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1-я КАФЕДРА ТЕРАПЕВТИЧЕСКОЙ СТОМАТОЛОГИИ

Л. А. Казеко, О. А. Тарасенко

ЗУБНЫЕ ОТЛОЖЕНИЯ

DEPOSITS ON THE TEETH

Рекомендовано Учебно-методическим объединением
по высшему медицинскому, фармацевтическому образованию
в качестве учебно-методического пособия для студентов
учреждений высшего образования, обучающихся на английском языке
по специальности 1-79 01 07 «Стоматология»

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CLASSIFICATION OF DEPOSITS ON THE TEETH (WHO, 1995)

K 03.6. Deposits [accretions] on teeth
Includes: staining of teeth NOS
K03.60 Pigmented film
Black
Green
Orange
K03.61 Due to tobacco habit
K03.62 Due to betel-chewing habit
K03.63 Other gross soft deposits
Materia alba
K03.64 Supragingival calculus
K03.65 Subgingival calculus
K03.66 Dental plaque
K03.68 Other specified deposits on teeth
K03.69 Deposits on teeth, unspecified

DENTAL PLAQUE, DENTAL BIOFILM

Dental plaque can be defined as the soft deposits that form the biofilm adhering to the tooth surface or other hard surfaces in the oral cavity, including removable and fixed restorations (dentures, bridge), etc. if left undisturbed.

Dental plaque is a dense, nonmineralized highly organized biofilm of microbes, organic and inorganic material derived from the saliva, gingival crevicular fluid and bacterial byproducts (polymers that they secrete).

Due to scientific advances we have learnt more about the true nature of plaque: it is currently viewed as “biofilm” (Wilderer and Charaklis 1989).

Dental biofilm — a diverse community (predominantly bacteria) found on the surfaces of the teeth (and oral tissue and prosthetic devices) embedded in matrix of polymers of bacterial and salivary origin.

Biofilm — a matrix enclosed bacterial population adherent to each other and or surfaces or interfaces, ecological communities that evolved to permit the survival of the whole community. Biofilms consist of mushroom-shaped bacterial colonies in which incompatible species of bacteria cooperate to thrive in a hostile environment (fig. 1). Channels of primitive circulatory system act as alimentary canals.

Biofilm can be seen as positive e.g. used for detoxification of waste water but often biofilms provide a challenge for humans e. g. legionnares disease (in air condition units).

Biofilms have a diversity of defense mechanisms. When compared to their planktonic equivalents, biofilm cells are 10–1000 times more resistant to antimicrobials. The way how microorganisms develop resistance is not well understood. Some hypothesis mentioned the function of extracellular polymeric

substances as a polymer that could interact with antimicrobials, quenching their activity, before they could reach the cells embedded in the matrix. Extracellular polymeric substances can either bond to the antimicrobials, delaying their diffusion, or chemically react with them, causing their inactivation. A deeper understanding of biofilm resistance mechanisms is necessary in order to develop new and more effective biofilm control strategies.

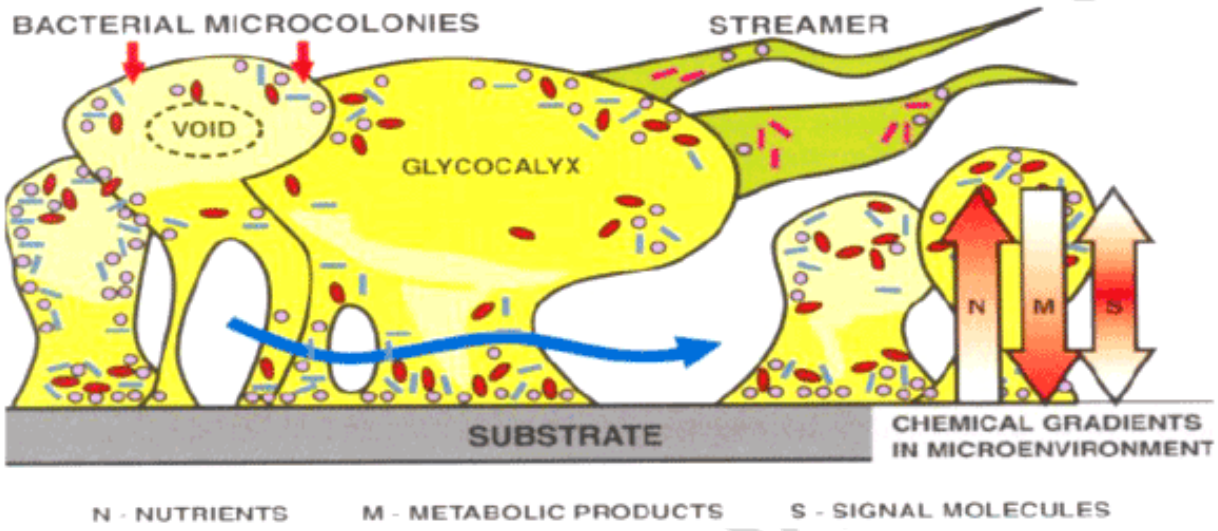


Fig. 1. Cooperation of bacteria in dental biofilm (blue arrow point at fluid channels)

Plaque is differentiated from other deposits that may be found at the tooth surface such as materia alba and calculus. Materia alba refers to soft accumulation of bacteria and tissue cells that lack the organized structure of dental plaque and are easily displaced with a water spray. Calculus is a hard deposit that forms by mineralization of dental plaque and is generally covered by a layer of unmineralized plaque.

Classification of dental biofilm on basis of its location:

1. *Supragingival* — Present coronal to the gingival margin.
2. *Subgingival* — Present apical to the gingival margin.

On basis of pathogenicity:

1. *Cariogenic* — Generally acidogenic and gram-positive.
2. *Periopathogenic* — Mostly basophilic and gram-negative.

Supragingival plaque is found at or above the gingival margin; supragingival plaque that is in direct contact with the gingival margin is referred to as marginal plaque. Supragingival plaque commonly forms in between the teeth, in the pits and grooves of the teeth and along the gums. It is made up of mostly aerobic bacteria, meaning these bacteria need oxygen to survive. As plaque remains on the tooth for a longer period of time, anaerobic bacteria begin to form in this plaque.

Marginal plaque is of prime importance in development of gingival inflammation (fig. 2). This is characterized by the cardinal signs of inflammation including a red, puffy appearance of the gums and bleeding due to brushing or flossing. Gingival inflammation due to plaque can be *reversible* by removal of the cause, plaque.

Supragingival plaque. Streptococcus are the initial colonisers of the tooth surface, and play a major role in the establishment of the early biofilm community. Besides microorganisms there are three main factors in the pathogenesis of dental caries: diet, time and host factors. Streptococcus mutans starts enamel demineralization (e. g. inorganic part) of tooth by fermentation dietary carbohydrates to lactic acid. Later Lactobacteria acidophilus destroy organic part in caries cavity.

Saliva is unable to penetrate the build-up of plaque and thus cannot act to neutralize the acid produced by the bacteria and remineralize the tooth surface.

Supragingival plaque and tooth-assosiated subgingival plaque are critical in calculus formation and root caries, whereas tissue-assosiated subgingival plaque is important in the soft tissue destruction. Periodontal destruction occurs after gingival inflammation has been established, but not all individuals who have gingival inflammation will get periodontal destruction. Plaque accumulation is vital in the progression of periodontal destruction as the bacteria in plaque release enzymes which attack the bone and cause it to break down, and at the same time the osteoclasts in the bone break down the bone as a way to prevent further infection. This can be treated with strict oral hygiene such as tooth brushing and cleaning in between the teeth and as well as surgical debridement completed by a dental professional.

Subgingival plaque is found below the gingival margin, between the tooth and the gingival sulcular tissue. Subgingival plaque occurs after the formation of the supragingival plaque by a downward growth of the bacteria from above the gums to below. This plaque is mostly made up of anaerobic bacteria, meaning that these bacteria will only survive if there is no oxygen. As this plaque attaches in a pocket under the gums, no oxygen in the mouth can reach this bacteria meaning it will thrive if not removed. Morphologic studies indicate a differentiation of tooth-assosiated and tissue-assosiated regions of subgingival plaque (fig. 3).

Fig. 2. Gingival inflammation

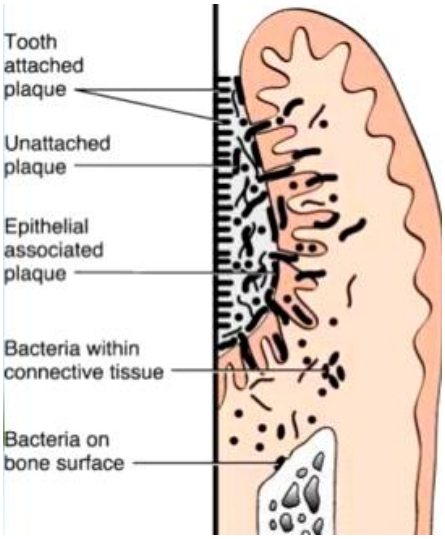


Fig. 3. Subgingival plaque

The bacteria that exhibits the most fit plasticity for the change in environment dominates the given environment. Often, this could lead to opportunistic pathogens that lead to dental caries and periodontal disease. Pathogens that have the potential to cause dental caries flourish in acidic environments. Pathogenic bacteria that have the potential to cause periodontal disease flourish in a slightly alkaline environment.

Composition of dental plaque:

Water — 80%.

Solids — 20% (bacterial and salivary proteins — 50%), carbohydrates and lipids — 25% (carbohydrate — 15%, lipid — 12%), Inorganic ions, mainly Ca and PO_4.

Dental plaque is composed primarily of microorganisms (50–70 %); 30 % is composed of inter bacteria substance. It includes organic and inorganic materials derived from saliva, gingival crevicular fluid, and bacterial products. Organical constituents of the matrix include extracellular polysaccharides (produced by bacteria), proteins (from crevicular fluid), glycoproteins, lipid material (debris) and host cells (epithelial cells, macrophages, and leucocytes). Extracellular polysaccharides make the plaque sticky and hard to rinse off with water. Extracellular polysaccharides are a source of nutrition for bacteria when the dietary supplies are low, helpful in allowing bacteria adhere and aggregate, gelatinous and help keep acids formed in plaque near the tooth, they coat the bacterial cells to protect them from bursting from osmotic effects of sucrose. One gram of plaque (wet weight) contains approximately 2×10^{11} bacteria. Bacteria account for almost all of plaque weight. It has been estimated that more than 325 different bacterial species may be found in plaque. Nonbacterial microorganisms that are found in plaque include Mycoplasma species, yeasts, protozoa, and viruses.

The inorganic component of plaque is primarily calcium and phosphorus, with trace amounts of other minerals such as sodium, potassium, and fluoride.

***Plaque formation*.** The mechanisms involved in enamel pellicle formation include electrostatic, van der Waals, and hydrophobic forces. All surfaces in the oral cavity, including all tissue surfaces as well as surfaces of teeth and fixed and removable restoration, are coated with glycoprotein pellicle. This pellicle is derived from components of saliva and crevicular fluid, as well as from bacterial and host tissue cells products and debris. Pellicle takes 1 week to mature.

Protective functions of pellicle:

A) Reservoir of ions — calcium, phosphate, fluoride;

B) Acts as semi-permeable membrane (may influence the movement of ions especially calcium and phosphate from the external environment into the tooth);

C) Restricts diffusion of the acids — protects enamel from minor acid attack (areas without pellicle more rapidly damaged than those with intact pellicle);

D) Lubricant — can protect tooth surface from wear during mastication (chewing/grinding);

E) It contains antibacterial factors — IgA, lysozyme.

Damaging functions of pellicle:

A) Influences which bacteria colonize the tooth (specific proteins which make up the pellicle having affinity for some bacteria and not others);

B) Nutrient supply (glycoprotein) for some bacteria in dental plaque/biofilm;

C) Presence of pellicle alter surface energy of tooth (the use of dental adhesive materials requires its removal before bonding of tooth colored restoration);

D) Difficult to remove with toothbrushing (professional cleaning needed)

Pellicle function as protective barrier, providing lubrication for the surfaces and preventing tissue desiccation. On the hard surfaces pellicle provides a substrat on which bacteria progressively accumulate to form dental plaque. Gram-positive facultative microorganisms as Actinomyces viscosus and Streptococcus sanguis adhere to the pellicle through specific molecules, termed adhesins.

Secondary colonizers are the microorganisms that do not initially colonize clean tooth surfaces, including Prevotella, Capnocytophaga, Fusobacterium and Porphyromonas. These microorganisms adhere to cells of bacteria already in plaque mass. Different species of plaque microorganisms have ability to adhere to one another, a process known as coaggregation. There is transition from early aerobic environment characterized by gram-positive facultative species to a highly oxygen-deprived environment in which gram-negative anaerobic microorganisms predominate.

The following provides a more detailed (six step) explanation of plaque (biofilm) formation (fig. 4)

Steps of Plaque Formation	Description
Association	Dental pellicle forms on the tooth (normally on tooth), and provides bacteria surface to attach
Adhesion	Within hours, bacteria loosely binds to the pellicle.
Proliferation	Bacteria spreads throughout the mouth and begins to multiply.
Microcolonies	Microcolonies are formed. Streptococci secrete protective layer (slime layer).
Biofilm formation	Microcolonies form complex groups with metabolic advantages.
Growth or maturation	The biofilm develops a primitive circulatory system

Fig. 4. Steps of plaque formation

The microorganisms that form the biofilm are mainly Streptococcus mutans and anaerobes, with the composition varying by location in the mouth. Examples of such anaerobes include fusobacterium and actinobacteria. These microorganisms are normally harmless. However, failure to remove plaque by regular tooth brushing means that they are allowed to build up in a thick layer and cause dental disease. Those microorganisms nearest the tooth surface ferment dietary sucrose and start to produce acids.

It is important to understand that the bacterial component changes at different stages of formation. Below is a summary of the bacteria that may be present during the plaque maturation (fig. 5).

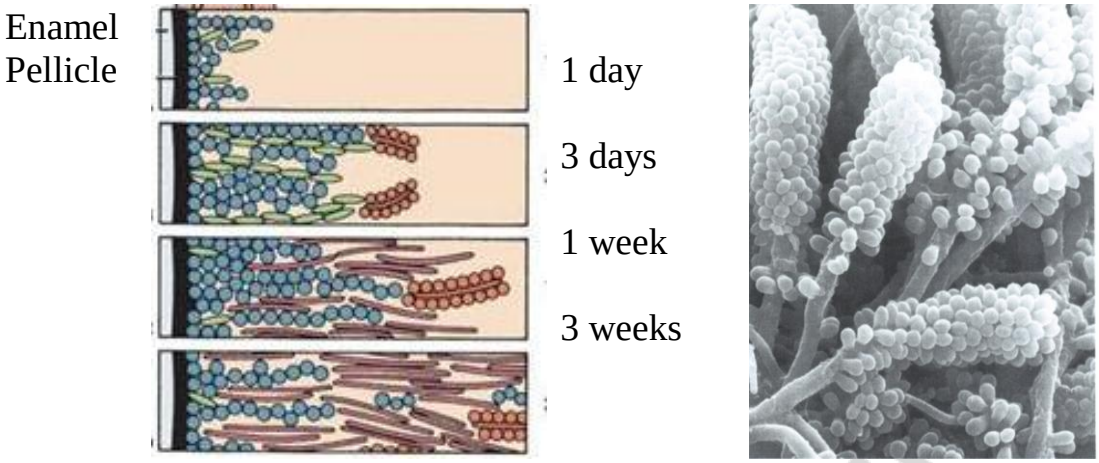


Fig. 5. Maturation of the dental plaque

Early biofilm: primarily gram-positive cocci.
Older biofilm (3–4 days): increased numbers of filaments and fusiforms.
4–9 days undisturbed: more complex flora with rods, filamentous forms.
7–14 days: vibrios, spirochetes, more gram-negative organisms.

DENTAL CALCULUS

Calculus is an adherent calcified or calcifying mass that forms on the surface of natural teeth and dental prostheses. Ordinary calculus consists of mineralized bacterial plaque.

The presence of calculus is of great concern to the clinician. These calcified deposits play a major role in maintaining and accentuating periodontal disease by keeping plaque in close contact in gingival tissue and creating areas where plaque removal is impossible. Therefore, the clinician must be extremely competent in the removal of calculus and the necrotic cementum to which it attaches.

According to its relation to the gingival margin calculus is classified as supragingival or subgingival.

Supragingival calculus is located coronal to the gingival margin and therefore is visible in oral cavity. It is usually white or whitish yellow; has a hard, clay-like consistency; and easily detached from the tooth surface. After removal it may recur rapidly, especially in the lingual area of the mandibular incisors. The color is affected by contact with such substances as tobacco and food pigments. It may localize on a single tooth or group of teeth, or it may be generalized throughout the mouth.

Supragingival calculus (fig. 6) occurs most frequently and in greatest quantity on the buccal surfaces of the maxillary molars opposite Stensen's duct and on the lingual surfaces of the mandibular anterior teeth, particularly the centrals, opposite Warton's duct. In extreme cases calculus may form a bridge-like structure over the interdental papilla of adjacent teeth or cover the occlusal surface of teeth without functional antagonists.

Fig. 6. Supragingival calculus

Subgingival calculus is located below the crest of marginal gingiva and therefore is not visible on routine clinical examination (fig. 7). Determination of the location and extent of subgingival calculus requires careful examination with an explorer. It is usually dense, dark brown or greenish black, and hard or flint-like in consistency; it is firmly attached to the tooth surface. Supragingival calculus and subgingival calculus generally occur together, but one may be present without the other. Microscopic studies demonstrate that the deposits usually extend near but do not reach the base of periodontal pockets in chronic periodontal lesions. Calculus may be detected at roentgenogram (fig. 8).

Fig. 7. Subgingival calculus

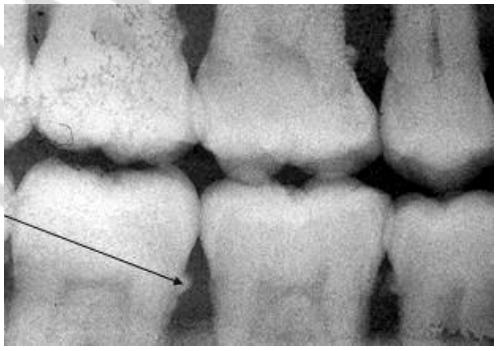


Fig. 8. Detection of calculus at roentgenogram

Supragingival calculus has also been referred to as salivary calculus and subgingival calculus as serumal calculus, based on the assumption that the former is derived from the saliva (it supplies the mineral) and the latter from the blood serum.

Composition of dental calculus. Supragingival calculus consists of inorganic (70 % to 90 %) and organic components (approximately 85 % cellular and 15 % extracellular matrix).

The composition of subgingival calculus is similar to that of supragingival calculus, with some differences. It has the same hydroxyapatite content, more magnesium whitlockite, and less brushite and octacalcium phosphate. Salivary proteins present in supragingival calculus are not found subgingivally.

Calculus formation. Calculus is attached to the dental plaque that has undergone mineralization. The soft plaque is hardened by precipitation of mineral salts, which usually starts between the first and 14^{th} day of plaque formation. Microorganisms are not always essential in calculus formation, as calculus occurs

readily in germ-free rodents. On the basis of calculus accumulation rate persons can be classified as heavy, moderate, or slight calculus formers.

Calculus formation continues until it reaches a maximum, after which it may be reduced in amount. The time required to reach the maximum level has been reported 10 weeks – 6 month.

Theories regarding the mineralization of calculus.

1. Mineral precipitation results from a local rise in degree of saturation of calcium and phosphate ions, which may be brought about in several ways:

A rise in the pH of the saliva causes precipitation of calcium phosphate salts by lowering the precipitation constant. The pH may be elevated by loss of the carbon dioxide and by the formation of ammonia by dental plaque bacteria or by protein degradation during stagnation.

Colloidal proteins in saliva bind calcium and phosphate ions and maintain a supersaturated solution with respect to calcium phosphate salts. With stagnation of saliva, colloids settle out; the supersaturated state is no longer maintained, leading to precipitation of calcium phosphate salts.

Phosphatase liberated from dental plaque, desquamated epithelial cells, or bacteria precipitate calcium phosphate by hydrolyzing organic phosphates in saliva, thus increasing the concentration of free phosphate ions. Another enzyme, esterase, which is present in the cocci, filamentous organisms, leucocytes, macrophages, and desquamated epithelial cells of dental plaque, may initiate calcification by hydrolyzing fatty esters into free fatty acids. The fatty acids form soaps with calcium and magnesium that are later converted into the less soluble calcium phosphate salts.

2. Seeding agents induce small foci of calcification that enlarge and coalesce to form a calcified mass. This concept has been referred to as the epitactic concept or, more appropriately, heterogeneous nucleation. The seeding agents in calculus formation are not known, but it is suspected that extracellular matrix of plaque plays an active role.

The carbohydrate-protein complexes may initiate calcification by removing calcium from the saliva (chelation) and binding with it to form nuclei that induce subsequent deposition of minerals. Plaque bacteria have also been implicated as possible seeding agents.

It is difficult to separate the effects of calculus and plaque on the gingiva, because calculus is always covered with nonmineralized layer of plaque. There is a positive correlation between the presence of calculus and the prevalence of gingivitis, but the correlation is not as great as that between plaque and gingivitis. In young persons periodontal condition is more closely related to plaque accumulation than to calculus, but the situation is reversed with age.

Subgingival calculus may be the product rather than the cause of periodontal pockets. Regardless of its primary or secondary relationship in pocket formation, and although the principal irritation feature of calculus is its surface plaque rather than its calcified interior, calculus is a significant pathogenic factor in periodontal disease.

METHODS OF IDENTIFICATION OF DENTAL PLAQUE

1. Visual.
2. Probing.
3. Using disclosing solutions and tablets.
4. Using dental hygiene indices to measure plaque accumulation.

Great quantity of dental plaque may be defined visually.

Small amounts of dental plaque may be defined by probe.

Plaque disclosing products, also known as disclosants, make plaque clinically visible. Clean surfaces of the teeth do not absorb the disclosant, only rough surfaces. Plaque disclosing gels can be either completed at home or in the dental clinic. Before using these at home or in the dental clinic patient should check with his general practitioners for any allergies for Iodine, food coloring or any other ingredients that may be present in these products. The first chemical reported to stain plaque was iodine but, over the time, a variety of dyes have been used, such as: fuchsine, erythrosine, merbromin, methylene blue, brilliant blue, crystal violet, gentian violet, fluorescein. These gels provide a visual aid in assessing plaque biolfim presence and can also show the maturity of the dental plaque (fig. 9). 2Tone (Young Dental) is a specialized multicolored disclosing agent which increases patient compliance. Older plaque stains blue while newer plaque stains red. Available in liquid or tablet varieties.

Fig. 9. Disclosing agents

OHI-S (Oral Hygiene Index Simplified, Greene, Vermillion, 1964). It is used to evaluate OH status by providing an estimation of tooth surfaces covered by debris and/or calculus. There are two parts to this index, which can be used separately or together:

DI-S (Debris Index Simplified);

CI-S (Calculus Index Simplified).

When you add them up, the total becomes OHI-S score. This index is reversible, can be changed, and will decrease or increase depending on the patient's oral hygiene habits and technique.

6 teeth total are chosen for examination (fig. 10).

Posterior teeth: on both the maxilla and the mandible, choose the first fully erupted tooth distal to the 2nd premolar (typically a first molar, but can also be a second or third molar) on the right and the left. On the maxilla, evaluate the facial surface, on the mandible, evaluate the lingual surface.

Anterior teeth: use the facial of tooth #11 (if missing, use #21) on the maxilla. Use the facial of tooth #31 (if missing, use #41) on the mandible (fig. 10).

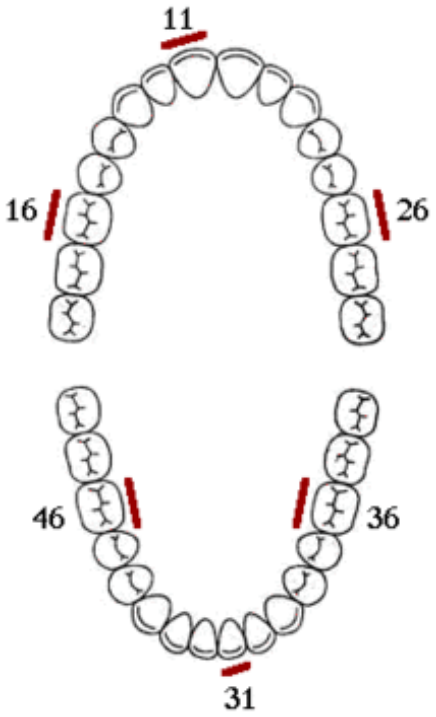


Fig. 10. The red lines denote the typical surfaces used in the OHI-S

Include the interproximal surfaces up to the contact.

At least two of the surfaces used must be examined and scored individually to calculate OHI-S.

Evaluation of Debris Score (DI-S): run the tip of your probe zigzag from occlusal to gingival part of the tooth surface looking for biofilm, materia alba, and food debris.

Criteria for classifying debris (fig. 11):

0 No debris or stain present

1 Soft debris not covering more than 1/3 of the tooth surface, or any amount of extrinsic staining without debris present

2 Soft debris that covers more than 1/3 of the tooth surface but not more than 2/3 of the exposed tooth surface

3 Soft debris covering more than 2/3 of the tooth surface

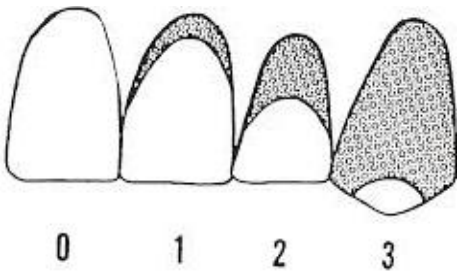


Fig. 11. Criteria for scoring DI-S Component of the OHI-S

Calculus Score (CI-S): use an explorer to estimate surface area covered by supragingival calculus then make zigzag motions along gingival margin. Record only definite areas of calculus noted.

Criteria for classifying calculus (fig. 12):

0 No calculus present

1 Supragingival calculus covering not more than 1/3 of the exposed tooth surface

2 Supragingival calculus covering more than 1/3 but not more than 2/3 of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both

3 Supragingival calculus covering more than 2/3 of the exposed tooth surface or a continuos heavy band of subgingival calculus around the cervical portion of the tooth or both

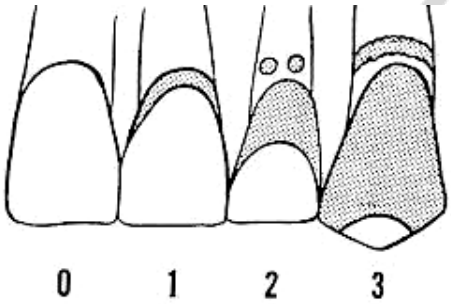


Fig. 12. Criteria for scoring CI-S Component of the OHI-S

Add up the results.

DI-S = total debris score / # of teeth evaluated (which is usually 6)

CI-S = total calculus score / # of teeth evaluated (which is usually 6)

Complete OHI-S = DI-S + CI-S

Meaning of OHI-S	Evaluation of oral hygiene
< 0.6	excellent
0.7–1.6	good
1.7–2.5	fair
≥ 2.6	poor

This index is good to use clinically in order to place patients into a “category” of oral hygiene status. For example, on the initial visit a patient may have poor oral hygiene according to his or her OHI-S score. However, it could become a motivational goal to improve the patient's oral hygiene to good or excellent over time. Another setting in which this index is useful is when measuring the OH status of groups of people such as in clinical studies and research, school programs, hospitals, and nursing homes.

PHP (Patient Hygiene Performance Index, Podshadley and Haley, 1968) This index was developed to evaluate patients’ hygiene performance following toothbrush instructions. It uses the same six tooth surfaces as in the OHI-S but divides each tooth surface into five principal areas (fig. 13).

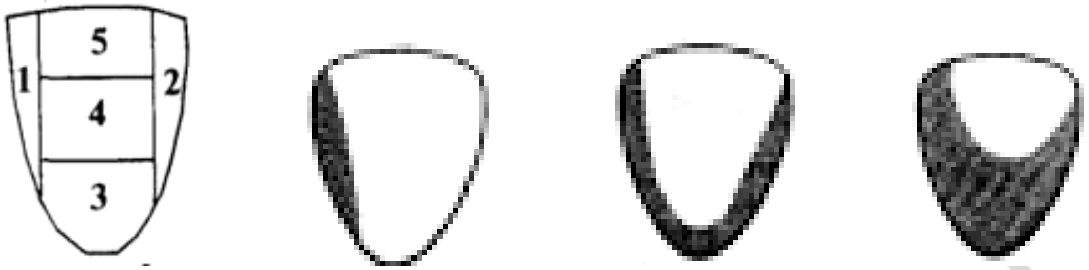


Fig. 13. Patient Hygiene Performance Index:
a — five subdivisions; *b* — debris score of 1; *c* — debris score of 3; *d* — debris score of 4

Within each surface area the debris is scored on a yes or no basis, where if any debris is present, a score of one is assigned, and where a surface is free of debris a score of 0 is given. The PHP score is the total of the score for each surface divided by the number of tooth surfaces examined.

Meaning of PHP	Evaluation of oral hygiene
0	excellent
0.1–0.6	good
0.7–1.6	fair
≥ 1.7	poor

PRINCIPLES OF DEONTOLOGY DURING IDENTIFICATION AND REMOVAL OF DENTAL DEPOSITS

1. Deal with the patient using his name politely.

2. Converse with the patient in easy and kindly tone. During motivation use the terms which are clear to the patient. Make sure that the patient understands you correctly.

3. Watch your speech carefully. It shouldn't contain anything offensive or insulting. Instead of "You have abundant dental deposits" you can say "I see that you brush your teeth, but use your toothbrush in the wrong way. Let me show you the right method of brushing teeth or flossing" (fig. 14).

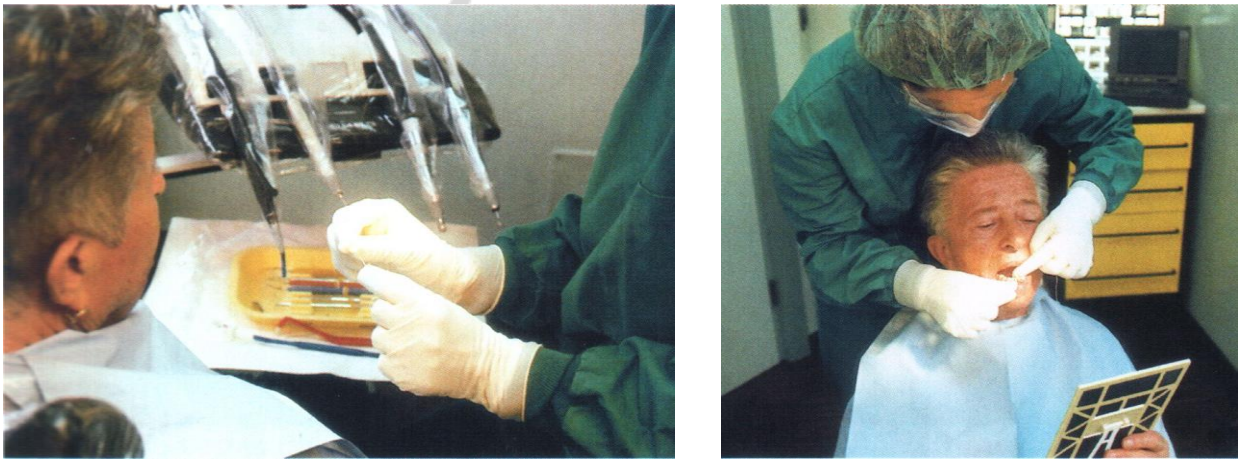


Fig. 14. Motivation of patient. Demonstration of floss use

4. Encourage the right actions of the patient. Never criticize patient. Dental hygiene recommendations should be gentle, but persistent. During every visit stress the importance of dental deposits removal.

MOTIVATION

Every day the enamel on teeth is attacked by acids produced in dental plaque. These acids can make teeth weaker, and can result in decay. When fluoride reaches teeth, it is absorbed into the enamel. It helps to repair the enamel and prevent tooth decay. It can even help stop the decay process.

Fluoride can work from the outside of teeth, and from the inside of body. To work the best, you need to get it both ways. At home it is necessary to brush with fluoride toothpaste at least twice a day, especially after eating breakfast and before bedtime.

If fluoride is greatest protection against decay, then frequent snacking can be teeth's biggest enemy. Every day, you face snacking challenges. The truth is that what you eat isn't as important as when and how often you snack. It all has to do with the "plaque reaction", and this is how it works. Everyone has plaque bacteria in their mouths. But when these plaque bacteria meet up with the sugars and starches that are found in snacks such as cookies, candies, dried fruits, soft drinks or even pretzels or potato chips, the plaque reacts to create acid, and a "plaque attack" occurs. The fact is most snacks that you eat contain either sugars or starches that give plaque this opportunity to make acid. And each "plaque attack" can last for up to 20 minutes after you have finished your snack. During this period, the plaque acid is attacking tooth enamel, making it weak. That's when cavities can start!

Sugars and sugary foods in the mouth are the main foods that germs (bacteria) thrive on to make acid which can contribute to tooth decay. Acid foods and drinks are also the main factor in tooth erosion. It is necessary to do following:

1. Limit the amount of sugary foods and drinks that you have. In particular, don't snack on sugary foods.

2. Try to reduce the amount of acid in contact with your teeth. So, limit fizzy drinks (including fizzy water) and fruit juices as these tend to be acidic. Perhaps just limit yourself to one fizzy or fruit juice drink a day. Otherwise, choose drinks that are much less acidic, such as still water, and milk, tea, or coffee (without sugar).

3. Drink any acid drinks, such as fizzy drinks and fruit juices, quickly. Don't swish them around your mouth or hold them in your mouth for any period of time.

4. Brush your teeth at least an hour after eating or drinking anything — especially acidic foods and drinks.

5. Likewise, do not brush your teeth within an hour of being sick (vomiting). This is because stomach acid will be part of the vomit.

By brushing twice daily with a fluoride toothpaste and by reducing the number of times you snack each day, you can help prevent tooth decay. When it comes to snacking, it's best to choose something nutritious and to snack in

moderation. It's also better to eat the whole snack at one time! Here's why: eating five pieces of a snack at one time exposes your teeth to possible tooth decay — for approximately 20 minutes. Nibbling on those same five pieces at five different times exposes your teeth to possible tooth decay for approximately 100 minutes. What a difference! Limit between-meal snacking. Fewer snacks mean less acid exposure for your teeth. If you snack, choose foods that are not fermentable carbohydrates.

– **Best choices** — Cheese, chicken or other meats, or nuts. These foods actually may help protect tooth enamel. They do this by neutralizing acids or by providing the calcium and phosphorus needed to put minerals back in the teeth.

– **Moderate choices** — Firm fruits such as apples and pears and vegetables. Firm fruits contain natural sugars. However, their high water content dilutes the effects of the sugars. These fruits also stimulate the flow of saliva, which fights bacteria and helps protect against decay. Vegetables do not contain enough carbohydrates to be dangerous.

– **Worst choices** — Candy, cookies, cakes, crackers, breads, muffins, potato chips, french fries, pretzels, bananas, raisins and other dried fruits. These foods provide a source of sugar that certain bacteria can use to produce acid. The problem can be worse if the foods stick to teeth or get caught between them.

Four Steps to a bright smile:

1. Brush at least twice a day **for about two minutes** with a fluoride toothpaste, especially after eating breakfast and before bedtime.
2. Floss every day.
3. Limit the number of times you eat snacks each day.
4. Visit your dentist regularly.

TOOTHBRUSHING

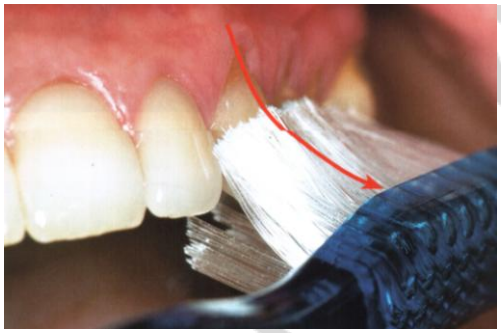


Fig. 15. Brush movement

1. Place the toothbrush at a 45 angle along the gum line. Move the toothbrush toward occlusal surface by sweeping motion (fig. 15), and repeat for 10–12 times every 2 teeth.
2. Brush the inside surface of each tooth, using the same technique.
3. Brush the chewing surface (top) of each tooth.
4. Use tip of brush to brush behind each tooth — front and back, top and bottom and up and down strokes.

Be sure to brush your tongue to remove odor-causing bacteria.

Firstly, brush the outer surfaces of the lower teeth. Then brush the inner surfaces of teeth in the same way as brushing the outer surfaces. When we brush the inner surfaces of front teeth, we should hold the toothbrush upright using gentle motion brushing from the gingival margin towards the crowns of the teeth.

Then brush the chewing surfaces of the teeth with the toothbrush moving backward and forward.

Finally, brush the outer surfaces, inner surfaces and the chewing surfaces of the upper teeth in the same way as the lower one.

Even if you have grasped the toothbrushing technique, it is important to use appropriate toothbrush and toothpaste. Toothbrushing cannot remove plaque from the proximal tooth surfaces. They have to be cleaned by dental floss, floss holder or interdental brush.

The order of brushing and flossing or interdental brushing does not affect the effectiveness of tooth cleaning. As long as you do these jobs thoroughly, you can achieve satisfactory results.

Solutions to common problems encountered during toothbrushing

Areas that are hard to be reached by a toothbrush are difficult to be cleaned by toothbrushing, for example, the inner surfaces of lower teeth or crooked teeth. The solution is to clean with a small head toothbrush or a single-tuft toothbrush.

Some people may gag when they brush their teeth. To improve this situation, you can choose to use a toothbrush with a small head.

The accumulation of dental plaque causes gingival inflammation. In that case, the gum will bleed when brushing. You can choose to use a toothbrush with soft bristles to clean away the plaque in such areas. Gingival inflammation will slowly subside and the gingivae will become healthy when the oral hygiene has improved.

Manual toothbrush. Shape of toothbrush head. All conventional toothbrush head designs are effective in cleaning every tooth surface. The tips of diamond shape toothbrush heads are narrower than those of the conventional ones. These tips are designed for easy access to posterior teeth. Brush head size should be approximately ~25 mm.

Bristle pattern (fig. 16). Toothbrush with block pattern has the bristles of the same length. They are arranged neatly like a block. Toothbrush with wavy or V-shape pattern is intended to give the bristles a better contact with the areas around the adjacent tooth surfaces. Multilevel trim pattern enables the brush to reach difficult-to-clean areas. Criss-cross pattern design can lift up plaque effectively. *Medium or soft* bristles are best for most people.

Fig. 16. Bristle pattern

Handle design (fig. 17).

All conventional toothbrushes have straight handles that are easier to control. Contra-angle handle design is similar to a dental instrument, intending to access to the difficult-to-clean areas. Flexible handle intends to reduce gum injury caused by excessive brushing force. Slip prevention grip handle intends to prevent the toothbrush from slipping away during toothbrushing. Some toothbrushes can be angled for increased access. Heat the neck under hot running water, bend to the desired angle and cool in cold water.

Fig. 17. Handle design

Powered Toothbrush. It has been shown that powered toothbrushes with a rotation oscillation action reduce plaque and gingivitis more than that of manual toothbrushes. However, to clean the teeth thoroughly, the most important is to adopt a proper and effective toothbrushing technique. For people with special needs, such as the physically and mentally disabled people, choosing powered toothbrushes may enhance the cleaning effect. Both manual and powered toothbrushes clean the teeth effectively as long as they are used correctly. Making sure you thoroughly clean your teeth at least twice a day is more important than the type of brush you use.

The technique in using powered toothbrush is different from that of the manual toothbrush.

Electric toothbrush should have soft, nylon, and round-ended bristles for the most effective brushing. These bristles can wear with regular use and patient should inspect the brush regularly to maintain its integrity.

Hold toothbrush at a 45-degree angle to gum line. Keep the bristles in contact with tooth surface and gum line. It can help ensure to get the most effective brush possible. Only gentle pressure should be applied, as too much can injure teeth and gums. The vibrations of electronic toothbrush can also add a little additional pressure. Maintaining the 45-degree angle, brush the outer surfaces of 2–3 teeth using a back and forth rolling motion. The rolling motion is achieved by contacting the brush to the gum line and then moving downward with the toothbrush towards the chewing surface. To brush behind front teeth, tilt the brush vertically and make up and down strokes using only the front half of your brush.

Use a gentle back and forth scrubbing motion to clean the biting surfaces and tongue.

Brush your teeth at least twice a day. When you brush, don’t rush. Take enough time to do a thorough job.

Always rinse toothbrush with water after brushing. Store toothbrush in an upright position, if possible, and allow it to air-dry until using it again. Don’t routinely cover toothbrushes or store them in closed containers, which can encourage the growth of bacteria.

Know when to replace your toothbrush. Get a new toothbrush or a replacement head for your electric or battery-operated toothbrush every *three* months, after contagious illness or sooner if the bristles are worn.

FLOSSING

Toothbrushing cannot clean the adjacent surfaces of teeth. To remove the plaque accumulated on the adjacent tooth surfaces, we must use dental floss or interdental brush daily. Parents or caregivers can assist children or people in need to clean adjacent tooth surfaces by using a floss holder.

Plaque that is not removed can harden into tartar, which can only be removed through professional cleaning by a dentist. When this happens, brushing and cleaning between teeth become more difficult, and gum tissue can become swollen or may bleed. Regular flossing may reduce gum disease and bad breath by removing plaque that forms along the gum line.

Floss was once made from silk fibers twisted to form a long strand. Today, floss is usually made from nylon filaments or plastic monofilaments. Waxed, unwaxed, flavored, or plain floss all do the same thing. Waxed floss is coated with wax which makes it easier for the floss to slide into the interdental spaces. Mint flavoured floss gives a feeling of freshness. Fluoride coated floss is intended to prevent tooth decay from occurring on the adjacent tooth surfaces, but its effectiveness has not yet been proven.

Shape of floss. Flattened floss is designed to increase the contact surface with the tooth. Ultra floss is spongy and soft. Round floss is relatively thinner. Superfloss contains segments of stiffened-end threader, spongy floss and regular floss. Stiffened-end threader can make it easier for us to slide the superfloss through the gap between the teeth and fixed orthodontic appliances. Spongy floss cleans around the appliances and between wide spaces or to floss underneath the bridge. Regular floss removes plaque from the adjacent tooth surfaces.

It’s not what type of floss you use, but how and when you use it. If you have a preferred type of floss, you may be more likely to use it.

Other tools that may be used to clean between your teeth include small brushes, special wooden or plastic picks, sticks or water flossers.

It is recommended to clean between teeth with floss (or another interdental cleaner) *once a day*. Some patients prefer to floss in the evening before bedtime so that the mouth is clean while sleeping.

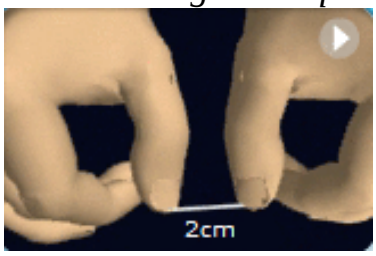
As long as you do a thorough job, it doesn't matter if you brush or floss first. However, flossing before brushing might allow more fluoride from toothpaste to

reach between teeth. It is not recommended using a floss strand more than once. Used floss might fray, lose its effectiveness or may deposit bacteria in the mouth. Discard after use.

Some people prefer floss tape which slides between teeth more easily than normal floss. Also, some people use disposable plastic forks with a small length of floss between the two prongs. These may be easier to hold and manipulate. However, they are expensive. The gums may bleed a little when you first begin to clean between your teeth. This should settle in a few days. If it persists then it may indicate gum disease.

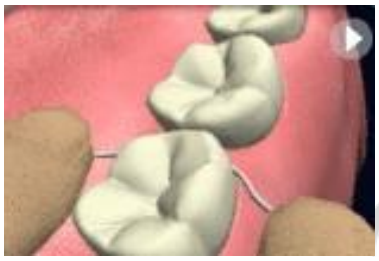
If you find it hard to handle floss, use an interdental cleaner — such as a special wooden or plastic pick, stick or brush designed to clean between the teeth.

Flossing technique



1 Use a piece of dental floss which is approximately 45 cm long. Tie both ends to make a loop or wind most of the floss around the middle finger on one hand, and the rest around the middle finger on the other hand. Use the thumbs and the forefingers of both hands to hold the floss, leaving about 2 cm of floss in between.

2 Use a sawing or rubbing motion to slide the floss into the interdental space. Be gentle. Don't snap the floss into your gums. When the floss reaches gumline, curve it into a C shape against one tooth.



3 Wrap around one tooth making a "C" shape and gently pull down to the deepest part of the gingival sulcus, and then slide it up and down with 8–10 strokes against the tooth. Then wrap around the adjacent tooth and repeat the up and down motions. Unwind fresh floss as you progress to the rest of your teeth because used floss was contaminated with bacteria already.

4 Clean all the other adjacent tooth surfaces in the same way.

Floss holder (Dental floss stick). Floss holder is a supplementary tool for flossing. It is suitable for parents or caregivers in helping children or individuals with special care needs to clean the adjacent surfaces of their teeth. There are many different types of floss holder in the market. One should choose the appropriate type according to durability, shape, and handle length.

Floss holder comes in a "knife" shape or a "Y" shape. They are similarly effective in cleaning teeth. A new thread of dental floss can be reattached to the floss holder every time after use if it is a non-disposable one. When cleaning the back teeth using a "knife" shaped dental floss stick, one will need to stretch

the lips to facilitate the access of the floss stick. Handles of floss holder differ in length. Those with shorter handles are more difficult to use. Therefore, parents and caregivers should choose the one with a longer handle to floss for their children or the elderly person.

To effectively clean adjacent surfaces of teeth, the floss on the floss holder must be taut. Therefore, we need to pay attention to the tautness of the floss when buying disposable floss holder.

Method of using floss holder. Move the floss holder left and right and slowly slide the floss towards the gingival margin. Pull the floss tightly against one of the adjacent tooth surfaces. Start from the deepest part of the gingival sulcus, gently slide the floss up and down to clean the adjacent tooth surface (fig. 18). Pull the floss tightly against the other adjacent tooth surface. Use the same technique, starting from the deepest part of the gingival sulcus, gently slide the floss up and down to clean the other adjacent tooth surface. Clean all the other adjacent tooth surfaces in the same way.

Fig. 18. Method of using floss holder

If there is a wide gap between the neighboring teeth, an interdental brush may be used instead of dental floss.

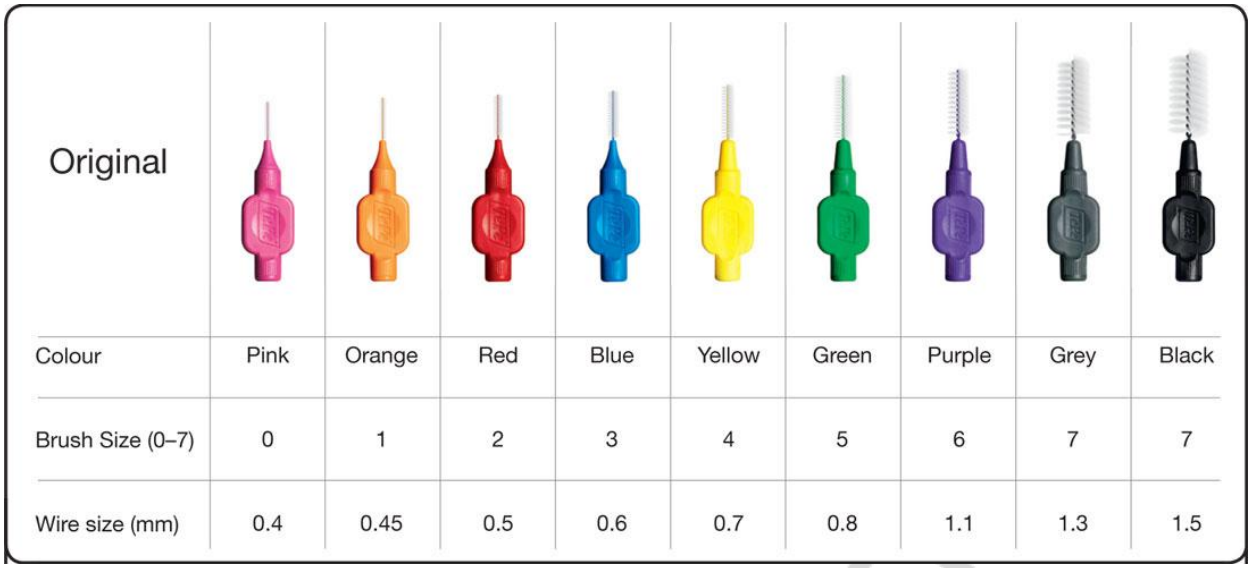
INTERDENTAL BRUSHES

Interdental brushes are the easy and effective way to clean between teeth. Interdental cleaning is the removal of plaque and impacted food from between the teeth, which normal toothbrush cannot reach. This is where a lot of dental disease starts. If the spaces between teeth are large like those teeth with gum recession due to gum disease, you may use interdental brush to clean the interdental space. Insert the interdental brush into the gap between the roots of the teeth, brush forward and backward to clean the adjacent tooth surfaces.

Interdental brushes have small bristled heads specially designed to clean between your teeth. The brush should fit snugly between the teeth. They are available from pharmacies and come in different width to suit the sizes of the gaps between teeth.

TePe Interdental Brushes are available in 9 colour-coded sizes (fig. 19, *a*). Extra soft brushes are available in 5 coded sizes (fig. 19, *b*). Another manufacturer produces four sizes of brushes (fig. 19, *c*, *d*).

Generally, the spaces between the teeth at the front of the mouth are smaller than those at the back. Patient may need to use more than one brush size (fig. 20). The wires used in TePe Interdental Brushes are plastic coated and safe to use. It is recommended to change the brush every week or when the bristles become worn or wires become buckled or distorted. Undue force and bending at severe angles will lead to damage of the wire.



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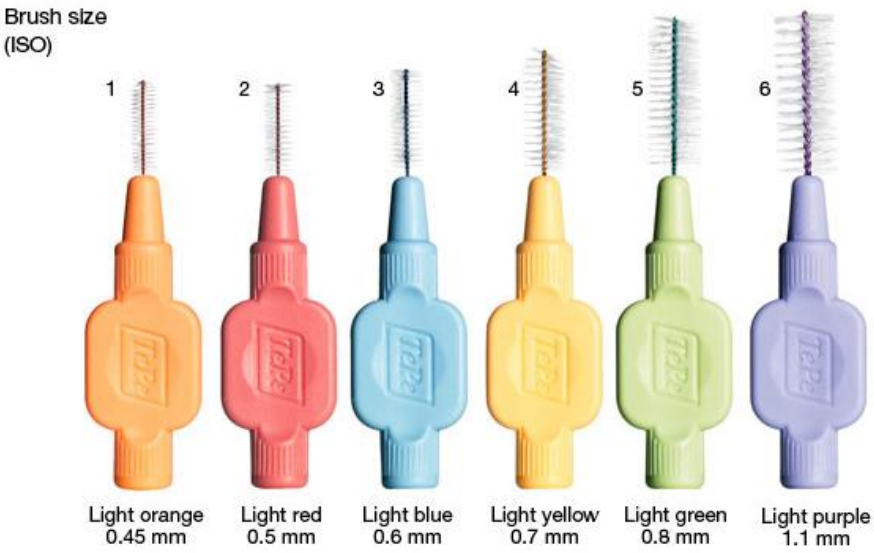

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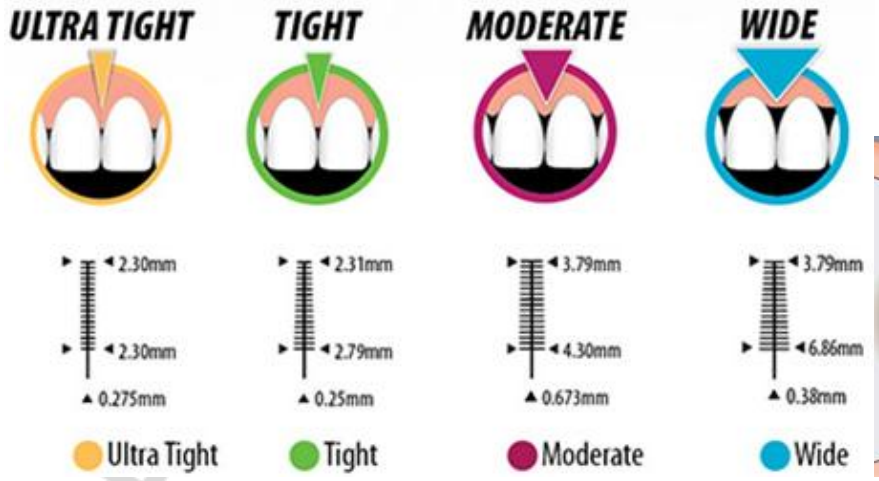

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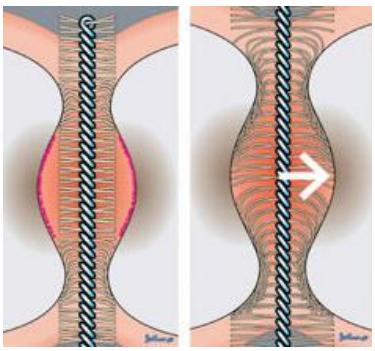


d

Fig. 19. Interdental Brushes:
a — standard brushes; *b* — extrasoft brushes; *c* — choice of brush; *d* — size of brush should be appropriate

a ***b*** Dental stick Interdental brush Floss

c

Fig. 20. Use of interdental brushes:
a — chart for patient; *b* — use of interdental brush; *c* — choice appropriate method

Steps of use interdental brushes:

1. Use a brush appropriate for the size of the space between teeth.

2. Insert the brush gently between teeth — don't try to force the brush into the space. Insert the brush into the space between teeth at gum level, turning slightly. This technique aids access and prolongs the life of the brush. Once inserted, gently move the brush backwards and forwards a few times to remove plaque and debris.

3. If patient work to a pattern round the whole of mouth, it will help not to miss out any of the spaces.

Back of mouth: The new TePe Angle™ brush, with its long handle and pre-angled head, is ideal for cleaning difficult-to-reach areas such as between the teeth at the back of the mouth. The TePe Angle can be used to clean from both the tongue and cheek sides (fig. 21).

Fig. 21. Areas of using interdental brush

Always rinse brush in clean water during and after use. When patient first start using interdental brushes, gums may be tender and bleed a little as you start to get rid of any plaque build-up. Carry on using the brushes and the bleeding should reduce as gums become healthier. If gums bleed on brushing, then it can be probably gum disease and patient needs periodontal treatment.

The chart helps to record which colour brush fits where (fig. 20, *a*).

Interdental brushes TePe with the G2™ neck withstand well over 1000 repeated bending cycles. Thanks to the flexible neck, the brush is easier to use in the posterior area. Access is also extended, as the brush reaches further in between the teeth. This enables longer back-and-forth movements, which improve the cleaning effect.

All sizes of TePe interdental brushes have plastic coated wire for safe cleaning. They clean implants and orthodontic appliances efficiently.

The largest interdental brush can be used in difficult to reach areas: missing tooth or distal surface of the last tooth. For easier access curve the brush gently when cleaning the back teeth. Do not bend back. Use another straight brush for the front teeth.

Interdental brushes TePe extra soft are recommended for delicate oral tissue or inflammation and for patients with mucosal sensivity (sensitive gums and teeth, after oral surgery, dry mouth, mucositis, periimplantitis). They are also an excellent option for everyone who prefers a softer interdental brush.

TePe Proximal™ is recommended for those who prefer an interdental brush with a long handle (fig. 22). It facilitates cleaning between the posterior teeth and from the palatal and lingual sites. The color codes and sizes correspond with those of TePe Interdental brushes.

The unique handcrafted dental model is a perfect visual tool for instructing patients in cleaning techniques using the best oral hygiene aid for every individual need. The color coded interdental spaces correspond the colours of TePe's interdental brushes. The dental model shows: crowding, furcation involvement, erupting molar and missing tooth (fig. 23).

If there is a wide gap between neighbouring teeth, an interdental brush may be used instead of dental floss. Insert the interdental brush into the gap between the teeth, placing the brush as close to the gum margin as possible, move the brush back and forth to clean the adjacent tooth surfaces.

Fig. 22. TePe Proximal™

Fig. 23. The unique handcrafted dental model

It is rather difficult to clean the teeth with fixed orthodontic appliances in place. The teeth and the appliance should be cleaned in the morning and before bed at night every day, as well as after each meal.

Replace with a new brush when the bristles are worn or deformed.

SINGLE-TUFT TOOTHBRUSH

It is a toothbrush with a very small head which can be used to clean wisdom teeth and crooked teeth effectively (fig. 24). There are various shapes of brush head. The effectiveness of cleaning by different shapes of the brush head is similar.

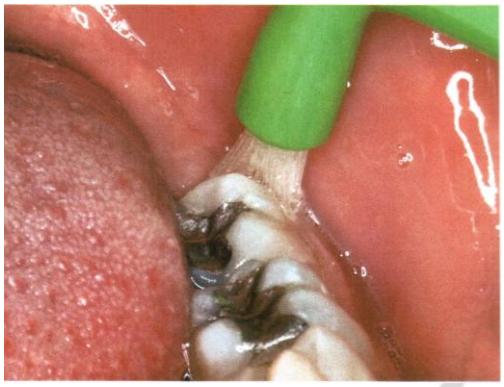
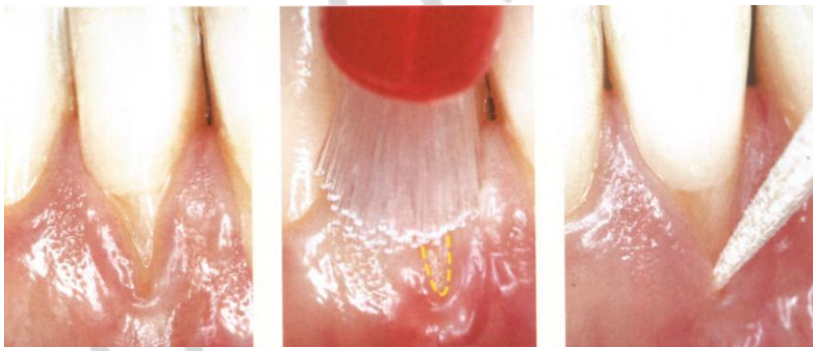


Fig. 24. Single-tuft toothbrush

PERIO-AID

Perio-Aid is a toothpick in the holder. It is suitable for cleaning root surfaces near gingival cleft, where single-tufted brush cannot reach (fig. 25).

a



b

Fig. 25. Perio-Aid:
a — Perio-Aid; *b* — Advantages of Perio-Aid

CLEANING A FIXED BRIDGE

As dental plaque also accumulates on the surface under the bridge, people wearing bridges should use superfloss to clean the area daily.

Firstly, insert the stiffened end into the area between bridge and the tooth, then pull the superfloss until the spongy part reaches the bridge. Wrap the spongy floss around the real tooth, silde up and down to clean the adjacent tooth surface.

Gently move the spongy floss between the gum and the base of the bridge, use a soft back-and-forth motion to remove plaque under the false tooth (fig. 26). Then wrap the spongy floss around the real tooth at the other side of the bridge, slide up and down to clean the adjacent tooth surface.

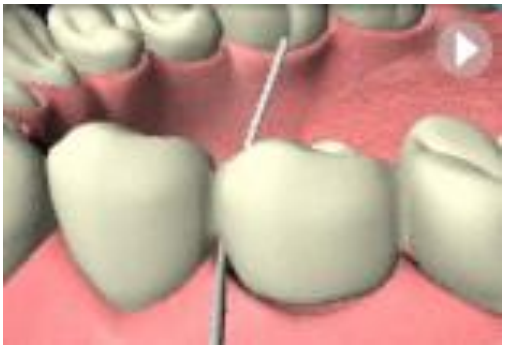


Fig. 26. Cleaning a fixed bridge

Finally, slowly pull it out from the space between the tooth and the bridge.

The regular floss is used to remove the plaque from the adjacent tooth surfaces for the rest of the teeth.

CLEANING IMPLANT SUPPORTED SINGLE CROWN

The cleaning method is similar to that of a real tooth. Brush at the gum margin, and use floss or interdental brush to clean the interdental surfaces (fig. 27).

Fig. 27. Cleaning implant supported single crown

CLEANING IMPLANT SUPPORTED BRIDGE

If the false teeth have two or more implants supporting, the cleaning method is similar to that of a conventional bridge. Since there is a gap between the false teeth and the gum, it is necessary to use superfloss or interdental brush to clean the surfaces underneath the false teeth.

CLEANING IMPLANT SUPPORTED DENTURE

Implant supported false tooth can help to improve chewing ability. However, if oral self care is not appropriate, the gum around the implant may become

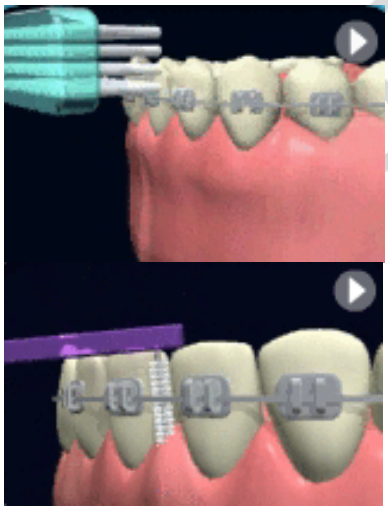
inflamed, leading to development of peri-implantitis. Gradually, the implant may become mobile and even come out.

After removing the denture, use a single-tuft toothbrush to clean around the abutment of the implant (fig. 28). The cleaning method for the denture is the same as for conventional dentures. Use soft toothbrush and detergent to clean every part of the denture. Then rinse with water and immerse it in a glass of water overnight.

Fig. 28. Cleaning implants and implant supported denture

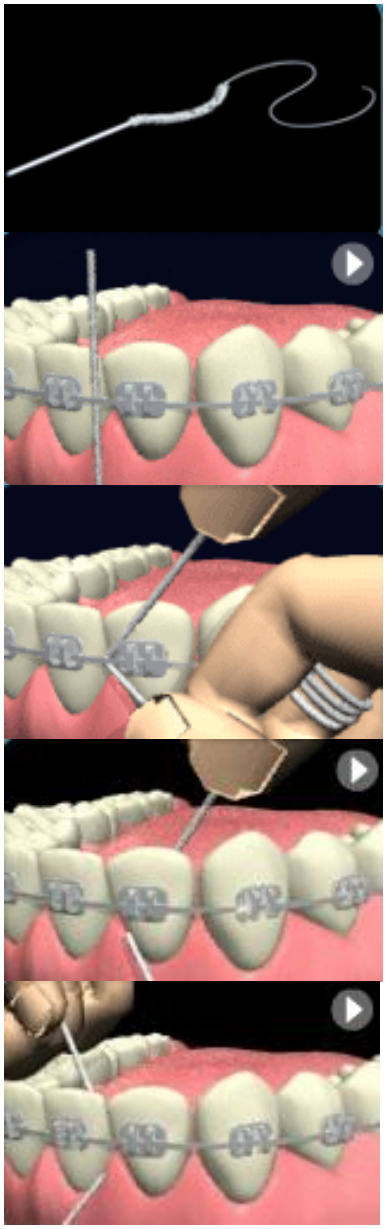
CLEANING FIXED ORTHODONTIC APPLIANCES

People wearing orthodontic appliances should clean the appliances every day as dental plaque also adheres to the appliances. It is rather difficult to clean the teeth with the fixed orthodontic appliance in place. People wearing fixed orthodontic appliances should pay special attention to their oral hygiene to reduce the chance of developing tooth decay or gum disease. They should clean teeth and the appliance every day in the morning and before bed at night as well as after each meal.



1 Firstly, brush the area between the orthodontic appliance and gingiva (gums). Then, brush the area between the appliance and the crown of the teeth.

2 Finally, insert an interdental brush into the area between the tooth and the appliance to clean.



Flossing is difficult for people wearing fixed orthodontic appliance. Hence, superfloss can be used to facilitate the removal of dental plaque in the adjacent tooth surfaces.

1 Push the stiffened end through the space between the teeth and the orthodontic appliance.

2 Then wrap the floss ends around middle fingers, hold it tightly between the thumbs and forefingers of both hands, leaving about 2 cm of floss in between.

3 Gently pull the floss into the interdental space by using a sawing motion.

4 Wrap the floss around one tooth in a "C" shape, pull down to the deepest part of the gingival sulcus, and then slide up and down to clean the tooth surface. Then wrap around the adjacent tooth and repeat the cleaning.

TOOTHPASTE

The main function of toothpaste is to help remove dental plaque. Their various functions depend on the active ingredients they contain. The followings are the common types of toothpaste: fluoride toothpaste, desensitizing toothpaste, anti-calculus toothpaste, anti-plaque toothpaste, and whitening toothpaste.

A *pea-sized blob* of toothpaste is adequate.

Anti-decay toothpaste. They contain Fluoride Compounds such as Sodium Fluoride (NaF), Stannous Fluoride (SnF_2), or Monofluorophosphate (MFP_2) etc. It's important to use a toothpaste with the right concentration of fluoride. Check the packaging to find out how much fluoride each brand contains. Adults should use a toothpaste that contains at least 1000–1500 parts per million (ppm) fluoride. After brushing, spit out any excess toothpaste. Don't rinse your mouth immediately after brushing, as it will wash away the concentrated fluoride in

the remaining toothpaste, thus diluting it and reducing its preventative effects. Children toothpaste contains 500 ppm fluoride and is usually flavoured, e. g. fruit flavour, candy flavour, which is more appealing to children.

Since we are all susceptible to tooth decay, we all need fluoride toothpaste. Fluoride strengthens teeth, and increases their resistance to acid attacks. It inhibits the growth of dental plaque and reduces its acid-producing capability.

During the initial stage of tooth decay, when minerals are lost from the surfaces of the tooth, and a cavity has not formed yet, an appropriate amount of fluoride can promote the remineralization (enhance the saliva to replenish the lost minerals) of the tooth and repair early tooth decay.

Desensitizing toothpaste. The active ingredients provide relief from dentine hypersensitivity symptoms in 2 ways. First, they interrupt the neurone response to pain stimuli; second, they occlude the dentinal tubules of dentine. Active ingredients such as Potassium Nitrate or Arginine, etc., are used by different product manufacturers. There are many different types of desensitizing toothpastes marketed by different brand names. Their various functions depend on different active ingredients they contain.

Anti-calculus toothpaste. The active ingredient is Pyrophosphate or Zinc Citrate, etc. However, these inhibitors are not capable of dissolving existing deposits. Moreover, the effects of these anti-tartar products are mostly limited to the supragingival area.

Anti-plaque toothpaste. This kind of toothpaste inhibits plaque accumulation, reduces effects of the bacterial toxins on the tooth surrounding tissues, thereby reduces the chances of getting gum disease. In the market, different anti-plaque toothpastes contain different active ingredients. For example, Triclosan or Zinc Citrate, Clorhexidine Gluconate etc. It should be used no longer than 3 weeks.

Whitening toothpaste. This kind of toothpaste contains relatively coarse abrasives which function by abrading the stains on the tooth surface, giving a whitening effect or enzymes. The effects of the long term use of this kind of toothpaste are still unknown.

MOUTHWASHES

Depending on the active ingredients they contain, different types of mouthwash can be used to prevent tooth decay, reduce formation of dental plaque and inflammation of the gums or reduce tooth sensivity.

Fluoride mouthwash. This kind of mouthwash contains fluoride compounds such as 0.05 % Sodium Fluoride (NaF) which provides extra fluoride to the people who need it. Using it daily may give additional protection against tooth decay. Don’t use mouthwash — even a fluoride one — straight after brushing your teeth or it will wash away the concentrated fluoride in the toothpaste left on your teeth. Choose a different time to use mouthwash, such as after lunch. Don’t eat or drink for 30 minutes after using a fluoride mouthwash.

For those who are prone to tooth decay or having severe tooth decay, wearing orthodontic appliance or after undergoing radiotherapy to the head and neck region, fluoride containing mouthwash can offer additional protection against tooth decay.

Anti-plaque mouthwash. It inhibits plaque accumulation, thus reducing the chance of getting gingivitis. The active ingredients include Chlorhexidine Gluconate, Triclosan, Thymol, Cetylpyridinium Chloride (CPC), etc. However, long term use of mouthwash may stain the teeth and alter taste sensation.

Desensitizing mouthwash. This kind of mouthwash contains active ingredients such as Arginine which claims to seal the dentinal tubules at the sensitive site, thus reducing tooth sensitivity.

Remember mouthwash cannot replace toothbrushing and flossing or interdental brush.

Use mouthwash in addition to daily cleaning routine may offer additional benefit in terms of plaque and gingivitis reduction.

For those who have just undergone oral surgical procedures, toothbrushing may be hindered temporarily by the surgery. They should use of mouthwash.

CHEWING SUGAR-FREE GUM

Chewing sugar-free gum can neutralise plaque acids and protect against decay, but it can give a false sense of security. Avoiding sugar in the first place is the best policy.

CHOICE OF DENTAL HYGIENE MEANS

Type I embrasure[1]	Use regular floss
Type II embrasure[2]	1. Floss (superfloss) — best choice 2. Interdental brush — second 3. Wooden interdental cleaner — third
Type III embrasure[3]	1. Interdental brush 2. Wooden interdental cleaner 3. Floss (superfloss)
Type III embrasure with a slight open contact/diastema	Superfloss
Type III embrasure with a wide open contact/diastema	Single tuft brush
Class I, II, III furcation	1. Toothpick in holder (perio-aid) 2. Rubber or plastic inerdental tip
Class IV furcation	1. Interdental brush 2. Superfloss 3. Single tuft brush
Buccoverted/lingoverted teeth	1. Single tuft brush — brush vertically

Missing teeth with a wide open space Edentulous areas Distal surface of most posterior tooth	1. Single tuft brush — brush vertically
Lingually inclined mandibular teeth	1. Single tuft brush — brush vertically
Diastema or open contact	1. Superfloss
Gingival cleft	1. Toothpick in holder (perio-aid)
Under Pontic	1. Floss threaded with floss
Under Pontic that has a clinically visible, exposed space between the Pontic and gingival margin	1. Superfloss 2. Interdental brush if the space is very large between the Pontic and gingival margin
Interdental cleaning between Pontic and abutment in a type I embrasure	1. Floss threaded with floss
Interdental cleaning between Pontic and abutment in a type II embrasure	1. Superfloss 2. Small cylindrical interdental brush
Interdental cleaning between Pontic and abutment in a type III embrasure	1. Interdental brush 2. Superfloss
Interdental care for fixed orthodontics Around facial brackets Around facial gingival margins	1. No best choise 2. Floss threader with floss 3. Superfloss 4. Interdental brush 1. Single tuft brush 1. Oral irrigation (water pick) 2. Toothpick in holder (perio-aid) 3. Single tuft brush 4. Interdental brush 5. Superfloss 6. Wooden interdental cleaner

1. The interdental papilla fills the gingival embrasure (Type I embrasure).
2. There is slight to moderate recession of the interdental papilla (Type II embrasure).
3. There is extensive recession or complete loss of the interdental papilla (Type III embrasure).

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