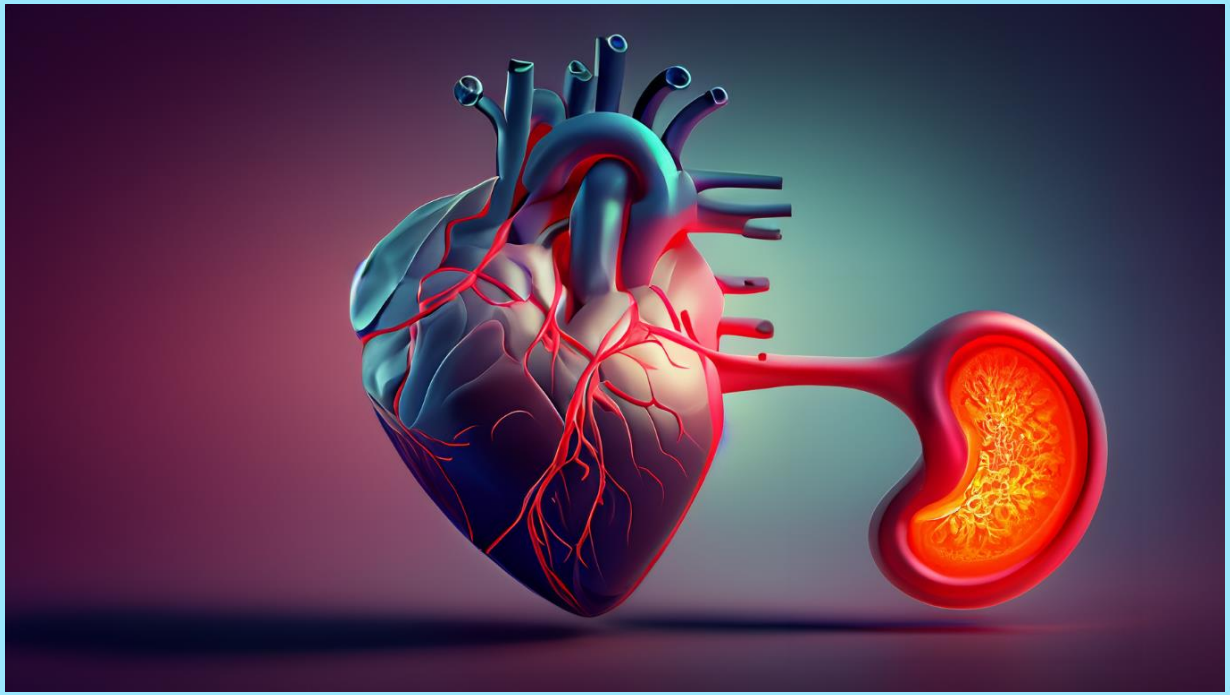


Diabetes Unfiltered: The Management of CKD & DKD

Kevin Fernando FRCGP FRCP Edin. FAcadMEd MSc Diabetes

University of Edinburgh Medical School 2000

Portfolio GP, Edinburgh
Specialist Interests in Diabetes/CVRM & Medical Education

Content Advisor, Medscape Global & UK

Honorary Clinical Reader

Co-Founder CVRMUK

@drkevinfernando YouTube @DrKevinFernando

Disclosures 2024/5

Speaker Fees: AstraZeneca, Bayer, Boehringer Ingelheim, Dexcom, Daiichi Sankyo, Grunenthal, Lilly, Menarini, Idorsia, Thornton & Ross, Boston Scientific

Consultancy Fees: AstraZeneca, Dexcom, Boehringer Ingelheim, Lilly, Menarini, Roche, Oviva, Idorsia, Grunenthal, Boston Scientific

Congress Attendance: Menarini, Daiichi Sankyo, Lilly, Bayer

Identification of Chronic Kidney Disease in Primary Care

Medscape UK X Guidelines
Primary Care Hacks

Authors: Dr Eimear Darcy, GP Partner, Grange Family Practice Omagh; **Dr William Hinchliffe**, Consultant in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Deepika Manoharan**, Registrar in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Kevin Fernando**, GP Partner, North Berwick Health Centre and Content Advisor, Medscape Global and UK (email: kfernando@webmd.net)

Prevention of ESRD matters, as it has lower survival rates than colorectal, prostate, and breast cancer.[1] Microalbuminuria and eGFR <60 ml/min/1.73 m² are independent and amplifying predictors of mortality risk.[2]

1. Identify Individuals at Risk of CKD[3–7]

Key Clinical Risk Factors:[3–6]
- Hypertension
- CVD
- Diabetes
- Obesity

Other Groups at Risk of CKD:[3–5]
- Previous history of AKI
- Family history of kidney failure
- Structural renal tract disease
- Recurrent nephrolithiasis
- Prostatic hypertrophy
- Gout
- Multisystem disease
- Hereditary kidney disease
- Long-term treatment with nephrotoxins (e.g. NSAIDs, lithium, CNIs)
- Older people

2. Test At-risk Adults for CKD[3,7]

Evaluate kidney function—eGFR (calculated based on sCr)
AND
Evaluate kidney damage—albuminuria (uACR[A])

If uACR ≥3 mg/mmol (≥30 mg/g) **OR** eGFR <60 ml/min/1.73 m²

If uACR <3 mg/mmol (<30 mg/g) **AND** eGFR ≥60 ml/min/1.73 m²

Retest in 3 months[B]

3. Diagnose CKD[3,7]

If low eGFR or high uACR is present for >3 months, **diagnose CKD**

Retest at least once per year

4. Classify and Code CKD[3–5,8]

CKD prognosis is depicted in the RAG/heatmap table (Figure 1); the recommended frequency for monitoring eGFR is represented by the numbers in the boxes (e.g. test once per year if uACR <3 mg/mmol and GFR ≥60 ml/min/1.73 m²)

Code CKD as priority 1, documenting eGFR + ACR + cause

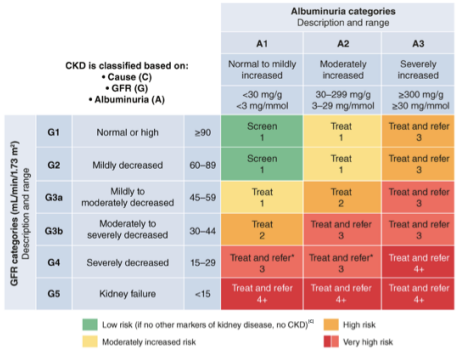


Figure 1: Risk of CKD Progression, Frequency of Monitoring, and Referral to Nephrology According to GFR and Albuminuria[8]

5. Refer to Secondary Care Where Appropriate

Refer to Renal if:[3–5,9]
- **KFRE** (kidneyfailurerisk.co.uk): 5-year risk of ESRD of >5% in CKD G3 or 2-year risk exceeds 10% if eGFR <30 ml/min/1.73 m² (G4)—it may be wise to calculate likely timing of clinical outcomes (ckdpcrisk.org/lowgfrevents) to contextualise life expectancy and probability of CVE within 2–4 years, as referral may impact QoL
- a sustained decrease in eGFR of ≥25% and a change in eGFR category within 12 months
- a sustained decrease in eGFR of ≥15 ml/min/1.73 m² per year
- uACR 70 mg/mmol, unless known to be secondary to diabetes
- uACR >30 mg/mmol **AND** haematuria
- poorly controlled hypertension, despite the use of **at least four** antihypertensives
- suspected genetic causation, e.g. PKD
- suspected renal artery stenosis
- recurrent nephrolithiasis
- persistent anaemia (Hb <10 g/dl) in G4, as EPO and intravenous iron may help QoL
- any previous episode where serum potassium has breached 6 mmol/l.

Urgent/immediate referral to/discussion with specialist services may be warranted if:[10]
- eGFR <15 ml/min/1.73 m²
- AKI
- nephrotic syndrome (heavy proteinuria with low serum albumin)
- hypertensive crisis: BP >180/120 mmHg
- suspicion that a systemic illness (e.g. sarcoidosis, myeloma) has renal involvement.

In patients with persistent NVH and no evidence of UTI, refer to Urology using a **suspected cancer pathway referral** if age ≥60 years (do not assume secondary to CKD).[11]

Footnotes

[A] A spot uACR is acceptable.[3,6]

[B] NICE suggests repeating the eGFR within 2 weeks if eGFR <60 ml/min/1.73 m²[3];—this is at the discretion of the ordering clinician, based on the acuity of the presenting cause. If there is persistent invisible haematuria, also consider referring for investigation for urinary tract malignancy.[3]

[C] Key markers of kidney disease include urine sediment abnormalities, tubular disorders, histology-proven abnormalities, imaging-proven structural abnormalities, and kidney transplantation.[4,5]

ACR=albumin to creatinine ratio; **AKI**=acute kidney injury; **BP**=blood pressure; **CKD**=chronic kidney disease; **CNI**=calcineurin inhibitor; **CVD**=cardiovascular disease; **CVE**=cardiovascular event; **eGFR**=estimated glomerular filtration rate; **EPO**=erythropoietin; **ESRD**=end-stage renal disease; **GFR**=glomerular filtration rate; **KFRE**=Kidney Failure Risk Equation; **NSAID**=nonsteroidal anti-inflammatory drug; **NVH**=non-visible haematuria; **PKD**=polycystic kidney disease; **QoL**=quality of life; **RAG**=red, amber, green; **sCr**=serum creatinine; **uACR**=urine albumin to creatinine ratio; **UTI**=urinary tract infection

@GLNS_Medscape @drkevinfernando medscape.co.uk/guidelines

View this Primary Care Hack online at medscape-uk.co/Hack-CKD

Last updated: February 2025.

Interventions for Chronic Kidney Disease in Primary Care

Medscape UK × Guidelines
Primary Care Hacks

Authors: Dr Eimear Darcy, GP Partner, Grange Family Practice Omagh; **Dr William Hinchliffe**, Consultant in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Deepika Manoharan**, Registrar in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Kevin Fernando**, GP Partner, North Berwick Health Centre and Content Advisor, Medscape Global and UK (email: kfernando@webmd.net)

1. Lipids[3–5,15–18]

- For primary prevention, start **atorvastatin 20 mg OD**
- For secondary prevention, do not stop or attenuate dose if eGFR <30 ml/min/1.73 m²
- Offer **aspirin** for **secondary prevention** of CVD
- See also the Primary Care Hack on lipid management.

2. RAASis and Blood Pressure[3–5,12,18–25]

- Aim for **SBP <130 mmHg**, or **as low as reasonably achievable**[A]
- Follow NG136[19] and NG203[3] when choosing medications
- When RAASi is first line, choose an **ARB**[8]
- Independent of BP:[8]
  - if uACR >30 mg/mmol: start **ARB** and titrate to maximum tolerated dose
  - if uACR >3 mg/mmol in people with diabetes: start **ARB** and titrate to maximum tolerated dose
    - additional agents may be required
- If eGFR <60 ml/min/1.73 m² when starting or increasing RAASi, check U&E within **28 days**; if eGFR ≥60 ml/min/1.73 m², there is no need to routinely recheck U&E
  - **if K+ ≥5.5 mmol/l or sCr rise ≥50% encountered, follow Figure 1**; otherwise, continue to optimise RAASi dose.

3. SGLT2 Inhibitors[18,20,21,26]

- Once RAASi has been titrated to maximum tolerated dose, start an **SGLT2i** in eligible groups as per Figure 2, unless contraindicated (e.g. in people living with T1DM)[B],[C],[D]
- Continue the SGLT2i until dialysis or transplant[18,20,26]
- See also the Primary Care Hack on extra-glycaemic indications of SGLT2is.

4. Specific Considerations in T2DM

If T2DM, eGFR ≥25 ml/min/1.73 m², and uACR ≥3 mg/mmol (≥30 mg/g), consider adding:

- **finerenone**[B]—a nonsteroidal MRA that can be added as third line to an RAASi and an SGLT2i (or second line if SGLT2i is inappropriate or not tolerated) if serum potassium concentration is <5.0 mmol/l, to reduce the risk of adverse kidney and CV outcomes[6,8,18,20,27,28]—see **bit.ly/3v8PX4f**
- **semaglutide**[B]—the FLOW study demonstrated that weekly SC semaglutide 1 mg reduced the risk of adverse kidney and CV outcomes in T2DM and CKD[29]
  - consider if glycaemic and weight management goals are not met and/or K+ >5.0 mmol/l[5,18,21]
  - deprescribe any DPP4 inhibitor if initiating semaglutide[18]
  - do not switch to semaglutide if an existing GLP-1 RA with proven CV benefit is achieving goals (e.g. liraglutide or dulaglutide).

5. Holistic Care

- Opportunistically check FBC/HbA_1/lipids/LBTs/weight/WtHR/BP at the same time as checking U&E and ACR, to support holistic interventions (see the Primary Care Hacks T2DM CVRM checklist, as well as the Primary Care Hacks on lipid management and LBTs)
- Offer vaccinations according to the Green Book.[30,31]

Lifestyle and Dietary Modification

- Encourage **weight loss** and **smoking cessation**[3–6,8]
- Advise on **salt restriction** (ideally <2 g of sodium per day, equating to <5 g of sodium chloride)[3–5,8,12]
- If gastric protection is required, consider **H_2RAs** over PPIs, as PPI use has been associated with increased risk of nephritis and progression of CKD[13,14]
- Avoid **NSAIDs**[3–5]
- Promote **exercise** of at least 150 minutes per week[3–6,8]
- Kidney Care UK has produced a helpful patient information leaflet to support people living with CKD.

Figure 1: Managing Acute Changes in Kidney Function Related to RAASis[3,22–25]

	Serum K+ (mmol/l) 5.5–6.1	6.2–6.4	≥6.5
Unwell and/or ≥50% sCr rise	**Consider hospital referral** according to clinical circumstances, likely cause, and risk of deterioration **Suspend RAASi[1,2]**	**Urgent hospital referral** **Suspend RAASi[1,2]**	**Urgent hospital referral**
Well and <50% sCr rise	**Maintain RAASi[1,2] dose** **Repeat K+ within 14 days** If repeat K+ is: • **≤5.5**: optimise RAASi[1,2] dose • **5.6–5.9**: maintain RAASi[1,2] dose • **6.0–6.4**: suspend RAASi[1,2] and discuss initiation of K+ binders with Renal team[3,4] • **≥6.5**: **consider hospital referral**	**Halve RAASi[1,2] dose** **Repeat K+ within 7 days** If repeat K+ is: • **≤5.5**: optimise RAASi[1,2] dose • **5.6–5.9**: maintain RAASi[1,2] dose • **6.0–6.4**: suspend RAASi[1,2] and discuss initiation of K+ binders with Renal team[3,4] • **≥6.5**: **consider hospital referral**	**Consider hospital referral**

1. Note: RAASis include ACEis, ARBs, potassium-sparing diuretics, and MRAs.
2. Suspend finerenone if K+ ≥5.5 mmol/l, restarting at 10 mg when K+ is <5.0 mmol/l.
3. NICE endorses potassium binders, as they enable RAASi use in those not on dialysis.
4. See NICE TA599 and TA623. Note: that K+ binders are contraindicated in people with a history of bowel obstruction, major GI surgery, or a swallowing disorder.

Table based on the authors' clinical experience and interpretation of clinical guidance.

Figure 2: SGLT2i Initiation in CKD

eGFR (ml/min/1.73 m²)	uACR (mg/mmol) <20	≥20
≥60	Suggested in T2DM	Recommended
45–60	Suggested in T2DM	Recommended
20–45	Recommended	Recommended
<20	Suggested[E]	Suggested[E]
Dialysis	Not recommended[E]	

Footnotes

[A] BP target can be relaxed and individualised if the patient cannot tolerate SBP <130 mmHg or because of other factors, e.g. frailty, reduced life expectancy, syncope.[3–5,12] NICE recommends targets of 120–139 mmHg (SBP) and <90 mmHg (DBP) if ACR <70 mg/mmol, and targets of 120–129 mmHg and <80 mmHg if ACR ≥70 mg/mmol.[3] However, in various studies, intense SBP control has not resulted in compromise.[3,4,12]

[B] Provide advice on SICK day rules and review the SADMANS mnemonic (to include finerenone and GLP-1 RAs). See **bit.ly/4bRbejF**.[18,33]

[C] Counsel patient on the main side effects of SGLT2i use, including risk of UTIs, mycotic genital infections, Fournier's gangrene, DKA, foot disease, and dehydration.[26,33] Provide SICK day guidance, including a leaflet (**bit.ly/4bRbejF**).[24,32] **DO NOT** routinely check renal function after commencing an SGLT2i.[3,26] Consider the patient's hydration status and adjust/reduce diuretic or anti-BP doses if high risk of hypovolaemia.[26] As eGFR drops below 45 ml/min/1.73 m², SGLT2is' glycaemic efficacy reduces.[26] However, SGLT2is can be continued if tolerated until RRT.[18,20,26]

[D] Relative contraindications to SGLT2i use include immunosuppression (e.g. kidney transplantation, lupus, vasculitis) and ADPKD.[26]

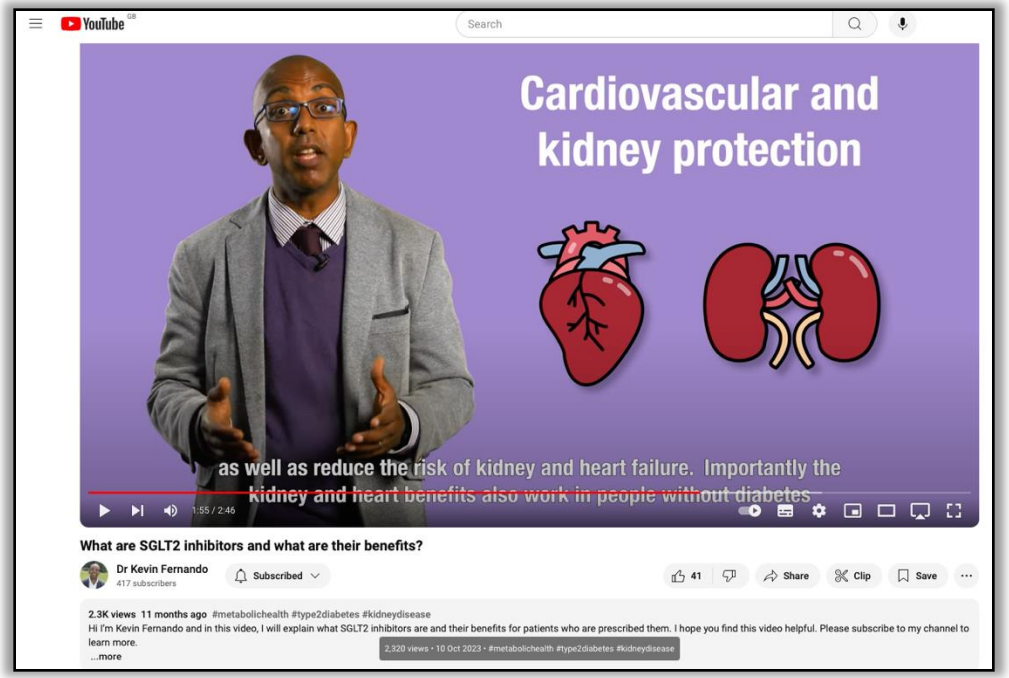
[E] Do not discontinue SGLT2i if renal function deteriorates (eGFR <20 ml/min/1.73 m²), as long as the SGLT2i was initiated prior to this.[26]

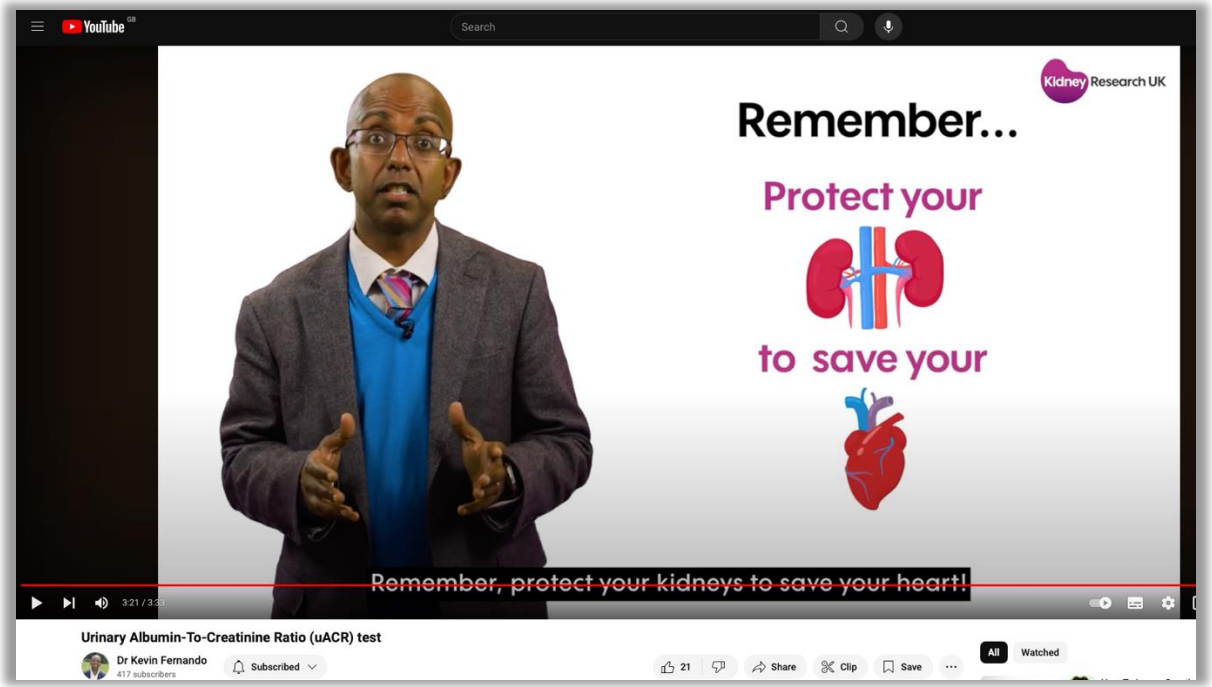
ACEi=angiotensin-converting enzyme inhibitor; **ACR**=albumin to creatinine ratio; **ADPKD**=autosomal dominant polycystic kidney disease; **AKI**=acute kidney injury; **ARB**=angiotensin II receptor blocker; **BP**=blood pressure; **CKD**=chronic kidney disease; **CV**=cardiovascular; **CVD**=cardiovascular disease; **DBP**=diastolic blood pressure; **DKA**=diabetic ketoacidosis; **DPP4**=dipeptidyl peptidase-4; **eGFR**=estimated glomerular filtration rate; **FBC**=full blood count; **GI**=gastrointestinal; **GLP-1 RA**=glucagon-like peptide-1 receptor agonist; **H_2RA**=histamine-2 receptor antagonist; **Hb**=haemoglobin; **HbA_1**=haemoglobin A1c; **HF**=heart failure; **KDIGO**=Kidney Disease: Improving Global Outcomes; **K+**=potassium; **LBT**=liver blood test; **MRA**=mineralocorticoid receptor antagonist; **NG**=NICE Guideline; **NSAID**=nonsteroidal anti-inflammatory drug; **OD**=once daily; **OOH**=out of hours; **PPI**=proton-pump inhibitor; **RAASi**=renin–angiotensin–aldosterone system inhibitor; **RRT**=renal replacement therapy; **SADMANS**=sulfonylureas, ACEis, diuretics, metformin, ARBs, NSAIDs, SGLT2is; **SBP**=systolic blood pressure; **SC**=subcutaneous; **sCr**=serum creatinine; **SGLT2i**=sodium–glucose co-transporter-2 inhibitor; **SICK**=sugar, insulin, carbohydrate, ketones; **T1DM**=type 1 diabetes mellitus; **T2DM**=type 2 diabetes mellitus; **U&E**=urea and electrolytes; **uACR**=urine albumin to creatinine ratio; **UTI**=urinary tract infection; **WtHR**=waist-to-height ratio

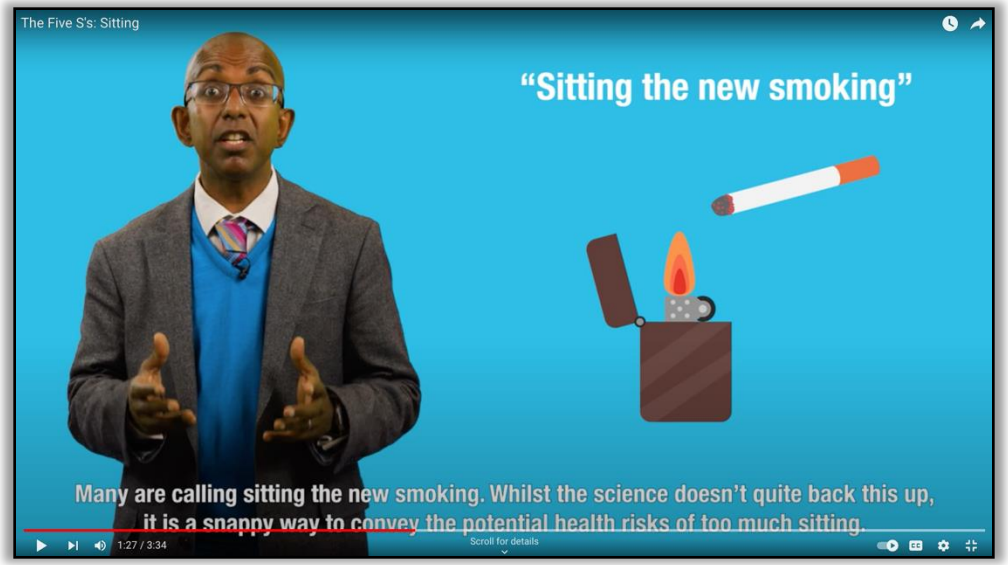
@GLNS_Medscape @drkevinfernando medscape.co.uk/guidelines

View this Primary Care Hack online at medscape-uk.co/Hack-CKD

Last updated: February 2025.

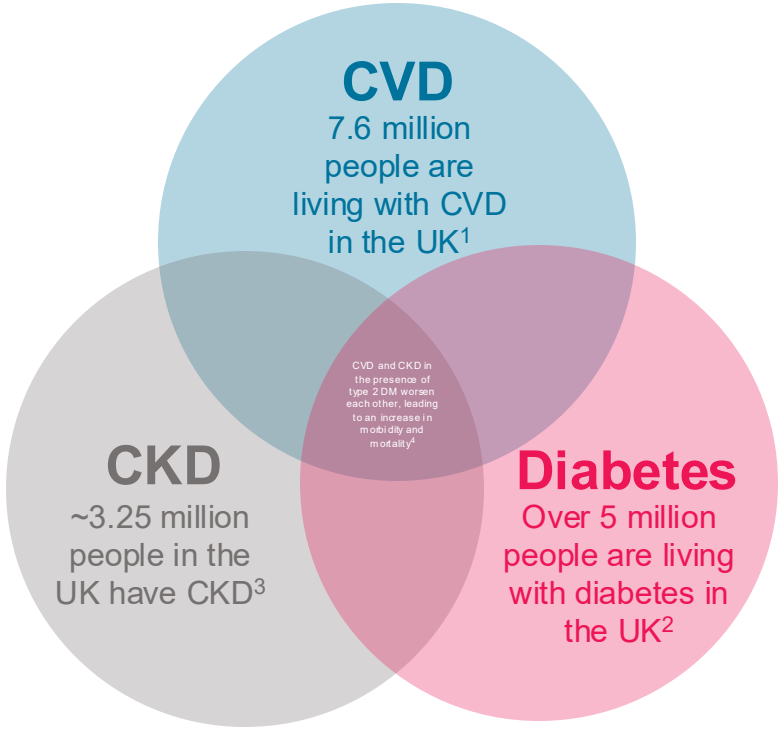






YouTube @DrKevinFernando

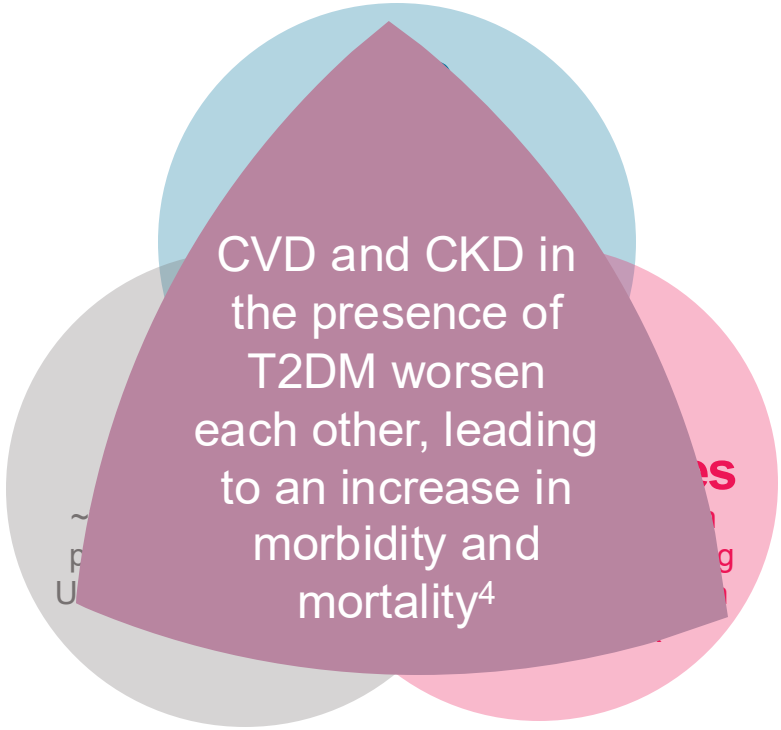
Cardiovascular, renal and metabolic conditions are all interlinked



CKD, chronic kidney disease; CVD, cardiovascular disease; DM, diabetes mellitus; T2DM, type 2 diabetes mellitus; UK, United Kingdom.

1. British Heart Foundation. UK Factsheet September 2024. Available at: https://www.bhf.org.uk/what-we-do/our-research/heart-statistics. Accessed October 2024; 2. Diabetes UK. Number of people living with diabetes in the UK tops 5 million for the first time. Available at: https://www.diabetes.org.uk/about_us/news/number-people-living-diabetes-uk-tops-5-million-first-time. Accessed October 2024; 3. Kidney Care UK. Key facts about kidneys. Available at: https://www.kidneycareuk.org/news-and-campaigns/facts-and-stats/. Accessed October 2024; 4. Usman MS, et al. The Interplay Between Diabetes, Cardiovascular Disease, and Kidney Disease. In: Chronic Kidney Disease and Type 2 Diabetes. American Diabetes Association 2021 Arlington (VA). Available at: https://www.ncbi.nlm.nih.gov/books/NBK571718/. Accessed October 2024.

Cardiovascular, renal and metabolic conditions are all interlinked



CKD, chronic kidney disease; CVD, cardiovascular disease; DM, diabetes mellitus; T2DM, type 2 diabetes mellitus; UK, United Kingdom.

1. British Heart Foundation. UK Factsheet September 2024. Available at: https://www.bhf.org.uk/what-we-do/our-research/heart-statistics. Accessed October 2024; 2. Diabetes UK. Number of people living with diabetes in the UK tops 5 million for the first time. Available at: https://www.diabetes.org.uk/about_us/news/number-people-living-diabetes-uk-tops-5-million-first-time. Accessed October 2024; 3. Kidney Care UK. Key facts about kidneys. Available at: https://www.kidneycareuk.org/news-and-campaigns/facts-and-stats/. Accessed October 2024; 4. Usman MS, et al. The Interplay Between Diabetes, Cardiovascular Disease, and Kidney Disease. In: Chronic Kidney Disease and Type 2 Diabetes. American Diabetes Association 2021 Arlington (VA). Available at: https://www.ncbi.nlm.nih.gov/books/NBK571718/. Accessed October 2024.

Chronic kidney disease, indicated by an eGFR <60 mL/min/1.73m^2,* means that your patient....

- Is more likely to have ischaemic heart disease, heart failure, peripheral vascular disease or cerebrovascular disease[2]
- Has a higher risk of cardiovascular mortality[2]
- Can find it more difficult to achieve blood pressure targets[3]
- May be prone to ankle swelling and fluid retention[4]
- May be at increased risk of sustaining a hip fracture[5]
- Is at increased risk of hypoglycaemia[6]

*Chronic kidney disease may also be diagnosed in patients with an eGFR >60 mL/min/1.73m^2 but who have markers of kidney damage (micro- or macroalbuminuria)

1. Wang Y, et al. *Kidney Int.* 2014; 85(5): 1192–1199; 2. Wright J and Hutchison A. *Vasc Health Risk Manag.* 2009; 5:713–722; 3. McCullough PA et al. *Curr Diab Rep*. 2011; 11(1):47–55; 4. Renal Resource Centre. Understanding Chronic Kidney Disease. Available at: https://kidney.org.au/cms_uploads/docs/rrc-understanding-chronic-kidney-disease.pdf (Accessed July 2020) 5. Nickolas TL et al. *J Am Soc Nephrol*. 2006; 17(11):3223–3232; 6. Moen MF et al. *Clin J Am Soc Nephrol*. 2009;4(6):1121–1127.

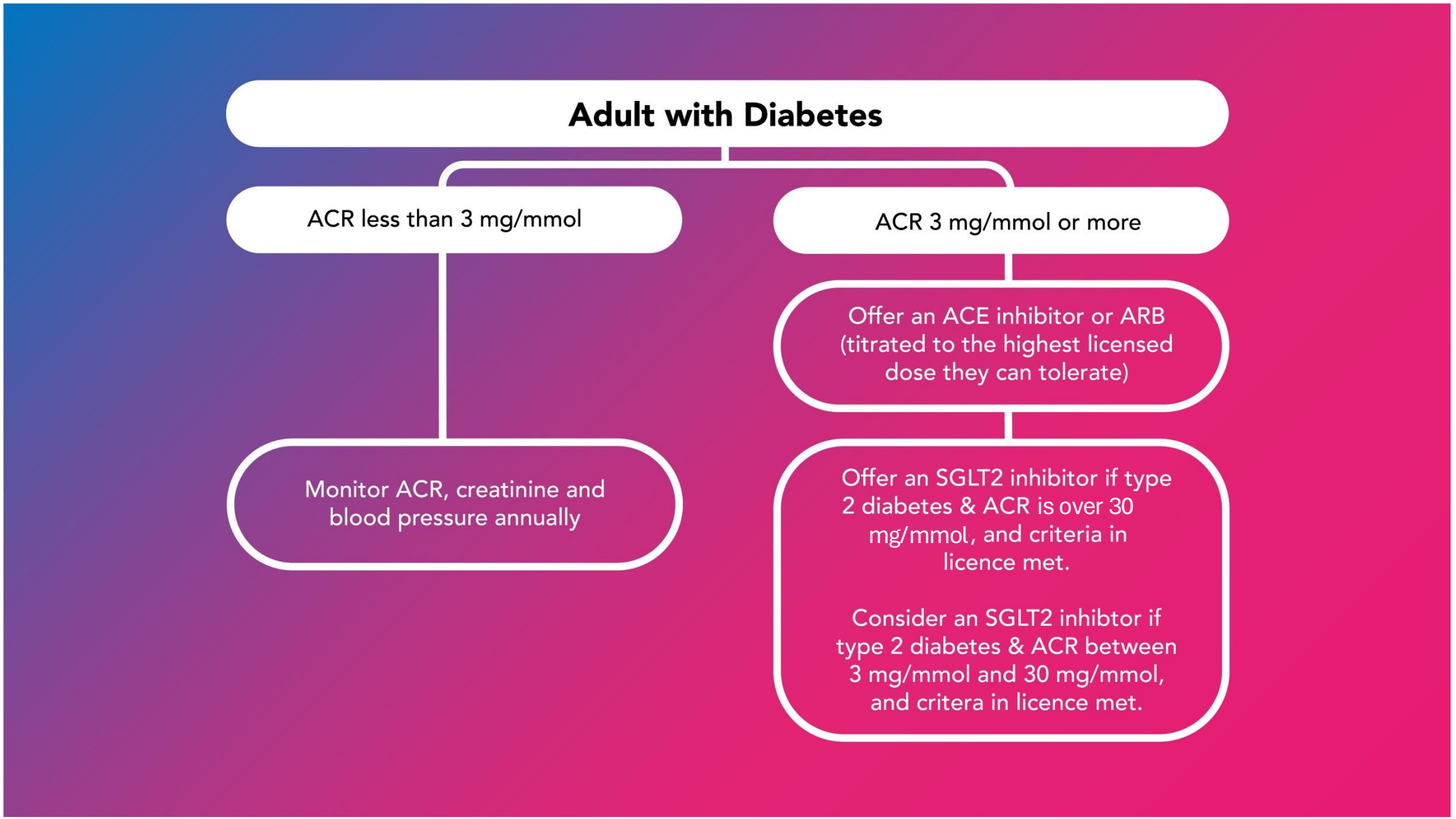
Chron… kidney disease, indicated by an eGFR … your patie…

- Is mor… ilure, peripl… [2]
- Has a…
- Can f… gets[3]
- May b…
- May b…
- Is at ir…

*Chronic kidney dise… minuria)

1. Wang Y, et al. *Ki… *Diab Rep*. 2011; 11(1):47–55; 4. Ren… onic-kidney-disease.pdf (Accessed July 202…

NICE. Chronic kidney disease: assessment and management [NG203]. Available at: https://www.nice.org.uk/guidance/ng203. Accessed October 2024.



ACE, angiotensin-converting enzyme; ACR, albumin to creatinine ratio; ARB, angiotensin receptor blocker; SGLT2, sodium-glucose cotransporter-2.
Adapted from: NICE. Type 2 diabetes in adults: management [NG28]. Available at: https://www.nice.org.uk/guidance/ng28. Accessed October 2024.

UKKA
UK Kidney Association

Home | The Guideline | For Patients | About Us | Contact Us

Search ...

UK Kidney Association Clinical Practice Guideline: Sodium-Glucose Co-transporter-2 (SGLT-2) Inhibition in Adults with Kidney Disease

Working Group co-chairs: Assoc. Prof William G. Herrington & Dr Andrew H. Frankel

Final Version: 13 April 2023
Review Date: 13 April 2027

UKKA
UK Kidney Association

Home | The Guideline | For Patients | About Us | Contact Us

Search ...

Summary of Recommendations

▲ Recommendations for Use in people with Type 2 DM

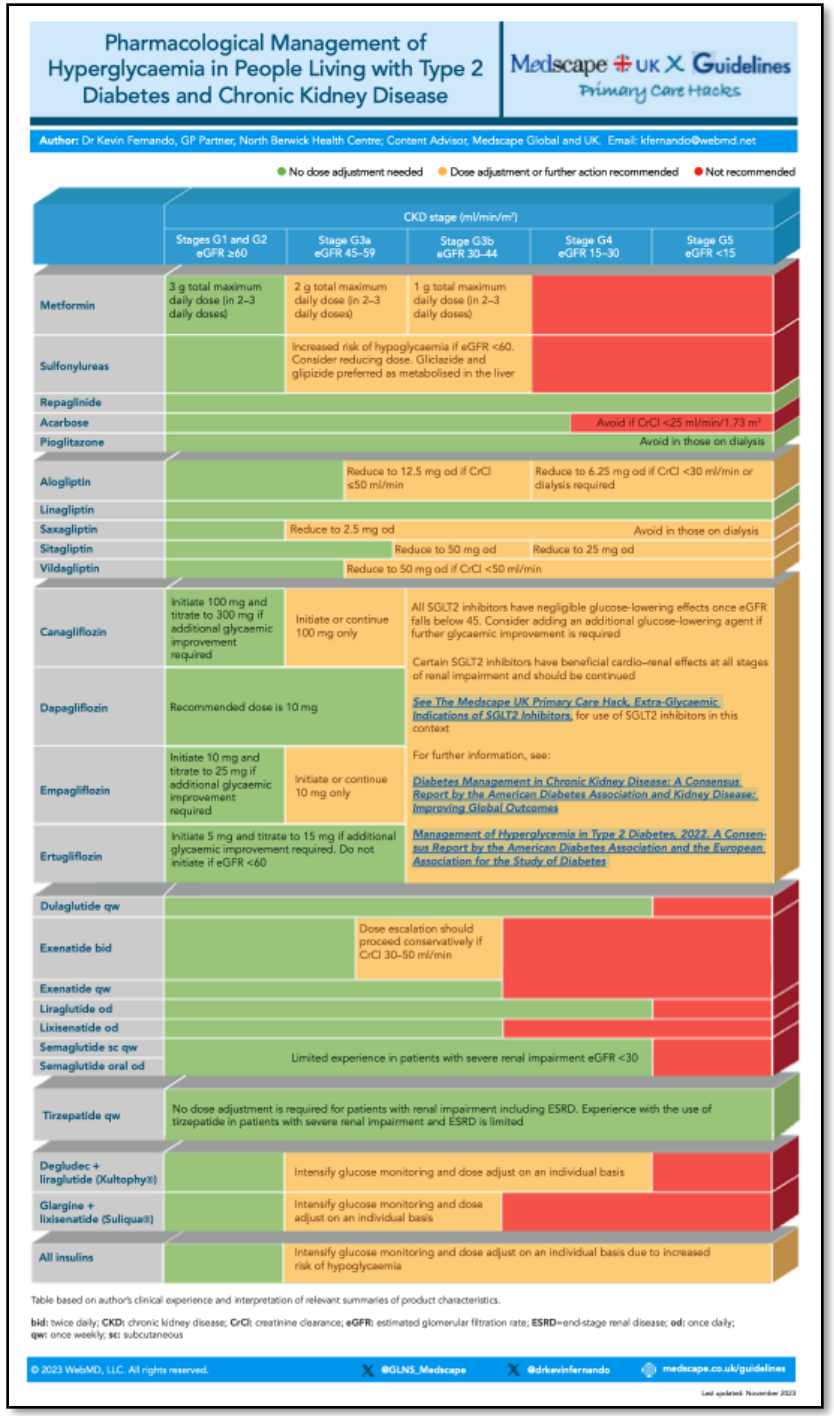
Section 2	PEOPLE WITH TYPE 2 DM	Grade
1.	We recommend initiating SGLT-2 inhibition in people with chronic kidney disease and type 2 diabetes, irrespective of primary kidney disease,* for any of the following 4 clinical scenarios: a) eGFR of 20-45 mL/min/1.73m^2 b) eGFR of >45 mL/min/1.73m^2 and a urinary albumin-to-creatinine ratio (uACR) of ≥25 mg/mmol† c) Symptomatic heart failure, irrespective of ejection fraction d) Established coronary disease	1A
2.	We suggest initiating SGLT-2 inhibition to modify cardiovascular risk and slow rate of kidney function decline in people with an eGFR >45-60 mL/min/1.73m^2 and a uACR of <25 mg/mmol, recognising effects on glycaemic control will be limited.	2B
3.	We suggest clinicians consider initiating SGLT-2 inhibition in people with an eGFR below 20 mL/min/1.73m^2 to slow progression of kidney disease.	2B

▲ Recommendations for Use in people without DM

Section 3	PEOPLE WITHOUT DM	
1.	We recommend initiating SGLT-2 inhibition in people with chronic kidney disease, irrespective of primary kidney disease,* for any of the following clinical scenarios: (a) eGFR of ≥20 mL/min/1.73m^2 and a urinary albumin-to-creatinine ratio (uACR) of ≥25 mg/mmol† (b) Symptomatic heart failure, irrespective of ejection fraction	1A
2.	We recommend initiating SGLT-2 inhibition to slow rate of kidney function decline in people with an eGFR of 20-45 mL/min/1.73m^2 and a uACR of <25 mg/mmol†.	1B
3.	We suggest clinicians consider initiating SGLT-2 inhibition in people with an eGFR below 20 mL/min/1.73m^2 to slow progression of kidney disease.	2B
** excludes people with polycystic kidney disease, type 1 diabetes, or a kidney transplant* *† urinary protein-to-creatinine ratio of 35 mg/mmol can be considered equivalent*		

DM, diabetes mellitus; eGFR, estimated glomerular filtration rate.

1. UKKA. UK Kidney Association Clinical Practice Guideline: Sodium-Glucose Co-transporter-2 (SGLT-2) Inhibition in Adults with Kidney Disease. Available at: https://guidelines.ukkidney.org/. Accessed October 2024;
2. UKKA. Summary of Recommendations. Available at: https://guidelines.ukkidney.org/summary-of-recommendations/. Accessed October 2024.



Pharmacological Management of Hyperglycaemia in People Living with Type 2 Diabetes and Chronic Kidney Disease

Medscape UK X Guidelines
Primary Care Hacks

Author: Dr Kevin Fernando, GP Partner, North Berwick Health Centre; Content Advisor, Medscape Global and UK. Email: kfernando@webmd.net

● No dose adjustment needed ● Dose adjustment or further action recommended ● Not recommended

	CKD stage (ml/min/m²)				
	Stages G1 and G2 eGFR ≥60	Stage G3a eGFR 45–59	Stage G3b eGFR 30–44	Stage G4 eGFR 15–30	Stage G5 eGFR <15
Metformin	3 g total maximum daily dose (in 2–3 daily doses)	2 g total maximum daily dose (in 2–3 daily doses)	1 g total maximum daily dose (in 2–3 daily doses)		
Sulfonylureas		Increased risk of hypoglycaemia if eGFR <60. Consider reducing dose. Gliclazide and glipizide preferred as metabolised in the liver			
Repaglinide					
Acarbose				Avoid if CrCl <25 ml/min/1.73 m²	
Pioglitazone				Avoid in those on dialysis	
Alogliptin			Reduce to 12.5 mg od if CrCl ≤50 ml/min	Reduce to 6.25 mg od if CrCl <30 ml/min or dialysis required	
Linagliptin					
Saxagliptin		Reduce to 2.5 mg od		Avoid in those on dialysis	
Sitagliptin			Reduce to 50 mg od	Reduce to 25 mg od	
Vildagliptin			Reduce to 50 mg od if CrCl <50 ml/min		
Canagliflozin	Initiate 100 mg and titrate to 300 mg if additional glycaemic improvement required	Initiate or continue 100 mg only	All SGLT2 inhibitors have negligible glucose-lowering effects once eGFR falls below 45. Consider adding an additional glucose-lowering agent if further glycaemic improvement is required Certain SGLT2 inhibitors have beneficial cardio–renal effects at all stages of renal impairment and should be continued *See The Medscape UK Primary Care Hack, Extra-Glycaemic Indications of SGLT2 Inhibitors*, for use of SGLT2 inhibitors in this context For further information, see: *Diabetes Management in Chronic Kidney Disease: A Consensus Report by the American Diabetes Association and Kidney Disease: Improving Global Outcomes* *Management of Hyperglycemia in Type 2 Diabetes, 2022. A Consensus Report by the American Diabetes Association and the European Association for the Study of Diabetes*		
Dapagliflozin	Recommended dose is 10 mg				
Empagliflozin	Initiate 10 mg and titrate to 25 mg if additional glycaemic improvement required	Initiate or continue 10 mg only			
Ertugliflozin	Initiate 5 mg and titrate to 15 mg if additional glycaemic improvement required. Do not initiate if eGFR <60				
Dulaglutide qw					
Exenatide bid		Dose escalation should proceed conservatively if CrCl 30–50 ml/min			
Exenatide qw					
Liraglutide od					
Lixisenatide od					
Semaglutide sc qw	Limited experience in patients with severe renal impairment eGFR <30				
Semaglutide oral od					
Tirzepatide qw	No dose adjustment is required for patients with renal impairment including ESRD. Experience with the use of tirzepatide in patients with severe renal impairment and ESRD is limited				
Degludec + liraglutide (Xultophy®)		Intensify glucose monitoring and dose adjust on an individual basis			
Glargine + lixisenatide (Suliqua®)		Intensify glucose monitoring and dose adjust on an individual basis			
All insulins		Intensify glucose monitoring and dose adjust on an individual basis due to increased risk of hypoglycaemia			

Table based on author's clinical experience and interpretation of relevant summaries of product characteristics.

bid: twice daily; **CKD:** chronic kidney disease; **CrCl:** creatinine clearance; **eGFR:** estimated glomerular filtration rate; **ESRD**=end-stage renal disease; **od:** once daily; **qw:** once weekly; **sc:** subcutaneous

@GLNS_Medscape @drkevinfernando medscape.co.uk/guidelines

Last updated: November 2023

bitly

The glucose-lowering efficacy of all SGLT2 inhibitors is dependent on renal function and is negligible when eGFR <45

If eGFR falls <45, additional glucose-lowering treatment should be considered in people living with T2D

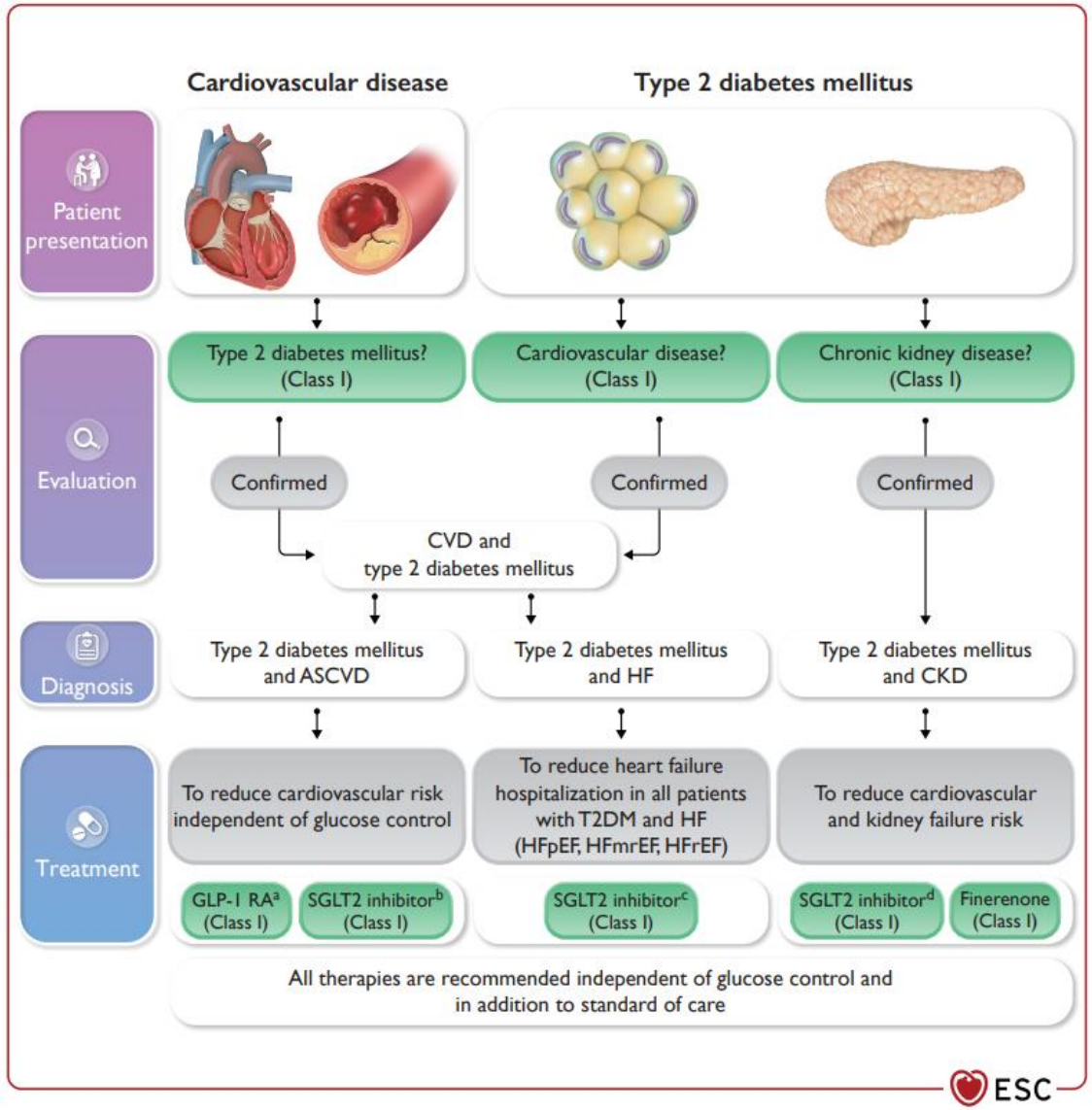
2023 ESC Guidelines for the management of cardiovascular disease in patients with diabetes

Official ESC Guidelines slide set

ESC
European Society of Cardiology

ESC, European Society of Cardiology.
Marx N, et al. Eur Heart J 2023;44:4043-4140.

Figure 1: Management of CVD in patients with type 2 diabetes: clinical approach and key recommendations

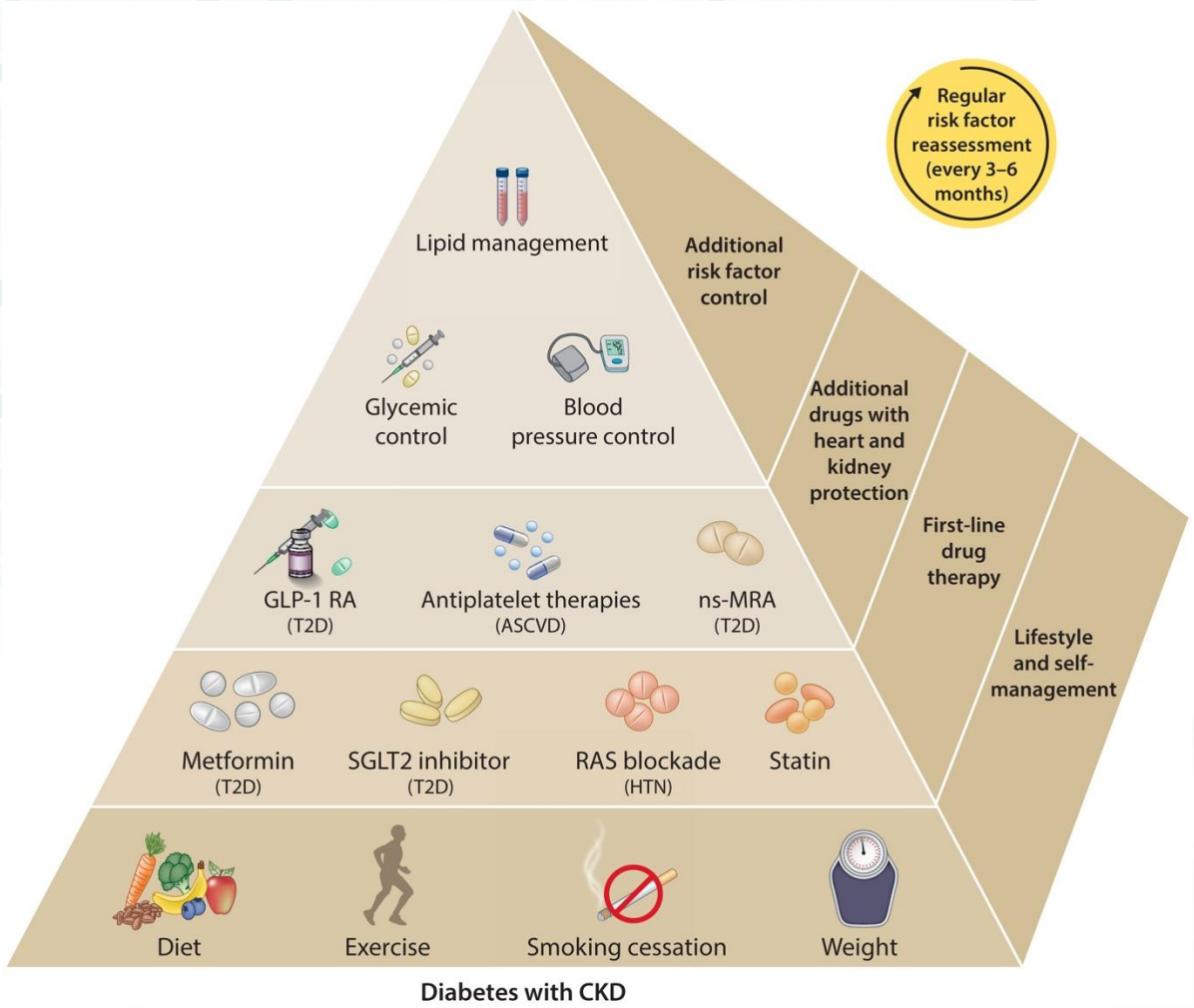


ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; CVD, cardiovascular disease; ESC, European Society of Cardiology; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HF, heart failure; HFmrEF, heart failure with mildly reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; SGLT2, sodium-glucose cotransporter-2; T2DM, type 2 diabetes mellitus.

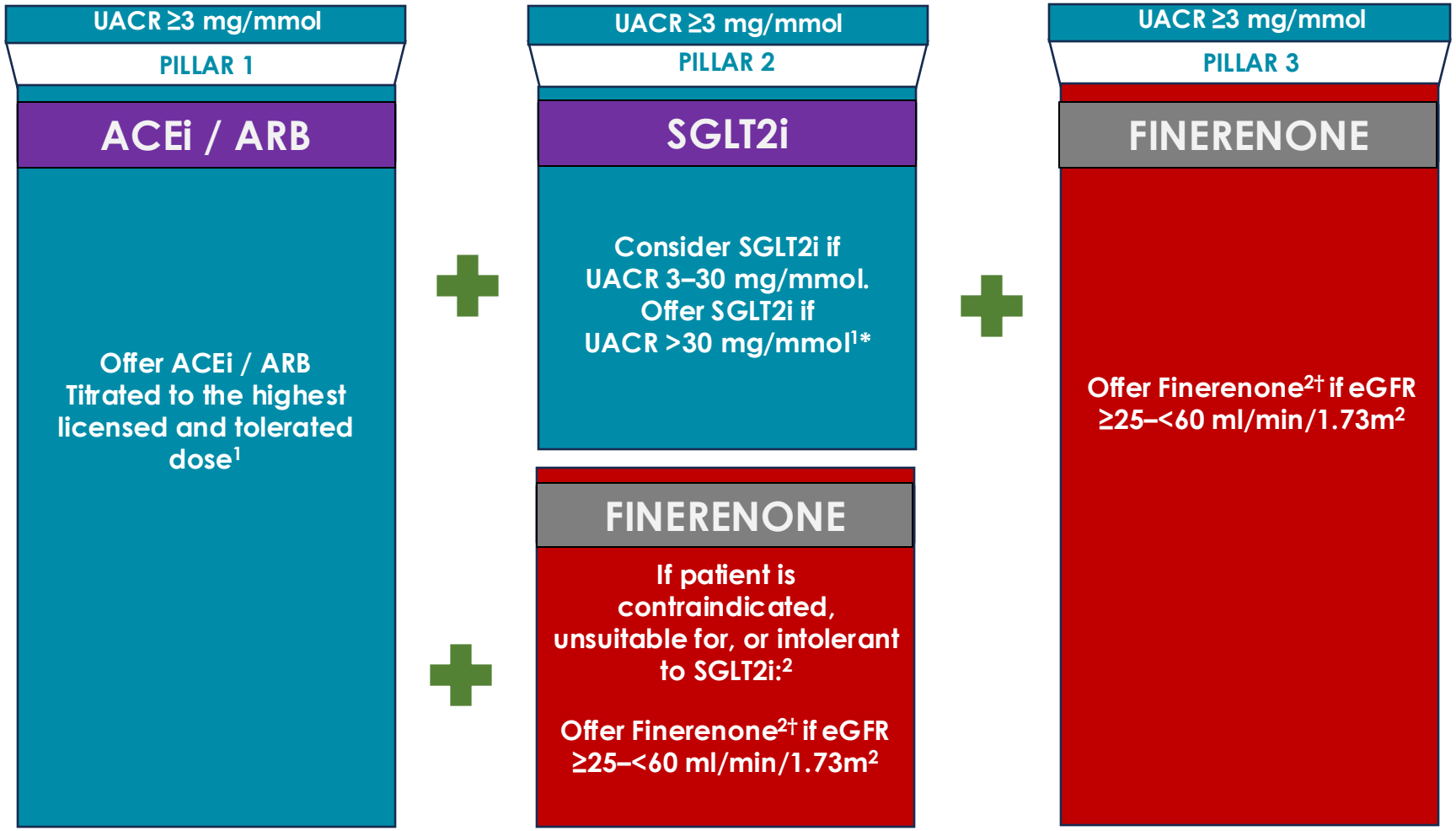
Marx N, et al. Eur Heart J 2023;44:4043-4140.

Comprehensive Care in Patients with Diabetes and CKD

Practice Point 1.1.1: Patients with diabetes and chronic kidney disease (CKD) should be treated with a comprehensive strategy to reduce risks of kidney disease progression and cardiovascular disease (Figure 1 and 2).



Three pillars approach to management of CKD associated with T2D



***If criteria met and within licence, unless unsuitable.[1] Refer to relevant SGLT2i SmPC before prescribing due to variability in licenses.**
†If criteria met and within licence.[2]

ACEi, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; SGLT2i, sodium-glucose cotransporter 2 inhibitor; SmPC, summary of product characteristics; T2D, type 2 diabetes; UACR, urinary albumin to creatinine ratio.

1. NICE. Type 2 diabetes in adults: management [NG28]. Available at: https://www.nice.org.uk/guidance/ng28. Accessed October 2024; 2. NICE. Finerenone for treating chronic kidney disease in type 2 diabetes [TA877]. Available at: https://www.nice.org.uk/guidance/ta877. Accessed October 2024.

WHO SHOULD BE TESTED FOR CKD?

Offer testing using eGFR, creatinine & ACR if these risk factors present:

- ❑ Diabetes
- ❑ Hypertension
- ❑ Previous AKI
- ❑ CVD
- ❑ Structural renal tract disease, recurrent renal calculi or BPH
- ❑ Multisystem disease with potential renal involvement e.g. SLE
- ❑ Gout
- ❑ FH of ESRD or hereditary kidney disease
- ❑ Incidental haematuria or proteinuria

•Reference: NICE NG203 2021. CKD: assessment & management

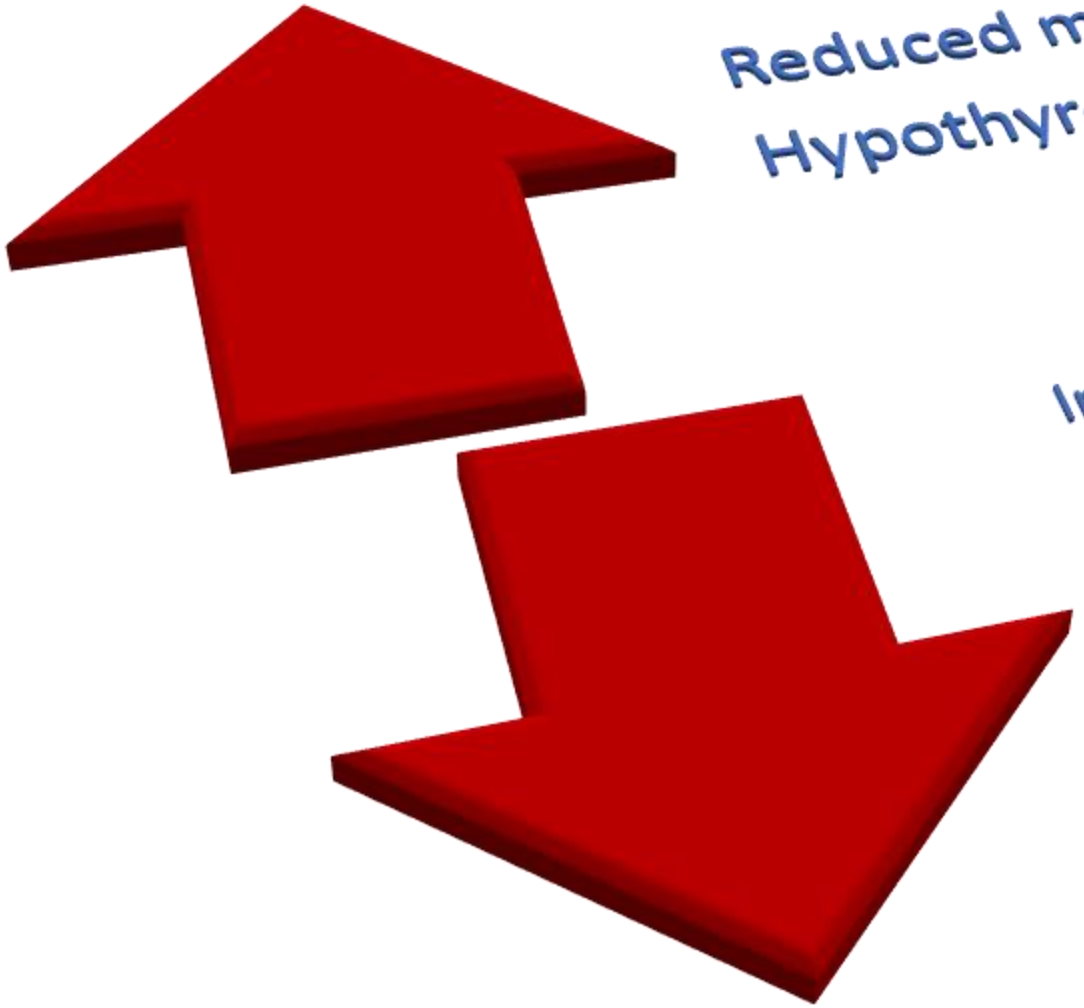
Pitfalls & Cautions When Interpreting eGFR[1]

- It is only an estimate and significant error is possible…
- Most likely to be inaccurate in people at extremes of body type e.g. limb amputations, malnourished or morbidly obese
- Also AKI, pregnancy, oedematous states & certain ethnic groups
- Identifying trends in eGFR is often more informative

AKI, acute kidney injury; eGFR, estimated glomerular filtration rate.

1. UKKA. Measurement of kidney function. Available at: https://ukkidney.org/health-professionals/information-resources/uk-eckd-guide/measurement-kidney-function. Accessed October 2024.

Pitfalls & Cautions When Interpreting eGFR



Reduced muscle mass
Hypothyroidism

Increased muscle mass
Hyperthyroidism
Dehydration
Eating meat during 12hrs before testing
Delay processing sample >12hrs

eGFR, estimated glomerular filtration rate.

1. UKKA. Measurement of kidney function. Available at: https://ukkidney.org/health-professionals/information-resources/uk-eckd-guide/measurement-kidney-function. Accessed October 2024; 2. Naguib R and Elkemary E. Cureus 2023;15:e35242; 3. Roncal-Jimenez C, et al. Ann Nutr Metab 2015;66:10–13.

Pitfalls & Cautions When Interpreting Urinary ACR

- Send off sample in plain urine container[1,2]
  - No need for early morning sample
  - Can be stored overnight in fridge
  - **ACR>3mg/mmol** is clinically important proteinuria in PLWD[1]
    - 2 positive samples over 3 months

- Do not use reagent strips to identify proteinuria![1]

- Why do we need 2 samples?

ACR, albumin to creatinine ratio; PLWD, people living with diabetes.

1. Royal United Hospitals Bath NHS Foundation Trust. Screening Patients for Proteinuria. Available at: https://www.ruh.nhs.uk/pathology/documents/clinical_guidelines/PATH-005_Screening_Patients_for_Proteinuria%20Guideline.pdf?t=15010.9. Accessed October 2024; 2. Gloucestershire Hospitals NHS Foundation Trust. Available at: https://www.gloshospitals.nhs.uk/our-services/services-we-offer/pathology/tests-and-investigations/albumincreatinine-ratio-acr-and-proteincreatinine-ratio-pcr/. Accessed October 2024.

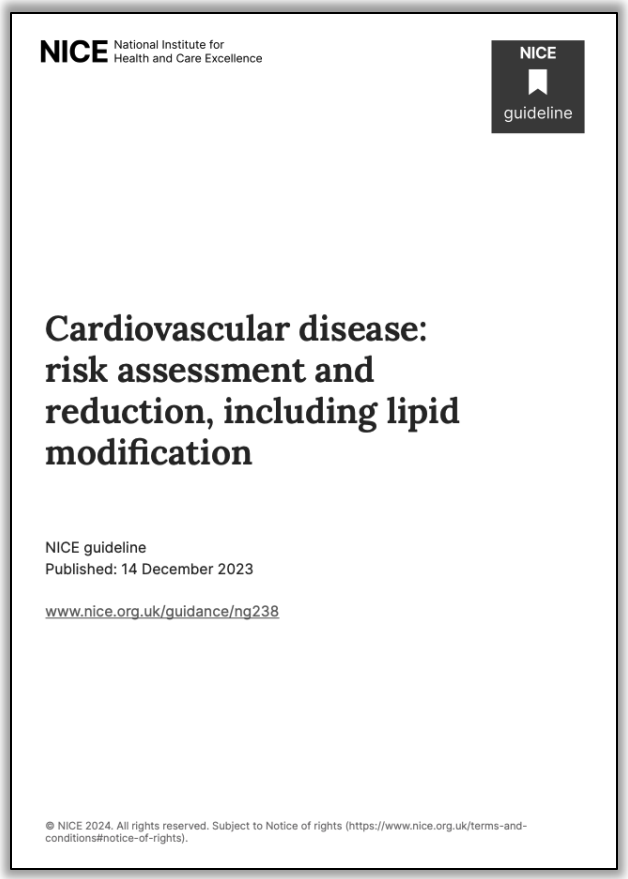
Causes of transient albuminuria:

- Biological variability
- Recent heavy exercise
- Acute fluid loads or diuresis
- Orthostatic proteinuria
- UTI / any febrile illness
- Decompensated heart failure
- Menstruation
- Acute elevation in BP or blood glucose

BP, blood pressure; UTI, urinary tract infection.

1. UKKA. UK Kidney Association Clinical Practice Guideline: Sodium-Glucose Co-transporter-2 (SGLT-2) Inhibition in Adults with Kidney Disease. Available at: https://ukkidney.org/sites/renal.org/files/UKKA%20guideline_SGLT2i%20in%20adults%20with%20kidney%20disease%20v1%2020.10.21.pdf. Accessed October 2024; 2. Park S, et al. Front Cardiovasc Med 2022;9:882599; 3. Haider MZ and Aslam A. Proteinuria. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available at: https://www.ncbi.nlm.nih.gov/books/NBK564390/. Accessed October 2024.

Lipid-lowering


NICE National Institute for Health and Care Excellence

NICE guideline

Cardiovascular disease: risk assessment and reduction, including lipid modification

NICE guideline
Published: 14 December 2023

www.nice.org.uk/guidance/ng238

Atorvastatin 20mg for primary or secondary prevention of CVD for people with CKD

- ❑ For primary prevention, aim for >40% ↓ non-HDL-C
- ❑ For secondary prevention, aim for LDL-C ≤2mmol/L or non-HDL ≤2.6mmol/L
- ❑ Increase dose of atorvastatin if lipid targets not met
- ❑ Agree use of higher doses with renal specialist if eGFR <30ml/min/1.73m^2

CKD, chronic kidney disease; CVD, cardiovascular disease; eGFR, estimated glomerular filtration rate; HDL-C, high density lipoprotein; LDL-C, low density lipoprotein.

NICE. Cardiovascular disease: risk assessment and reduction, including lipid modification [NG238]. Available at: https://www.nice.org.uk/guidance/ng238. Accessed October 2024.

BP-lowering (adults)

NICE NG203 (2021) recommendations[1]	Target mmHg
CKD and ACR <70 mg/mmol	120–139/<90
CKD and ACR ≥70 mg/mmol	120–129/<80

- T2D & hypertension: commence ACEi or ARB irrespective of age or ethnicity[2]
- For people aged ≥80 years, aim for a clinic BP <150/90mmHg[2]

ACEi, angiotensin converting enzyme inhibitor; ACR, albumin to creatinine ratio; ARB, angiotensin receptor blocker; BP, blood pressure; CKD, chronic kidney disease; NICE, National Institute for Health and Care Excellence; T2D, type 2 diabetes.

1. NICE. Chronic kidney disease: assessment and management [NG203]. Available at: https://www.nice.org.uk/guidance/ng203. Accessed October 2024; 2. NICE. Hypertension in adults: diagnosis and management [NG136]. Available at: https://www.nice.org.uk/guidance/ng136. Accessed October 2024.

Oral antiplatelets

What does NICE NG203 recommend?

- Offer to adults with CKD for CVD secondary prevention

  But be aware of ↑ risk of bleeding

CKD, chronic kidney disease; CVD, cardiovascular disease; NICE, National Institute for Health and Care Excellence,
NICE. Chronic kidney disease: assessment and management [NG203]. Available at: https://www.nice.org.uk/guidance/ng203. Accessed October 2024.

HbA1c targets

- Tight glycaemic control reduces risk of microvascular disease

  However, no consensus on glycaemic targets

- Little evidence HbA1c <53mmol/mol reduces progression especially if ≥CKD G3
- Individualised HbA1c targets

NOTE

Anaemia in CKD may invalidate HbA1c assay

CKD, chronic kidney disease; DN, diabetic nephropathy; GLP-1, glucagon-like peptide-1; HbA1c, glycated haemoglobin; SGLT-2, sodium-glucose cotransporter 2.

1. Winocour P, et al. Br J Diabetes 2018;18:78–89; 2. Cochrane SR CD10137 2017.

HbA1c targets

- Tight glycaemic … vascular disease

  However, no co … ts

- Little evidence … s progression especially if ≥CK

- Individualised H …

  NOTE

  Anaemia in CK … ay

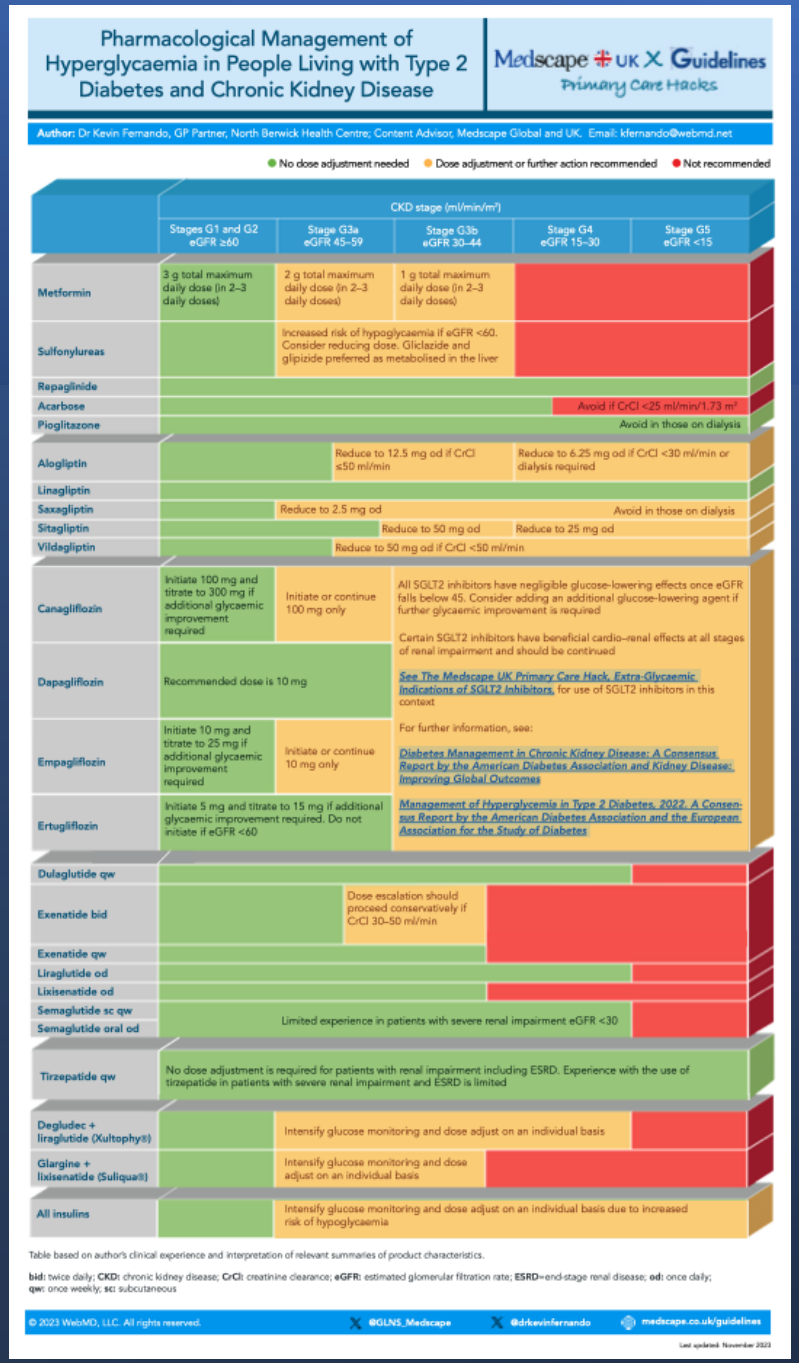
Table 1 Glycaemic targets in patients with diabetes and diabetic nephropathy–chronic kidney disease (DN-CKD)

	Glycaemic target	Note
Type 1 diabetes	48–58 mmol/mol (6.5–7.5%)	Younger patients within 10 years' duration of diabetes and variable microalbuminuria–CKD stage 2
	58–62 mmol/mol (7.5–7.8%)	The majority of patients with proteinuria and/or CKD stages 3–4
	58–68 mmol/mol (7.5–8.5%)	Patients with CKD stage 5 dialysis
Type 2 diabetes	48–58 mmol/mol (6.5–7.5%)	For the majority of patients who are aged <40 years, or have CKD stages 1–2 (no basis to aim for <52 mmol/mol (6.9%) unless the patient is aged <40 years and has CKD stages 1–2)
	52–58 mmol/mol (6.9–7.5%)	For those with CKD stages 3–4 this target may be appropriate with a GLP-1/SGLT-2 inhibitor-based treatment regime without insulin
	58–68 mmol/mol (7.5–8.5 %)	For those with CKD stages 3–4 proteinuria who are on an insulin-based regime, and those with CKD stage 5 who are on dialysis

GLP-1, glucagon-like peptide-1; SGLT-2, sodium glucose co-transporter-2.

CKD, chronic kidney disease; DN, diabetic nephropathy; GLP-1, … porter 2.

1. Winocour P, et al. Br J Diabetes 2018;18:78–89; 2. Cochrane SR CD10137 2017.



Pharmacological Management of Hyperglycaemia in People Living with Type 2 Diabetes and Chronic Kidney Disease

Medscape UK X Guidelines
Primary Care Hacks

Author: Dr Kevin Fernando, GP Partner, North Berwick Health Centre; Content Advisor, Medscape Global and UK. Email: kfernando@webmd.net

● No dose adjustment needed ● Dose adjustment or further action recommended ● Not recommended

	CKD stage (ml/min/m²)				
	Stages G1 and G2 eGFR ≥60	Stage G3a eGFR 45–59	Stage G3b eGFR 30–44	Stage G4 eGFR 15–30	Stage G5 eGFR <15
Metformin	3 g total maximum daily dose (in 2–3 daily doses)	2 g total maximum daily dose (in 2–3 daily doses)	1 g total maximum daily dose (in 2–3 daily doses)		
Sulfonylureas		Increased risk of hypoglycaemia if eGFR <60. Consider reducing dose. Gliclazide and glipizide preferred as metabolised in the liver			
Repaglinide					
Acarbose				Avoid if CrCl <25 ml/min/1.73 m²	
Pioglitazone				Avoid in those on dialysis	
Alogliptin			Reduce to 12.5 mg od if CrCl ≤50 ml/min	Reduce to 6.25 mg od if CrCl <30 ml/min or dialysis required	
Linagliptin					
Saxagliptin		Reduce to 2.5 mg od		Avoid in those on dialysis	
Sitagliptin			Reduce to 50 mg od	Reduce to 25 mg od	
Vildagliptin			Reduce to 50 mg od if CrCl <50 ml/min		
Canagliflozin	Initiate 100 mg and titrate to 300 mg if additional glycaemic improvement required	Initiate or continue 100 mg only	All SGLT2 inhibitors have negligible glucose-lowering effects once eGFR falls below 45. Consider adding an additional glucose-lowering agent if further glycaemic improvement is required Certain SGLT2 inhibitors have beneficial cardio–renal effects at all stages of renal impairment and should be continued *See The Medscape UK Primary Care Hack, Extra-Glycaemic Indications of SGLT2 Inhibitors*, for use of SGLT2 inhibitors in this context For further information, see: *Diabetes Management in Chronic Kidney Disease: A Consensus Report by the American Diabetes Association and Kidney Disease: Improving Global Outcomes* *Management of Hyperglycemia in Type 2 Diabetes, 2022. A Consensus Report by the American Diabetes Association and the European Association for the Study of Diabetes*		
Dapagliflozin	Recommended dose is 10 mg				
Empagliflozin	Initiate 10 mg and titrate to 25 mg if additional glycaemic improvement required	Initiate or continue 10 mg only			
Ertugliflozin	Initiate 5 mg and titrate to 15 mg if additional glycaemic improvement required. Do not initiate if eGFR <60				
Dulaglutide qw					
Exenatide bid			Dose escalation should proceed conservatively if CrCl 30–50 ml/min		
Exenatide qw					
Liraglutide od					
Lixisenatide od					
Semaglutide sc qw	Limited experience in patients with severe renal impairment eGFR <30				
Semaglutide oral od					
Tirzepatide qw	No dose adjustment is required for patients with renal impairment including ESRD. Experience with the use of tirzepatide in patients with severe renal impairment and ESRD is limited				
Degludec + liraglutide (Xultophy®)		Intensify glucose monitoring and dose adjust on an individual basis			
Glargine + lixisenatide (Suliqua®)		Intensify glucose monitoring and dose adjust on an individual basis			
All insulins		Intensify glucose monitoring and dose adjust on an individual basis due to increased risk of hypoglycaemia			

Table based on author's clinical experience and interpretation of relevant summaries of product characteristics.

bid: twice daily; **CKD:** chronic kidney disease; **CrCl:** creatinine clearance; **eGFR:** estimated glomerular filtration rate; **ESRD**=end-stage renal disease; **od:** once daily; **qw:** once weekly; **sc:** subcutaneous

@GLNS_Medscape @drkevinfernando medscape.co.uk/guidelines

Last updated: November 2023

bitly

Medscape UK. Guidelines Primary Care Hacks: Pharmacological Management of Hyperglycaemia in People Living with Type 2 Diabetes and Chronic Kidney Disease. Available at: https://www.medscape.co.uk/viewarticle/primary-care-hacks-pharmacological-management-hyperglycaemia-2022a10024hx. Accessed October 2024.

When to consider referral?

- ❑ 5-year risk of needing RRT >5% measured using 4-variable KFRE
- ❑ Sustained ⬇ in eGFR ≥25% and change in eGFR category
- ❑ Sustained ⬇ in eGFR ≥15 within 12 months
- ❑ ACR ≥70mg/mmol unless known to be caused by diabetes & appropriately treated
- ❑ ACR >30mg/mmol (A3) with haematuria
- ❑ Poorly controlled BP despite 4 agents
- ❑ Suspected renal artery stenosis
- ❑ Known or suspected rare or genetic causes of CKD
- ❑ RRT required within lifetime?

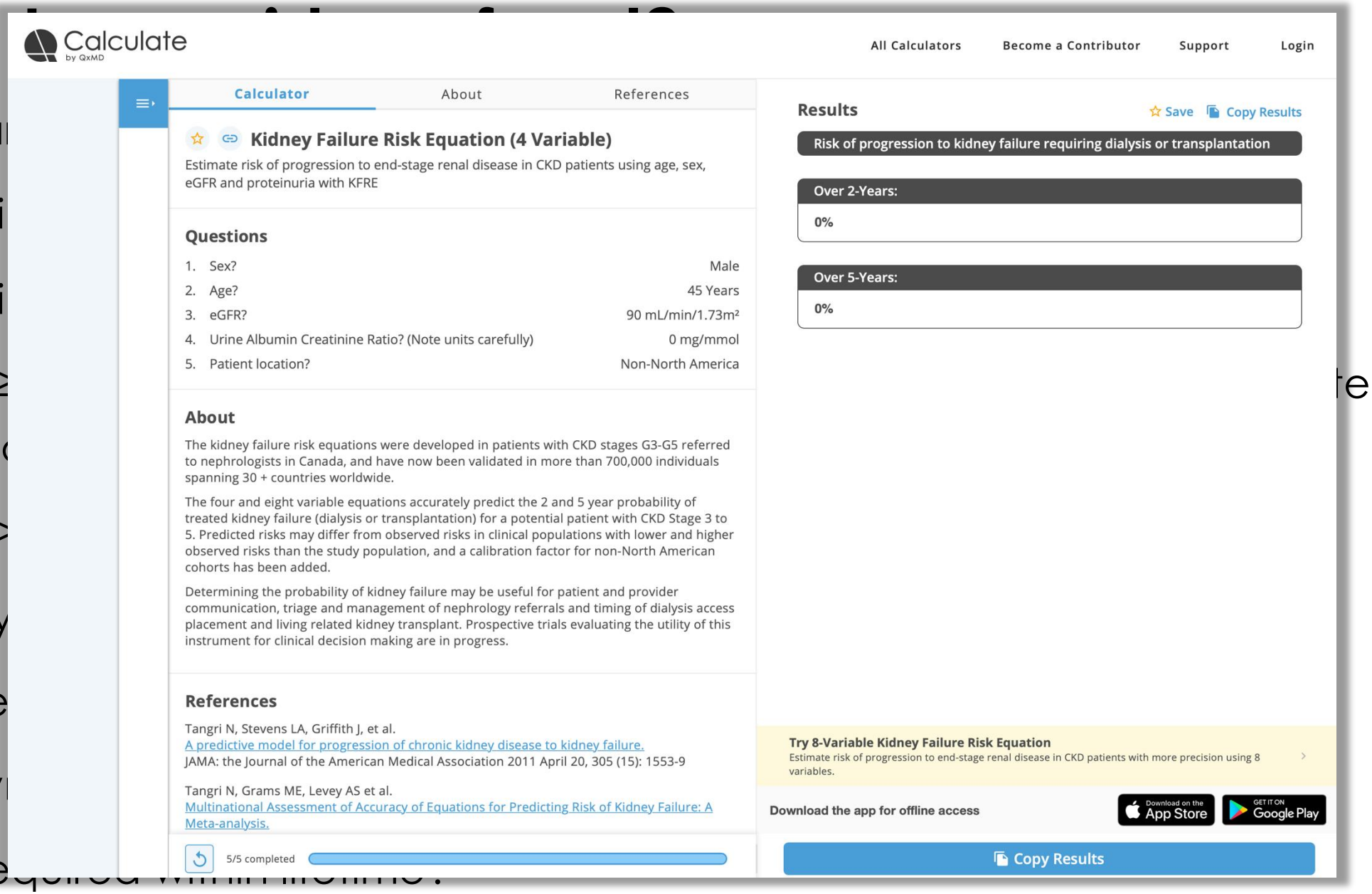
ACR, albumin to creatinine ratio; BP, blood pressure; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; KFRE, Kidney Failure Risk Equation; RRT, renal replacement therapy.

1. NICE. Chronic kidney disease: assessment and management [NG203]. Available at: https://www.nice.org.uk/guidance/ng203. Accessed October 2024; 2. Calculate by QxMD. Kidney Failure Risk Equation (4 Variable). Available at: https://qxmd.com/calculate/calculator_308/kidney-failure-risk-equation-4-variable. Accessed October 2024.

When

- ❑ 5-yea
- ❑ Sustai
- ❑ Sustai
- ❑ ACR ≥
  treate
- ❑ ACR >
- ❑ Poorly
- ❑ Suspe
- ❑ Know
- ❑ RRT re

tely



ACR, albumin to creatinine ratio; BP, blood pressure; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; KFRE, Kidney Failure Risk Equation; RRT, renal replacement therapy.
1. NICE. Chronic kidney disease: assessment and management [NG203]. Available at: https://www.nice.org.uk/guidance/ng203. Accessed October 2024; 2. Calculate by QxMD. Kidney Failure Risk Equation (4 Variable). Available at: https://qxmd.com/calculate/calculator_308/kidney-failure-risk-equation-4-variable. Accessed October 2024.

2. RAASis and Blood Pressure[3–5,12,18–25]

- Aim for **SBP <130 mmHg**, or **as low as reasonably achievable**[A]
- Follow NG136[19] and NG203[3] when choosing medications
- When RAASi is first line, choose an **ARB**[B]
- Independent of BP:[B]
  - if uACR >30 mg/mmol: start **ARB** and titrate to maximum tolerated dose
  - if uACR >3 mg/mmol in people with diabetes: start **ARB** and titrate to maximum tolerated dose
    - additional agents may be required
- If eGFR <60 ml/min/1.73 m^2 when starting or increasing RAASi, check U&E within **28 days**; if eGFR ≥60 ml/min/1.73 m^2, there is no need to routinely recheck U&E
  - **if K+ ≥5.5 mmol/l or sCr rise ≥50% encountered, follow Figure 1**; otherwise, continue to optimise RAASi dose.

Figure 1: Managing Acute Changes in Kidney Function Related to RAASis[3,22–25]

	Serum K+ (mmol/l)		
	5.5–6.1	**6.2–6.4**	**≥6.5**
Unwell and/or ≥50% sCr rise	**Consider hospital referral** according to clinical circumstances, likely cause, and risk of deterioration **Suspend RAASi[1,2]**	**Urgent hospital referral** **Suspend RAASi[1,2]**	**Urgent hospital referral**
Well and <50% sCr rise	**Maintain RAASi[1,2] dose** **Repeat K+ within 14 days** If repeat K+ is: • **≤5.5**: optimise RAASi[1,2] dose • **5.6–5.9**: maintain RAASi[1,2] dose • **6.0–6.4**: suspend RAASi[1,2] and discuss initiation of K+ binders with Renal team[3,4] • **≥6.5**: **consider hospital referral**	**Halve RAASi[1,2] dose** **Repeat K+ within 7 days** If repeat K+ is: • **≤5.5**: optimise RAASi[1,2] dose • **5.6–5.9**: maintain RAASi[1,2] dose • **6.0–6.4**: suspend RAASi[1,2] and discuss initiation of K+ binders with Renal team[3,4] • **≥6.5**: **consider hospital referral**	**Consider hospital referral**

1. Note: RAASis include ACEis, ARBs, potassium-sparing diuretics, and MRAs.
2. Suspend finerenone if K+ ≥5.5 mmol/l, restarting at 10 mg when K+ is <5.0 mmol/l.
3. NICE endorses potassium binders, as they enable RAASi use in those not on dialysis.
4. See NICE TA599 and TA623. Note: that K+ binders are contraindicated in people with a history of bowel obstruction, major GI surgery, or a swallowing disorder.

Table based on the authors' clinical experience and interpretation of clinical guidance.

Interventions for Chronic Kidney Disease in Primary Care

Medscape UK × Guidelines
Primary Care Hacks

Authors: Dr Eimear Darcy, GP Partner, Grange Family Practice Omagh; **Dr William Hinchliffe**, Consultant in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Deepika Manoharan**, Registrar in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Kevin Fernando**, GP Partner, North Berwick Health Centre and Content Advisor, Medscape Global and UK (email: kfernando@webmd.net)

1. Lipids[3–5,15–18]

- For primary prevention, start **atorvastatin 20 mg OD**
- For secondary prevention, do not stop or attenuate dose if eGFR <30 ml/min/1.73 m²
- Offer **aspirin** for **secondary prevention** of CVD
- See also the Primary Care Hack on lipid management.

2. RAASis and Blood Pressure[3–5,12,18–25]

- Aim for **SBP <130 mmHg**, or **as low as reasonably achievable**[A]
- Follow NG136[19] and NG203[3] when choosing medications
- When RAASi is first line, choose an **ARB**[8]
- Independent of BP:[8]
  - if uACR >30 mg/mmol: start **ARB** and titrate to maximum tolerated dose
  - if uACR >3 mg/mmol in people with diabetes: start **ARB** and titrate to maximum tolerated dose
    - additional agents may be required
- If eGFR <60 ml/min/1.73 m² when starting or increasing RAASi, check U&E within **28 days**; if eGFR ≥60 ml/min/1.73 m², there is no need to routinely recheck U&E
  - **if K+ ≥5.5 mmol/l or sCr rise ≥50% encountered, follow Figure 1**; otherwise, continue to optimise RAASi dose.

3. SGLT2 Inhibitors[18,20,21,26]

- Once RAASi has been titrated to maximum tolerated dose, start an **SGLT2i** in eligible groups as per Figure 2, unless contraindicated (e.g. in people living with T1DM)[B],[C],[D]
- Continue the SGLT2i until dialysis or transplant[18,20,26]
- See also the Primary Care Hack on extra-glycaemic indications of SGLT2is.

4. Specific Considerations in T2DM

If T2DM, eGFR ≥25 ml/min/1.73 m², and uACR ≥3 mg/mmol (≥30 mg/g), consider adding:

- **finerenone**[B]—a nonsteroidal MRA that can be added as third line to an RAASi and an SGLT2i (or second line if SGLT2i is inappropriate or not tolerated) if serum potassium concentration is <5.0 mmol/l, to reduce the risk of adverse kidney and CV outcomes[6,8,18,20,27,28]—see **bit.ly/3v8PX4f**
- **semaglutide**[B]—the FLOW study demonstrated that weekly SC semaglutide 1 mg reduced the risk of adverse kidney and CV outcomes in T2DM and CKD[29]
  - consider if glycaemic and weight management goals are not met and/or K+ >5.0 mmol/l[5,18,21]
  - deprescribe any DPP4 inhibitor if initiating semaglutide[18]
  - do not switch to semaglutide if an existing GLP-1 RA with proven CV benefit is achieving goals (e.g. liraglutide or dulaglutide).

5. Holistic Care

- Opportunistically check FBC/HbA_1/lipids/LBTs/weight/WtHR/BP at the same time as checking U&E and ACR, to support holistic interventions (see the Primary Care Hacks T2DM CVRM checklist, as well as the Primary Care Hacks on lipid management and LBTs)
- Offer vaccinations according to the Green Book.[30,31]

Lifestyle and Dietary Modification

- Encourage **weight loss** and **smoking cessation**[3–6,8]
- Advise on **salt restriction** (ideally <2 g of sodium per day, equating to <5 g of sodium chloride)[3–5,8,12]
- If gastric protection is required, consider **H_2RAs** over PPIs, as PPI use has been associated with increased risk of nephritis and progression of CKD[13,14]
- Avoid **NSAIDs**[3–5]
- Promote **exercise** of at least 150 minutes per week[3–6,8]
- Kidney Care UK has produced a helpful patient information leaflet to support people living with CKD.

Figure 1: Managing Acute Changes in Kidney Function Related to RAASis[3,22–25]

	Serum K+ (mmol/l) 5.5–6.1	6.2–6.4	≥6.5
Unwell and/or ≥50% sCr rise	**Consider hospital referral** according to clinical circumstances, likely cause, and risk of deterioration **Suspend RAASi[1,2]**	**Urgent hospital referral** **Suspend RAASi[1,2]**	**Urgent hospital referral**
Well and <50% sCr rise	**Maintain RAASi[1,2] dose** **Repeat K+ within 14 days** If repeat K+ is: • **≤5.5**: optimise RAASi[1,2] dose • **5.6–5.9**: maintain RAASi[1,2] dose • **6.0–6.4**: suspend RAASi[1,2] and discuss initiation of K+ binders with Renal team[3,4] • **≥6.5**: **consider hospital referral**	**Halve RAASi[1,2] dose** **Repeat K+ within 7 days** If repeat K+ is: • **≤5.5**: optimise RAASi[1,2] dose • **5.6–5.9**: maintain RAASi[1,2] dose • **6.0–6.4**: suspend RAASi[1,2] and discuss initiation of K+ binders with Renal team[3,4] • **≥6.5**: **consider hospital referral**	**Consider hospital referral**

1. Note: RAASis include ACEis, ARBs, potassium-sparing diuretics, and MRAs.
2. Suspend finerenone if K+ ≥5.5 mmol/l, restarting at 10 mg when K+ is <5.0 mmol/l.
3. NICE endorses potassium binders, as they enable RAASi use in those not on dialysis.
4. See NICE TA599 and TA623. Note: that K+ binders are contraindicated in people with a history of bowel obstruction, major GI surgery, or a swallowing disorder.

Table based on the authors' clinical experience and interpretation of clinical guidance.

Figure 2: SGLT2i Initiation in CKD

eGFR (ml/min/1.73 m²)	uACR (mg/mmol) <20	≥20
≥60	Suggested in T2DM	Recommended
45–60	Suggested in T2DM	Recommended
20–45	Recommended	Recommended
<20	Suggested[E]	Suggested[E]
Dialysis	Not recommended[E]	

Footnotes

[A] BP target can be relaxed and individualised if the patient cannot tolerate SBP <130 mmHg or because of other factors, e.g. frailty, reduced life expectancy, syncope.[3–5,12] NICE recommends targets of 120–139 mmHg (SBP) and <90 mmHg (DBP) if ACR <70 mg/mmol, and targets of 120–129 mmHg and <80 mmHg if ACR ≥70 mg/mmol.[3] However, in various studies, intense SBP control has not resulted in compromise.[3,4,12]

[B] Provide advice on SICK day rules and review the SADMANS mnemonic (to include finerenone and GLP-1 RAs). See **bit.ly/4bRbejF**.[18,33]

[C] Counsel patient on the main side effects of SGLT2i use, including risk of UTIs, mycotic genital infections, Fournier's gangrene, DKA, foot disease, and dehydration.[26,33] Provide SICK day guidance, including a leaflet (**bit.ly/4bRbejF**).[24,32] **DO NOT** routinely check renal function after commencing an SGLT2i.[3,26] Consider the patient's hydration status and adjust/reduce diuretic or anti-BP doses if high risk of hypovolaemia.[26] As eGFR drops below 45 ml/min/1.73 m², SGLT2is' glycaemic efficacy reduces.[26] However, SGLT2is can be continued if tolerated until RRT.[18,20,26]

[D] Relative contraindications to SGLT2i use include immunosuppression (e.g. kidney transplantation, lupus, vasculitis) and ADPKD.[26]

[E] Do not discontinue SGLT2i if renal function deteriorates (eGFR <20 ml/min/1.73 m²), as long as the SGLT2i was initiated prior to this.[26]

ACEi=angiotensin-converting enzyme inhibitor; **ACR**=albumin to creatinine ratio; **ADPKD**=autosomal dominant polycystic kidney disease; **AKI**=acute kidney injury; **ARB**=angiotensin II receptor blocker; **BP**=blood pressure; **CKD**=chronic kidney disease; **CV**=cardiovascular; **CVD**=cardiovascular disease; **DBP**=diastolic blood pressure; **DKA**=diabetic ketoacidosis; **DPP4**=dipeptidyl peptidase-4; **eGFR**=estimated glomerular filtration rate; **FBC**=full blood count; **GI**=gastrointestinal; **GLP-1 RA**=glucagon-like peptide-1 receptor agonist; **H_2RA**=histamine-2 receptor antagonist; **Hb**=haemoglobin; **HbA_1**=haemoglobin A1c; **HF**=heart failure; **KDIGO**=Kidney Disease: Improving Global Outcomes; **K+**=potassium; **LBT**=liver blood test; **MRA**=mineralocorticoid receptor antagonist; **NG**=NICE Guideline; **NSAID**=nonsteroidal anti-inflammatory drug; **OD**=once daily; **OOH**=out of hours; **PPI**=proton-pump inhibitor; **RAASi**=renin–angiotensin–aldosterone system inhibitor; **RRT**=renal replacement therapy; **SADMANS**=sulfonylureas, ACEis, diuretics, metformin, ARBs, NSAIDs, SGLT2is; **SBP**=systolic blood pressure; **SC**=subcutaneous; **sCr**=serum creatinine; **SGLT2i**=sodium–glucose co-transporter-2 inhibitor; **SICK**=sugar, insulin, carbohydrate, ketones; **T1DM**=type 1 diabetes mellitus; **T2DM**=type 2 diabetes mellitus; **U&E**=urea and electrolytes; **uACR**=urine albumin to creatinine ratio; **UTI**=urinary tract infection; **WtHR**=waist-to-height ratio

@GLNS_Medscape @drkevinfernando medscape.co.uk/guidelines

View this Primary Care Hack online at medscape-uk.co/Hack-CKD

Last updated: February 2025.

Identification of Chronic Kidney Disease in Primary Care

Medscape UK X Guidelines
Primary Care Hacks

Authors: Dr Eimear Darcy, GP Partner, Grange Family Practice Omagh; **Dr William Hinchliffe**, Consultant in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Deepika Manoharan**, Registrar in Renal and General Medicine, South Tyneside and Sunderland Foundation NHS Trust; **Dr Kevin Fernando**, GP Partner, North Berwick Health Centre and Content Advisor, Medscape Global and UK (email: kfernando@webmd.net)

Prevention of ESRD matters, as it has lower survival rates than colorectal, prostate, and breast cancer.[1] Microalbuminuria and eGFR <60 ml/min/1.73 m² are independent and amplifying predictors of mortality risk.[2]

1. Identify Individuals at Risk of CKD[3–7]

Key Clinical Risk Factors:[3–6]
- Hypertension
- CVD
- Diabetes
- Obesity

Other Groups at Risk of CKD:[3–5]
- Previous history of AKI
- Family history of kidney failure
- Structural renal tract disease
- Recurrent nephrolithiasis
- Prostatic hypertrophy
- Gout
- Multisystem disease
- Hereditary kidney disease
- Long-term treatment with nephrotoxins (e.g. NSAIDs, lithium, CNIs)
- Older people

2. Test At-risk Adults for CKD[3,7]

Evaluate kidney function—eGFR (calculated based on sCr)
AND
Evaluate kidney damage—albuminuria (uACR[A])

If uACR ≥3 mg/mmol (≥30 mg/g) **OR** eGFR <60 ml/min/1.73 m²

If uACR <3 mg/mmol (<30 mg/g) **AND** eGFR ≥60 ml/min/1.73 m²

Retest in 3 months[B]

3. Diagnose CKD[3,7]

If low eGFR or high uACR is present for >3 months, **diagnose CKD**

Retest at least once per year

4. Classify and Code CKD[3–5,8]

CKD prognosis is depicted in the RAG/heatmap table (Figure 1); the recommended frequency for monitoring eGFR is represented by the numbers in the boxes (e.g. test once per year if uACR <3 mg/mmol and GFR ≥60 ml/min/1.73 m²)

Code CKD as priority 1, documenting eGFR + ACR + cause

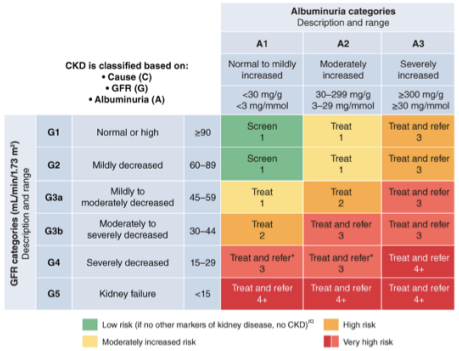


Figure 1: Risk of CKD Progression, Frequency of Monitoring, and Referral to Nephrology According to GFR and Albuminuria[8]

5. Refer to Secondary Care Where Appropriate

Refer to Renal if:[3–5,9]
- **KFRE** (kidneyfailurerisk.co.uk): 5-year risk of ESRD of >5% in CKD G3 or 2-year risk exceeds 10% if eGFR <30 ml/min/1.73 m² (G4)—it may be wise to calculate likely timing of clinical outcomes (ckdpcrisk.org/lowgfrevents) to contextualise life expectancy and probability of CVE within 2–4 years, as referral may impact QoL
- a sustained decrease in eGFR of ≥25% and a change in eGFR category within 12 months
- a sustained decrease in eGFR of ≥15 ml/min/1.73 m² per year
- uACR 70 mg/mmol, unless known to be secondary to diabetes
- uACR >30 mg/mmol **AND** haematuria
- poorly controlled hypertension, despite the use of **at least four** antihypertensives
- suspected genetic causation, e.g. PKD
- suspected renal artery stenosis
- recurrent nephrolithiasis
- persistent anaemia (Hb <10 g/dl) in G4, as EPO and intravenous iron may help QoL
- any previous episode where serum potassium has breached 6 mmol/l.

Urgent/immediate referral to/discussion with specialist services may be warranted if:[10]
- eGFR <15 ml/min/1.73 m²
- AKI
- nephrotic syndrome (heavy proteinuria with low serum albumin)
- hypertensive crisis: BP >180/120 mmHg
- suspicion that a systemic illness (e.g. sarcoidosis, myeloma) has renal involvement.

In patients with persistent NVH and no evidence of UTI, refer to Urology using a **suspected cancer pathway referral** if age ≥60 years (do not assume secondary to CKD).[11]

Footnotes

[A] A spot uACR is acceptable.[3,6]

[B] NICE suggests repeating the eGFR within 2 weeks if eGFR <60 ml/min/1.73 m²[3];—this is at the discretion of the ordering clinician, based on the acuity of the presenting cause. If there is persistent invisible haematuria, also consider referring for investigation for urinary tract malignancy.[3]

[C] Key markers of kidney disease include urine sediment abnormalities, tubular disorders, histology-proven abnormalities, imaging-proven structural abnormalities, and kidney transplantation.[4,5]

ACR=albumin to creatinine ratio; **AKI**=acute kidney injury; **BP**=blood pressure; **CKD**=chronic kidney disease; **CNI**=calcineurin inhibitor; **CVD**=cardiovascular disease; **CVE**=cardiovascular event; **eGFR**=estimated glomerular filtration rate; **EPO**=erythropoietin; **ESRD**=end-stage renal disease; **GFR**=glomerular filtration rate; **KFRE**=Kidney Failure Risk Equation; **NSAID**=nonsteroidal anti-inflammatory drug; **NVH**=non-visible haematuria; **PKD**=polycystic kidney disease; **QoL**=quality of life; **RAG**=red, amber, green; **sCr**=serum creatinine; **uACR**=urine albumin to creatinine ratio; **UTI**=urinary tract infection

@GLNS_Medscape @drkevinfernando medscape.co.uk/guidelines

View this Primary Care Hack online at medscape-uk.co/Hack-CKD

Last updated: February 2025.

Thank-you for listening. Any questions?

 kevinfernando@doctors.org.uk

 @drkevinfernando

 Kevin Fernando