Selected non-HIV drugs requiring dosage adjustment in renal impairment

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Comedication	CrCl threshold for adjustment	Additional information
Analgesic		
Morphine	-	Risk of respiratory depression in patients with renal impairment due to accumulation of 6-morphine-glucuronide (highly active metabolite). Avoid if alternatives available; or titrate to adequate pain control with close monitoring for signs of overdose.
NSAIDs	-	Avoid chronic use in patients with any stage of renal impairment.
Oxycodone	<50 ml/min	Reduce dose and titrate to adequate pain control with close monitoring for signs of overdose.
Tramadol	<30 ml/min	Increase dosing interval to 8-12 hours. Maximum daily dose 200 mg.
Antibacterials		
Amikacin	≤70 ml/min	Dose dependent oto- and nephro-toxicity. Avoid in renal impairment if alternatives available, otherwise perform TDM.
Amoxicillin/clavulanate	≤30 ml/min	
Benzylpenicillin (parenteral)	≤60 ml/min	
Cefepime	≤50 ml/min	
Cefpodoxime	≤40 ml/min	
Ceftazidime	≤50 ml/min	
Ciprofloxacin	≤60 ml/min	
Ethambutol	≤30 ml/min	
Gentamicin	≤70 ml/min	Dose dependent oto- and nephro-toxicity. Avoid in renal impairment if alternatives available, otherwise perform TDM.
Levofloxacin	≤50 ml/min	
Nitrofurantoin	-	Avoid if CrCl ≤60 ml/min.
Ofloxacin	≤50 ml/min	
Piperacillin/tazobactam	≤40 ml/min	
Tobramycin	≤70 ml/min	Dose dependent oto- and nephro-toxicity. Avoid in renal impairment if alternatives available, otherwise perform TDM.
Trimethoprim/ sulfamethoxazole	≤30 ml/min	
Vancomycin	≤50 ml/min	Dose dependent nephrotoxicity. TDM recommended.

(Table continued on page 2)

Notes

- All information refers to licensed use of products and is from product labels for Great Britain. For complete dosing, administration, and safety information, consult regional product labels.
- Renal function estimated for dosage adjustment mostly based on Cockcroft formula (CrCl, creatinine clearance).
- For patients with CrCl <15 ml/min or dialysis patients, a nephrologist should be consulted.
- The drug package insert should be consulted for specific dose adjustments.
- No dose adjustment on antibacterial loading dose.

References

1. SmPCs for Great Britain accessed via medicines.org.uk/emc .
2. American Geriatrics Society 2019 Updated AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatr Soc, 2019, 67:674-94*.
3. The Renal Drug Handbook. Ashley C, Dunleavy A, editors. 5th ed. Boca Raton:CRC Press; 2019.

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Comedication	CrCl threshold for adjustment	Additional information
Anti-coagulant, Anti-platelet and Fibrinolytic		
Apixaban	<50 ml/min	Dose adjustment depends on indication and patient characteristics and may be required for CrCl <50 ml/min. Avoid if CrCl <15-30 ml/min.
Dabigatran	≤50 ml/min	Contraindicated if CrCl <30 ml/min.
Edoxaban	≤50 ml/min	Avoid if CrCl <15 ml/min.
Enoxaparin	<30 ml/min	Dose adjustment depends on indication and patient characteristics.
Rivaroxaban	<50 ml/min	Dose adjustment depends on indication and patient characteristics and may be required for CrCl <50 ml/min. No dose adjustment if recommended dose is 10 mg once daily. Avoid if CrCl <15 ml/min.
Anticonvulsants		
Gabapentin	<80 ml/min	
Levetiracetam	<80 ml/min	
Pregabalin	<60 ml/min	
Antidepressants		
Lithium	<90 ml/min	Reduced dose and slow titration. TDM recommended. Avoid if CrCl <30 ml/min.
Antidiabetics		
Alogliptin	≤50 ml/min	
Canagliflozin	<60 ml/min	Should not be initiated if CrCl <60 ml/min. Dose adjustment if CrCl falls below 60 ml/min during treatment, and stop if CrCl <45 ml/min (lack of efficacy).
Dapagliflozin	-	Should not be initiated if CrCl <60 ml/min. Stop if CrCl <45 ml/min (lack of efficacy).
Empagliflozin	<60 ml/min	Should not be initiated if CrCl <60 ml/min. Dose adjustment if CrCl falls below 60 ml/min during treatment, and stop if CrCl <45 ml/min (lack of efficacy).
Exenatide	≤50 ml/min	Avoid if CrCl <30 ml/min.
Metformin	<60 ml/min	Contraindicated if CrCl <30 ml/min.
Saxagliptin	<45 ml/min	
Sitagliptin	<45 ml/min	
Vildagliptin	<50 ml/min	

Comedication	CrCl threshold for adjustment	Additional information
Antifungals		
Fluconazole	≤50 ml/min	No adjustment in single dose therapy.
Antivirals		
Ribavirin	≤50 ml/min	
Valaciclovir	variable	Dose adjustment depends on indication and patient characteristics and may be required for CrCl <30, <50 or <75 mL/min.
Beta Blockers		
Atenolol	≤35 ml/min	
Sotalol	≤60 ml/min	
Hypertension and Heart Failure Agents		
Digoxin	≤100 ml/min	Dose adjustment for maintenance and loading dose. Avoid in renal impairment if alternatives available.
Enalapril	≤80 ml/min	Dose adjustment for starting dose.
Lisinopril	≤80 ml/min	Dose adjustment for starting dose.
Perindopril	<60 ml/min	
Ramipril	<60 ml/min	
Other		
Allopurinol	≤50 ml/min	
Colchicine	≤50 ml/min	Dose dependent toxicity. Routine monitoring of colchicine adverse reactions recommended.
Methotrexate (low dose)	<60 ml/min	Dose dependent toxicity. Contraindicated if CrCl <30 ml/min.
Parkinsonism Agents		
Pramipexole	≤50 ml/min	Dose adjustment depends on indication.

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(See notes and references on page 1)

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