MOUTHRINSES

Mouthrinses (Mouthwash). A mouthwash is defined as a nonsterile aqueous solution used mostly for its deodorant, refreshing or antiseptic effect. Mouthwashes or rinses are designed to reduce oral bacteria, remove food particles, temporary reduce bad breathe and provide a pleasant taste. Many types of mouthrinse active ingredients have been evaluated for their plaque reducing effectiveness and ability to reduce mutans streptococci, including chlorhexidine, essential oils, triclosan, cetylpyridinium chloride, sanquinarin, sodium dodecyl sulphate, and various metal ions (tin, zinc, copper).

Mouthrinses are generally classified by FDA as either cosmetic or therapeutic or a combination of the two. The cosmetic mouthrinses are overthe-counter products that are mainly intended as mouth fresheners. Therapeutic rinses are available on prescription or over-the counter products that have an added active ingredient and are marketed as antiplaque/antigingivitis and anticaries drug products.

Cosmetic rinses are commercial over-the-counter products that help remove oral debris before or after brushing, temporary suppress bad breath, diminish bacteria in the mouth and refresh the mouth with a pleasant taste.

Therapeutic rinses often have the benefits of their cosmetic counterparts, but also contain an added active ingredient, for example. fluoride or chlorhexidine, that help protect against some oral diseases.

The amount of the different components in mouthwashes varies from product to product. Some practically have the same composition as toothpastes, although they do not contain abrasives. Distinct from toothpastes most mouthrinses contain alcohol, as a preservative and a semiactive ingredient. The amount of alcohol is usually ranging from 18 to 26 percent.

Mouthrinse formulations are generally much simpler than dentifrices, and compatibility problems are not as large an issue as they are with dentifrice products.

The oldest and simplest used mouthrinse has been a dilute saline solution.

Ideal properties of oral rinses include the following:

– safety;
– access to bacteria even in difficult areas;
– palatability;
– low-cost;
– high solubility within the formulation;
– effective antibacterial impact;
– broad spectrum preferably;
– selectivity;
– adequate bioavailability (plaque penetration and reactivity);
– specificity with regard to oral bacteria;
– minimal side effects;
– ability to reach and provide adequate retention in sites of disease initiation;
– stability in storage.

Ingredients

Humectant: for example, sorbitol and glycerin to prevent drying.

Surfactant: helps to keep ingredients in solution.

Alcohol: to enhance antibacterial activity and taste. Also to help keep flavoring agents in solution.

Antibacterial agents: the most commonly used antimicrobial agent is the quaternary ammonium compounds such as cetylpyridinium chloride, benzethonium chloride and povidineiodine, sodium lauryl sulphate, zinc citrate trihydrate, triclosan, metal salts.

Sweetening agents: saccharin.

Flavoring agents: Spearmint, peppermint, eucalyptus and menthol are often used as flavoring agents mouthwashes. The flavoring agents are solubilized and dispersed through liquid via the detergent.

Therapeutic Rinses. Fluoride containing: Sodium fluoride (NaF) mouthrinse has been used as 0.2 percent for weekly rinse and 0.05 percent for daily rinsing. It is the most widely used fluoride rinse because of its low cost, convenience in handling and pleasant taste.

Chlorhexidine Rinses. Chlorhexidine digluconate, useful in decreasing gingivitis and plaque buildup, is an active ingredient in certain ADA-approved commercial mouthrinses. It is one of two mouthrinse shown to reduce gingivitis in long-term clinical trials and appears to be the most effective antiplaque and antigingivitis agent known today. But since the effect of chlorhexidine is influenced by anionic tensides such as sodium lauryl sulphate, when using a toothpaste containing sodium lauryl sulphate you should wait for at least 30 minutes between brushing and rinsing with a CHX mouthrinse.

CHX 0.2 percent is suitable as supportive measure during treatment of gingivitis and periodontitis, but it should not be used for longer than two weeks. After this, however, it is important to restore healthy oral flora.

■ Mechanical aids may not be sufficient to maintain optimum oral health for certain patients and may be supplemented with the use of a chemotherapeutic mouthrinse.

■ Classification of mouthrinses: preventive, cosmetic, and therapeutic

■ Chemotherapeutic rinses may have active ingredients to reduce inflammation.

■ Cosmetic rinses can provide some extrinsic stain removal when it is superficial in unattached biofilm.

■ Delivery: rinsing can deliver an agent less than 2 mm into the sulcus or pocket and is not a delivery of choice for patients with moderate or deep pockets.

PREVENTIVE AND THERAPEUTIC AGENTS OF MOUTHRINSES

I. FLUORIDE

A. Mechanism of Action

- Stannous:
- Deposit of fl uoride ion on enamel
- Tin ion from stannous fl uoride interferes with cell metabolism for antimicrobial effect
- Sodium:
- Deposit of fl uoride ion on enamel
- Cariostatic: inhibits demineralization and enhances remineralization

B. Availability and Use

- Available in varying concentrations in a dentifrice, gel, or rinse
- Uses:
- Prevention of dental caries
- Reduction of hypersensitivity
- Reduction of gingivitis

II. CHLORHEXIDINE (CHX)

A. Mechanism of Action

- A cationic bisbiguanide with broad antibacterial activity
- Binds to oral hard and soft tissues
- Attaches to bacterial cell membrane, thereby damaging the cytoplasm causing lysis
- Binds to pellicle and salivary mucing to prevent biofilm accumulation
- Bactericidal and bacteriostatic depending on concentration
- Bactericidal concentrations cause cell lyses
- Bacteriostatic concentrations interfere with cell wall transport system
- The substantivity of chlorhexidine: 8–12 hours
- Antimicrobial and antigingivitis agent

B. Availability and Uses

- CHX is the most effective antimicrobial and antigingivitis agent available for clinical use.
- Mouthrinse available by prescription in a 0.12% solution in the United States (higher concentrations are available in other countries); postsurgery for enhanced wound healing
- Recommend uses:

- Preprocedural rinse to reduce bacterial load before instrumentation-producing aerosols
- Before, during, and after periodontal debridement
- Patients who are at a high risk for dental caries
- Immunocompromised individuals who are more susceptible to infection
- Postsurgery for enhanced wound healing

III. TRICLOSAN

A. Mechanism of Action

- Bisphenol and nonionic antimicrobial agent
- A broad-spectrum agent effective against gramnegative and gram-positive bacteria
- Acts on the microbial cytoplasmic membrane, causing leakage of the cell contents, or bacteriolysis
- Antimicrobial and antigingivitis agent
- Low toxicity

B. Availability and Uses

- Triclosan-containing mouthrinse and dentifrice are available in other countries
- Available only in a dentifrice in the United States
- Recommended uses:
- Reduction of biofilm and gingivitis
- Reduced biofilm accumulation
- Reduced supragingival calculus formation

IV. PHENOLIC-RELATED ESSENTIAL OILS

A. Mechanism of Action

- Phenolics disrupt cell walls and inhibit bacterial enzymes
- Poor substantivity
- Decreases pathogenicity of biofilm
- Antimicrobial and antigingivitis agent

B. Availability and Uses

- A combination of thymol, eucalyptol, menthol, and methyl salicylate is available as a brand name product and generic product.
- Recommended uses:
- Individuals unable to perform adequate brushing and flossing

■ Initially or periodically to help improve oral hygiene

■ Adjunct for mechanical self-care routines that are not sufficient in reducing biofilm, bleeding, and gingivitis

■ Preprocedural rinse to reduce bacterial load before instrumentation producing aerosols

V. QUATERNARY AMMONIUM COMPOUNDS

A. Mechanism of Action

■ Cationic agents that bind to oral tissues

■ Rupture the cell wall and alter the cytoplasm

■ Initial attachment to oral tissue is very strong, but released rapidly

■ Decreases the ability for bacteria to attach to the pellicle

■ Low substantivity

B. Availability and Uses

■ The most commonly used agent is cetylpyridinium chloride (CPC), at 0.05–0.07%

■ Recommended uses:

A. Reduction in biofilm accumulation
B. Adjunct for mechanical self-care routines

VI. OXYGENATING AGENTS

A. Mechanism of Action

■ Alters bacterial cell membrane increasing permeability

■ Release of oxygen acts to debride area

■ Poor substantivity

B. Availability and Uses

■ The common agents available in commercial rinses are:

■ 10% carbamide peroxide

■ 1.5% hydrogen peroxide

■ Recommended for short-term use to reduce the symptoms of pericoronitis and necrotizing ulcerative gingivitis.

COMMERCIAL MOUTHRINSE INGREDIENTS

I. ACTIVE INGREDIENTS

- Commercial mouthrinses generally contain more than one active ingredient and, therefore, may advertise multiple claims for use.
- Factors that influence how effective an agent may be:
- Dilution by the saliva
- Length of time the agent is in contact with the tissue or bacteria
- Evidence supporting the particular product

II. INACTIVE INGREDIENTS

A. Water

- Makes up the largest percentage by volume

B. Alcohol

- Increases the solubility of some active ingredients
- Percentage varies from 0% to 26.9%
- Enhances flavor
- No link to oral cancer 35

C. Flavoring

- Essential oils and their derivatives (eucalyptus oil, oil of wintergreen)
- Aromatic waters (peppermint, spearmint, wintergreen, or others)
- Artificial noncariogenic sweetener

CHEWING GUM

Because gum chewing is pleasurable, people normally chew for longer periods of time than they spend brushing their teeth. In addition, chewing gum is especially advantageous during the course of the day when toothbrushing is not possible or convenient. Likewise, gum can complement toothbrushing by reaching many of the tooth surfaces commonly missed during brushing. The average American fails to contact approximately 40% of tooth surfaces, especially the posterior teeth and lingual surfaces, during toothbrushing. Regular toothbrushing removes only about 35% to 40% of dental plaque on tooth surfaces.

Beneficial effects of gum chewing include increased saliva production, resulting in the mechanical removal of dental plaque and debris. Studies have shown that chewing sugared or sugar-free gum is an effective means of reducing plaque accumulation and that gum chewing can also effectively reduce established plaque on many tooth surfaces.

During gum chewing, salivary flow rates increase, especially in the first few minutes because of both mechanical and gustatory (taste) stimulation. Increased salivary stimulation can continue for periods of 5 to 20 minutes, usually until the flavor in the product dissipates. However, even with

unflavored chewing gum, saliva flow, as evidenced by swallowing rates, increases over the baseline. The beneficial effects of additional saliva in the mouth include increased plaque biofilm calcium levels and increased buffer capacity and mineral supersaturation; the latter two effects help regulate or increase plaque pH. In addition, increased saliva flow can assist in loosening and removing debris from occlusal or interproximal sites and can be beneficial to xerostomia patients.