EXPLORING CONSERVATIVE RENAL CARE THROUGH CASE DISCUSSIONS

Michael Wang

Steve Gobran

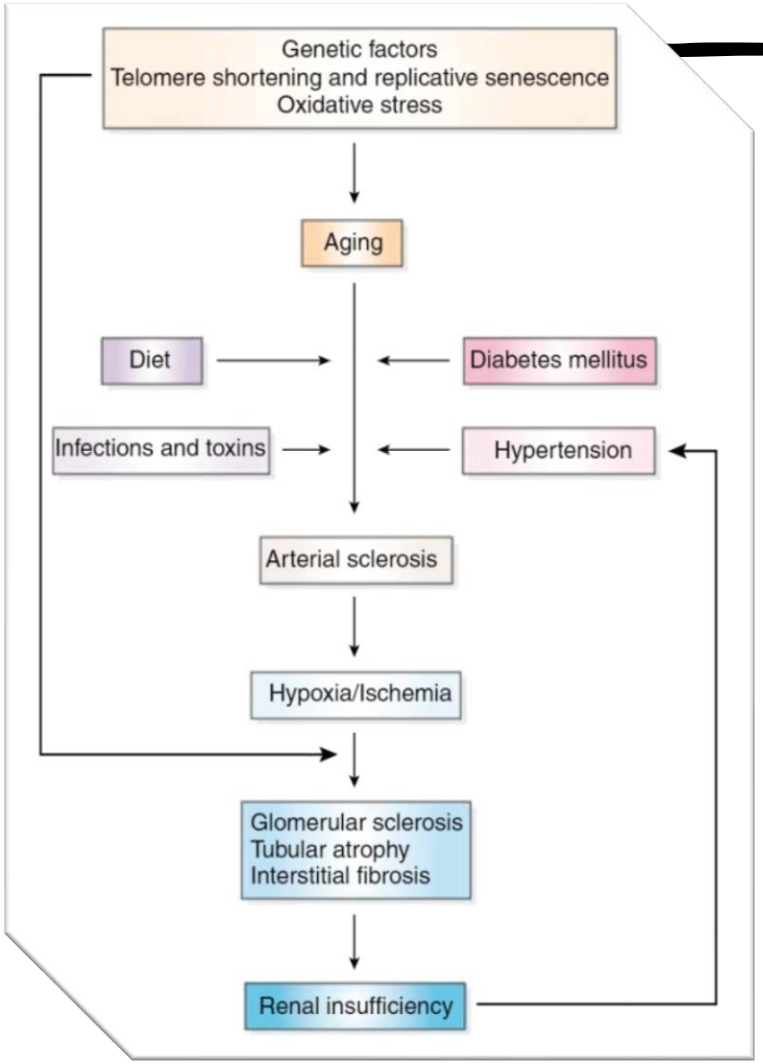
Objectives

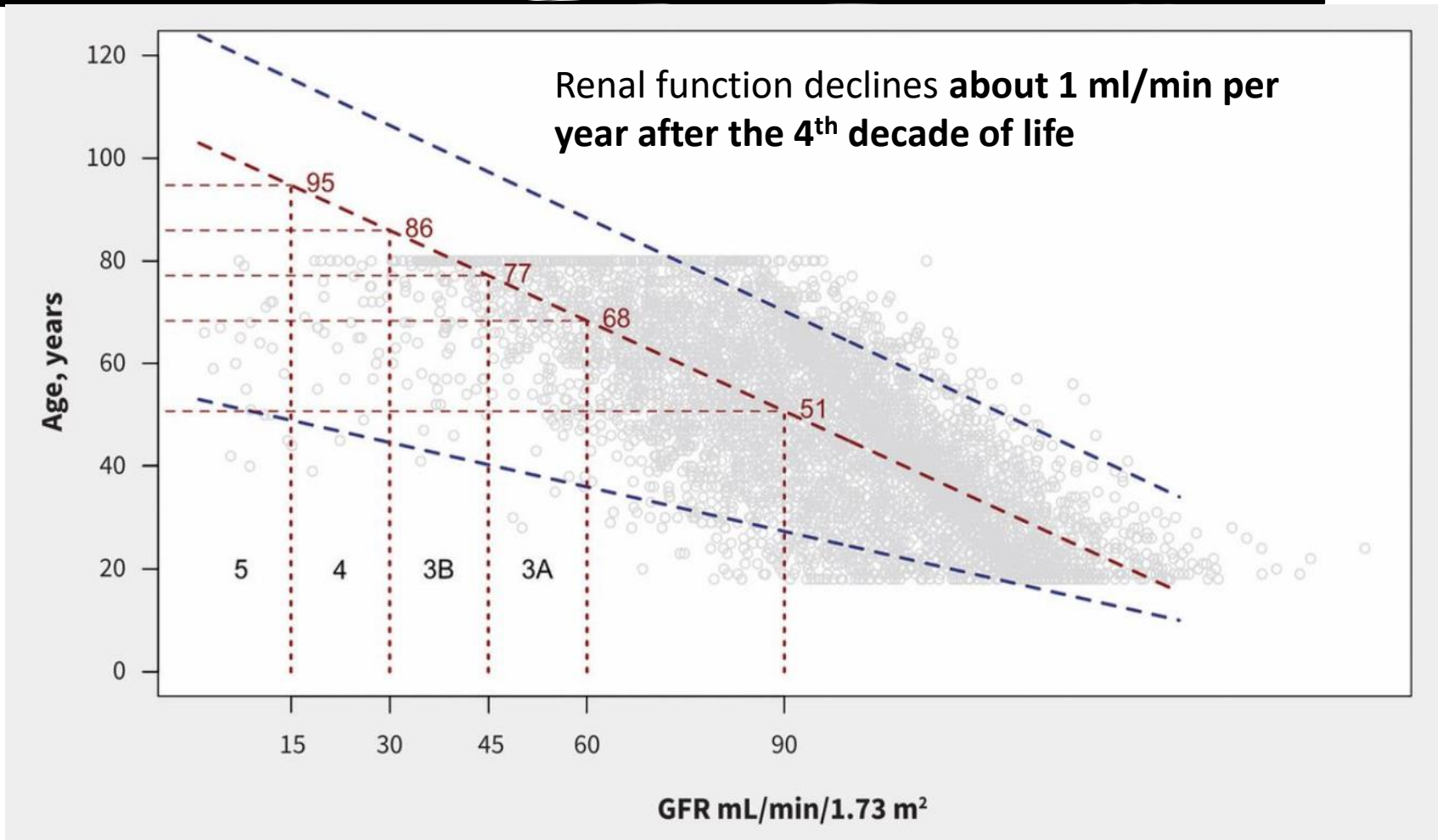
- Develop an approach on how to discuss gals of care with patients with declining renal function
- Gain an appreciation of the potential roles and limitations of renal replacement therapy, both as life-extending therapy but also for symptom relief
- Become familiar with common symptoms experienced by patients with declining renal function and associated strategies for management
- Gain confidence in approaching lab work abnormalities commonly seen in patients with advanced kidney disease

Format of workshop

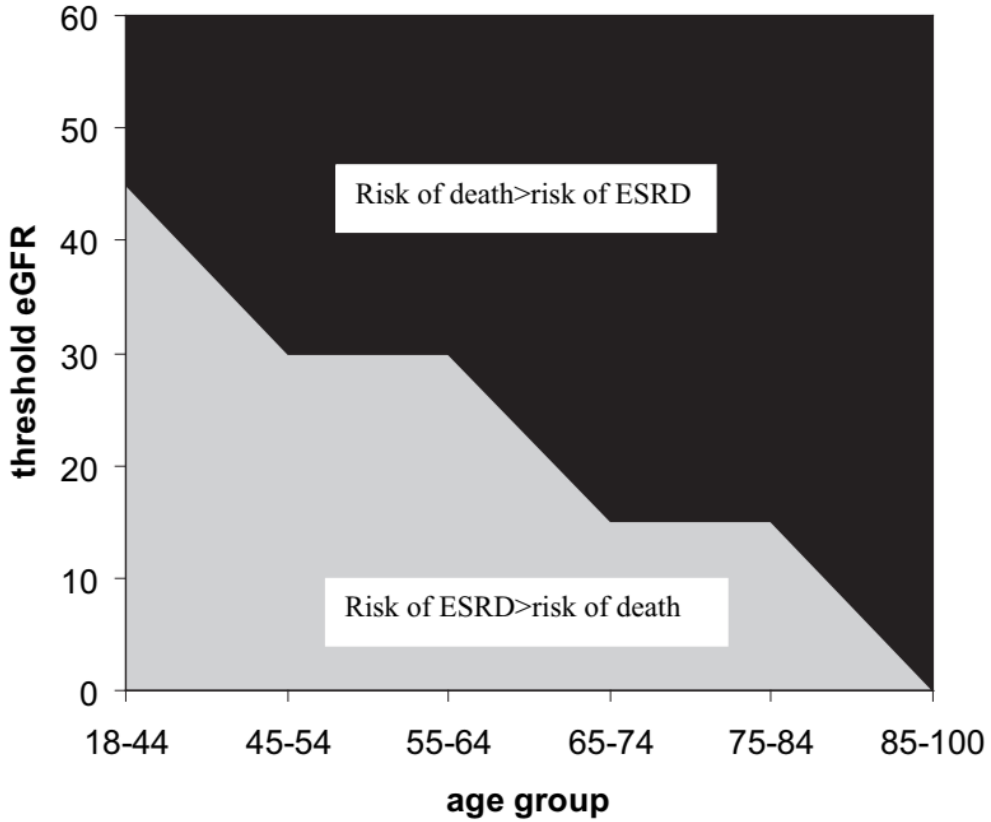
- Breakout groups will be formed to discuss illustrative cases.
- The following PowerPoint slides serve as useful references to guide our discussion & illustrate key concepts
- Cases will be provided the day of the workshop

The useful concept of Kidney Age





Kidneys outliving the patient

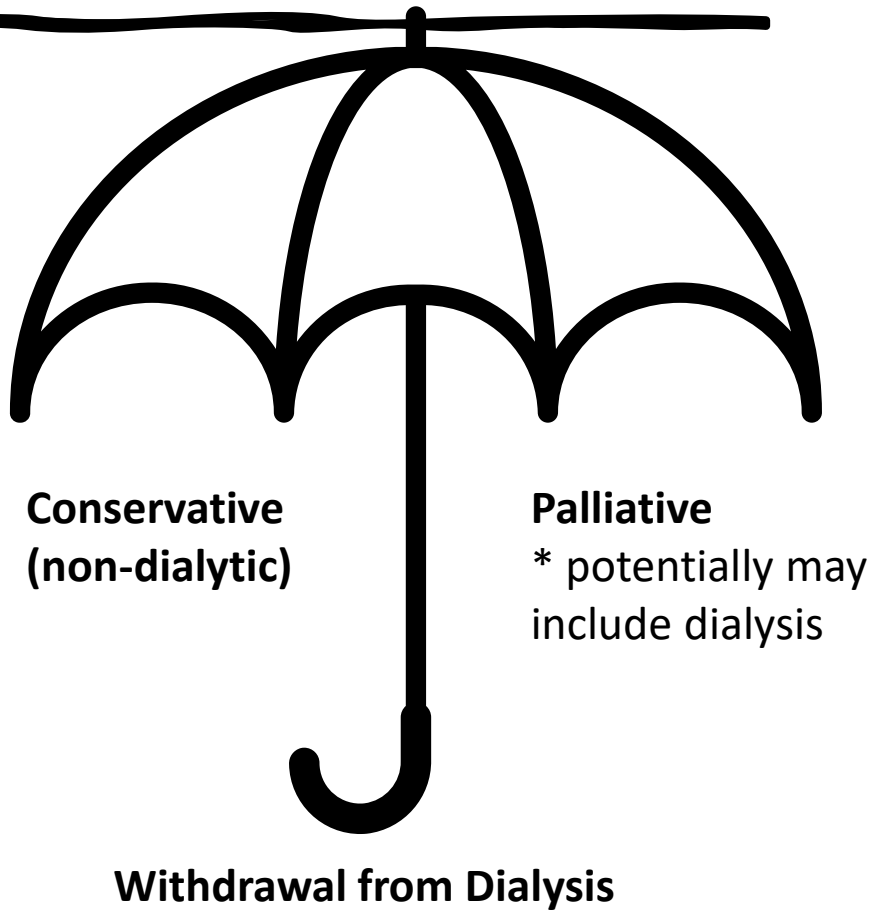


Age	eGFR	Death /1000 patient yrs.	ESRD / 1000 patient yrs.
75-84	15-29	15.4	6.31
	<15	27.0	44.7
>85	15-29	25.3	2.65
	<15	49.4	29.2

O'Hare et al (2007): 209,622 US veterans' database, patients aged ≥ 75 years with Stage 4 and lower CKD had a higher risk of dying from a competing illness

CONSERVATIVE CARE

- "Active management without dialysis" –
  - **Interventions** with aims to
    - **Delay CKD** progression
    - **Minimize risk** of adverse events & complications
    - Relieve **symptoms**
  - Detailed **communication**, advance care planning
  - **Support**: psychologic, social, family, spiritual
  - **DOES NOT include dialysis**



Davidson et al., 2015 / Murtagh et al., 2016

Why conservative care?

"**Dialysis is widely understood as the default standard of care** for kidney failure that cannot be treated by transplantation. Implicit in this are **2 assumptions** […]

Everyone benefits from dialysis

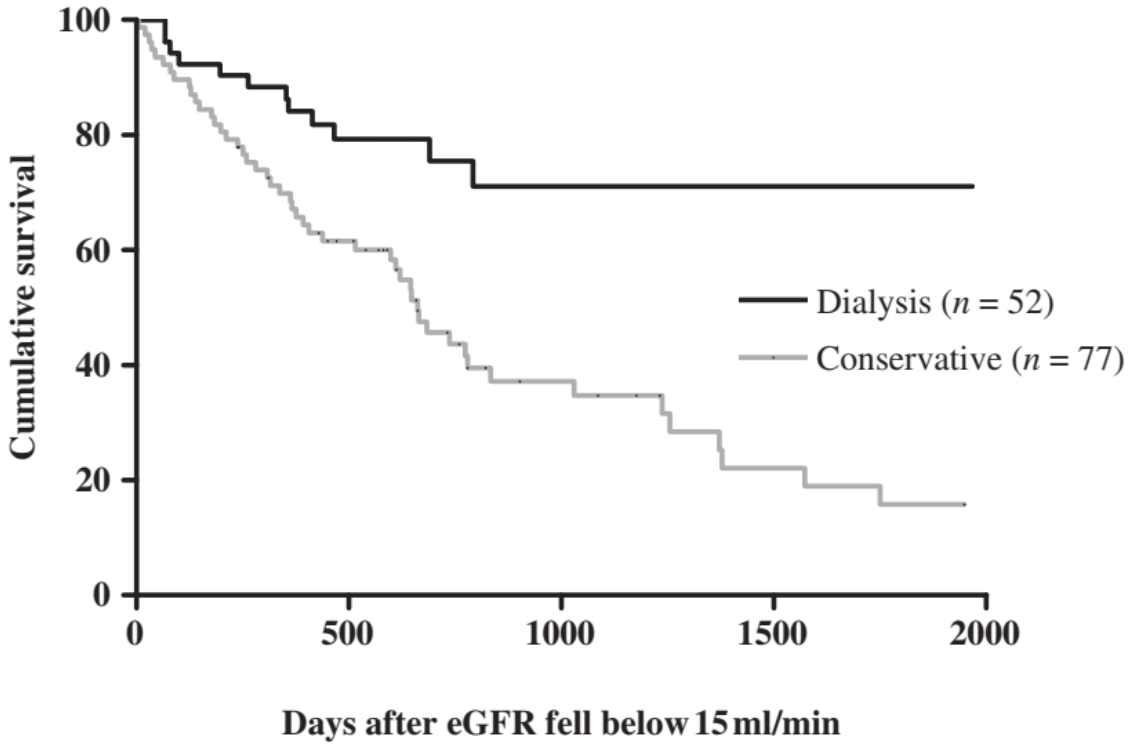
Alternative to dialysis is imminent death"

- AJKD Core Curriculum: Kidney Supportive Care 2020

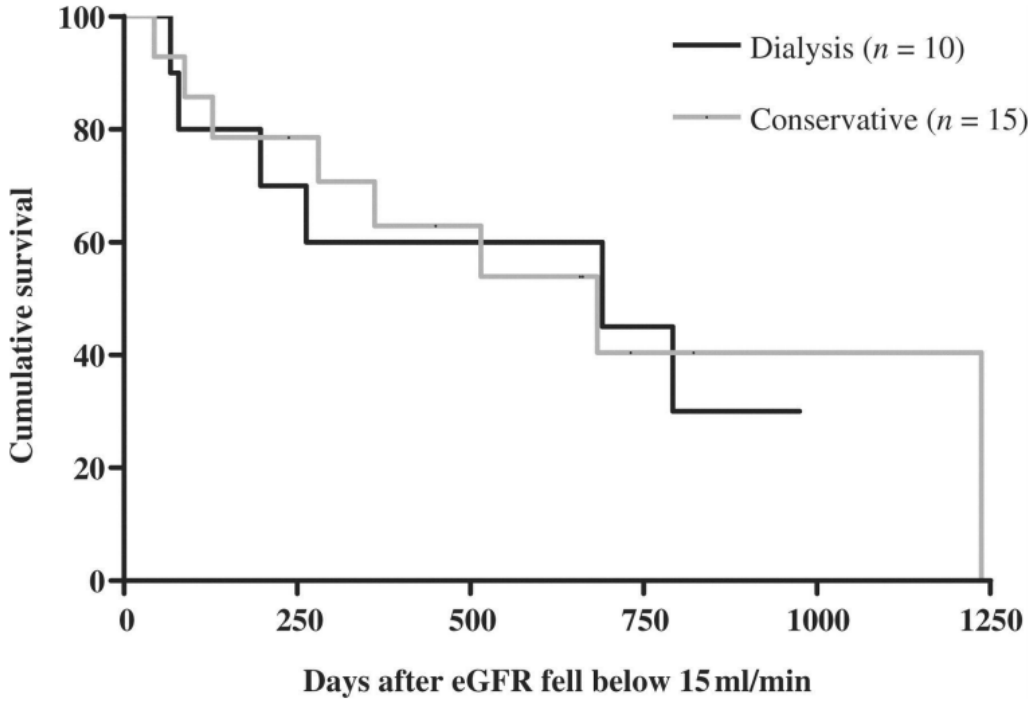
Everyone does NOT benefit from dialysis

Dialysis or not? A comparative survival study of patients over 75 years with chronic kidney disease stage 5

Fliss E. M. Murtagh[1], James E. Marsh[2], Paul Donohoe[3], Nasirul J. Ekbal[4], Neil S. Sheerin[5] and Fiona E. Harris[2]



Kaplan–Meier survival curves for those with high comorbidity (score = 2), comparing dialysis and conservative groups (log rank statistic <0.001, df 1, P = 0.98).



Murtagh F E M et al. Nephrol. Dial. Transplant. 2007;22:1955-1962

Comparison of survival analysis and palliative care involvement in patients aged over 70 years choosing conservative management or renal replacement therapy in advanced chronic kidney disease

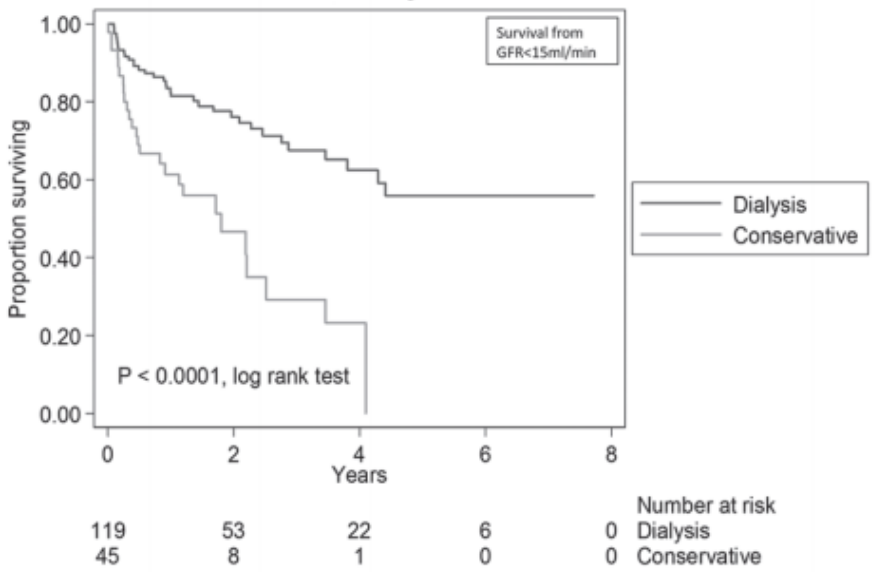
Jamilla A Hussain *Leeds Teaching Hospitals NHS Trust, Leeds, UK*
Andrew Mooney *Renal Unit Leeds Teaching Hospitals NHS Trust, Leeds, UK*
Lynne Russon *Sue Ryder Wheatfields Hospice, Leeds, UK; Leeds Teaching Hospitals NHS Trust, Leeds, UK*

Retrospective study

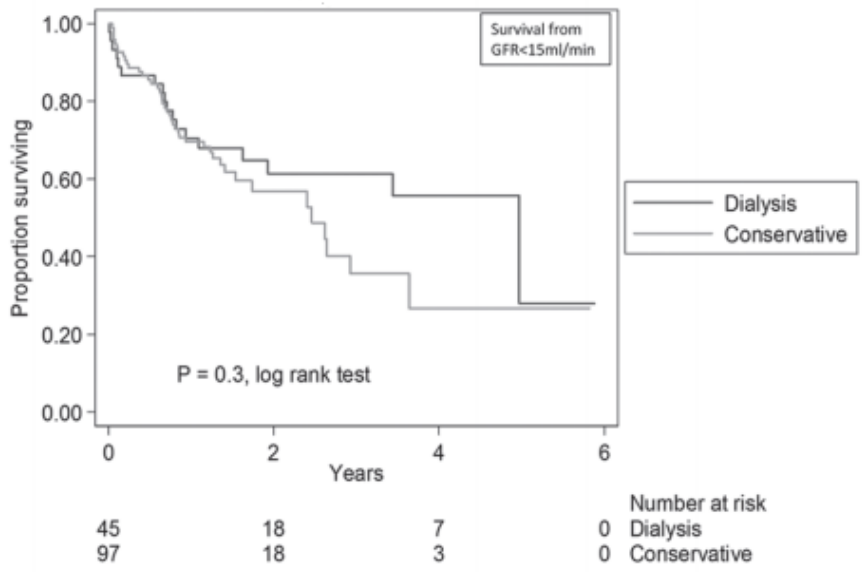
P: patients aged > 70 with Stage 5 CKD
I: 172 conservative
C: 269 RRT
O: survival, hospital admissions

GFR < 15

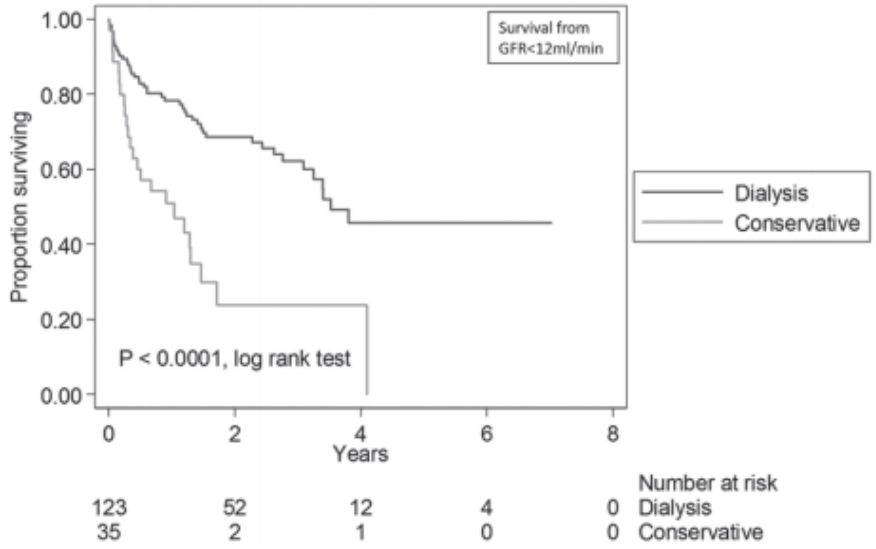
Age < 80

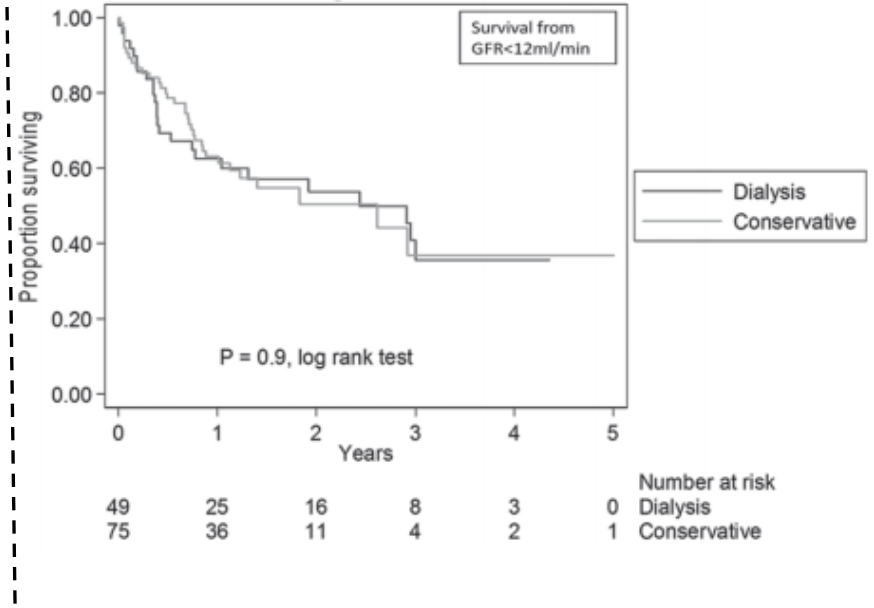


Age 80+



GFR < 12





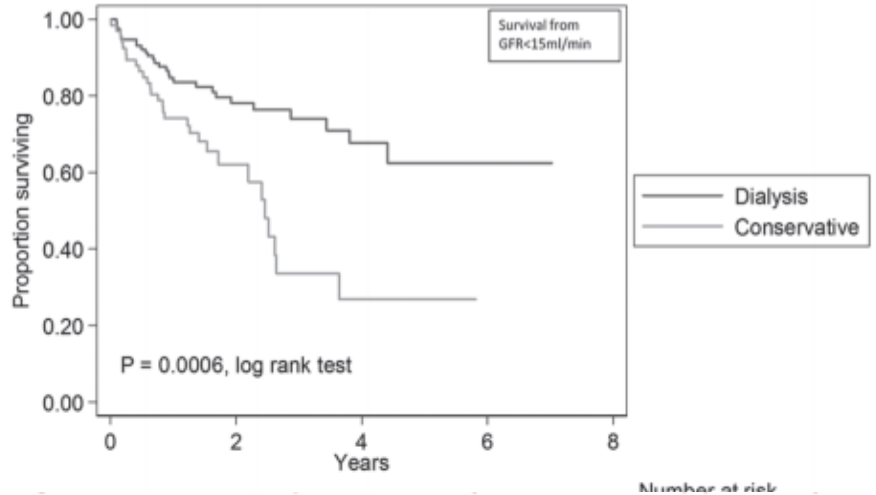
Comparison of survival analysis and palliative care involvement in patients aged over 70 years choosing conservative management or renal replacement therapy in advanced chronic kidney disease

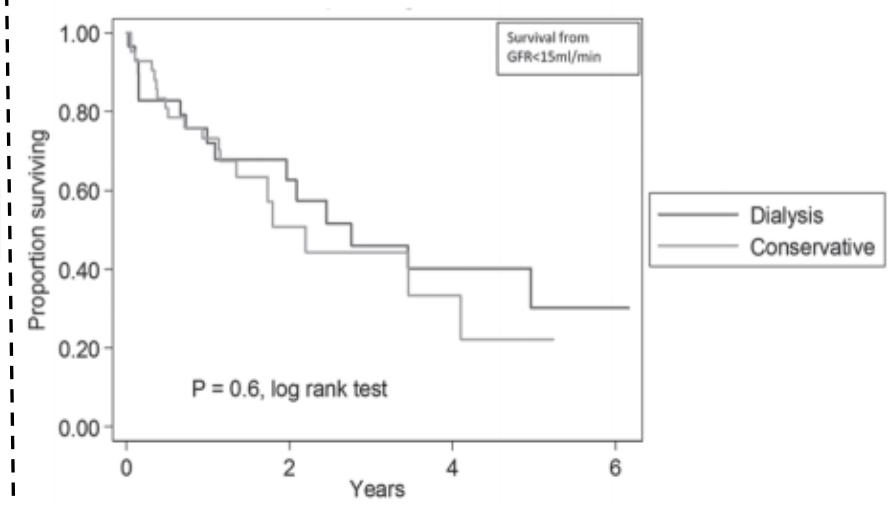
Jamilla A Hussain *Leeds Teaching Hospitals NHS Trust, Leeds, UK*
Andrew Mooney *Renal Unit Leeds Teaching Hospitals NHS Trust, Leeds, UK*
Lynne Russon *Sue Ryder Wheatfields Hospice, Leeds, UK; Leeds Teaching Hospitals NHS Trust, Leeds, UK*

WHO < 3

WHO 3+

GFR < 15





Results: In total, 172 patients chose conservative management and 269 chose renal replacement therapy. The renal replacement therapy group survived for longer when survival was taken from the time estimated glomerular filtration rate <20 mL/min ($p < 0.0001$), <15 mL/min ($p < 0.0001$) and <12 mL/min ($p = 0.002$). When factors influencing survival were stratified for both groups independently, renal replacement therapy failed to show a survival advantage over conservative management, in patients older than 80 years or with a World Health Organization performance score of 3 or more. There was also a significant reduction in the effect of renal replacement therapy on survival in patients with high Charlson's Comorbidity Index scores. The relative risk of an acute hospital admission (renal replacement therapy vs conservative management) was 1.6 ($p < 0.05$; 95% confidence interval = 1.14–2.13). A total of 47% of conservative management patients died in hospital, compared to 69% undergoing renal replacement therapy (Renal Registry data). Seventy-six percent of the conservative management group accessed community palliative care services compared to 0% of renal replacement therapy patients.

Conclusions: For patients aged over 80 years, with a poor performance status or high co-morbidity scores, the survival advantage of renal replacement therapy over conservative management was lost at all levels of disease severity. Those accessing a conservative management pathway had greater access to palliative care services and were less likely to be admitted to or die in hospital.

Years

				Number at risk
123	49	7	0	Dialysis
49	6	1	0	Conservative

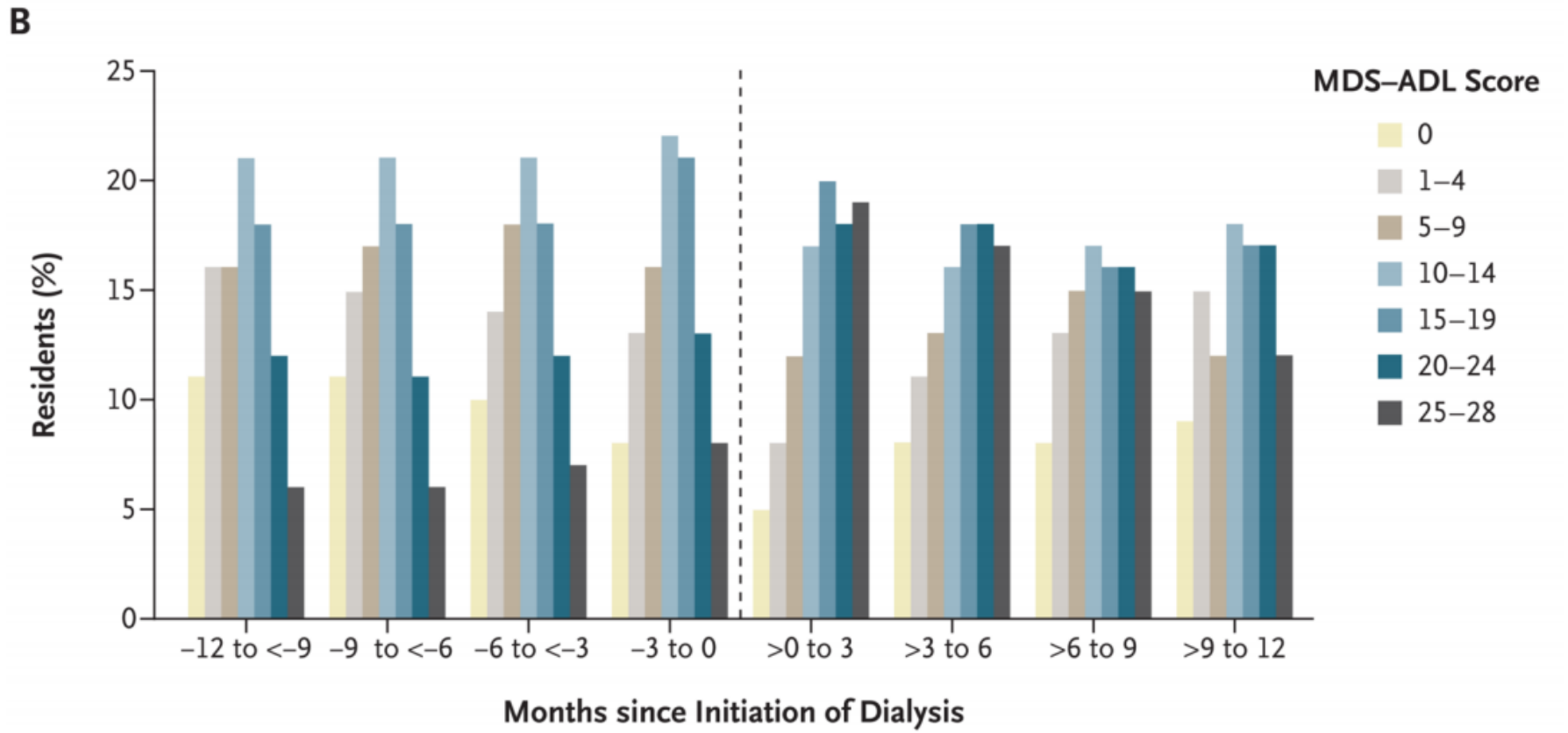
Years

				Number at risk
31	10	3	1	Dialysis
35	6	2	0	Conservative

Dialysis in the NH Population

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.



3702 NH residents in US over 2-year period.

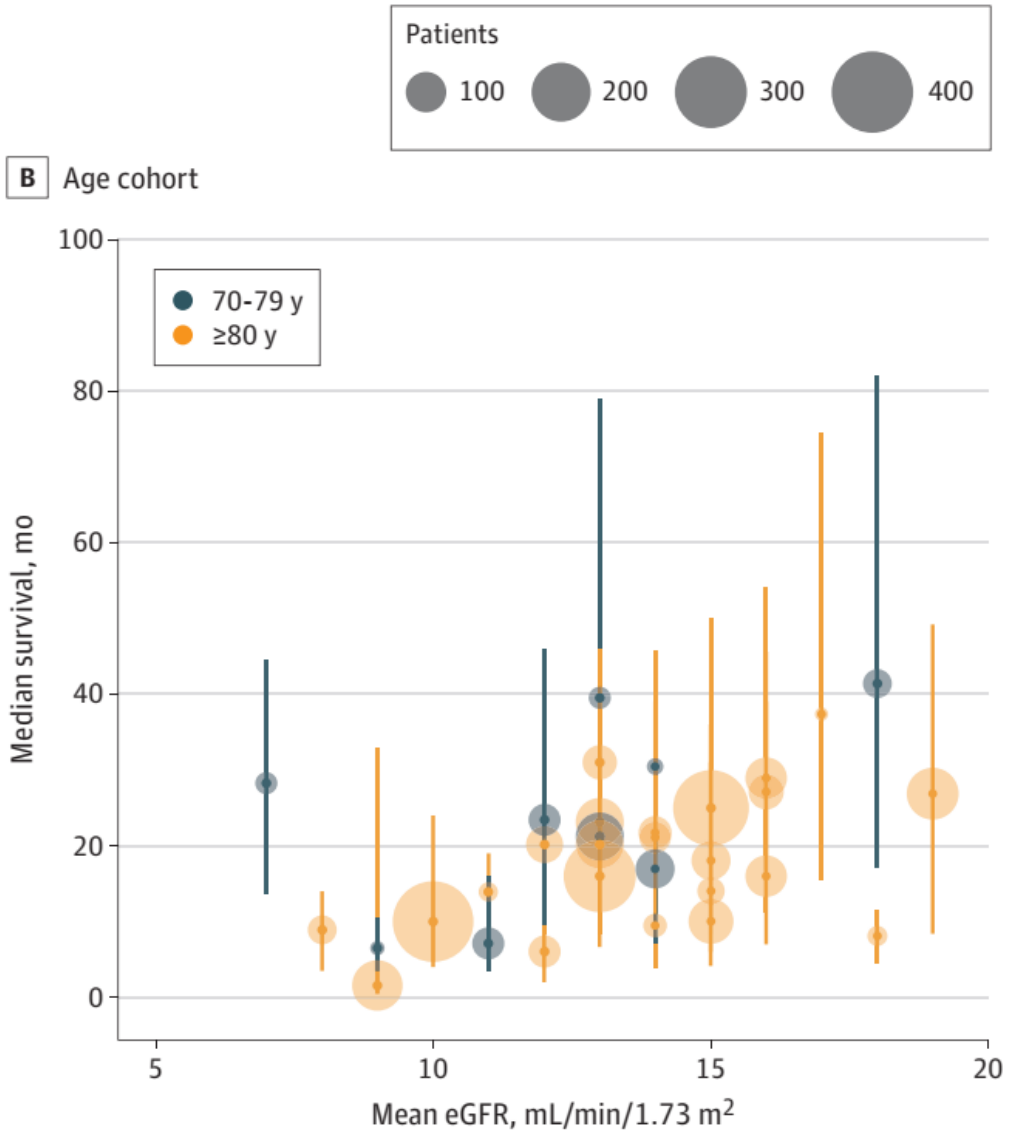
Alternative to dialysis is not imminent death

Original Investigation | Nephrology

Long-term Outcomes Among Patients With Advanced Kidney Disease Who Forgo Maintenance Dialysis
A Systematic Review

Susan P. Y. Wong, MD, MS; Tamara Rubenzik, MD; Leila Zelnick, PhD; Sara N. Davison, MD; Diana Louden, MLib; Taryn Oestreich, MPH, MCHES; Ann L. Jennerich, MD, MS

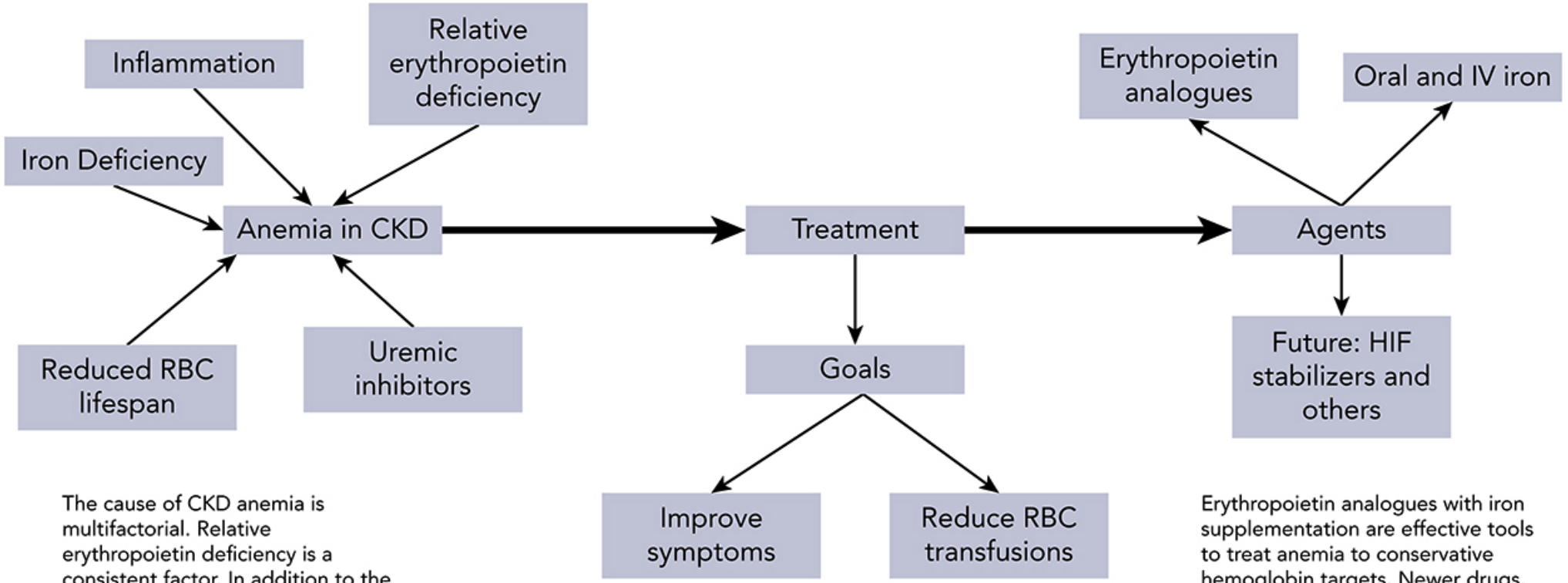
- Systematic review of observational studies (3754 patients) showed a wide range of **median survival from 1 – 41 months**



Anemia management

How I treat renal anemia

Steven Fishbane[1,*] and Daniel W. Coyne[2,*]



The cause of CKD anemia is multifactorial. Relative erythropoietin deficiency is a consistent factor. In addition to the causes listed, other hematologic conditions including occult blood loss should be considered

Anemia can cause uncomfortable symptoms, and treatment has potential to alleviate them. Multiple studies have found a reduction in blood transfusions, which could help to avoid allosensitization, which could block kidney transplantation.

Erythropoietin analogues with iron supplementation are effective tools to treat anemia to conservative hemoglobin targets. Newer drugs, including hypoxia inducible factor stabilizers are in development

Any change in Hgb greater than or equal to 15 g/L, OR if Hgb is less than 85 g/L OR if Hgb is greater than 139 g/L AND on ESA (or ESA on hold) → Notify nephrologist

Hgb less than 95 g/L

Receiving ESA?

NO

Check that the previous iron studies have been appropriately monitored and addressed prior to increasing the dose.

Suggested initial dose: epoetin 50 units/kg/wk or darbepoetin 0.22 mcg/kg/wk. Obtain an order from MD to start anemia protocol.

YES

- Check that the previous iron studies have been appropriately monitored and addressed prior to increasing the dose.
- **If TSAT less than 22%, consider increasing PO iron dosage or prescribing IV iron**

- If no dose increase in the past 5 weeks, **increase ESA dose** as per ESA Dosage Adjustment Tables.
- If dose was increased in past 5 weeks, maintain that dose until next blood work.
- Continue to monitor Hgb at the regular blood work cycle.
- **Notify MD if Hgb is not in target range after 3 consecutive dose increases.** Refer to ESA Hyporesponsiveness Flowchart.

Hgb 95 to 115 g/L and stable

Receiving ESA?

NO

No ESA required. Continue to monitor Hgb at the regular blood work cycle.

YES

Maintain ESA dose and continue to monitor Hgb at the regular bloodwork cycle.

ESA on hold or discontinued because Hgb above target

- **Restart ESA at a reduced dose based on the dose before hold.** Refer to protocol ESA Dosage Adjustment Tables.
- Continue Hgb monitoring at regular blood work cycle.

Hgb greater than 115 g/L

Receiving ESA?

NO

No ESA required. Continue to monitor Hgb at the regular blood work cycle.

YES

Hgb 116 to 125 g/L

- If there has been no dosage reduction in the past 5 weeks, **reduce ESA dosage** as per protocol ESA Dosage Adjustment Tables.
- If there have been dosage reductions in the past 5 weeks, maintain current dose.
- Measure Hgb at the regular blood work cycle.

Hgb greater than 125 g/L

- **Hold ESA**
- Measure Hgb in 2 weeks and reassess Hgb status and ESA dosage.
- If Hgb is greater than 125 g/L after 12 weeks of hold, discontinue ESA - no ESA required.

ESA on hold or discontinued because Hgb above target

Hgb 116 to 125 g/L

If change is greater than 10 g/L from last hemoglobin, then **resume ESA at reduced dose.** Refer to protocol ESA Dosage Adjustment Tables.

Continue to monitor Hgb at the regular bloodwork cycle.

If change is less than or equal to 10 g/L from last hemoglobin, then **continue to hold ESA**.

BCRenal
Provincial Health Services Authority

TSAT <u>less than 22%</u>
REPLENISH IRON STORES

If patient is currently not receiving iron therapy:

- **Contact MD to start ferrous fumarate (e.g. 300 mg po HS)**
- If TSAT less than 10%, order ferrous fumarate 300 mg po HS x 1 week, then 600 mg po HS

If patient is currently receiving oral iron therapy:

- Assess iron compliance and proper administration (empty stomach)
- Increase ferrous fumarate by 300 mg/day as tolerated (max. 900 mg/day)

Notify MD if iron parameters remain low after 3 consecutive blood work cycles.

If oral iron is ineffective or patient is intolerant, consider giving IV iron.

Measure TSAT and ferritin with Q3 or 4 months bloodwork cycle and reassess iron dosage regimen.

TSAT 22% to 49%
MAINTAIN IRON STORES

If receiving PO iron:
Continue current maintenance dose

If PO iron is currently on hold due to iron overload:
Consider restarting ferrous fumarate at half the previous dose. Ferrous sulfate and ferrous gluconate could also be considered.

Measure TSAT and ferritin in 6-12 weeks as per local program policy and reassess iron dosage regimen.

TSAT greater than or equal to 50%
POSSIBLE IRON OVERLOAD

HOLD IRON

Measure TSAT and ferritin at next routine blood work cycle and reassess iron dosage regimen.

Note: Notify MD if iron indices remain high for 3 consecutive blood work cycles.

<u>If patient is unable to tolerate or adhere to oral iron regimen:</u>
Schedule IV iron as per nephrologist's prescription.
Measure TSAT and ferritin in 12 weeks (and at least 1 week after last IV iron dose) and reassess.

<u>Usual maximum single doses tolerated of common agents:</u>

- Iron sucrose 200-300 mg over 2-3 hours as per local practice & policy
- Iron isomaltoside (Monoferric) 500-1000 mg IV (infusion time varies)
- Sodium ferric gluconate (Ferrlecit®) 125mg IV over 1 hour

*** If iron blood work appears unusual compared to previous results (e.g. replacement of iron stores, TSAT goes from less than 25% to greater than 49%) repeat the blood work before initiating next action.

IV iron benefits

Controversies in optimal anemia management: conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Conference

Jodie L. Babitt[1], Michele F. Eisenga[2], Volker H. Haase[3,4,5], Abhijit V. Kshirsagar[6], Adeera Levin[7], Francesco Locatelli[8], Jolanta Małyszko[9], Dorine W. Swinkels[10], Der-Cherng Tarng[11], Michael Cheung[12], Michel Jadoul[13], Wolfgang C. Winkelmayer[14] and Tilman B. Drüeke[15,16]; for Conference Participants[17]

	Patients with CKD not on dialysis	Patients on dialysis
Reduction of congestive heart failure	Limited[60,61]	Yes[62]
Reduced occurrence of myocardial infarction	Limited[63]	Yes[62]
Improved quality of life	Not studied	Limited[64]
Reduced occurrence of fatigue	Not studied	Limited[64]
Improved cognitive function	Not studied	Limited[64]
ESA dose reduction	Yes[65]	Yes[65]
Reduced blood transfusions	Not studied	Yes[62]

CKD, chronic kidney disease; ESA, erythropoiesis-stimulating agents; RCT, randomized controlled trial.

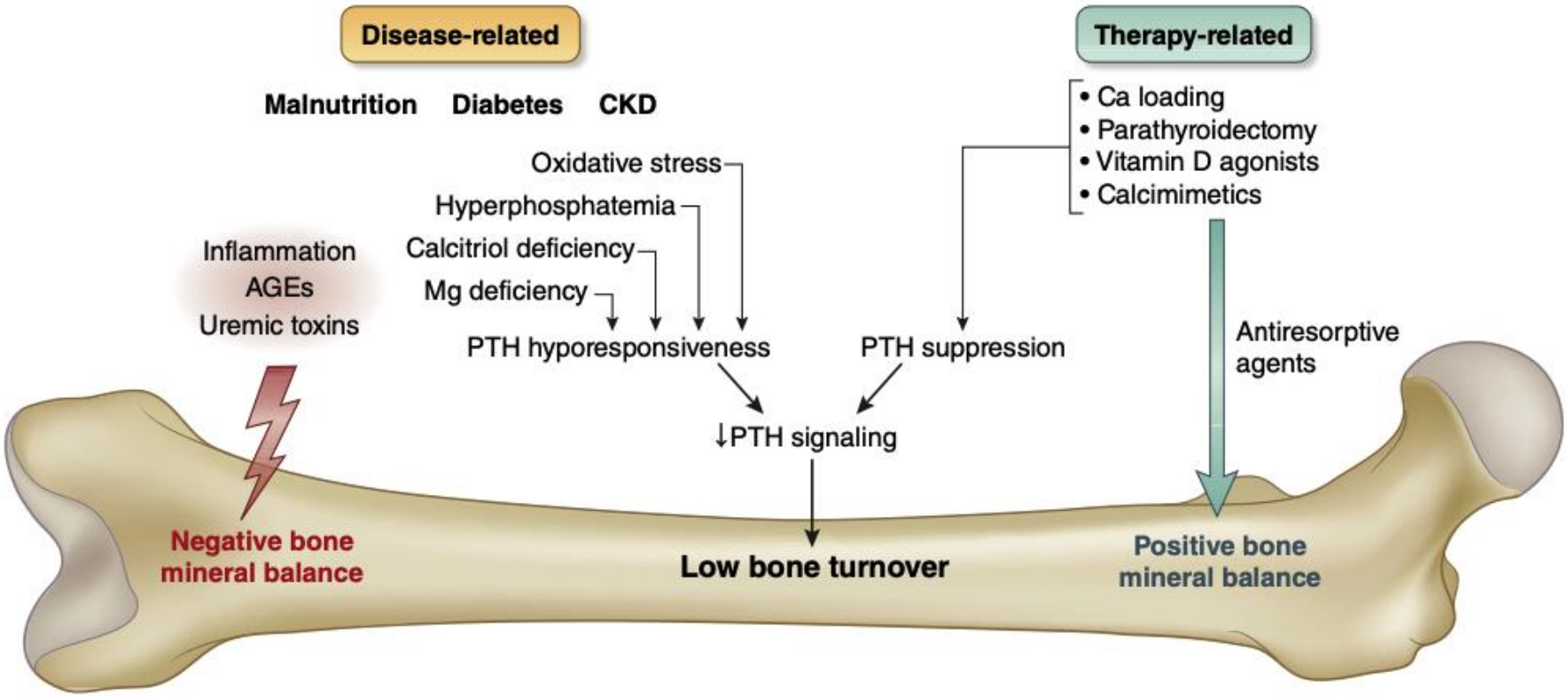
Limited: data from retrospective, observational studies. Yes: supported by RCT data.

IV iron evidence of harm

	Patients with CKD not on dialysis	Patients on dialysis
Infections	Limited[78,79]	No[80,81]
Cardiovascular events	Limited[78,79,82]	No[62]
Diabetes	Limited[83]	Limited[83]
CKD progression	Limited[78,79]	Not applicable
Anaphylaxis	Minimal[84]	Minimal[84]

CKD, chronic kidney disease; i.v., intravenous; RCT, randomized controlled trial.
No: supported by RCT data. Limited: data from retrospective, observational trials only. Minimal: overall minimal risk for contemporary i.v. iron formulations.

Bone mineral disease



Bone mineral disease

	Bisphosphonates	Denosumab
Pros	Improves BMD in all CKD stages	Improves BMD in all CKD stages
	Oral or i.v. dose (can be administered during dialysis)	Subcutaneous dosing every 6 mo
	Low risk of severe hypocalcemia	Continued effectiveness for at least 10 yr (in patients without CKD)
	Can be stopped after limited treatment time	
Cons	Risk of kidney damage in CKD 4–5	Risk of severe hypocalcemia
	Wear out after several years	Risk of fractures if stopped
	Osteonecrosis of the jaw	Osteonecrosis of the jaw
	Atypical femoral fractures	Atypical femoral fractures
	Acute phase reaction (i.v. bisphosphonates only)	Risk of infections
	Esophagitis	
	Uveitis	
	Atrial fibrillation	

Differentiating the causes of adynamic bone in advanced chronic kidney disease informs osteoporosis treatment

Mathias Haarhaus[1,2] and Pieter Evenepoel[3]; on behalf of the European Renal Osteodystrophy (EUROD) workgroup, an initiative of the Chronic Kidney Disease Mineral and Bone Disorder (CKD-MBD) working group of the European Renal Association–European Dialysis and Transplant Association (ERA-EDTA)

Treatment related

Ca load – dialysate/ supplements
Vitamin D agonists
Calcimimetics
Aluminum load
Bisphosphonates
Parathyroidectomy

PTH release

CKD related

Hyperphosphatemia
Calcitirol deficiency
Magnesium deficiency
Metabolic acidosis
Oxidative stress
Uremic toxins

PTH resistance

Malnutrition
Diabetes
Increased age

Inflammation ↑ TNF α
AGEs
↓ WNT/β catenin signal
Hypogonadism

Low Bone Turnover

Clinical features

Hypercalcemia

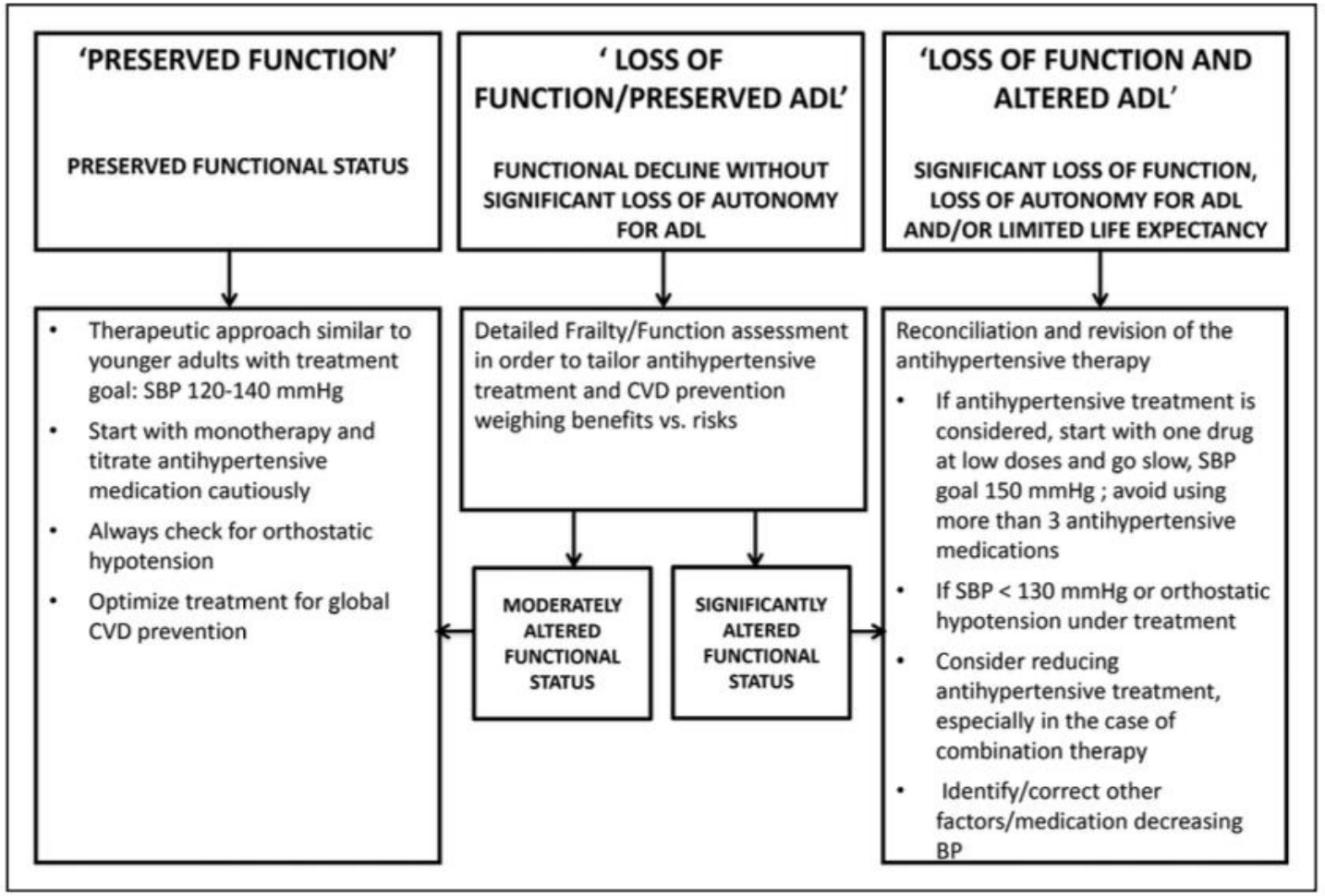
Bone pains

Fracture risk

Vascular calcifications

Blood pressure management

- What are the goals?
- What are the risks to my patient specifically?
- Evidence?



Hypertension Management in Older and Frail Older Patients

Athanase Benetos, Mirko Petrovic, Timo Strandberg

Drug Class	Most Common Adverse Effects	Special Precautions/Considerations in Old Individuals
CCB Dihydropyridine CCB Non dihydropyridine CCB	Signs related to sympathetic activation (flushing, headache, tachycardia) are less frequent than in younger subjects. Lower limb edema (frequent since many other factors for LLE). Bradycardia, AV block, worsening heart failure, constipation (verapamil), fatigue, dyspnea.	LLE, which is relatively frequent with these drugs, can be erroneously interpreted as a clinical sign of heart failure. In addition, LLE can contribute to the decrease in social and physical activities for practical reasons (difficulties in walking with shoes). Second-line selection; diltiazem can also cause LLE. With verapamil, LLE is unusual, but constipation may be a major problem in very old individuals, as it can lead to fecal impaction, with nausea, anorexia, delirium, and functional decline. Never combine verapamil with β-blockers.
Diuretics Thiazide Loop diuretic	Hyponatremia, hypokalemia, hyperuricemia and gout attacks, hypotension, dehydration. Similar to Thiazides	For both thiazide and loop diuretics: Diuretic should be titrated according to the patient's volemic status. The latter may be difficult to assess in very old and frail individuals. Creatinine and electrolyte monitoring is warranted after each dose change. Association with SSRI antidepressants increases the risk of severe hyponatremia. Risk of aggravation of urine incontinence. For this reason, diuretics may have an impact on the social life of the patient and can contribute to his/her isolation. Other patients often do not take their treatment if they want to have outdoor activities. Thiazide-like indapamide has been tested in the only RCT specific for subjects >80 y. Small doses (up to 25 mg of HCTZ or equivalent) are safe and well tolerated. Loop diuretics are not indicated for hypertension unless there is severe renal insufficiency (estimated creatinine clearance <30 mL/[min·1.73 m^2]). In the presence of both hypertension and heart failure, loop diuretics can be used for both diseases, either alone or in combination with thiazides.
ACE inhibitors	Dry cough, hyperkalemia, rash, angioedema, dizziness, fatigue, acute renal failure	ACE inhibitors have been tested in the only RCT specific for subjects >80 y. Avoid if you suspect dehydration, do not simultaneously increase diuretics to avoid a worsening in renal function. Regular control of creatinine and potassium levels.

Drug Class	Most Common Adverse Effects	Special Precautions/Considerations in Old Individuals
Angiotensin II receptor antagonists	Hyperkalemia, rash, dizziness, fatigue, acute renal failure	The same as for ACE inhibitors: Do not combine ARB with ACE inhibitor or renin inhibitor. Be cautious with aldosterone antagonist because of increased risk of hyperkalemia.
β- adrenoreceptor antagonists (β-blockers)	Bradycardia, cardiac decompensation, peripheral vasoconstriction, bronchospasm, fatigue, depression, dizziness, confusion, hypoglycemia	Fatigue, which is multifactorial in older subjects, can be accentuated. Nightmares, sleep disturbances, depression, and confusion may be present especially for the β-blockers crossing the blood brain barrier. Cardiac conduction problems can also be aggravated. Caution when used in combination with acetylcholinesterase inhibitors (for Alzheimer disease): risk of major bradycardia.
Aldosterone antagonists	Hyperkalemia, hyponatremia, and gastrointestinal disturbances, including cramps and diarrhea, gynecomastia	Aldosterone antagonist should not be given in instances of severe renal insufficiency, estimated creatinine clearance <30 mL/(min·1.73 m^2) or hyperkalemia. Creatinine and electrolyte monitoring is warranted after each dose change.
α-adrenoreceptor antagonists (α-blockers)	Dizziness, fatigue, nausea, urinary incontinence, orthostatic hypotension, syncope	Usually not indicated. Risk of hypotension (orthostatic, postprandial) and syncope.
Central α-adrenoreceptor agonists	Drowsiness, dry mouth, dizziness, constipation, depression, anxiety, fatigue, urinary retention or incontinence, orthostatic hypotension, confusion, and delirium	High risk of delirium and confusion. Depression, which is atypical and frequent in older subjects (and tricky to diagnose vs cognitive disorders), can be aggravated.

Electrolytes and acid base

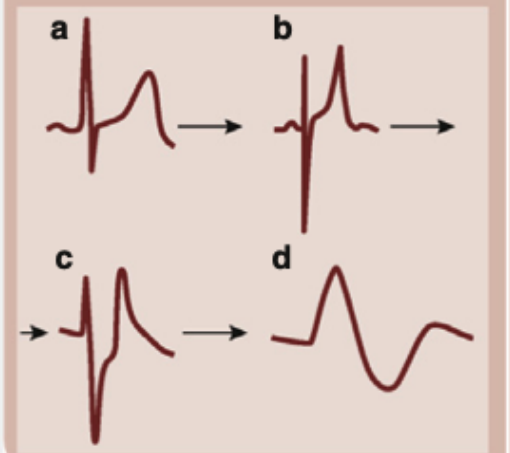
ECG changes	5.0*–5.9	6.0–6.4	≥6.5
+	Moderate	Severe	Severe
–	Mild	Moderate	

Potassium concentration (mmol/l)

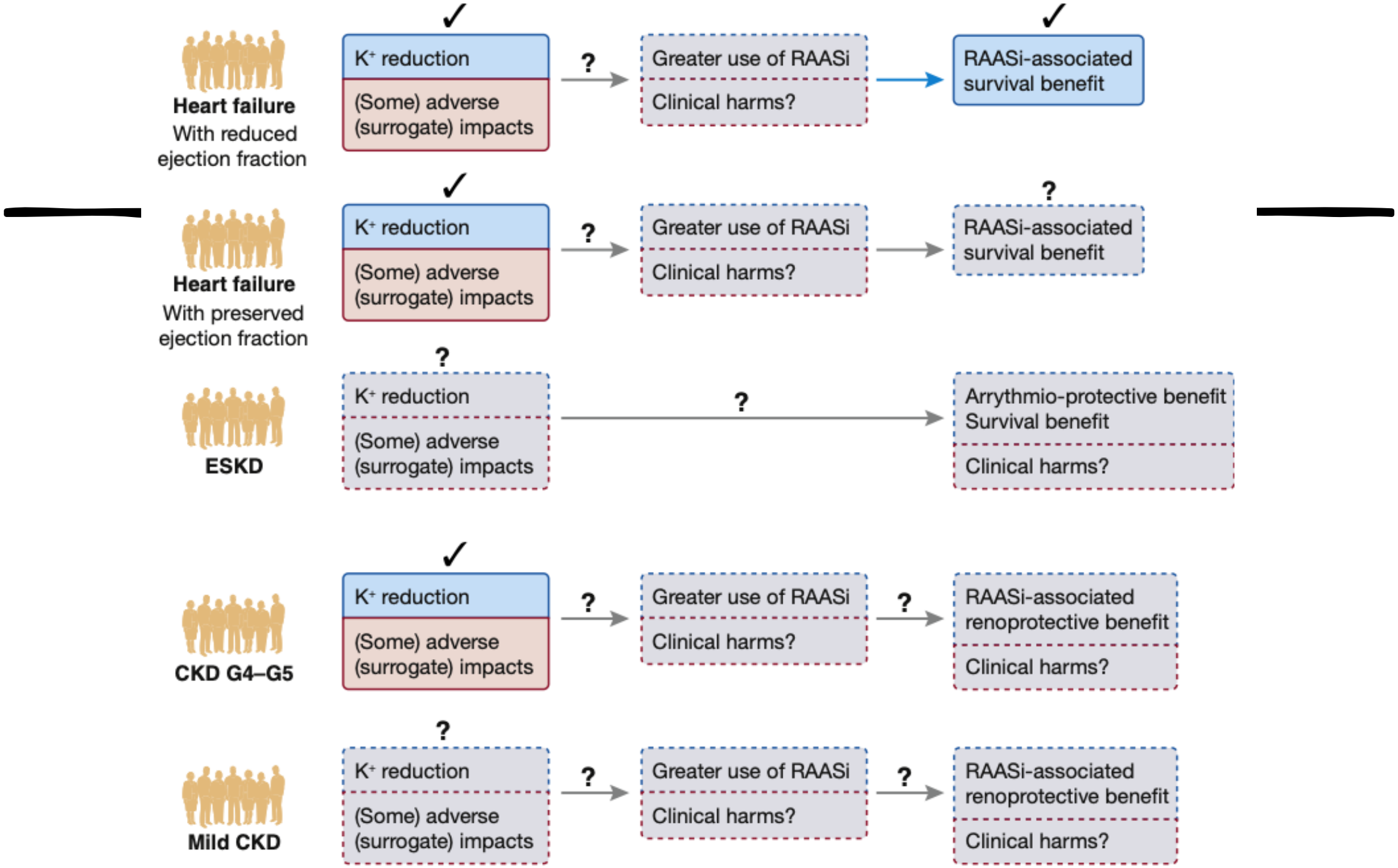
Potassium homeostasis and management of dyskalemia in kidney diseases: conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Controversies Conference

OPEN

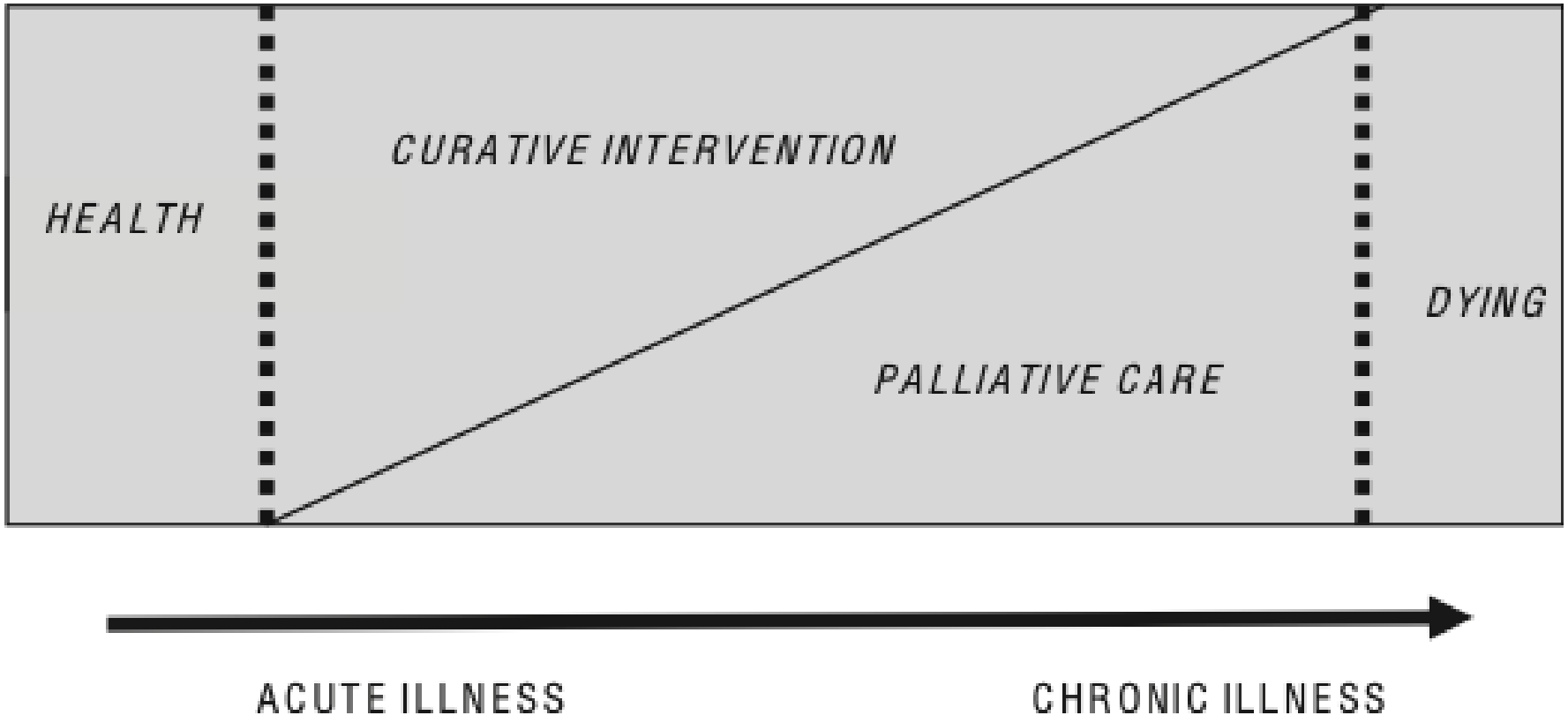
Catherine M. Clase[1,2], Juan-Jesus Carrero[3], David H. Ellison[4], Morgan E. Grams[5,6], Brenda R. Hemmelgarn[7,8], Meg J. Jardine[9,10], Csaba P. Kovesdy[11,12], Gregory A. Kline[13], Gregor Lindner[14], Gregorio T. Obrador[15], Biff F. Palmer[16], Michael Cheung[17], David C. Wheeler[18], Wolfgang C. Winkelmayer[19] and Roberto Pecoits-Filho[20,21]; for Conference Participants[22]

Serum potassium	Expected ECG abnormality
5.5–6.5 mmol/l	Tall, "peaked" T waves with narrow base, best seen in precordial leads
6.5–8.0 mmol/l	Peaked T waves Prolonged PR interval Decrease amplitude of P waves Widening of QRS complex
>8.0 mmol/l 	Absence of T wave Intraventricular blocks, fascicular blocks, bundle branch blocks, QRS axis shift Progressive widening of QRS resulting in bizarre morphology "Sine wave" patterns (sinoventricular rhythm), VF, asystole

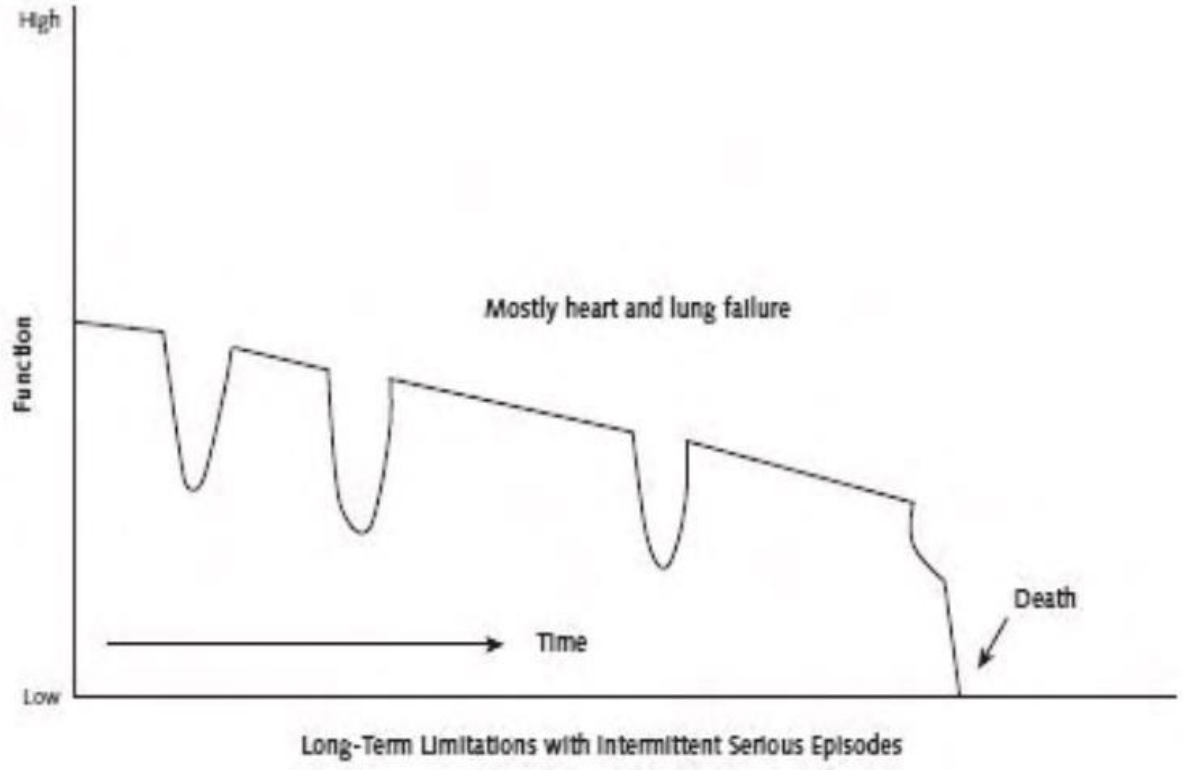
Strategy	Comment
Dietary potassium restriction	• Reliant on lifestyle change • Uncertainty on degree and reliability of response • Poor evidence base to support the practice • Financial cost of special diets • Practical issues in implementation • Potential for harm because of impact of diet on intake of other beneficial nutrients, healthy dietary pattern • Potential for harm through loss of enjoyment in food and impact on social activities
Permissive approach (no additions or changes to management despite awareness of hyperkalemia)	• The extent of practice poorly documented • Potentially could be tested in randomized trials given the uncertainty on benefits and harms of approaches based on tolerance of different potassium thresholds
Discontinuation of medications elevating potassium (e.g., RAAS inhibitors)	• Common strategy • Effect on outcomes unknown[168,204]
Use of potassium-wasting diuretics	• Dependent on kidney function; RCT evidence of no impact on potassium concentrations in people on PD with residual kidney function[213]; small pre-post studies suggest that metolazone but not thiazides may be kaliuretic in patients with GFR <20 ml/min per 1.73 m^2 [214,215] • Degree and predictability of response uncertain • Clearest role when diuresis or an additional antihypertensive agent is also a desired effect • In between-study comparisons, high-dose furosemide was more kaliuretic than metolazone in patients with GFR <20 ml/min per 1.73 m^2 [214,216]
Mineralocorticoid agonists	• Dependent on kidney function • Weak (small observational studies and clinical trials) and inconsistent data about efficacy[217,218] • Possibly harmful, given the hypothesis that mineralocorticoid antagonism may reduce CV outcomes in ESKD
Gastrointestinal potassium wasting	• Potential management option • Scant evidence • One small pre-post study[219] found that increasing the number of stools from 1 to 2–4 per day with laxatives lowered potassium from mean 5.9 ± 0.2 to 5.5 ± 0.2 mmol/l without inducing diarrhea
Correction of coincident acidosis	• No evidence
Use of low potassium dialysate	• Observational evidence of increased risk of mortality, arrhythmias and emergency department visits at dialysate potassium concentration <2 mmol/l and with higher serum-dialysate gradients (see text)
Older potassium binder: SPS	• Concern about rare but serious adverse gastrointestinal effects from postmarketing studies • FDA warning in 2009 against use with sorbitol[220] • Use only in patients with normal bowel function • Limited randomized evidence for efficacy • Binds other medications; other oral medications to be taken at least 3 h before or 3 h after SPS, 6 hours in patients with gastroparesis[221]
Newer potassium binders: patiromer, zirconium cyclosilicate	• Evidence for efficacy in reducing hyperkalemia incidence of up to 12 mo • Evidence of adverse effects for exposure of up to 12 mo • Lack of large-scale postmarketing studies • Patiromer binds other medications; other oral medications to be taken at least 3 h before or 3 h after patiromer[222] • Zirconium cyclosilicate affects the absorption of drugs whose bioavailability is dependent on gastric pH[a]; these oral medications should be taken at least 2 h before or 2 h after zirconium cyclosilicate[223]


Heart failure
With reduced ejection fraction
✓
K⁺ reduction
(Some) adverse (surrogate) impacts
?
Greater use of RAASi
Clinical harms?
✓
RAASi-associated survival benefit
Heart failure
With preserved ejection fraction
✓
K⁺ reduction
(Some) adverse (surrogate) impacts
?
Greater use of RAASi
Clinical harms?
?
RAASi-associated survival benefit
ESKD
?
K⁺ reduction
(Some) adverse (surrogate) impacts
?
Arrythmio-protective benefit
Survival benefit
Clinical harms?
CKD G4–G5
✓
K⁺ reduction
(Some) adverse (surrogate) impacts
?
Greater use of RAASi
Clinical harms?
?
RAASi-associated renoprotective benefit
Clinical harms?
Mild CKD
?
K⁺ reduction
(Some) adverse (surrogate) impacts
?
Greater use of RAASi
Clinical harms?
?
RAASi-associated renoprotective benefit
Clinical harms?

Goals of care



Goals of care



Characterized by:

- functional decline months to years

- episodes of acute (serious) complications

- 1 year probability death .24 /hospitalization .66 general dialysis population[19]

- 1 year mortality rate 46% octogenarians and nonagenarians starting dialysis [20]

- un-certain course for individual dialysis patient

Goals of care

Table 4. Survival of octogenarians and nonagenarians starting dialysis[20]

	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 method[36] for analysis of a ethical problem in clinical medicine adapted to the geriatric patient with CKD/ESRD

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

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

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

De-prescribing

Review Article

Kidney360

Less is More: Deprescribing Medications in Older Adults with Kidney Disease: A Review

Dinushika Mohottige,[1,2] Harold J. Manley,[3] and Rasheeda K. Hall [1,2]

L	List	Create accurate medication list (medication reconciliation)
E	Evaluate	Review each medication to identify target medications for deprescribing: Medications that are not indicated for the patient Medications that carry greater risk of harm than benefit for the patient Medications that have questionable efficacy for the patient
S	Shared Decision-Making	Discuss with patient (and caregiver or other prescribers if indicated): Information: risk, benefit, and alternative medications Patient concerns about deprescribing Goals of Care
S	Support	Support patient in implementation of deprescribing: Provide clear instructions to patient Close communication plan to monitor for intolerance to deprescribing Notify pharmacy and other clinicians about medication change(s)

Table 1. Deprescribing principles and examples of medications to deprescribe in older adults with kidney disease[a]

Deprescribing Principle	Medication	Considerations in Nondialysis Patients	Considerations in Dialysis
Deprescribe medication with risk exceeds desired benefit	First generation sulfonylurea - glyburide	No specific restrictions	Avoid due to higher risk of hypoglycemic events compared with other antiglycemic agents (88,89)
	Dabigatran	No specific data (90)	bleed risk increases with GFR decline; safer agent available (apixaban) (91,92)
	Metformin	Discontinue use of metformin as it is excreted by the kidneys, and accumulation with reduced kidney function may increase risk of lactic acidosis (88) when eGFR is <30 per Food and Drug Administration standards (93)	Contraindicated in dialysis
	Baclofen and other muscle relaxants (*e.g.*, dantrolene, metaxalone, carisoprodol, chlorzoxazone, cyclobenzaprine, methocarbamol, tizanidine, or orphenadrine)	Baclofen use is associated with encephalopathy among older adults with CKD at high doses (≥20 mg per day) (94) In older adults with CKD (eGFR <60), baclofen prescriptions at ≥20 mg per day were associated with higher risk of fall-related hospitalization and hypotension (vs <20 mg/day) (95)	Muscle relaxant use is common in patients with ESKD on hemodialysis and associated with encephalopathy and falls (96) Baclofen should be avoided in individuals on dialysis because of the risk of hospitalization and encephalopathy (97)
	Opiate (*e.g.*, hydrocodone, oxycodone, tramadol, codeine, hydromorphone, fentanyl, methadone, meperidine, and morphine)	Among individuals on hemodialysis, all opiate agents were associated with a significantly higher hazard of altered mental status. Several agents were associated with a higher hazard of falls, and fracture in a dose-dependent manner, and risks were present even at lower dosing and for agents recommended for use in dialysis (98)	Opiate use was associated with 50% GFR reduction and kidney failure/ hospitalization and prekidney failure death vs nonsteroidal anti-inflammatory drugs among individuals with CKD (99)

Deprescribing Principle	Medication	Considerations in Nondialysis Patients	Considerations in Dialysis
	Pregabalin and gabapentin	Data unavailable except for limited data showing effective use for chronic uremic pruritis (100)	Among individuals with ESKD on hemodialysis, gabapentin was associated with higher hazards of altered mental status, fall, and fracture, respectively, in the highest dose category; pregabalin was associated with up to 51% and 68% higher hazards of altered mental status and fall, respectively (101)
	Benzodiazepines	Limited data available	Codispensing opioids and short-acting benz odiazepines is common among individuals on dialysis and associated with a higher risk of death (102)
	Sedative hypnotics (zolpidem)	Limited data available	Individuals initiating zolpidem had an increased risk of fall related fractures vs trazodone among individuals on maintenance hemodialysis (103)

Determinant	Key Components of Assessment	Example
Clinical	Assess the complex comorbid conditions affecting a patient, the risks/benefits of medications used to treat each of these, and the adverse drug events exacerbated by specific agents. Identify medication benefits vs harms and expected time to benefit in the context of diagnosis, and symptom management goals (*e.g.*, decreasing pruritis). Prescribing cascades (*e.g.*, proton pump inhibitor for aspirin use) should also be noted along with medications that have equivocal evidence for benefit including preventive agents such as statins etc. Finally, available alternatives should be discussed.	Understand the role of each medication and assess its use in the context of patient circumstances, *e.g.*, diuretics in an anuric patient.
Psychologic	Determine anxiety/worry about medications or conditions that affect deprescribing and assess perceptions and/or knowledge regarding treatments (*e.g.*, perceptions of a need for intensive glucose or BP control, or intensive phosphate control). Any anxieties or distress that arises from possible discontinuation of certain medications should be addressed, and patient-identified prioritization of treatment goals. This includes an understanding of health literacy, cognitive function, goals of care (*e.g.*, relief of symptoms, overall function), decisional self-efficacy etc.	Prioritizing volume management and dyspnea reduction over phosphate control; exploring anxieties regarding stroke and other cardiovascular event concerns in individuals with nonindicated long-term anticoagulant use.
Social	Assess caregiver and other loved ones' effect on medication decision making, which may manifest as gatekeeping (e.*g.*, concerns by family members regarding discontinuation of certain medications); assess other social support concerns and other social responsibilities (e.*g.*, caring for another family member), which may limit time and opportunities for self-care. Family and other loved ones may need to serve as partners in deprescribing plans, while centering patient values and priorities in this process.	Concerns among caregivers that deprescribing agents such as sleep aids etc. will increase their caregiving needs.
Financial	Carefully assess costs of medications in the context of health insurance coverage and access including out of pocket costs for nonprescription medications are important provide reassurance that deprescribing should not be driven exclusively by cost-reduction incentives.	Consider when Tums could be safely substituted for more expensive phosphorous binders.
Physical	Assess frailty, changes in dexterity, vision, cognition, and the challenge of taking certain medications (*e.g.*, those more complex to administer including injectables) is an important consideration among older adults. This also may include considerations of how changes in dexterity or memory may impair the ability to adhere to medications before and after dialysis or meals.	Considering prepackaged medications for each day of week.

Symptom care

An approach to treating older adults with chronic kidney disease

Asad Ali Merchant MD MScCH, Erick Ling MD PhD

Cite as: *CMAJ* 2023 May 1;195:E612-8. doi: 10.1503/cmaj.221427

Table 3: Suggestions for management of symptoms related to chronic kidney disease in older adults

Symptoms	Management
Fatigue	Optimize anemia management. Optimize cardiac function and ensure adequate diuretic doses. Consider dose reduction of β-blockers. Consider an exercise program.[43] Optimize nutrition.
Dyspnea	Restrict salt and fluid consumption. Consider volume overload. Higher doses of furosemide may be required as GFR drops. Optimize anemia management.
Pain	Avoid oral NSAIDs. Topical agents may be used with caution. Acetaminophen may have limited efficacy. Neuropathic agents such as gabapentinoids (start gabapentin at 100 mg orally daily). Monitor for fall risk. Opioids may be used for unremitting pain. Hydromorphone is the preferred opioid (start with 0.5 to 1 mg orally every 4–6 h, as necessary). There is limited evidence for cannabinoid use in CKD.
Nausea	Treat constipation. Large meals and strong smells may be triggering. Metoclopramide (2.5 mg orally every 4 h, as necessary) and ondansetron (4–8 mg orally every 8 h, as necessary).[43] Atypical antipsychotics such as olanzapine (2.5 mg orally every 4 h, as necessary) or low-dose haloperidol (0.5 mg orally every 4 h, as necessary) can be beneficial.[43]

Symptoms	Management
Pruritus	Thick emollients should be first line for symptomatic relief. Patients should avoid hot showers or baths as they may exacerbate dryness of skin. Topical agents include camphor and menthol-based compounds and low-potency steroids. Capsaicin-based creams may be effective. Gabapentinoids and SSRIs at low doses may be helpful. Antihistamines should be avoided, but hydroxyzine may be used with caution (10 mg twice per day, as necessary). Ultraviolet-B therapy may be used (poor evidence).[43]
Sleep disturbance	Nonpharmacologic therapies include exercise, reducing caffeine and limiting fluid intake in the evening. Diuretics should be dosed earlier in the day (e.g., second dose of furosemide no later than 2 pm). Treat benign prostatic hyperplasia where applicable. Treat pain, restless leg syndrome and pruritus. Consider melatonin (initiate at 3 mg at night) and mirtazapine (initiate at 3.75 mg to 7.5 mg at night).
Restless leg syndrome or cramping or both	Manage modifiable factors such as iron deficiency and use of antidepressants and dopamine antagonists.[43] Low-dose magnesium supplementation may be beneficial. Gabapentinoids (start gabapentin 100 mg orally at night and titrate up). Consider dopamine agonists such as pramipexole (0.125–0.25 mg orally three times daily, as necessary) or ropinirole (starting dose 0.25 mg/d).[43]
Depression	Manage contributing symptoms (e.g., pain, insomnia, pruritus).[43] Optimize social supports. Nonpharmacologic interventions include cognitive behaviour therapy and exercise.[43] Dose-adjusted antidepressants such as mirtazapine may be effective.