

## End Stage Kidney Disease and RRT in the Oldest-Old

SEKI A BALOGUN, MD, FACP, CMD, AGSF  
 DONALD W. REYNOLDS PROFESSOR OF MEDICINE  
 VICE CHIEF OF EDUCATION  
 DIRECTOR, GERIATRIC FELLOWSHIP PROGRAM  
 DONALD W. REYNOLDS SECTION OF GERIATRIC MEDICINE



### Disclosure of Financial Relationships

- No financial disclosures

### Case

- 90 year old woman, CCRC patient, AL section
- PMHx: HTN, DM type 2, controlled, CKD stage 4, HLD, DJD
- Ambulates with a walker, requires assistance with bathing, otherwise independent of ADLs and IADLs
- Meds:
  - PE: VSS, Lungs: clear; trace pedal edema
  - Labs: BUN/Cr: 35/4.0 eGFR: 10; K+ - 4.0, Ca: 9.0
- Asks: Should I consider dialysis?



Should RRT be recommended for the oldest old?

What are the outcomes of the oldest old on RRT?

Is there a quality-of-life benefit?

Is there any benefit in life expectancy (quantity)?

Is conservative therapy a reasonable alternative?



## Aging Kidney

### Structural changes

- Decline in renal mass per decade: approx. 10%
  - cortical thinning
  - decrease in the number of functional nephrons

- In younger and older age groups (18-29 vs. 70-75yrs)
  - cortical volume decreased by 16%
  - proportion of globally sclerotic glomeruli on biopsy increased by 15%.

### Functional Changes

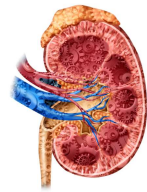
- Glomerular Filtration Rate
  - Progressive fall in GFR in  $\geq 40$  years
  - No decrease in CrCl in up to a third of older adults

### Renal Plasma Flow

- RPF decreases: (mean of 650 ml/min in the 4<sup>th</sup> decade to 290 ml/min by the 9<sup>th</sup> decade)
- Renal vascular resistance increases

## CKD Scope in Older Adults

- Aging population
- 1:6 persons >65 yrs, double in 30 years
- CKD in about 14% of total US population
- Up to 40% in >60yrs
- CKD stage 1-2: 7%
- CKD stage 3: 30%
- CKD stage 4-5: 5%



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Corbett L et al. *Nephrol Dial Transpl*. 2007  
Fung E et al. *Adv Chronic Kidney Dis*. 2016

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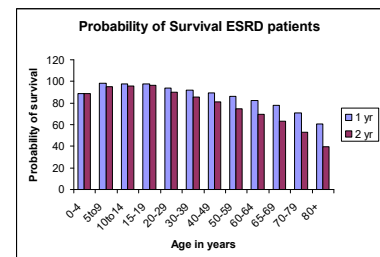
Is conservative therapy a reasonable alternative?



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## Aging burden and ESKD/dialysis

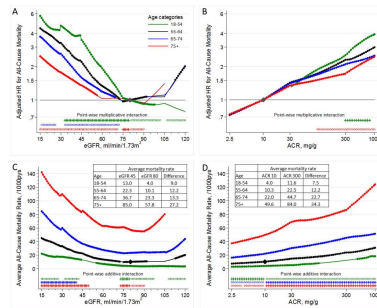
- All cause mortality is 6 times higher in ESKD vs. general medicare population
- Annual mortality risk increases with age
- Almost 50% in oldest old



## CKD Prognosis

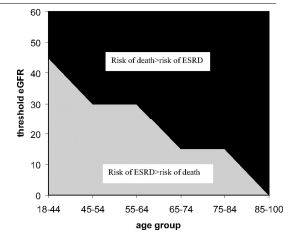
- Adjusted HR (relative risk) and average all-cause mortality rate (absolute risk) increase with lower eGFR and increased albuminuria across age groups.
- Higher absolute mortality risk with lower eGFR and progressive albuminuria, more pronounced in older age groups.
- Relative risk of all-cause mortality attenuated effect in older population
- Likely a reflection of increased comorbidities in older age groups.

Hallan SI et al. JAMA. 2012



## ESKD progression

- Varies with age
- > 65 yrs
  - Higher rates of death
  - Lower rates of ESKD
- > 85 yrs, eGFR <60
  - Risk of death higher than risk of ESKD



O'Hare AM et al. J Am Soc Nephrol. 2007



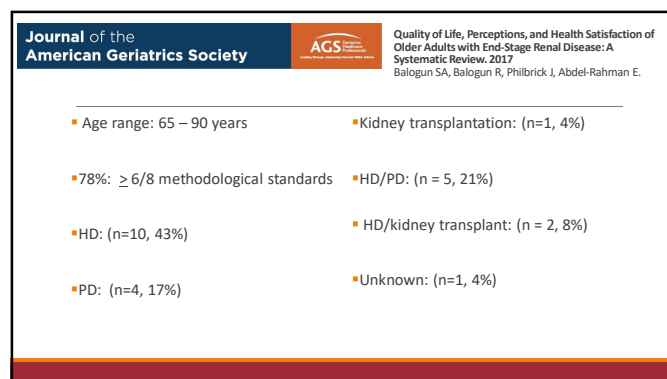
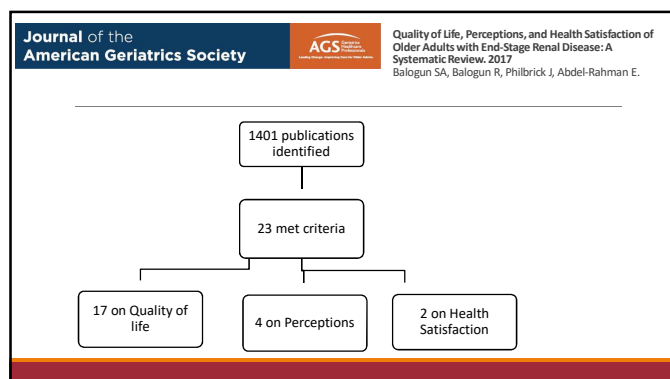
Oldest old with CKD are more likely to die of causes other than ESKD

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**Journal of the American Geriatrics Society** **AGS** AMERICAN GERIATRICS SOCIETY

Quality of Life, Perceptions, and Health Satisfaction of Older Adults with End-Stage Renal Disease: A Systematic Review. 2017  
Balogun SA, Balogun R, Philbrick J, Abdel-Rahman E.

## Quality of Life

- 47%: Health-related and mental component summary QOL scores  $\neq$  /  $>$  age-matched controls or younger individuals
- Physical component summary QOL scores  $<$  in older adults.


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## Perceptions


- Results: highly variable.
- Three studies on HD patients
- One on PD pts
- Ranged from:
  - Very high expectations that it "would make them feel better and keep them independent" and "I still fully enjoy life..."
  - Feeling that it was a way of staying alive without better alternatives—"I had no choice" or "I would be dying slowly".
- Health teams being "paternalistic" and making them feel "powerless in the decision-making process about hemodialysis".
- Change after starting hemodialysis, with 55% finding hemodialysis unacceptable.
- PD remained socially engaged and had strong support systems.
- Peers and family were found to influence perceptions about Home PD treatments.

Balogun SA, Balogun R, Philbrick J, Abdel-Rahman E. J AGS. 2017.

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**Health Satisfaction**

- Two studies
- Cross-sectional studies, with 308 and 45 participants, respectively.
  - Age ranged from 60 to 87.
- High level of health satisfaction with home-based RRT
- Greater health satisfaction and fewer symptoms in elderly blacks
- Difficult to draw generalizable conclusions.


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**Caveats**

- Cognitive, functional, or sensory (vision, hearing) impairments or terminal illnesses were excluded
- Results applicable to those considered "healthy"
- Limited data on 'best' RRT


**Conclusions**

- Few studies specifically examine QOL
  - QOL data promising
- Health-related and mental component QOL scores similar to age-matched controls and younger patients
- Very limited data on perceptions/health satisfaction

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**A Qualitative Pilot Study of the Perceptions in Older Adults with End-Stage Kidney Disease on Hemodialysis 2019**  
Balogun SA; May NB; Briley M; Bosch A; Duerr I; Owens J; Abdel Rahman E.

- Outpt chronic hemodialysis
- Cross-sectional
- Open-ended interviews
- 15 participants
- AA: 53%; Caucasian: 47%
- Age: 63 – 92 (mean: 75.1)
- Female: 53%; Male: 47%
- HD duration: 0.5 – 14 yrs (mean: 4.5)
- Ability to consent and participate in the interview process.

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**Four domains:**

- Decision to initiate HD
- Preconceptions and expectations of HD
- Drawback of HD
- Coping strategies

CGJ CANADIAN GERIATRICS JOURNAL

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### Decision to initiate HD

- All participants were reluctant to initiate HD
- Decision made on advice from their physicians for varying reasons:
  - symptom control,
  - trust in physician,
  - to prolong life,
  - no other choice
- All participants were influenced by family relationships
- Some used outside sources of information such as past experiences of friends or family on HD
- Some relied on religious faith/spiritually in making the decision

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### Preconceptions and expectations

- Majority had preconceptions based on:
  - Experience of friends or family on HD
  - Discussions with physicians or patient education programs
- Some had positive preconceptions that HD would prolong life or make them feel better
- Few had negative preconceptions – either from media or experience of others
- Two patients had no preconceptions or prior exposure to others on HD
- Two expected HD to cure their kidney disease

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### Drawback of HD

Drawback	Experiences	Representative Quotes
Time consuming		"Yes, the great objection to it (hemodialysis) that, um, is just saying that it is something that intrudes heavily in your life. It really takes three days because I come in at 10:30 and I'm out around 4:00. It really just cancels three days of the week...And there is almost nothing that I can do before and I really am tired afterwards. So, I think that is the strongest feeling against it, but it's..."
Limits independence		"...I worked and came to dialysis from 2003 to 2004. Then in 2004 it got to be too much for me, so I quit work. And, just, I've been on disability ever since..." "Being on dialysis, it confines you."
Limits ability to travel		"I just, I just can't travel now. Um, to the various layouts and things that we used to. Because there are certain days that I have to come to dialysis and they have meetings I can't attend with them."
Dietary Restrictions		"Then there is a thousand things. Like they give you a paper that says, "now you can't eat any of this, you can't..." and, a lot of times, they are so conservative about my kidneys that they forget that I am diabetic too...You should see the list. I've got one list that's things that I can't have on dialysis. The other list is the things I can't have on, when I'm being diabetic. So, a lot of times it's just, "don't eat that."
Lack of energy		"Um, it wipes you out, but still I try to go on. You know? And sometimes it wipes me out more. And um, weakens you down so. Most of the time when I go home and, you know, do a few things. And then I just sit and rest"
Boredom		"Uh-huh. Yeah, you get bored here."
Difficulty with AV fistula/graft		"I've just been laying in this one position and I'm glad to get out of here." "I have you ever seen a dialysis arm? Well I could show you. Great huge bumps. It's, they're weird colors. Ah, and, um, so anyway it's not a pretty thing." "I don't like the sight of blood, don't like none of the pain with it. I just sit up here and take it. When they stick me, I just go on and take it..."
Poor relationship with hemodialysis team		"I don't even get to see the kidney doctors, he come once in a while, they come here and there. I ain't had nothing to do with him since I got on the kidney machine."

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### Coping strategies

Theme	Subtheme	Representative quotes
Reliance on family and friends	Supportive relationships	"I've got my family supporting me. My church is supporting me and it makes a big deal, a big difference." "Because when I was having my legs, my pants kind of got big and my husband wouldn't let me go if I got hurt, so he does the cooking. But he doesn't, I help him do everything else..." "My husband said, 'To come and get you and, um, you have done here and...'. And I said, 'Okay'."
	Worried how to be in same household on family members	"I got some grandchildren and eleven grandkids, great-grandkids. I read my grandkids and my great-grandkids are there that and 'New Year' and they always say... so, I'm protected by that."
	Worried supportive relationships	"My oldest granddaughter, she's a single in the house, she been there three years. I'm, every time she can come, I call her when I go home today. I didn't call her yesterday. I got one grandson that calls me every day, every day."
Reliance on spirituality	Faith in God	"Yes, it helps. I think, that's the Christian and... make them understand and, you know..." "There's a lot of people that are, have diabetes that are in here and they are, um, you know... it's some trouble, I've got to have faith because I would say no and grateful me. I ain't know what people do without to let you be honest truth."
	Religious community	"And the pastor comes to church being faithful to hold me, and he bring communion when he comes. We get communion and, uh, it's very helpful. Yeah."
	Religious community	"I like to go to church and do church things like church functions. I'm very active in the church."
Self-care	Diet	"I think myself, I read it somewhere, your diet is one of the best things you can do. It's your diet. Keep up with your diet, try to do things the right way. And they tell you, you'll feel better."
	Exercise	"I can get up and walk. Okay, I get up and walk all the time. The doctor said it was the best thing I could do. Get out and walk."
	Monitoring fluid intake	"Well if they told to take fluid off, then I started getting cramps. And now I am learning, after five or six years, don't drink so much and you won't have that problem."
Engaging in activities that foster well-being	Nature/Gardening	"And then, when it's pretty good I would take me out to the front... and I'd take. The other day I saw, it was yesterday, and it was just so great. It was still in the morning, but I got out there for about two and a half hours. And then I'm, then I'm got, um, red pretty flowers and different things you can... and there's birds everywhere and like doing that."
	Music	"I play guitar for the church and I got back to that, so I'm playing that now. Singing songs."
	Travel	"Yeah, I like to go independent. My youngest son says, 'Well, just keep your life alive on.'"
	Maintain normal routine	"Yeah, I have my meals, I have my get my coffee. And, um, sometimes I sleep and get a bag of, um, oh what are they called? Cookies. I love those little things. I can't eat all of them, I mean, but I love it when I eat."

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# Depression in OA on RRT

- High prevalence of depression and antidepressant use in CKD: 20 - 30%<sup>2,3</sup>
- Associated higher mortality
- ESKD patients (> 65 years older) on HD
- Median survival time:
  - without depression: (45.2 months, 95% CI 23.4–66.3) vs.
  - depression (23.15 months, 95% CI 13.0–46.6)
- 91% higher risk of death with depression<sup>2</sup>

The graph is a Kaplan-Meier survival plot. The y-axis is labeled 'Proportion alive' and ranges from 0.70 to 1.00. The x-axis is labeled 'Analysis time (years)' and ranges from 0 to 5. There are two lines: a blue line for 'Depression absent' and a red line for 'Depression present'. Both lines start at 1.00 at year 0. The blue line remains higher than the red line throughout the 5-year period. At year 5, the blue line is at approximately 0.85 and the red line is at approximately 0.75. A p-value of <0.001 is indicated in the upper right corner of the plot area.

Analysis time (years)	Depression absent (Proportion alive)	Depression present (Proportion alive)
0	1.00	1.00
1	~0.98	~0.95
2	~0.95	~0.90
3	~0.92	~0.85
4	~0.88	~0.80
5	~0.85	~0.75

Legend: — Depression absent — Depression present

Abdel-Rahman EM<sup>1</sup>, Balogun SA, Kepple A et al. Nephrol Dial Transplant. 2011 Jun;26(6):"Balogun BA", Balogun SA, Kepple Al et al. J Am Geriatr Soc. 2011 Aug;59(8): Balogun SA, Balogun SA, Kepple A et al. J Am Geriatr Soc. 2011 Aug;59(8):



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## Conservative Management

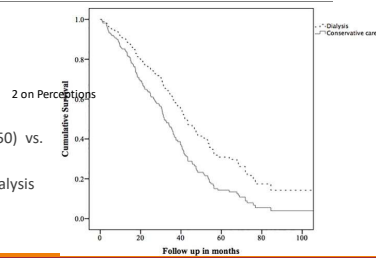
- Systematic review
- Goals of care
  - Less hospitalization
  - More deaths at home
- Median survival was at least 6 months with a range of 6.3–23.4 months
- Factors associated with better survival:
  - Female gender
  - Lower comorbidity score
  - Albumin greater than 35g/L
  - Early referral to a nephrologist
- Treatment choices (dialysis versus non-dialysis) should be individualized.
  - Involve shared decision-making.

(Abdel-Rahman EM and Holey HJ, Hosp. Pract. 2020)

## Survival Outcomes: HD vs. Conservative care

Prospective cohort, CKD stage 5

- $\geq 75$  years
- 204 patients
  - HD: 123
  - CC: 81
- Median survival dialysis vs. CC: 42 (33–50) vs. 31 (21–41) months.
- Adjusted hazard ratio (HR) for death: dialysis vs. CC: 0.61 (0.41–0.61,  $p = 0.01$ ).



Raman M, Middleton RJ, Kalra PA et al. *PLoS One*. 2018.

## Summary

In the oldest old with ESKD:

- more likely to die from other causes
- RRT can be clinically appropriate ('healthy')
- QOL benefit:
  - Health –related and mental component QOL scores compared to younger pts and non- ESKD
  - Lower physical component QOL scores
- Adverse outcomes such as depression common
- Limited data on health satisfaction
- Perceptions widely varied
- Conservative therapy a reasonable alternative