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ST VINCENT'S PATHOLOGY

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MEROPENEM DRUG MEASUREMENT INFORMATION SHEET

Meropenem	Broad-spectrum carbapenem antibiotic. Time dependent killing. **Active against**: enteric Gram-negative rods (including extended spectrum beta-lactamase producers) and *Pseudomonas aeruginosa*; Gram-positive organisms, including unusual organisms such as *Nocardia* spp.; anaerobic organisms including *Bacteroides fragilis*. **Inactive against:** MRSA, VRE, *Enterococcus faecium*, atypical organisms (no cell wall and do not stain with Gram stain) and *Stenotrophomonas maltophilia*.
When to consider TDM	Patients who **do not respond to therapy**, those with **renal impairment**, **meningitis**, **septic shock** or **signs of neurotoxicity** (acute drowsiness, delirium, or confusion). TDM should be undertaken in any patient where >2 weeks of therapy is planned to ensure the optimal dosing.
Pharmacokinetics (may be altered in critical illness and organ dysfunction)	Absorption: N/A – IV only Protein binding: 2% Clearance: As metabolites: 30% | Unchanged in urine: 70% Elimination t½: 1 hour
Sample Collection Time	**Trough sample (<1 hour prior to the next dose), minimum 24 hours** after initiation or dose change..
Requesting and Collection	Collect 4 mL in a purple top (EDTA) tube (no gel separator). **Important information required on request form**: 1. Time of blood sample collection 2. Dosing regimen (dose and frequency) 3. Date and time of commencement 4. Date and time of last dose
Handling and Transport	Sample must be delivered to laboratory within 1 hour of collection. If not delivered to the lab within this time, centrifuge, separate plasma and freeze within 3 hours of collection.
Test Availability	Test performed Mondays to Fridays. Results available after 4 pm. For tests outside these hours, see handling & transport instructions above. Add-on tests are generally not available as sample integrity cannot be guaranteed.
Reference Intervals	**TARGET FOR EMPIRICAL THERAPY**: EUCAST PK-PD non-species related sensitivity breakpoint for meropenem is 2mg/L.[1] A trough concentration of 8 mg/L is an appropriate target. **TARGET FOR DIRECTED THERAPY:** Trough concentration > 4 times the pathogen's MIC. Contact the Microbiology registrar for assistance with MICs: (02) 8382 9194. **TOXIC RANGE:** Risk of **nephrotoxicity** with trough concentrations > 44 mg/L.[2] High risk of **neurotoxicity** expected with trough concentrations > 64 mg/L.[2] Features of neurotoxicity include delirium, decreased level of consciousness and seizures.
Contact	Clinical Pharmacology Laboratory: (02) 8382 9184. Patient Results: (02) 8382 9100 Further information: www.sydpath.com.au - Test Database
Instructions for Referring Laboratories	Centrifuge, separate plasma within 3 hours of collection, store and transport plasma frozen.
Document Approval	TDM Matters committee, March 16th 2023. Signed Ric Day, director CPT Dept
References	1. EUCAST Clinical Breakpoint Tables v. 12.0, 2022 (link) 2. Imani et al. 2017 DOI: 10.1093/jac/dkx209