

# PRODUCT INFORMATION

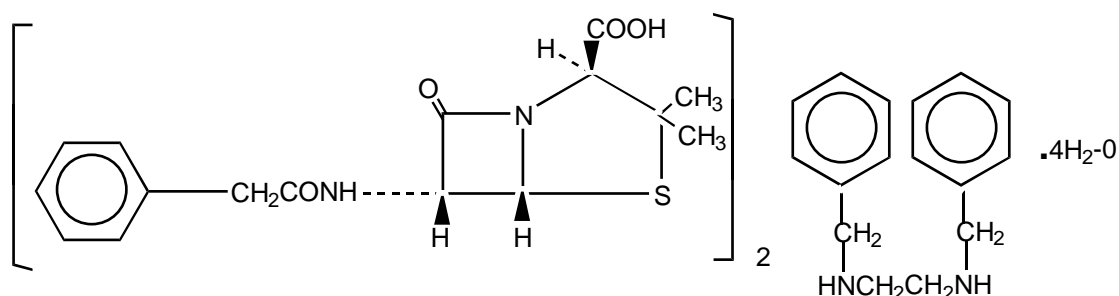
## BICILLIN<sup>â</sup> L-A 2.3 mL (Benzathine Benzylpenicillin Injection) for deep IM injection only

### NAME OF THE MEDICINE

#### BICILLIN L-A

Benzathine Benzylpenicillin 900 mg (1,200,000 Units)/2.3mL size Pre-filled syringe and Needle.

BICILLIN L-A (sterile benzathine benzylpenicillin suspension) is chemically designated as (2S,5R,6R)-3,3-dimethyl-7-oxo-6-(2-phenylacetamido)-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid compound with *N,N'*-dibenzylethylenediamine (2:1), tetrahydrate. Its chemical structure is as follows:



### DESCRIPTION

BICILLIN L-A contains benzathine benzylpenicillin (the benzathine salt of benzylpenicillin) in aqueous suspension with anhydrous sodium citrate buffer; and as w/v, approximately 0.5% lecithin, 0.6% carmellose sodium, 0.6% povidone, 0.1% methyl hydroxybenzoate and 0.01% propyl hydroxybenzoate.

BICILLIN L-A suspension in the disposable pre-filled syringe formulation is viscous and opaque.

### PHARMACOLOGY

#### Microbiology

Benzylpenicillin exerts a bactericidal action against penicillin-sensitive micro-organisms during the stage of active multiplication. It acts through the inhibition of biosynthesis of cell-wall peptidoglycan, rendering the cell wall osmotically unstable. It is not active against the penicillinase-producing bacteria or against organisms resistant to beta-lactams because of alterations in the penicillin-binding proteins.

The following in-vitro data are available but the clinical significance is unknown. Benzylpenicillin exerts high in vitro activity against Staphylococci (except penicillinase-producing strains), Streptococci (Groups A, C, G, H, L and M) and Pneumococci. Other organisms sensitive to benzylpenicillin are: *Neisseria gonorrhoea*, *Corynebacterium diphtheria*, *Bacillus anthracis*, Clostridia spp, *Actinomyces bovis*, *Streptobacillus moniliformis*, *Listeria monocytogenes* and Leptospira spp. *Treponema pallidum* is extremely sensitive to the bactericidal action of benzylpenicillin.

## **Pharmacokinetics**

### ***Absorption***

Intramuscular benzathine benzylpenicillin is absorbed very slowly into the bloodstream from the intramuscular site and converted by hydrolysis to benzylpenicillin. This combination of hydrolysis and slow absorption results in blood serum levels much lower but much more prolonged than other parenteral penicillins.

Intramuscular administration of 225 mg of benzathine benzylpenicillin in adults results in blood levels of 22.5 to 37.5 nanogram per mL, which are maintained for 4 to 5 days. Similar blood levels may persist for 10 days following administration of 450 mg and for 14 days following administration of 900 mg. Blood concentrations of 2.25 nanogram per mL may still be detectable 4 weeks following administration of 900 mg.

### ***Distribution***

Approximately 60% of benzylpenicillin is bound to serum protein. The drug is distributed throughout the body tissues in widely varying amounts. Highest levels are found in the kidneys with lesser amounts in the liver, skin and intestines. Benzylpenicillin penetrates into all other tissues and the spinal fluid to a lesser degree.

### ***Excretion***

With normal kidney function, the drug is excreted rapidly by tubular excretion.

In neonates and young infants and in individuals with impaired kidney function, excretion is considerably delayed.

## **INDICATIONS**

Intramuscular benzathine benzylpenicillin is indicated in the treatment of infections due to penicillin-sensitive micro-organisms that are susceptible to the low and very prolonged serum levels common to this particular dosage form. Therapy should be guided by bacteriological studies (including sensitivity tests) and by clinical response.

The following infections will usually respond to adequate dosage of intramuscular benzathine benzylpenicillin:

Streptococcal infections (Group A - without bacteraemia). Mild-to-moderate infections of the upper respiratory tract (eg., pharyngitis).

Venereal infections - Syphilis, yaws, bejel and pinta.

Medical conditions in which benzathine benzylpenicillin therapy is indicated as prophylaxis:

Rheumatic fever and/or chorea - Prophylaxis with benzathine benzylpenicillin has proven effective in preventing recurrence of these conditions. It has also been used as follow-up prophylactic therapy for rheumatic heart disease and acute glomerulonephritis.

## CONTRAINDICATIONS

Previous hypersensitivity reaction to any of the penicillins.

## PRECAUTIONS

### Allergic reactions

Serious and occasionally fatal hypersensitivity (anaphylactoid) reactions have been reported in patients on penicillin therapy. Although anaphylaxis is more frequent following parenteral therapy, it has occurred in patients on oral penicillins. These reactions are more apt to occur in individuals with a history of sensitivity to multiple allergens. There have been well-documented reports of individuals with a history of penicillin hypersensitivity reactions who have experienced severe hypersensitivity reactions when treated with a cephalosporin. Before therapy with a penicillin, careful inquiry should be made concerning previous hypersensitivity reactions to penicillins, cephalosporins and other allergens. If an allergic reaction occurs, the drug should be discontinued and the patient treated with the usual agents, e.g., pressor amines, antihistamines and corticosteroids. Severe anaphylactoid reactions require emergency treatment with adrenaline. Oxygen and intravenous corticosteroids and airway management, including intubation, should also be administered as indicated.

Penicillin should be used with caution in individuals with histories of significant allergies and/or asthma.

Whenever allergic reactions occur, penicillin should be withdrawn unless, in the opinion of the physician, the condition being treated is life-threatening and amenable only to penicillin therapy.

### Administration precautions

**Do not inject intravenously or admix with other intravenous solutions.** There have been reports of inadvertent intravenous administration of benzathine which has been associated with cardiorespiratory arrest and death.

Inadvertent intravascular administration, including inadvertent direct intra-arterial injection or injection immediately adjacent to arteries, of BICILLIN L-A and other penicillin preparations has resulted in severe neurovascular damage, including transverse myelitis with permanent paralysis, gangrene requiring amputation of digits and more proximal portions of extremities, and necrosis and sloughing at and surrounding the injection site. Such severe effects have been reported following injections into the buttock, thigh and deltoid areas. Other serious complications of suspected intravascular administration which have been reported include immediate pallor, mottling or cyanosis of the extremity, both distal and proximal to the injection site, followed by bleb formation; severe oedema requiring anterior and/or posterior compartment fasciotomy in the lower extremity.

Severe effects and complications following accidental intravascular administration have most often occurred in infants and small children. Prompt consultation with an appropriate specialist is indicated if any evidence of compromise of the blood supply occurs at, proximal to, or distal to the site of injection.

**Do not inject into or near a nerve.** Injection into or near a nerve may result in permanent neurological damage.

Quadriceps femoris fibrosis and atrophy have been reported following repeated intramuscular injections of penicillin preparations into the anterolateral thigh.

### **Antibiotic-associated pseudomembranous colitis**

Antibiotic-associated pseudomembranous colitis has been reported with many antibiotics including penicillin. Treatment with antibacterial agents alters the normal flora of the colon leading to overgrowth of *C. difficile*.

*C. difficile* produces toxins A and B which contribute to the development of *Clostridium difficile* associated diarrhoea (CDAD). Hypertoxin producing strains of *C. difficile* cause increased morbidity and mortality, as these infections can be refractory to antimicrobial therapy and may require colectomy. CDAD must be considered in all patients who present with diarrhoea following antibacterial use. Careful medical history is necessary since CDAD has been reported to occur over two months after the administration of antibacterial agents.

The severity of the colitis may range from mild to life-threatening. It is important to consider this diagnosis in patients who develop diarrhoea or colitis in association with antibiotic use (this may occur up to several weeks after cessation of antibiotic therapy). Mild cases usually respond to drug discontinuation alone. However, in moderate to severe cases, appropriate therapy with a suitable oral antibacterial agent effective against *C. difficile* should be considered. Fluids, electrolytes and protein replacement should be provided when indicated. Drugs which delay peristalsis, e.g. opiates and diphenoxylate with atropine (Lomotil) may prolong and/or worsen the condition and should not be used.

### **Non-susceptible organisms and superinfections**

Prolonged use of antibiotics may promote the overgrowth of non-susceptible organisms, including fungi. Should superinfection occur, appropriate measures should be taken.

## **Streptococcal infections**

In streptococcal infections, therapy must be sufficient to eliminate the organism otherwise the sequelae of streptococcal disease may occur. Cultures should be taken following completion of treatment to determine whether streptococci have been eradicated.

## **Blood and kidney function tests**

In prolonged therapy with penicillin and particularly with high-dosage schedules, periodic evaluation of the renal and haematopoietic systems is recommended.

Fluids, electrolytes and protein replacement therapy should be provided when indicated.

## **Use in pregnancy**

Category A - Drugs which have been taken by a large number of pregnant women and women of child-bearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the foetus having been observed.

Although generally considered to be safe, BICILLIN L-A should be used during pregnancy only if clearly needed.

## **Use in lactation**

Soluble penicillin is excreted in breast milk. The effect on the infant, if any, is not known. Caution should be used when BICILLIN L-A is administered to a nursing woman.

## **Pediatric use**

(See INDICATIONS and DOSAGE AND ADMINISTRATION sections.)

## **Use in the elderly**

BICILLIN L-A is known to be mainly excreted by the kidney, the risk of toxic reactions to this drug may be greater in patients with impaired renal function (see PHARMACOLOGY section). It may be useful to monitor renal function in elderly patients.

## **Effects on laboratory tests**

Penicillins can interfere with the copper sulphate reagent method of testing for glycosuria, resulting in falsely elevated or falsely decreased readings. Such interference does not occur with the glucose oxidase method.

## **INTERACTION WITH OTHER MEDICINES**

Tetracyclines may antagonise the bactericidal effect of penicillin and concurrent use of these drugs should be avoided.

The rate of excretion of the penicillins is decreased by concomitant administration of probenecid which prolongs, as well as increases, blood levels of the penicillins.

## **ADVERSE EFFECTS**

As with other penicillins, untoward reactions of the sensitivity phenomena are likely to occur, particularly in individuals who have previously demonstrated hypersensitivity to penicillins or in those with a history of allergy, asthma, hay fever, or urticaria.

The following adverse reactions have been reported:

General: Hypersensitivity reactions including the following: skin eruptions (maculopapular to exfoliative dermatitis), urticaria, laryngeal oedema, fever, eosinophilia; other serum sickness-like reactions (including chills, fever, oedema, arthralgia and prostration), and anaphylactic/anaphylactoid reaction (including shock and †death).

Fever and eosinophilia may frequently be the only reaction observed.

Gastrointestinal: Pseudomembranous colitis. Onset of pseudomembranous colitis symptoms may occur during or after antibacterial treatment (see PRECAUTIONS section).

Haematologic: Haemolytic anaemia, leucopenia, thrombocytopenia

Neurologic: Neuropathy

Urogenital: Nephropathy, acute interstitial nephritis

As with other treatments for syphilis, the Jarisch-Herxheimer reaction has been reported.

†The following adverse events have been temporally associated with parenteral administration of benzylpenicillin:

Body as a Whole: Hypersensitivity reactions (including allergic vasculitis, pruritus, fatigue, asthenia, and pain); aggravation of existing disorder; headache.

Cardiovascular: Cardiac arrest; hypotension; tachycardia; palpitations; pulmonary hypertension; pulmonary embolism; vasodilation; vasovagal reaction; cerebrovascular accident; syncope.

Gastrointestinal: Nausea, vomiting; blood in stool; intestinal necrosis.

Haematological: Lymphadenopathy.

Injection Site: Injection site reactions (including pain, inflammation, lump, abscess, necrosis, oedema, haemorrhage, cellulitis, hypersensitivity, atrophy, ecchymosis, and skin ulcer);

neurovascular reactions (including warmth, vasospasm, pallor, mottling, gangrene, numbness of the extremities, cyanosis of the extremities, and neurovascular damage).

Metabolic: Elevated BUN, creatinine, and SGOT.

Musculoskeletal: Joint disorder; periostitis; exacerbation of arthritis; myoglobinuria; rhabdomyolysis.

Nervous System: Nervousness; tremors; dizziness; somnolence; confusion; anxiety; euphoria; transverse myelitis; seizures; coma.

A syndrome manifested by a variety of CNS symptoms such as severe agitation with confusion, visual and auditory hallucinations, and a fear of impending death (Hoigne's syndrome), has been reported after administration of benzylpenicillin procaine and, less commonly, after injection of the combination of benzylpenicillin benzathine and benzylpenicillin procaine. Other symptoms associated with this syndrome, such as psychosis, seizures, dizziness, tinnitus, cyanosis, palpitations, tachycardia, and/or abnormal perception in taste, also may occur.

Respiratory: Hypoxia; apnoea; dyspnoea.

Skin: Diaphoresis.

Special Senses: Blurred vision; blindness.

Urogenital: Neurogenic bladder; haematuria; proteinuria; renal failure; impotence; priapism.

## **DOSAGE AND ADMINISTRATION**

The stated volume of 2.3mL is a theoretical volume based on potency at the time of manufacture. Use a concentration of 442mg/mL when measuring part doses.

### **Streptococcal (Group A) upper respiratory infections (for example, pharyngitis)**

A single injection of 900 mg (1,200,000 Units) for adults.

A single injection of 675 mg (900,000 Units) for older children.

A single injection of 225 mg to 450 mg (300,000 to 600,000 Units) for infants and for children under 27 kg.

### **Venereal infections**

Syphilis - Primary, secondary and latent - 1.8 g (2,400,000 Units) (1-dose). Late (tertiary including neurosyphilis) - 1.8 g at 7-day intervals for three doses.

Congenital (with normal CSF) - under 2 years of age: 37.5 mg (50,000 Units)/kg body weight; ages 2-12 years; adjust dosage based on adult dosage schedule.

Yaws, bejel and pinta - 900 mg (1,200,000 Units) (single injection).

### **Prophylaxis - for rheumatic fever and glomerulonephritis**

Following an acute attack, benzathine benzylpenicillin (parenteral) may be given in doses of 900 mg (1,200,000 Units) once a month or 450 mg (600,000 Units) every 2 weeks.

### **TO ADMINISTER**

Because of the high concentration of suspended material in this product, the needle may be blocked if the injection is not made at a slow, steady rate.

Administer by DEEP, INTRAMUSCULAR INJECTION in the upper, outer quadrant of the buttock. In infants and small children, the midlateral aspect of the thigh may be preferable. When doses are repeated, vary the injection site.

Method of administration is the same as with conventional syringe. Remove needle cover by grasping it securely; twist and pull. Introduce needle into patient, aspirate by pulling back slightly on the plunger, and inject.

Discard any unused portion.

### **OVERDOSAGE**

There have been no reported overdoses with BICILLIN L-A. Penicillin in overdose has the potential to cause neuromuscular hyperirritability and convulsive seizures. This is particularly so if the penicillin is given intravenously or to patients with renal failure.

### **PRESENTATION AND STORAGE CONDITIONS**

BICILLIN L-A benzathine benzylpenicillin injection is supplied as follows:  
2.3 mL size, containing 900 mg (1,200,000 Units) benzathine benzylpenicillin per pre-filled syringe. (The stated volume of 2.3mL is a theoretical volume based on potency at the time of manufacture. Use a concentration of 442mg/mL when measuring part doses.)

#### **Storage**

Store at 2 to 8°C. Refrigerate, do not freeze.

### **NAME AND ADDRESS OF THE SPONSOR**

Pfizer Australia Pty Ltd  
38-42 Wharf Road  
West Ryde NSW 2114



## **POSITION SCHEDULE OF THE MEDICINE**

Schedule 4 - Prescription Only Medicine

## **DATE OF FIRST INCLUSION IN THE AUSTRALIAN REGISTER OF THERAPEUTIC GOODS**

19 July 1996

## **DATE OF MOST RECENT AMENDMENT**

10 September 2012

† Please note changes to product information

â Registered trademark