Meropenem Dosage Therapeutic Interchange

Meropenem is a broad spectrum carbapenem antibacterial which should be reserved for polymicrobial and/or serious infections where there is an increased risk of resistant organisms.

When meropenem is indicated, the majority of infections can be treated with a dosage of 500 mg IV every 6 hours. This dosage provides similar clinical outcomes as 1 g IV every 8 hours, and reduces unnecessary drug exposure while maintaining activity against relevant pathogens.
To facilitate this, the following therapeutic interchange is approved in Alberta Health Services:

Original Order	Therapeutic Interchange	Complexity Level†
Meropenem 1-2 g IV q6-8h in adults	Meropenem 500 mg IV q6h‡ EXCEPT in cystic fibrosis, central nervous system infections, or ophthalmologic infections. For these infections, contact prescriber to suggest dose of 2g IV q8h.	2

† Level 2: Mid Complexity - Additional patient specific information required/additional pharmacist assessment required.

‡ Dosage adjustment for renal dysfunction in adult patients	
Creatinine Clearance (CrCl) (mL/min)	**Recommended Dose & Interval using 500 mg q6h as standard dose**
26-50	500 mg q8h
10-25	500 mg q12h
Less than 10	500 mg q24h
For patients on intermittent hemodialysis	500 mg q24h – administered after dialysis
Continuous veno-venous hemodialysis (CVVHD)	Dose as CrCl greater than 50 mL/min = 500mg IV q6h
Peritoneal dialysis	500 mg q24h

EFFICACY

PHARMACODYNAMICS

- Meropenem exhibits time-dependent bactericidal activity, whereby its efficacy is best predicted by the percentage of time (T) that free drug concentrations exceed the minimum inhibitory concentration (MIC) for a bacterial pathogen (%fT>MIC). Maximal bactericidal activity occurs when fT>MIC ≥ 40% of the dosing interval.[1,2]
    - **Key point**: Meropenem 500 mg q6h has similar or greater T>MIC than 1 g q8h.[3,4]

Reference	%fT>MIC	
	500 mg q6h	**1 g q8h**
Kuti et.al.[3]	43.9%	45.8%
Ariano et.al.[4]	75%	68%

CLINICAL EVIDENCE

- Studies demonstrate that meropenem 500 mg q6h has equivalent clinical outcomes (e.g. time to defervescence, clinical and microbiological success, treatment duration, length of stay, mortality) as 1 g q8h.[5,6,7]

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Antimicrobial Stewardship Backgrounder

SAFETY

Reducing patient drug exposure by one-third may have advantages in terms of reduced adverse events and "collateral damage" of antibiotic therapy, with no loss of efficacy.

SUSTAINABILITY

At 500 mg q6h, the cost of meropenem is 17% less than at 1 g q8h; a cost savings of $3/day/patient.

Did you know…
that **meropenem is less than half the cost of imipenem** and should be used instead (except for infections due to *Nocardia spp* or nontuberculous *Mycobacteria spp*)?

Antimicrobial Stewardship means using antibiotics responsibly, for better outcomes today and less antibiotic resistance in the future.

All healthcare professionals share this responsibility.

References

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