Fluor Protector

Shield against caries
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Fluor Protector

Professional caries prophylaxis - long-term

To remain healthy, teeth need to be supplied regularly with small amounts of fluoride.

Fluor Protector, a varnish containing 0.1% fluoride, offers professional protection from caries.

The protective varnish is quick and easy to apply and adheres well to tooth surfaces. Fluor Protector is suitable for patients of all age groups and is professionally applied by dentists or skilled personnel. Generally a twice yearly application is sufficient.

Fluor Protector is highly effective for the treatment of hypersensitive cervicals and long-term caries prophylaxis.

Over two decades of experience document the effectiveness of this product.

The sound protection provided by Fluor Protector is based on:

- Tight blockage of the dentin tubuli
- Control of remineralisation processes
- Incorporation of fluoride into the lower layers of the enamel
- Repair of initial caries lesions
**Hypersensitivity**


The sealing of open dentin tubuli helps to prevent or reduce hypersensitivity. Varnishes that penetrate the tooth structure and seal the dentin tubuli are therefore very useful. Investigations carried out with a confocal laser scanning microscope (CLSM) have shown that Fluor Protector penetrates the dentin tubuli efficiently.


Recession of the gingiva is often associated with hypersensitive dentin. Both Fluor Protector and Cervitec varnishes are suitable for this indication. In a clinical study, no significant difference between the varnishes was found – both significantly reduced the sensitivity of all 20 patients over the study period of one month.

Fluor Protector was applied on hypersensitive cervicals at Baseline 1 and at Week 1. After these two applications, the level of sensitivity to hot and cold sensations was clearly lower than that at Baseline 0.

*Reduction of pain after two applications of Fluor Protector on hypersensitive cervicals.*
A major part of the fluoride retained on tooth surfaces after topical application is calcium fluoride or calcium-fluoride-like material. A pH dependent fluoride depot is formed, i.e. fluoride is released when the pH value sinks.

Fluor Protector induces a comparatively substantial calcium fluoride layer. Fluor Protector deposited more KOH removable fluoride both on and in the enamel compared to an APF gel and a resinous NaF varnish.

Proteins and phosphate stabilize the calcium fluoride layer, which enhances its retention.


Calcium fluoride particles adhere particularly well to porous surfaces, such as demineralized areas. In addition, they are retained on such areas for comparatively long periods.


With fluoride varnishes, fluoride exposure can be better controlled, and less chair-time is required, compared with conventional solutions and gels.
Demineralisation
At acidic pH levels, the enamel is demineralised without fluoride protection.

Protective calcium fluoride layer
After the application of Fluor Protector, a protective calcium fluoride layer forms over the tooth surface.

Bioavailability of fluoride
When the pH level drops, calcium and fluoride ions are released. The tooth structure is no longer directly attacked. The calcium fluoride layer is tight and homogenous forming a reliable depot that releases fluoride over an extended period of time.

After the application of Fluor Protector, the uptake of KOH-soluble and permanently bound fluoride clearly increased compared to cases in which Fluor Protector was not applied. Three consecutive enamel layers that were treated with Fluor Protector exhibited a significantly higher fluoride content compared to those that had been treated with a comparison varnish.

Mean fluoride concentration in three consecutive enamel layers after the application of varnishes containing fluoride.

One month after the application of Fluor Protector on enamel surfaces a significant inhibition of plaque formation was noticeable. Additionally SEM studies showed dispersion and reduced density of the plaque matrix.


Bacterial biofilms or dental plaque are a prerequisite for the development of caries and periodontal disease. Fluoride is able to reduce acid formation in some bacterial species of dental plaque. E.g. Mutans streptococci by impairing glycolysis so inhibiting sugar uptake and in turn lactic acid production. In order to evaluate the effect of fluoride-bound hydroxyapatite on lactic acid formation, in vitro – hydroxyapatite discs were coated with a Strep. mutans biofilm. The discs were either left untreated or pre-treated with one of the following: 0% placebo varnish, Fluor Protector, 0.2% NaF or 0.05% NaF. Discs were incubated in growth medium at pH 7.0 with glucose for 3 hours. The discs pre-treated with fluoride reduced lactate production compared to untreated controls or placebo discs. Fluor Protector and 0.2% NaF had a statistically significant inhibitory effect on lactate production.
Lactic acid production in biofilms. Comparison of fluoride pre-treated discs and placebo. (Balzar Ekenbäck 2001).

This randomised controlled study compared the treatment of white spot lesions in caries active adolescents. Fluor Protector plus professional tooth cleaning (n=13) was compared with professional tooth cleaning (PTC) alone (n=18). In the FP group, PTC was followed by an application of FP, at baseline, after 1 week and every 6 weeks for 6 months. In the control group PTC was carried out once every 6 weeks for 6 months. Enamel fluorescence using quantitative light fluorescence (QLF) techniques was measured at baseline and at each visit. In the FP group there was a significant change over time for both lesion area and average change in fluorescence. These changes were not seen in the control group. There was a significant difference in average change in fluorescence between the two test groups. For lesion area, there was no significant difference, but a tendency towards a difference between the test groups. It was concluded that repeated fluoride applications had a favourable effect on the remineralisation of white spot lesions as measured after 6 months.

Remineralisation/ Reduced demineralisation

Initial situation:
White spot appears dark

After six months:
Size of white spot is reduced and fluorescence is increased

Note regarding QLF: Mineralised healthy enamel exhibits high fluorescence i.e. a light colour
Demineralised areas appear darker i.e. show low fluorescence.

The treatment with both Fluor Protector and Cervitec led to significantly shallower dentin lesions compared to the control group. A mixture of both varnishes had no inhibiting effect on the demineralisation process.


Children aged 7-13 were repeatedly treated with Fluor Protector over 12 months. 72 labial enamel opacities in the permanent teeth were treated. Clinical findings showed an improvement of the surface quality of the enamel lesions - some appeared to be fully mineralised.


An in vitro demineralisation model compared the protective effect of two chlorhexidine varnishes and Fluor Protector. On enamel Fluor Protector provided better protection from demineralisation due to Mutans streptococci compared to Cervitec or another CHX varnish. However the dentin specimens were best protected by Cervitec. For the optimal protection of both enamel and dentin the application of both varnishes could prove optimal.

Fluor Protector protects the enamel from mineral loss. After a single application of Fluor Protector, the mean lesion depth after four months was significantly shallower than that of the control group which had been treated with a placebo varnish.

Mean lesion depth four months after a single application of various varnishes.

The colour stability of a compomer, hybrid ionomer and a composite were tested with the fluoride varnishes Durafluor (DF), Duraphat (DP), and Fluor Protector (FP). Five discs per varnish were treated and then brushed. Water was used as a control. Colour was compared with a spectrophotometer at baseline after staining (treatment) and after brushing. Durafluor and Duraphat both caused a perceptible colour change after staining in all restoratives. Durafluor caused a lasting colour change (i.e. after brushing) with the composite material. Fluor Protector did not affect the colour of any of the restorative materials.
Suitable for all age groups:

Pre-school children


The treatment with Fluor Protector is safe and can be used for children of preschool age.

L.G. Petersson: Fluoride mouthrinses and fluoride varnishes; Caries Res 27, (Suppl. 1 1993) 35-42.

The average application time of fluoride varnishes is 3-5 minutes per patient. The acceptance even by small children is very positive.


The application of Fluor Protector at 6 month intervals demonstrated a cariostatic effect on the primary dentition, even with today’s low caries incidence. Over the course of the two-year study, all the 648 preschool children accepted the Fluor Protector treatment very well.


A cost/benefit assessment indicated the advantage of a fluoride varnish program for children showing dental caries at baseline. Biannual application of Fluor Protector on preschool children with active caries is beneficial and should be recommended.
Adolescents


The differential effect of a fluoride dentifrice (2 x day), a fluoride mouth-rinse (1 x week) and a fluoride varnish (4 x year) on approximal caries was examined in 252 adolescents aged between 13 and 14 years. Fluor Protector was applied by a dental professional; the dentifrice and mouth-rinse were applied at home. Fluor Protector reduced caries more significantly than the fluoride mouth-rinse.

Average number of new carious lesions

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<th>Group</th>
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Average number of new carious lesions after various combinations of fluoride therapy for 3 years.

The combination of Fluor Protector and Cervitec is a simple, quick, non-invasive highly useful method of managing and controlling root-caries. Treatment can be carried out by dental hygienists and is equally useful for high risk groups such as patients suffering from Parkinson’s disease and neuro-muscular disorders.

This study of 103 patients aged between 78 and 87, showed that a combination of Fluor Protector (applied first) and Cervitec (applied second) improved the clinical status of active root caries. The combination of Cervitec and Fluor Protector was significantly more effective than Fluor Protector alone.

Given their easy application technique and reliability of use, varnishes containing fluoride have become widely accepted. The time patients spend in the dental chair is shorter than that required to conduct conventional prophylactic measures.


Fluoride varnishes are safe and easy to apply and are able to set in contact with intra-oral moisture. Compared with other topical fluoride vehicles, varnishes have advantages in terms of safety and ease of application.


In school-based programs, children can be treated without prior prophylaxis from the hygienist. Tooth brushing is sufficient in such cases as the pellicle does not act as a barrier to fluoride uptake by the enamel.

Fluoride varnishes are quicker, more convenient and less messy to apply. Uncomfortable trays the bitter taste and potential swallowing problems of gels are avoided. Fluoride varnish is a superior topical fluoride agent for use in children and would seem to be most useful in public health settings.


In a school based preventive oral health care programme in the Philippines, children were treated both preventively (tooth-brushing and fluoride varnish) and therapeutically (ART Atraumatic restorative treatment whereby teeth could be filled with amalgam using hand instruments). Fluor Protector was applied every 4 months by trained parents. 1600 7 year olds were recruited for the pilot project. For the primary dentition mean caries prevalence was 7.2 dmft and for the permanent dentition 1.2 DMFT. Only 8.8% were entirely caries free. After 3 years the children had an average age of 10.2 and 16.2% were caries free. Caries prevalence was 1.6 DMFT, the small increase of 0.4 DMFT within 3 years reflected the effectiveness of the comprehensive dental care approach.
Targeted caries control


Patients demonstrating either active caries or a medium/high caries risk, should be treated with professionally applied fluoride to control caries.


The fissures and proximal surfaces of premolars and molars may exhibit sub-clinical initial lesions. In the course of regular check-ups by the dental professional, fluoride varnish can be selectively applied onto these areas to promote the remineralization of the tooth structure.

Areas particularly susceptible to caries

- Pits and fissures
- Interdental surfaces
- Dentinoenamel junction
- Exposed cervicals

A study of 180 13 to 14 year olds with at least two approximal enamel caries lesions. One group was treated with Fluor Protector and the other with Cervitec every 3 months. Overall each subject was treated 12 times. Treatments with either of the varnishes showed promising effects with a low approximal caries incidence and progression in teenagers with proven caries susceptibility.

5137 preschool children (4-5 years) attending one of 24 public dental health clinics in Halland, Sweden were treated with Fluor Protector or a placebo varnish. Treatment took place once every six months with all children receiving counselling with regard to tooth brushing and diet. Caries prevalence data was collected at baseline and after 1 and 2 years. The incidence of approximal lesions (dfsa) was significantly lower in the fluoride group than in the placebo group. In children with clinical caries at the outset i.e. dfs scores of 1-4 or ≥ 5 approximal caries was reduced 19 and 25% respectively compared to the placebo group.

Reduction in approximal caries [%]

Reduction in approximal caries after 2 years treatment with Fluor Protector in children with clinical caries at baseline.
Fluor Protector and Cervitec reduced bacterial demineralisation deep within artificial fissures in vitro.


Cervitec und Fluor Protector either alone or in combination are able to reduce demineralisation within fissures.

FDI policy statement on fluorides and fluoridation for the prevention of dental caries; FDI Dental World, May/June 1993: 11-17.

According to the FDI, the professional application of topical fluoride is a safe and effective procedure to reduce dental caries.