NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINE

Chronic Kidney Disease, Adult: Diagnosis and Management

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

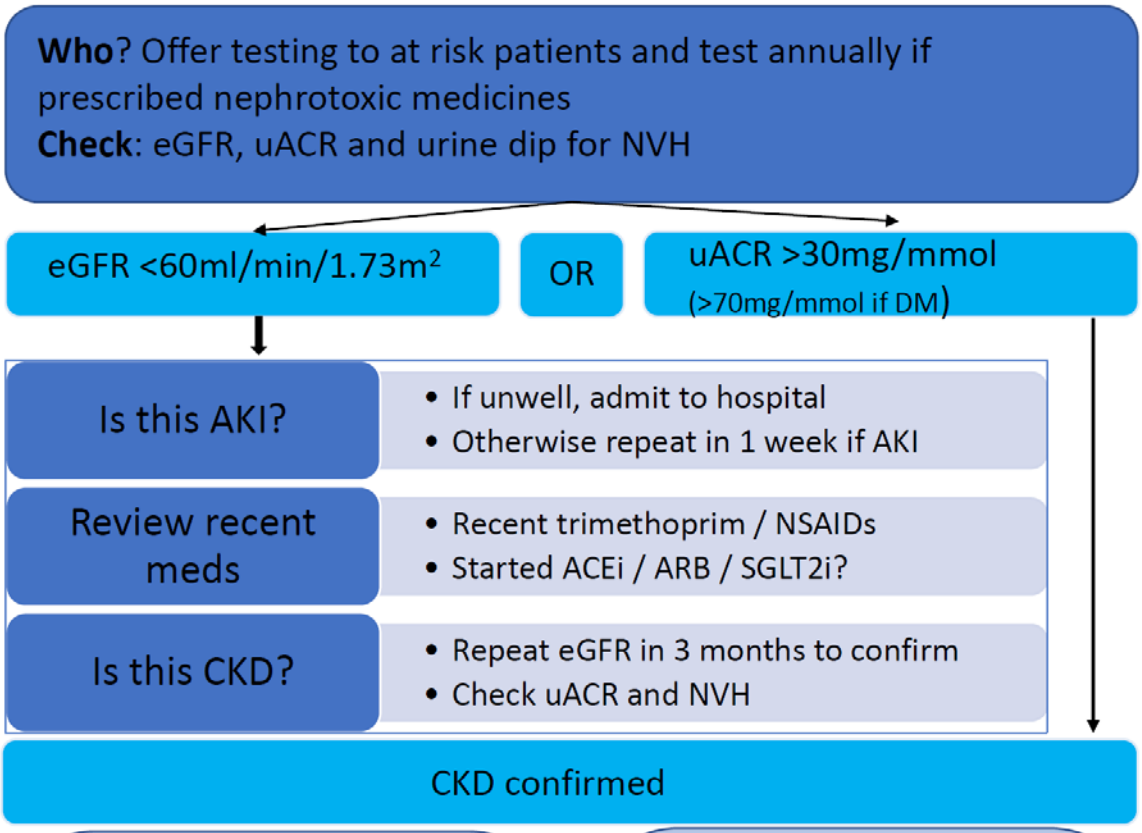
If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

Version Number:	1
Does this version include changes to clinical advice:	N/A
Date Approved:	10th May 2023
Date of Next Review:	1st April 2026
Lead Author:	Emily McQuarrie
Approval Group:	Medicines Utilisation Subcommittee of ADTC

Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

CKD diagnosis and management in primary care: An overview



Primary care management:

1. Consider cardiovascular risk and lifestyle measures
2. Review regular medicines and doses of currently prescribed medicines
3. Manage blood pressure to target <140/90mmHg (unless uACR >70mg/mmol or diabetes: <130/80mmHg – ACE/ARB preferred)
4. Consider SGLT2i
5. Monitor renal function – frequency depends on stage of CKD and proteinuria
6. Refer to renal if needed

Refer renal if:

1. Cause of CKD unclear
2. eGFR dropping quickly e.g.
   A. CKD 4/5
   B. eGFR drop >25% in 12 months
   C. KFRE >5%
3. Significant proteinuria (uACR >30mg/mmol without diabetes; uACR >70mg/mmol with diabetes

Aims of referral:

1. Establish diagnosis
2. Manage CKD complications e.g. anaemia
3. Reduce risk of progression to ESKD

Acronyms

ACEi	Angiotensin converting enzyme inhibitor
AKI	Acute kidney injury
APKD	Adult polycystic kidney disease
ARB	Angiotensin receptor blocker
BMI	body mass index
BP	Blood pressure
CKD	Chronic kidney disease
DKA	Diabetic ketoacidosis
eGFR	Estimated glomerular filtration rate
ESKD	End stage kidney disease ('kidney failure')
HBPM	Home blood pressure monitoring
KFRE	Kidney failure risk equation
LUTS	Lower urinary tract symptoms

NSAID	Non-steroidal anti-inflammatory drug
NVH	Non-visible haematuria
RAASi	Renin angiotensin aldosterone system inhibitor (ACEi or ARB)
SGLT2i	Sodium linked glucose transporter 2 inhibitor
T2DM	Type 2 diabetes mellitus
uACR	Urinary albumin to creatinine ratio
UE	Urea and electrolytes
uPCR	Urinary protein to creatinine ratio
UTI	Urinary tract infection

GGC Renal Unit Contacts

1. SCI gateway: NEW referrals (routine or urgent) to the renal clinic

2. Telephone referrals to on call renal registrar: 0141 452 2417 (includes option to contact the renal pharmacist) - URGENT advice

3. Email ggc.renalservices@nhs.scot : Inform renal unit of change relating to existing patient

➢ Who is at increased risk of chronic kidney disease (CKD)?

The following conditions are associated with an increased risk of CKD:

1. Diabetes, hypertension, previous acute kidney injury (AKI), vascular disease, structural renal disease (e.g. stones, prostatic hypertrophy), hereditary kidney disease or family history of kidney disease, incidental detection of haematuria or proteinuria. These patients should be offered testing for CKD.
2. Annual testing of kidney function is recommended for patients prescribed: calcineurin inhibitors (ciclosporin, tacrolimus), lithium and non-steroidal anti-inflammatory drugs (NSAIDs).

➢ What should I check? Blood and urine

1. **Estimated glomerular filtration rate (eGFR)** Urea and electrolytes (UEs)
2. **Urine albumin to creatinine ratio (uACR)** – this should be measured in patients with diabetes and in patients found to have eGFR <60ml/min/1.73m^2

   Proteinuria is a useful marker of kidney damage and cardiovascular risk. uACR is the preferred test for quantification of urinary protein excretion in primary care. However, if urine protein to creatinine ratio (uPCR) has been performed, there is no need to repeat uACR. As a rule of thumb uACR is approximately 70% of the value of uPCR (e.g. uACR 70mg/mmol is approximately uPCR 100mg/mmol). uPCR 100mg/mmol is roughly equivalent to 1g of proteinuria per 24 hours.

3. Urine dipstick for **non-visible haematuria (NVH)** in patients found to have eGFR <60ml/min/1.73m^2

➢ How do I diagnose CKD?

1. **Reduced eGFR** (below 60ml/min/1.73m^2) on 2 measures, 3 months apart

And or:

2. **Proteinuria** (uACR > 3mg/mmol)
   i. If initial result 3-70mg/mmol, repeat to confirm (ideally early morning sample).
   ii. If initial result >70mg/mmol, repeat sample may not be needed.
   iii. uACR above 230 mg/mmol is nephrotic range proteinuria.

Before diagnosing CKD (e.g. first eGFR measure <60ml/min/1.73m^2), consider

- **Is this acute kidney injury (AKI)?** Is the patient unwell? What was the clinical context of the bloods being checked?
- **Any recent medicine changes?** For example, recent trimethoprim, NSAIDs, recent start angiotensin converting enzyme inhibitors (ACEi), angiotensin receptor blockers (ARB), sodium glucose linked transporter 2 inhibitors (SGLT2i). These are all medicines which can acutely (usually transiently) alter creatinine levels.

If clinical concern that this is acute, repeat UEs in 1 week. If patient unwell, consider admission to general medicine for AKI management.

- **How do I classify CKD?**

Classification of CKD depends on eGFR and proteinuria – see figure 1 (page 8).

NB – CKD 1 or 2 does not need to be screened for but may be coded if identified e.g. patient has urine protein check in diabetes or is known to have structural kidney disease e.g. adult polycystic kidney disease (APKD).

- **I've identified CKD – what now?**

Consider causes:

a. Pre-renal (particularly medicines including diuretics, vascular disease, diabetes)

b. Renal (abnormal urinalysis, multisystem disorder, possible structural disease)

c. Post-renal (consider ultrasound to exclude obstruction) – any LUTS?

- **Who should I refer to the renal unit?**

Goals of referral are to establish a diagnosis if unclear and review patients where there is a risk of end stage kidney disease or secondary complications of CKD. Consider referral if:

1. uACR >30mg/mmol without diabetes, uACR >70mg/mmol with diabetes
2. Suspected rare or genetic cause of CKD; or multisystem disorder with suspected renal involvement
3. A drop in eGFR of 25% or more over 12 months
4. A decrease in eGFR of 15 ml/min/1.73 m^2 or more over 12 months.

5. The 5 year risk of needing dialysis or a kidney transplant for kidney failure is calculated to be greater than 5% using the kidney failure risk equation (KFRE) www.kidneyfailurerisk.co.uk. This is an optional tool recommended by NICE.
6. Complications of CKD including anaemia, acidosis and bone disease (usually seen in CKD 3b onwards). Renal anaemia should only be diagnosed after exclusion of other causes including iron / folate / B12 deficiency and is unusual when eGFR >30ml/min/1.73m^2.

Other indications for referral to the renal clinic including nephrotic syndrome and unexplained AKI are not covered by this guideline.

Throughout this guideline, realistic medicine principles should be applied.

➢ Stable CKD – management in primary care

The main risk of CKD is cardiovascular complications.

Management of patients should be realistic and tailored to the individual and their goals and expectations.

1. **Lifestyle**: Encourage a healthy lifestyle - stop smoking, undertake physical activity, achieve a healthy weight.
2. **Diet**: Reduce salt intake. Other specific renal dietary advice is only necessary if guided by renal unit.
3. **Review the patient's regular medicines** – avoid oral NSAIDs; topical NSAID can be used after individual consideration of alternatives. Administer usual vaccinations.
4. **Blood pressure control**: Overview | Hypertension in adults: diagnosis and management | Guidance | NICE

Clinical context	Target blood pressure
CKD with uACR below 70mg/mmol	Aim BP below 140/90mmHg (HBPM 135/85mmHg)
CKD with uACR above 70mg/mmol CKD with diabetes	Aim BP below 130/80mmHg (HBPM 125/75mmHg)

   a. Beware of BP targets in frail patients. See GGC guideline: Polypharmacy review in adults living with moderate to severe frailty (1013) (nhsggc.org.uk)

   b. ACEi or ARB are the agents of choice for hypertension if CKD and diabetes or CKD and uACR >30mg/mmol * See figure 2. Otherwise refer to BP guidance. Hypertension Management (183) (nhsggc.org.uk)

   If CKD without hypertension, consider trial of ACEi or ARB if uACR >70mg/mmol*

   *Check UEs 7-10 days after each ACE/ARB dose increase - continue unless eGFR drop >25% or serum potassium >6.0mmol/l. If hyperkalaemia limiting titration of ACEi/ARB in CKD 4 consider novel potassium binder long term after discussion with renal unit (figure 2).

5. **SGLT2i:** See figure 3. Recommended if the patient is already prescribed maximally tolerated ACE/ARB (unless these are not tolerated or contraindicated) and has eGFR ≥25 to ≤75 mL/min/1.73m^2 at treatment initiation, and has a urine albumin-creatinine ratio of at least 23mg/mmol and/or type 2 diabetes mellitus. If renal advice needed regarding SGLT2i required, refer via SCI - "SGLT2i Advice Referral" in the presenting complaints box. Nephrologist will review case and provide individual patient advice. There is no need to routinely check eGFR, monitor BP or adjust diuretics after initiating SGLT2i.

6. Cardiovascular risk management – other medicines

a. Statin therapy is recommended for patients age >50 years with CKD3 or lower. Coronary Heart Disease and Stroke, Primary and Secondary Prevention (Cholesterol) (181) (nhsggc.org.uk)

b. Aspirin – There is no evidence for routine prescribing of aspirin for primary prevention of cardiovascular disease in patients with CKD. Aspirin or other antiplatelet agents can be prescribed as routinely recommended in other cardiovascular guidelines for secondary CVD prevention

7. Monitoring: How often do I need to monitor patients with CKD?

This depends on the stage of CKD and amount of albuminuria (figure 1).

This should be tailored to the patient, medicines and comorbidities.

Monitoring of CKD 4/5 would usually be in conjunction with the renal clinic.

- CKD 1 or 2 (ie normal eGFR but known structural kidney disease or identified proteinuria), annual monitoring is recommended.
- CKD 3 should be monitored 1-2 times per year depending on level of albuminuria.
- CKD 4 should be monitored a minimum of twice per year.
- CKD 5 should be monitored a minimum of 4 times per year.

Figure 1: CKD classification and monitoring.

Numbering in boxes documents the recommended frequency of monitoring per year by eGFR (G3a – G5) and proteinuria category (A1-A3), which relates to risk of CKD progression. Adapted from reference 1.

	ACR category A1 (<3mg/mmol)	ACR category A2 (3-30mg/mmol)	ACR category A3 (>30mg/mmol)
eGFR category G3a (45-59 ml/min/1.73m^2)	1	1	2
eGFR category G3b (30-44 ml/min/1.73m^2)	1	2	2
eGFR category G4 (15-29 ml/min/1.73m^2)	2	2	3
eGFR category G5 (<15 ml/min/1.73m^2)	4	4	4+

Figure 2: Initiation and uptitration of ACEi or ARB and SGLT2i

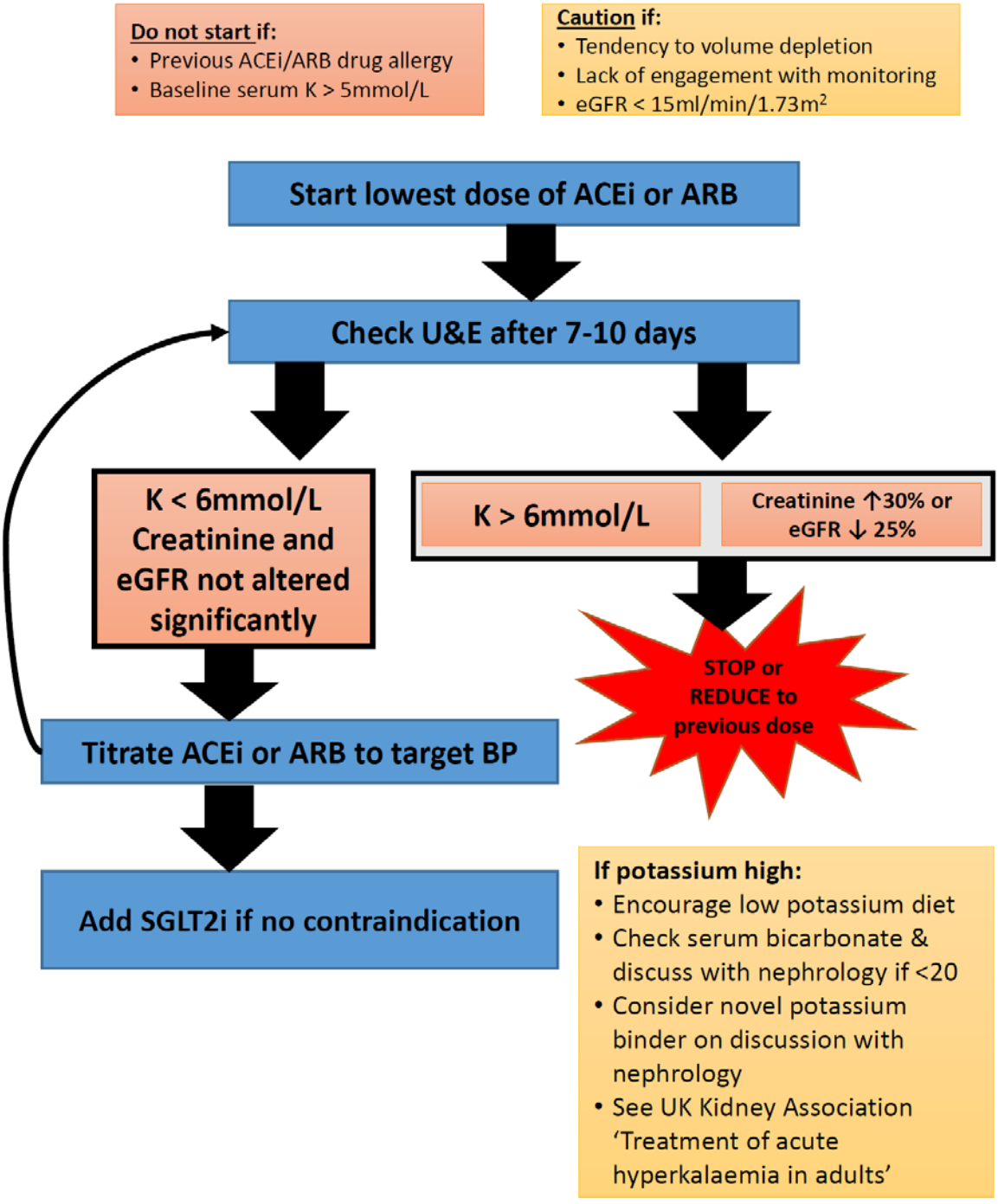
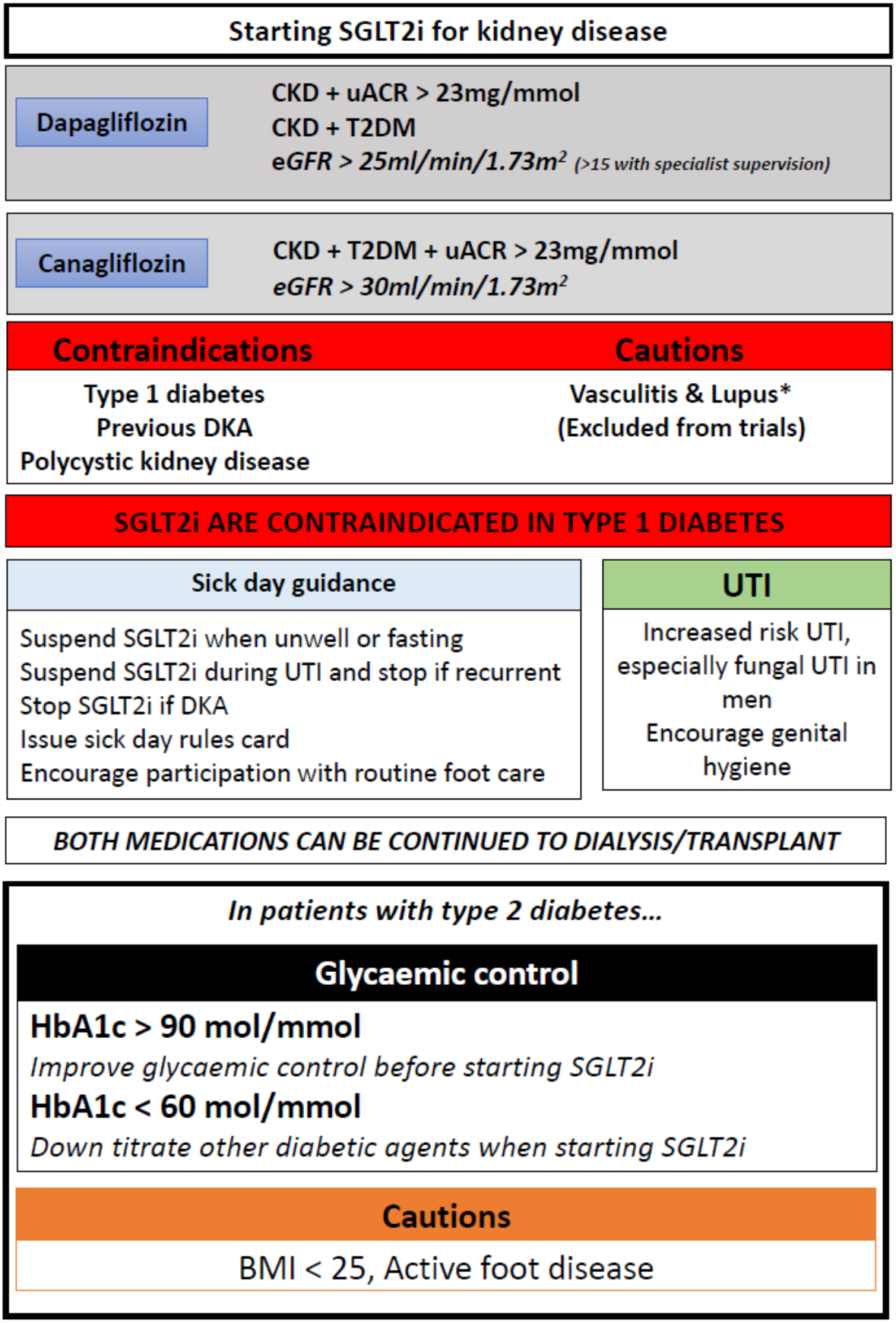


Figure 3: SGLT2i in CKD



References:

1. https://www.nice.org.uk/guidance/ng203

2. https://kdigo.org/guidelines/ckd-evaluation-and-management/

3. Overview | Hypertension in adults: diagnosis and management | Guidance | NICE

Appendix: Isolated non visible haematuria (NVH)

(ie NVH without proteinuria or impaired kidney function).

Dipstick haematuria is not diagnostically useful if the patient is menstruating, has a concurrent urinary tract infection (UTI) or is catheterised.

1. Urological referral for assessment if :
    a. All patients with visible haematuria (any age)
    b. All patients with symptomatic NVH (any age)
    c. All patients with NVH aged ≥45 yrs
2. For patients who have had a urological cause of NVH excluded, or have not met the referral criteria for a urological assessment, the need for a renal referral in this situation depends on factors other than simply the presence of haematuria. Nephrology referral is recommended if there is
    i. evidence of declining GFR;
    ii. stage 4 or 5 CKD (eGFR <30ml/min/1.73m^2);
    iii. significant proteinuria (ACR ≥30mg/mmol or PCR ≥50mg/mmol);
    iv. isolated haematuria (i.e. in the absence of significant proteinuria) with hypertension in those aged <50 yrs);
    v. visible haematuria coinciding with intercurrent (usually upper respiratory tract) infection.

In the event the above criteria are not met, haematuria itself (visible or non-visible) does not require nephrology referral. Such patients should however continue to be monitored annually in primary care for the development of: lower urinary tract symptoms (LUTS), visible haematuria, progressive renal impairment or hypertension.

Appendix – Education

An educational programme of videos accompanies this guideline. These are available via the links from the links and QR codes below.

Part 1: Screening and Diagnosis

COVERS STRUCTURE AND FUNCTION OF THE KIDNEY, AND EXPLORES MEASURES OF KIDNEY FUNCTION AND STRUCTURE, AND SCREENING AND DIAGNOSIS OF CKD

PART 1 HYPERLINK

Part 2: Classification and Referral

DISCUSSES HOW TO CLASSIFY CKD USING EGFR AND UACR, AND WHO TO REFER TO SECONDARY CARE

PART 2 HYPERLINK

Part 3: Management and Monitoring

DESCRIBES THERAPEUTIC GOALS AND INTERVENTION, AND FREQUENCY OF MONITORING IN CKD

PART 3 HYPERLINK

Part 4: Hot Topics

GOES BEYOND THE GUIDELINE, TO DISCUSS HOT TOPICS AND DIFFICULT MANAGEMENT DECISIONS IN GREATER DEPTH

PART 4 HYPERLINK