AMOXIL- amoxicillin tablet, film coated DIRECT RX

AMOXICILLIN

1 INDICATIONS AND USAGE

To reduce the development of drug-resistant bacteria and maintain the effectiveness of amoxicillin and other antibacterial drugs, Amoxicillin Tablets, USP should be used only to treat infections that are proven or strongly suspected to be caused by bacteria. When culture and susceptibility information are available, they should be considered in selecting or modifying antibacterial therapy. In the absence of such data, local epidemiology and susceptibility patterns may contribute to the empiric selection of therapy.

Amoxicillin Tablets, USP are indicated in the treatment of infections due to susceptible (ONLY β -lactamase-negative) isolates of the designated bacteria in the conditions listed below:

- 1.1 Infections of the ear, nose, and throat
- due to Streptococcus species.

 $(\alpha$ - and β -hemolytic isolates only), Streptococcus pneumoniae, Staphylococcus spp., or Haemophilus influenzae.

- 1.2 Infections of the genitourinary tract
- due to Escherichia coli, Proteus mirabilis, or Enterococcus faecalis.
- 1.3 Infections of the skin and skin structure
- due to Streptococcus spp.

(α - and β -hemolytic isolates only), Staphylococcus spp., or E. coli.

- 1.4 Infections of the lower respiratory tract
- due to Streptococcus spp.

 $(\alpha$ - and β -hemolytic isolates only), S. pneumoniae, Staphylococcus spp., or H. influenzae.

- 1.5 Gonorrhea, acute uncomplicated (ano-genital and urethral infections)
- due to Neisseria gonorrhoeae.

Because of high rates of amoxicillin resistance, Amoxicillin Tablets, USP are not recommended for empiric treatment of gonorrhea. Amoxicillin Tablets, USP use should be limited to situations where N. gonorrhoeae isolates are known to be susceptible to amoxicillin.

1.6 Triple therapy for Helicobacter pylori with clarithromycin and lansoprazole

Amoxicillin Tablets, USP, in combination with clarithromycin plus lansoprazole as triple therapy, are indicated for the treatment of patients with H. pylori infection and duodenal ulcer disease (active or 1-year history of a duodenal ulcer) to eradicate H. pylori. Eradication of H. pylori has been shown to reduce the risk of duodenal ulcer recurrence.

1.7 Dual therapy for H. Pylori with lansoprazole

Dual therapy for H. pylori with lansoprazole: Amoxicillin Tablets, USP, in combination with lansoprazole delayed-release capsules as dual therapy, are indicated for the treatment of patients with H. pylori infection and duodenal ulcer disease (active or 1-year history of a duodenal ulcer) who are either allergic or intolerant to clarithromycin or in whom resistance to clarithromycin is known or suspected. (See the clarithromycin package insert, MICROBIOLOGY.) Eradication of H. pylori has been shown to reduce the risk of duodenal ulcer recurrence.

2.1 Dosing for Adult and Pediatric Patients > 3Months of Age

Except for gonorrhea, treatment should be continued for a minimum of 48 to 72 hours beyond the time that the patient becomes asymptomatic or evidence of bacterial eradication has been obtained. It is recommended that there be at least 10 days' treatment for any infection caused by Streptococcus pyogenes to prevent the occurrence of acute rheumatic fever. In some infections, therapy may be required for several weeks. It may be necessary to continue clinical and/or bacteriological follow-up for several months after cessation of therapy.

Table 1

2.2 Dosing in Neonates and Infants Aged 12 Weeks (3 Months)

Treatment should be continued for a minimum of 48 to 72 hours beyond the time that the patient becomes asymptomatic or evidence of bacterial eradication has been obtained. It is recommended that there be at least 10 days' treatment for any infection caused by Streptococcus pyogenes to prevent the occurrence of acute rheumatic fever. Due to incompletely developed renal function affecting elimination of amoxicillin in this age group, the recommended upper dose of amoxicillin 30 mg/kg/day divided every 12 hours. There are currently no dosing recommendations for pediatric patients with impaired renal function.

2.3 Dosing for H. pylori Infection

Triple therapy: The recommended adult oral dose is 1 gram amoxicillin, 500 mg clarithromycin, and 30 mg lansoprazole, all given twice daily (every 12 hours) for 14 days.

Dual therapy: The recommended adult oral dose is 1 gram amoxicillin and 30 mg lansoprazole, each given three times daily (every 8 hours) for 14 days.

Please refer to clarithromycin and lansoprazole full prescribing information.

2.4 Dosing in Renal Impairment

Patients with impaired renal function do not generally require a reduction in dose unless the impairment is severe.

Severely impaired patients with a glomerular filtration rate of < 30 mL/min. should not receive a 875-mg dose.

Patients with a glomerular filtration rate of 10 to 30 mL/min should receive 500 mg or 250 mg every 12 hours, depending on the severity of the infection.

Patients with a glomerular filtration rate less than 10 mL/min should receive 500 mg or 250 mg every 24 hours, depending on severity of the infection.

Hemodialysis patients should receive 500 mg or 250 mg every 24 hours, depending on severity of the infection. They should receive an additional dose both during and at the end of dialysis.

Tablets: 875 mg. Each tablet contains 875 mg amoxicillin as the trihydrate. Each film-coated, capsule-shaped, pink tablet is scored on one side and imprinted WW951 on the other side.

Amoxicillin is contraindicated in patients who have experienced a serious hypersensitivity reaction (e.g., anaphylaxis or Stevens-Johnson syndrome) to amoxicillin or to other β -lactam antibiotics (e.g., penicillins and cephalosporins).

The following are discussed in more detail in other sections of the labeling:

Anaphylactic reactions [see Warnings and Precautions (5.1)] CDAD [see Warnings and Precautions (5.2)]

6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

The most common adverse reactions (> 1%) observed in clinical trials of amoxicillin tablets were

diarrhea, rash, vomiting, and nausea.

Triple therapy: The most frequently reported adverse events for patients who received triple therapy (amoxicillin/clarithromycin/ lansoprazole) were diarrhea (7%), headache (6%), and taste perversion (5%).

Dual therapy: The most frequently reported adverse events for patients who received double therapy amoxicillin/lansoprazole were diarrhea (8%) and headache (7%). For more information on adverse reactions with clarithromycin or lansoprazole, refer to the Adverse Reactions section of their package inserts.

6.2 Postmarketing or Other Experience

In addition to adverse events reported from clinical trials, the following events have been identified during postmarketing use of penicillins. Because they are reported voluntarily from a population of unknown size, estimates of frequency cannot be made. These events have been chosen for inclusion due to a combination of their seriousness, frequency of reporting, or potential causal connection to amoxicillin.

Infections and Infestations: Mucocutaneous candidiasis.

Gastrointestinal: Black hairy tongue, and hemorrhagic/pseudomembranous colitis.

Onset of pseudomembranous colitis symptoms may occur during or after antibacterial treatment [see Warnings and Precautions (5.2)].

Hypersensitivity Reactions: Anaphylaxis [see Warnings and Precautions (5.1)]. Serum sickness—like reactions, erythematous maculopapular rashes, erythema multiforme, Stevens-Johnson syndrome, exfoliative dermatitis, toxic epidermal necrolysis, acute generalized exanthematous pustulosis, hypersensitivity vasculitis, and urticaria have been reported.

Liver: A moderate rise in AST and/or ALT has been noted, but the significance of this finding is unknown. Hepatic dysfunction including cholestatic jaundice, hepatic cholestasis and acute cytolytic hepatitis have been reported.

Renal: Crystalluria has been reported [see Overdosage (10)].

Hemic and Lymphatic Systems: Anemia, including hemolytic anemia, thrombocytopenia, thrombocytopenic purpura, eosinophilia, leukopenia, and agranulocytosis have been reported. These reactions are usually reversible on discontinuation of therapy and are believed to be hypersensitivity phenomena.

Central Nervous System: Reversible hyperactivity, agitation, anxiety, insomnia, confusion, convulsions, behavioral changes, and/or dizziness have been reported.

Miscellaneous: Tooth discoloration (brown, yellow, or gray staining) has been reported. Most reports occurred in pediatric patients. Discoloration was reduced or eliminated with brushing or dental cleaning in most cases.

7.1 Probenecid

Probenecid decreases the renal tubular secretion of amoxicillin. Concurrent use of amoxicillin and probenecid may result in increased and prolonged blood levels of amoxicillin.

7.2 Oral Anticoagulants

Abnormal prolongation of prothrombin time (increased international normalized ratio [INR]) has been reported in patients receiving amoxicillin and oral anticoagulants. Appropriate monitoring should be undertaken when anticoagulants are prescribed concurrently. Adjustments in the dose of oral anticoagulants may be necessary to maintain the desired level of anticoagulation.

7.3 Allopurinol

The concurrent administration of allopurinol and amoxicillin increases the incidence of rashes in patients receiving both drugs as compared to patients receiving amoxicillin alone. It is not known whether this potentiation of amoxicillin rashes is due to allopurinol or the hyperuricemia present in these patients.

7.4 Oral Contraceptives

Amoxicillin may affect the gut flora, leading to lower estrogen reabsorption and reduced efficacy of combined oral estrogen/progesterone contraceptives.

7.5 Other Antibacterials

Chloramphenicol, macrolides, sulfonamides, and tetracyclines may interfere with the bactericidal effects of penicillin. This has been demonstrated in vitro; however, the clinical significance of this interaction is not well documented.

7.6 Drug/Laboratory Interactions

High urine concentrations of ampicillin may result in false-positive reactions when testing for the presence of glucose in urine using CLINITEST®, Benedict's Solution, or Fehling's Solution. Since this effect may also occur with amoxicillin, it is recommended that glucose tests based on enzymatic glucose oxidase reactions (such as CLINISTIX®) be used.

Following administration of ampicillin or amoxicillin to pregnant women, a transient decrease in plasma concentration of total conjugated estriol, estriol-glucuronide, conjugated estrone, and estradiol has been noted.

8.1 Pregnancy

Teratogenic Effects: Pregnancy Category B. Reproduction studies have been performed in mice and rats at doses up to 2000 mg/kg (3 and 6 times the 3 g human dose, based on body surface area). There was no evidence of harm to the fetus due to amoxicillin. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, amoxicillin should be used during pregnancy only if clearly needed.

8.2 Labor and Delivery

Oral ampicillin is poorly absorbed during labor. It is not known whether use of amoxicillin in humans during labor or delivery has immediate or delayed adverse effects on the fetus, prolongs the duration of labor, or increases the likelihood of the necessity for an obstetrical intervention.

8.3 Nursing Mothers

Penicillins have been shown to be excreted in human milk. Amoxicillin use by nursing mothers may lead to sensitization of infants. Caution should be exercised when amoxicillin is administered to a nursing woman.

8.4 Pediatric Use

Because of incompletely developed renal function in neonates and young infants, the elimination of amoxicillin may be delayed. Dosing of amoxicillin should be modified in pediatric patients 12 weeks or younger (\leq 3 months). [See Dosage and Administration (2.2).]

8.5 Geriatric Use

An analysis of clinical studies of amoxicillin was conducted to determine whether subjects aged 65 and over respond differently from younger subjects. These analyses have not identified differences in responses between the elderly and younger patients, but a greater sensitivity of some older individuals cannot be ruled out.

This drug is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function.

8.6 Dosing in Renal Impairment

Amoxicillin is primarily eliminated by the kidney and dosage adjustment is usually required in patients

with severe renal impairment (GFR <30 mL/min). See Dosing in Renal Impairment (2.4) for specific recommendations in patients with renal impairment.

In case of overdosage, discontinue medication, treat symptomatically, and institute supportive measures as required. A prospective study of 51 pediatric patients at a poison control center suggested that overdosages of less than 250 mg/kg of amoxicillin are not associated with significant clinical symptoms.

Interstitial nephritis resulting in oliguric renal failure has been reported in a small number of patients after overdosage with amoxicillin1.

Crystalluria, in some cases leading to renal failure, has also been reported after amoxicillin overdosage in adult and pediatric patients. In case of overdosage, adequate fluid intake and diuresis should be maintained to reduce the risk of amoxicillin crystalluria.

Renal impairment appears to be reversible with cessation of drug administration. High blood levels may occur more readily in patients with impaired renal function because of decreased renal clearance of amoxicillin. Amoxicillin may be removed from circulation by hemodialysis

Formulations of Amoxicillin Tablets, USP contain amoxicillin, a semisynthetic antibiotic, an analog of ampicillin, with a broad spectrum of bactericidal activity against many Gram-positive and Gram-negative microorganisms. Chemically, it is (2S,5R,6R)-6-[(R)-(-)-2-amino-2-(p-hydroxyphenyl)acetamido]-3,3-dimethyl-7-oxo-4-thia-1-zabicyclo[3.2.0]heptane-2-carboxylic acid trihydrate. It may be represented structurally as:

Chemical Structure

The amoxicillin molecular formula is C16H19N3O5S•3H2O and the molecular weight is 419.45.

Tablets: Each film coated tablet contains 875 mg amoxicillin as the trihydrate. Each film-coated, capsule shaped, pink tablet is scored on one side and imprinted WW951 on the other side. Inactive ingredients: carmine, colloidal silicone dioxide, crospovidone, FD&C Rws #40 Lake, magnesium stearate, microcrystalline cellulose, polyvinyl alcohol-partially hydrolized, polyethylene glycol, sodium starch glycolate, talc, and titanium dioxide

12.1 Mechanism of Action

Amoxicillin is an antibacterial drug. [see Microbiology (12.4)].

12.3 Pharmacokinetics

Absorption: Amoxicillin is stable in the presence of gastric acid and is rapidly absorbed after oral administration. The effect of food on the absorption of amoxicillin from the tablets and suspension of amoxicillin has been partially investigated; 400 mg and 875 mg formulations have been studied only when administered at the start of a light meal.

Orally administered doses of 250 mg and 500 mg amoxicillin tablets result in average peak blood levels 1 to 2 hours after administration in the range of 3.5 mcg/mL to 5 mcg/mL and 5.5 mcg/mL to 7.5 mcg/mL, respectively.

Mean amoxicillin pharmacokinetic parameters from an open, two-part, single-dose crossover bioequivalence study in 27 adults comparing 875 mg of amoxicillin with 875 mg of amoxicillin/clavulanate potassium showed that the 875 mg tablet of amoxicillin produces an AUC0- ∞ of 35.4 \pm 8.1 mcg•hr/mL and a Cmax of 13.8 \pm 4.1 mcg/mL. Dosing was at the start of a light meal following an overnight fast.

Orally administered doses of amoxicillin suspension, 125 mg/5 mL and 250 mg/5 mL, result in average peak blood levels 1 to 2 hours after administration in the range of 1.5 mcg/mL to 3 mcg/mL and 3.5 mcg/mL to 5 mcg/mL, respectively.

Oral administration of single doses of 400 mg chewable tablets and 400 mg/5 mL suspension of amoxicillin to 24 adult volunteers yielded comparable pharmacokinetic data:

Table 3

Distribution: Amoxicillin diffuses readily into most body tissues and fluids, with the exception of brain and spinal fluid, except when meninges are inflamed. In blood serum, amoxicillin is approximately 20% protein-bound. Following a 1-gram dose and utilizing a special skin window technique to determine levels of the antibiotic, it was noted that therapeutic levels were found in the interstitial fluid.

Metabolism and Excretion: The half-life of amoxicillin is 61.3 minutes. Approximately 60% of an orally administered dose of amoxicillin is excreted in the urine within 6 to 8 hours. Detectable serum levels are observed up to 8 hours after an orally administered dose of amoxicillin. Since most of the amoxicillin is excreted unchanged in the urine, its excretion can be delayed by concurrent administration of probenecid [see DRUG INTERACTIONS (7.1)].

12.4 Microbiology

Mechanism of Action

Amoxicillin is similar to penicillin in its bactericidal action against susceptible bacteria during the stage of active multiplication. It acts through the inhibition of cell wall biosynthesis that leads to the death of the bacteria.

Method of Resistance

Resistance to amoxicillin is mediated primarily through enzymes called beta-lactamases that cleave the beta-lactam ring of amoxicillin, rendering it inactive.

Amoxicillin has been shown to be active against most isolates of the bacteria listed below, both in vitro and in clinical infections as described in the INDICATIONS AND USAGE section.

Bacteria

Susceptibility Test Methods: (susceptibility to amoxicillin can be determined using ampicillin powder and a 10 mcg ampicillin disk).

When available, clinical microbiology should provide the results of in vitro susceptibility test results for antimicrobial drugs used in resident hospitals to the physician as periodic reports that describe the susceptibility profile of nosocomial and community-acquired pathogens. These reports should aid the physician in selecting an antimicrobial drug product for treatment.

Dilution Techniques: Quantitative methods are used to determine antimicrobial minimum inhibitory concentrations (MICs). These MICs provide estimates of the susceptibility of bacteria to antimicrobial compounds. The MICs should be determined using a standardized procedure. Standardized procedures are based on dilution methods (broth or agar)2,3 or equivalent with standardized inoculum concentrations and standardized concentrations of ampicillin powder. The MIC values should be interpreted according to the criteria in Table 4.

Diffusion Techniques: Quantitative methods that require measurement of zone diameters also provide reproducible estimates of the susceptibility of bacteria to antimicrobial compounds. One such standardized procedure3 requires the use of standardized inoculum concentrations. This procedure uses paper disks impregnated with 10 mcg ampicillin to test the susceptibility of bacteria to ampicillin. Interpretation involves correlation of the diameter obtained in the disk test with the MIC for amoxicillin. Reports from the laboratory providing results of the standard single-disk susceptibility test with a 10 mcg ampicillin disk should be interpreted according to the criteria listed in Table 4.

A report of "Susceptible" indicates the pathogen is likely to be inhibited if the antimicrobial compound in the blood reaches concentrations that are usually achievable. A report of 'Intermediate' indicates that result should be considered equivocal, and, if the microorganism is not fully susceptible to alternative, clinically feasible drugs, the test should be repeated. The intermediate category implies possible clinical applicability in body sites where the drug is physiologically concentrated or in situations where high dosage of drug can be used. The intermediate category also provides a buffer

zone, which prevents small uncontrolled technical factors from causing major discrepancies in interpretation. A report of 'Resistant' indicates the pathogen is not likely to be inhibited if the antimicrobial compound in the blood reaches concentrations that are usually achievable and other therapy(ies) are likely to be preferred.

Quality Control:

Susceptibility techniques require use of laboratory control microorganisms to control the technical aspects of the laboratory standardized procedures.2,3,4 Standard ampicillin powder should provide the MIC values described below. For the diffusion technique using the 10 mcg ampicillin disk, the criteria are provided in Table 5.

Table 5

Susceptibility Testing for Helicobacter pylori: Amoxicillin in vitro susceptibility testing methods for determining minimum inhibitory concentrations (MICs) and zone sizes have not been standardized, validated, or approved for testing H. pylori. Specimens for H. pylori and clarithromycin susceptibility test results should be obtained on isolates from patients who fail triple therapy. If clarithromycin resistance is found, a non-clarithromycin-containing regimen should be used.

13.1 Carcinogenesis and Mutagenesis and Impairment of Fertility

Long-term studies in animals have not been performed to evaluate carcinogenic potential. Studies to detect mutagenic potential of amoxicillin alone have not been conducted; however, the following information is available from tests on a 4:1 mixture of amoxicillin and potassium clavulanate. Amoxicillin and potassium clavulanate was non-mutagenic in the Ames bacterial mutation assay, and the yeast gene conversion assay. Amoxicillin and clavulanate potassium was weakly positive in the mouse lymphoma assay, but the trend toward increased mutation frequencies in this assay occurred at doses that were also associated with decreased cell survival. Amoxicillin and clavulanate potassium was negative in the mouse micronucleus test and in the dominant lethal assay in mice. Potassium clavulanate alone was tested in the Ames bacterial mutation assay and in the mouse micronucleus test, and was negative in each of these assays. In a multi-generation reproduction study in rats, no impairment of fertility or other adverse reproductive effects were seen at doses up to 500 mg/kg (approximately 2 times the 3 g human dose based on body surface area)

14.1 H. pylori Eradication to Reduce the Risk of Duodenal Ulcer Recurrence

Randomized, double-blind clinical studies performed in the United States in patients with H. pylori and duodenal ulcer disease (defined as an active ulcer or history of an ulcer within 1 year) evaluated the efficacy of lansoprazole in combination with amoxicillin tablets and clarithromycin tablets as triple 14-day therapy, or in combination with amoxicillin tablets as dual 14-day therapy, for the eradication of H. pylori. Based on the results of these studies, the safety and efficacy of 2 different eradication regimens were established: Triple therapy: Amoxicillin 1 gram twice daily/clarithromycin 500 mg twice daily/lansoprazole 30 mg twice daily (see Table 6). Dual therapy: Amoxicillin 1 gram three times daily/lansoprazole 30 mg three times daily (see Table 7). All treatments were for 14 days. H. pylori eradication was defined as 2 negative tests (culture and histology) at 4 to 6 weeks following the end of treatment. Triple therapy was shown to be more effective than all possible dual therapy combinations. Dual therapy was shown to be more effective than both monotherapies. Eradication of H. pylori has been shown to reduce the risk of duodenal ulcer recurrence.

Table 6

Table 7

Amoxicillin Tablets, USP 875 mg: Each film-coated tablet contains 875 mg amoxicillin as the trihydrate. Film-coated, capsule-shaped, pink tablet is scored on one side and imprinted WW951 on the other side. Dispense in a tight, light-resistant container as defined in the USP using a child resistant closure.



AMOXIL

amoxicillin tablet, film coated

Product Information				
Product Type	HUMAN PRESCRIPTION DRUG	Item Code (Source)	NDC:61919-041(NDC:0143-9951)	
Route of Administration	ORAL			

Active Ingredient/Active Moiety			
Ingredient Name	Basis of Strength	Strength	
AMO XICILLIN (UNII: 804826J2HU) (AMO XICILLIN ANHYDROUS - UNII:9EM05410Q9)	AMOXICILLIN ANHYDROUS	875 mg	

Inactive Ingredients			
Ingredient Name	Strength		
TALC (UNII: 7SEV7J4R1U)			
TITANIUM DIO XIDE (UNII: 15FIX9 V2JP)			
SILICON DIO XIDE (UNII: ETJ7Z6 XBU4)			
CROSPOVIDONE (UNII: 68401960 MK)			
FD&C RED NO. 40 (UNII: WZB9127XOA)			
MAGNESIUM STEARATE (UNII: 70097M6I30)			
CELLULOSE, MICRO CRYSTALLINE (UNII: OP1R32D61U)			
POLYVINYL ALCOHOL (UNII: 532B59J990)			
POLYETHYLENE GLYCOL, UNSPECIFIED (UNII: 3WJQ0SDW1A)			
SODIUM STARCH GLYCOLATE TYPE A POTATO (UNII: 5856J3G2A2)			

Product Characteristics				
Color	pink	Score	2 pieces	
Shape	CAPSULE	Size	9mm	
Flavor		Imprint Code	WW;951	
Contains				

Pa	ckaging			
#	Item Code	Package Description	Marketing Start Date	Marketing End Date

1 NDC:61919-041-20 20 in 1 BOTTLE; Type 0: Not a Combination Product 06/05/2015				
Marketing Information				
Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date	
ANDA	ANDA065255	06/05/2015		

Labeler - DIRECT RX (079254320)

Establishment			
Name	Address	ID/FEI	Business Operations
DIRECT RX		079254320	repack(61919-041)

Revised: 1/2020 DIRECT RX