SensitiveGum Rerences

Ref1

[J Orofac Pain.](http://www.ncbi.nlm.nih.gov/pubmed/11203743) 2000 Winter;14(1):9-19.

**The efficacy of potassium salts as agents for treating dentin hypersensitivity.**

[Orchardson R](http://www.ncbi.nlm.nih.gov/pubmed?term=Orchardson%20R%5BAuthor%5D&cauthor=true&cauthor_uid=11203743), [Gillam DG](http://www.ncbi.nlm.nih.gov/pubmed?term=Gillam%20DG%5BAuthor%5D&cauthor=true&cauthor_uid=11203743).

**Source**

Division of Neuroscience and Biomedical Systems, Institute of Biomedical and Life Sciences, University of Glasgow, Glasgow, Scotland, United Kingdom. R.Orchardson@bio.gla.ac.uk

**Abstract**

Formulations containing potassium salts (e.g., chloride, nitrate, citrate, oxalate) are widely used for treating dentin hypersensitivity (DH). The purpose of this review was to evaluate evidence for the clinical efficacy of potassium salts in reducing DH and also to consider the biologic basis for any effects. Literature searches were used to identify reports of clinical trials of potassium-containing preparations. Searches revealed 3 trials of potassium nitrate solutions or gels; 2 trials of mouthwashes containing potassium nitrate or citrate; 6 trials of potassium oxalates; and 16 double-blind randomized trials of toothpastes containing potassium nitrate, chloride, or citrate. The toothpaste studies provided quantitative data on treatment effects. These outcome measures were expressed as percentage reductions in sensitivity to cold air and mechanical stimulation and the patients' subjective reports. Trials of topically applied solutions yielded inconsistent results. Potassium-containing mouthwashes produced significant reductions in sensitivity. All potassium-containing toothpastes produced a significant reduction in sensitivity to tactile and air stimuli, as well as subjectively reported sensitivity. In most studies, the active agent (potassium) was superior to the minus-active control (placebo), but a few of the more recent trials have demonstrated significant placebo effects. It is postulated that potassium ions released from toothpastes diffuse along the dentinal tubules to inactivate intradental nerves. However, this principle has never been confirmed in intact human teeth. The mechanism of the desensitizing effects of potassium-containing toothpastes remains uncertain at present.

Ref2

[Cochrane Database Syst Rev.](http://www.ncbi.nlm.nih.gov/pubmed/11405992) 2001;(2):CD001476.

# Potassium nitrate toothpaste for dentine hypersensitivity.

[Poulsen S](http://www.ncbi.nlm.nih.gov/pubmed?term=Poulsen%20S%5BAuthor%5D&cauthor=true&cauthor_uid=11405992), [Errboe M](http://www.ncbi.nlm.nih.gov/pubmed?term=Errboe%20M%5BAuthor%5D&cauthor=true&cauthor_uid=11405992), [Hovgaard O](http://www.ncbi.nlm.nih.gov/pubmed?term=Hovgaard%20O%5BAuthor%5D&cauthor=true&cauthor_uid=11405992), [Worthington HW](http://www.ncbi.nlm.nih.gov/pubmed?term=Worthington%20HW%5BAuthor%5D&cauthor=true&cauthor_uid=11405992).

### Source

Department of Community Oral Health and Pediatric Dentistry, University of Aarhus, 9 Vennelyst Boulevard, DK-8000 Aarhus C, Denmark. spoulsen@odont.au.dk

### Update in

[Cochrane Database Syst Rev. 2006;(3):CD001476.](http://www.ncbi.nlm.nih.gov/pubmed/16855970)

### Abstract

#### BACKGROUND:

Dentine hypersensitivity may be defined as the pain arising from exposed dentine, typically in response to external stimuli, and which cannot be explained by any other form of dental disease. Many treatment regimes have been recommended over the years, and in recent years particular attention has been focused on toothpastes containing potassium nitrate.

#### OBJECTIVES:

To compare the effectiveness of potassium nitrate containing toothpastes with placebo toothpastes in reducing dentine hypersensitivity.

#### SEARCH STRATEGY:

The following databases were cross searched via the database host DIALOG: MEDLINE, EMBASE, ELSEVIER BIOBASE, BIOSIS PREVIEWS, CAB HEALTH, SCI SEARCH, CURRENT CONTENTS until 1 April 2000. The specialised Cochrane Oral Health Group Trials Register was also searched. Bibliographies of clinical studies and reviews identified in the electronic search were checked for studies published outside the electronically searched journals.

#### SELECTION CRITERIA:

Randomised clinical trials (RCTs) in which the effect on dentine hypersensitivity of potassium nitrate toothpastes were tested against non-potassium nitrate containing placebo toothpastes.

#### DATA COLLECTION AND ANALYSIS:

Two of the reviewers independently recorded the results of the included trials using a specially designed chart. Sensitivity was assessed by using thermal, tactile, air blast, and subjective methods. The quality of all RCTs, that fulfilled the inclusion criteria, was acceptable with Jadad scores ranging from 3 to 4 (Jadad 1998).

#### MAIN RESULTS:

Out of the eight studies that initially fulfilled the criteria to be included in the review, four studies did not present mean and standard deviations and could thus not be included in the meta-analysis. Three of these did not show an effect on any of the measurements of dentine hypersensitivity, while one did. Four studies were included in the meta-analysis which showed statistically significant effect of potassium nitrate toothpaste on air blast and tactile sensitivity, e.g. the meta analysis of air blast sensitivity showed a standardized mean difference in sensitivity score of -1.51 (95% CI: -2.09 to -0.94) in favour of treatment. The subjective assessment failed to show a significant effect at the six to eight week assessment.

#### REVIEWER'S CONCLUSIONS:

No strong evidence is available supporting the efficacy of potassium nitrate toothpaste for dentine hypersensitivity.

Ref3

[J Clin Periodontol.](http://www.ncbi.nlm.nih.gov/pubmed/15642059) 2005 Jan;32(1):53-8.

# The effect of a new toothpaste containing potassium nitrate and triclosan on gingival health, plaque formation and dentine hypersensitivity.

[Wara-aswapati N](http://www.ncbi.nlm.nih.gov/pubmed?term=Wara-aswapati%20N%5BAuthor%5D&cauthor=true&cauthor_uid=15642059), [Krongnawakul D](http://www.ncbi.nlm.nih.gov/pubmed?term=Krongnawakul%20D%5BAuthor%5D&cauthor=true&cauthor_uid=15642059), [Jiraviboon D](http://www.ncbi.nlm.nih.gov/pubmed?term=Jiraviboon%20D%5BAuthor%5D&cauthor=true&cauthor_uid=15642059), [Adulyanon S](http://www.ncbi.nlm.nih.gov/pubmed?term=Adulyanon%20S%5BAuthor%5D&cauthor=true&cauthor_uid=15642059), [Karimbux N](http://www.ncbi.nlm.nih.gov/pubmed?term=Karimbux%20N%5BAuthor%5D&cauthor=true&cauthor_uid=15642059), [Pitiphat W](http://www.ncbi.nlm.nih.gov/pubmed?term=Pitiphat%20W%5BAuthor%5D&cauthor=true&cauthor_uid=15642059).

### Source

Department of Periodontology, Faculty of Dentistry, Khon Kaen University, Khon, Kaen, Thailand. nawarat@kku.ac.th

### Abstract

#### OBJECTIVES:

The purpose of this study was to investigate the effect of a new toothpaste containing an antiplaque and antiinflammatory agent (0.3% triclosan), a desensitizing agent (5% potassium nitrate) and an anticaries agent (0.76% sodium monofluorophosphate (SMFP)) on gingival health, plaque formation and dentine hypersensitivity in a 12-week home study. The efficacy of the test toothpaste was compared with that of a control toothpaste containing 5% potassium nitrate and 0.76% SMFP and a benchmark product containing only 0.76% SMFP.

#### MATERIAL AND METHODS:

One hundred and two healthy volunteers, who had a minimum of 20 natural permanent teeth with no probing depth >4 mm and at least one sensitive tooth, participated in this study. Following enrollment, the subjects received a dental prophylaxis and instruction in brushing technique. After a 4-week pre-experimental phase, baseline gingival bleeding index (GBI), plaque index (PI) and visual analogue scales (VASs) indicating dentine hypersensitivity levels responding to tactile and air stimuli were assessed. The subjects were then randomly given one of the three toothpastes; test, control, or benchmark toothpaste, and a soft-filamented toothbrush for home use. The GBI, PI and VASs were re-examined at weeks 4 and 12.

#### RESULTS:

Overall, the GBI scores were significantly reduced compared with baseline in all groups (p<0.01). However, there was no significant difference in GBI score among the three comparison groups. The PI score decreased in the test group and benchmark group from baseline to the end of study, whereas there was no significant change in the control group. Post hoc comparison indicated that the PI score was not statistically different between the three groups. There was a significant difference between the three treatment groups for sensitivity. For both the tactile and air stimuli, the reductions in VAS sensitivity scores for the test group and the control group were significantly greater compared with the benchmark group. Although the sensitivity score for air stimulus decreased more rapidly from baseline to week 4 in the test group, there was no overall difference between the test group and the control group.

#### CONCLUSIONS:

This study demonstrated that the new toothpaste was effective in reducing dentine hypersensitivity. More studies are needed to further determine the potential interaction between triclosan and potassium nitrate in dentifrices.

Copyright Blackwell Munksgaard, 2004.

Ref4

[J Dent.](http://www.ncbi.nlm.nih.gov/pubmed/23380072) 2013 Mar;41 Suppl 1:S26-33. doi: 10.1016/j.jdent.2012.10.001. Epub 2013 Feb 1.

# Efficacy of a mouthwash containing 0.8% arginine, PVM/MA copolymer, pyrophosphates, and 0.05% sodium fluoride compared to a negative control mouthwash on dentin hypersensitivity reduction. A randomized clinical trial.

[Hu D](http://www.ncbi.nlm.nih.gov/pubmed?term=Hu%20D%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Stewart B](http://www.ncbi.nlm.nih.gov/pubmed?term=Stewart%20B%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Mello S](http://www.ncbi.nlm.nih.gov/pubmed?term=Mello%20S%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Arvanitidou L](http://www.ncbi.nlm.nih.gov/pubmed?term=Arvanitidou%20L%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Panagakos F](http://www.ncbi.nlm.nih.gov/pubmed?term=Panagakos%20F%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [De Vizio W](http://www.ncbi.nlm.nih.gov/pubmed?term=De%20Vizio%20W%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Zhang YP](http://www.ncbi.nlm.nih.gov/pubmed?term=Zhang%20YP%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Mateo LR](http://www.ncbi.nlm.nih.gov/pubmed?term=Mateo%20LR%5BAuthor%5D&cauthor=true&cauthor_uid=23380072), [Yin W](http://www.ncbi.nlm.nih.gov/pubmed?term=Yin%20W%5BAuthor%5D&cauthor=true&cauthor_uid=23380072).

### Source

Department of Preventive Dentistry, College of Stomatology, West China University of Medial Sciences, Chengdu, China. hudeyu@vip.sina.com

### Abstract

#### OBJECTIVE:

The objective of this eight week, single-center, two-cell, double-blind, and randomized clinical study was to evaluate the dentin hypersensitivity reduction efficacy of a mouthwash using Pro-Argin™ Mouthwash Technology containing 0.8% arginine, PVM/MA copolymer, pyrophosphates, and 0.05% sodium fluoride in an alcohol-free base ("Arginine Mouthwash") compared to an ordinary mouthwash without any active ingredients ("Negative Control").

#### METHODS:

Qualifying subjects who presented two hypersensitive teeth with a tactile hypersensitivity score between 10 and 50 g of force, and an air blast hypersensitivity score of 2 or 3 participated in this study and were randomized into one of two treatment groups. Subjects brushed with the toothbrush and fluoride toothpaste provided and then rinsed with 20 mL of their assigned mouthwash for 30s twice daily. Subjects refrained from eating or drinking for 30 min after rinsing. Dentin hypersensitivity assessments, as well as examinations of oral hard and soft tissues, were conducted at the baseline visit and again after two weeks, four weeks and eight weeks of product use.

#### RESULTS:

Ninety (90) subjects entered and completed the eight week study. After two weeks, four weeks and eight weeks of product use, subjects in the Arginine Mouthwash group exhibited statistically significant (p<0.05) improvements in mean tactile and air blast hypersensitivity scores as compared to the Negative Control Mouthwash.

#### CONCLUSION:

The results of this study support the conclusion that the Arginine Mouthwash provides a significant reduction in dentin hypersensitivity after eight weeks of product use as compared to a Negative Control mouthwash.

Ref5

[Am J Dent.](http://www.ncbi.nlm.nih.gov/pubmed/22988684) 2012 Jun;25(3):146-52.

# Comparative efficacy of two treatment regimens combining in-office and at-home programs for dentin hypersensitivity relief: a 24-week clinical study.

[Hamlin D](http://www.ncbi.nlm.nih.gov/pubmed?term=Hamlin%20D%5BAuthor%5D&cauthor=true&cauthor_uid=22988684), [Mateo LR](http://www.ncbi.nlm.nih.gov/pubmed?term=Mateo%20LR%5BAuthor%5D&cauthor=true&cauthor_uid=22988684), [Dibart S](http://www.ncbi.nlm.nih.gov/pubmed?term=Dibart%20S%5BAuthor%5D&cauthor=true&cauthor_uid=22988684), [Delgado E](http://www.ncbi.nlm.nih.gov/pubmed?term=Delgado%20E%5BAuthor%5D&cauthor=true&cauthor_uid=22988684), [Zhang YP](http://www.ncbi.nlm.nih.gov/pubmed?term=Zhang%20YP%5BAuthor%5D&cauthor=true&cauthor_uid=22988684), [DeVizio W](http://www.ncbi.nlm.nih.gov/pubmed?term=DeVizio%20W%5BAuthor%5D&cauthor=true&cauthor_uid=22988684).

### Source

Contract Dental Evaluations, Langhorne, Pennsylvania, USA.

### Abstract

#### PURPOSE:

Dentin hypersensitivity is a significant clinical problem that affects numerous individuals. This sharp pain, arising from exposed dentin in response to external stimuli, can be a particularly uncomfortable and unpleasant sensation for patients, because it interferes with their quality of life. The objective of this 24-week, single-center, parallel group, double-blind, stratified and randomized clinical study was to evaluate the clinical efficacy of a single professional treatment with an in-office desensitizing paste followed by twice daily brushing with a desensitizing toothpaste and toothbrush for 24 weeks.

#### METHODS:

100 adults with confirmed dentin hypersensitivity were randomly assigned into two groups. One group received a single in-office treatment with a desensitizing paste containing 8% arginine and calcium carbonate (marketed as Colgate Sensitive Pro-Relief Desensitizing Paste and Elmex Sensitive Professional desensitizing paste), after dental scaling, followed by 24 weeks of brushing twice daily with a desensitizing toothpaste containing 8% arginine, calcium carbonate with 1450 ppm fluoride as MFP (marketed as Colgate Sensitive Pro-Relief toothpaste and Elmex Sensitive Professional toothpaste) and using the Colgate Sensitive Pro-Relief toothbrush (Test Group). The other group received a single in-office treatment with Nupro-M pumice prophylaxis paste, after dental scaling, followed by 24 weeks of brushing twice daily with a non-desensitizing toothpaste containing 1450 ppm fluoride as MFP and with the Oral-B Indicator toothbrush (Negative Control Group). Hypersensitivity was reexamined immediately after in-office product application and after 8 and 24 weeks of twice daily brushing.

#### RESULTS:

Immediately after professional product application, and after 8 and 24 weeks, subjects assigned to the Test Group demonstrated statistically significant improvements in dentin hypersensitivity compared to subjects assigned to the Negative Control Group in tactile (49.8%, 57.5% and 32.9%, respectively) and air blast (26.0%, 38.4% and 34.3%, respectively) sensitivity scores. The instant reductions in dentin hypersensitivityprovided by the single professional application of a desensitizing paste for in-office use, containing 8% arginine and calcium carbonate were maintained by twice daily brushing with the 8% arginine, calcium carbonate toothpaste with 1450 ppm fluoride as MFP and the Colgate Sensitive Pro-Relief toothbrush for at least 24 weeks.

Ref6

**In situ Remineralization of Subsurface Enamel Lesion after the Use of a Fluoride Chewing Gum**  
Lamb W.J. · Corpron R.E. · More F.G. · Beltran E.D. · Strachan D.S. · Kowalski C.J.   
Caries Res 1993;27:111–116 (DOI: 10.1159/000261527)

## Abstract

In situ remineralization of early enamel lesions by a fluoride chewing gum was studied. Human enamel specimens with subsurface lesions were mounted in removable lower appliances for 6 adults. Subjects used a F-free dentifrice 3 ×/day and chewed five sticks/day for the F gum group (0.1 mg F/stick) or five sticks of sugarless gum. No gum was chewed for controls. Surface microhardness was performed on: (1) sound enamel; (2) lesions; (3) after intraoral exposure, and (4) after acid-resistance testing (ART). Separate specimens were etched and measured for F uptake and image analyses on microradiographs were performed for all regimens. ΔZ values were calculated and converted to percent of mineralization. Values for F gum were significantly higher (p > 0.05) than non-F gum and controls for ART, percent remineralization, and F uptake up to 70 μm depth.

Ref8

[J Clin Periodontol.](http://www.ncbi.nlm.nih.gov/pubmed/6964679) 1982 Jul;9(4):346-54.

**Effects of sugared and sugar-free chewing gum on the accumulation of plaque and debris on the teeth.**

[Addy M](http://www.ncbi.nlm.nih.gov/pubmed?term=Addy%20M%5BAuthor%5D&cauthor=true&cauthor_uid=6964679), [Perriam E](http://www.ncbi.nlm.nih.gov/pubmed?term=Perriam%20E%5BAuthor%5D&cauthor=true&cauthor_uid=6964679), [Sterry A](http://www.ncbi.nlm.nih.gov/pubmed?term=Sterry%20A%5BAuthor%5D&cauthor=true&cauthor_uid=6964679).

**Abstract**

The aim of this study was to determine the effects of sugar-free and sugar-containing gums on plaque formation, established plaque and salivary debris. Plaque accumulating during three 5-day periods was recorded in a group of 10 students who, in the absence of normal oral hygiene methods, chewed sugar-free or sugar-containing chewing gum or did not chew gum. In a second group of 10 students the effect of chewing the two types of gum on 3-day accumulations of plaque was recorded. Finally, the wet weight of liquorice debris present in saliva with and without gum chewing, was recorded. During the no chewing periods distinct and significant differences in the amounts of plaque accumulating at different sites were apparent. Both types of chewing gum significantly and comparably reduced plaque accumulation during the 5-day period. The chewing gums also significantly reduced established plaque on many tooth surfaces. Salivary debris was significantly reduced by 50% after chewing gum. It was noted that plaque removal occurred primarily from sites remote from the gingival margin and interdental areas and therefore it was concluded that the observed effects of chewing gum on plaque would not be reflected in a reduction in gingival inflammation.

Ref9

[Caries Res.](http://www.ncbi.nlm.nih.gov/pubmed/1628291) 1992;26(3):176-82.

**Effects of nine different chewing-gums and lozenges on salivary flow rate and pH.**

[Dawes C](http://www.ncbi.nlm.nih.gov/pubmed?term=Dawes%20C%5BAuthor%5D&cauthor=true&cauthor_uid=1628291), [Macpherson LM](http://www.ncbi.nlm.nih.gov/pubmed?term=Macpherson%20LM%5BAuthor%5D&cauthor=true&cauthor_uid=1628291).

**Source**

Department of Oral Biology, Faculty of Dentistry, University of Manitoba, Winnipeg, Canada.

**Abstract**

The objectives of this study were to determine how salivary flow rate and pH vary with time during use of chewing-gums and lozenges. Twenty-four young adults collected unstimulated saliva and then, on different occasions, chewed one of six flavoured gums, or gum base, or sucked on one of two lozenges, for 20 min, during which time eight separate saliva samples were collected. Flow rate peaked during the 1st minute of stimulation with all nine products. With the lozenges, flow rate fell towards the unstimulated rate when the lozenges had dissolved. There were no significant differences in the flow rates elicited by cinnamon- or peppermint-flavoured gums or between sugar-containing or sugar-free gums. With the flavoured gums, the mean flow rate followed a power curve (r = -0.992) with time and within about 10 min was not significantly different from that when gum base was the stimulus. The initial stimulated flow rate with flavoured gums was about 10-12 times greater than the unstimulated rate (0.47 ml/min). After 20 min of chewing, it was still about 2.7 times that rate and about the same as the flow rate elicited by chewing-gum base alone. The pH of unstimulated saliva was about 6.95. With one gum containing about 1.5% organic acids, the salivary pH fell to a minimum of 6.18 in the 1st minute of stimulation, but then rose rapidly to a level above that in unstimulated saliva. With a sucrose-containing and a sucrose-free gum, the pH rose immediately on stimulation and then fell slightly with time to levels which were significantly above the pH of unstimulated saliva.

Ref10

[J Dent Res.](http://www.ncbi.nlm.nih.gov/pubmed/8501281) 1993 May;72(5):852-7.

**The distribution of saliva and sucrose around the mouth during the use of chewing gum and the implications for the site-specificity of caries and calculus deposition.**

[Dawes C](http://www.ncbi.nlm.nih.gov/pubmed?term=Dawes%20C%5BAuthor%5D&cauthor=true&cauthor_uid=8501281), [MacPherson LM](http://www.ncbi.nlm.nih.gov/pubmed?term=MacPherson%20LM%5BAuthor%5D&cauthor=true&cauthor_uid=8501281).

**Source**

Department of Oral Biology, Faculty of Dentistry, University of Manitoba, Winnipeg, Canada.

**Abstract**

Over a 20-minute period, subjects expectorated 8 samples of whole saliva (EWS) while chewing gum. Flow rates were calculated, and sucrose was analyzed in these samples as well as in saliva collected on filter paper strips from different tooth surfaces. Salivary film velocity (SFV), based on a 0.1-mm-thick film, was estimated from the clearance half-times of KCl in agarose disks positioned in different regions of the mouth. Salivary flow rate peaked at 5.1 mL/min in the first min but fell to about 1.25 mL/min by the end of the 20 min of gum-chewing. In contrast, flow rate when subjects sucked sour lemon drops averaged about 5.3 mL/min throughout the 20-minute period. The mean salivary sucrose concentration during gum-chewing peaked in the second min at 384 mmol/L (13.1%) but had fallen to 14 mmol/L by the 15-20-minute time interval. The sucrose concentrations on the palatal surfaces of the upper incisors and the facial and lingual surfaces of the lower molars were not significantly different from that in EWS but were much lower on the facial surfaces of the upper incisors and molars, and on the lingual surfaces of the lower incisors. When flow was unstimulated, SFV was 0.8-1.0 mm/min on the facial surfaces of the upper incisors and lower molars but about 5-8 mm/min on the facial surfaces of the upper molars and on the lingual surfaces of the lower incisors and molars

Ref11

[Caries Res.](http://www.ncbi.nlm.nih.gov/pubmed/1521303" \o "Caries research.) 1992;26(2):104-9.

**Effects of chewing gums sweetened with sorbitol or a sorbitol/xylitol mixture on the remineralisation of human enamel lesions in situ.**

[Manning RH](http://www.ncbi.nlm.nih.gov/pubmed?term=Manning%20RH%5BAuthor%5D&cauthor=true&cauthor_uid=1521303), [Edgar WM](http://www.ncbi.nlm.nih.gov/pubmed?term=Edgar%20WM%5BAuthor%5D&cauthor=true&cauthor_uid=1521303), [Agalamanyi EA](http://www.ncbi.nlm.nih.gov/pubmed?term=Agalamanyi%20EA%5BAuthor%5D&cauthor=true&cauthor_uid=1521303).

**Source**

Department of Clinical Dental Sciences, University of Liverpool, UK.

**Abstract**

Intra-oral remineralisation of experimental caries-like lesions in human enamel, as determined by polarised light microscopy and quantitative microradiography, was promoted to a similar extent (% fall in delta Z, 18.6 and 19.0) by chewing a sorbitol or sorbitol/xylitol (3:1)-sweetened gum for 20 min after each of three meals and two sugary snacks daily. The results suggest that reported differences in the properties of the two sweeteners do not affect their ability to enhance remineralisation due to salivary stimulation.