

# Principles.

For oral health

## Principles for oral health Report

By **Sepa.** Supported by **LISTERINE**

# Principles.

For oral health



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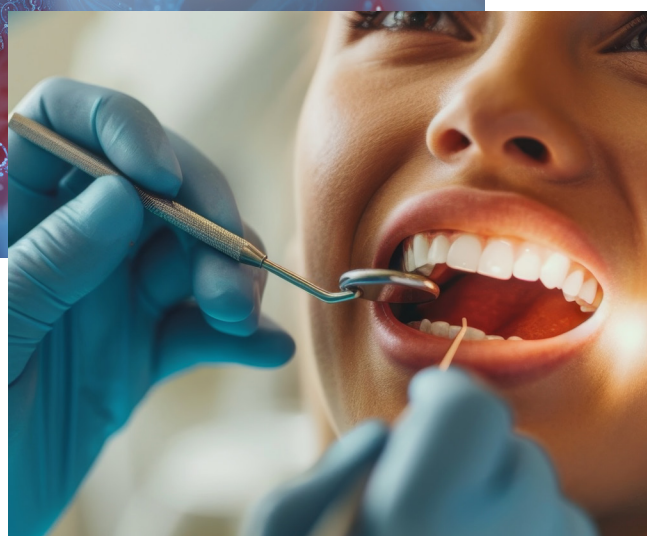
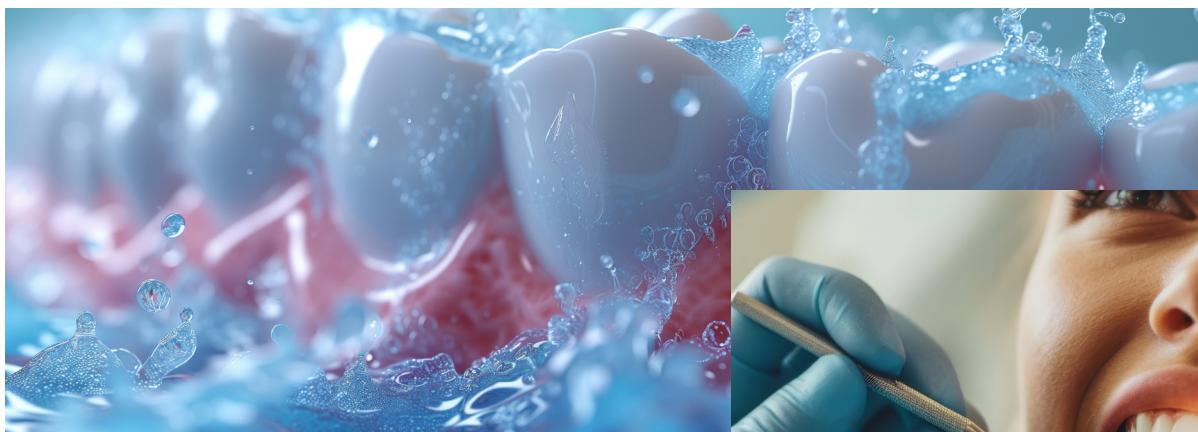
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# Introduction

*Principles for oral health* is a strategic global alliance to simplify and cascade evidence-based messages from literature and clinical practice guidelines as they relate the use of antimicrobial / antiseptic mouth washes and toothpastes to grassroots oral healthcare professionals, and drive the importance of patients self-performed oral care at home to help maintain patients gum health and prevent periodontal diseases.

Despite being largely preventable, the global burden of periodontal diseases is increasing, with >1.1 billion cases of severe periodontitis globally. Additionally, there is a need to refocus oral health priorities upon primary prevention of periodontitis by managing gingivitis (Chapple et al., 2015) and upon secondary prevention aimed at preventing disease recurrence in previously treated periodontitis patients (Tonetti, Eickholz, et al., 2015).

Prevention, diagnosis and management of periodontitis is cost-effective. First and foremost, the role of home care led by patients is of paramount importance to prevent periodontal diseases.





Bearing these concepts in mind, the main objectives of this work and the subsequent report are:

- **To highlight prevention** as the framework to achieve oral health.
- **To highlight the evidence-based** approaches related to treatment according to the S3 level Clinical Practice Guidelines (CPGs).
- **To empower oral healthcare professionals** (OHPs) with guidance to be aware of when to recommend antimicrobial / antiseptic mouthwashes as an adjuvant to mechanical oral hygiene.
- **To support patients** to promote their periodontal health through effective daily practice for the prevention of dental plaque biofilm accumulation.

Given the importance of a proper understanding of the word “antiseptic” to achieve the maximum benefit from this work, the authors of this report feel it is advisable to define the term. According to the glossary for the Centers for Disease Control and Prevention (CDC), antiseptic is a “substance that prevents or arrests the growth or action of microorganisms by inhibiting their activity or by destroying them. The term is used especially for preparations applied topically to living tissues”. Antiseptics should be distinguished from disinfectants, which refers to agents “that eliminate many or all pathogenic microorganisms except bacterial spores on inanimate objects”.



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# Questions

## 01

### Should we recommend the use of antiseptics as adjuncts to mechanical biofilm control for the general population?

The main intervention for controlling biofilm accumulation and maintaining oral health is brushing twice daily for at least two minutes with a fluoride toothpaste in association with interdental hygiene. However, even if oral hygiene instructions are given and time of brushing is accomplished, levels of biofilm removal are insufficient in the general population, which poses a risk for the development of oral diseases (periodontal diseases and caries), especially in susceptible patients (Serrano, Escribano, Roldan, Martin, & Herrera, 2015; The Economist Intelligence Unit, 2021).

Therefore, taking into account the limitations of self-performed mechanical oral hygiene in biofilm removal, and the high prevalence of gingivitis and periodontitis worldwide, it can be argued that the general population may benefit from the use of antiseptics as adjuncts to mechanical biofilm removal.

Notwithstanding the added benefits of antiseptics as adjuncts to mechanical biofilm control, certain aspects should be considered when prescribing antiseptics, including: 1) possible side effects, 2) added cost, 3) and the environmental impact derived from their use (Chapple et al., 2015). For this reason, it is of the utmost importance to identify those clinical situations in which patients would benefit the most from the adjunctive use of antiseptics, which are influenced by the presence of local and general factors:

#### Local factors:

- High levels of gingival inflammation despite low biofilm levels (e.g. >10% bleeding on probing in SPC patients).
- Inadequate accessibility for cleaning around teeth or implants (e.g. tooth crowding, overhanging restorations, fixed orthodontic appliances).
- Anatomical factors that may act as biofilm retentive factors (e.g. root concavities, enamel pearls, radicular grooves, dental lesions such as cervical tooth wear).
- Dental implants and/or extensive prosthodontic restorations in susceptible patients.

#### General factors:

- General health status, with a certain degree of immune compromise or chronic disease (e.g. patients with sub-optimally controlled diabetes).
- Frailty or elderly patients.
- Patients with limited dexterity (either temporary or permanent) or low motivation.

## 02

### Are antiseptics indicated in the prevention of periodontal diseases?

Overall, antiseptics may be considered in the prevention of periodontal diseases.

There is evidence that antiseptics help reduce biofilm and gingival indices, being helpful in the management of gingivitis. Since gingivitis and periodontitis are considered as a continuum of the same inflammatory disease (Chapple et al., 2015), management of gingivitis is a primary prevention strategy for developing periodontitis; therefore, antiseptics may help reducing the risk, at the population level, of periodontitis onset by reducing gingival inflammation (primary prevention of periodontitis) (Tonetti, Chapple, Jepsen, & Sanz, 2015).

In addition, limited but statistically significant and clinically relevant information, has shown that antiseptics can help to prevent the recurrence of periodontitis in Supportive Periodontal Care (SPC) patients (secondary prevention of periodontitis) (Rosling et al., 1997; Sanz et al., 2020).

However, there is no direct evidence that antiseptics can be helpful in the primary prevention of periodontal diseases.

## 03

### Are home-use antiseptics indicated in the management of periodontitis?

The use of antiseptics may be considered in the management of periodontitis, since they can be used in the different steps of the treatment of periodontitis:

**Step 1:** antiseptics may help in the control of gingival inflammation, adjunctively to interventions for supragingival biofilm control, both patient- and professionally-applied (Chapple et al., 2015).

**Step 2:** the adjunctive use of antiseptics with subgingival instrumentation may improve clinical outcomes, including additional reductions in probing depths (PD) and bleeding on probing (BoP) (da Costa, Amaral, Barbirato, Leao, & Fogacci, 2017; Figuero et al., 2019).

**Step 3:** antiseptics may be considered as an adjunct to subgingival re-instrumentation; and, in periodontal surgery, they may be considered to overcome the limitations of mechanical biofilm control after surgery, when patients cannot brush the operative site properly, and to improve wound healing and the results of the treatment (in terms of PD and BoP) (Tsourounakis, Palaiologou-Gallis, Stoute, Maney, & Lallier, 2013; Zambon, Ciancio, Mather, & Charles, 1989).

## 04

**What are the potential benefits of using antiseptics as adjuncts to periodontal treatment?**

The benefits derived from the use of antiseptics in the management of periodontitis differ for the different steps of periodontal therapy (Sanz et al., 2020):

**Step 1:** according to the existing Clinical Practice Guideline (Sanz et al., 2020), although adjunct use of antiseptics was not specifically analyzed in the evaluation of the recommendations of the first step of periodontal therapy, the shared objectives between this step and gingivitis treatment allows some inferences to be derived from the latter. Since control of gingival inflammation is one of the main goals of this step, adjunctive use of certain antiseptics may represent a good option when combined with self-performed mechanical biofilm control, given the significant reductions in gingival indices and plaque levels they provide (Chapple et al., 2015; Escribano et al., 2016; Figuero et al., 2019; Figuero et al., 2020; Serrano et al., 2015).

**Step 2:** the added benefits derived from the adjunctive use of antiseptics in the second step of periodontal therapy, led to an open recommendation in the Clinical Practice Guideline of the European Federation of Periodontology (EFP) (Sanz et al., 2020), in which it is said that “adjunctive antiseptics may be considered, specifically chlorhexidine mouth rinses for a limited period of time, in periodontitis therapy, as adjuncts to mechanical debridement, in specific cases”. According to the systematic review with meta-analysis by Figuero and coworkers (Figuero et al., 2019), the adjunctive use of chlorhexidine (CHX) mouth rinses with subgingival instrumentation resulted in an additional PD reduction, versus subgingival instrumentation alone.

**Step 3:** when mechanical biofilm control is limited, essential oils (EOs) and CHX formulated in mouth rinses may represent an aid to promote healing. The efficacy of EOs in reducing dental biofilm levels and improving wound healing one week after surgery as measured by edema has been reported, although no significant differences in terms of gingival index scores or bleeding were found at any time. Similar patterns have been found with chlorhexidine, with reported significantly less dental plaque biofilm accumulation when using chlorhexidine rinses after surgery compared to the placebo groups and higher BoP reductions (Chye, Perrotti, Piattelli, Iaculli, & Quaranta, 2019; Solderer et al., 2019). Originally, and based on in vitro studies, it was thought that some antiseptics could interfere with fibroblasts and as a consequence, affect wound healing after surgical procedures, but this assumption is no longer supported (Tsourounakis et al., 2013; Zambon et al., 1989).



## 05

### Can antiseptics be indicated in the prevention of the recurrent periodontitis (secondary prevention)?

According to the literature, there is an additional reduction in gingival inflammation and dental biofilm levels when antiseptics are used in patients with treated periodontitis during SPC, similar to that seen in patients with gingivitis, in terms of gingival and plaque indices.

According to the EFP S3 level CPG, the patients that would benefit the most from the use of antiseptic adjuvants in the prevention of the recurrence of periodontitis would be those with local and systemic factors (Sanz et al., 2020):

**Local factors:** gingival inflammation related to biofilm levels, accessibility for cleaning,

anatomical factors, etc.

**General factors:** systemic factors, general health status, frailty, limited dexterity, etc., some of which may be more relevant in elderly patients.

A limited number of studies have analyzed the impact of certain antiseptics in the progression of periodontitis, showing benefits in terms of frequency of deep periodontal pockets and in the number of sites with additional clinical attachment loss (CAL) and bone loss (Rosling et al., 1997).

## 06

### Is there any difference between the different antiseptics/active agents in terms of efficacy?

According to the EFP S3 level CPG (Sanz et al., 2020), among the different antiseptics that have been tested, the active agents considered as most efficacious are EOs, CHX (at concentrations  $\geq 0.10\%$ ), and cetylpyridinium chloride ( $\geq 0.05\%$ ) in mouth rinses; and CHX, stannous fluoride with sodium hexametaphosphate and triclosan-copolymer in toothpastes. The toothpaste with triclosan-copolymer is no longer available in the market due to the negative environmental impact of Triclosan.

For gingival index, the greatest effect was observed for mouthrinses containing EOs, followed by triclosan-copolymer toothpaste, and then by CHX and CPC mouth rinses (Figuro et al., 2019).

For plaque index, EOs and CHX mouth rinses showed the greatest effect (Escribano et al., 2016; Figuro et al., 2019).

Caution should be taken when interpreting this information since most of the data do not come from direct comparisons between chemical agents, but from network meta-analysis, in which direct and indirect comparisons are made using a statistical tool.

# 07

## What is the best delivery format for antiseptics/chemotherapeutics?

There is a lack of direct comparisons between delivery formats precludes statements of superiority (Chapple et al., 2015; Serrano et al., 2015).

Understanding that most people use toothpastes containing active agents in tooth brushing, the requisite comparisons to address should not be toothpastes versus mouth rinses, but active toothpastes alone versus conventional toothpastes plus active mouth rinse.

Mouth rinse delivery formats offer a better distribution in the mouth and better pharmacokinetic properties. Mouth rinses have been proven to achieve greater reductions in dental biofilm levels, when compared to toothpastes, whereas there is limited evidence to support which vehicle is better at reducing gingival inflammation (Serrano et al., 2015).

In addition, it is also evident that the ideal delivery format will depend on the active agent to be delivered: as examples, the ideal vehicle for CHX, CPC and EOs would be the mouth rinse, while for triclosan/copolymer or stannous fluoride, toothpaste is the ideal delivery format.

# 08

## What is the recommended dosage for the use of active agents as adjuncts to periodontal therapy and supportive periodontal care?

The ideal dosage and the optimal conditions of use for each antiseptic are based on the pharmacokinetic properties of the product as well as on local regulations and legal considerations. Therefore, oral health care professionals and patients are encouraged to strictly follow manufacturer's instructions on this matter.

# 09

## Patients' acceptance and potential adverse/side effects arising from the use of active agents.

According to the evidence reviewed for the development of the EFP S3 level CPG, both toothpastes and mouth rinses are widely accepted by the population.

Nevertheless, all the recommended antiseptics have adverse/side effects that may vary in intensity and frequency of occurrence among the different active agents. The most frequently reported are:

**EOs:** dental staining, taste alterations and mild burning sensation.

**CHX:** dental staining, taste alterations and tongue alterations.

**CPC:** dental staining, taste alterations and burning sensation.

**Stannous fluoride:** dental staining, taste alterations and mucosal irritation.

**Triclosan copolymer\*:** dental staining. (\* This product is no longer available in the market)

When prescribing the adjunct use of antiseptics, oral health care professionals should inform and educate patients on the possible adverse/side effects derived from their use, and how to prevent or minimize occurrence. As with any product, a local allergic reaction may occur, which should lead to immediate discontinuation of treatment.

# 10

## Could active agents be used by the whole population?

Toothpastes and mouth rinses with antiseptics are safe for the general population and can provide oral health benefits for the whole population.

However, a cautious approach should be followed when considering some specific groups:

— Children below 7 years old or population without a proper control of deglutition should avoid the use of mouthwashes to prevent undesired swallowing.

— Pregnant women: the safety of antiseptics has not been tested in pregnant or lactating women. When prescribing oral antiseptics in pregnant/lactating women local regulations and gynecologists and obstetricians' advice should be followed.

— Current or former alcoholics alcohol abusers: the use of alcohol-containing products should be avoided aiming to prevent unrecorded alcohol consumption (Rehm et al., 2022).

— Smokers: some concerns have been raised about the use of alcohol-containing antiseptics in smokers, but the available evidence does not support associations between the use of alcohol-containing mouth rinses and an increased risk of oropharyngeal cancer in smokers (Cole, Rodu, & Mathisen, 2003).

Other local conditions, such as the presence of chronic oral mucosal disease or dry mouth, must also be taken into account.

## 11

**Is the adjunctive use of antiseptics cost-effective in the management of periodontal diseases?**

The cost derived from the use of antiseptics as adjuncts to mechanical biofilm control is not high and may be affordable by the majority of the population. Therefore, cost may not be a major concern in prescribing their use.

Despite the fact that appropriate cost-efficiency studies are not yet available, decisions on recommendation should account for the economic cost and adverse effects (e.g. staining) associated with long-term use of such agents and for country-specific regulations and environmental implications (The Economist Impact, 2021).

Identifying those subjects that will benefit the most from the use of antiseptics would be a wise strategy from an economic standpoint.

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# Summary

01

The use of specific antiseptics, as adjuncts to mechanical biofilm control, is effective in reducing gingival inflammation and dental biofilm levels.

02

Antiseptics can effectively help in the treatment of gingivitis and periodontitis, and in the prevention of periodontitis recurrence.

03

Antiseptics are generally safe, although side effects can appear with their use.

04

Some concerns regarding the use of antiseptics in specific groups of patients may be considered (children under 7-years-old, patients without control of swallowing reflexes, pregnant/lactating women and alcohol-abusers).

05

The general population can benefit from the adjunctive use of antiseptics; however, it is essential to identify those subjects that will benefit the most, by considering local and systemic factors:

**Local factors:**

- High levels of gingival inflammation despite low dental plaque biofilm levels (e.g. >10% BoP in SPC patients).
- Inadequate accessibility for cleaning (e.g. tooth crowding, overhanging restorations).
- Anatomical factors that may act as dental plaque biofilm retentive factors (e.g. root concavities, enamel pearls, radicular grooves).
- Patients with dental implants towards mechanical plaque control.

**General factors:**

- General health status, especially with a certain degree of immune compromise (e.g. patients with diabetes).
- Frailty or elderly patients.
- Patients with limited dexterity (either temporary or permanent) or low motivation.



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