

# Meropenem Newborn Use Only

2017

| <b>Alert</b>                | The Antimicrobial Stewardship Team recommends this drug is listed under the following category: Restricted.<br>Widespread use of carbapenems has been linked with increasing prevalence of infections caused by methicillin-resistant <i>Staphylococcus aureus</i> (MRSA), vancomycin-resistant enterococci (VRE), multi-resistant Gram-negative organisms and <i>Clostridium difficile</i> .   |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
|-----------------------------|---|--------------------------|---------------|------|----------|--------------------------|-----------|----------|-----------|--------------------------|----------|----------|----------|--------------------------|-----------|----------|----------|--------------------------|----------|----------|----------|--------------------------|---------------|------|----------|-----|-----|----------|----------|
| <b>Indication</b>           | Severe infections (e.g., sepsis or meningitis) caused by Gram-negative organisms resistant to other conventional antibiotics but susceptible to meropenem e.g., Extended Spectrum Beta Lactamase (ESBL)-producing organisms.<br>Note: Meropenem is NOT active against many resistant Gram-positive organisms, such as MRSA and most <i>Staphylococcus epidermidis</i> . Vancomycin is first-line therapy for these. Meropenem does have activity against penicillin-susceptible Gram-positive organisms and most anaerobic organisms. For individual advice, discuss therapy with a microbiologist or infectious diseases physician.  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Action</b>               | Meropenem is a carbapenem. It inhibits cell wall synthesis. <sup>1</sup><br><br>Meropenem is a better choice than imipenem for central nervous system infections. Meropenem attains a higher concentration in the cerebrospinal fluid particularly with inflamed meninges and has a lower incidence of seizures than imipenem.  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Drug Type</b>            | Carbapenem antibiotic.  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Trade Name</b>           | Meropenem APOTEX, Meropenem DBL, Meropenem Kabi, Meropenem Ranbaxy, Meropenem Sandoz, Merrem  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Presentation</b>         | 500 mg vial<br>1000 mg vial   |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Dosage / Interval</b>    | <p><b>Non-CNS and Non-<i>Pseudomonas</i> Sepsis</b></p> <table border="1"> <thead> <tr> <th>Gestational Age at birth</th> <th>Postnatal Age</th> <th>Dose</th> <th>Interval</th> </tr> </thead> <tbody> <tr> <td>&lt; 32<sup>+0</sup> weeks</td> <td>0–13 days</td> <td>20 mg/kg</td> <td>12 hourly</td> </tr> <tr> <td>&lt; 32<sup>+0</sup> weeks</td> <td>14+ days</td> <td>20 mg/kg</td> <td>8 hourly</td> </tr> <tr> <td>≥ 32<sup>+0</sup> weeks</td> <td>0–13 days</td> <td>20 mg/kg</td> <td>8 hourly</td> </tr> <tr> <td>≥ 32<sup>+0</sup> weeks</td> <td>14+ days</td> <td>30 mg/kg</td> <td>8 hourly</td> </tr> </tbody> </table> <p><b>Meningitis and <i>Pseudomonas</i> Sepsis*</b></p> <table border="1"> <thead> <tr> <th>Gestational Age at birth</th> <th>Postnatal Age</th> <th>Dose</th> <th>Interval</th> </tr> </thead> <tbody> <tr> <td>Any</td> <td>Any</td> <td>40 mg/kg</td> <td>8 hourly</td> </tr> </tbody> </table> <p>*Assess for any renal impairment prior to using higher doses as meropenem is primarily excreted via the kidneys.</p> | Gestational Age at birth | Postnatal Age | Dose | Interval | < 32 <sup>+0</sup> weeks | 0–13 days | 20 mg/kg | 12 hourly | < 32 <sup>+0</sup> weeks | 14+ days | 20 mg/kg | 8 hourly | ≥ 32 <sup>+0</sup> weeks | 0–13 days | 20 mg/kg | 8 hourly | ≥ 32 <sup>+0</sup> weeks | 14+ days | 30 mg/kg | 8 hourly | Gestational Age at birth | Postnatal Age | Dose | Interval | Any | Any | 40 mg/kg | 8 hourly |
| Gestational Age at birth    | Postnatal Age   | Dose                     | Interval      |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| < 32 <sup>+0</sup> weeks    | 0–13 days   | 20 mg/kg                 | 12 hourly     |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| < 32 <sup>+0</sup> weeks    | 14+ days  | 20 mg/kg                 | 8 hourly      |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| ≥ 32 <sup>+0</sup> weeks    | 0–13 days   | 20 mg/kg                 | 8 hourly      |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| ≥ 32 <sup>+0</sup> weeks    | 14+ days  | 30 mg/kg                 | 8 hourly      |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| Gestational Age at birth    | Postnatal Age   | Dose                     | Interval      |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| Any                         | Any   | 40 mg/kg                 | 8 hourly      |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Route</b>                | IV infusion.  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Maximum Daily Dose</b>   |   |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Preparation/Dilution</b> | Add 9.6 mL of WFI to the 500 mg powder for reconstitution to make a volume of 10 mL with a concentration of 50 mg/mL.<br>Draw up 2 mL (100 mg of meropenem) of solution and add 8 mL sodium chloride 0.9% to make a final volume of 10 mL with a concentration of 10 mg/mL.<br><br><b>Larger doses or neonates with a fluid restriction.</b><br>Add 9.6 mL of WFI to the 500 mg powder for reconstitution to make a volume of 10 mL with a concentration of 50 mg/mL.<br>Draw up 4 mL (200 mg of meropenem) of solution and add 6 mL sodium chloride 0.9% to make a final volume of 10 mL with a concentration of 20 mg/mL.   |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Administration</b>       | IV infusion over 4 hours.<br>May be given over 15 to 30 minutes if longer infusion not feasible due to line access issues from other infusions.   |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Monitoring</b>           | Monitor renal function. Dose may need to be adjusted in impaired renal function.  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |
| <b>Contraindications</b>    | Hypersensitivity to penicillins, cephalosporins and carbapenems.  |                          |               |      |          |                          |           |          |           |                          |          |          |          |                          |           |          |          |                          |          |          |          |                          |               |      |          |     |     |          |          |

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| <b>Precautions</b>       | Colitis–due to risk of pseudomembranous colitis.<br>Renal impairment.   |
| <b>Drug Interactions</b> | Sodium valproate– meropenem may result in clinically significant reduction in concentration of sodium valproate, which may cause seizures.  |
| <b>Adverse Reactions</b> | Injection site inflammation, diarrhoea (up to 6% in children), anaemia and eosinophilia.  |
| <b>Compatibility</b>     | Fluids: Glucose 5%, glucose 10%, sodium chloride 0.9%.<br>Y-site: Amino acid solutions, anidulafungin, caspofungin, linezolid, atropine sulfate monohydrate, dexamethasone sodium, gentamicin, heparin sodium, metronidazole.   |
| <b>Incompatibility</b>   | Fluids: No information<br><br>Y-site: Dolasetron, ketamine, mycophenolate mofetil, zidovudine.  |
| <b>Stability</b>         | Merrem: Solutions in sodium chloride are stable for 3 hours below 25°C and 24 hours at 2–8 °C. Use solutions in glucose 5% immediately.<br>Meropenem (DBL, Kabi, Ranbaxy, Sandoz): Solutions in sodium chloride are stable for 8 hours below 25°C and 24 hours at 2–8 °C. Solutions in glucose 5% are stable for 3 hours below 25 °C and 14 hours at 2–8°C.<br>Diluted solutions are potentially unstable, particularly glucose containing solutions and should be discarded if not used immediately. |
| <b>Storage</b>           | Vial: Store at room temperature.  |
| <b>Special Comments</b>  | Meropenem 1 g vial contains 3.92 mmol of sodium.  |
| <b>Evidence summary</b>  | Refer to full version.  |
| <b>References</b>        | Refer to full version.  |

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| <b>Original version Date: 05/12/2015</b> | <b>Author: NMF Consensus Group</b> |
| <b>Current Version number: 1.2</b>       | <b>Version Date: 14/10/2017</b>    |
| <b>Risk Rating: Medium</b>               | <b>Due for Review: 14/10/2020</b>  |
| <b>Approved by: JHCH CQ&amp;PCC</b>      | <b>Approval Date: 28/11/2017</b>   |

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