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Tooth brushing for oral prophylaxis



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Summary Control of plaque and debris is essential for the prevention of inflammatory periodontal diseases and dental caries, because plaque is the primary etiological factor in the introduction and development of both of these infection-oriented diseases. Plaque removal with a toothbrush is the most frequently used method of oral hygiene. Powered toothbrushes were developed beginning in the 1960s and are now widely used in developed countries. The bristles of a toothbrush should be able to reach and clean efficiently most areas of the mouth, and recently the design of both manual and powered toothbrushes has focused on the ability to reach and clean interproximal tooth surfaces. An individual's tooth brushing behavior, including force, duration, motivation and motion, are also critical to tooth brushing efficacy. Dental floss and the type of toothpaste play additional important roles as auxiliary tools for oral prophylaxis. Dental professionals should help their care-receivers' meet the requirements of oral hygiene to maintain their QOL. This article reviews these topics.

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1. Introduction

Oral prophylaxis is the foundation of oral health, and daily plaque removal is considered important for oral health. Specific oral bacteria, generically known as “dental plaque” are the primary cause of gingivitis (gum disease) and caries. The removal of dental plaque is thought to play a key role in the maintenance of oral health. There is some evidence that electric toothbrushes, other than those with a counter-rotating movement, are more effective than manual brushes for tooth brushing [1]. One explanation might be the varying dexterity of the participants in the different studies. Clear deficiencies in manual tooth brushing have been recognized both from epidemiological and clinical researches [2–5]. This article reviews the contemporary literature to provide an overview of present knowledge concerning tooth brushing.

2. Dental plaque

A great diversity of microorganisms—over 700 species—has been detected in the oral cavity [6], and evidence shows that the investigation of specific microorganisms or associations of microorganisms as etiological agents of periodontal diseases and caries is a simplistic approach. Instead, dental plaque must be studied as a biofilm (i.e., as communities composed

of microorganisms not individual pathogens) in order to understand its biology and functional implications [7]. The clinical presentation of these dental diseases is a net result of the cross-talk between the pathogenic dental plaque biofilm and the host tissue response. In the healthy state, both plaque biofilm and adjacent tissues maintain a delicate balance, establishing a harmonious relationship between the two. However, changes occur during the disease process that transform this ‘healthy’ dental plaque into a ‘pathogenic’ biofilm. Recent advances in molecular microbiology have improved our understanding of dental plaque biofilm, producing numerous clinical benefits.

3. Toothbrushes

3.1. Manual toothbrush design

During the 18th century, the bristle toothbrush came into use. Forerunners of today’s brushes were developed in the 1930s. These nylon toothbrushes with plastic handles were easy to manufacture and therefore more affordable, making tooth brushing a common practice in Western society. Ever since, much imagination and inventiveness has been applied to toothbrush design, and now numerous models of manual toothbrushes are available [8] (Fig. 1), with more than 450

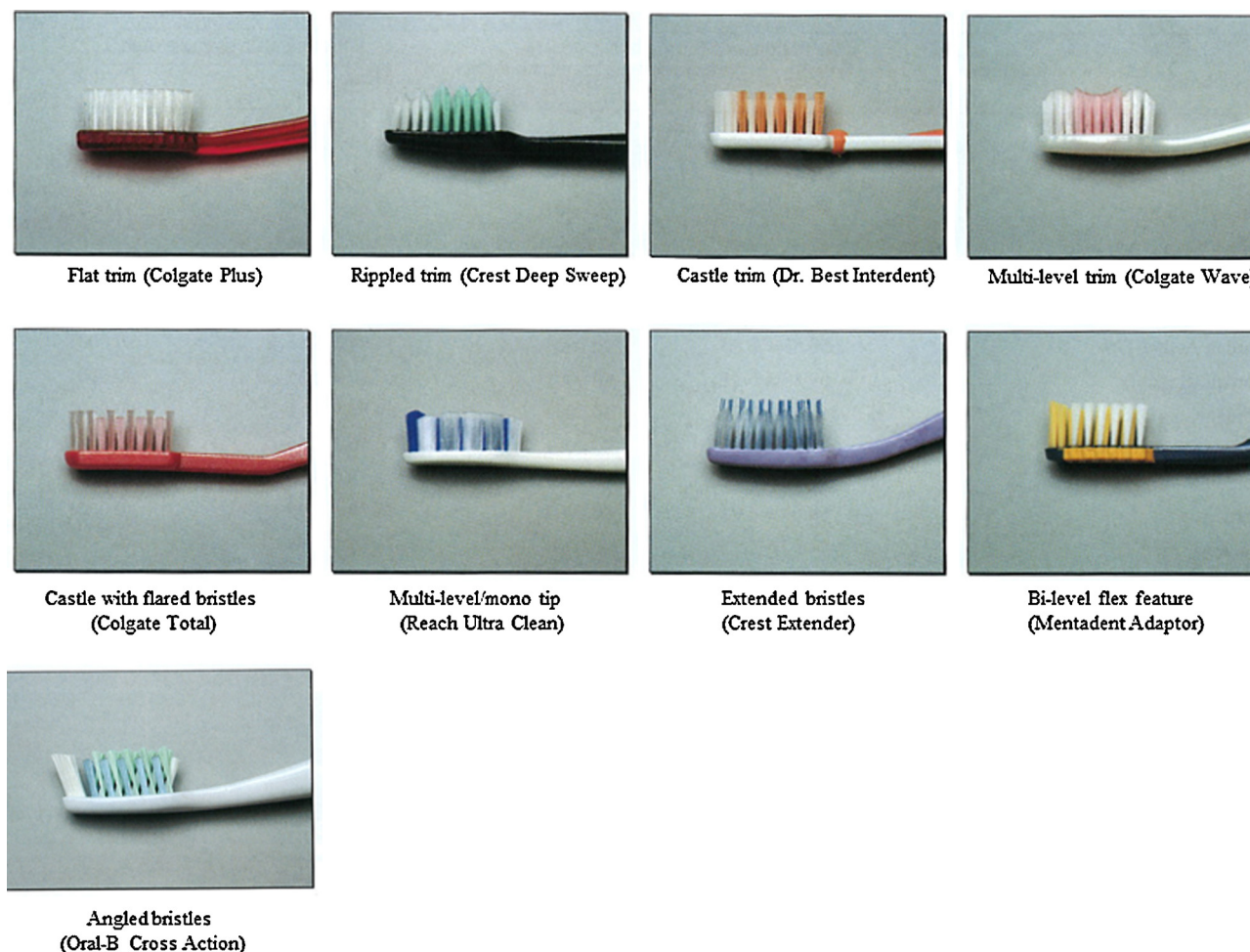


Figure 1 Examples of typical bristle profiles [8].

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