

The management of hyperglycaemia in people with diabetes and chronic kidney disease: A GPnotebook Shortcut

Optimising glycaemic control is an important aspect of managing chronic kidney disease (CKD) in people with diabetes; however, dose adjustments may be required to prevent adverse effects in renally impaired individuals. This GPnotebook Shortcut provides a concise summary of the indications and dosing recommendations of antidiabetes drugs in people with diabetes and CKD.

Chronic kidney disease (CKD) confers increased risk of end-stage renal disease, cardiovascular disease and death, and this risk increases as urinary albumin levels rise and estimated glomerular filtration rate (eGFR) falls.

The majority of people with moderate-to-severe CKD are managed in primary care. In addition to the management considerations listed in *Box 1* (Diggle, 2017), optimising blood glucose levels is of crucial importance as hyperglycaemia drives the initiation and progression of CKD (Alicic et al, 2017), and intensive glucose control has consistently been shown to reduce the risk of albuminuria (Coca et al, 2012).

In addition, emerging evidence suggests that the sodium–glucose cotransporter 2 (SGLT2) inhibitors in particular may have renoprotective

effects independent of their effects on blood glucose, such that the American Diabetes Association and European Association for the Study of Diabetes now prioritise their use after metformin in people with type 2 diabetes and CKD (Davies et al, 2018; Buse et al, 2020). Although SGLT2 inhibitors are not currently licensed for initiation in people with an eGFR <60 mL/min/1.73 m², they can be used in those with albuminuria and an eGFR ≥60. This is an important group who may make up 10% of the population with type 2 diabetes, and at this early stage it may be possible to reverse albuminuria.

However, optimising glycaemic control in people with CKD is complicated by the alterations in glucose homeostasis and drug pharmacokinetics that result from reduced kidney function (Neumiller et al, 2017), such that the majority of antidiabetes drugs will require dose adjustment or discontinuation as eGFR decreases.

This GPnotebook Shortcut provides a concise summary of the indications and dosing recommendations of antidiabetes drugs in people with diabetes and CKD. ■

Alicic RZ et al (2017) *Clin J Am Soc Nephrol* **12**: 2032–45

Buse JB et al (2020) *Diabetologia* **63**: 221–8

Coca SG et al (2012) *Arch Intern Med* **172**: 761–9

Davies MJ et al (2018) *Diabetologia* **61**: 2461–98

Diggle J (2017) *Diabetes & Primary Care* **19**: 59–60

Neumiller JJ et al (2017) *J Am Soc Nephrol* **28**: 2263–74

NICE (2014) *Cardiovascular disease: risk assessment and reduction, including lipid modification* [CG181]

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Box 1. CKD management in primary care.

- Lifestyle advice: exercise, smoking cessation, achieve healthy weight, dietary advice regarding potassium, phosphate and salt intake as appropriate
- Aim for blood pressure <130/80 mmHg
- Offer ACE inhibitor or ARB if ACR is ≥3 mg/mmol
- Offer statins as per NICE (2014) CG181.
- Offer antiplatelet drugs for secondary cardiovascular disease prevention.
- Avoid non-steroidal anti-inflammatory drugs if possible.

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CKD Stage (ml/min/1.73m ²)	Stages G1 & G2 eGFR>60	Stage G3a eGFR 45-59	Stage G3b eGFR 30-44	Stage G4 eGFR 15-30	Stage G5 eGFR<15
Metformin			Reduce dose to 500mg twice daily		
Sulfonylureas	Gliclazide & glipizide preferred as metabolised in the liver	Increased risk of hypoglycaemia if eGFR<60. Consider reducing SU dose			
Repaglinide					
Acarbose	Avoid if eGFR<25				
Pioglitazone	Avoid in those on dialysis				
Alogliptin			Reduce to 12.5mg daily if eGFR <50	Reduce to 6.25mg daily	
Linagliptin					
Saxagliptin			Reduce to 2.5mg daily. Avoid in those on dialysis		
Sitagliptin			Reduce to 50mg daily	Reduce to 25mg od	
Vildagliptin			Reduce to 50mg once daily if eGFR<50		
Canagliflozin	Do not initiate if eGFR<60	If eGFR later falls <60 reduce dose to 100mg & stop if <45			
Dapagliflozin	Do not initiate if eGFR<60				
Empagliflozin	Do not initiate if eGFR<60	If eGFR later falls <60, reduce dose to 10mg & stop if <45			
Ertugliflozin	Do not initiate if eGFR<60				
Dulaglutide					
Exenatide bid					
Exenatide qw	Not recommended if CrCl<50ml/min				
Liraglutide	No therapeutic experience in those with ESRD and therefore not recommended for use				
Lixisenatide					
Semaglutide					
Insulin	Increased risk of hypoglycaemia as kidney main route of insulin clearance				

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● No dose adjustment required
 ● Dose adjustment recommended
 ● Not recommended / contraindicated

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