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Plaque Control
The Key To Preventive Dentistry
Preventive Dentistry:
Is An Integral Part Of Community Dentistry

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Rational
of
plaque control
The role of dental plaque as a main factor in the etiology and progress of prevalent oral diseases (i.e.)

- Dental caries
- Gingival disease
- Periodontal disease
Dental Plaque /Microbial Plaque

Definition Of Nolte (1973):

“The non-mineralized microbial accumulation that adhered tenaciously to tooth surfaces, restorations, and Prosthetic appliances, shows structural organization with predominance of filamentous forms, is composed of an organic matrix derived from salivary glycoproteins and extra cellular microbial products, and can not be removed by rinsing or water spray”
Dental plaque can be defined as the soft deposits that form the biofilm adhering to the tooth surface or other hard surface in the oral cavity.
Dental plaque as a biofilm

The term biofilm describes the relatively undefinable microbial community associated with a tooth surface or any other hard, non-shedding material.

Wildere & Charaklis 1989

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Fig 33  Schematic illustration of a plaque biofilm. The pellicle and biofilm extracellular matrix are depicted as firmly embedded in each other, contributing to the well-known recalcitrance of dental plaque. The unique shape of biofilms are believed to facilitate growth and symbiosis among the microbiota. The large arrows depict solvent flow that occurs through both large and small aqueous channels that are believed to carry nutrients and metabolic products to different members of the community. (From Darveau et al, 1997. Reprinted with permission.)

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The conditions of biofilm formation

- Hard-Non shedding surface.
- Natural aqueous environment.
- A regular nutrient supply to the bacteria
Significance of the biofilm environment:

- Produce of extracellular polymers is typically for biofilms.
- Importance of E.P as a mediate for bacterial attachment.
- Biofilm bacteria behave differently from liquid-pluse cells.
- Biofilm effectively protect bacteria from host defence mechanisms and antimicrobial agents.

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Stages in the formation of dental plaque.

Dental plaque is formed in three basic steps:

- Pellicle formation
- Bacterial colonization
- Plaque maturation
Stage 1  Salivary glycoproteins are adsorbed onto dental enamel to form pellicle.

Stage 2  Selective colonization of the pellicle by microorganisms

Stage 3  Growth and maturation of biofilm

Composition of dental plaque

- Microorganisms 70%-80%
- Intermicrobial matrix 20%-30%

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Fig 29  Corncob formation of coccoid and filamentous bacteria in phase III of plaque formation (original magnification ×8,000). (From Saxton, 1973. Reprinted with permission.)
**Fig 3** Increase in gingival plaque over the 3-week experimental period. For the first few days, this plaque is composed of gram-positive (+) cocci and rods, the indigenous microflora of the tooth. After 4 to 5 days, filamentous organisms and gram-negative (−) cocci and rods “infect” the plaque. Gradually, nonattaching spirochetes appear in the sulcus, while the assortment of microorganisms in the gingival biofilm increases continuously. (Modified from Loe et al, 1965 with permission.)
Types of dental plaque

Supragingival plaque

Subgingival plaque

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Loe et al., 1965:

*Gingivitis and enamel caries were induced in healthy young adults in the absence of oral hygiene within 3 weeks.*
Fig 1  Plaque accumulation in a subject in an experimental gingivitis study. Note the relationship between the plaque and inflammation of the gingival margin. (From Löe et al, 1965. Reprinted with permission.)

Fig 2  Resolution of the gingival inflammation shown in Fig 1, within 1 week of resumption of adequate oral hygiene. (From Löe et al, 1965. Reprinted with permission.)
Lindhe et al., 1975; Saxe et al., 1967: Experimental studies in animals have shown that untreated, plaque-induced gingivitis can eventually progress to periodontitis.
Manual toothbrush

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Parts of manual toothbrush

**FIGURE 25-1** Parts of a Toothbrush.
Dimensions of toothbrush

(Recommended by ADA)

1. Total brush length: about 15 to 19 cm
2. Head:
   a. Brushing plane/surface,
      * width, from 7.9 to 9.5 mm
      * length, from 26.4 to 31.8 mm
   B. Filaments,
      * diameter, from 0.005 inch (0.1 mm) to 0.014 inch (0.4 mm)
      * Height from 8/7 mm to 11 mm

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Handle of toothbrush

- Composition
- Shape
- Variations
Brush head

- Design
- Brushing plane (profile)

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Factors influencing stiffness of filaments

- Diameter of filaments
- Length of filaments
- Number of filaments in a tufts
- Angle of filaments
- Distance among tufts
- Nature of Nilon
Numbers of tufts & filaments

* Number of tufts in the width, 2 to 4 tufts
* Number of tufts in the length, 5 to 12 tufts
* Number of filaments per tuft 80 to 86.
Bass method
**Fig. 49-6** Bass method. **A**, Proper position of the brush in the mouth aims the bristle tips toward the gingival margin. **B**, Diagram shows the ideal placement, which could permit slight subgingival penetration of the bristle tips.
Fig. 49-5 Bass method. A, Place the toothbrush so that the bristles are angled approximately 45 degrees from the tooth surfaces. B, Start at the most distal tooth in the arch and use a vibrating, back-and-forth motion to brush.
Fig. 49-7 Bass method. The correct palatal position on molars and premolars is with the bristle tips at the gingival margin as shown in the diagram, not on the occlusal surfaces.
Fig. 49-9 Bass method. Adjusting the palatal position of the toothbrush on incisors, as shown in the diagram, may provide better access for plaque removal.
Fig. 49-8 Bass method. Palatal position of the soft toothbrush on the molars and premolars permits bristle tip penetration into the interproximal areas and possibly slightly subgingivally.
Fig. 49-10 Bass method. Placement of the bristles on the palatal surfaces of the incisor teeth can be difficult and often requires this modified approach.
Correct occlusal brushing

Incorrect

Incorrect

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