



## MONOGRAPH

# Benzylpenicillin Monograph - Paediatric

<b>Scope (Staff):</b>	Medical, Pharmacy, Nursing
<b>Scope (Area):</b>	All Clinical Areas

### Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [DISCLAIMER](#)

### QUICKLINKS

<a href="#">Dosage/Dosage Adjustments</a>	<a href="#">Administration</a>	<a href="#">Compatibility</a>	<a href="#">Monitoring</a>
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### DRUG CLASS

Benzylpenicillin (also known as penicillin G) is a narrow spectrum, bactericidal penicillin antibiotic.<sup>(1, 2)</sup>

### INDICATIONS AND RESTRICTIONS

#### IV: Unrestricted (green) antibiotic

This is not a restricted agent. Follow standard ChAMP guidelines where appropriate.

- Benzylpenicillin is active against many Gram-positive bacteria including *Streptococcus pyogenes*, *Streptococcus agalactiae* (Group B Streptococcus) and *Streptococcus pneumoniae*.<sup>(1, 3)</sup>
- It has activity against some Gram-negative bacteria including *Treponema pallidum* (syphilis).<sup>(1, 2)</sup>

### CONTRAINDICATIONS

- Hypersensitivity to benzylpenicillin or any component of the formulation or a history of [high risk allergy](#) to penicillins.<sup>(1, 3-5)</sup>

## PRECAUTIONS

- Benzylpenicillin may be prescribed in selected patients with high risk allergy to another Beta-lactam sub-class (e.g. some cephalosporins, carbapenems) in discussion with immunology.<sup>(1)</sup>
- In patients with a previous [low risk reaction](#) to benzylpenicillin or another penicillin (delayed rash [ $>1$ hr after initial exposure] without mucosal or systemic involvement) the risk of subsequent reaction is low. Re-challenge may be acceptable in discussion with immunology.
- Rapid IV injection of large doses may cause seizures and electrolyte imbalance.<sup>(1, 6)</sup>
- High doses of benzylpenicillin should be used with caution in renal impairment as it may result in electrolyte disturbances, neurotoxicity and increase the risk of neutropenia.<sup>(1, 5)</sup>
- Each 600mg of benzylpenicillin sodium salt contains 41.4mg (1.8mmol) of sodium.<sup>(6)</sup>

## FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- 600 mg powder for injection vial
- 1.2 gram powder for injection vial

Imprest location: [Formulary One](#)

## DOSAGE & DOSAGE ADJUSTMENTS

**Note:** 600 mg of benzylpenicillin is equivalent to 1 million units.

**Neonates:** [Refer to Neonatal Medication Protocols](#)

**IV - Children  $\geq$  4 weeks:**

- **Usual dose:** 50 mg/kg/dose (to a maximum of 1.2 grams) 6 hourly.<sup>(2)</sup>
- **Severe infections:** 50 mg/kg/dose (to a maximum of 2.4 grams) 4 to 6 hourly.<sup>(2)</sup>

**IV - Hospital in the Home (HiTH) dosing:**

- 200 to 300 mg/kg/DAY (to a maximum of 14.4 grams per day) via a buffered continuous infusion.<sup>(6)</sup>

- **Note:** this infusion MUST be prepared by Baxter®.<sup>(6)</sup> Refer to [Hospital in the Home \(HiTH\) Antimicrobial Guidelines](#).

**[Dosing in Overweight and Obese Children:](#)** Dose based on measured body weight.<sup>(7)</sup>

**Renal impairment:**

[eGFR calculator](#)

- eGFR  $\geq$  50 mL/minute: normal dosing
- eGFR  $\geq$  10 to  $<$  50 mL/minute: 75% dose at the normal dosing interval
- eGFR  $<$  10 mL/minute: 20-50% dose at the normal dosing interval (maximum total daily dose of 6 grams).<sup>(2, 4)</sup>
- Sodium content of the injection may accumulate in patients with renal impairment. Electrolyte levels should be closely monitored.<sup>(1, 4)</sup>

**Hepatic impairment:**

- No dosage adjustment is required in patients with hepatic impairment.<sup>(4)</sup>

**RECONSTITUTION & ADMINISTRATION****IV:**

- Reconstitute each vial with the volume of water for injection in the table below.<sup>(6)</sup>

Vial strength	Volume of water for injection required	Powder volume	Resulting concentration
600 mg	9.6 mL	0.4 mL (BenPen® brand)	60 mg/mL
1.2 gram	19.2 mL	0.8 mL (BenPen® brand)	60 mg/mL

**IM:**

- Reconstitute each vial with the volume of water for injection in the table below.<sup>(3)</sup>

Vial strength	Volume of water for injection required	Powder volume	Resulting concentration
600 mg	1.6 mL	0.4 mL (BenPen® brand)	300 mg/mL
1.2 gram	3.2 mL	0.8 mL (BenPen® brand)	300 mg/mL

**IV infusion:**

- Infuse the reconstituted vial (maximum concentration of 60mg/mL) over 30 to 60 minutes.<sup>(6)</sup>

**HiTH administration:**

- Give via continuous Baxter® infusion. This solution must be buffered with sodium citrate to ensure stability.<sup>(6)</sup>

**IM Injection:**

- If IV access is not available this medication may be given by IM injection.
- Reconstitute as directed above with water for injection to a concentration of 300 mg/mL and inject as per PCH guideline [Intramuscular Injections](#) (internal link).

**COMPATIBILITY (LIST IS NOT EXHAUSTIVE)****Compatible fluids:**

- Glucose 5%
- Sodium chloride 0.9%<sup>(3, 6, 8)</sup>

**Compatible at Y-site:**

[Compatibilities of IV drugs](#) must be checked when two or more drugs are given concurrently.

**MONITORING**

Renal & hepatic function and full blood count should be monitored weekly with prolonged high-dose therapy (i.e. longer than 10 days).<sup>(1, 4, 5)</sup>

**ADVERSE EFFECTS**

**Common:** diarrhoea, nausea, pain and inflammation at injection site, fever.<sup>(1, 9)</sup>

**Infrequent:** *Clostridium difficile*-associated disease, vomiting, arthralgia, leucopenia.<sup>(1, 9)</sup>

**Rare:** black tongue, electrolyte disturbances, neurotoxicity (including; drowsiness, hallucinations, coma, seizures), bleeding, blood dyscrasias (including neutropenia & thrombocytopaenia).<sup>(1, 9)</sup>

**STORAGE**

- Store vials at < 25°C and protect from light.<sup>(3, 6)</sup>

**INTERACTIONS**

This medication may interact with other medications; consult PCH approved references (e.g. [Clinical Pharmacology](#)), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

*\*\*Please note: The information contained in this guideline is to assist with the preparation and administration of **benzylpenicillin**. Any variations to the doses recommended should be clarified with the prescriber prior to administration\*\**

**Related CAHS internal policies, procedures and guidelines**

[Antimicrobial Stewardship Policy](#)

[ChAMP Empiric Guidelines and Monographs](#)


[KEMH Neonatal Medication Protocols](#)

**References**

1. Rossi S, editor. Australian Medicines Handbook. Adelaide, S. Aust.: Australian Medicines Handbook; 2022.
2. Antibiotic Writing Group. Therapeutic Guidelines - Antibiotic. West Melbourne: Therapeutic Guidelines Ltd; 2022. Available from: <https://tgldcdp-tg-org-au.pklibresources.health.wa.gov.au/etgAccess>.
3. MIMS Australia. MIMS online [full product information]. St Leonards, N.S.W: CMP Medica Australia.; 2022. p. 1v. (various pagings).
4. Clinical Pharmacology [Internet]. Elsevier BV. 2022 [cited 24/10/2022]. Available from: <http://www.clinicalpharmacology-ip.com.pklibresources.health.wa.gov.au/default.aspx>.
5. IBM Micromedex [Internet]. Truven Health Analytics. 2022 [cited 24/10/2022]. Available from: <http://www-micromedexsolutions-com.pklibresources.health.wa.gov.au/micromedex2/librarian>.
6. Symons K. Ermer J. (editors). Australian injectable drugs handbook. Collingwood: The Society of Hospital Pharmacists of Australia; 2022.
7. Kendrick JG, Carr RR, Ensom MH. Pediatric Obesity: Pharmacokinetics and Implications for Drug Dosing. Clin Ther. 2015;37(9):1897-923.
8. Miller J, editor. AHFS Drug Information. Maryland: American Society of Health-System Pharmacists; 2022.
9. Paediatric Formulary Committee. BNF for Children: 2022. London: BMJ Group

Pharmaceutical Press; 2022.

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Compassion

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