MONOGRAPH

Flucloxacillin Monograph - Paediatric

Scope (Staff):	Medical, Pharmacy, Nursing
Scope (Area):	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

DRUG CLASS

Narrow spectrum penicillin antibiotic with anti-staphylococcal activity.[1, 2]

INDICATIONS AND RESTRICTIONS

Flucloxacillin is indicated for the treatment of confirmed or suspected methicillin susceptible *Staphylococcus aureus* infections (MSSA) e.g. skin and soft tissue infections, bacteraemia, osteomyelitis and pneumonia.[1, 2] Also active against streptococci.[2]

Oral and IV: Unrestricted (green) antibiotic

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

CONTRAINDICATIONS

- Hypersensitivity to flucloxacillin, any component of the formulation or patients with a history of high risk allergy to penicillins.[1, 3]
- Flucloxacillin is contraindicated in patients with a history of cholestatic hepatitis associated with either dicloxacillin or flucloxacillin.[1, 4]

PRECAUTIONS

- Flucloxacillin 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.[5] In patients with a previous low risk reaction to flucloxacillin or another penicillin (delayed rash [>1hr after initial exposure] without mucosal or systemic involvement) the risk of subsequent reaction is low. Re-challenge may be acceptable in discussion with immunology.[1, 5]
- Use with extreme caution in jaundiced neonates or premature infants as it reduces albumin bound bilirubin to 50 – 70% of the baseline concentration.[4]
- Flucloxacillin can rarely cause severe hepatitis and cholestatic jaundice, particularly with prolonged IV courses.[2, 4]
- Pain and phlebitis are common with IV injection and may be severe. Consider a central line if prolonged treatment or a continuous infusion is required.[3]
- Each 1 gram vial of flucloxacillin contains 2.2mmol of sodium.[3, 4]

FORMULATIONS

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

- 250mg/5mL oral liquid
- 250mg and 500mg capsules
- 1 gram powder for injection vial

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: Refer to Neonatal Medication Protocols

Children ≥4 weeks to 18 years:

IV or IM:

- **Usual dose:** 50 mg/kg/dose (to a maximum of 2 grams) 6 hourly[2]
- The dose may be increased to 50 mg/kg/dose (to a maximum of 2 grams) 4 hourly in severe infections, patients who are critically unwell, those with CNS infections and/or endocarditis.[1, 6]

Continuous infusions:

- **Usual dose:** 200 mg/kg/DAY (to a maximum of 8 grams per day) given via continuous infusion[1]
- **Severe infections:** 300 mg/kg/DAY (to a maximum of 12 grams per day) given via continuous infusion[1]

- Continuous infusions can be given either via a 24 hour Baxter® Infusor OR via two 12 hour continuous infusions (see reconstitution and administration sections for further information). These orders must be charted on the paediatric hospital medication chart (PHMC).

Oral:

- **Usual dose:** 12.5 mg/kg/dose (to a maximum of 500 mg) 6 hourly.[1, 6]
- **Severe infections (including osteomyelitis):** 25 mg/kg/dose (to a maximum of 1 gram) 6 hourly.[1, 6]

Although 6 hourly dosing is preferred for oral administration, giving the four doses evenly spaced throughout the waking hours has been used in children.[2]

Dosing in Overweight and Obese Children: Dose based on measured body weight.[7]

Renal impairment:

eGFR calculator

- eGFR ≥10mL/minute: normal dose
- eGFR <10mL/minute: 100% dose 8 hourly.[5]
- High doses may cause nephrotoxicity or neurotoxicity in renal impairment.[5]

Hepatic impairment:

- There is no dosage adjustment required in hepatic impairment. Manufacturer advises caution; including those with risk factors for hepatic impairment.[1, 5]
- Flucloxacillin is contraindicated in patients with a history of jaundice or hepatic dysfunction associated with dicloxacillin or flucloxacillin.[1, 4, 5]
- Flucloxacillin can cause cholestatic hepatitis. The risk is increased for patients on courses longer than 2 weeks. Pre-existing hepatic impairment is not a risk factor.[1]

RECONSTITUTION & ADMINISTRATION

IV reconstitution:

Reconstitute each vial with the volume of water for injection in the table below. Further dilution with a compatible fluid to a final concentration of 50mg/mL or weaker is required prior to administration.[3]

Vial strength	Volume of water for injection required	Resulting concentration	Powder volume
1 gram	9.3 mL	100 mg/mL	0.7 mL

IV Administration:

IV infusion (preferred):

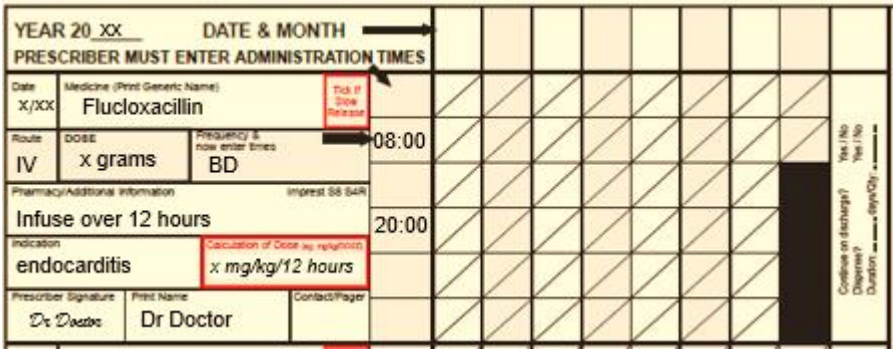
- Dilute to a final concentration of 50 mg/mL or weaker and infuse over 30 to 60 minutes.[3]
- Rapid administration of large doses has been associated with seizures.[1]

IV push:

- Administer a 50 mg/mL or weaker solution over 3 to 4 minutes. Pain and phlebitis are more common with IV push administration and may be severe.[3]

Continuous infusion:

- The total dose may be given over 24 hours via a continuous Baxter® Infusor as an inpatient or via HiTH.[3] Flucloxacillin solutions prepared in a Baxter® Infusor are buffered to make them stable for 24 hours at room temperature.
- If Baxter® Infusors are not available, divide the total 24 hour dose in half and give as two 12 hour continuous infusions. This is because diluted flucloxacillin has reduced stability when stored at room temperature.[3]
    - Prescribe on the PHMC as TWICE DAILY (12 hour interval) and annotate with 'infuse over 12 hours'. See example below:



    - Dilute to a final concentration of 50 mg/mL and infuse over 12 hours[3]. To ensure an accurate infusion volume when preparing the dose in a bag, remove and discard the overage volume from the bag in addition to the volume of the flucloxacillin dose being added.
        - 50 mL bag (Baxter) has a 7 mL overage (total initial volume is 57 mL)
        - 100 mL bag (Baxter) has an 8 mL overage (total initial volume is 108mL)

Note: Due to rounding of the rate with the BBraun pumps, it may not be possible to deliver the dose over exactly 12 hours. The pump may adjust the time by up to 10 minutes (e.g. 11 hours and 54 minutes); this will not affect the efficacy of the medication.

IM reconstitution:

- Reconstitute each vial with water for injection or lidocaine (lignocaine) 1% (10 mg/mL) using the exact volume shown in the table below; this is for IM injection only.[3, 4]

Vial size	**Reconstitution volume**[3]	**Final concentration**
1 gram	1.3 mL	500 mg/mL

IM administration:

- Doses up to 1 gram may be injected into a large muscle mass; larger doses should be administered into separate sites. Refer to the Intramuscular Injections Guideline for advice on maximum recommended injection volumes for different aged children.

Oral reconstitution (250mg/5mL strength):

Open foil packaging and reconstitute with water as per the product information as follows:

- Tap bottle until all powder flows freely; add approximately half the total volume of water for reconstitution and shake vigorously to suspend powder.
- Add remainder of the water and again shake vigorously.
- Store reconstituted solution in the refrigerator (between 2 and 8ºC) and discard any remaining suspension after 14 days.[4]
- Refer to packaging for the reconstitution instructions for alternative brands and strengths.

Oral administration:

Give on an empty stomach at least 30 minutes before food or 2 hours after food.[1, 4]

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids:

- Glucose 5%
- Glucose / sodium chloride solutions
- Sodium chloride 0.9%
- Hartmann's[3]

Compatible at Y-site:

Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

MONITORING

- Renal, hepatic and haematological function should be monitored weekly with prolonged therapy (i.e. longer than 7 days).[1]
- Hepatic adverse effects are more likely with larger doses or long treatment courses (greater than 2 weeks).[1, 4]
- Patients must be monitored for phlebitis if the flucoxacillin is administered via a peripheral IV catheter.[1, 3]

ADVERSE EFFECTS

Common: transient increases in liver enzymes and bilirubin, diarrhoea, nausea, pain and inflammation at injection site, allergy.[1, 4, 5]

Infrequent: vomiting, *Clostridium difficile*-associated disease, arthralgia, leucopenia[5]

Rare: cholestatic hepatitis (more common in females and in treatment courses >2weeks), black tongue, electrolyte disturbances, neurotoxicity (usually with high doses, e.g. drowsiness, hallucinations, coma, seizures), nephritis, fever, myalgia, bleeding, blood dyscrasias (e.g.

eosinophilia, agranulocytosis, neutropenia-related to dose and duration of treatment, thrombocytopenia) severe cutaneous adverse reactions (SCARs).[1, 4, 5]

STORAGE

- **Oral:**
  - 250mg and 500mg capsules – store below 25ºC and protect from light.[4]
  - 250mg/5mL oral liquid – store un-reconstituted bottle below 25ºC and protect from light. After reconstitution, store in the refrigerator (between 2 and 8ºC) and discard any remaining solution after 14 days.[4]
- **IV:**
  - 1g powder for injection vial – store below 25ºC, protect from light and moisture. Use immediately after reconstitution.[4]

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 **flucloxacillin**. 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

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4. MIMS Australia. MIMS online [full product information]. St Leonards, N.S.W: CMP Medica Australia.; 2022 [cited 2022 6th Dec].
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