



Mechanical and Chemotherapeutic Home Oral Hygiene

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A decorative graphic on the left side of the slide. It features a white tube of toothpaste with a blue cap, tilted and dispensing a dollop of light blue toothpaste. Below the tube is a toothbrush with a white handle and a green grip, and a red and white toothbrush head. The background is white with a curved orange and green border.

INTRODUCTION

- **The basics of patient care are establishing and maintaining effective preventive habits in our patients.**
- **We must reach the ratio of 90% prevention to 10% treatment.**
- **The traditional focus of oral hygiene is the control of two most prevalent oral diseases: caries and periodontal disease.**
- **Treatment should be designed to control rather than to eliminate dental plaque.**
- **In the presence of 12 hours or less biofilm, the enamel demineralization resulting from a single exposure to sucrose will be remineralized by saliva within about 10 min but in a 48 or more hours dental biofilm, at least 4 hours is required.**
- **The global oral care market size is anticipated to reach 40.9 billion USD by 2025.**



Objective

- **Plaque control efforts should be directed toward two goals:**
- **1) Limiting the numbers of cariogenic organisms, including MS in dental plaques for the prevention of caries by mechanical elimination of supragingival plaque and limitation of dietary sucrose**
- **2) Maintaining the predominantly gram-positive flora associated with gingival health by mechanical removal of plaque from the subgingival area on a regular basis.(and use of chemotherapeutic agents particularly CHX)**

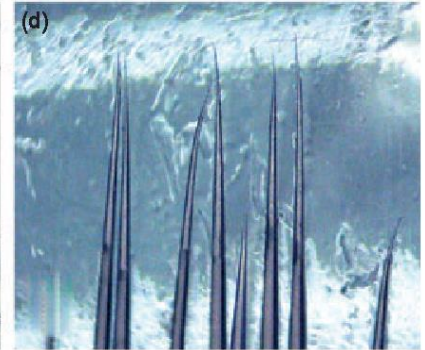
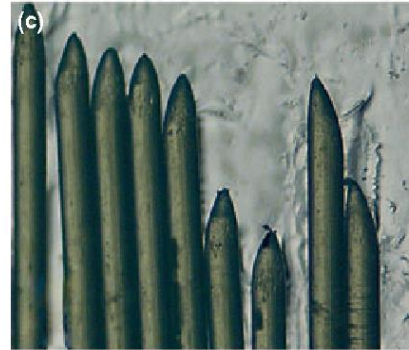
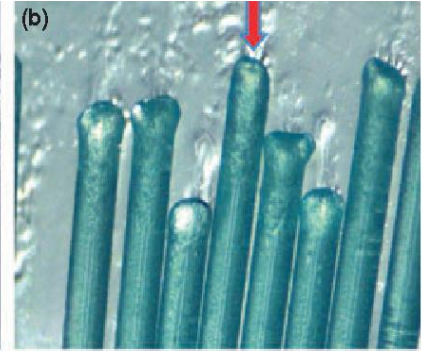
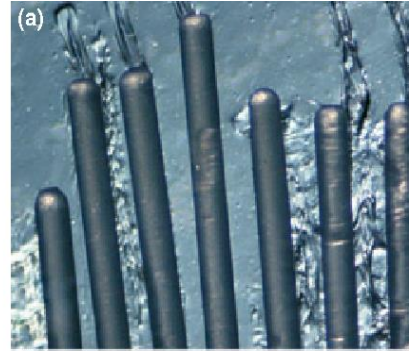
Mechanical Methods of Plaque Control

- **Manual Toothbrush:** Several variables enter into the design and fabrication of toothbrushes, including the bristle material; length, diameter, and total number of fibers; length of brush head; trim design of brush head; number and arrangement of bristle tufts; angulation of brush head to handle; and handle design.
- Toothbrushes are classified as soft, medium, or hard based on the diameter of these bristles. Diameter ranges for these classifications are 0.16–0.22 mm for **soft**, 0.23–0.29 mm for **medium**, and ≥ 0.30 mm for **hard**.
- Of the three types of bristle ends: coarse-cut, enlarged bulbous, and round; the **round end** is the bristle type of choice





(a) Acceptable bristle ends; (b) Slightly enlarged, bulbous bristle ends. Arrow shows an acceptable bristle end; (c) Arrow-shaped, unacceptable bristle ends; (d) Spiky, unacceptable bristle ends.





A soft brush with a smaller head and a thicker handle is preferable in children





Neon colors or cartoon characters on toothbrushes



Single finger swabs
(Tenders Pre-Toothbrushes)



Infant/toddler safety
toothbrushes



Visual-Motor Mastery

- A child can have well-developed visual and motor skills but may be unable to **coordinate the two**. Although both chronologic and developmental ages were found to be predictors of plaque removal ability, only **developmental age** demonstrated statistically significant predictive power. Because of the complexity of this test, however, we are left without a practical method for making recommendations to parents as to when their child can begin brushing unsupervised. As Preisch laments, many dentists use anecdotal accounts and tell parents to supervise their children's brushing until the children can **color within the lines**, **tie their own shoelaces**, or **cut through a tough piece of meat**. However, these may still be our best practical recommendations.



School-Aged Children(6 to 12 years)

- By the second half of this stage, most children can provide their basic oral hygiene (brushing and flossing). Parents may find that they need to brush or floss their child's teeth **only in certain difficult-to-reach areas of the mouth or if there is a compliance problem**. Parents do need to **actively inspect** their child's teeth for cleanliness on a regular basis. One helpful adjunct is the **periodic use of a disclosing agent**. After the child has brushed, flossed, and used the disclosing agent on his or her teeth, the parent can easily visualize any remaining plaque and assist the child in removing it.



Adolescents(12 to 19 years old)

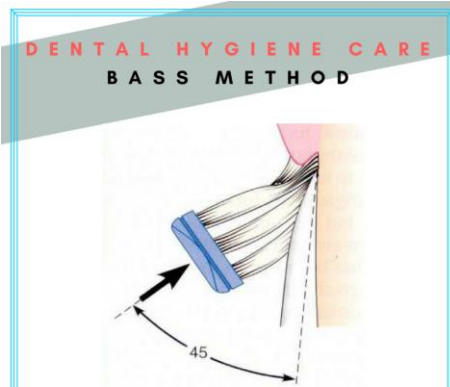
- Because **self-esteem declines** between the ages of 11 and 14 years and then shows a gradual improvement into adulthood, it is not difficult to understand why plaque control in these patients declines. Furthermore, poor dietary habits and pubertal hormonal changes increase adolescents' risk for caries and gingival inflammation.
- Stressing the children's increased responsibility as young adults **without appearing authoritarian** can aid them in accepting their new role.
- Increasing the adolescents' **knowledge** regarding plaque control and oral diseases, as well as appealing to their **appearance**, may also help in motivating these patients.



Time Consideration

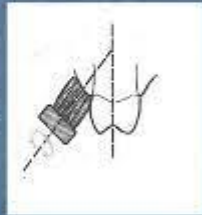
- In children, thorough oral hygiene procedures should be performed at least **once daily**, preferably **twice**, with parental supervision. Teeth should be brushed for **at least 1 minute** with a fluoridated dentifrice; flossing and other plaque removal activities are added to this time. If oral hygiene is accomplished only once per day, it should be the last thing the child does before bedtime at night.
- To optimize the benefits of fluoride, **rinsing at bedtime brushing should be discouraged.**

Manual toothbrushing methods



The Stillman's Method

- Like the Bass Method the filaments are placed at a 45° angle to the tooth.
- Unlike the Bass Method the filaments are placed half in the sulcus and half on the gingiva.
- The same stroke is used as the Bass.



The Roll Method

- Direct the filaments toward the root of the tooth.
- Place side of the brush on the gingiva and have the plastic part of the brush even with the tooth.



The Charter's Method

- Position the filaments toward the chewing surface of the tooth
- Place the sides of the filaments against the enamel and angle them at a 45° to the tooth.



Manual toothbrushing methods

CHARTER'S METHOD

INDICATIONS:

persons having :

- I. missing papilla and exposed root surfaces.
- II. FPD and orthodontic appliances.
- III. periodontal surgery.
- IV. interproximal gingival recession.



Manual toothbrushing methods

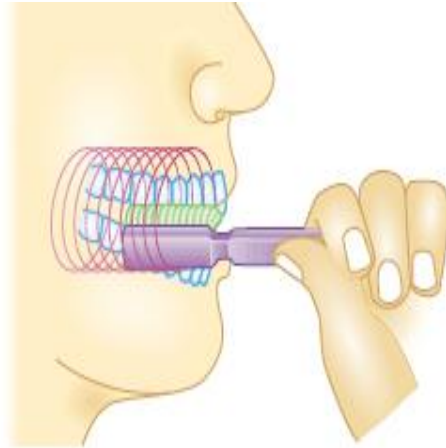
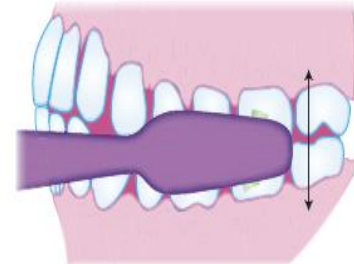
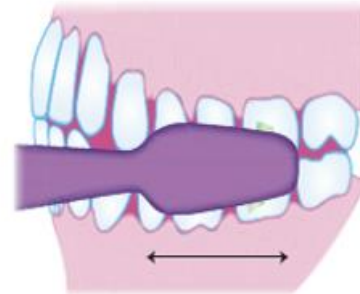


FIGURE 12 Fones toothbrushing technique: Circulatory motion extending from maxillary to mandibular teeth.



Leonard toothbrushing technique



Horizontal toothbrushing technique

Manual toothbrushing methods

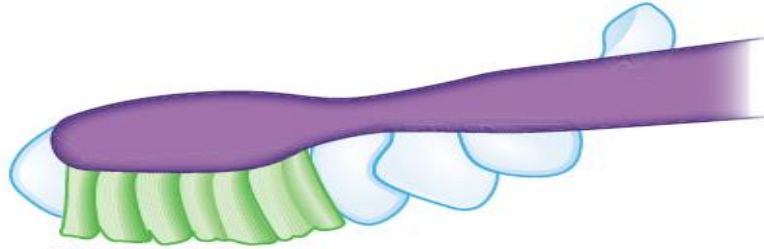


FIGURE ■ 15 Smith toothbrushing technique.

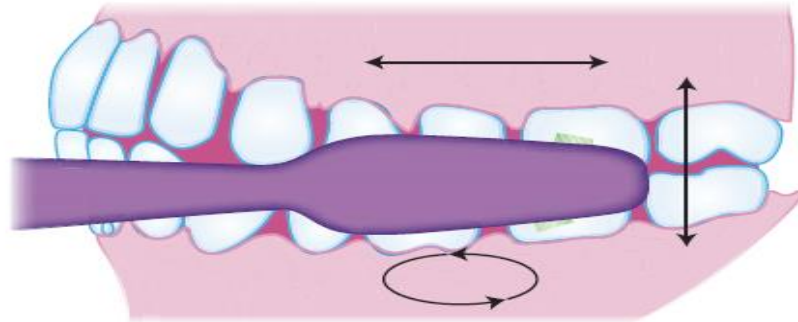
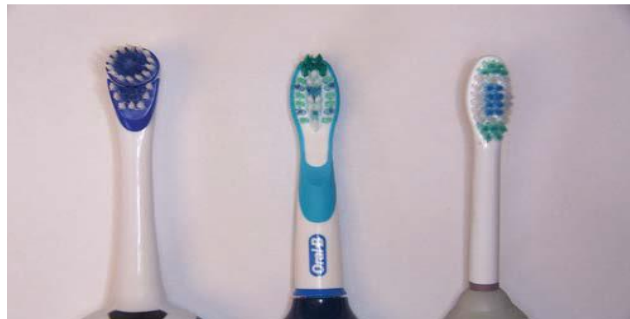


FIGURE ■ 16 Scrub toothbrushing technique.

Powered Toothbrushes

- **Hawthorne effect:** almost any change or experimental manipulation will induce an improvement in behavior, apparently because of a novelty effect. It seems the introduction of powered toothbrushes causes an initial increase in use, and therefore better plaque control. Over time, however, the results are comparable with those achieved with manual toothbrushes.
- Today powered toothbrushes can be categorized as **mechanical, sonic, or ionic**. A **mechanical** brush literally uses the motion of the bristles to remove the plaque and debris. The **sonic** toothbrush emits sound waves in addition to the movement of the filaments. The vibration is said to help loosen the plaque and food particles for removal. Lastly, the **ionic** toothbrushes are believed to temporarily reverse the negative ionic charge of a tooth to a positive charge. A portion of the toothbrush that is also positively charged is thought to attract the plaque and food particles away from the tooth, allowing bristles to brush the loosened particles away.





Selected power toothbrushes, from left to right: Crest SpinBrush; Oral-B Sonic Complete; Sonicare Elite.

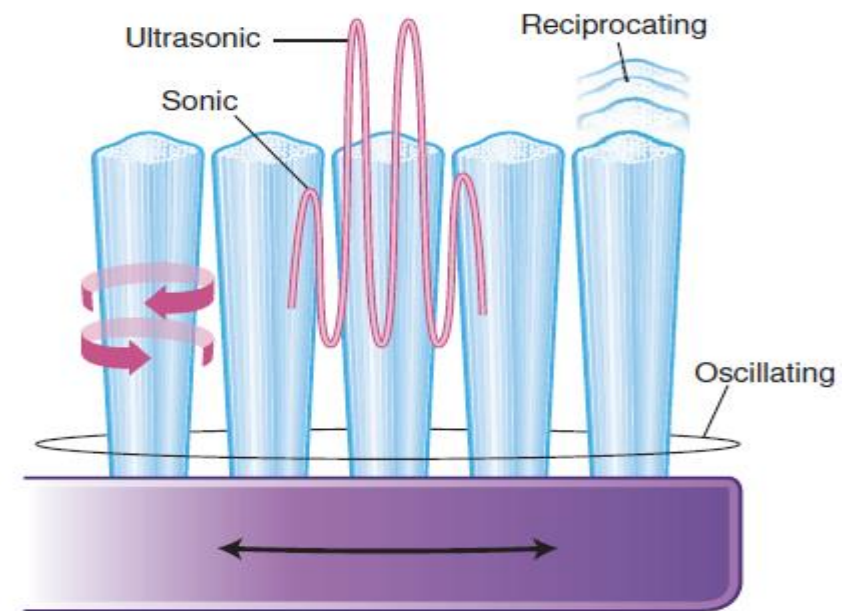


FIGURE 18 Movements of power-assisted toothbrushes.

meta-analyses have continued to demonstrate a modest superiority of the rotation-oscillation action design





Common positions for plaque removal:

- A) Standing
- B) Upright wheelchair
- C) Reclining on couch
- D) Reclining in bed
- E) Leg-lock position
- F) Reclining on floor



Fig. 26.3 Common positions for plaque removal. (A) Standing. (B) Upright wheelchair. (C) Reclining on couch. (D) Reclining in bed. (E) "Leg-lock" position. (F) Reclining on floor.

Various toothbrush handle modifications





FLOSS

- **Corby et al. did find differences in the microbial composition of dental plaques following flossing. After a 2-week study period of 12- to 21-year-old well-matched twins, they found that tooth and tongue brushing plus flossing significantly decreased the abundance of microbial species associated with periodontal disease and dental caries.**
- **Chen and Rubinson demonstrated that daily flossing was practiced by only 20% of mothers, 12% of fathers, and 6% of children within families.**
- **Several different types of floss are available: flavored and unflavored; waxed and unwaxed; and thin, tape, and mesh-work (Super Floss; Oral-B Laboratories, Inc., Belmont, California, United States)**

FLOSS



Several different methods for interproximal cleaning. Left to right, interdental brush, Y- shaped floss holder, disposable floss holders, and end-tuft brush.

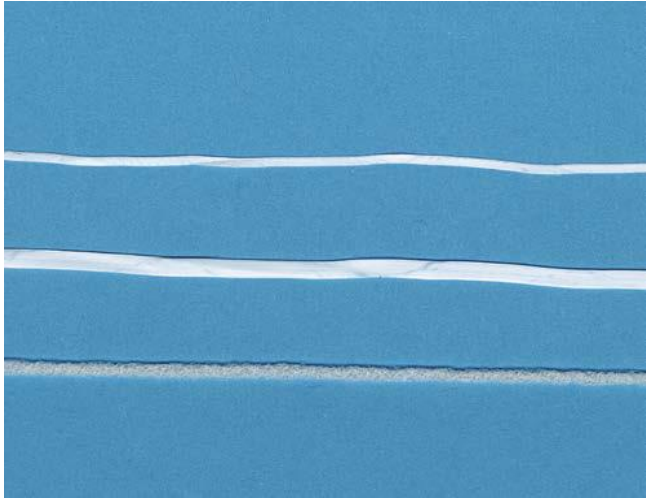
Floss Holders

BOX 3 Floss Holders Recommended for These Patients

- Physical disabilities
- Poor manual dexterity
- Large hands
- Limited mouth opening
- Strong gag reflex
- Low motivation for traditional flossing



FLOSS



Dental floss. Thin (top), tape (middle), and meshwork (bottom).



Floss

- The manufacturer claims that, because **Teflon material** has a lower coefficient of friction than nylon, this floss does not shred, slides easily between tight contacts, and minimizes snapping of the floss.
- **Unwaxed nylon-filament floss** has generally been considered the floss of choice because of the ease of passing the floss between tight contacts, the lack of a wax residue, the squeaking sound produced by moving the floss over a clean tooth, and the fiber spread, which results in increased surface contact and greater plaque removal.

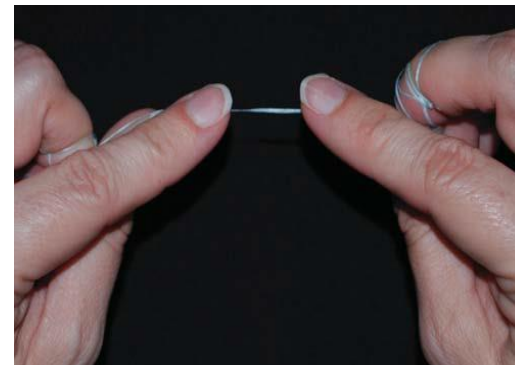
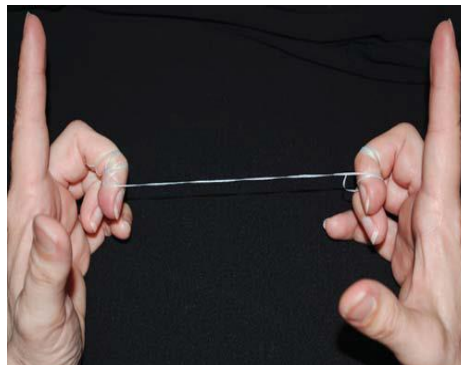
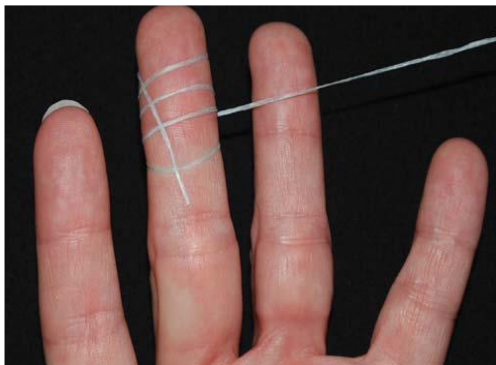


Flossing

- Flossing is a complex skill. Therefore, until children develop adequate dexterity, usually around the age of **10 to 12 years**, their attempts at flossing will be ineffective. The American Academy of Pediatric Dentistry has recommended that an adult should perform flossing on the child. To accomplish this, the adult should support the child's head in the adult's lap, against the chest, or in some other stable position, preferably flossing from behind. Younger children whose teeth still exhibit primate spaces with no interproximal contacts will not require flossing.
- The **spool method** is particularly suited for teenagers and adults who have acquired the necessary neuromuscular coordination.
- The **loop method** is suited for children as well as adults with less nimble hands or physical limitations caused by conditions such as poor muscular coordination or arthritis.

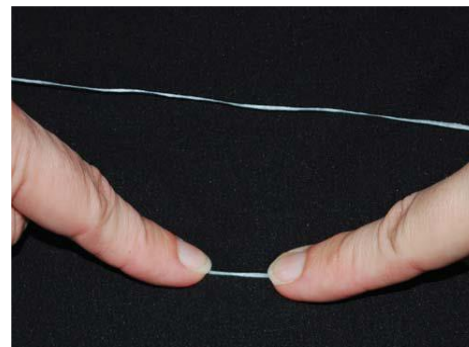
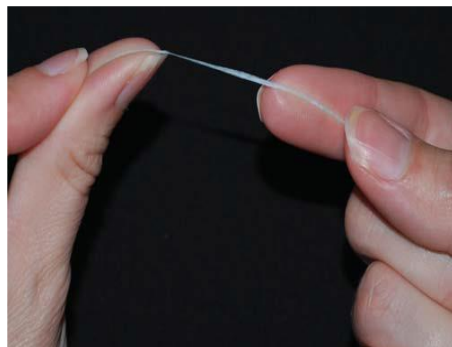


Spool Method



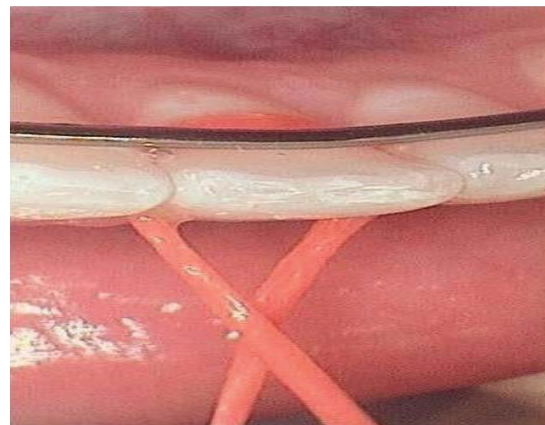


Loop Method





Gingival Floss-cuts



Cleaning under a lingual orthodontic retainer by crossing over the floss



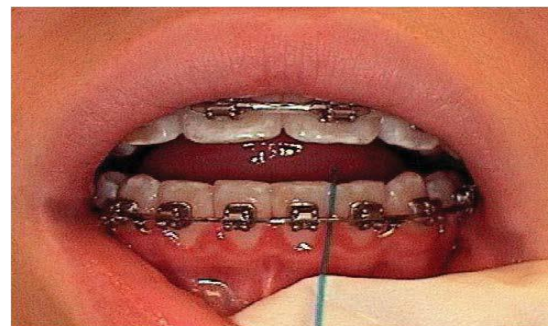
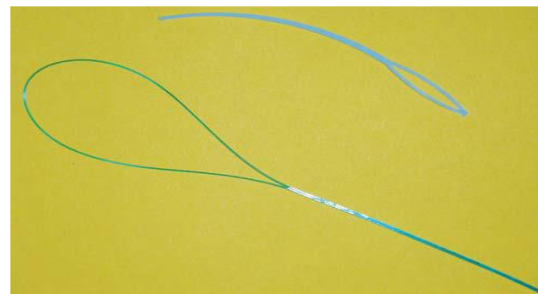
- Various agents have been impregnated into dental floss and have the potential to help prevent and control oral diseases. Examples of these include floss treated with baking soda, fluoride, herbal extracts, antimicrobial agents, or abrasives for whitening.

Although use of these agents as rinses or other means has demonstrated effectiveness, limited research has been published relative to their effectiveness when impregnated into dental floss.

- **chlorhexidine gel** applied with dental floss has been shown to reduce caries incidence in children, and the use of chlorhexidine-impregnated floss has reduced plaque biofilm and gingivitis. A study with **fluoride-impregnated** dental floss demonstrated higher fluoride concentration of the saliva in the treated interproximal sites, which lasted up to 30 minutes



FLOSS Threader



Power Flosser



- they may be helpful for individuals who have **physical disabilities** or limited dexterity. They are also useful in **difficult-to-clean areas** such as around orthodontic appliances.
- The **Waterpik Power Flosser** has a single nylon filament tip that reaches from the buccal surface to the lingual surface and electronically moves up and down at 10,000 linear strokes per minute, spinning rapidly in the interproximal space to clean the proximal surfaces.
- A new power flosser, the **Sonicare AirFloss**, uses new microburst technology by which **microdroplets** of water are accelerated by pressurized air to disrupt and remove interproximal plaque biofilm.

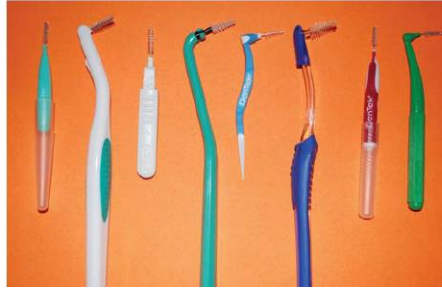


Interdental Brushes

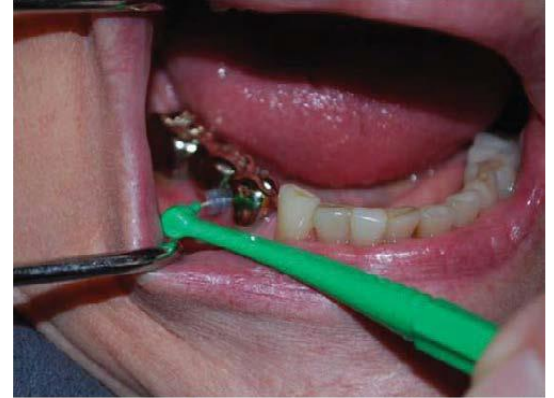
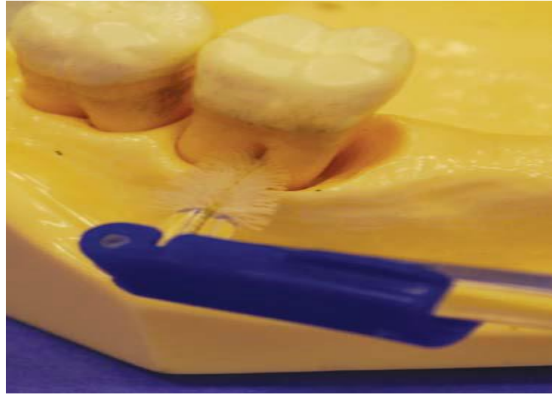
SELF-CARE ADJUNCTS

BOX 4 Uses of Interdental Brushes

- Type II & III embrasure spaces
- Class IV furcations
- Root concavities
- Orthodontic appliances
- Space maintainers
- Small diastemas
- Fixed prostheses
- Splints
- Dental implants



Interdental Brush



Tongue Cleaning



FIGURE ■ 42 Toothbrush placed across the tongue on the dorsal surface as far back as possible and anterior to the circumvallate papillae prior to rolling it forward to clean the dorsal surface.

(Source: Courtesy of Amy Teague.)



FIGURE ■ 43 Tongue cleaner placed on the dorsum of the tongue as far back as possible and anterior to the circumvallate papillae prior to gently pulling it forward with a sweeping motion. Serrations on the rounded portion clean the surface as it is pulled forward.

(Source: Courtesy of Amy Teague.)



FIGURE ■ 44 Plastic tongue scraper used by pressing it against the dorsum of the tongue in an arc. Serrations on the tongue scraper clean the dorsal surface as it is skimmed forward on the tongue.

(Source: Courtesy of Amy Teague.)



Irrigation Devices(Dental water jets)

- individuals with inconsistent or ineffective interproximal cleaning, fixed orthodontic appliances, crowns, fixed bridges, implants, and malodor may benefit from a home irrigation self-care regimen. Oral irrigation may also be helpful for individuals who have their jaws temporarily wired together for stabilization after surgery or have head and neck trauma.
- Oral irrigation is superior to rinsing for the delivery of antimicrobials.
- A moderate power setting is recommended for supragingival irrigation, and a lower power setting is suggested for subgingival irrigation.



An oral irrigator for home use:
Water Flosser



FIGURE 40 A variety of oral irrigator tips.

(Source: Courtesy of Amy Teague.)

BOX 6 Uses of Various Irrigation Tips

TIP		USE
A.	Toothbrush tip.	To brush and irrigate at the same time
B.	Classic Jet tip	To clean deep interproximally and supragingivally, also reaching slightly subgingivally
C.	Orthodontic tip	To clean around orthodontic brackets and wires
D.	Plaque Seeker™ tip	To clean around implants, crowns, bridges and other restorations
E.	Pik Pocket™ tip	To clean and deliver chemotherapeutic rinses in periodontal pockets and furcations with low pressure
F.	Tongue cleaner	To clean and irrigate the



**Rubbertip
stimulators**



**A variety of
wooden and
plastic
triangular
sticks. The
seven to the
left are plastic,
and the two to
the right
are wooden**

Chemotherapeutic Plaque Control

- Specificity only for the pathogenic bacteria
- Substantivity—the ability to attach to and be retained by oral surfaces and then be released over time without loss of potency
- Chemical stability during storage
- Absence of adverse reactions, such as staining or mucosal interactions
- Toxicologic safety
- Ecologic safety so as not to alter the microbiotic flora adversely
- Ease of use



Chemotherapeutic Plaque Control

Box 8.1 Chemotherapeutic plaque control agents

Antiseptic Agents

Positively Charged Organic Molecules: Quaternary ammonium compounds—cetylpyridinium chloride
Pyrimidines—hexedine

Bis-biguanides—chlorhexidine, alexidine

Noncharged Phenolic Agents: Listerine (thymol, eucalyptol, menthol, and methylsalicylate), triclosan, phenol, and thymol

Oxygenating Agents: Peroxides and perborate

Bis-Pyridines: Octenidine

Halogens: Iodine, iodophors, and fluorides

Heavy Metal Salts: Silver, mercury, zinc, copper, and tin

Antibiotics

Niddamycin, kanamycin sulfate, tetracycline hydrochloride, and vancomycin hydrochloride

Enzymes

Mucinases, pancreatin, fungal enzymes, and protease

Plaque-Modifying Agents

Urea peroxide

Sugar Substitutes

Xylitol, mannitol

Plaque Attachment Interference Agents

Sodium polyvinylphosphonic acid, perfluoroalkyl



Mouthrinses

- **Cosmetic mouthrinses: Halitosis**
- **Xerostomia mouthrinses**
- **Therapeutic mouthrinses: CHX, Essential Oils, Fluoride Rinses, Triclosan**



digikala



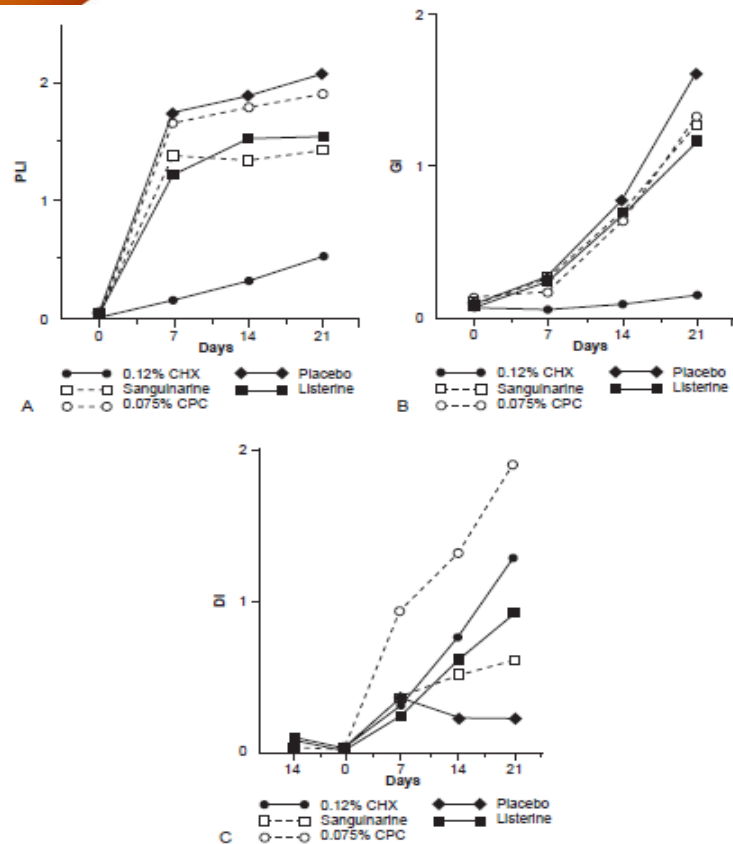


Fig. 8.12 Mean indices in five groups of eight individuals refraining from oral hygiene for 21 days and rinsing with 0.12% chlorhexidine digluconate (CHX), 0.075% cetylpyridinium chloride (CPC), Listerine, sanguinarine, or placebo. (A) Mean plaque index (PI). (B) Mean gingival index (GI). (C) Mean discoloration index (DI). (From Lang NP, Brex MC. Chlorhexidine digluconate: an agent for chemical plaque control and prevention of gingival inflammation. *J Periodontol Res* 16 [Suppl 21]:74-89, 1986.)



Alcohol-based mouthwash as a risk factor of oral cancer: A systematic review

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Results: Out of 497 potentially eligible papers, 8 studies were included in the qualitative analysis which include a total of 43,499 subjects: two meta-analyses, a clinical trial, three case-control studies and two cohort studies. One study ($n = 3,926$) found a relationship between alcohol mouthwash and oral cancer, two studies ($n = 25,033$) found this relationship when a high frequency of mouthwash was present, three studies ($n = 14,482$) failed to find this relationship and 2 studies ($n = 58$) found a temporary increase of acetaldehyde levels in saliva after alcohol mouthwash.

Conclusions: It cannot be guaranteed that the use of mouthwash represents an independent risk factor for the development of head and neck cancer. However, the risk does increase when it occurs in association with other carcinogenic risk factors.

Key words: *Oral Cancer, Oropharyngeal Neoplasms, Mouthwashes, Mouth rinse, Ethanol, Acetaldehyde, alcohol.*



- 1)Chlorhexidine (CHX)
- 2)C31G
- 3)Povidone-iodine (iodine with the water-soluble polymer polyvinylpyrrolidone, PVP-I)

Antiviral mouthwashes: possible benefit for COVID-19 with evidence-based approach

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ABSTRACT

Background The outbreak, and pandemic of COVID-19 causing widespread concerns in all health systems of countries. Virus-carrying aerosols can penetrate the healthy human body and lungs, resulting in rapid transmission. For the first time, in this evidence-based article, the effects of different types of mouthwashes to reduce the viral load were investigated. Also, another aim of this essay is a reduction in viral load in patients with COVID-19 and prevention developing ventilator-associated pneumonia in critically ill patients.

Methods Related databases were comprehensively searched for relevant studies. The present study was performed according to the preferred cases for standard systematic reviews (PRISMA).

Results Five original studies in which the subject matter was directly evaluated were included. Different types of mouthwashes and viruses were investigated in this study.

Conclusions The antiviral mouthwashes play a certainly important role in reducing the viral load of the salivary virus. In the present study, this importance could be proved in two different aspects, that is, the use of mouthwash before dental procedures to reduce the risk of transmission of the virus to the dental team and the use of this mouthwash in COVID-19 patients to help improve systemic problems associated with oral microbial flora.

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