

# BENZYL PENICILLIN

| <b>Indication</b>  | <ul style="list-style-type: none"> <li>Treatment of<sup>1</sup>: <ul style="list-style-type: none"> <li>Susceptible infections (most gram-positive organisms) including GBS</li> <li>Congenital syphilis</li> <li>Meningitis</li> </ul> </li> </ul>   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
|--|---|----------------------------|----------------------------|----------------|--------------|---------------|----------------|--------------------|---------------|-----------|------|----------------|------------|---------------|-----------|-----|----------------|-----------|---------------|--------------|-----------|---------------|
| <b>INTRAVENOUS</b>   | <b>Presentation</b> <ul style="list-style-type: none"> <li>Vial 600 mg   1.2 g</li> </ul>   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
|  | <ul style="list-style-type: none"> <li>60 mg/kg (frequency according to *current gestational age and day of life)<sup>2,3</sup></li> </ul> <table border="1"> <thead> <tr> <th>*Current gest age (weeks)</th> <th>Current day of life (days)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td rowspan="2">29+6 or less</td> <td>0–28</td> <td>every 12 hours</td> </tr> <tr> <td>29 or more</td> <td>every 8 hours</td> </tr> <tr> <td rowspan="2">30+0–36+6</td> <td>0–14</td> <td>every 12 hours</td> </tr> <tr> <td>15 or more</td> <td>every 8 hours</td> </tr> <tr> <td rowspan="2">37+0–44+6</td> <td>0–7</td> <td>every 12 hours</td> </tr> <tr> <td>8 or more</td> <td>every 6 hours</td> </tr> <tr> <td>45+0 or more</td> <td>0 or more</td> <td>every 6 hours</td> </tr> </tbody> </table> <p><i>*Current gestational age is the same as post menstrual age (PMA)</i></p> | *Current gest age (weeks)  | Current day of life (days) | Frequency      | 29+6 or less | 0–28          | every 12 hours | 29 or more         | every 8 hours | 30+0–36+6 | 0–14 | every 12 hours | 15 or more | every 8 hours | 37+0–44+6 | 0–7 | every 12 hours | 8 or more | every 6 hours | 45+0 or more | 0 or more | every 6 hours |
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| <ul style="list-style-type: none"> <li>30 mg/kg (frequency according to current day of life) for total of 10 days</li> </ul> <table border="1"> <thead> <tr> <th>Current day of life (days)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>0–7</td> <td>every 12 hours</td> </tr> <tr> <td>8–30</td> <td>every 8 hours</td> </tr> <tr> <td>31 or more</td> <td>every 4 to 6 hours</td> </tr> </tbody> </table>  | Current day of life (days)  | Frequency                  | 0–7                        | every 12 hours | 8–30         | every 8 hours | 31 or more     | every 4 to 6 hours |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
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| 31 or more   | every 4 to 6 hours  |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
| <b>Preparation</b> <ul style="list-style-type: none"> <li>600 mg vial <ul style="list-style-type: none"> <li>Add 1.6 mL of water for injection</li> <li>Draw up solution and make up to 10 mL total volume with water for injection</li> <li>Concentration now equal to 60 mg/mL<sup>4</sup></li> </ul> </li> <li>1.2 g vial <ul style="list-style-type: none"> <li>Add 3.2 mL of water for injection<sup>4</sup></li> <li>Draw up 2 mL of solution and make up to 10 mL total volume with water for injection<sup>4</sup></li> <li>Concentration now equal to 60 mg/mL<sup>4</sup></li> </ul> </li> </ul> |   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
| <b>Administration</b> <ul style="list-style-type: none"> <li>IV infusion <ul style="list-style-type: none"> <li>Prime the infusion line and reduce total syringe volume to the prescribed dose</li> <li>IV infusion via syringe driver pump over 30 minutes<sup>5</sup></li> <li>On completion, disconnect syringe and infusion line</li> <li>Flush access port at same rate of infusion</li> </ul> </li> </ul>  |   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |



| <b>IM</b>                                     | <b>Presentation</b>   | <ul style="list-style-type: none"> <li>Vial 600 mg   1.2 g</li> </ul>   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
|---|---|---|----------------------------|----------------------------|----------------|--------------|---------------|----------------|--------------------|---------------|-----------|------|----------------|------------|---------------|-----------|-----|----------------|-----------|---------------|--------------|-----------|---------------|
|   | <b>Dosage sepsis</b>  | <ul style="list-style-type: none"> <li>60 mg/kg (frequency according to current gestational age and day of life)<sup>3</sup></li> </ul> <table border="1"> <thead> <tr> <th>*Current gest age (weeks)</th> <th>Current day of life (days)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td rowspan="2">29+6 or less</td> <td>0–28</td> <td>every 12 hours</td> </tr> <tr> <td>29 or more</td> <td>every 8 hours</td> </tr> <tr> <td rowspan="2">30+0–36+6</td> <td>0–14</td> <td>every 12 hours</td> </tr> <tr> <td>15 or more</td> <td>every 8 hours</td> </tr> <tr> <td rowspan="2">37+0–44+6</td> <td>0–7</td> <td>every 12 hours</td> </tr> <tr> <td>8 or more</td> <td>every 6 hours</td> </tr> <tr> <td>45+0 or more</td> <td>0 or more</td> <td>every 6 hours</td> </tr> </tbody> </table> <p><i>*Current gestational age is the same as post menstrual age (PMA)</i></p> | *Current gest age (weeks)  | Current day of life (days) | Frequency      | 29+6 or less | 0–28          | every 12 hours | 29 or more         | every 8 hours | 30+0–36+6 | 0–14 | every 12 hours | 15 or more | every 8 hours | 37+0–44+6 | 0–7 | every 12 hours | 8 or more | every 6 hours | 45+0 or more | 0 or more | every 6 hours |
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| 37+0–44+6                                     | 0–7   | every 12 hours  |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
|   | 8 or more   | every 6 hours   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
| 45+0 or more                                  | 0 or more   | every 6 hours   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
| <b>Dosage congenital syphilis<sup>3</sup></b> | <ul style="list-style-type: none"> <li>30 mg/kg (frequency according to current day of life) for total of 10 days</li> </ul> <table border="1"> <thead> <tr> <th>Current day of life (days)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>0–7</td> <td>every 12 hours</td> </tr> <tr> <td>8–30</td> <td>every 8 hours</td> </tr> <tr> <td>31 or more</td> <td>every 4 to 6 hours</td> </tr> </tbody> </table>                     | Current day of life (days)  | Frequency                  | 0–7                        | every 12 hours | 8–30         | every 8 hours | 31 or more     | every 4 to 6 hours |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
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| <b>Preparation</b>                            | <ul style="list-style-type: none"> <li>600 mg vial                             <ul style="list-style-type: none"> <li>Add 1.6 mL of water for injection</li> <li>Concentration now equal to 300 mg/mL<sup>4,5</sup></li> </ul> </li> <li>1.2 g vial                             <ul style="list-style-type: none"> <li>Add 3.2 mL of water for injection</li> <li>Concentration now equal to 300 mg/mL<sup>4,5</sup></li> </ul> </li> </ul> |   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |
| <b>Administration</b>                         | <ul style="list-style-type: none"> <li>Draw up the prescribed dose</li> <li>Intramuscular injection into thickest part of the vastus lateralis in the anterolateral thigh (maximum 0.5 mL per site)<sup>6</sup> immediately after reconstitution</li> </ul>   |   |                            |                            |                |              |               |                |                    |               |           |      |                |            |               |           |     |                |           |               |              |           |               |



|                               |  |
|-------------------------------|--|
| <b>Special considerations</b> | <ul style="list-style-type: none"> <li>Alter frequency of dose as baby ages</li> <li>Cautions                             <ul style="list-style-type: none"> <li>600 mg contains 41.4 mg of sodium<sup>4,5</sup></li> <li>If renal impairment, may need dosage adjustment</li> </ul> </li> <li>600 mg is equivalent to 1 million units of benzylpenicillin (also referred to as Penicillin G)</li> <li>If co-prescribed with aminoglycoside, give the antibiotic with shortest duration of administration first (so antibiotic cover commences asap)                             <ul style="list-style-type: none"> <li>Do not mix in the same injection or infusion solution; flush before and after</li> </ul> </li> <li>IM route only if IV not possible</li> <li>UAC route: consult with neonatologist/paediatrician prior to use and refer to Queensland Clinical Guideline: <i>Neonatal medicines</i><sup>7</sup></li> </ul> |
| <b>Monitoring</b>             | <ul style="list-style-type: none"> <li>Renal and hepatic function if prolonged high-dose treatment<sup>8</sup></li> <li>Extravasation risk</li> </ul>  |
| <b>Compatibility</b>          | <ul style="list-style-type: none"> <li>Fluids                             <ul style="list-style-type: none"> <li>5% glucose<sup>5</sup>, 0.9% sodium chloride<sup>5,9</sup>, water for injection<sup>5</sup></li> </ul> </li> <li>Y-site                             <ul style="list-style-type: none"> <li>Limited and conflicting information. Check with pharmacist</li> </ul> </li> </ul>  |
| <b>Incompatibility</b>        | <ul style="list-style-type: none"> <li>PN and fat emulsion<sup>5</sup>: co-infusion with benzylpenicillin not recommended (evidence limited)                             <ul style="list-style-type: none"> <li>If unavoidable, seek pharmacist advice first, filter infusion and flush before and after</li> </ul> </li> <li>Drugs                             <ul style="list-style-type: none"> <li>Aminoglycosides<sup>5</sup> (amikacin, gentamicin, tobramycin) dobutamine<sup>5</sup>, heparin<sup>5</sup>, noradrenaline (norepinephrine)<sup>5</sup>, phenobarbital (phenobarbitone)<sup>5</sup>, suxamethonium<sup>5</sup></li> </ul> </li> </ul>  |
| <b>Interactions</b>           | <ul style="list-style-type: none"> <li>IV aminoglycosides are inactivated by IV cephalosporins, penicillins and teicoplanin<sup>5</sup></li> </ul>   |

|                                 |   |
|---------------------------------|---|
| <b>Stability</b>                | <ul style="list-style-type: none"> <li>• Vial <ul style="list-style-type: none"> <li>○ Store below 25 °C. Protect from light<sup>4,5</sup></li> </ul> </li> <li>• Reconstituted solution <ul style="list-style-type: none"> <li>○ Use immediately<sup>4,5</sup></li> </ul> </li> </ul>  |
| <b>Side effects<sup>8</sup></b> | <ul style="list-style-type: none"> <li>• Hypersensitivity reactions: rare in neonates. May present as erythema and rash (maculopapular rash, red purple plaques or urticarial type plaques)<sup>10-13</sup></li> <li>• Blood pathology: electrolyte disturbances (hypernatremia or hypokalaemia), dyscrasias (e.g. neutropenia, related to dose and duration of treatment, thrombocytopenia) angioedema, haemolytic anaemia, eosinophilia, serum sickness-like syndrome</li> <li>• Digestive: diarrhoea, vomiting, Clostridium difficile-associated disease</li> <li>• Genitourinary: interstitial nephritis</li> <li>• Integumentary: inflammation at injection site</li> <li>• Nervous system: neurotoxicity with high doses and/or rapid IV injection<sup>5</sup> (e.g. drowsiness, coma, seizures)</li> </ul> |
| <b>Actions</b>                  | <ul style="list-style-type: none"> <li>• Beta-lactamase sensitive penicillin antibiotic</li> </ul>  |
| <b>Abbreviations</b>            | *Current gestational age is the same as post-menstrual age (PMA)<br>ASAP: as soon as possible, EOGBSD: early onset group B streptococcal disease, GBS: Group B streptococcus, IM: intramuscular, IV: intravenous, UAC: umbilical arterial catheter  |
| <b>Keywords</b>                 | Benzylpenicillin, penicillin, penicillin G sodium, crystalline penicillin, BenPen   |

The Queensland Clinical Guideline *Neonatal Medicines* is integral to and should be read in conjunction with this monograph. Refer to the disclaimer. Destroy all printed copies of this monograph after use.

## References

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## Document history

| ID number          | Effective  | Review     | Summary of updates  |
|--------------------|------------|------------|---|
| NMedQ20.013-V1-R25 | 01/03/2020 | 01/03/2025 | Endorsed by Queensland Neonatal Services Advisory Group (QNSAG)   |
| NMedQ20.013-V2-R25 | 03/12/2020 | 01/03/2025 | <ul style="list-style-type: none"> <li>Dose for congenital syphilis changed FROM 50 mg/kg TO 30 mg/kg</li> <li>PMA changed to current gestational age</li> <li>QR code added</li> </ul>   |
| NMedQ20.013-V3-R25 | 13/08/2021 | 01/03/2025 | <ul style="list-style-type: none"> <li>Removed UAC icon and amended instructions for administration via UAC</li> <li>Amended instructions for co-prescription with aminoglycosides to clarify order of administration</li> </ul>  |
| NMedQ20.013-V4-R25 | 31/03/2023 | 01/03/2025 | <ul style="list-style-type: none"> <li>Dosage for sepsis (IV and IM) amended for 37+0 weeks or more current gestational age at 8 or more days of age FROM 60 mg/kg every 8 hours TO 60 mg/kg every 6 hours to align with ASID recommendations<sup>3</sup> for term infants</li> </ul> |
| NMedQ20.013-V5-R25 | 25/01/2024 | 01/03/2025 | <ul style="list-style-type: none"> <li>Added definition of current gestational age</li> <li>Amended instructions for dose frequency to clarify frequency alters as baby ages</li> <li>Added duration of dosage for congenital syphilis</li> </ul>                                     |

## QR code

