

Guide to drug dose adjustment in Renal Impairment

(Based on Cockcroft-Gault equation, Adapted from BNF¹)

	Degree of renal impairment as per GFR
Drug or class of drug	Dose adjustment based on creatinine clearance
Allopurinol	10–20 mL/min; 100–200 mg daily <10 ml/min; 100 mg on alternate days (max 100 mg daily)
ACE inhibitors	Start low and go slow. Start with very low doses and titrate to maximum tolerated dose. Proceed cautiously at doses above enalapril 10 mg or equivalent, i.e. captopril 75 mg or cilazapril 2.5 mg daily
Bezafibrate 400 mg (Bezalip retard)	< 60 mL/min; Avoid (For 200 mg tablets see product data sheet)
β-blockers	Dose reduction of some β-blockers required, especially atenolol, sotalol and nadolol. Refer to individual drug datasheets
Cotrimoxazole	< 15 mL/min; Avoid 15–30 ml/min; Use half normal dose
Colchicine (from Prescriber Update, Nov 2005)	< 10 mL/min; avoid < 50 mL/min; reduce dose by half
Digoxin	Dose adjustment required in renal impairment (including age related). Adjust according to plasma concentrations
Lithium	Dose adjustment required in renal impairment (including age related). Adjust according to plasma concentrations
Metformin* (from bpac ^{nz} Diabetes POEMs, Oct 2004)	< 30 mL/min; avoid 30–60 mL/min; max 1000 mg/day 60–90 mL/min; max 2000 mg/day
Nitrofurantoin	Avoid in mild, moderate and severe impairment
NSAIDs	Mild impairment; Use lowest effective dose and monitor renal function, sodium and water retention Moderate and Severe; avoid if possible
Ranitidine	< 20 mL/min; use half the normal dose
Simvastatin	< 30 mL/min; Doses above 10 mg daily should be used with caution
Venlafaxine	< 10 mL/min; avoid 10–30 mL/min; use half normal dose

* Some references recommend avoiding metformin even in mild renal impairment but metformin can be used with caution if the dose is reduced. All patients should be advised to withhold treatment and seek medical advice if they experience vomiting and diarrhoea and if they have planned medical, surgical or radiological procedures.

Action plan for Chronic Kidney Disease (Based on eGFR)

eGFR mL/min/1.73 m ²	Description	Clinical action plan
≥ 60	No kidney damage OR Stage 1 CKD (Kidney damage with normal or ↑ kidney function) ± proteinuria OR Stage 2 CKD (Kidney damage with mild ↓ kidney function)	Further investigation for CKD may be indicated in those at increased risk (smoking, diabetes, high blood pressure, age over 50 years, family history, Māori or Pacific Island or Asian heritage): <ul style="list-style-type: none"> - Assessment of proteinuria - Urinalysis - Blood pressure Cardiovascular risk reduction (blood pressure, lipids, blood glucose, smoking, obesity, physical activity) Blood pressure targets ≤ 130/80; ≤ 122/76 if protein > 1 g/24 hours
30 - 59	Stage 3 CKD – Moderate ↓ kidney function	As for Stage 2 plus: <ul style="list-style-type: none"> - Blood pressure control - Monitor eGFR 3 monthly - Avoid nephrotoxic drugs (e.g. NSAIDs, colchicine) - Prescribe antiproteinuric drugs (ACE inhibitors and/or angiotensin receptor blockers) if appropriate - Address anaemia, acidosis and hyperparathyroidism - Ensure drug dosages appropriate for level of kidney function (adjust according to Cockcroft-Gault equation) Consider referral to nephrologist
15 - 29	Stage 4 CKD – Severe ↓ kidney function	As for Stage 3 plus: <ul style="list-style-type: none"> - Referral to nephrologist is usually indicated for preparation for dialysis (including access surgery, education) or transplantation
< 15	Stage 5 CKD – End-stage kidney failure	As for Stage 4 plus referral to nephrologist

Cockcroft-Gault equation for calculating creatinine clearance

$$\text{Creatinine Clearance mL/min} = \frac{(140 - \text{age}) \times \text{weight (kg)}}{815 \times \text{serum creatinine (mmol/L)}}$$

The MDRD equation for eGFR

$$\text{GFR} = 186 \times (S_{\text{CR}} \div 88.4)^{1.154} \times \text{age}^{0.203}$$

(Female: multiply result by 0.742; African-Caribbean's: multiply result by 1.212)

Note: Ethnicity factors have not yet been calculated for other ethnic groups.