Selected non-HIV drugs requiring dosage adjustment in renal impairment

All information refers to licensed use of products and is from manufacturers' EUROPEAN product labels.
For complete dosing, administration, and safety information, consult the product label for your region.

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.

Comments

- 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. European SmPCs 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	

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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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