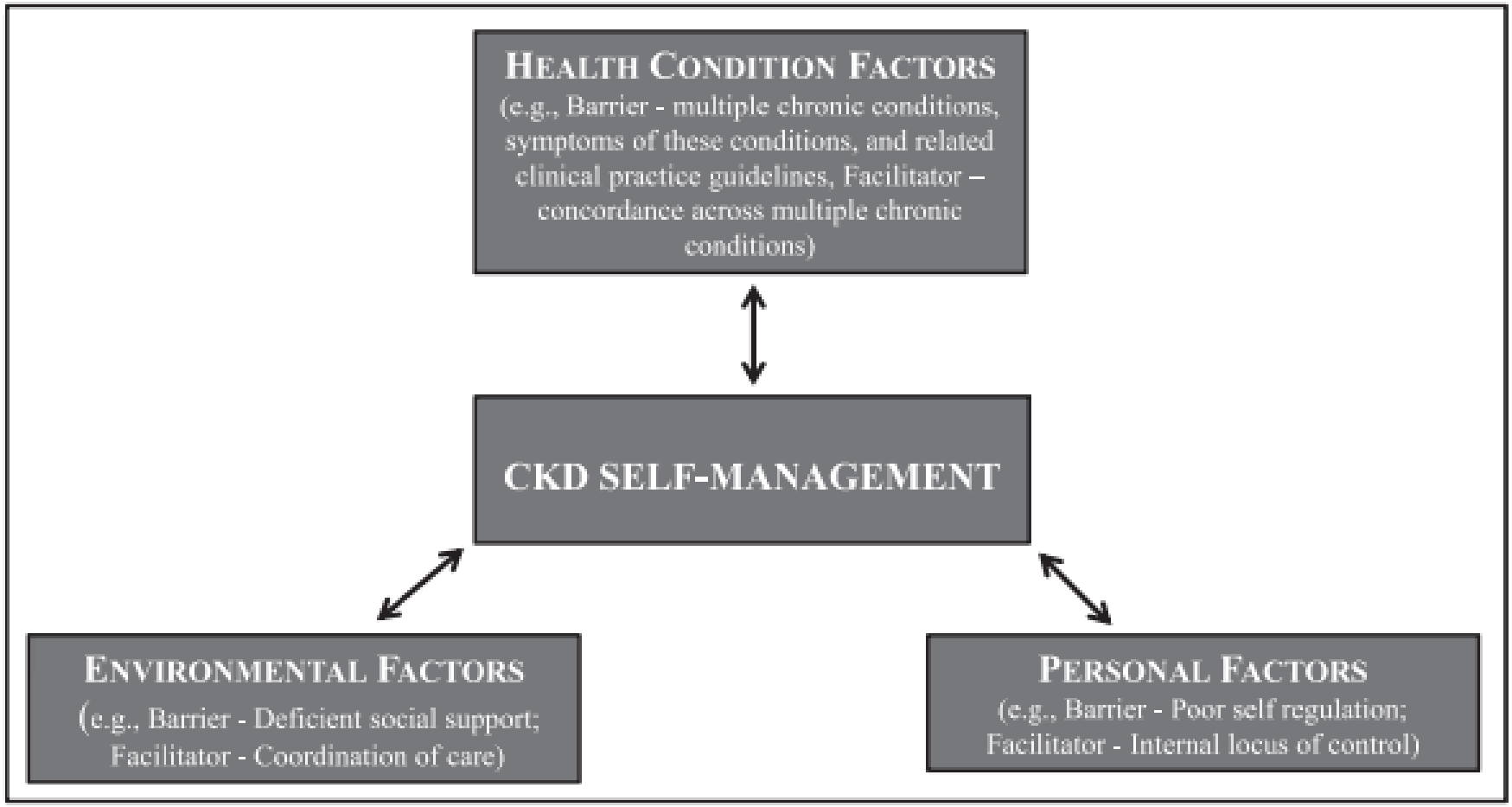
Table 3. Reported treatment advice and related self-management situations across comorbid chronic conditions

CKD Treatment Advice	Comorbidity	Comorbidity Treatment Advice	Self-Management Situation	Examples of Self-Management Conflict
Avoid NSAIDs	Arthritis, gout	Take NSAIDs	Discordant	"[L]ast week I had tremendous gout attack in my wrists, I mean it was swoll and I couldn't, if I try to move my wrist that far, I was in excruciating pain, so I took some Aleve, which I'm not supposed to take, but it relieved the pain that I had, it was the only thing that I had that would relieve the pain" (FG1) "Got a little arthritis and things like that, that I need anti-inflammatories" (FG1)
Drink plenty of water	Heart failure	Avoid drinking water	Discordant	"One doctor says drink a lot of water. Another doctor says you're drinking too much water. Well, what is it?" (FG3) "One of the doctors mentioned the volume of water that I should drink, and then another said 'Don't drink very much water; you got too much as it is.' So I'm caught in between so I just take it when I get thirsty, I get something to drink." (FG6) "They told me to drink water, a lot of water. But, then my cardiologist told me not to drink too much water." (FG2)
Avoid potassium	Hypokalemia – leg cramps	Take potassium pills Eat high-potassium foods	Discordant	"...but I've got to have so many bananas. That's the way I can keep from getting leg cramps at night" (FG1) "[I]f potassium is a problem for the kidney, why would your doctor give you potassium pills, why? So, evidently that is not affecting my kidneys. ...Because I take 10 mg of potassium and that is from my doctor." (FG2)
Avoid protein	Gout	Avoid protein	Concordant	"I mostly just reduce the amount of meat. I have gout too like the gentleman number 5 here. Does anyone else have gout here? I just wondered how common it is with kidney problems. Anyhow, I just have to watch these kinds of foods with the gout too." (FG1) "I have gout also. So I have two things working there. I can't have steak anymore, because it is red meat and it [also] activates the gout." (FG3)

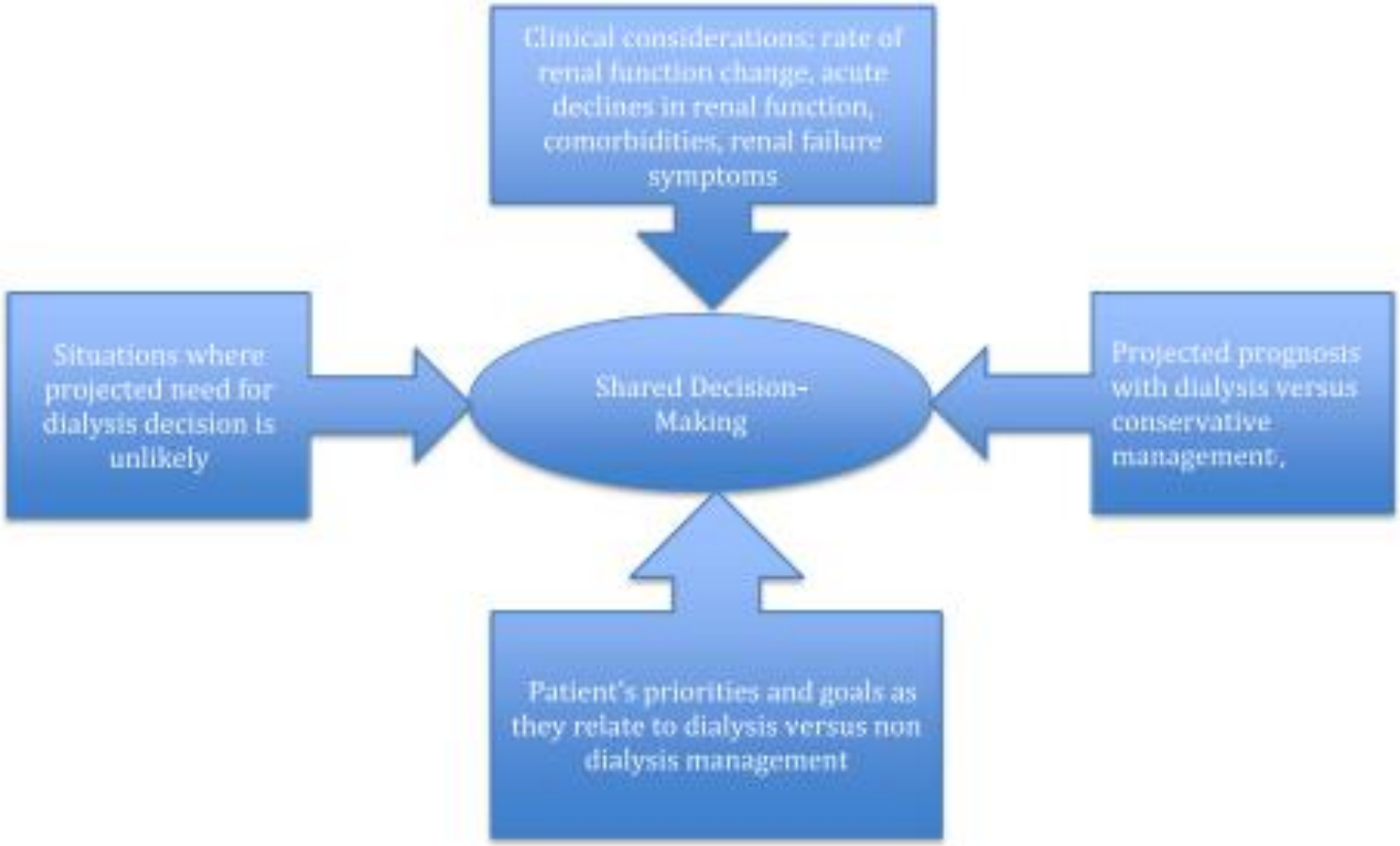
Older Patients' Perspectives on CKD Self-Management

- Asymptomatic nature of CKD was reported as a barrier to CKD self-management.
- Patients asked for recommendations that address co-occurring chronic conditions, routine clinical care follows a one-condition-at-a-time approach.
- Take into account the dynamic relationship between multiple chronic conditions, personal factors, and environmental factors.

CKD Self Management



Shared Decision Making



Withdrawal from Dialysis and Palliative Care Case

- 85 yo M with severe CHF, dementia, and advanced CKD 2/2 to HTN admitted to hospital for dyspnea.
- HD vs PD.
- Readmitted due to swelling scrotum/hydrocele.

.Withdrawal dialysis and switch to palliative care.

- Family agree to conservative care.
- Passed away with dignity with family.

Palliative Care

- Offers solace and relief from the progressive consequences of inexorable failure to thrive.
- Should be considered long before individuals reach a state of advanced debility.
- Address end-of life issues.
- Patient-focused effort that emphasizes those factors important to the individual patient.

Palliative Care

- Focus include greater education and support for patients.
- Dialysis patients who discontinue treatments generally have ongoing support.
- Patients with CKD stages 4 to 5, in whom many months of survival is anticipated, face challenges.
- Interactions with social workers, dietitians, and nurses may be infrequent or nonexistent.

JAMA Internal Medicine | Original Investigation

Association Between Hospice Length of Stay, Health Care Utilization, and Medicare Costs at the End of Life Among Patients Who Received Maintenance Hemodialysis

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Invited Commentary
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Supplemental content

IMPORTANCE Patients with end-stage renal disease are less likely to use hospice services than other patients with advanced chronic illness. Little is known about the timing of hospice referral in this population and its association with health care utilization and costs.

OBJECTIVE To examine the association between hospice length of stay and health care utilization and costs at the end of life among Medicare beneficiaries who had received maintenance hemodialysis.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional observational study was conducted via the United States Renal Data System registry. Participants were all 770 191 hemodialysis patients in the registry who were enrolled in fee-for-service Medicare and died between January 1, 2000, and December 31, 2014. The dates of analysis were April 2016 to December 2017.

MAIN OUTCOMES AND MEASURES Hospital admission, intensive care unit (ICU) admission, and receipt of an intensive procedure during the last month of life; death in the hospital; and costs to the Medicare program in the last week of life.

RESULTS Among 770 191 patients, the mean (SD) age was 74.8 (11.0) years, and 53.7% were male. Twenty percent of cohort members were receiving hospice services when they died. Of these, 41.5% received hospice for 3 days or fewer. In adjusted analyses, compared with patients who did not receive hospice, those enrolled in hospice for 3 days or fewer were less likely to die in the hospital (13.5% vs 55.1%; $P < .001$) or to undergo an intensive procedure in the last month of life (17.7% vs 31.6%; $P < .001$) but had higher rates of hospitalization (83.6% vs 74.4%; $P < .001$) and ICU admission (54.0% vs 51.0%; $P < .001$) and similar Medicare costs in the last week of life ($10 756 vs $10 871; $P = .08$). Longer lengths of stay in hospice beyond 3 days were associated with progressively lower rates of utilization and costs, especially for

ESRD and Hospice Association

- Patients with ESRD are less likely to use hospice services.
- 41.5% received hospice for 3 days or fewer.
- Hospice referral occurs late in the course.
- Use of hospice unlikely to translate into meaningful changes in health care utilization.
- Many must halt dialysis to receive hospice care.

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