Help your caries-prone patients in 3 easy steps.

- Restore
- Protect
- Mineralize
Lifelong Oral Health at Every Stage of Life

Protect

Restore

Mineralize
Lifelong Oral Health at Every Stage of Life

Teeth for Life

Minimal Intervention Oral Care

What is the overall Strategy?

Oral Care Plan
Teeth for Life

- Oral care and protection against disease should be provided throughout the lifespan of our patients

- Minimum Intervention Oral Care embraces this concept by customizing your patient’s treatment according to their specific needs, which can vary at different stages of their life
Teeth for Life

Children | Pediatric Population Specifics

- Early childhood caries
  Baby bottle containing natural or added sugar

- Lack of, or inadequate, exposure to fluoride

- Lack of, or inadequate, oral hygiene

- Diet high in fermentable carbohydrates

- Special needs patients
Teens | Adolescent Population Specifics

- Increasing dental erosion
  High consumption of sugary and acidic drinks
- Use of braces/orthodontia appliances
- Problems with oral hygiene compliance
- Lack of, or inadequate, exposure to fluoride

Guideline on Caries-risk Assessment and Management for Infants, Children, and Adolescents AAPD.
Teeth for Life

Adults  |  Adult Population Specifics

- Patients under medications or systemic conditions that induce hypo-salivation, xerostomia/dry mouth
- Patients with drug abuse problems
- Patients with gum recession and periodontal disease with exposed root dentin
- Poor oral hygiene and dietary habits
Elderly | Geriatric Population Specifics

- **Xerostomia/dry mouth**
  - Medication-induced hypo-salivation
  - Associated with systemic/immunological disease
  - Associated with cancer treatment

- **Motor functions alterations**

- **Impaired oral hygiene**

- **Gum recession and periodontal disease**

- **Exposed root or with root caries**

- **Partial denture wearers**
The aim of Minimum Intervention Oral Care is to keep the patient in a state of health by promoting prevention and disease control.

**Teeth for Life**

- Keep healthy and remineralizable tooth tissue alive
- Do not remove these tissues unnecessarily when treating carious lesions
Minimum Intervention Oral Care

Principles: strategies for keeping teeth free from caries lesions and disease control

- Biofilm management
- Patient education
- Early caries detection, assessment of caries activity and risk
- Remineralization of non-cavitated lesions of enamel and dentin
- Minimal invasive intervention of cavitated lesions
- Repair of defective restorations instead of replacement

FDI POLICY STATEMENT (revision)
Minimal Intervention Dentistry (MID) for Managing Dental Caries
2002 and 2016
What is the overall Strategy?

Establish a Minimum Intervention Oral Care Plan:

- Identify: Risk assessment care plan
- Recall: Maintenance review re-assess
- Protect: Dental office At-home care
- Restore: Minimally invasive

Restore & Protect

Video for dentists
Restore & Protect

Video for patients
Restore

Minimum Intervention Oral Care of Cavitated Lesions

Glass Ionomer Cements

Resin-modified Glass Ionomer Cements

Esthetics – 3M™ Photac™ Fil Quick Aplicap™

Fast and easy – 3M™ Ketac™ Universal Aplicap™
Minimum Intervention Oral Care of Cavitated Lesions

How can you provide extra protection with restorative products when confronting a cavitated lesion?

For a minimum intervention procedure, apply the following principles:

- Remove soft decomposed (formerly infected) dentin
- Leave demineralized (formerly affected) dentin behind
- Restore the cleaned cavity with a restorative that has optimum biological (nontoxic) and physical properties (Frencken et al, 2012)
Glass Ionomer Cements

**Benefits**

- **Ion release and recharge**
  F, Ca, Sr release
  Strengthen tooth structure

- **Self adhesion by**
  Ion exchange
  Strong ionic bonds

- **Favorable clinical history**
  No allergic responses over decades

- **Tolerates moisture**

- **Bulk placement**

- **Minimum intervention dentistry**
  Protection of enamel and dentin
Resin-modified Glass Ionomer Cements

Benefits

- **High fluoride release and recharge**
  Strengthen tooth structure

- **Self adhesion**
  Conditioning partly necessary
  Setting reaction activated by light curing

- **Favorable clinical history** –
  No allergic responses over decades

- **Fair esthetics**

- **Tolerates moisture**

- **Minimum intervention dentistry** –
  Protection of enamel and dentin
3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Esthetics

Product features ➔
Indications ➔
Handling ➔
Clinical Performance ➔
Internal studies ➔
Product features

High fluoride release – can be recharged with topical fluoride source application

Strong adhesion to dentin without any conditioning steps

Saves time and cost by reducing the number of steps necessary for placing a restoration

Dual cure provides longer working time and short setting time

Self-bonding and light curable

Esthetic versatility of 8 shades
Indications

Fillings in Black’s class III and V
Small fillings in Black’s class I
Wedge-shaped defects
Fillings in deciduous teeth
Fissure sealing
Temporary restorations in Black’s class I and II
Esthetics

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Handling

Activation ➔

Application ➔

Time savings ➔
Handling | Activation

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative
Handling | Application

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative
3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Handling | Time savings

- Fast and easy
- Saves time and cost
- Esthetics with 8 colours

Esthetics combined with Efficiency

Esthetics

Handling

Time savings

Efficiency

Save Steps and Time Using Photac Fil Material

<table>
<thead>
<tr>
<th>Step by step Comparison</th>
<th>Photac Fil</th>
<th>Fuji II LC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare tooth</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Apply a conditioner</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Rinse and dry</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Activate and mix capsule</td>
<td>● ●</td>
<td>● ●</td>
</tr>
<tr>
<td>Place in 2 mm increments</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Light cure</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Finish</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Apply glaze or vanish</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Light cure</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Photos courtesy of Dr. Gunnar Reich.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Clinical Performance

Clinical Case

Clinical Video
Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Initial clinical situation with wedge-shaped defect in the cervical area of the first molar.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

3M™ Photac™ Fil Quick Aplicap™ Light-Curing Glass Ionomer Dental Restorative

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Application of the fluoride-releasing material (shade A3) into the cavity.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Adaptation of the material to the tooth structure.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Careful removal of excess material in the interproximal area using a scaler.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Light curing of the restoration for 20 seconds.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Smoothening of the surface with a stone.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Checking of the margin quality with an explorer.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

Pre-polishing ...
Clinical Performance  |  Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

... and high-gloss polishing with the 3M™ Sof-Lex™ Diamond Polishing Spiral.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

Hypersensitivity testing with a stream of cold air.

Clinical Performance | Clinical Case
Non-carious cervical lesions: How to treat them with RMGI?

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Hypersensitivity testing with a stream of cold air.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case
Non-caries cervical lesions: How to treat them with RMGI?

Final restoration in place.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Esthetics

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Clinical Performance | Clinical Video
# Internal studies

**3M™ Photac™ Fil Quick Aplicap™**
Light-Curing Glass Ionomer Dental Restorative

<table>
<thead>
<tr>
<th>Properties</th>
<th>Photac™ Fil Quick Aplicap™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength</td>
<td>180 ± 9 MPa</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>60 ± 3 MPa</td>
</tr>
<tr>
<td>Surface hardness</td>
<td>220 ± 11 MPa</td>
</tr>
<tr>
<td>Adhesion to enamel w/o conditioning</td>
<td>16 MPa</td>
</tr>
<tr>
<td>Adhesion to dentin w/o conditioning</td>
<td>7 MPa</td>
</tr>
</tbody>
</table>

3M Internal Lab Studies.
Internal studies | Adhesion & marginal sealing

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Enamel adhesion (mean value, MPa)

Photac™ Fil Quick without conditioning
Compmomer C with primer
Compmomer D with primer

3M Internal Lab Studies.
Esthetics

3M™ Photac™ Fil Quick Aplicap™
Light-Curing Glass Ionomer Dental Restorative

Internal studies | Adhesion & marginal sealing

Without the addition of bonding agents Photac™ Fil Quick makes a lasting bond with the natural substances of the tooth. Expensive etching, bonding and priming procedures are no longer necessary. The light-curing glass ionomer flows very well on to the wet dentine and enamel. Adhesion depends on mechanical and chemical forces. The microretentive anchoring is reinforced by the chemical bond, in which the copolymer acids form bridges with the calcium ions of the hydroxyl apatites of the dentine and enamel.

In-house research results show that Photac™ Fil Quick (without conditioning) is distinguished by much better adhesion values than compomers (with primer).

The adhesion to enamel and dentine favours a gentle preparation of the cavity, in which as little healthy tooth substance as possible is removed for retention.

Molecular anchoring to enamel and dentine and minimal shrinkage of the polymer make an impermeable perfect marginal seal of the filling. Photac™ Fil Quick's tooth-like coefficient of thermal expansion prevents the information of marginal fissures by thermal influences.

3M Internal Lab Studies.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Product features ➔
Indications ➔
Handling ➔
Clinical Performance ➔
External Studies ➔
Internal Studies ➔
FAQ ➔
Product features

Radiopaque glass ionomer restorative used for bulk fillings

In capsules, handmix version available

Chemically bond to enamel and dentin for easy, gentle preparation and excellent sealing of the margins of fillings

Can be applied without conditioner or glaze/coating

Releases fluoride ions

Available in various shades corresponding to the Vita™ Classical color system

Long-term performance and extended indications provide an economical solution for your practice
Indications

Linings for single- or multi-surface composite filling
Core build-ups prior to crown placement
Primary tooth fillings
Cervical fillings, if esthetics are not the prime consideration
Single- and multi-surface temporary fillings
Fissure sealing

Extended indications!

Stress-bearing Class I restorations with at least one additional support outside of the filling area
Stress-bearing Class II restorations when the isthmus is less than half of the intercuspal distance and with at least one additional support outside of the filling area
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling

Activation ➞
Application ➞
Time savings ➞
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling | Activation
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling | Application | Step by step card
84% of dentists who evaluated Ketac Universal Aplicap restorative clinically agreed or fully agreed that the design of the nozzle leads to better access to deep cavities. The viscosity is lower than Ketac™ Molar Aplicap™ Glass Ionomer Restorative, enabling the extrusion of the mixed paste through the new tapered nozzle for better access to the cavity.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling | Application | Viscosity

This test mechanically simulates a ball-shaped metal plunger (sphere diameter: 3 mm, speed: 5 mm/sec.) placed onto the restorative material during its setting phase. The force needed to move the ball a certain distance (3 mm) into the paste is measured. The higher this force is, the higher the viscosity of the tested material.

Ketac™ Universal Aplicap™ Glass Ionomer Restorative has a medium viscosity.

84% of dentists who evaluated Ketac Universal Aplicap™ restorative clinically agreed or fully agreed that the design of the nozzle leads to better access to deep cavities. The viscosity is lower than Ketac™ Molar Aplicap™ Glass Ionomer Restorative, enabling the extrusion of the mixed paste through the new tapered nozzle for better access to the cavity.
Handling  |  Application  |  Stickiness

This laboratory test mechanically simulates a ball plunger being placed onto restorative material and removed, highlighting the level of “pull back” or stickiness of a material – as seen in the pictures below.

Test method: Dipping of the plunger into the mixed paste and withdrawal immediately afterwards.

While Ketac™ Universal Aplicap™ Glass Ionomer Restorative does not stick to the metal ball, other glass ionomer materials display a clear “pull back” effect when the ball plunger is lifted.
Handling  |  Application  |  Stickiness

This laboratory test mechanically simulates a ball plunger being placed onto restorative material and removed, highlighting the level of “pull back” or stickiness of a material – as seen in the pictures below.

Test method: Dipping of the plunger into the mixed paste and withdrawal immediately afterwards.

The quality of being non-sticky is a fundamental factor for the practitioner. While a restorative material should not stick to dental instruments while filling the cavity, it should be sticky enough to stay in the prepared cavity.

While 3M™ Ketac™ Universal Aplicap™ Glass Ionomer Restorative does not stick to the metal ball, other glass ionomer materials display a clear “pull back” effect when the ball plunger is lifted.
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling  |  Application  |  Stickiness
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling | Time savings

Efficiency

<table>
<thead>
<tr>
<th>Efficiency Drives Economics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics</td>
</tr>
</tbody>
</table>

Fewer steps = a simple, faster procedure

<table>
<thead>
<tr>
<th>Fewer steps</th>
<th>Ketac™ Universal Aplicap™ Glass Ionomer Restorative</th>
<th>Fuji IX GP®</th>
<th>EQUIA® Fil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steps after cavity preparation*</td>
<td>only 4 steps</td>
<td>13 steps</td>
<td>13 steps</td>
</tr>
<tr>
<td>Cavity Conditioner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rinse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shake capsule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activate capsule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prime capsule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mix capsule (Mixing device)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place in bulk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light cure/air dry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finishing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coating</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Light cure/air dry</td>
<td></td>
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</tr>
</tbody>
</table>

*Clinical steps according to manufacturer’s Instruction for Use.

- Fewer steps to reduce chair time
- Fluoride protection
- Low stickiness allows an easy placement
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Handling | Time savings
Clinical Performance

Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Clinical Case 3
Restorative treatment of a restless kid’s primary molar

Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Clinical Video
Clinical Performance | Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Initial situation: primary first and second molar with carious lesions.

Photos courtesy of Dr. Jacqueline Esch, Munich, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral.
Clinical Performance | Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Minimally invasive cavity preparation.

Photos courtesy of Dr. Jacqueline Esch, Munich, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral.
Clinical Performance  |  Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Placement of Tofflemair matrix.

Photos courtesy of Dr. Jacqueline Esch, Munich, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral.
Clinical Performance | Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Finishing of occlusal surface.

Photos courtesy of Dr. Jacqueline Esch, Munich, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral.
Clinical Performance | Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Photos courtesy of Dr. Jacqueline Esch, Munich, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral.
Clinical Performance | Clinical Case 1
Effective use of glass ionomer restorative in pediatric dentistry

Bulk placement of Ketac™ Universal Aplicap™ into cavity.

Photos courtesy of Dr. Jacqueline Esch, Munich, Germany. Dr. Jacqueline Esch has received honoraria from 3M Oral.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Initial situation with some early enamel lesions.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Tooth surfaces covered with a layer of the white varnish immediately after its application.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Existing composite restoration showing secondary decay.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

MOD cavity requiring a high-strength restorative material.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Isolation of the prepared tooth using a T-Band Matrix and a wedge.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
**Clinical Performance | Clinical Case 2**

Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

3M™ Ketac™ Universal Glass Ionomer Restorative in the Aplicap™ capsule.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Bulk placement of the glass ionomer restorative into the cavity.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Fast and easy

Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Treatment result.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
**Fast and easy**

**Clinical Performance | Clinical Case 2**
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Intact restoration after 12 months next to a new carious lesion on the adjacent tooth.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 2
Effective where additional protection is needed: Use of a glass ionomer restorative in the primary dentition

Newly restored tooth number 85.

Photos courtesy of Dr. Rajeev Thaper, India.
Dr. Rajeev Thaper has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case 3
Restorative treatment of a restless kid’s primary molar

Copious amounts of saliva visible in tooth 75.

Photos courtesy of Dr. Riaan Mulder, South Africa.
Dr. Riaan Mulder has received honoraria from 3M Oral Care.
Lingual involvement of the fractured tooth 75.

Photos courtesy of Dr. Riaan Mulder, South Africa.
Dr. Riaan Mulder has received honoraria from 3M Oral Care.
Occlusal view of the carious lesion tooth 75. Infected carious dentin is clearly visible.

Photos courtesy of Dr. Riaan Mulder, South Africa.
Dr. Riaan Mulder has received honoraria from 3M Oral Care.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 3
Restorative treatment of a restless kid’s primary molar

3M™ Ketac™ Universal Aplicap™ Glass Ionomer Restorative.

Photos courtesy of Dr. Riaan Mulder, South Africa.
Dr. Riaan Mulder has received honoraria from 3M Oral Care.
Clinical Performance | Clinical Case 3
Restorative treatment of a restless kid’s primary molar

An adult matrix band filled with petroleum jelly to the superior margin.

Photos courtesy of Dr. Riaan Mulder, South Africa.
Dr. Riaan Mulder has received honoraria from 3M Oral Care.
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance  |  Clinical Case 3
Restorative treatment of a restless kid’s primary molar

Completed restoration prior to final petroleum jelly placement.

Photos courtesy of Dr. Riaan Mulder, South Africa.
Dr. Riaan Mulder has received honoraria from 3M Oral Care.
45-year-old female patient with a wedge-shaped non-carious lesion on the upper right second premolar.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance  |  Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Verification of the size and shape of a cervical matrix to be used for simplified sculpting.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance  |  Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

3M™ Ketac™ Universal Aplicap™ Glass Ionomer Restorative for automatic mixing.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 4
Treatment of a non-caries cervical lesion with glass ionomer restorative

Placement of the restorative material (shade A3) directly into the cavity. Previously, the material was mixed for eight seconds in a 3M™ RotoMix™ Capsule Mixing Unit.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Fast and easy

A cervical matrix is used to create a smooth surface and restoration margin and to reduce the effort needed for finishing and polishing.

Clinical Performance | Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Clinical Performance  |  Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Excess removal with a Heidemann spatula.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Finishing with a 3M™ Sof-Lex™ Extra Thin Contouring and Polishing Disc (fine grit).

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Result obtained immediately after polishing.

Photos courtesy of Dr. Gunnar Reich, Germany.
Dr. Gunnar Reich has received honoraria from 3M Oral Care.
Fast and easy

3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Clinical Performance | Clinical Case 4
Treatment of a non-carious cervical lesion with glass ionomer restorative

Situation after one week.

Photos courtesy of Dr. Gunnar Reich, Germany.
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Fast and easy

3M™ Ketac™ Universal Aplicap™
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Clinical Performance | Clinical Video
Fast and easy

3M™ Ketac™ Universal Aplicap™
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External Studies

- Compressive Strength
- Wear resistance
- Surface hardness
External studies  |  Compressive strength

CED IADR abstract # 0396 Vienna, Austria 2017
In-vitro compressive strength and edge stability of glass ionomer cements.
N. Ilie, Ludwig-Maximilians-University, Munich, Germany

CED IADR abstract # 0091 Vienna, Austria 2017
Experimental tests for mechanical properties of glass ionomer cements.
K. Gorseta, D. Glavina, University of Zagreb, Croatia

IADR abstract # 2957746 London, UK 2018
In-vitro Compressive Strength and Edge Stability of Glass Ionomer Cements (GICs).
J. Zhang, P. Braun, P. Pilecki, A. Banerjee
External studies | Wear resistance

CED IADR abstract # 0092 Vienna, Austria 2017

Sliding wear of glass ionomer cements.
V. Preis, S. Hahnel, M. Behr, M. Rosentritt,
UKR University Regensburg, Germany
External studies | Surface hardness

Martens hardness according to DIN 50359-1:1997-10
Source: N. Ilie, University Munich, Germany, not published.
External studies | Surface hardness

The test procedure was carried out force controlled; the test load increased and decreased with constant speed between 0.4 mN and 500 mN. The load and penetration depth were continuously measured. The Universal hardness (Martens hardness) is defined as the test force divided by the apparent area of the indentation under the applied test force.

The Martens hardness of Ketac™ Universal Aplicap™ Glass Ionomer Restorative is statistically equivalent with or without coating to Ketac™ Molar Aplicap™ Glass Ionomer Restorative.

Martens hardness according to DIN 50359-1:1997-10
Source: N. Ilie, University Munich, Germany, not published.
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Internal Studies

Quality

Fluoride release

In-vitro 3-body wear

Flexural strength
Internal studies | Quality

CED IADR abstract # 0093 Vienna, Austria 2017
Determination of the Amount of Air Bubbles in Different Glass Ionomer Restoratives.
P. Braun, K. Claussen, C. Stein, M. Mikulla, C. Thalacker,
3M Germany, Seefeld, Germany
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Internal studies | Fluoride release

Accumulated fluoride release from various Glass Ionomer Restoratives over a 24-month testing period.

- Ketac™ Universal Aplicap™ Restorative
- riva self cure FS Caps
- riva self cure Regular Set Caps
- EQUIA™ Fil Capsule
- Fuji IX GP® Extra Caps
- riva self cure HV Caps
- Fuji IX GP® Caps
- Ketac™ Molar Aplicap™ Restorative
- ChemFil® Rock Caps
- Fuji IX GP® Fast Caps

3M Internal Lab Studies.
Recurrent caries is the most frequent cause for the failure of dental restorations. Fluoride is well documented as an anticariogenic agent.

Ketac™ Universal Aplicap™ Glass Ionomer Restorative releases a higher amount of fluoride than several competitive glass ionomer restoratives at least over a period of 24 months.
Fast and easy

**3M™ Ketac™ Universal Aplicap™**
Glass Ionomer Restorative

**Internal studies | In-vitro 3-body wear**

![Graph showing wear results for different restorative materials.](image)

- Ketac™ Universal Aplicap™ Glass Ionomer Restorative
- Ionofil® Plus Medium Viscosity Glass Ionomer Filling Cement
- Ketac™ Molar Aplicap™ Glass Ionomer Restorative
- riva self cure FS fast set Glass Ionomer Restorative Material
- Fuji IX GP® Capsule Radiopaque Posterior Glass Ionomer Restorative Cement
- Ionofil® Molar Glass Ionomer Restorative Material
- riva self cure HV High Viscosity Glass Ionomer Restorative Material

*3M Internal Lab Studies.*
Internal studies | In-vitro 3-body wear

Wear is measured as dimensional loss during 156,000 cycles which is determined by profilometry.

The wear resistance Ketac™ Universal Aplicap™ Glass Ionomer Restorative is better than the wear resistance of VOCO Ionofil® Plus Caps and Ketac™ Molar Aplicap™ and comparable to the wear resistance of Fuji IX GP® Caps and SDI riva self cure Fast Set Caps.
3M™ Ketac™ Universal Aplicap™
Glass Ionomer Restorative

Internal studies | Flexural strength

3M Internal Lab Studies.
The flexural strength is measured by applying a perpendicular load to a material specimen that is supported at each end. Flexural strength is the value obtained when the sample breaks.

The flexural strength of Ketac™ Universal Aplicap™ Glass Ionomer Restorative is comparable to several competitive encapsulated glass ionomer restoratives.
FAQ

What are the benefits of Ketac™ Universal Aplicap™ Glass Ionomer Restorative vs. conventional glass ionomer restoratives?

- 1-step placement: No need for conditioner/coating
- Extended indications for use: Long-term restricted stress-bearing Class I and Class II restorations
- Lower stickiness to metal instruments allows easy placement
- Better cavity adaptation

How is Ketac Universal Aplicap restorative different from previous Ketac™ products?

- No need for conditioner/coating
- Nicer aesthetics compared to Ketac™ Molar Aplicap™ Glass Ionomer Restorative
- Extended indications for use: Long-term restricted stress-bearing Class I and Class II restorations*
- Improved filler composition leading to high mechanical properties, even with lower viscosity (compared to Ketac™ Molar Glass Ionomer Restorative)

*Refer to the Instructions for Use for more information.

Why doesn't Ketac Universal Aplicap restorative need a conditioner?

Ketac Universal Aplicap restorative has comparable adhesion values when used with or without a Ketac™ Conditioner. Furthermore, adhesion tests performed in-house show that these adhesion values are statistically comparable to the adhesion values of the clinically proven Ketac™ Molar Alicap™ Glass Ionomer Restorative with Ketac™ Conditioner.
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<tr>
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<th>Answer</th>
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<td>Ketac Universal Aplicap restorative is compatible with Ketac™ Conditioner. Using a conditioner does not lead to negative effects; however, it does not significantly change the adhesion values.</td>
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<td><strong>Why doesn’t Ketac™ Universal Aplicap™ restorative need a coating?</strong></td>
<td>The special filler composition-in combination with the co-polymeric acid used-and the accelerated setting performance lead to high compressive and flexural strength. In addition, the material exhibits high surface hardness values even in early maturation stages (within 10 minutes after the start of setting), thus surface hardness is high regardless of using a coating or not.</td>
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<tr>
<td><strong>Can I use a coating? Does it have any effects?</strong></td>
<td>Ketac Universal Aplicap restorative can be coated using Ketac™ Glaze, Scotchbond™ Universal Adhesive or Single Bond Universal Adhesive. Applying a coating will make the surface of the restoration glossier for the first hours; nevertheless, the performance of the material will remain unchanged.</td>
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Protect

Minimum Intervention Oral Care of Non-Cavitated Lesions

Fluoride Intervention

Calcium/Phosphate Intervention

Comfortable caries protection – 3M™ Clinpro™ Sealant Fissure sealant

Extended-release formula – 3M™ Clinpro™ White Varnish 5% sodium fluoride
Minimum Intervention Oral Care of Non-Cavitated Lesions

How can you provide extra protection for your susceptible patient?

- Assess and determine each patient’s risk of caries – a patient’s individual risk will depend on their habits and protective factors
- Educate the patient on that risk – a risk assessment tool may be very beneficial
- Help your patient reduce the risk with specific treatment protocols and products
- Help maintain a healthy oral environment by implementing and documenting the plan of care
Minimum Intervention Oral Care of Non-Cavitated Lesions

How can you provide extra protection for your susceptible patient?

Our Goals: Help tooth enamel and dentin better resist acid challenge in order to remineralize and avoid progressing to cavitated lesions. Once the lesion is there, provide extra protection to prevent new cavities from forming and avoid the failure of new or existing fillings.
Fluoride Intervention

Fluoride must be present in the:

- Right place (biofilm fluid or saliva)
- Right time (when biofilm is exposed to sugar or right after biofilm removal) to interfere with de- and remineralization events

Why?

- When fluoride is available in plaque biofilm during an acid attack, hydroxyapatite (HA) is dissolved at the same time that fluorapatite (FA) is formed
- The net result is a decrease in enamel dissolution, since a certain amount of calcium and phosphate that was lost as HA is now recovered by enamel as FA
- In addition, fluorapatite makes the crystals less susceptible to acid attack

Fluoride and tri-calcium phosphate enhance the natural mineral content of saliva needed for building strong teeth.

\[
\text{Calcium + Phosphate Mineral} = \text{Hydroxyapatite} \\
\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2
\]

\[
\text{Calcium + Phosphate + Fluoride Mineral} = \text{Fluorapatite} \\
\text{Ca}_5(\text{PO}_4)_3\text{F}
\]
Calcium/Phosphate Intervention

• Calcium and phosphate are the building blocks of the tooth, thus providing an extra source of it will boost the remineralization process, giving extra protection.

• There are many forms, but not all of them act the same; it is important to choose the proper one.

<table>
<thead>
<tr>
<th>ACP</th>
<th>TTCP</th>
<th>α-TCP</th>
<th>DCPD</th>
<th>OCP</th>
<th>β-TCP</th>
<th>HAP</th>
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<tr>
<td>Very soluble</td>
<td></td>
<td></td>
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<tr>
<td>• Reacts prematurely with fluoride and precipitates</td>
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<tr>
<td>• Needs transformation prior to crystallizing with teeth</td>
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</tbody>
</table>

• Closest to HAP in solubility
• Most likely to remain on tooth
• Aids in remineralization
Calcium/Phosphate Intervention | Functionalized $f$TCP

In 3M products:

- $f$TCP is functionalized to prevent CaF$_2$ precipitation
- $f$TCP protects fluoride from interacting prematurely with calcium
- Functionalized with small molecules that dissolve in oral cavity

When used:

- Saliva breaks down the protective coating to activate the calcium TCP compound
- Calcium, phosphate and fluoride are available to the tooth
- Enhances remineralization of hydroxyapatite
Comfortable caries protection

<table>
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<th>3M™ Clinpro™ Sealant</th>
<th>Fissure Sealant</th>
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<td>Pit- and fissure sealants</td>
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<td>Product features</td>
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<td>FAQ</td>
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</tbody>
</table>
Comfortable caries protection

Pit- and fissure sealants

3M™ Clinpro™ Sealant
Fissure Sealant

Recommendations
Efficacy
Indications
Most tooth decay in children and teens occurs on the chewing surfaces of molars. Grooves on the biting surfaces of teeth can be impossible to clean effectively. Trapped food and germs create acids that eat away at the enamel, increasing the risk of decay. This makes pits and fissures especially prone to caries, and early lesions can quickly deteriorate into full-blown cavities.

Dental sealants fill and seal these grooves, forming a physical barrier to tooth decay. And that’s not all: updated ADA and AAPD guidelines now conclude that sealants are effective in preventing and arresting non-cavitated carious lesions. Products like 3M™ Clinpro™ Sealant can stop initial lesions in their tracks and help prevent further decay.

The AAPD and EAPD strongly recommend the use of sealants not only to prevent pit-and-fissure caries lesions, but also to arrest non-cavitated occlusal lesions.
Pit- and Fissure Sealants | Efficacy

The Centers for Disease Control and Prevention have also evaluated the efficacy of sealants. The graphic below illustrates the correlation between the number of children with sealants who have cavities, versus those without sealants. While low-income children are still at a disadvantage compared to high-income children, access to sealant programs minimizes the negative impact.

**Cavities: disparities still exist**

Low-income children without sealants have about 60% more cavities in their 1st permanent molars than higher-income children.

- Low-income children
- Higher-income children

Pit- and Fissure Sealants | Indications

Pit and fissure sealing is therefore indicated in the following clinical situations:

- Caries-free pits and fissures in patients at high risk for caries
- Caries-free but susceptible pits and fissures with a ragged and deep fissure relief, irrespective of the estimated risk for caries
- Pits and fissures with non-cavitated carious lesions, irrespective of the estimated risk for caries
- In patients in whom the caries risk caries is persisting, partially or completely lost sealants should be repaired or renewed

Examination for caries prior to pit and fissure sealing.

- Healthy fissure
- Non-cavitated carious lesion
- (Micro) Cavitation

- Site- and patient-specific risk for caries
- Additional diagnostic tools
- No dentine caries
- Dentine caries
- Monitoring
- Pit and fissure sealing
- Minimally invasive restoration

Courtesy by Prof. Jan Kühnisch, Munich.
Prof. Jan Kühnisch has received honoraria from 3M Oral Care.
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

Product features

Aids in the prevention of caries

Changes color from pink to white during light cure

Unfilled: flows into pits and fissures

Self-occluding: needs little or no adjustment after curing

Contains fluoride

Supplied in a syringe or bottle dispenser

Needle-nose tip on syringe to aid in placement
Indications

Sealing the enamel pits and fissures of teeth to aid in the prevention of caries
Comfortable caries protection

**3M™ Clinpro™ Sealant**
Fissure Sealant

**Handling**

- Step by step card ➔
- Video ➔
Comfortable caries protection

Handling | Step by step card

Pit and Fissure Sealant application technique

1. Apply etohant to all enamel surfaces to be sealed.

   Note: Adhesive may be used instead of etoh technique.

2. Thoroughly rinse teeth to remove etohant, then dry the etched surfaces.

3. Apply 3M™ Clinpro™ Sealant into pits and fissures.

4. Light cure the sealant according to manufacturer's instructions.

   LED: 10 sec.
   Halogen: 20 sec.
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

Handling | Video

3M™ Clinpro™ Sealant

Technique for sealing pits and fissures
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

Clinical Performance

Clinical Case 1
Fissure sealing of tooth 26

Clinical Case 2
Fissure sealing of teeth 64 and 65
Clinical Performance | Clinical Case 1
Fissure sealing of tooth 26

The upper permanent molars of a seven-year-old child at high risk for caries showed essentially normal fissure relief. The teeth were first cleaned with a rotating prophylaxis brush and prophylaxis paste, relative dryness was obtained, acid etching was performed for about 60 seconds, the etching gel was sprayed off, and the etched areas were force-dried.

The sealant was then applied, distributed over the entire fissure relief and cured. A fluoride varnish was then applied.
Comfortable caries protection

Clinical Performance | Clinical Case 1
Fissure sealing of tooth 26

3M™ Clinpro™ Sealant
Fissure Sealant

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Clinical Performance | Clinical Case 1
Fissure sealing of tooth 26

Courtesy by Prof. Jan Kühnisch, Munich.
Prof. Jan Kühnisch has received honoraria from 3M Oral Care.
A four-year-old child was found to have early childhood caries. Multiple fillings and extractions were required in all areas other than the left upper quadrant, the posterior teeth of which were essentially intact. However, radiography showed microcavitation suggestive of dentine caries in the outer half of the dentin of tooth 55. This tooth was restored by minimally invasive filling.

In light of the child’s high risk for caries, it was decided to seal the fissures that were present in the upper left first and second deciduous molars. To this end, relative dryness was obtained, acid etching was performed for about 120 seconds, the etching gel was sprayed off and the etched areas were force-dried. The sealant was then applied, distributed over the entire fissure relief, and cured. A fluoride varnish was then applied.
Comfortable caries protection

Clinical Performance | Clinical Case 2
Fissure sealing of teeth 64 and 65

3M™ Clinpro™ Sealant
Fissure Sealant

Courtesy by Prof. Jan Kühnisch, Munich.
Prof. Jan Kühnisch has received honoraria from 3M Oral Care.
Comfortable caries protection

3M™ Clinpro™ Sealant
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Clinical Performance | Clinical Case 2
Fissure sealing of teeth 64 and 65

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Comfortable caries protection

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Comfortable caries protection

**3M™ Clinpro™ Sealant**
Fissure Sealant

**External in-vitro studies**

- Microtensile bond strength
- Microleakage and marginal adaptation
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

External in-vitro studies | Microtensile bond strength

Microtensile Bond Strength to Surface Enamel

The figure shows microtensile bond strength of sealants bonded to buccal enamel surfaces of bovine teeth measured by Papacchini et al. [2006]. Clinpro™ Sealant and Delton® Sealant were applied with etching, Dyract® Seal was applied with a non-rinse conditioner, and Fuji II LC with GC Cavity Conditioner.

**Conclusion:** According to this model, resin-based materials (Clinpro Sealant, Delton) showed better microtensile bond strength than compomer (Dyract Seal) or resin-modified glass ionomer (Fuji II LC).
Comfortable caries protection

External in-vitro studies | Microleakage and marginal adaptation

Microleakage After Thermal-Mechanical Loading

Rodriguez Tapia MT, Ardu S, et al, Evaluation of marginal adaptation, seal and resistance against fatigue cracks of different pit and fissure sealants under laboratory load.


### External in-vitro studies | Microleakage and marginal adaptation

<table>
<thead>
<tr>
<th>Sealant</th>
<th>Dye Penetration along Margin, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delton® LC</td>
<td>0.2</td>
</tr>
<tr>
<td>Optibond™ FL</td>
<td>0.4</td>
</tr>
<tr>
<td>3M™ Clinpro™ Sealant</td>
<td>0.6</td>
</tr>
<tr>
<td>Grandio Seal</td>
<td>0.8</td>
</tr>
<tr>
<td>Embrace™ WetBond™</td>
<td>1.0</td>
</tr>
<tr>
<td>Seal-N-Glo®</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Rodriguez et al. (2011) studied microleakage of sealants on extracted human molars after mechanical loading and thermocycling. The percentage of continuous margin was measured under a scanning electron microscope; microleakage was measured after immersion in cresyl blue dye. The figure shows microleakage after thermal-mechanical loading. Clinpro™ Sealant was statistically not different from Optibond™ FL and Delton® LC, and statistically lower than Grandio Seal, Embrace™ WetBond™, and Seal-N-Glo®.
Comfortable caries protection

External in-vitro studies  | Microleakage and marginal adaptation

External in-vitro studies | Microleakage and marginal adaptation

The figure shows marginal adaptation after thermal-mechanical loading. Clinpro™ Sealant was equivalent to Optibond FL, Delton LC, and Seal-N-Glo, and higher than Grandio Seal and Embrace WetBond.

Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

Internal in-vitro studies

- Fluoride release
- Fluoride uptake
- 3-body wear
Internal in-vitro studies | Fluoride release

3M™ Clinpro™ Sealant
Fissure Sealant

Cumulative Fluoride Release

- 3M™ Clinpro™ Sealant
- Ulroseal XT® plus
- Helioseal® F

3M Internal Lab Studies.
Comfortable caries protection

Internal in-vitro studies | Fluoride release

Cured disks of sealant (1 mm thick, 20 mm diameter) were stored in deionized water at 37°C; the water was exchanged periodically and fluoride concentration measured with a fluoride ion electrode (n=3). Clinpro™ Sealant had greater cumulative fluoride release than Ultraseal XT® plus Pit and Fissure Sealant and Helioseal® F after 28 days.
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

Internal in-vitro studies | Fluoride uptake

3M™ Clinpro™ Sealant with 3M™ Clinpro™ Tooth Crème

3M Internal Lab Studies.
Internal in-vitro studies | Fluoride uptake

The fluoride release of Clinpro™ Sealant was measured before and after multiple treatments with Clinpro™ Tooth Crème 0.21% Sodium Anti-Cavity Toothpaste, and after a single treatment of Clinpro™ White Varnish 5% Sodium Fluoride. Treatment with Clinpro Tooth Crème resulted in enhanced fluoride release from Clinpro Sealant up to six hours afterward; this recharge effect is repeatable.
Comfortable caries protection

**3M™ Clinpro™ Sealant**
Fissure Sealant

**Internal in-vitro studies | Fluoride uptake**

![Fluoride Uptake Chart](image_url)

**Fluoride uptake**

- **Fluoride release rate, µgF/cm²/hr**

 shameful

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3M™ Clinpro™ Sealant with 3M™ Clinpro™ White Varnish

3M Internal Lab Studies.
Internal in-vitro studies | Fluoride uptake

Treatment with Clinpro™ White Varnish also resulted in enhanced fluoride release up to six hours later. This demonstrates that Clinpro™ Sealant can absorb and re-release fluoride from a variety of topical fluoride treatments.

3M™ Clinpro™ Sealant
Fissure Sealant

3M Internal Lab Studies
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

Internal in-vitro studies | 3-body wear

3M™ Clinpro™ Sealant

3-Body Wear, 200k Cycles

3M Internal Lab Studies.
Internal in-vitro studies | 3-body wear

The 3-body wear of Clinpro™ Sealant, Embrace™ WetBond™, and Teethmate™ F-1 was determined with an ACTA Wear Machine (ACTA, Amsterdam, NL). The material loss in micrometers (µm) was measured after 200,000 cycles with a profilometer (n=2). The wear of Clinpro Sealant was statistically not different from Embrace WetBond and Teethmate.
Comfortable caries protection

External in-vivo studies

- Retention rate
- Caries prevention
- Comparison with GI's

3M™ Clinpro™ Sealant
Fissure Sealant
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

External in-vivo studies | Retention rate

Sealant Retention on First Permanent Molars at One Year

- **3M™ Clinpro™ Sealant**
- **Delton® FS+ Fuji VII Helioseal® F**

- Complete retention
- Partial retention
- Completely missing

Kumaran P., Clinical evaluation of the retention of different pit and fissure sealants: a 1-year study.
In a split-mouth design by Kumaran (2013), 40 children in Kochi, India, received four different pit and fissure sealants, which were evaluated at 6 and 12 months for total retention, partial retention, and total loss. Clinpro™ Sealant displayed retention that was statistically not different between 6 and 12 months, while Delton® FS+, Helioseal® F, and Fuji VII were statistically lower. Clinpro Sealant showed statistically significantly higher retention rate than Helioseal F and Fuji VII at 12 months.

Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

External in-vivo studies | Caries prevention

Percentage of Pit/Fissure Sites with Dentin Caries at Four Years

Liu BY, Lo EC, et al, Randomized trial on fluorides and sealants for fissure caries prevention.
In a study by Liu et al. (2012), 501 children (9.1 year average) in Guangzhou, China, received one of four treatments on their molar teeth (1,539 molars): Clinpro™ Sealant, annual silver diamine fluoride (SDF) application, biannual sodium fluoride varnish application, or placebo control. Examinations were conducted every 6 months through 24 months by a masked examiner. Fissures in all three treatment groups provided statistically significantly lower risk of dentin caries development than the untreated control.

Liu BY, Lo EC, et al, Randomized trial on fluorides and sealants for fissure caries prevention.
Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

External in-vivo studies | Comparison with GIs

**Cumulative Retention at 18 months**

- **3M™ Clinpro™ Sealant**
- **Glass Ionomer**

**Cumulative Caries-Free Survival at 18 months**

- **3M™ Clinpro™ Sealant**
- **Glass Ionomers**

In a split-mouth, randomized clinical trial by Al-Jobair et al. (2017), 140 fully erupted permanent first molars in children aged 6-9 years, in Riyadh, Saudi Arabia, were sealed with either Clinpro™ Sealant or a glass ionomer. Retention and caries status were evaluated semi-annually through 18 months. The cumulative survival percentage of sealant retention and caries-free pits and fissures were statistically not different for Clinpro Sealant and the glass ionomer at 18 months.
FAQ

Can I use a bonding agent with 3M™ Clinpro™ Sealant?
Several studies have been conducted with sealants and bonding agents. This technique has been shown to be useful when applying sealant to teeth that are difficult to keep isolated and there is concern about moisture contamination.

How will I know how many seconds are needed to cure Clinpro Sealant?
Consult your curing light manufacturer’s instructions. 3M lab testing showed Clinpro Sealant required the following cure times to pass the desired Barcol hardness test rating of 30, or higher, on both the top and bottom of prepared samples: All halogen lights (with output of 550-1000 mW/cm²) 20 seconds. All LED lights (with output 1000-2000 mW/cm²) 10 seconds.

How many teeth can be sealed with one syringe of Clinpro Sealant?
Each syringe contains approximately 70 applications. However, there are variations among patients that can impact the exact number.

Can I use a fluoride prophy paste to clean the teeth before placing a sealant?
Yes. There were no deleterious effects identified when polishing with either fluoridated or nonfluoridated polishing pastes.
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Comfortable caries protection

3M™ Clinpro™ Sealant
Fissure Sealant

FAQ

After curing, why is there an air-inhibited layer on the sealant?
The air-inhibited layer is unavoidable with methacrylate curing chemistry used in sealants and composites. Thinner layers will produce a higher level of air inhibition.

Because you are etching the enamel beyond where the sealant will be placed, will this exposed etched enamel now be more susceptible to caries?
The caries process on the occlusal surface is initiated within the fissures not on the cuspal inclines. In addition, it has been shown that etched enamel remineralizes completely within 48 hours due to the deposition of salivary calcium and phosphate salts.

Are sealants covered by insurance?
Most dental insurance companies have coverage for child and adolescent sealants. However, they do not always reimburse the dental professional if a sealant needs to be replaced.

Is a fissurotomy or enamelplasty recommended prior to sealant placement?
Fissurotomy and enamelplasty are no longer recommended for occlusal surfaces that have non-cavitated lesions. These practices result in a loss of healthy tooth structure and have not been shown to increase healthy outcomes.
**Comfortable caries protection**

3M™ Clinpro™ Sealant  
Fissure Sealant

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Extended-release formula

Product features

Extended fluoride release – 22,600 ppm sodium fluoride

Added calcium and phosphate (TCP)

Contains xylitol

No need to dry tooth surface

Can be applied to tooth surfaces where plaque is present

Can be applied with a swiping technique – no need to paint individual tooth surfaces

Unique applicator for back-of-glove dispensing

Migrates to hard-to-reach areas

Relieves hypersensitivity

Does not change appearance of metal or ceramic orthodontic brackets

Over 10 years of clinical success
Extended-release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Indications

Clinpro White Varnish is a 5% sodium fluoride varnish which produces mechanical occlusion of the dentinal tubules in the treatment of tooth hypersensitivity.
Extended-release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Handling

Step by step card

Video
**Handling | Step by step card**

1. Clinpro™ White Varnish can be applied to tooth surfaces where plaque is present. A prophylaxis is not required.

2. Open the unit-dose package of Clinpro™ White Varnish and dispense the entire contents. Use the applicator brush to thoroughly mix the varnish, since components of all sodium fluoride varnishes can separate during storage.

3. Apply the product to the teeth in a thin layer with the supplied brush. Apply the varnish with sweeping horizontal brush strokes. Avoid excessive contact with soft tissue. It is not necessary to use all of the varnish provided. Use only enough varnish to form a thin coating on the desired treatment area.

4. After application, instruct the patient to close their mouth to set the varnish. Rinsing or suctioning immediately after application is not recommended. You may see a thin coating on the teeth. The patient may feel the thin coating when rubbing the treated area with their tongue.

5. The treatment period for Clinpro™ White Varnish is a **minimum** of 4 hours. Left undisturbed, Clinpro™ White Varnish will continue to release fluoride, calcium and phosphate for 24 hours.

6. To achieve the maximum benefit after application, please advise the patient to follow the Patient Instructions above.

**Extended-release formula**

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

**Open the unit-dose package and dispense the entire contents onto a mixing surface.**

For easy application, squeeze onto the gloved hand like a painter’s palette, so you can efficiently deliver varnish to the patient.

**IMPORTANT: Use the applicator brush to thoroughly mix Clinpro™ White Varnish, since components of all sodium fluoride varnishes can separate during storage. While mixing, keep the material evenly distributed.**

**Apply Clinpro™ White Varnish evenly in a thin layer over treatment area(s) with sweeping, horizontal brush strokes. No suction required. Refer to Instructions for Use for complete details.**
Extended-release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Handling | Video
Clinical Performance

Clinical Case
Prevention programs adapted to the individual patient’s needs

Clinical Video
**Clinical Performance | Clinical Case**

Prevention programs adapted to the individual patient’s needs

Patient after professional tooth cleaning.

Photos courtesy of Dr. Jacqueline Esch, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral Care.
Extended-release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Clinical Performance | Clinical Case
Prevention programs adapted to the individual patient’s needs

Application of 3M™ Clinpro™ White Varnish onto the patient’s teeth horizontally in a thin, uniform layer. Since it sets in the presence of saliva, drying of the tooth surfaces is not required.

Photos courtesy of Dr. Jacqueline Esch, Germany.
Dr. Jacqueline Esch has received honoraria from 3M Oral Care.
Extended-release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Clinical Performance | Clinical Case
Prevention programs adapted to the individual patient’s needs

The fluoride varnish also migrates to hard-to-reach surfaces, which is supported by the patient licking the teeth with her tongue.

Photos courtesy of Dr. Jacqueline Esch, Germany.
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Extended-release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Clinical Performance | Clinical Video

Staying in contact matters,
Internal in-vitro studies

Migration
Fluoride release
Fluoride uptake
Calcium and phosphate release
Internal in-vitro studies | Migration

In Vitro Migration of Varnish Over 10 Minutes

Vertical Flow Test 3M™ Vanish White Varnish begins to migrate immediately after placement:

Migration is enabled through 3M’s unique, patented formulation.
3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Internal in-vitro studies | Fluoride release

Cumulative Fluoride Release of Vanish™ White Varnish Over 24 Hours

3M Internal Lab Studies.
Laboratory testing demonstrates that Vanish™ White Varnish releases fluoride consistently for 24 hours when the coating is left in place. After 24 hours, Vanish White Varnish still has the ability to release fluoride from the remaining coating. You can be confident your patients are protected long after they leave your dental chair.
Internal in-vitro studies  |  Fluoride uptake

Extended release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

In Vitro Enamel Fluoride Uptake of Vanish White Varnish After 4-Hour Dynamic Model (n = 10, +/- standard deviation)

3M Internal Lab Studies.
Fluoride uptake is the ability of fluoride to be absorbed into the tooth and thus be incorporated into the mineral. Laboratory testing using a model similar to FDA Method 40 for enamel fluoride uptake demonstrates the fluoride in Vanish™ White Varnish can be absorbed by lesioned enamel.

Method used for fluoride uptakes: Bovine enamel specimens with artificial lesions were placed into stratified treatment groups (n=10) based on Vickers surface-microhardness (4x200g-load-15sec.). Samples were treated with varnish and submerged in artificial saliva. The artificial saliva was removed and replaced with fresh artificial saliva at 0.25, 0.50, 1.0, 2.0 and 4.0 hours to simulate saliva flow during treatment. After 24-hour samples were challenged with lactic acid (pH=5.0) for 24 hours, fluoride uptake (microdrill biopsy 100µm deepx1mm diameter) and Vickers microhardness were measured after treatment and after acid attack.
Internal in-vitro studies | Calcium and phosphate release

In Vitro Calcium and Phosphorous Release From Vanish™ White Varnish Over 24 Hours (n = 5, +/- standard deviation)

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Extended release formula

3M Internal Lab Studies.
3M™ Clinpro™ White Varnish
5% Sodium Fluoride

Internal in-vitro studies | Calcium and phosphate release

Calcium and phosphate are essential for building strong tooth mineral. Vanish™ White Varnish contains added calcium and phosphate and releases these minerals from the varnish coating alongside fluoride, so all three minerals are able to interact. Laboratory testing demonstrates Vanish White Varnish releases calcium and phosphate for 24 hours when the coating is left in place.
### Extended release formula

**3M™ Clinpro™ White Varnish**
5% Sodium Fluoride

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**Internal in-vivo study | Varnish migration**

<table>
<thead>
<tr>
<th>Number of Teeth on Which Varnish was Detected</th>
<th>Initial</th>
<th>3 Minutes</th>
<th>1 Hour</th>
<th>4 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>18</td>
</tr>
</tbody>
</table>

**In Vivo Migration of 3M™ Vanish™ White Varnish Over 4 Hours**

Internal in-vivo study | Varnish migration

**Method:**
Vanish™ White Varnish was applied to 8 anterior maxillary teeth of 20 subjects.

**Results:**
Varnish migration began almost immediately after application and continued for at least four hours. Vanish White Varnish migrated to more than double the number of surfaces to which it was applied.

Extended release formula

3M™ Clinpro™ White Varnish
5% Sodium Fluoride

External in-vivo studies   |   Fluoride in saliva


![Graph showing Fluoride concentration in saliva and biofilm fluid for 3M™ Vanish™ White Varnish and Premier® Enamel Pro® Varnish. The graph indicates higher fluoride concentration for 3M™ Vanish™ White Varnish.](image-url)
Clinical study of fluoride concentration in biofilm fluid and saliva after varnish application.

The total fluoride content (area-under-curve) in centrifuged saliva is higher for Vanish™ White Varnish than Premier® Enamel Pro® Varnish.

This measure shows the freely available ionic fluoride in saliva; centrifuging eliminates fluoride that might be bound to minerals or molecules and therefore unavailable.
FAQ

What advantages does Clinpro™ White Varnish 5% Sodium Fluoride offer over other fluoride varnishes?

Clinpro White Varnish contains 22,600 ppm fluoride and an innovative tri-calcium phosphate ingredient, available exclusively from 3M. A protective coating is added to the tri-calcium phosphate. This protective layer keeps it separate from the fluoride in the varnish to prevent the minerals from prematurely combining. After Clinpro White Varnish is applied to the tooth surface, the protective coating slowly dissolves and releases fluoride, calcium and phosphate ions into the saliva. Fluoride and calcium react to form calcium fluoride.

Clinpro White Varnish creates a durable coating that adheres to teeth and also migrates to additional tooth surfaces. The varnish contains a modified rosin in an alcohol-based solution that allows Clinpro White Varnish to adhere to the teeth to which it has been applied and yet migrate to additional tooth surfaces, including areas of the mouth that may be difficult to reach.

Clinpro White Varnish is virtually invisible on the tooth. The product is white in color when applied to the tooth. Clinical studies show 95% of subjects rated the appearance of Clinpro White Varnish to be acceptable after application. Clinpro White Varnish can be applied to moist tooth surfaces and to tooth surfaces where plaque is present. Saliva activates the varnish and forms a coating on the tooth surface.

What is the role of calcium and phosphate in Clinpro White Varnish?

The added calcium and phosphate in Clinpro White Varnish increases the likelihood of forming calcium fluoride globules on tooth surfaces.
Extended release formula

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**How is Clinpro™ White Varnish packaged?**
Clinpro White Varnish is supplied in single unit-dose packages to eliminate the problems of product separation that may occur in large, multi-dose containers. Unit-dose packaging also eliminates the chance of cross-contamination. You can be assured each unit-dose contains the correct amount of fluoride. Use the applicator brush to thoroughly mix Clinpro White Varnish prior to application, as all sodium fluoride varnishes separate during storage.

**How often should I apply Clinpro White Varnish?**
Many dental professionals apply Clinpro White Varnish twice a year, but the product can be applied more frequently if needed. Clinpro White Varnish is safe to use four times per year for patients 6 years and older.

**Will my patients notice Clinpro White Varnish on their teeth?**
Patients may feel a thin coating of varnish on their teeth when rubbing the treated area with the tongue. Patients may see a thin coating when looking at the teeth, but for most patients, Clinpro White Varnish is not noticeable in appearance.

**Can patients undergoing orthodontic treatment use Clinpro White Varnish 5% Sodium Fluoride?**
Patients undergoing orthodontic treatment with traditional metal or ceramic brackets may use Clinpro White Varnish. Laboratory testing demonstrates that Clinpro White Varnish has the ability to migrate around orthodontic banding. Patients who use removable clear tray aligners should refrain from using rosin-based varnishes, as these products will stick to the aligner.
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Can my patient eat after application of Clinpro™ White Varnish?
Patients can eat immediately after application of Clinpro White Varnish. They should avoid eating foods that are hard or sticky and drinking beverages that are hot or contain alcohol. This includes the use of mouth rinses containing alcohol.

Should patients stop using fluoride rinses or supplements after application of Clinpro White Varnish?
Patients should not use prescriptive fluoride preparations such as gels or rinses for 24 hours after application of Clinpro White Varnish. Children who are taking fluoride supplements should discontinue use of these supplements for 2–3 days following treatment with Clinpro White Varnish.

Are there any contraindications to the use of Clinpro White Varnish?
As with other fluoride varnishes, Clinpro White Varnish should not be applied to patients with ulcerative gingivitis (ANUG) or stomatitis. Patients with a known allergy to colophony/rosin should avoid this product.

What is the best way to remove Clinpro White Varnish if it accidentally gets on my dental instruments or equipment?
A small amount of rubbing alcohol or alcohol-based hand sanitizer will remove the product from unwanted surfaces.
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Mineralize

3M™ Clinpro™ Tooth Crème
0.21% Sodium Fluoride Anti-Cavity Toothpaste
Non-prescription strength

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3M™ Clinpro™ Tooth Crème
0.21% Sodium Fluoride Anti-cavity Toothpaste

Product features

Contains 0.21% NaF (950 ppm fluoride ion)

Contains Innovative Calcium and Phosphate Ingredient

Patented

Exclusive

Low Abrasion

Ideal for patients with exposed roots and root caries

Effective Cleaning

Gently removes stains to whiten teeth
Indications

Aids in the prevention of tooth decay – part of a professional program

Tooth decay – a multi-factorial, infectious disease that afflicts most people
Non-prescription strength

3M™ Clinpro™ Tooth Crème
0.21% Sodium Fluoride Anti-cavity Toothpaste

Internal in-vitro studies

- pH cycling 20-day: Fluoride uptake
- pH cycling 20-day: Remineralization
- Abrasivity testing: Enamel / Dentine
- Stained pellicle cleaning
Non-prescription strength

3M™ Clinpro™ Tooth Crème
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Internal in-vitro studies  |  pH cycling 20-day:
Fluoride uptake

Fluoride Uptake [Mean +/- SEM]

- GC MI Paste Plus® (CPP-ACP + 900ppm F)
- Colgate® PreviDent® 5000 Booster
- 3M™ Clinpro™ Tooth Crème (950ppm F)

Superior Fluoride Uptake

3M Internal Lab Studies.
Non-prescription strength

3M™ Clinpro™ Tooth Crème
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Internal in-vitro studies | pH cycling 20-day:
Remineralization

% Change in Surface Microhardness [Mean +/- SEM]

Fluoride-Free | GC MI Paste Plus® (CPP-ACP + 900ppm F) | Colgate® PreviDent® 5000 Booster | 3M™ Clinpro™ Tooth Crème (950ppm F)

Superior Remineralization

3M Internal Lab Studies.
Non-prescription strength

**3M™ Clinpro™ Tooth Crème**
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Internal in-vitro studies | Abrasivity testing: Enamel/Dentin results

![Graph showing Relative Enamel Abrasion (REA) scores](image_url)

*Low abrasion*

3M Internal Lab Studies.
Data generated by Therametric Technologies for 3M.
Non-prescription strength

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Internal in-vitro studies | Abrasivity testing: Enamel/Dentin results

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Non-prescription strength

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Internal in-vitro studies | Stained pellicle cleaning

Pellicle Cleaning Ratio [Mean +/- SEM]

Gentle cleaning
Gentle whitening

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Data generated by Therametric Technologies for 3M.
Non-prescription strength

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External in-vitro studies

Remineralization study 1
In-vitro remineralization of enamel subsurface lesions and assessments of dentin tubule occlusion from NaF dentifrices with and without calcium

Remineralization study 2
Comparative Evaluation of Remineralizing Potential of Three Agents on Artificially Demineralized Human Enamel: An In Vitro Study

Remineralization study 3
Effect of Tri-Calcium Phosphate, Casein Phosphopeptide- Amorphous Calcium Phosphate and Sodium Fluoride Products on Demineralization of Artificial Advanced Enamel Lesions

Protection against acid attacks
External in-vitro studies | Remineralization study 1
In-vitro remineralization of enamel subsurface lesions and assessments of dentin tubule occlusion from NaF dentifrices with and without calcium

Non-prescription strength

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External in-vitro studies | Remineralization study 2
Comparative Evaluation of Remineralizing Potential of Three Agents on Artificially Demineralized Human Enamel: An In Vitro Study

Mean (±SD) change in DIAGNOdent scoring (Δ Score) of enamel lesions after remineralization for seven days

Artificial Salvia
CPP-ACP
900 ppm F + CPP-ACP
950 ppm F + f TCP

External in-vitro studies | Remineralization study 2
Comparative Evaluation of Remineralizing Potential of Three Agents on Artificially Demineralized Human Enamel: An In Vitro Study

Human molar enamel sections with lesions were treated with toothpaste slurry via cotton applicator for 4 minutes, rinsed with deionized water, then immersed in daily refreshed artificial saliva (pH 7) for 7 days. Specimens were assessed with DIAGNOdent and scanning electron microscopy.

Between the two CPP-ACP pastes, greater remineralization was achieved when combined with fluoride.

Clinpro™ Tooth Crème produced superior remineralization of advanced enamel lesions compared to Tooth Mousse, Tooth Mousse Plus, and the artificial saliva control.

Non-prescription strength

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0.21% Sodium Fluoride Anti-cavity Toothpaste

External in-vitro studies | Remineralization study 3
Effect of Tri-Calcium Phosphate, Casein Phosphopeptide- Amorphous Calcium Phosphate and Sodium Fluoride Products on Demineralization of Artificial Advanced Enamel Lesions

Human molar enamel sections with advanced lesions (>300 μm deep) were subjected to pH cycling for 10 days, with two 2-min treatments per day.

The lesion size before and after treatment was measured via polarized light microscopy.

A fluoride dose-response was observed, indicating model sensitivity to fluoride.

Between the two CPP-ACP pastes, greater remineralization was achieved when combined with fluoride.

Clinpro™ Tooth Crème produced superior remineralization of advanced enamel lesions compared to Tooth Mousse, Tooth Mousse Plus, and a 1,000 ppm F toothpaste.
Non-prescription strength

**External in-vitro studies** | **Protection against acid attack**

SEM images (1,000x) of enamel surfaces after 28-day remin phase, followed by a 4-day demineralization event

- **Control**
- **900 ppm F + CPP-ACP**
- **950 ppm F + TCP**

Non-prescription strength

3M™ Clinpro™ Tooth Crème
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External in-vivo studies

- Remineralization study 1
  - In situ evaluation of 950 and 1100 ppm F dentifrices

- Remineralization study 2
  - Efficacy of two calcium phosphate pastes on the remineralization of artificial caries: a randomized controlled double-blind in situ study

- White-spot reduction
Non-prescription strength

3M™ Clinpro™ Tooth Crème
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External in-vivo studies | Remineralization study 1
In situ evaluation of 950 and 1100 ppm F dentifrices

ΔVHN, kg/mm²

Demineralized, sterilized human enamel tiles were bonded to molars of 38 subjects in a randomized single-blinded crossover study. Each subject brushed with each toothpaste for 28 days, with a one-week washout in between.

Vickers hardness was measured before and after the brushing period; enamel fluoride uptake was measured after.

Despite having 150 ppm less fluoride, Clinpro™ Tooth Crème exhibited remineralization and enamel fluoride uptake not statistically different from the conventional 1,100 ppm F toothpaste.

These results demonstrate inclusion of TCP did not interfere with fluoride, suggesting Clinpro Tooth Crème may be a safe, effective option for those desiring a lower-fluoride dentifrice.
Non-prescription strength

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**External in-vivo studies | Remineralization study 2**
Efficacy of two calcium phosphate pastes on the remineralization of artificial caries: a randomized controlled double-blind in situ study

External in-vivo studies | Remineralization study 2
Efficacy of two calcium phosphate pastes on the remineralization of artificial caries: a randomized controlled double-blind in situ study

Double-blind crossover in situ clinical study with 9 subjects who wore palatal appliances with human enamel tiles with artificial lesions, 14 days per phase.

Subjects brushed with 0.25 g of Clinpro™ Tooth Crème, or 1.0 g of fluoride toothpaste. In a third phase, subjects applied Tooth Mousse Plus after brushing with fluoride toothpaste.

Lesion area was measured via polarized light microscopy before and after the test period.

Brushing with a pea-sized amount of Clinpro Tooth Crème produced the same level of remineralization as with 4 times that amount of an over-the-counter fluoride toothpaste.

Tooth Mousse Plus provided no additional benefit over the fluoride toothpaste alone.

Non-prescription strength

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External in-vivo studies | White-Spot Reduction

% Change in White-Spot Lesion Area After 12 Weeks

Non-prescription strength

19 healthy orthodontic patients with white-spot lesions at debonding were instructed to brush twice daily for 2 minutes with Clinpro™ Tooth Crème.

White-spot areas were measured on photos taken at debonding, 4, 8 and 12 weeks.

Clinpro Tooth Crème provided statistically significant reduction in white-spot lesion area at 12 weeks after debonding (p=0.00).

Clinpro Tooth Crème reduced white-spot lesion area by 48% at 12 weeks after orthodontic debonding.