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CVD Academy

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PCCS CKD QI Programme

Chronic Kidney Disease Treatment and Management

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Dr Jim Moore Disclosures

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- Novo Nordisk
- VIFOR

Chronic Kidney Disease Treatment and Management

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- Primary care management of chronic kidney disease
- Guidance and data for use of dapagliflozin and finerenone for chronic kidney disease and diabetic kidney disease
- Patient engagement
- Virtual chronic kidney disease clinics and specialist advice

How would the management of CKD look like in an ideal world from a Primary Care perspective?

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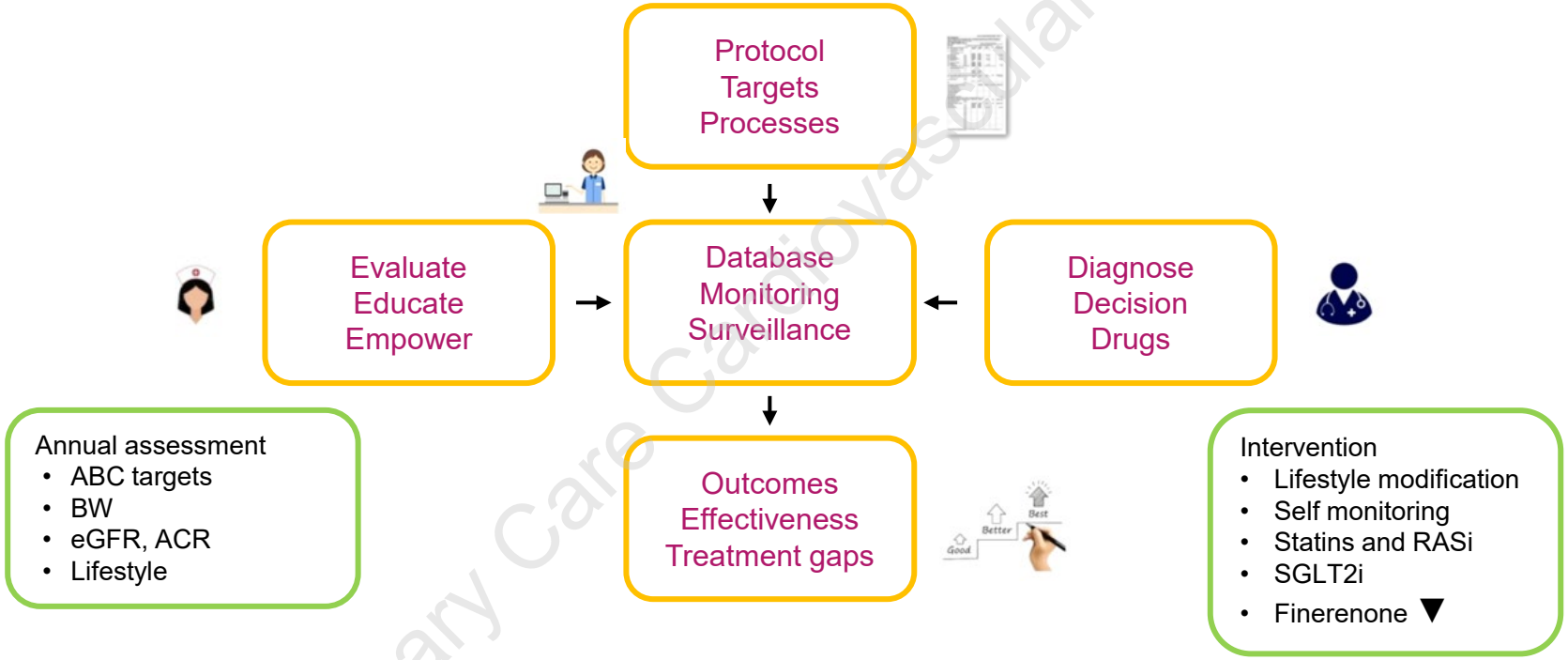

ABC, atrial fibrillation, blood pressure and cholesterol; ACR, albumin:creatinine ratio; BW, body weight; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; RASi, renin-angiotensin system inhibitors; SGLT2i, sodium-glucose co-transporter-2 inhibitors.
Speaker's experience.

Identification and management in primary care

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Identification

- CKD coding
- Case finding for unidentified CKD using eGFR and ACR
- Inequalities
- Frailty and EOL

Management

- Education – cardiovascular health / lifestyle / modifiable risk-factors

Medical optimisation

- Blood pressure optimisation
- Lipid lowering therapy
- Maximum renin angiotensinogen aldosterone inhibition
- Sodium glucose transporter-2 inhibitor (SGT2i) and or finerenone

ACR, albumin-to-creatinine ratio; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; EOL, end of life.
Speaker's own experience.

CVD risk management in patients with CKD should be initiated early

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- Code patient's CKD status on medical record
- Full cardiovascular risk assessment including relevant history: smoking status, physical examination (including weight), labs and QRISK etc
- Discuss/offer lifestyle measures for control of modifiable risk factors e.g. referral to local weight loss pathway, smoking cessation etc
- Uptitrate to maximum tolerated dose of ACEi or ARB. Consider addition of SGLT2i and finerenone in line with national guidance and local pathways
- Avoid NSAIDs and other nephrotoxic medications
- Aim for BP <140/90 unless ACR>70 mg/mmol, whereby aim for BP<130/80
- Consider antiplatelet and lipid lowering therapy as indicated by cardiovascular risk
- Consider referral to secondary care as per NICE guidance and local pathways
- Optimise secondary prevention e.g. HF

ACEi, angiotensin-converting enzyme inhibitor; ACR, albumin to creatinine ratio; ARB, angiotensin receptor blockers; BP, blood pressure; HF, heart failure; NSAID, non-steroidal anti-inflammatory drugs; SGT2i, sodium glucose transporter-2 inhibitor.

Healthy.io. Home page. Healthy.io | Healthcare at the speed of life. Accessed January 2023.

Referral of adults with CKD for specialist assessment

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Refer patients (taking into account their wishes and comorbidities) if they have any of the following:

eGFR

estimated glomerular filtration rate

- Sustained decrease in eGFR of ≥25% **and** Change in GFR category within 12 months
- Sustained decrease in eGFR of ≥15mLs/min/1.73m^2 per year

UACR

Urinary albumin to creatinine ratio

- ≥70mg/mmol unless known to be caused by diabetes **and** already appropriately treated
- >30mg/mmol (A3) **and** haematuria

Blood pressure

- Hypertension that remains poorly controlled despite use of at least 4 antihypertensives at therapeutic doses (consider patient adherence with antihypertensive medication)

"Other"

- Known or suspected rare or genetic causes of CKD
- Suspected renal artery stenosis

5 year risk of needing renal replacement therapy >5% (measure using 4 variable KFRE) Calculate KFRE at https://kidneyfailurerisk.co.uk/. Accessed January 2023.
NICE Guideline (NG203). https://www.nice.org.uk/guidance/ng203. Accessed January 2023.

Primary care management: CKD/BP/Diabetes

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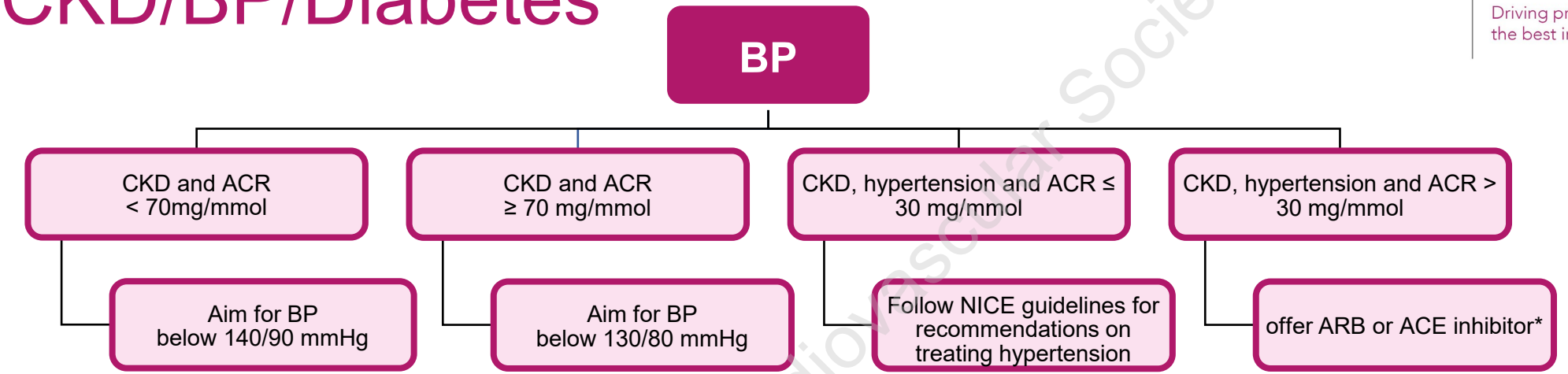

Diabetes

For CKD and diabetes*, offer an ARB or an ACE inhibitor† if ACR ≥ 3mg/mmol

No diabetes

Refer for nephrology assessment and offer ARB or ACE inhibitor† if ACR ≥ 70 mg/mmol.

If ACR > 30 but < 70 mg/mmol agree frequency of CKD monitoring. Consider discussing with nephrologist if eGFR ↓ or ACR ↑

- Check serum potassium and eGFR prior to starting RAS antagonists (repeat checks 1 and 2 weeks after initiation and after dose increase)
- If eGFR decreases by ≥ 25% or serum creatinine increases by ≥ 30% investigate other causes of renal deterioration. If no other cause found stop RAS antagonist or reduce dose to a previously tolerated lower dose and add an alternative antihypertensive medication if needed

*Type 1 or type 2. †titrated to highest licensed dose that the person can tolerate. ACR, albumin:creatinine ratio; ACE, angiotensin-converting enzyme; ARB, angiotensin II receptor blocker; BP, blood pressure; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; RAS, renin-angiotensin system.

NICE Guideline (NG203). https://www.nice.org.uk/guidance/ng203. Accessed January 2023.

Statin therapy for CKD

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Offer atorvastatin 20 mg for primary or secondary prevention of CVD in patients with CKD

- Increase dose if > 40% reduction in non-HDL cholesterol is not achieved and eGFR ≥ 30ml/min/1.73m^2
- If eGFR < 30ml/min/1.73m^2 agree use of higher doses with renal specialist

Follow up:

- Measure TC, HDL cholesterol and non-HDL cholesterol in all patients started on high-intensity statins* at 3 months
- Aim for > 40% reduction in non-HDL cholesterol. If this is not achieved:
  - Discuss adherence and dose timing
  - Optimise adherence to diet and lifestyle measures
  - Consider dose increase if started on less than atorvastatin 80 mg and the person is deemed to be at higher risk because of comorbidities, risk score or using clinical judgement

Do not offer any of the following to patients with CKD for prevention of CVD:

- Plant stanols and sterols
- Fibrates
- Nicotinic acid
- Bile acid sequestrant
- Omega-3 fatty acid compounds

! In patients intolerant to 3 different statins seek specialist advice on treatment options

People on RRT are out of the scope of NICE guidance CG181 on use of statin therapy in patients with CKD. *both primary and secondary prevention, including atorvastatin 20 mg for primary prevention.
CKD, chronic kidney disease; CVD, cardiovascular disease; eGFR, estimated glomerular filtration rate; HDL, high-density lipoprotein; RRT, renal replacement therapy; TC, total cholesterol.

NICE Guideline (CG181). https://www.nice.org.uk/guidance/cg181. Accessed January 2023.

Anaemia in CKD

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Consider investigating anaemia in patients with CKD if:

- Hb levels ≤ 110 g/litre
- Symptomatic of anaemia (tiredness/SOB/lethargy/palpitations)

Following anaemia assessment:

- If no alternative cause found, refer to specialist secondary care services for further advice, as it is likely that anaemia is attributed to CKD
- In this case, the patient may be considered for ESA treatment by secondary care

CKD, chronic kidney disease; ESA, erythropoietic stimulating agent; Hb, haemoglobin; SOB, shortness of breath.

1. NICE Guideline (NG203). https://www.nice.org.uk/guidance/ng203. Accessed February 2023.

NICE TA for dapagliflozin for treating CKD

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Recommendations

Dapagliflozin is recommended as an option for treating CKD in adults, only if:

- It is an add-on to optimised standard care including highest tolerated licensed doses of ACE inhibitors or ARBs, unless these are contraindicated and
- People have an eGFR of 25 ml/min/1.73m^2 to 75 ml/min/1.73m^2 at the start of treatment and:
  - Have type 2 diabetes or
  - Have a uACR ≥ 22.6 mg/mmol

This recommendation is not intended to affect treatment with dapagliflozin that was started in the NHS before this guidance was published. People having treatment outside this recommendation may continue without change to the funding arrangements in place for them before this guidance was published, until they and their NHS clinician consider it appropriate to stop.

ACE, angiotensin-converting enzyme; ARBs, angiotensin-receptor blockers; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; NHS, National Health Service; NICE TA, National Institute for Health and Care Excellence Technology Appraisal; uACR, urinary albumin-creatinine ratio.

NICE Guideline (TA775). https://www.nice.org.uk/guidance/ta775. Accessed March 2023.

Evidence for SGLT2i on CVD and renal outcomes in patients with and without diabetic kidney disease[1,2]

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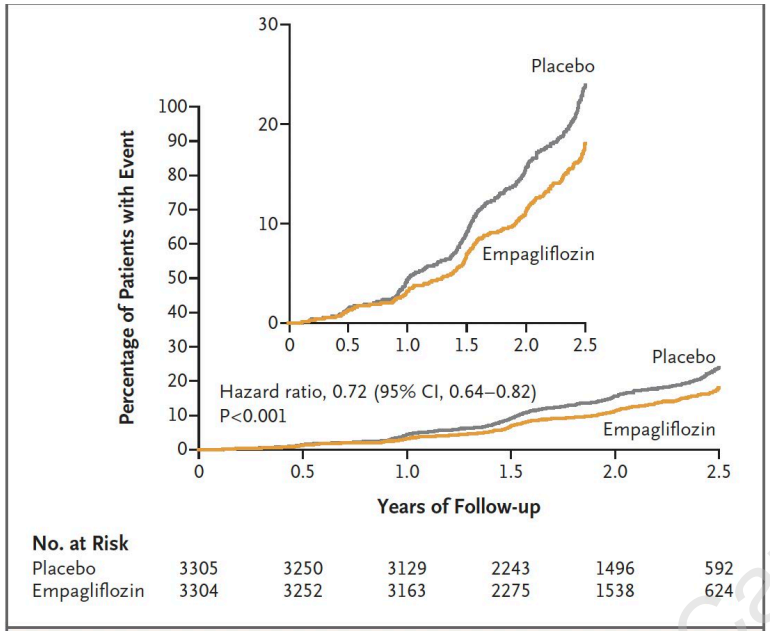
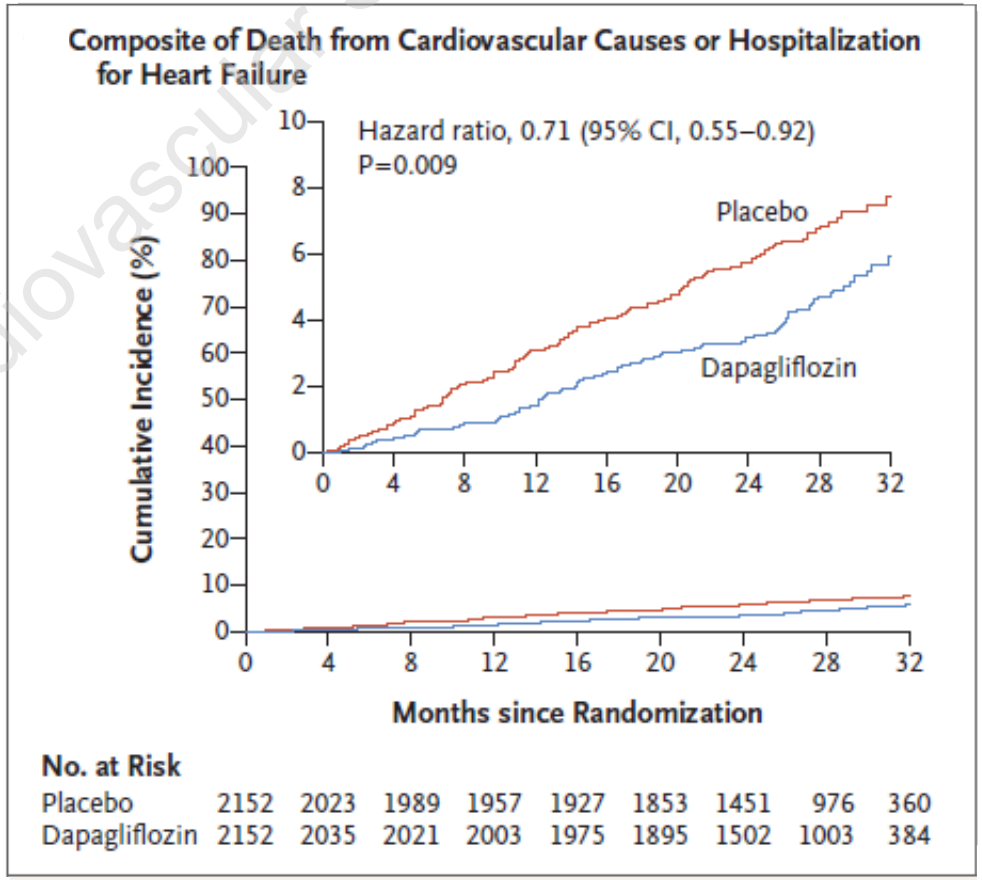


Figure 1. Progression of Kidney Disease or Death from Cardiovascular Causes.
Shown are the results of the primary composite outcome of progression of kidney disease or death from cardiovascular causes. Over a median of 2 years of follow-up, progression of kidney disease or death from cardiovascular causes occurred in 432 patients (13.1%) in the empagliflozin group and in 558 patients (16.9%) in the placebo group, representing 42 fewer primary-outcome events per 1000 patients in the empagliflozin group than in the placebo group over 2 years. The inset shows the same data on an enlarged y axis.



CI, confidence interval; SGT2i, sodium glucose transporter-2 inhibitor.

1. EMPA-KIDNEY Collaborative Group. N Engl J Med 2022 Nov 4 doi: 10.1056/NEJMoa2204233; 2. Heerspink HJL et al. N Engl J Med 8;383(15):1436–1446.

Finerenone licensed Indication

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Finerenone is indicated for the treatment of chronic kidney disease (Stage 3 & 4 with albuminuria) associated with type-2 diabetes in adults[1]

Finerenone SmPC.

NICE TA for finerenone for treating CKD in type 2 diabetes

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Recommendations

Finerenone is recommended as an option for treating stage 3 and 4 CKD (with albuminuria) associated with type 2 diabetes in adults. It is recommended only if:

- It is an add-on to optimised standard care. This should include, unless they are unsuitable, the highest tolerated licensed doses of:
  - ACE inhibitors or ARBs, and
  - SGLT2 inhibitors, and
- People have an eGFR of 25 ml/min/1.73m^2 or more

This recommendation is not intended to affect treatment with finerenone that was started in the NHS before this guidance was published. People having treatment outside this recommendation may continue without change to the funding arrangements in place for them before this guidance was published, until they and their NHS clinician consider it appropriate to stop.

ACE, angiotensin-converting enzyme; ARBs, angiotensin-receptor blockers; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; NHS, National Health Service; NICE TA, National Institute for Health and Care Excellence Technology Appraisal; SGLT2, sodium-glucose co-transporter 2.

NICE. Final appraisal document: finerenone for treating chronic kidney disease in type 2 diabetes. Available from: https://www.nice.org.uk/guidance/gid-ta10820/documents/final-appraisal-determination-document. Accessed March 2023.

FIDELIO-DKD study design[1-4]

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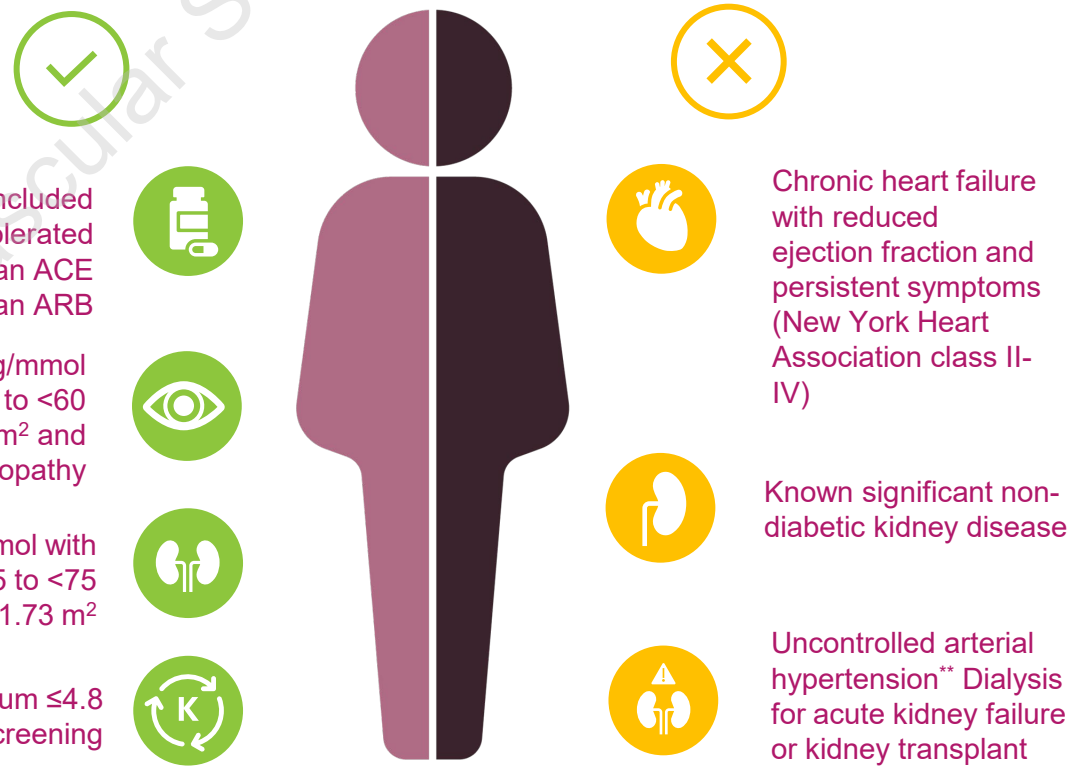
- A randomised, double-blind, placebo-controlled, multicentre trial
- 5,734 patients randomised to either finerenone 10 mg or 20 mg OD*
- 2.6 years median post-treatment follow-up
- Primary endpoint: Kidney failure†, sustained ≥40% decrease in eGFR from baseline over a period of at least 4 weeks, or death from renal causes‡
- Secondary endpoint: Time to death from CV causes, non-fatal MI, non-fatal stroke or hospitalisation for HF



*10 mg if screening eGFR ≥ 25 to < 60 mL/min/1.73 m^2; 20 mg if ≥60 mL/min/1.73 m^2, up-titration encouraged from month 1 if serum potassium ≤4.8 mEq/L & eGFR stable. †ESKD or an eGFR <15 ml/min/1.73 m^2. ‡Events were classified as renal death if: (1) the patient died; (2) RRT had not been initiated despite being clinically indicated; & (3) there was no other likely cause of death.[3] **Mean sitting SBP ≥170 mmHg or mean sitting DBP ≥110 mmHg at the run-in visit or mean sitting SBP ≥160 mmHg or mean sitting DBP ≥100 mmHg at the screening visit. ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; CV, cardiovascular; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate; HF, heart failure; MI, myocardial infarction; OD, once daily; SBP, systolic blood pressure; UACR, urinary albumin creatinine ratio.

1. Bakris GL et al., N Engl J Med 2020; 383:2219-2229; 2. NCT02540993. Available at: https://clinicaltrials.gov/ct2/show/NCT02540993. Accessed January 2023; 3. Bakris GL et al., N Engl J Med 2020; 383:2219-2229 Supplementary appendix; 4. Bakris GL, et al. Am J Nephrol 2019;50:333–344.

FIDELIO-DKD: KDIGO stratification and selected baseline characteristics

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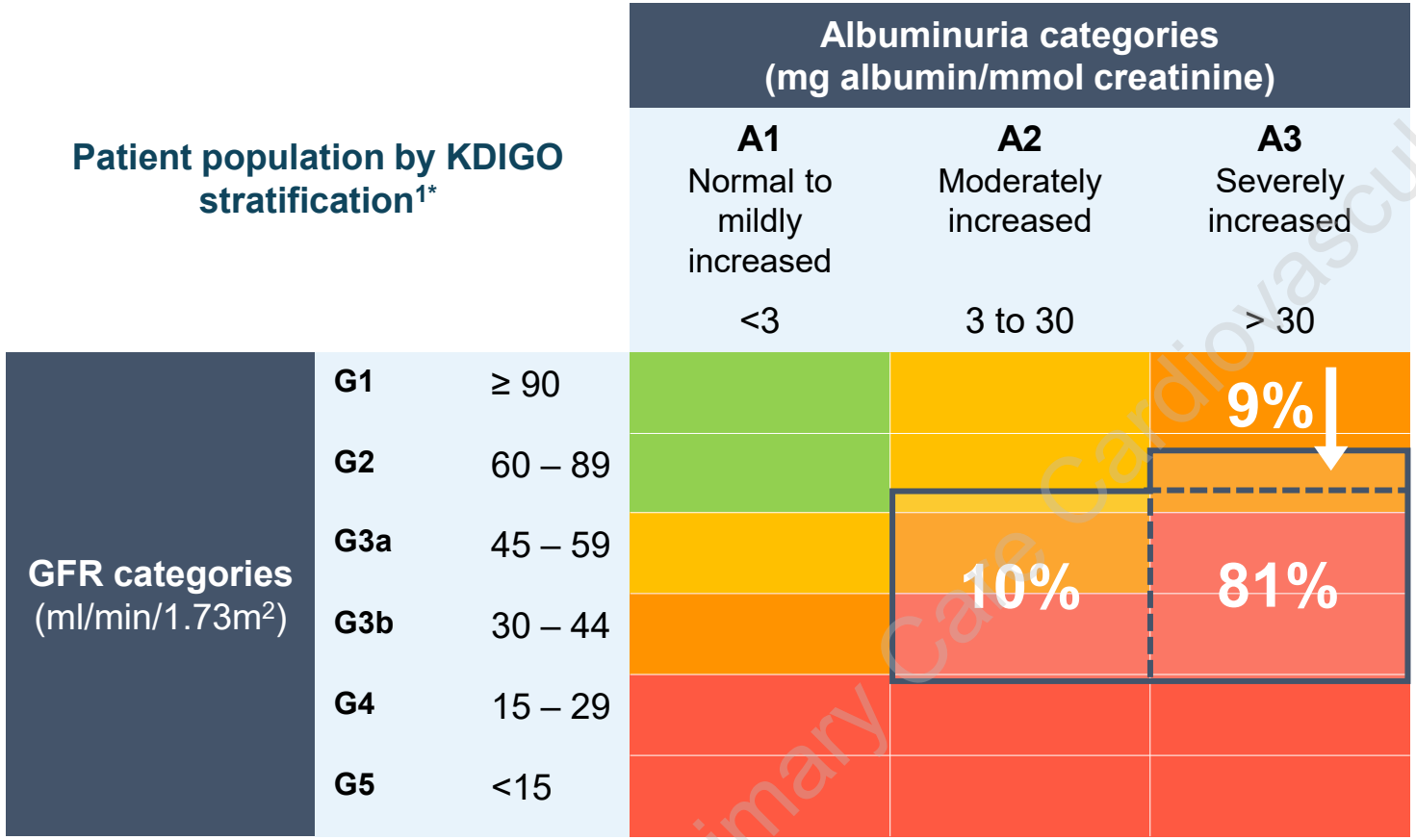
Patient population by KDIGO stratification[1*]



Characteristics	FIDELIO-DKD[2] N=5674
Mean age (years)	65.6
Gender, male (%)	70.2
Mean duration of diabetes (years)	16.6
HbA1c (mmol/mol)	61
Mean eGFR at baseline (ml/min/1.73m²)	44.3
Median uACR at baseline (mg/g)	852
CV history (%)	45.9
Median follow-up duration (years)	2.6
History of diabetic retinopathy (%)	46.9
History of diabetic neuropathy (%)	25.6

*Green: low risk (if no other markers of kidney disease, no CKD); yellow: moderately increased risk; orange: high risk; red: very high risk.
CV, cardiovascular; eGFR, estimated glomerular filtration rate; HbA1c, haemoglobin A1C; uACR, urinary albumin:creatinine ratio.
1. KDIGO Clinical Practice Guideline for Diabetes Management in Chronic Kidney Disease. 2020; 98 (4S). Available at: https://kdigo.org/wp-content/uploads/2020/10/KDIGO-2020-Diabetes-in-CKD-GL.pdf. Accessed January 2023; 2. Bakris GL, et al. N Engl J Med 2020;383:2219-2229.

FIDELIO-DKD: primary composite endpoints[1,2]

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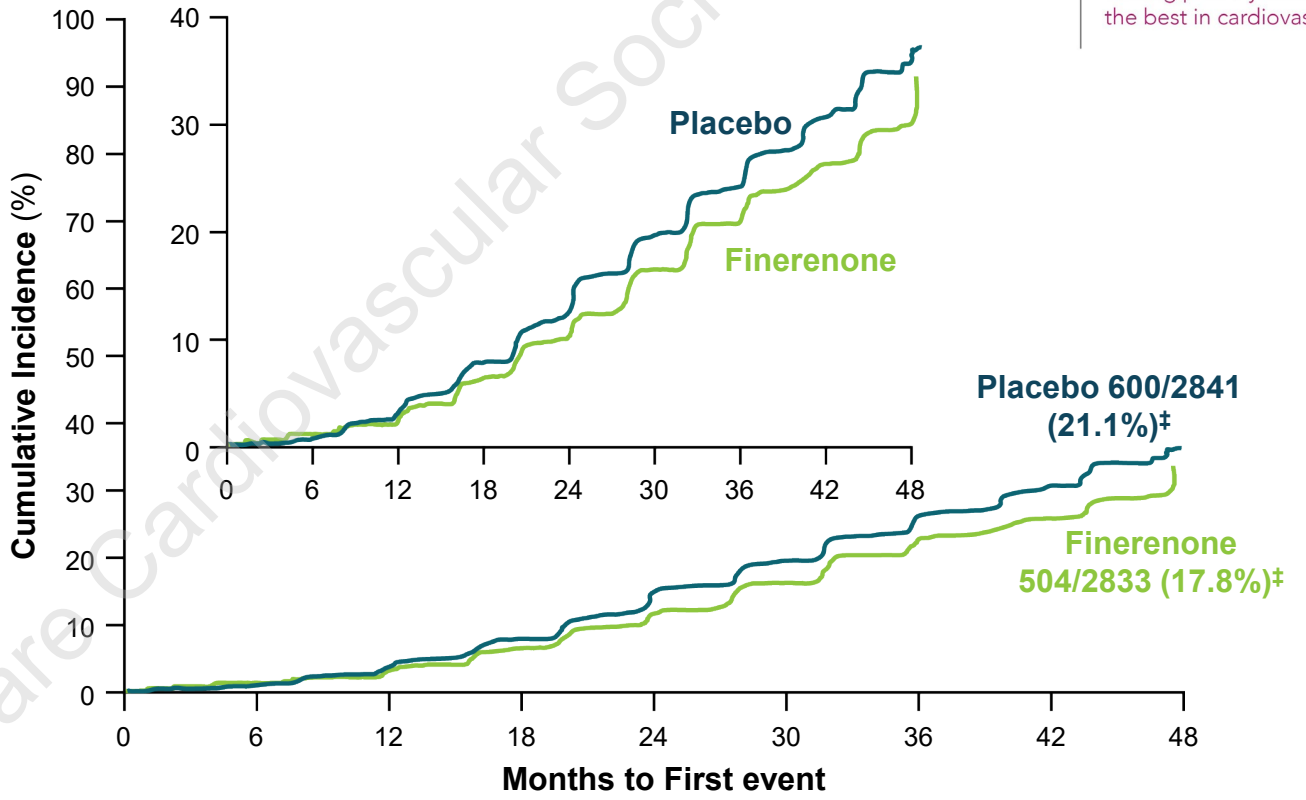
Primary renal endpoint:

Kidney failure*, sustained ≥40% decrease in eGFR from baseline over a period of at least 4 weeks, or death from renal causes†

HR 0.82
(95% CI, 0.73–0.93)
p=0.001

After 3 years:
ARR 3.4% (95% CI, 0.62–6.2)
NNT 29 (95% CI, 16–166)



No. at Risk

Placebo	2841	2724	2586	2379	1758	1248	792	453	82
Finerenone	2833	2705	2607	2397	1808	1274	787	441	83

*ESKD or an eGFR <15 ml/min/1.73 m^2; †Events were classified as renal death if: (1) the patient died; (2) RRT had not been initiated despite being clinically indicated; & (3) there was no other likely cause of death;[2] ‡Median follow-up 2.6 years. ARR, absolute risk reduction; CI, confidence interval; CV, cardiovascular; eGFR, estimated glomerular filtration rate; ESKD, end-stage kidney disease; HF, heart failure; HR, hazard ratio; MI, myocardial infarction; NNT, number needed to treat; RRT, renal replacement therapy.1. Adapted from Bakris GL et al., N Engl J Med 2020; 383:2219-2229; 2. Adapted from Bakris GL et al., N Engl J Med 2020; 383:2219-2229 Supplementary appendix.

FIDELIO-DKD: secondary composite endpoints[1,2]

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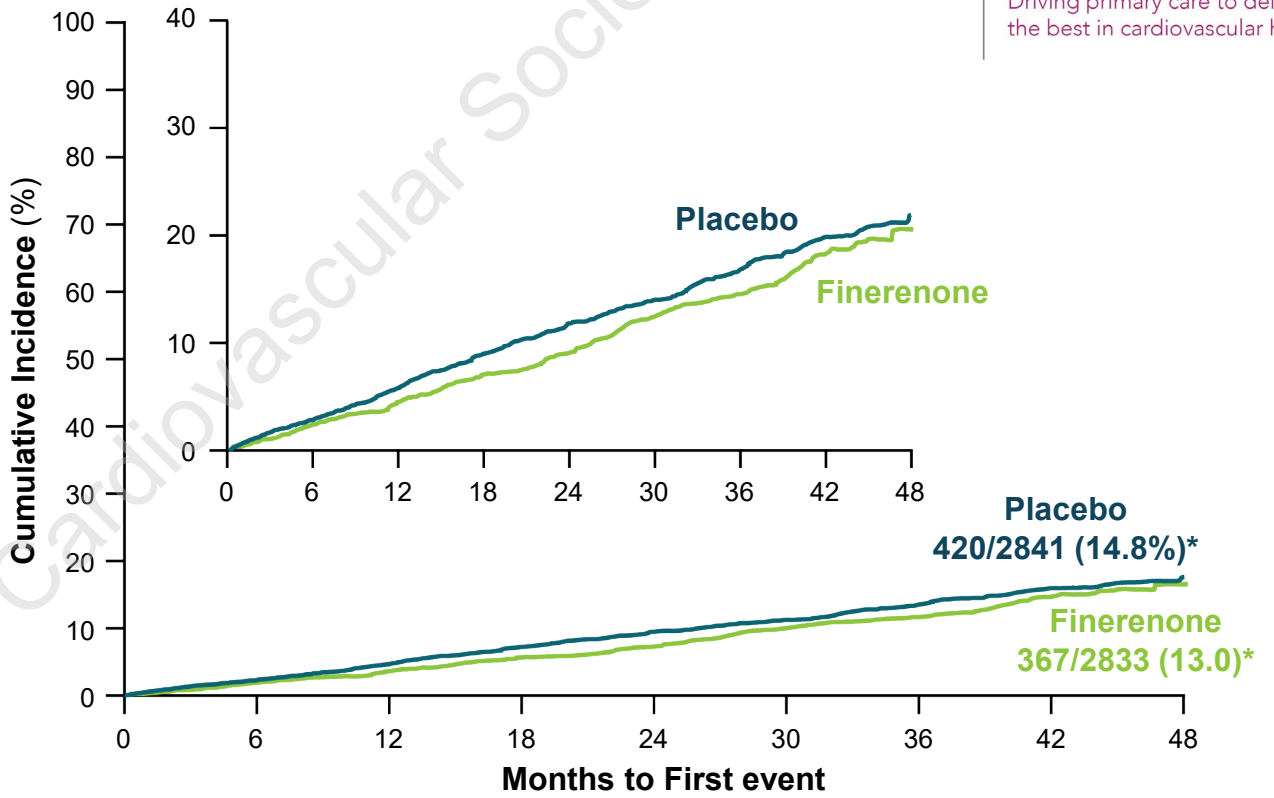
Secondary cardiovascular endpoint:

Time to death from CV causes, non-fatal MI, non-fatal stroke or hospitalisation for HF

HR 0.86
(95% CI, 0.75–0.99)
p=0.03

After 3 years:
ARR 2.4% (95% CI, 0.3–4.5)
NNT 42 (95% CI, 22–397)



No. at Risk

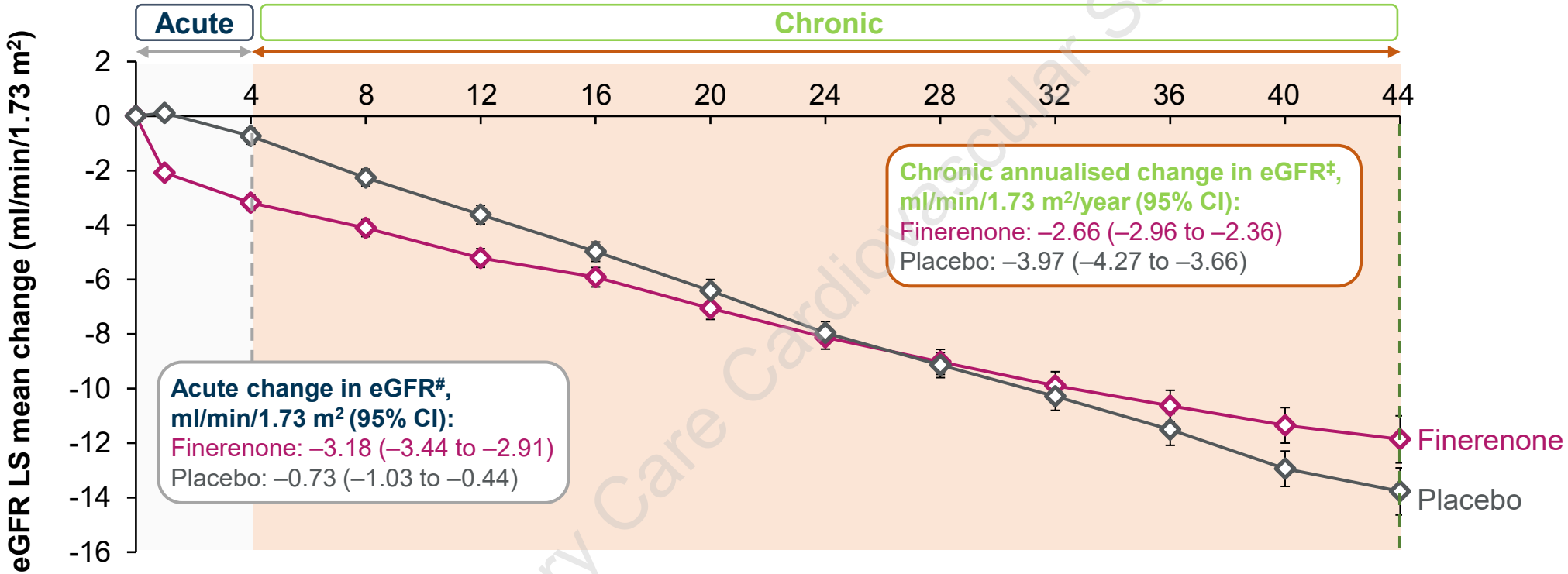
Placebo	2841	2753	2653	2549	1969	1475	951	536	115
Finerenone	2833	2760	2688	2582	2017	1488	984	537	111

*Median follow-up 2.6 years. ARR, absolute risk reduction; CI, confidence interval; CV, cardiovascular; eGFR, estimated glomerular filtration rate; ESKD, end-stage kidney disease; HF, heart failure; HR, hazard ratio; MI, myocardial infarction; NNT, number needed to treat.

1. Adapted from Bakris GL et al., N Engl J Med 2020; 383:2219-2229; 2. Adapted from Bakris GL et al., N Engl J Med 2020; 383:2219-2229 Supplementary appendix.

Change from baseline level in eGFR*

Mean eGFR at baseline (ml/min/1.73 m²): Finerenone = 44.4±12.5, Placebo = 44.3±12.6



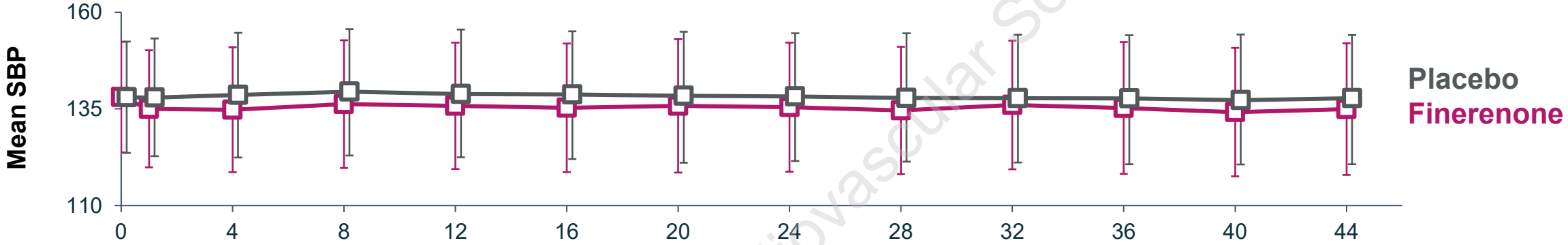
N					
Finerenone	2799	2722	2613	1870	867	336
Placebo	2800	2720	2611	1846	844	339

*Mixed model analysis of eGFR over time. Full analysis set; #LS mean change in eGFR slope from baseline to month 4; ‡LS mean change in eGFR slope from month 4 to the permanent discontinuation or end-of-study visit.

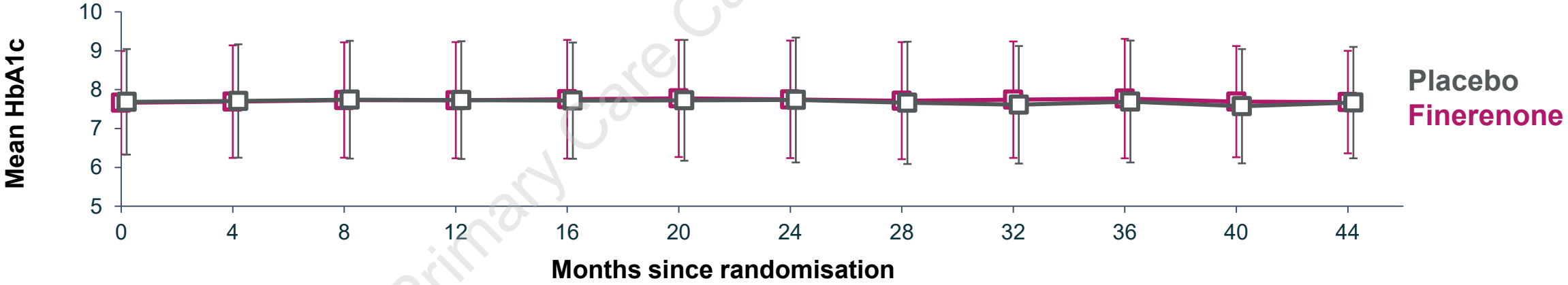
CI, confidence interval; eGFR, estimated glomerular filtration rate. Adapted from Bakris GL et al., N Engl J Med 2020; 383:2219-2229 Supplementary appendix.

Blood pressure & blood glucose*

Change in SBP (mmHg) over time: at month 1, -2.9; at month 12, -3.0#



Change in HbA1c (%) over time



Error bars show standard deviation; *Analysis of safety set; SBP, systolic blood pressure; HbA1c, glycated haemoglobin #Mean change in SBP from baseline to month 1 & month 12 was –3.0 & –2.1 mmHg with finerenone & –0.1 & 0.9 mmHg with placebo, respectively. Adapted from Bakris GL et al., N Engl J Med 2020; 383:2219-2229

Investigator reported treatment emergent AEs in FIDELIO-DKD

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Safety outcome, n (%)	Finerenone (n=2827)		Placebo (n=2831)	
Any AE*	2468	(87.3)	2478	(87.5)
AE related to study drug	646	(22.9)	449	(15.9)
AE leading to treatment discontinuation	207	(7.3)	168	(5.9)
Any serious AE	902	(31.9)	971	(34.3)
Serious AE related to study drug	48	(1.7)	34	(1.2)
Serious AE leading to treatment discontinuation	75	(2.7)	78	(2.8)
Investigator-reported hyperkalaemia†	516	(18.3)	255	(9.0)
Hyperkalaemia related to trial regimen	333	(11.8)	135	(4.8)
Serious hyperkalaemia‡	44	(1.6)	12	(0.4)
Hospitalisation due to hyperkalaemia	40	(1.4)	8	(0.3)
Permanent discontinuation of trial regimen due to hyperkalaemia	64	(2.3)	25	(0.9)

Overall, AEs were similar with finerenone and placebo

*See section of 4.8 of the SPC for full list of reported AEs. †Shown are adverse events that were reported by the investigators with the use of the Medical Dictionary for Regulatory activities (MedDRA) preferred terms “hyperkalaemia” and “blood potassium increased”. ‡An adverse event was considered to be a serious adverse event if it resulted in death, was life-threatening, resulted in inpatient hospitalisation (or prolongation of existing hospitalisation), caused persistent or clinically significant disability or incapacity, was a congenital abnormality or birth defect, or was judged by the investigator to be a serious or important medical event. AE, adverse events. Bakris GL et al., N Engl J Med 2020; 383:2219-2229.

Initiating treatment

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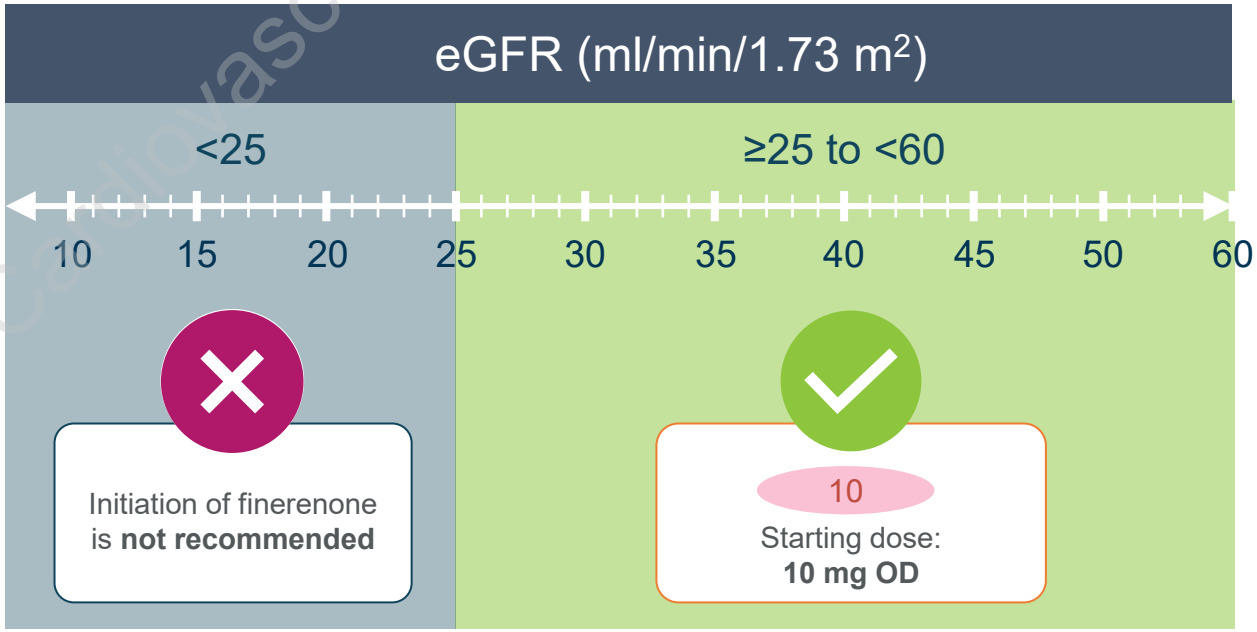
Measurement of Serum Potassium Level & eGFR

Serum potassium levels & eGFR have to be measured to determine whether patients can initiate finerenone

The recommended starting dose of finerenone is 10mg OD

Serum potassium levels	
mmol/l	Initiation of finerenone
≤4.8	✓ Can be started
>4.8–5.0	✓ May be considered*
>5.0	✗ Not recommended



*Initiation of finerenone may be considered with additional serum potassium monitoring within the first 4 weeks based on patient characteristics & serum potassium levels.
Summary of Product Characteristics Finerenone 10 & 20mg tablets March 2022.

Continuation of treatment & dose adjustment[1]

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- **Serum potassium & eGFR have to be re-checked 4 weeks after:**
  - Initiation of treatment
  - Restarting treatment (with 10 mg OD)
  - An increase in dose to 20 mg OD
- **Thereafter, serum potassium should be re-measured periodically & as needed based on patient characteristics & serum potassium levels**
- **Due to limited data finerenone should be discontinued if eGFR <15ml/min/1.73m^2**

The recommended target dose & maximum recommended dose of finerenone is 20 mg OD

Serum potassium (K^+)	Current finerenone dose	Action to take
≤4.8 mmol/L	10 mg OD	**Increase dose** to **20 mg OD***
	20 mg OD	**Continue on current dose**
>4.8–5.5 mmol/L	10 mg OD	
	20 mg OD	
>5.5 mmol/L	10 mg OD	**Withhold treatment** Consider restarting at **10 mg OD** when serum is potassium ≤5.0 mmol/L
	20 mg OD	**Withhold treatment** Restart at **10 mg OD** when serum is potassium ≤5.0 mmol/L

*Maintain 10 mg OD if eGFR has decreased by >30% compared with the previous measurement.

1. Finerenone SmPC.

Engage with stakeholders: **Patients**[1]

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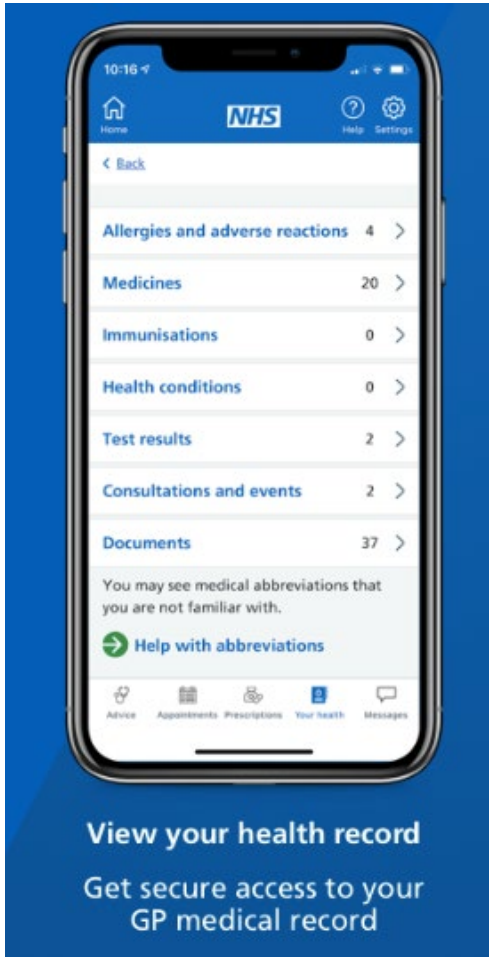
- Provide the right information to the right patients
  - Send with clinic appointment letter
  - Posters/leaflets in clinics
  - Patient knows best/patient view apps
- Empower patients to ask about treatments that might benefit them
- Educate patients about drug-specific factors
  - Sick day rules[2], DKA risk
- Shared decision-making with patients is key



Adapted from NHS APP: GP Health Record.

DKA, diabetic ketoacidosis. 1. Speaker's experience; 2. NHS London Clinical Networks. Sick day rules: how to manage Type 2 diabetes if you become unwell with coronavirus and what to do with your medication. 2020; Available from: https://www.england.nhs.uk/london/wp-content/uploads/sites/8/2020/04/3.-Covid-19-Type-2-Sick-Day-Rules-Crib-Sheet-06042020.pdf. Accessed March 2022; 3. NHS APP. GP Health Record. Available from: https://www.nhs.uk/nhs-app/nhs-app-help-and-support/health-records-in-the-nhs-app/gp-health-record/. Accessed March 2022.

Major challenges when managing patients with heart failure & CKD

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- Sequencing of drugs for the patient with HFrEF
- Response to deterioration in renal function when initiating/optimising drugs
- Decompensated (congested) patient with heart failure and AKI
- Hyperkalaemia

AKI, acute kidney injury; CKD, chronic kidney disease; HFrEF, heart failure with reduced ejection fraction.

Management of renal function during initiation of RAAS inhibitors

Table 1 Management of RAAS inhibitors in response to change in renal function

Clinical assessment:

- Compare with baseline renal function (review series of results).
- Assess fluid status: if intravascularly depleted (jugular venous pulse not visible, postural drop in BP and no oedema), consider cautious intravenous fluids.
- Interpret BP in the context of usual values (low BP does not necessarily mean patient needs fluid).
- Reduce/withdraw RAASI if symptomatic hypotension.
- Repeated clinical and biochemical assessment is vital.
- Presence of moderate or severe hyperkalaemia may override recommendations based on change in renal function.
- In severe renal dysfunction assess for symptoms or uraemia.

	Recommendations for RAAS inhibitors	
Change in renal function compared with baseline	**HFpEF (assuming no other prognostic indication).**	**HFREF.**
Increase in serum creatinine by <30%	Consider stop ACEI/ARB/ARNI Review MRA according to fluid status.	Continue unless symptomatic hypotension.
Increase in serum creatinine 30%–50%	Stop RAAS inhibitor.	Consider reducing dose or temporary withdrawal.*
Increase in serum creatinine >50%	Stop RAAS inhibitor.	Temporarily stop RAAS inhibitor.*
Severe renal dysfunction, for example, eGFR <20	Stop RAAS inhibitor.	Stop RAAS inhibitor if symptomatic uraemia irrespective of baseline function.

*Reinitiate and/or re-titrate when renal function improved in patients with HFrEF

ACE-I, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; ARNI, angiontensin receptor neprilysin inhibitor; eGFR, estimated glomerular filtration rate; HFrEF, heart failure with reduced ejection fraction; MRA, mineralocorticoid receptor antagonists; RAAS, renin-angiotensin-aldosterone system.

Clark, AL et al. Heart 2019;105:904–910.

Virtual CKD – East London Experience

Primary Care Cardiovascular Society

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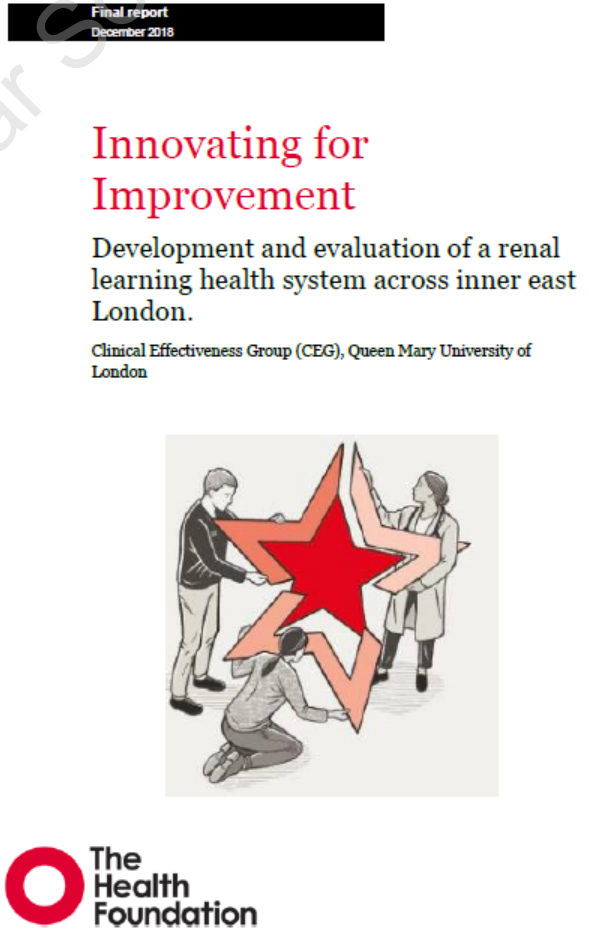
- A virtual CKD clinic, in which nephrologists can see the entire GP patient record (with consent) and enter management suggestions.
- A suite of IT tools for practices to improve identification and management of CKD. A novel 'trigger tool' alerts GPs to cases of possible CKD progression.

Major impacts include:

- A reduction in wait time for a specialist opinion from 64 to 5-10 days
- Only 20% of patients referred to the virtual clinic require a hospital appt
- Significant improvements to GP identification and management of CKD.
- Nurse led self-management education for patients
- 96% of GPs were satisfied with the clinical advice they received.



CKD, chronic kidney disease; GP, general practitioner; IT, information technology.

Clinical Effectiveness Group, Queen Mary University of London. The Health Foundation. Innovating for Improvement: Development and evaluation of a renal learning health system across inner east London. 2018. Available from: https://www.health.org.uk/sites/default/files/2019-05/IFI%20R6%20Queen%20Mary%20final%20report.pdf. Accessed March 2022.

Specialist Advice

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- Specialist Advice is an umbrella term for a range of specialist-led models, that can be provided in Secondary, Community or Primary Care settings, which allow the sharing of relevant clinical information so that:
- **Prior to or instead of referral** the referring clinician is able to seek advice from a specialist through asynchronous methods e.g. e-RS A&G, or synchronous methods g. telephone, virtual specialist reviews
- **Where a referral has been made** the specialist is able to review the clinical information, returning the referral with guidance where appropriate or where it is necessary direct the onward referral to the most appropriate clinician, clinic and/or diagnostic pathway first time e.g. e-RS Referral Assessment Services (RAS), triage services

CKD, chronic kidney disease; e-RS, electronic-referral service advice & guidance.

NHS. The NHS Long Term Plan. 2019. Available from: https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf. Accessed March 2022.

Summary

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Driving primary care to deliver the best in cardiovascular health

- CVD risk management should be initiated early in patients with CKD[1]
- CKD management should include optimisation of BP, anaemia and comorbidities (e.g., diabetes)[2]
- Management options for type 2 diabetes and CKD include:
  - ACE inhibitors and ARB, dapagliflozin and finerenone[3-5]
- Virtual CKD clinics may help to improve identification and management of CKD[6]
- Management of patients with CKD is ultimately the decision of the individual clinician

ACE, angiotension-converting enzyme; ARB, angiotensin receptor blocker; BP, blood pressure; CKD, chronic kidney disease; CVD, cardiovascular disease.

1. Healthy.io. Home page. Healthy.io | Healthcare at the speed of life. Accessed January 2023; 2. NICE Guideline (NG203). https://www.nice.org.uk/guidance/ng203. Accessed January 2023; 3. NICE Guideline (NG28). https://www.nice.org.uk/guidance/ng28. Accessed January 2023; 4. NICE Guideline (TA775). https://www.nice.org.uk/guidance/ta775. Accessed January 2023; 5. Finerenone SPC; 6. Clinical Effectiveness Group, Queen Mary University of London. The Health Foundation. Innovating for Improvement: Development and evaluation of a renal learning health system across inner east London. 2018. Available from: https://www.health.org.uk/sites/default/files/2019-05/IFI%20R6%20Queen%20Mary%20final%20report.pdf. Accessed March 2022.