Royal Victoria Regional Health Centre

Pharmacy Department

Guide for Medication Dosing in Renal Dysfunction

Table 1 – Antimicrobials Requiring Renal Dose Adjustment in Adults (**See Legend Pg.5**)

Antibiotic	Indication	Renal Function (CrCl)	Dose
Acyclovir – IV *Use Adj BW if patient obese for encephalitis meningitis	Encephalitis meningitis	**> 50 mL/min**	10 mg/kg*/dose IV q8h
		25-50 mL/min	10 mg/kg*/dose IV q12h
		10-24 mL/min	10 mg/kg*/dose IV q24h
		< 10 mL/min	5 mg/kg*/dose IV q24h
		HD	5 mg/kg*/dose IV q24h after HD
	General indications	**> 50 mL/min**	5 mg/kg*/dose IV q8h
		25-50 mL/min	5 mg/kg*/dose IV q12h
		10-24 mL/min	5 mg/kg*/dose IV q24h
		< 10 mL/min	2.5 mg/kg*/dose IV q24h
		HD	2.5 mg/kg*/dose IV q24h after HD
Amoxicillin	General indications	**> 30 mL/min**	500 mg po q8h
		10-30 mL/min	250-500 mg po q12h
		< 10 mL/min	500 mg po q24h
		HD	500 mg po q24h after HD
Amoxicillin / Clavulanate	General indications	**> 30 mL/min**	875 mg po q12h (less diarrhea), or 500 mg po q8h
		10-30 mL/min	500 mg po q12h Avoid 875 mg tablet
		< 10 mL/min	500 mg po q24h Avoid 875 mg tablet
		HD	500 mg po q24h after HD Avoid 875 mg tablet
Ampicillin	General indications	**> 50 mL/min**	1 g IV q4-6h
		10-50 mL/min	1 g IV q6h
		< 10 mL/min	1 g IV q12h
		HD	1 g IV q12h, 2nd dose after HD
	Meningitis Endocarditis Osteomyelitis *Listeria* infections *Enteroccocus* Bacteremia	**> 50 mL/min**	2 g IV q4h
		10-50 mL/min	2 g IV q6h
		< 10 mL/min	2 g IV q12h
		HD	2 g IV q12h, 2nd dose after HD
Cefazolin	General indications	**> 35 mL/min**	1 g IV q8h
		10-35 mL/min	1 g IV q12h
		< 10 mL/min	1 g IV q24h
		HD	1 g IV q24h after HD
	Severe infections	**> 35 mL/min**	2 g IV q8h
		10-35 mL/min	1-2 g IV q12h
		< 10 mL/min	1 g IV q24h
		HD	1 g IV q24h after HD, or 2 g IV after each HD session

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Cefprozil	General Indications	**≥ 30 mL/min**	500 mg PO q12h
		< 30 mL/min	250 mg PO q12h
		HD	250 mg PO q12h, 2nd dose after HD
Ceftazidime	General Indications (e.g. UTIs)	**> 50 mL/min**	1 g IV q8h
		31-50 mL/min	1 g IV q12h
		10-30 mL/min	1 g IV q24h
		< 10 mL/min	500 g IV q24h
		HD	500 g IV q24h after HD
	Severe infections	**> 50 mL/min**	2 g IV q8h
		31-50 mL/min	2 g IV q12h
		10-30 mL/min	2 g IV q24h
		< 10 mL/min	1 g IV q24h
		HD	1 g IV q24h after HD
Cefuroxime – IV	General Indications	**> 30 mL/min**	0.75-1.5 g IV q8h
		10-30 mL/min	0.75-1.5 g IV q12h
		< 10 mL/min	0.75-1.5 g IV q24h
		HD	0.75-1.5 g IV q24H after HD
Cefuroxime – PO		**> 30 mL/min**	500 mg PO BID
		10-30 mL/min	500 mg PO daily, or 250 mg PO BID
		< 10 mL/min	250 mg PO daily
		HD	250 mg PO daily after HD
Cephalexin – PO	General Indications	**> 50 mL/min**	250-1000 mg PO q6h
		10-50 mL/min	250-500 mg PO q8h
		< 10 mL/min	250-500 mg PO q12h
		HD	250-500 mg PO q12h, 2nd dose after HD
Ciprofloxacin – IV	General Indications Pseudomonas UTIs	**≥ 30 mL/min**	400 mg IV q12h
		< 30 mL/min	400 mg IV q24h
		HD	400 mg IV q24h after HD
	Pseudomonas, Severe infections	**> 50 mL/min**	400 mg IV q8h
		30-50 mL/min	400 mg IV q8-12h
		< 30 mL/min	400 mg IV q24h
		HD	400 mg IV q24h after HD
Ciprofloxacin – PO	General Indications Pseudomonas UTIs	**> 30 mL/min**	500 mg PO q12h
		< 30 mL/min	500 mg PO q24h
		HD	500 mg PO q24h after HD
	Pseudomonas SPICE pathogens	**> 50 mL/min**	750 mg PO q12h
		30-50 mL/min	500 mg PO q12h
		< 30 mL/min	500 mg PO q24h
		HD	500 mg PO q24h after HD
Clarithromycin	General Indications	**≥ 30 mL/min**	500 mg PO BID
		< 30 mL/min	250 mg PO BID
		HD	250 mg PO BID, 2nd dose after HD

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Daptomycin – R *Use TBW if patient obese	All indications	**> 30 mL/min**	Weight-based dose* IV q24h
		< 30 mL/min	Weight-based dose* IV q48h
		HD	Weight-based dose* IV q48h after HD
Ertapenem - R	General Indications	**> 30 mL/min**	1 g IV q24h
		≤ 30 mL/min	500 mg IV q24h
		HD	500 mg IV q24h after HD
Fluconazole – IV/PO ***Load with 12 mg/kg (TBW) for candidemia (do not renally dose adjust)***	General Indications	**> 50 mL/min**	200-800 mg q24h
		10-50 mL/min	100-400 mg q24h
		< 10 mL/min	50-100 mg q24h
		HD	Usual dose after each HD
Ganciclovir *Use AdjBW if patient obese	Induction - CMV	**≥ 70 mL/min**	5 mg/kg*/dose q12h
		50-69 mL/min	2.5 mg/kg*/dose q12h
		25-49 mL/min	2.5 mg/kg*/dose q24h
		10-24 mL/min	1.25 mg/kg*/dose q24h
		< 10 mL/min	1.25 mg/kg*/dose 3 time/week
		HD	1.25 mg/kg*/dose only after HD
	Maintenance - CMV	**≥ 70 mL/min**	5 mg/kg*/dose q24h
		50-69 mL/min	2.5 mg/kg*/dose q24h
		25-49 mL/min	1.25 mg/kg*/dose q24h
		10-24 mL/min	0.625 mg/kg*/dose q24h
		< 10 mL/min	0.625 mg/kg*/dose 3 times/week
		HD	0.625 mg/kg*/dose only after HD
Gentamicin	**Follow medical directive for aminoglycoside dosing**		
Levofloxacin – IV/PO	General indications	**≥ 50 mL/min**	500 mg daily
		20-49 mL/min	500 mg q48h
		< 20 mL/min	500 mg X 1, then 250 mg PO q48h
		HD	500 mg X 1, then 250 mg PO q48h (give after HD)
	Community acquired pneumonia, Pseudomonas	**≥ 50 mL/min**	750 mg daily
		20-49 mL/min	750 mg q48h
		< 20 mL/min	750 mg X 1, then 500 mg PO q48h
		HD	750 mg X 1, then 500 mg PO q48h (give after HD)
Meropenem - R	General indications	**≥ 50 mL/min**	500 mg IV q6h
		25-49 mL/min	500 mg IV q8h
		10-24 mL/min	500 mg IV q12h
		< 10 mL/min	500 mg IV q24h
		HD	500 mg IV q24h after HD
	Severe infections, CNS infections	**≥ 50 mL/min**	2 g IV q8h
		25-49 mL/min	2 g IV q12h
		10-24 mL/min	1 g IV q12h
		< 10 mL/min	1 g IV q24h
		HD	1 g IV q24h after HD
Nitrofurantoin	Simple Cystitis	**≥ 40 mL/min**	100 mg PO q12h
		< 40 mL/min	Reduced efficacy, avoid if possible.
		HD	Avoid use. Suggest alternative agent.

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Oseltamivir	Influenza treatment	**> 60 mL/min**	75 mg PO BID
		31-60 mL/min	30 mg PO BID
		10-30 mL/min	30 mg PO daily
		HD	30 mg PO X1, then 30 mg after each HD
	Influenza prophylaxis	**> 60 mL/min**	75 mg PO daily
		31-60 mL/min	30 mg PO daily
		10-30 mL/min	30 mg PO every other day
		HD	30 mg PO X1, then 30 mg PO after every other each HD
Penicillin G – IV	Dose dependent on severity and site of infection.	**≥ 50 mL/min**	12-24 MU/day, divided q4-6h
		10-50 mL/min	12-18 MU/day, divided q4-6h
		< 10 mL/min	4 MU X1 load, then 4-12 MU/day, divided q6-8h
		HD	
Penicillin V – PO	General Indications	**> 10 mL/min**	600 mg PO QID
		< 10 mL/min	300 mg PO QID
Piperacillin / Tazobactam	General indications	**≥ 30 mL/min**	3.375 g IV q6h
		10-29 mL/min	3.375 g IV q8h
		< 10 mL/min	3.375 g IV q12h
		HD	3.375 g IV q12h, 2nd dose after HD
	Pseudomonas (suspected/confirmed) HAP VAP	**≥ 30 mL/min**	4.5 g IV q6h
		10-29 mL/min	4.5 g IV q8h
		< 10 mL/min	4.5 g IV q12h
		HD	4.5 g IV q12h, 2nd dose after HD
	Febrile Neutropenia	**≥ 10 mL/min**	4.5 g IV q8h
		< 10 mL/min	4.5 g IV q12h
		HD	4.5 g IV q12h, 2nd dose after HD
	ICU – general	**> 20 mL/min**	3.375 g over 4 hours IV q8h
	ICU – HAP, VAP, Pseudomonas	**> 20 mL/min**	4.5 g over 4 hours IV q8h
Trimethoprim / Sulfamethoxazole – IV *Dose expressed as TMP component per kg (one 5 mL vial contains 80 mg TMP)* *May use AdjBW in obesity.*	PCP (Treatment) Stenotrophomonas Nocardia	**> 30 mL/min**	15-20 mg/kg/day IV divided q6-8h
		10-30 mL/min	12-15 mg/kg/day IV divided q8-12h
		< 10 mL/min	Avoid use; if needed: 7.5 mg/kg/day IV q12-24h
		HD	Avoid use; if needed: 7.5 mg/kg IV q24h after HD
	General indications	**> 30 mL/min**	5-10 mg/kg/day IV divided q6-8h
		10-30 mL/min	2.5-5 mg/kg/day IV divided q8-12h
		< 10 mL/min	Avoid use
		HD	Avoid use
Trimethoprim / Sulfamethoxazole – PO	General indications	**> 30 mL/min**	1 DS tab PO q12h
		15-30 mL/min	½ DS tab PO q12h
		< 15 mL/min	Avoid use
	PCP Treatment, Nocardia Stenotrophomonas	Same dose calculation as IV, convert dose to oral form. Each Double-Strength (DS) tablet = 160 mg TMP	
	MRSA	**> 30 mL/min**	2 DS tabs PO q12h
		15-30 mL/min	1 DS tab PO q12h
		< 15 mL/min	Avoid use

Tobramycin – IV	**Follow medical directive for aminoglycoside dosing**		
Valacyclovir – PO	HSV/VZV Treatment	**> 50 mL/min**	1-2 g PO q6-8h
		30-50 mL/min	1 g PO q12h
		10-29 mL/min	1 g PO q24h
		< 10 mL/min	500 mg PO q24h after HD
Vancomycin - IV	**Follow medical directive for vancomycin dosing**		

Legend:

CF	Cystic Fibrosis	MU	Million Units
CrCl	Creatinine Clearance (Cockcroft-Gault equation)	PO	Oral
CNS	Central Nervous System	**- R**	Restricted drug to infectious disease/ASP
DS	Double Strength	TMP	trimethoprim
HAP	Hospital Acquired Pneumonia	VAP	Ventilator Associated Pneumonia
HD	Intermittent Hemodialysis	UTI	Urinary Tract Infection
IV	Intravenous		

Weight Calculations:

TBW	Total body weight (patient's actual body mass)
IBW	Ideal body weight • IBW (male) = 50 kg + (2.3 x height in inches > 60 inches) • IBW (female) = 45 kg + (2.3 x height in inches > 60 inches)
AdjBW	Adjusted Body Weight • AdjBW (kg) = IBW + 0.4 (TBW – IBW)

Table 2 – Antimicrobials **NOT** Requiring Renal Dose Adjustment

Antibiotic	Comment
Azithromycin – IV/PO	
Amphotericin B (Liposomal) **- R**	No dosage adjustments provided by the manufacturer; has been successfully administered to patients with pre-existing renal impairment.
Caspofungin **– R**	
Ceftriaxone	
Clindamycin – IV/PO	
Cloxacillin – IV/PO	
Doxycycline	
Fosfomycin	Non-formulary at RVH
Linezolid – IV/PO	Metabolites may accumulate in renal impairment but the clinical significance is unknown.
Metronidazole – IV/PO	Use beyond 3-4 weeks not suggested due to build-up of neurotoxic metabolites.
Moxifloxacin – IV/PO	
Vancomycin – PO	When using oral formulation for *Clostridium difficile* infection.
Voriconazole IV/PO **- R**	

Table 3 – Select Non-Antimicrobials Requiring Renal Dose Adjustment

Drug	Indication	Renal Function (CrCl)	Dose
Allopurinol	Gout	**> 20 mL/min**	Usual dose
		10-20 mL/min	Max 200 mg/day
		3-10 mL/min	Max 100 mg/day
		HD	Consult nephrology
Colchicine	Gout prophylaxis	**> 30 mL/min**	Usual dose
		< 30 mL/min	0.3 mg PO daily
		HD	0.3 mg PO twice weekly
	Gout treatment	**> 30 mL/min**	Usual dose
		< 30 mL/min	1.2 mg then 0.6 mg 1 hr later (not to be repeated more than every 14 days)
		HD	0.6 mg x one (not to be repeated more than every 14 days)
Enoxaparin	Anticoagulation Acute coronary syndrome	**≥ 30 mL/min**	1 mg/kg subcutaneous q12h
		< 30 mL/min	1 mg/kg subcutaneous q24h
Fesoterodine	Overactive bladder	**≥ 30 mL/min**	4-8 mg PO daily
		< 30 mL/min	Max 4 mg PO daily
Gabapentin	Various Indications *(Pharmacist to perform thorough baseline assessment prior to changing dose)*	**≥ 60 mL/min**	900-3600 mg/day in 3 divided doses
		30-59 mL/min	400-1400 mg/day in 2 divided doses
		15-29 mL/min	200-700 mg/day once daily
		15 mL/min	100-300 mg/day once daily
		< 15 mL/min	Reduce dose proportionately based on CrCl 15 mL/min (e.g. dose range of 50-150 mg/day if CrCl ~ 7.5 mL/min)
		HD	Dose based on CrCl, give after HD
Metformin	Diabetes type 2	**> 45 mL/min**	No dosage adjustment
		30-45 mL/min	Reduce dose to 500-1000 mg/day
		< 30 mL/min	Hold, monitor renal function and suggest alternative agent(s). Case by case.
Metoclopramide	IV dosing	**≥40 mL/min**	Usual dosing
		<40 mL/min	50% normal dose
	Gastroparesis	**>60 mLmin**	Usual dose
		≤60 mL/min	5 mg PO QID (max 20 mg/24hrs)
		<10 mL/min	5 mg PO BID (max 10 mg/24hrs)
		HD	5 mg PO BID (max 10 mg/24hrs)
	GERD	**>60 mL/min**	Usual dose
		≤60 mL/min	5 mg PO QID or 10 mg TID (max 30 mg/24hrs)
		<10 mL/min	5 mg PO QID (max 20 mg/24hrs)
		HD	5 mg PO QID or 10 mg PO BID (max 20 mg/24hrs)

Drug	Indication	Renal Function (CrCl)	Dose
Mirabegron	General indication	**>30 mL/min**	Usual dose
		15-29 mL/min	Max 25 mg/day
		<15 mL/min	Avoid use (not studied), hold order
		HD	Avoid use (not studied), hold order
Pregabalin	Various Indications *(Pharmacist to perform thorough baseline assessment prior to changing dose)*	**≥ 60 mL/min**	150-600 mg/day in 2-3 divided doses
		30-59 mL/min	75-300 mg/day in 2-3 divided doses
		15-29 mL/min	25-150 mg/day in 1-2 divided doses
		< 15 mL/min	25-75 mg/day in a single daily dose
		HD	25-75 mg/day in a single daily dose, give after HD
Ranitidine – IV/PO	Various Indications	**≥ 50 mL/min**	150 mg PO BID 50 mg IV q6-8h
		< 50 mL/min	150 mg PO daily 50 mg IV daily
		HD	Give after HD
Rosuvastatin	Hyperlipidemia	**≥ 30 mL/min**	Usual dose
		< 30 mL/min	Max 10 mg/day
Saxagliptin	Diabetes type 2	**≥ 50 mL/min**	5 mg PO daily
		< 50 mL/min	2.5 mg PO daily
		HD	2.5 mg PO daily after HD
Silodosin	Various Indications	**>50 mL/min**	Usual dose
		30-50 mL/min	4 mg/24 hrs
		<30 mL/min	Avoid use, hold order
Sitagliptin	Diabetes type 2	**≥ 45 mL/min**	Usual dose
		30-44 mL/min	50 mg PO daily
		< 30 mL/min	25 mg PO daily
Sodium Phosphate Enema	Constipation	**< 30 mL/min**	Change to tap water enema
Solifenacin	Overactive bladder	**≥ 30 mL/min**	5-10 mg PO daily
		< 30 mL/min	Max 5 mg PO daily
Tolterodine Long Acting	Various Indications	**10-30 mL/min**	Max 2 mg/24 hrs
		<10 mL/min	Avoid use (not studied), hold order
		HD	Avoid use (not studied), hold order
Acetaminophen and Tramadol - **Tramacet**	Pain	**≥ 30 mL/min**	Usual dose
		< 30 mL/min	Max 4 tablets/day

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