

# BACTERIAL INFECTIONS AND PERIODONTAL DISEASES - SAMPLE PRESCRIPTIONS

## General Prescription Comments

For the use of all antibiotic medications, prescribers should review the guidelines related to antimicrobial stewardship endorsed by the ADA that is cited in Bacterial Infections on page 1739. Sample prescription dosing is for adults. Closely monitor and reevaluate response at least every 2 weeks. If response is inadequate, reevaluate diagnosis, medication choice, and dosage.

## Sample Prescriptions

For additional information, see Bacterial Infections on page 1739, Amoxicillin on page 124, Amoxicillin and Clavulanate on page 130, Azithromycin (Systemic) on page 203, Cephalexin on page 322, Clindamycin (Systemic) on page 368, Doxycycline on page 522, Erythromycin (Systemic) on page 588, LevoFLOXacin (Systemic) on page 898, MetroNIDAZOLE (Systemic) on page 1011, Minocycline (Systemic) on page 1032, Penicillin V Potassium on page 1211.

**PLEASE NOTE:** Citing concerns over risk of pseudomembranous colitis the American Association of Endodontists has recently altered their recommendations for use of antibiotics to now recommend azithromycin as the alternative to penicillin in allergic individuals and also as a better choice in cases where response to penicillin is inadequate.

### Rx:

Penicillin V potassium 500 mg

Disp: 40 tablets

Sig: Take 1 tablet 4 times/day for 7 to 10 days (consider a loading dose of 1 g for acute infection). Reevaluate 48 to 72 hours after initiating antibiotics, if minimal or no response, consider changing to another class.

### Rx:

Clindamycin (Systemic) 150 mg

Disp: 40 capsules

Sig: Take 1 capsule 4 times/day for 7 to 10 days

**Note:** Prescription usually selected for patients allergic to penicillin; may be prescribed for 3 or 4 times/day. Recommend to be taken after food to reduce GI concerns.

### Rx:

Clindamycin (Systemic) 300 mg

Disp: 40 capsules

Sig: Take 1 capsule 4 times/day for 7 to 10 days

**Note:** Prescription usually selected for patients allergic to penicillin; may be prescribed for 3 or 4 times/day. Recommend to be taken after food to reduce GI concerns.

### Rx:

Azithromycin (Systemic) 250 mg

Disp: 1 Z-Pak

Sig: 2 tablets day 1, then 1 tablet/day until gone

**Note:** This option has been cited as an alternative in penicillin allergic patients by the Association of Endodontists due to concerns over pseudomembranous colitis.

## OTHER ANTIBIOTICS:

### Rx:

Amoxicillin 250 mg

Disp: 30 capsules

Sig: Take 1 capsule 3 times/day for 7 to 10 days

### Rx:

Amoxicillin 500 mg

Disp: 30 capsules or tablets

Sig: Take 1 capsule or tablet 3 times/day for 7 to 10 days

### Rx:

Amoxicillin 875 mg

Disp: 20 tablets

Sig: Take 1 tablet twice daily

### Rx:

Augmentin 250 mg

Disp: 30 tablets

Sig: Take 1 tablet 3 times/day for 7 to 10 days

**Pregnancy Considerations** Penicillin G crosses the placenta.

Maternal use of penicillins has generally not resulted in an increased risk of adverse fetal effects. Penicillin G procaine may be used in the treatment of syphilis during pregnancy (consult current guidelines) (CDC [Workowski 2015]). Penicillin G procaine is also approved for the management of *Bacillus anthracis*; however, other agents are preferred for use in pregnant women (Meaney-Delman 2014).

- ◆ **Penicillin G Procaine and Benzathine Combined** see Penicillin G Benzathine and Penicillin G Procaine on page 1209
- ◆ **Penicillin G Procaine/Benzathine** see Penicillin G Benzathine and Penicillin G Procaine on page 1209
- ◆ **Penicillin G Sodium** see Penicillin G (Parenteral/Aqueous) on page 1209

## Penicillin V Potassium

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### Related Information

Bacterial Infections on page 1739

Viral Infections on page 1754

### Related Sample Prescriptions

Bacterial Infections and Periodontal Diseases - Sample Prescriptions on page 35

**Brand Names:** Canada APO-Pen VK; NOVO-Pen VK [DSC]; Pen-VK

**Generic Availability (US)** Yes

**Pharmacologic Category** Antibiotic, Penicillin

**Dental Use** Treatment of common orofacial infections caused by aerobic gram-positive cocci and anaerobes. These orofacial infections include cellulitis, periapical abscess, periodontal abscess, acute suppurative pulpitis, oronasal fistula, pericoronitis, osteitis, osteomyelitis, postsurgical and post-traumatic infection.

### Use

**Fusospirochetosis (Vincent gingivitis and pharyngitis):** Treatment of fusospirochetosis (Vincent gingivitis and pharyngitis), in conjunction with dental care for infections involving gum tissue.

**Pneumococcal infections:** Treatment of mild to moderately severe pneumococcal respiratory tract infections, including otitis media.

**Rheumatic fever and/or chorea prophylaxis:** Prophylaxis (chronic, secondary) of rheumatic fever and/or chorea.

**Staphylococcal infections (penicillin G-sensitive):** Treatment of mild infections of the skin and soft tissues.

**Streptococcal infections (without bacteremia):** Treatment of mild to moderate streptococcal infections of the upper respiratory tract, scarlet fever, and mild erysipelas.

### Local Anesthetic/Vasoconstrictor Precautions

No information available to require special precautions

**Effects on Dental Treatment** Key adverse event(s) related to dental treatment: Oral candidiasis (prolonged use).

**Effects on Bleeding** No information available to require special precautions

### Adverse Reactions

>10%: Gastrointestinal: Melanoglossia, mild diarrhea, nausea, oral candidiasis, vomiting

<1%: Acute interstitial nephritis, anaphylaxis, convulsions, exfoliative dermatitis, fever, hemolytic anemia, hypersensitivity reaction, positive direct Coombs test, serum-sickness like reaction

### Dental Usual Dosage

Orofacial infections: Oral:

Children <12 years: 25 to 50 mg/kg/day in divided doses every 6 to 8 hours (maximum dose: 3,000 mg daily)

Children ≥12 years and Adults: 125 to 500 mg every 6 to 8 hours

### Dosing

#### Adult & Geriatric

**Usual dosage range:** Oral: 125 to 500 mg every 6 to 8 hours

**Actinomycosis (off-label use):** Oral: **Note:** Duration is dependent upon disease location and patient-specific factors; complicated infections requiring surgical intervention usually initiate IV therapy with penicillin G until disease subsidence followed by long term oral therapy (Hsieh 1993; Sudhakar 2004):

2 to 4 g/day in divided doses every 6 hours (Smego 1998)

**Anthrax (off-label use):** **Note:** Consult public health officials for event-specific recommendations.

**Inhalational exposure (postexposure prophylaxis [PEP]):** Oral: 500 mg every 6 hours for 42 to 60 days (CDC [Hendricks 2014]).

**Note:** Anthrax vaccine should also be administered to exposed individuals (CDC [Bower 2019]; CDC [Hendricks 2014]).

**Duration of therapy:** If the PEP anthrax vaccine series is administered on schedule (for all regimens), antibiotics may be discontinued in immunocompetent adults aged 18 to 65 years at 42 days after initiation of vaccine or 2 weeks after the last dose of the vaccine (whichever comes last and not to exceed 60 days); if the vaccination series cannot be completed, antibiotics should continue for 60 days (CDC [Bower 2019]). In addition, adults with immunocompromising conditions or receiving immunosuppressive therapy, patients >65 years of age, and patients who are pregnant or breastfeeding should receive antibiotics for 60 days (CDC [Bower 2019]).

**Cutaneous (without systemic involvement), treatment:** Oral: 500 mg 4 times daily.

**Duration of therapy:** For community-acquired cutaneous anthrax, treatment should continue for 7 to 10 days (IDSA [Stevens 2014]); for bioterrorism-related cases, treatment should continue for 60 days (CDC [Hendricks 2014]).

**Bite wounds (animal) (off-label use):** Oral: 500 mg 4 times daily in combination with dicloxacillin (IDSA [Stevens 2014])

**Cutaneous erysiploid (off-label use):** Oral: 500 mg 4 times daily for 7 to 10 days (IDSA [Stevens 2014])

**Erysipelas:** Oral:

500 mg 4 times daily (IDSA [Stevens 2014])

**Manufacturer's labeling:** Dosing in the prescribing information may not reflect current clinical practice. 125 to 250 mg every 6 to 8 hours.

**Fusospirochetosis (Vincent infection):** Oral: 250 to 500 mg every 6 to 8 hours

**Pneumococcal prophylaxis in hematopoietic cell transplant (off-label use):** Oral: 250 to 500 mg twice daily. **Note:** Use only in areas where incidence of penicillin-resistant *S. pneumoniae* is low (Tomblyn 2009).

# CALCIUM CHANNEL BLOCKERS AND GINGIVAL HYPERPLASIA

The last published report on calcium channel blocker-induced gingival hyperplasia (GH) by this author was in 2009 (Wynn 2009). This present update reviews the reports up through 2019, relative to the incidence of GH in patients taking calcium channel blockers (CCBs) and the mechanisms by which these drugs cause GH.

The first reported cases of gingival hyperplasia induced by nifedipine were reported by Ramon et al, in 1984 (Ramon 1984). Since that report, additional reports and case studies have been published describing gingival hyperplasia caused by nifedipine and other calcium channel blockers. The following table lists the number of reported cases with the specific drug involved and the number of cases from 1996 to the present.

FDA Approval	General Preparation	Cases of Gingival Hyperplasia in Clinical Literature Through 1995	Cases Reported in Literature 1996 to Present	Total Reported Cases
1982	Verapamil	7	9	16
1982	DiltiazEM	20	33	53
1982	NIFEdipine	120	194	314
1989	NiCARdipine	0	0	0
1989	NiMODipine	0	0	0
1991	Isradipine	0	0	0
1992	AmLODIPine	0	58	58
1992	Felodipine	1	8	9
1993	Nisoldipine	0	0	0
2008	Nitrendipine <sup>1</sup>	1	0	1
	Clevidipine	0	0	0
	Pinaverium <sup>a</sup>	0	0	0

<sup>a</sup>Not approved in the United States

Calcium channel blockers are so named because of their effects on calcium at the cellular level. Contractile cells of the myocardium and smooth muscle cells of coronary and systemic arteries are influenced by the movement of calcium across their membranes. Part of this influence is in the regulation of contractile processes in these cells by way of movement of calcium ions through specific membrane channels. By blocking this channel movement of calcium, these drugs cause depression of the mechanical contraction of the myocardial cells, depression of electrical impulse formation and conduction velocity within the myocardium, and depression of smooth muscle contraction in coronary and systemic arteries. Thus, these drugs are useful in cardiovascular diseases, such as angina and hypertension, in which relaxation of these cells to cause vasodilatation is desired. These agents are sometimes referred to as calcium antagonists.

## CLINICAL FINDINGS

Typical clinical findings of CCB-induced GH are hyperplastic gingiva around the maxillary and mandibular anterior teeth (Lederman 1984). The hyperplastic gingiva usually originates in the interdental papilla, and in many areas, bleeding upon probing and small ulcerations are present. False periodontal pockets may be present with no evidence of bone loss. Histopathological analysis usually shows a thick layer of stratified squamous epithelium with parakeratosis and elongated rete pegs (Lederman 1984; Lucas 1985). In the submucosa, a proliferation of collagen fibers together with lymphocytic and plasma cell infiltration can be noticed (Lucas 1985). The connective tissue usually shows large bundles of dense collagenous fibers with a moderate increase in fibroblasts. In addition, signs of inflammation are present with lymphocytes and plasma cells located perivascularly (Lucas 1985).

## MECHANISMS

Theories abound on the mechanism of CCB-induced gingival hyperplasia, but none have been proven. An early report using cell culture showed that the CCBs may lead to proliferation of selected fibroblasts, leading to an imbalance between regeneration and degeneration of those cells (Pernu 1989). Brown et al, proposed that CCBs influence calcium/sodium flux in gingival fibroblast to result in decreased uptake of folic acid (Brown 1990). The lack of intracellular folic acid then sets off a chain of events resulting in lack of production of active collagenases with no resultant catabolism of interstitial ground substance. The overabundance of ground substance manifests as gingival enlargement. To further the theory on fibroblast proliferation, amlodipine was shown to have direct effects on extracellular matrix of gingival fibroblasts after incubation with fibroblast cell culture (Lauritano 2019). Another theory suggests that these drugs elicit their effects indirectly through mediators which simulate proliferation and/or collagen synthesis by gingival fibroblasts (Giustiniani 1987). Two of the mediators are reported to be Interleukin-2 from T cells and the testosterone metabolite 5-dihydrotestosterone (Nishikawa 1991; Sooriyamoorthy 1990). The report by Sooriyamoorthy et al, showed convincing evidence in controlled experiments that increased levels of 5-dihydrotestosterone occurred in gingival hyperplasia induced by nifedipine (Sooriyamoorthy 1990). Their earlier work also showed that this testosterone metabolite had a stimulatory effect on the synthetic activity of fibroblasts (Sooriyamoorthy 1988). In another theory, Nishikawa et al, suggests that