

# Antimicrobial Therapy in Management of Odontogenic Infections in General Dentistry



Curtis J. Holmes, DDS<sup>a,\*</sup>, Robert Pellecchia, DDS<sup>b</sup>

## KEYWORDS

- Odontogenic infections • Antimicrobial therapy • Antibiotic therapy • Dental abscess
- Antibiotics • Allergy • Diagnosis and treatment plan

## KEY POINTS

- This article focuses on the diagnosis and management of odontogenic infections.
- Current antibiotic regimens are reviewed and discussed including use of alternative antibiotics with patients known to have a penicillin allergy.
- Emphasis is made on proper examination of the patient with use of diagnostic aids to provide the correct treatment of choice.

In the dental office, there are a number of conditions that can be classified as unscheduled dental emergencies ranging from tooth pain, to a fractured or avulsed tooth, to odontogenic infections. For the general dentist management of odontogenic infections can be the most concerning of these office based emergencies owing to the complex microbiology of odontogenic infections and potential for advancement to life-threatening medical emergencies. Odontogenic infections encompass a variety of conditions ranging from localized abscesses to deep space head and neck infections.<sup>1</sup> Deep space infections can carry a high incidence of morbidity and mortality.<sup>2</sup> Because these patients often present to the dental office unexpectedly, it is imperative for the dental professional to have an understanding of treatment and management of such infections. Management of patient with an odontogenic infection is a multifaceted approach involving an examination and assessment of the patient, identifying the source of the infection, anatomic considerations, surgical intervention, administration of the appropriate antimicrobial therapy, and referral to an appropriately trained

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<sup>a</sup> Department of Dentistry and Oral and Maxillofacial Surgery, The Brooklyn Hospital Center, Brooklyn, NY, USA; <sup>b</sup> Department of Dentistry and Oral and Maxillofacial Surgery, Geisinger Medical Center, Danville, PA, USA

\* Corresponding author. 100 North Academy Avenue, Danville, PA 17821.

E-mail address: [dr.cjholmes@gmail.com](mailto:dr.cjholmes@gmail.com)

provider if indicated. This article provides a basic understanding of the diagnosis and pharmacologic management of patients with infections that are odontogenic in origin. This article is limited to management in the outpatient setting. It is recommended that providers with desires to manage infections in the inpatient setting to review the literature on therapeutic management of these patients before treatment.

## EXAMINATION AND ASSESSMENT

A thorough patient examination is a critical component of treatment of odontogenic infections. Patient evaluation begins with a comprehensive history and physical examination followed by an assessment of the pertinent findings. This is then followed by a diagnosis and development of a treatment plan for patient care. Failure to complete a comprehensive history and examination of the patient can lead to improper treatment and/or delayed treatment of infections, potentially leading to serious complications, including but not limited to airway compromise, mediastinitis, sepsis, and death.<sup>2</sup>

A patient history includes attaining information regarding the symptoms, onset, and duration of the present illness. This information helps to form an understanding of the severity of the patient's infection. Common signs and symptoms that should alert a provider of a developing or established infection include trismus, fever, difficulty swallowing, pain, difficulty breathing, and pain on swallowing.<sup>1-3</sup> The patient's medical history and current medications are key in assessing the patient's ability to fight infection as well as providing insight to potential drug interactions.

The physical examination oftentimes begins before the provider enters the room with the recording of vital signs or on introduction with visual inspection swelling or general appearance and posturing. Airway assessment is a critical component of this examination. It allows for assessment of the necessity for emergent referral. Palpation, percussion, and thorough visual examination of the extraoral and intraoral cavities provide necessary information for identifying the source and location of the infection. Providers should pay close attention size of swelling, tongue position, floor of the mouth swelling or elevation, visual disturbances, voice changes, vestibules, and uvula position. This should be followed by radiographic examination.

After subjective and objective information has been gathered and interpreted an appropriate diagnosis is made, which guides the plan of treatment. This treatment could vary based on the findings present but can involve antibiotic therapy, surgical management, or a combination of both with or without an urgent referral to an oral and maxillofacial surgeon or hospital.

## STAGES OF ABSCESS DEVELOPMENT

The source of odontogenic infections is commonly bacteria native to the oral cavity. This bacteria acts on a tooth or the periodontium. In periodontal infections, attachment loss of the gingival fibers and destruction of supportive structures expose the teeth and tissues to bacterial introduction. Periapical infections begin with a carious lesion causing pulp necrosis, which introduces the pulp to microorganisms. This process then proceeds until the bacteria invades the periapical tissues.<sup>1,4</sup> Upon accessing the periapical tissues, the process can remain localized to the bony structures as a cyst, granuloma, or focal osteomyelitis. A second alternate a progressive process may ensue as periapical infection spreads through cortical bone involving cellulitis, and localized and deep space abscess formation.

After inoculation of bacteria into deeper tissues abscess, development progresses through cellulitis to abscess formation without early intervention. Cellulitis is an acute disorder associated with warm, diffuse, painful, indurated swelling of soft tissues that

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