



Preventing Rheumatic Fever

GUIDANCE FOR ADMINISTERING AN INTRAMUSCULAR INJECTION OF BENZATHINE BENZYL PENICILLIN

This guidance provides a standardised protocol for administering intramuscular penicillin, with lignocaine added for pain relief, to treat group A streptococcus (GAS) pharyngitis. Although this guidance has been written from the perspective of administering the intramuscular injection to children, the same principles apply for the administration in adults.

A single dose of intramuscular penicillin, or a daily oral dose of amoxicillin for 10 days, is the first-line treatment for GAS pharyngitis recommended within the Rheumatic Fever Prevention Programme.

Rheumatic fever is a serious but preventable illness. It is an autoimmune response to untreated GAS pharyngitis (Mirabel et al 2014) and can be prevented by treating GAS pharyngitis with appropriate antibiotics.

Benzathine benzylpenicillin, also known as Bicillin L-A®, is the long-acting formulation commonly used for the secondary prevention of rheumatic fever. It can also be used as a single-dose treatment for GAS pharyngitis. It is supplied in a syringe for once-only use.

Table 1 outlines the recommended regimen for oral or intramuscular antibiotics for treatment of GAS pharyngitis. Erythromycin is the alternative antibiotic if the child may or will definitely have an anaphylactic reaction to penicillin or amoxicillin.

Table 1: Recommended regimen for oral or intramuscular antibiotics for treatment of GAS pharyngitis

First-line treatment	
Amoxicillin orally for 10 days	Children < 30 kg: 750 mg once daily Children ≥ 30 kg: 1000 mg once daily
or	
Benzathine benzylpenicillin, intramuscular , single dose	Children < 30 kg: 450 mg (600,000 units) Children ≥ 30 kg: 900 mg (1,200,000 units)
Alternative for definite or possible anaphylaxis to penicillin or amoxicillin	
Erythromycin ethyl succinate orally for 10 days	Children and adults: 40 mg/kg/day in 2–3 divided doses

Why give intramuscular penicillin?

The key benefit of giving a single injection of intramuscular penicillin is that families do not need to remember to take antibiotics over 10 days. A single intramuscular injection may be a suitable option to treat GAS pharyngitis in some children and young people, particularly if they have a history of poor adherence to antibiotics.

Who can be offered intramuscular penicillin?

Intramuscular penicillin can be offered if both the following criteria are met.

1. A throat swab taken for a sore throat has grown GAS bacteria.
2. The family has no history of an anaphylactic reaction to penicillin.

If the child has a history of severe asthma, cephalosporin allergy or other anaphylaxis allergies, or if the family has a history of anaphylaxis to penicillin, discuss this with a medical doctor or nurse prescriber before giving intramuscular penicillin.

Informed consent

The right to consent to a child's medical treatment is covered in section 36 of the Care of Children Act 2004. A young person aged 16 years or over may give or withhold consent to medical treatment themselves. If the child is under 16 years, the health professional must assess whether the child has the understanding and maturity to form a balanced judgement about the proposed treatment. If they are able to form a balanced judgement, the child may be treated based on their own consent to the treatment. If they are not, the health professional may get informed consent from someone legally entitled to give consent on behalf of the child (eg, parent or guardian).

For more information on informed consent for children, see the Health and Disability Commissioner's [Fact Sheet 3: The age of consent and informed consent for children](#).

It is important to document the informed consent.

The family or whānau and child must be involved in the informed consent process, and understand:

1. that they have a choice about whether to agree to the treatment or not
2. why they are being offered the treatment
3. what the treatment involves
4. what the benefits, side effects and alternatives for this treatment are.

As discussed above, the key benefit of giving one-off intramuscular penicillin is that it removes the need for adherence to antibiotics.

Some side effects that sometimes occur after the injection include:

- pain at the injection site – which can be treated with pain relief such as ibuprofen or paracetamol
- hypersensitivity reactions such as rash, hives, nausea and vomiting. If such reactions occur, a registered health practitioner should review them.

As with other forms of penicillin, allergic reactions can occur. International data suggests that the incidence of allergic reactions is 3% and the incidence of anaphylactic reactions is 0.2% (Wyber 2013).

As for other intravenous and intramuscular injections, it is recommended that:

- the patient stays at the clinic for 20 minutes after the injection, where they can be observed for development of anaphylaxis
- emergency equipment is available.

[View information on Bicillin L-A®.](#)

You can give the whānau information card (*Treating a sore throat with a single penicillin injection*) to the family to reinforce your explanation of the procedure, the benefits of intramuscular penicillin, the potential side effects and after-care advice.

Who can give intramuscular penicillin?

Any registered health professional (eg, nurse, pharmacist or doctor) can give intramuscular penicillin as long as they are authorised to do so within the scope of practice defined by their governing body.

It is recommended that before administering intramuscular penicillin, health professionals:

- watch the [online training video](#) on the administration of intramuscular penicillin
- complete the Ministry of Health's [e-learning course on rheumatic fever](#).

The National Hauora Coalition have produced the online training video and it demonstrates how they administer intramuscular Bicillin L-A® (with lignocaine). The aim of the training video and the e-learning resource is to ensure health professionals are competent to offer and administer the option of intramuscular penicillin to treat GAS pharyngitis, if this is appropriate.

How do you give intramuscular penicillin?

Correct intramuscular injection technique is important for medicine effectiveness and patient safety (Brown et al, 2015; Greenway 2014, Cocoman and Murray 2010). Registered health professionals have a responsibility to ensure that current best evidence and individual patient assessment informs their practice, so injections are given:

- in the optimal site, at the correct depth and rate of delivery
- using the appropriate needle size
- using an accurate land-marking technique.

Current evidence supports the ventrogluteus (VG) site as the preferred site for intramuscular injections because:

- it is the largest muscle in adults and in children over seven months old
- potential complications are limited as it is free from nerves and major vascular structures
- the site is easily palpable and accessible in both thin and obese patients
- the muscle is accessible in the supine, prone or side-lying position
- subcutaneous tissue is thinner over this muscle and has a consistent thickness of adipose over it, ensuring that the needle will penetrate the muscle.

Reducing the pain of receiving an intramuscular penicillin injection

Receiving an intramuscular penicillin injection can be painful due to the volume and viscosity of the dose being administered.

This pain can be reduced by adding lignocaine to the antibiotic injection (it is important to check that there is no allergy to lignocaine).

Other helpful measures are to:

1. use the Buzzy® physiological pain blocker (highly recommended if available)¹
2. use age-appropriate distraction techniques such as games (eg, 'Where's Wally?' puzzle, 'I spy'), relaxation breathing, non-procedural talk or an electronic device (eg, iPad, computer tablet, smart phone)
3. warm the syringe to room temperature before using it
4. use ethylchloride (cold) spray before administering the injection
5. allow the alcohol swab to dry before inserting the needle
6. apply pressure on the injection site with your thumb for 10 seconds before inserting the needle
7. deliver the injection very slowly (preferably over two to three minutes), distracting the child throughout the injection.

Step-by-step guide to administering the intramuscular penicillin injection with lignocaine

Equipment needed

1. 900 mg (1,200,000 units) Bicillin L-A® (with needle)
2. 2% lignocaine ampoule
3. 1 mL syringe
4. 25 g needle
5. Emergency equipment (eg, adrenaline, oxygen)

Also needed for a child < 30 kg

6. 3 mL syringe
7. Large gauge needle (23 g or larger)

Optional equipment

1. Buzzy®
2. Ethylchloride spray
3. Distraction equipment (eg, 'Where's Wally' puzzle, electronic device)
4. Alcohol wipes

Preparation

1. Identify the patient and check their eligibility, including any contraindications to receiving the intramuscular penicillin (with lignocaine) injection.
2. Gain and document informed consent.
3. Reassure the family and child by explaining the methods used to reduce pain.

¹ Buzzy® is a physiological pain blocker that works by using cold and vibration. For more information, go to: <http://buzzy4shots.com>

Process

Throughout the procedure, use an aseptic non-touch technique and follow infection control guidelines.

1. Weigh the child to ensure the dose charted is appropriate.
 - a. Children weighing 30 kg and above receive 900 mg (1,200,000 units) benzathine benzylpenicillin.
 - b. Children weighing less than 30 kg receive 450 mg (600,000 units) benzathine benzylpenicillin.
2. Two health professionals independently check the pre-filled Bicillin L-A® syringe and 2% lignocaine ampoule. Check the:
 - a. right medication
 - b. right dose
 - c. right route
 - d. right time
 - e. expiry date
 - f. right patient.
3. Use the 1 mL syringe and attach the 25 g needle to draw up 0.25 mL of 2% lignocaine. The second health professional checks the amount.
4. Prepare the syringe.
 - a. Where the dosage is for children who weigh 30 kg and above:
 - i. remove the cap from pre-filled Bicillin L-A® syringe and draw back a 0.25 mL space for the lignocaine
 - ii. add 0.25 mL of 2% lignocaine from the 1 mL syringe.
 - b. Where the dosage is for children who weigh less than 30 kg:
 - i. prepare the 3 mL syringe by drawing back to 1.15 mL
 - ii. remove the cap from Bicillin L-A® syringe, attach 23 g or larger gauge needle and decant 1.15 mL (450 mg/600,000 units) Bicillin L-A® into the 3 mL syringe. The second health professional checks the amount
 - iii. draw back on the 3 mL syringe to 1.4 mL and add the 0.25 mL of 2% lignocaine.
5. Remove air from the prepared syringe containing lignocaine and Bicillin L-A® and attach the Bicillin needle (with the needle guard).
6. Hold the prepared syringe between your hands to warm it.
7. Locate the preferred site based on individual patient assessment and current best practice.
8. Press the activated Buzzy® directly on the injection site and leave for one minute. Then slide Buzzy® 2–5 cm medial to the site and leave it resting here.
9. Apply ethylchloride cold spray if it is available.
10. Re-locate the site and clean it with an alcohol wipe if indicated. Allow the alcohol wipe to dry. (Tip: You can leave the wipe with a corner pointing to the administration site to identify the spot, while you are picking up the prepared Bicillin L-A® (with lignocaine) syringe.)

11. Use age-appropriate distraction techniques while administering the injection (eg, non-procedural talk, a game such as 'I spy', an electronic device or relaxation breathing techniques).
12. Administer the prepared Bicillin L-A® (with lignocaine) slowly (over approximately one to two minutes). Give the first portion containing lignocaine and wait a few seconds, then give the remaining Bicillin L-A® (leave Buzzy® vibrating until needle is removed).
13. Keep the child or young person at the clinic for 20 minutes. Observe for any signs/symptoms of anaphylaxis (refer to clinic guidelines) or adverse reactions.
14. Use the correct practice documentation to record the date, time, site of injection, drug, dose and any other health data, including any adverse reactions.
15. Inform the child and their family or whānau of what they can expect after the injection, including any side effects, and advise them to contact their doctor, nurse practitioner or nurse if they are concerned.

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