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## **Introduction**

Dental pathology encompasses a diverse array of conditions that affect the oral cavity, teeth, and surrounding tissues. From common issues like dental caries and periodontal diseases to rare genetic abnormalities, understanding the underlying mechanisms of these pathologies is crucial for effective diagnosis and management [1]. This review aims to provide an overview of the current state of knowledge regarding dental pathology, highlighting recent advancements in research and clinical practice [2]. Dental pathology represents a broad spectrum of disorders affecting the oral cavity, teeth, and surrounding tissues, presenting diverse challenges to patients and clinicians alike [3]. As our understanding of the etiology, pathogenesis, diagnosis, and management of dental diseases continues to evolve, significant advances have been made in recent years. This comprehensive review aims to synthesize and analyze the latest developments in the field, providing a comprehensive overview of the current state of knowledge and highlighting emerging trends and innovations [4]. Over the past decades, research efforts have elucidated the complex interplay of genetic, environmental, microbial, and host-related factors underlying dental pathology. Genetic studies have identified susceptibility genes associated with developmental anomalies, while environmental factors such as diet and oral hygiene practices significantly impact disease prevalence and progression [5]. Moreover, advances in microbiology have revealed the intricate role of the oral microbiome in health and disease, with specific microbial species implicated in the pathogenesis of conditions like dental caries and periodontitis. Diagnostic modalities have also undergone notable advancements, with improvements in imaging techniques, molecular diagnostics, and biomarker identification enhancing our ability to detect and characterize dental diseases accurately [6]. From traditional clinical examinations to cutting-edge molecular imaging technologies, clinicians now have a

advances in molecular diagnostics have enabled the identification of specific microbial pathogens and genetic markers associated with various dental pathologies, enhancing our ability to tailor treatment plans to individual patients.

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Treatment strategies for dental pathology vary depending on