

GC Glass ionomer casebook

GC Glass Ionomer Casebook: Practical Solutions for Everyday Dentistry



Since 1921
100 years of Quality in Dental



Glass Ionomer casebook

Glass ionomer cement (GIC) a key material for cavity restorations due to its unique properties, helping to prevent recurrent decay and supporting long-term oral health: it chemically bonds to tooth structure, it can release and exchange ions important in rebuilding the enamel, and offers excellent biocompatibility. Moreover, it's easy to handle and the restorative procedure is quick. It does not require absolute isolation or bonding steps, therefore, making it suitable for a wide range of indications—from temporary sealing and restorations to long-term solutions, including cases where adhesion is challenging, such as molar incisor hypomineralisation (MIH). While dental professionals are generally familiar with the features of GICs, the wide variety of restorative materials available today can make it easy to overlook their benefits. In this book, we focus on conventional GICs to highlight their value and remind practitioners of their versatility and effectiveness.

In this glass ionomer casebook, we delve deeper into the reasons for using GICs and illustrate their use through practical examples.

We hope it serves as a valuable resource in your restorative practice.

GC Europe
Product Management



Moisture tolerant

'Forgiving' material
No rubber dam required



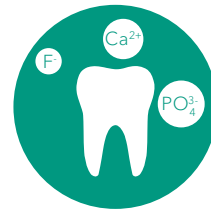
Chemical adhesion

No need for etchant or adhesive
Bonds even to aprismatic enamel and sclerotic dentine



Minimally invasive

Suitable for the partial caries excavation technique
Excellent biocompatibility



Natural ion reservoir

Through ion exchange, glass ionomers are able to stimulate tooth remineralization and prevent tooth demineralisation

Table of contents

1. History of GC Glass ionomers	4
2. STEP BY STEP Glass Ionomer Cement	5
3. CASE 1 Therapeutic sealant of an active moderate caries lesion with Fuji TRIAGE by Dr. Luciano Zafarano / Italy	6
4. CASE 2 Treatment of a disabled and phobic patient under general anaesthesia with Fuji IX GP by Dr. Camille Inquimbert / France	8
5. CASE 3 Restoration of a cervical lesion with hypersensitivity with Fuji II LC by Dr. Ivan Šalinović / Croatia	10
6. CASE 4 Class V cavity restoration with Fuji II LC by Dr. Azam Bakhshandeh / Denmark	12
7. Product information	15

History of GC Glass Ionomers

In January 1977, GC Corporation introduced the first luting glass ionomer cement “Fuji Ionomer type I” in Japan. By April of the same year, they released “Fuji Ionomer Type II”, a filling material exhibiting fluoride release and chemical adhesion. However, customers requested improvements in translucency, strength, radiopacity and less water absorption to avoid discolouration.

To meet these requests, GC further improved Fuji ionomer type II and developed “Fuji ionomer type II LC”, leading to the current resin modified glass ionomer, “Fuji II LC”.

At the same time, GC developed Fuji IX in collaboration with the WHO to provide emerging markets the ability to deliver dental treatment without the need for electric devices. In the early stages of caries, dentists can use a hand instrument such as an excavator to remove soft dentine and then fill the cavity with Fuji IX, which offers chemical tooth adhesion and biocompatibility. In 1995, the WHO adopted Fuji IX for the ART technique. The addition of shades to Fuji IX resulted in Fuji IX GP, which is now available in more than 80 countries.








While composite is the material of choice for cavity restorations in many countries, glass ionomer cements have proven their merit for over 35 years. Thanks to their proven benefits and continuous advancements, they remain a relevant and effective option that aligns well with the demands of modern dentistry.



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STEP BY STEP

INITIAL STEPS

<p>1</p>  <p>In case of Class II cavities, use a sectional matrix to form contact point</p>	<p>2</p>  <p>Clean the preparation and apply CAVITY CONDITIONER (10 sec.) or DENTIN CONDITIONER (20 sec.)</p>	<p>3</p>  <p>Rinse and gently dry, do not desiccate</p>	<p>4</p>  <p>Shake or tap the capsule on its side to loosen the powder. Make sure to depress the plunger and hold it down for 2 seconds.</p>
<p>5</p>  <p>Mix for 10 sec. at high speed Check IFU for working time</p>	<p>6</p>  <p>Insert on Capsule Applicator. Click twice to prime capsule</p>	<p>7</p>  <p>Proceed to capsule activation then immediately after dispense within 10 sec.</p>	

GC Fuji TRIAGE™ CAPSULE - Low-Viscosity Glass Ionomer Protection & Temporary Restorative

The Best Fluid Protection



8



Use a brush to directly spread a thin film of GC Fuji TRIAGE™ CAPSULE

9



Thermo cure for 20 - 40 sec. (Only for PINK shade)

10



Finish under water spray using superfine diamond bur or silicone finishing point

11



Apply GC Fuji VARNISH or GC Fuji COAT LC and light-cure for 10 sec.

GC Fuji IX GP Capsule - Radiopaque posterior glass ionomer restorative cement

The packable glass ionomer restorative



8



Final finishing under water spray using after 6 mins.

9



Apply a final coat of GC Fuji VARNISH (blow dry), GC Fuji COAT LC or G-COAT PLUS.

10



Light cure for 10 sec. (GC Fuji COAT LC) or for 20 sec. (G-COAT PLUS)

GC Fuji™ II LC CAPSULE - Light-Cured Resin Modified Glass Ionomer

The Easy Anterior Option



8



Form the contour and place a matrix if required

9



Light cure for 20 sec.

10



Finish under water spray using superfine diamond bur or silicone finishing point

11



Apply GC Fuji VARNISH or GC Fuji COAT LC and light-cure for 10 sec.

Case 1

Dr Luciano Zaffarano

DDS, Adjunct Professor, University of Cagliari, Italy



Therapeutic sealant of an active moderate caries lesion (tooth 27)

Initial situation : 12-year-old patient with high caries risk.

Behavioural risk factors:

Frequent exposure (>3 times/day) of sugar-containing snacks or beverages between meals.

Caries risk factors:

Visible plaque on teeth.

Protective factors:

The patient did not brush daily with fluoridated toothpaste.

Disease indicators: The patient had interproximal lesions, new non-cavitated caries lesions and recently placed restorations (< 3 years).

Moderate caries lesion (ICDAS 3), active caries lesion (Nyvad criteria).



Plaque disclosure with GC Tri Plaque ID Gel.
The three-toned gel reveals the location and age of the plaque.



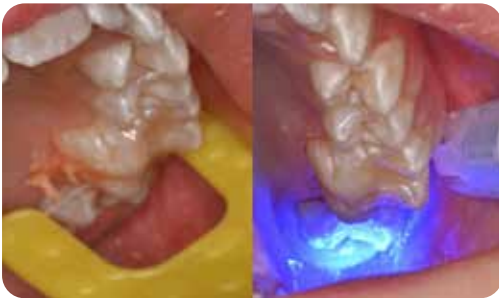
The cavity was cleaned by air polishing with glycine powder.



GC Fuji TRIAGE (Pink) was placed as a sealant. Setting of the pink shade can be accelerated by heat; additionally, the coloured sealant facilitates visual check-up.



The material can easily be placed with the "finger press technique".



After excess removal (interdentally with dental floss) heat was applied to accelerate the setting.

Post-operative situation and after occlusal check



Courtesy of Dr. Luciano Zaffarano, Italy



Used products: GC Tri Plaque ID Gel, GC Fuji TRIAGE

Case 2

Dr Camille Inquimbert

DDS, Faculty of Dental Medicine and Oral Health Sciences
Public health, France



Treatment of a Disabled and Phobic Patient under General Anaesthesia with Fuji IX GP

The management of patients with disabilities, particularly those with severe dental phobia, presents significant challenges for healthcare teams. This clinical case highlights the importance of a tailored approach in a hospital setting, specifically under general anaesthesia, to provide essential dental care for a patient with infrequent oral hygiene.

A disabled patient with severe dental phobia was referred for treatment under general anaesthesia. The patient's last dental surgery took place five years ago, indicating the difficulty in providing dental care due to the disabling phobia. The patient also presented with infrequent oral hygiene, which contributed to the development of multiple carious lesions and the overall deterioration of oral health.

Upon examination, several carious lesions were identified on teeth 14, 25, 35, and 45. Additionally, the remaining posterior teeth were deemed non-restorable and required extraction. Radiographic assessment confirmed these findings, showing root resorption and periapical lesions on some teeth.

Given the patient's dental phobia and the inability to undergo treatments in a dental chair, it was decided to proceed with treatment under general anaesthesia. The treatment plan included the following steps:

1. Extraction of Non-Restorable Posterior Teeth:

Extraction of teeth with significant mobility or irreversible infectious lesions was performed.



Courtesy of Dr. Camille Inquimbert, France

2. Conservative Treatment: The carious cavities of teeth 14, 25, 35, and 45 were thoroughly cleaned, removing infected dentine and preserving healthy dentine. The cavities were then restored using **glass ionomer cement (GIC)**, specifically GC Fuji IX GP A3, which provides strong adhesion to dental tissues and ion exchange to promote remineralization.



Courtesy of Dr. Camille Inquimbert, France

3. Oral Hygiene and Prophylaxis: Due to the patient's phobia, no further chairside dental care would be possible. Therefore, an **individual prophylaxis plan** was implemented, focusing on regular fluoride application to prevent new carious lesions. This included the use of fluoride gels tailored to the patient's specific needs.

The management of disabled and phobic patients often requires treatment under general anaesthesia to ensure appropriate dental care. In this case, the extraction of non-restorable teeth and the restoration of remaining teeth with GIC helped stabilize the patient's oral condition. An individual fluoride prophylaxis protocol is crucial to maintain oral health in a context where routine chairside dental care is not feasible.

- **Regular follow-up with specialized care teams:** Although the patient cannot be treated in a dental chair, regular hospital-based evaluations are recommended to monitor oral health.
- **Family and caregiver education:** It is essential to educate caregivers and family members on the importance of daily oral hygiene and the use of fluoride products to prevent further dental issues.



Used products: Fuji IX GP

Case 3

Dr Ivan Šalinović

DMD, PhD, University of Zagreb, Croatia



Restoration of a cervical lesion with hypersensitivity

A 37-year-old female patient was admitted to the clinic after complaining about persistent hypersensitivity of the tooth 43, in the cervical region. The hypersensitivity was so intense that it hindering the consumption of any food or drinks below room temperature. The application of different desensitizing agents on several occasions proved ineffective. During the clinical examination a smaller older restoration was found on the cervical region of the tooth. No gingival recessions or other issues were detected. Oral hygiene levels were not high, as plaque accumulation was noticed. After supragingival cleaning and oral hygiene instructions, the patient returned after one week for the treatment.

Material selection

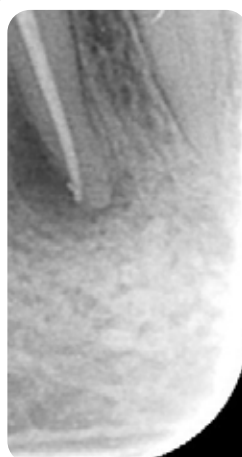
The selected material for this restoration was GC Fuji II LC, a resin-modified glass ionomer cement, in shade A2. Since the main reason the patient contacted us was hypersensitivity, a glass ionomer was chosen, as it eliminates the need for etching, which can further worsen the condition. Resin-based glass ionomers further offer improved aesthetic outcomes, compared to earlier generations. In addition, the material is less technique sensitive and is easily applied, shaped and polished in the cervical region. It's ion-releasing properties can also combat hypersensitivity and possible secondary caries formation for a longer period of time.

Treatment procedure

Step 1. Initial situation and preparation

Before the treatment the patient was anesthetised. During the preparation, a small round diamond bur was used to remove the old composite filling. The rest of the cervical area was slightly roughened using a fine polishing bur with minimum tissue loss, to ensure better adhesion.

Initial situation and x-ray



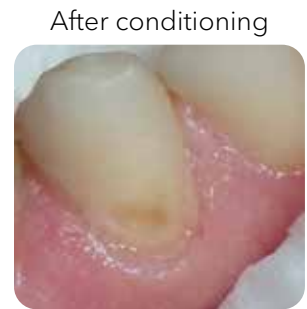
After preparation



Courtesy of Dr. Ivan Šalinović, Croatia

Step 2. Conditioning

The area was conditioned using GC Cavity Conditioner for 10 seconds. The conditioner was then thoroughly rinsed, and the area was gently air dried to avoid the worsening of hypersensitivity.



Step 3. Material application

The material (Fuji II LC) was applied in bulk and gently pressed and modelled with instruments, followed by polymerization.



Step 4. Finishing and polishing

The restoration was polished with sharp diamond burs, Arkansas stones, polishing cups and brushes.



Step 5. Varnish application

GC Fuji Coat LC was applied using a soft brush and polymerised for 10 seconds.



Outcome



Courtesy of Dr. Ivan Šalinović, Croatia



Used products: Fuji II LC, Cavity Conditioner, Fuji Coat LC

CASE 4

Azam Bakhshandeh, PhD, DDS

Associate professor, DDS Ilse Hessing-Olsen
University of Copenhagen, Department of Odontology,
Cariology and Endodontics, Denmark



Class V cavities located on the buccal surfaces of teeth #15, #14, #13, #46, and #45 needed restoration due to extensive abrasion. Fuji II LC was used as permanent restorative material.

Initial situation

No cavity preparation was conducted. A 15% polyacrylic acid conditioner was applied in 10 seconds to each of the cavities to clean the surfaces. After conditioning, the surfaces were rinsed and gently dried, ensuring the dentinal moisture was preserved. Fuji II LC was placed in the cavities using celluloid cervical matrices. The restorations were then polymerized in 20 seconds per area.



Postoperative situation

The restorations were polished using fine-grit polishing burs and silicone finishing points, achieving smooth and aesthetic results.



Control after 2 years

The clinical evaluation conducted at two years post-treatment showed satisfactory restorations, with only minor defects observed. These minor imperfections were not critical and did not require retreatment.



Tips & Tricks

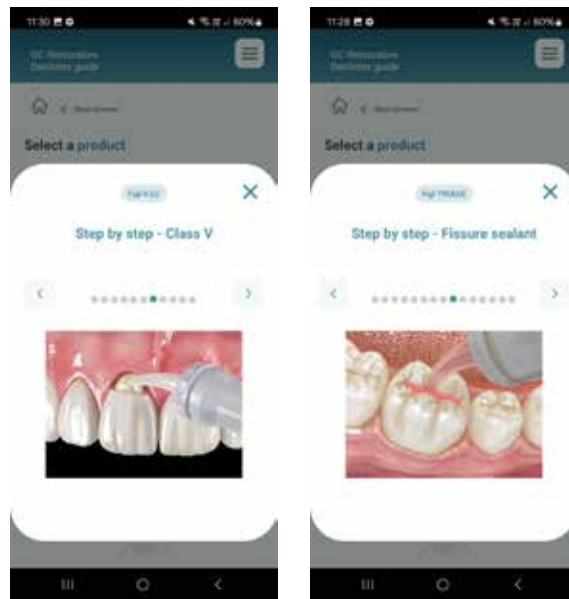
- Resin modified glass ionomer can be used in both primary and permanent dentitions.
- Resin modified glass ionomer can serve as both temporary and permanent restorative material, offering flexibility in clinical use.
- It is important to preserve natural dentinal moisture during the application process to enhance the material's mechanical and chemical properties.
- The cavity should be kept free of saliva and other contaminants. Use tools like a rubber dam, cotton rolls, or saliva ejectors to avoid excess moisture and ensure an optimal bonding surface.
- For larger cavities, the material should be applied in sufficiently thin layers to ensure proper light-curing.
- Enhance the mechanical strength and aesthetics of resin modified glass ionomer restorations by applying surface coating material to protect the restoration and improve its longevity.
- Instruction in oral hygiene and establishing healthy gingival status before restoring cervical cavities minimize the risk of contamination in the area and improve treatment outcome.
- Resin modified glass ionomer should be avoided in patients with allergic reaction to resin.

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Photos courtesy of Associate Professor Emeritus Vibeke Qvist University of Copenhagen, Department of Odontology, Cariology and Endodontics, Denmark



Used products: Fuji II LC

All product information is available on the Restorative Dentistry App.



Fuji IX GP FAST/EXTRA

High-viscosity glass ionomer

The proven gold standard for posterior cavities



- ✓ Resin-free, condensable, easy to apply and to contour
- ✓ Use Fuji IX GP FAST for a shorter procedure time;
- ✓ Fuji IX GP EXTRA also shows higher translucency

Fuji II LC

Resin-modified glass ionomer

The easy light-cure option



- ✓ Controlled placement with light-induced setting
- ✓ Posteriorly, the material can be reduced to a base under a composite restoration later on

Fuji TRIAGE

Low-viscosity glass ionomer

The fluid protection



- ✓ The first-line solution for MIH
- ✓ Provides instant relief and acts as 'tooth plaster'
- ✓ Available in pink & white

Product ordering information



Product	Product code	Shades
GC Fuji II LC	10000035	A2
	10000036	A3
	10000037	A3.5
	10000063	15g Powder, A2
	10000064	15g Powder, A3
	10000065	15g Powder, A3.5
	10000073	6.8ml (8g) Liquid
GC Fuji IX GP	10000053	A2
	10000054	A3
	10000055	A3.5
	10000046	15g Powder, A2
	10000047	15g Powder, A3
	10000048	15g Powder, A3.5
	10000052	6.4ml (8g) Liquid
GC Fuji IX GP Extra	10000401	A2
	10000402	A3
	10000403	A3.5
	10001035	15g Powder, A2
	10001036	15g Powder, A3
	10001037	15g Powder, A3.5
	10001028	6.4ml (8g) Liquid
GC Fuji IX GP Fast	10000078	A2
	10000079	A3
	10000080	A3.5
GC Fuji Triage	10000389	Pink
	10000390	White
	10000387	P/L Pink
	10000388	P/L White

More shades available.
Please visit our official website





Discover the full GC range of restorative materials



GC Fuji is a trademark of GC Corporation

Learn more about GC's legacy glass ionomer restorative options



Watch the step by step video: "Sealing of partially erupted teeth with Fuji Triage"

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