

GC get connected

Your product and innovation update



2013

GC



Entering a new age
of restorative dentistry

The **art** of creating beautiful smiles.



Welcome to the **GC G-ællery** – aesthetic solutions
for every case ... with exactly the handling you prefer

G-ænial from **GC**



At GC, we focus on individuality. We understand that no two patients are the same – and neither are their restorative challenges. We also understand no two dentists have exactly the same preference when it comes to placement technique or ideal composite restorative.

To meet this need GC presents a range of composites with **handling options** from firm and packable through to flowing and injectable. Each GC composite introduces **aesthetic qualities** which help clinicians create **invisible restorations** with simplicity and efficiency. Each of these composites offers **superior physical properties** and polish retention to ensure strength and **durable aesthetics**. And each product showcases the innovation and quality that is core to GC's product philosophy.

www.gceurope.com

GC EUROPE N.V.
Head Office
Tel. +32.16.74.10.00
info@gceurope.com
<http://www.gceurope.com>

GC UNITED KINGDOM Ltd.
Tel. +44.1908.218.999
info@uk.gceurope.com
<http://uk.gceurope.com>



'GC'

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GC get connected

Your product and innovation update



For decades it has been GC Europe's VISION to be Europe's benchmark dental company, and for this reason, we will continue to invest in innovative systems and products that deliver considerable added value to our customers. Through this we fulfil our MISSION of transforming GC into one of the leading oral health companies. We are proud to be a company that supplies world-class quality products and services to all European dental professionals.

One of our key aims is to engage with our customers to ensure we meet their needs. GC Europe embraces the diversity of the regional markets by having branches in all the major European countries, as well as strong support teams comprising local experts in the dental trade. Thanks to Europe-wide networking and a central database, we can ensure that all of our products are delivered promptly and are consistently available through our partners.

In an effort to further *connect* with our customers, this newsletter is one more way for us to provide you with educational content on latest trends in dentistry from well-respected Thought Leaders throughout Europe. Additionally, we will update you on GC's newest products and innovations, offering you some of the best solutions for your everyday challenges. The content developed is with you in mind, so if there are any topics you would like to see covered, please email us at news@gceurope.com or visit us at www.gceurope.com.



Best regards,

Eckhard Maedel

President
GC Europe

Welcome to GC 'get connected', GC Europe's newsletter that showcases our latest product innovations, techniques and trends in restorative dentistry.



For our first edition, and to mark the 35th International Dental Show (IDS), we bring you three of our newest product innovations: G-ænial, everX Posterior and EQUIA. In here you can learn more about the trends in restorative dentistry that have inspired and fuelled these developments and how dentists around Europe have successfully integrated these materials into their daily practise, with great outcomes for their patients.

35th IDS

On 12-16 March 2013 join us in Cologne at the International Dental Show in Hall 11.2, stand N010-O029. Meet our team of product



specialists from across Europe who will be able to answer your questions and demonstrate the materials to you. Since we have a wide network of European regional branches, there will be several local language representatives to help you in the language of your choice.

Socially yours

GC Europe has implemented a social media initiative as a part of our continued dedication to *connect* with our customers. Now you can interact with us on the following channels:



Advances in composite technology

The search is over. For an all-round restorative with outstanding invisible aesthetics, look no further than the G-ænial range from GC. Expand your dentistry with G-ænial, G-ænial Bond, G-ænial Flo and G-ænial Universal Flo.

And with fibre technologies now a part of the GC portfolio, discover extended possibilities in direct restorations such as direct bridges, splintings and even direct restorations of inlay-size cavities.

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Watch the GC G-ænial Anterior and Posterior animation



Trends in restorative dentistry

Choosing the material that suits you best

Austria

Dr Philipp Kober is a dentist working in private practice in Graz, Austria. He shared his thoughts on the recent advances in restorative dentistry in Europe and explained how this impacts his daily dentistry practise.

With the rise in minimally invasive dentistry, modern materials enable dental professionals to preserve as much of a healthy tooth as possible.

Choosing the material that's right for you

In recent years I have been exploring in depth the treatment possibilities of composites, particularly for the anterior region. As a result, I have tried various composite systems to see what

qualities the materials possess and which work better in certain cases, from a complex layering technique to a one-shade filling. The system I prefer to use in my daily practise allows me to achieve high quality results in terms of aesthetics and functionality.

In my opinion, choosing a brand that is right for you is individual to each dentist, as everyone has their own way of acquiring a skill, as well as ability and experience of working with a material. Thus, I have picked one brand which offers a wide range of composite characteristics (e.g. colour, translucency and polishability) which has become a universally applicable solution.

My decision to use a layering or one-shade technique depends

**COMPOSITE LAYERING
TECHNIQUE:
THE FOLLOWING CASE
SHOWS MY STEP-BY-STEP
LAYERING TECHNIQUE**

Step 1: In order to create basic opacity structure, GC G-ænial opaque dentin shade AO2 is applied.

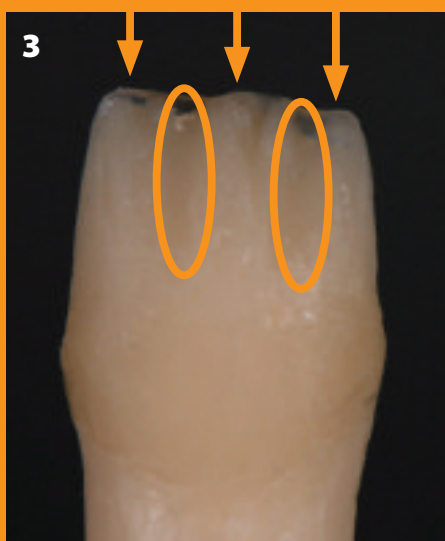
Step 2: A layer of GC G-ænial dentin shade A2 is applied to the mamelons in order to enhance their structure.

Step 3: GC G-ænial transparency shade TE is applied between the mamelons to create a depth effect.

Step 4: A thin layer of GC G-ænial enamel shade JE covers the entire body. To avoid an excessively grey effect, a very moderate amount is to be used.

Step 5: A GC G-ænial bleach white shade, BW, is applied in order to reduce the transparency and grey effect.

Step 6: Polish



“In my opinion, choosing a brand that is right for you is individual to each dentist, as everyone has their own way of acquiring a skill, as well as ability and experience of working with a material.”



About Philipp Kober

Dr Philipp Kober qualified as a dental technician in Graz, Austria in 1997. He then went on to complete a degree in dentistry at the University of Graz. Since 2006 Dr Kober has been a Clinical Scientific Assistant at the Department of Orthodontics and Restorative

Dentistry at the University Medical Clinic in Graz and also owns his own dental practice. From 2007 to 2009 he undertook the Implantology Curriculum at the German Society of Implantology, Germany. Currently he presents and gives workshops on aesthetic composite restorations, both nationally and internationally.

on each particular case, i.e natural characteristics of the tooth such as level of translucency and opacity to name a few.

Preferred layering technique

Generally for one composite restoration, I need two to four different shades to achieve a natural effect. I require mainly one opaque dentin shade, one dentin shade and one enamel shade. In a particularly complex case I would also apply dentin stains to create special natural effects.

For anterior restorations I use a smooth composite formula. My preferred adhesive system is an all-in-one material and I always etch enamel to ensure a better bonding.

I keep myself up-to-date with the new materials coming up in the market and follow research developments in the dental industry. As I have been focusing on aesthetic composite treatments both practically and theoretically, in the coming years I look forward to sharing my skills by delivering more composite presentations and workshops.



CLINICAL CASE: COMPOSITE VENEER ON TOOTH 12

Step 1: Situation after preparation: endodontically restored tooth with typical discoloration.

Step 2: The stained area is covered with opaque paste (GC Gradia).

Step 3: Final situation after two years in situ (GC G-ænial).

Trends in restorative dentistry

Embracing scientific advances

Spain

***Dr Javier Tapia Guadix** is a private dentist in Spain and he recently discussed his preferences for dental materials and their indications.*

I think there are several trends going on today but all of them have one clear link: minimally invasive dentistry. The ultra-conservative approach is gaining more relevance as technology provides us with better materials that allow minimum thickness while keeping the same physical properties with unrivalled aesthetics.

Adhesive techniques are constantly evolving and improving, empowering us to be highly conservative either by using direct or indirect techniques. The global economy is pushing this

conservative philosophy, as these kinds of treatments are usually less costly than traditional therapy. Furthermore, patients become more demanding, not only for aesthetics (both anterior and posterior) but also on less aggressive therapies.

Materials of choice

I've tried several materials in the past two years, especially composite resins. The new generation of micro-hybrid and nano-hybrid materials is one example. Highly filled flowable composites like G-ænial Universal Flo (GC) are probably one of the biggest improvements in this field.

At the same time, I've been testing new fibre reinforced materials,

including one composite that might be particularly important for prevention of tooth fractures on the long-term (everX Posterior from GC).

My preferred material for aesthetic direct restorations is a micro-hybrid composite (G-ænial Anterior from GC), it provides the best balance between handling, polishing, optical and bio-mechanical properties.

But I have a wide range of materials that I use depending on the clinical situation. Sometimes you will need to sacrifice one property for another in order to improve the final result and predictability. For example, with big posterior restorations, you may want to use a material as flexible as dentin while using a harder, highly filled material for enamel.

Accessibility is another important criteria for material selection. When you have difficulty filling some areas of the cavity without gaps using normal materials, you can always rely on the new highly filled flowables to do the job.

Approach to layering

I use a layering technique in almost every restoration. There are some exceptions, of course, and in cases where the volume to repair is minimal, I use just one shade. You might think that by not using layering you simplify the technique and save time, but a poor aesthetic result might be rejected by the patient, in which case you will have to do it again.

“Adhesive techniques are constantly evolving and improving, empowering us to be highly conservative either by using direct or indirect techniques.”



About Javier Tapia Guadix

Javier Tapia Guadix is a dentist based in Spain and obtained a Bachelor of Dental Surgery from European University of Madrid (UEM) where he has worked as an Associate Professor at Department of Prosthetics. He is the co-founder of Bio-Emulation

group and the founder of Juice - Dental Media Design. He runs a private practice in Prosthetic and Restorative Dentistry in Madrid while regularly presenting hands-on workshops and publishing articles on the topic of restorative dentistry, particularly composite stratification techniques, dental photography and computers in dentistry.

Furthermore, an incremental technique is mandatory to allow for a stress-free light curing of a composite. You can switch to layering by just changing to another syringe at a certain point in the incremental technique.

The layering technique I use follows what technicians have been doing for years; trying to achieve a natural appearance. The aim is to emulate each tooth substrate with a different material with respect to its histological thickness. Dentin opacity is graduated first according to the age of the patient providing both chromaticity and value, while age coded enamel is used to modulate value by either increasing (low translucency) or reducing it (high translucency).

When it comes to handling, I generally prefer softer materials because they usually allow for an extended working time and make it easier to sculpt all the anatomical details during the layering. Injectable materials like highly filled flowables are ideal for deep cavities with difficult access or as liners with high opacity shades to mask discolourations at the base of the preparation.

I mainly use three-step etch-and-rinse (4th generation) or one step self-etch (7th generation) adhesive systems. I always etch enamel, even in the self-etch technique. In my opinion the selective etching approach is essential to achieve good long-term results on self-etching adhesives. I believe dentin should be etched only for etch-and-rinse adhesives. Etching dentin when using a self-etch adhesive means depriving it from its unique advantage of demineralising and infiltrating dentin simultaneously, which could lead to post-operative sensitivity problems.

Future innovations

It's difficult to say what the future holds, but I will keep working with my colleagues in the Bio-Emulation group to evolve and improve a highly conservative and biomimetic approach for restorative dentistry. As dentists, we need to be open minded to new approaches and techniques while preserving the common sense and balance of our work, always keeping in mind the principle of evidence based dentistry.

CLINICAL CASE: DIASTEMA RESTORATION

Figure 1: Pre-operative situation: Large diastema on periodontal patient.

Figure 2: Isolation with rubber dam and teflon tape.

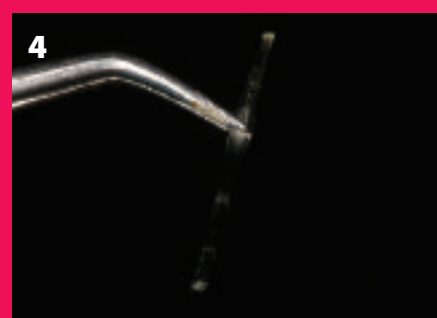
Figure 3: After bonding procedure, application of GC G-ænial Universal Flo as a base to fix the fibre in position (left uncured).

Figure 4: Pre-cut GC everStick® PERIO fibres.

Figure 5: GC everStick® fibres already in place. GC G-ænial Universal Flo beneath was cured by sections, pressing the fibre against each tooth.

Figure 6: Diastema closure using GC G-ænial Universal Flo inside shade (opaque dentin) and enamel shade.

Figure 7: Finalised case. Immediate post-operative situation.



Research and development

Fibres are changing dentistry

By Professor Pekka K. Vallittu DDS, PhD, Finland

The replacement of damaged dental tissues and utilising modern adhesive techniques have brought restorative and prosthetic dentistry into a new era. This new era is characterised by minimally invasive and non-metallic dentistry. Although adhesive techniques have developed considerably, especially with dentine bonding systems, only minor advances in composite resins have occurred. The development of particulate filler systems have improved wear resistance and lowered abrasiveness of the composite, but there have only been minor improvements in the mechanical properties and polymerisation contraction.

The field of science that focuses on mimicking natural structures is known

as biomimetics. Nature creates the material components and combines them as composites. In many of the natural materials which require high strength and toughness, the main constituent of the material is a high aspect ratio fibre. Examples of composites found in nature include wood, bone, ligaments, dentine and enamel. Fibres, if they have higher strength than the binding matrix and proper adhesion to the matrix, can efficiently reinforce and toughen a material. For this reason, fibre-reinforced composites (FRCs) have been utilised in variety of technical and everyday applications since the 1950s.

Interestingly, the use of FRCs in dental and medical fields has been

slow, despite the urgent need for cost-effective, mechanically and aesthetically high quality materials. At the moment, the dental profession uses FRCs in fixed and removable prosthodontics, restorative dentistry, orthodontics, endodontics and periodontology. The newest applications have been found in surgery, where implants are being fabricated from FRCs. A breakthrough for FRCs took place with the introduction of everStick® in 2000 by Stick Tech Ltd, a member of the GC Group, and now a novel filling composite, everX Posterior, is expanding the applications of FRCs even further.

“Fibres have changed the way dentistry is practised today by offering new treatment possibilities and solutions for chairside direct treatments with stronger restorations.”

Replacement of missing teeth

The most common application of FRCs is the replacement of one or several missing teeth. Fixed dental prostheses (FDP) can be made either directly in the mouth, chairside or by a dental laboratory technician. The attachment element of the FDP can vary from surface bonding wings to inlays, onlays, crowns and root canal posts. FDPs made of FRCs and good quality layering composite resins are definitive solutions with an expected functional lifetime of over 10 years.

A special feature of everStick® FRC is the polymer structure between the silanated glass fibers. The polymer is a mixture of thermoset and thermoplastic polymers, which form a so-called semi-interpenetrating polymer network (semi-IPN) structure. Semi-IPN structure toughens the polymer matrix, makes

the FRC easier to handle, and offers a good bonding site for veneering composites and luting cements. When a dentist or dental technician is planning a treatment with FRCs, special emphasis should be placed on the correct design of the supporting framework and to the use of good quality adhesive systems. The framework of everStick® FDP contains the following elements:

1. Main framework (combines abutments and provides vertical support)
2. Bonding wings / crowns (provides resistance against torque forces)
3. Pontic supports (eliminates risk of delamination of pontics)

Composite fillings

The failures of composite restorations



Professor Pekka K. Vallittu DDS, PhD is a EPA-Recognised Specialist in Prosthodontics and CDT. He is the Chair of Biomaterials Science and Director of Turku Clinical Biomaterials Centre at the Institute of Dentistry, University of Turku in Finland.
www.biomaterials.utu.fi

are typically due to secondary caries and bulk fractures of the composite. These relate to the material's properties; particulate filler composites are prone to crack propagation and therefore have low damage tolerance, causing bulk fractures to occur. On the other hand, particulate fillers keep the composite isotropic in terms of its many properties, including polymerisation shrinkage. Shrinkage causes gaps between the filling and the tooth and creates a predisposition to secondary caries. Research studies using FRCs in tooth filling applications have shown how the structure of a restored tooth can be more biomimetic. everX Posterior is a short fibre-reinforced composite which is used to replace tissue in damaged teeth, especially dentine. The fibres of the everX Posterior material simulate the collagen in the dentine and provide enhanced toughness for the restored tooth, while at the same time, the fibres also control and minimise polymerisation shrinkage. everX Posterior is used as a bilayered filling material, i.e. the outermost part of the filling, which simulates enamel, is made of high quality hybrid composite resin.

Conclusion

Fibres have changed the way dentistry is practised today by offering new treatment possibilities and solutions for chairside direct treatments with stronger restorations.

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Figure 1. In search to mimic the fibrous micro-structure of natural fiber-reinforced composites of wood like birch (*Betula pubescens*) or bone, dentine and tendons, a new group of biomaterials has been created. This group called fiber-reinforced composite is used, for instance, for dental bridges and in the most advanced filling composites.

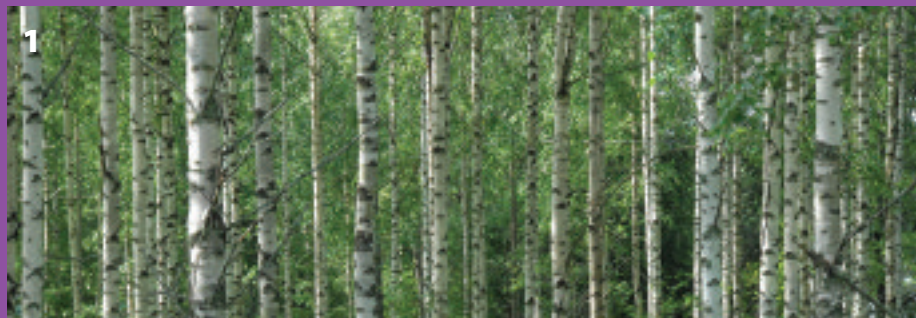


Figure 2: A cross section of the everStick® glass fibers. The fibre reinforcement is made from unidirectional glass fibres and a polymer/resin gel matrix. The polymer/resin gel holds the individual glass fibres in a bundle, which facilitates handling of the fibre bundle. The fibre bundle is flexible and sticky which allows it easily bond to teeth.



Figure 3: Schematic representation of everStick® fibers. In the case of everStick® C&B, the composition is 4000 silanated glass fibres impregnated with PMMA (polymethylmethacrylate) and bis-GMA.

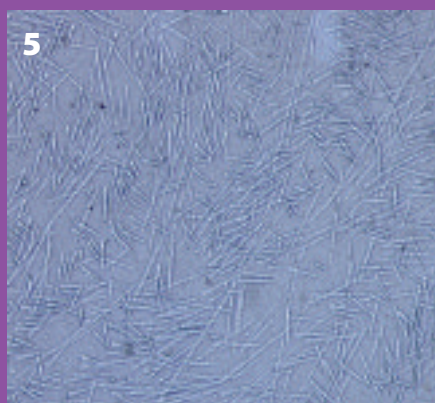


Figure 5: Microscopic view of everX Posterior fibre-reinforced composite

Figure 4a to 4c: Minimum invasive fibre-reinforced composite bridge made with everStick® C&B

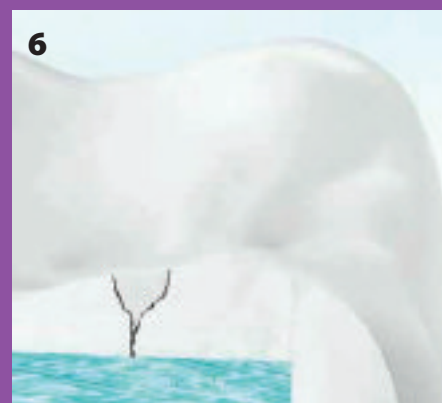


Figure 6: Fibres in everX Posterior stop crack propagation

At a glance



Watch the GC G-aenial Universal Flo animation

GC G-aenial Universal Flo



Product
Spotlight

Looking for a flowable composite with extra indications where optimal handling, long lasting restorations and ideal aesthetics are key requirements? G-aenial Universal Flo is your answer.

- **Fluidity and placement:** balanced viscosity, flowing but not runny for convenient placement and precise application.
- **Ergonomic Solution:** the syringe size is large enough to provide a comfortable grip while the nozzle surface is textured so that the paste does not stick to it
- **Unique filler technology:** thanks to the design of the fillers, G-aenial Universal Flo demonstrates the physical performance of a regular composite material but in a flowable consistency
- **Longevity and endurance:** outstanding physical properties, particularly in regards to the wear resistance. For safe and durable restorations
- **Polishability:** very high gloss and gloss retention. The speed

and ease with which a gloss is obtained is extremely impressive. G-aenial Universal Flo can almost be considered to be a self polishing material.

G-aenial Universal Flo from GC

Traditional flowable composites are appreciated for their ease of use and placement. Unfortunately, they also have limited indications due to their lower amount of fillers and lower physical properties.

GC has looked for a solution and created G-aenial Universal Flo; a material with a unique filler technology. Unlike other flowable composites, it offers a higher filler load and a homogeneous dispersion of fillers. As a result, the physical properties match those of regular composite materials, opening up the potential for a broader use such as:

- Direct restorative material for all Class I, II, III, IV and V cavities
- Minimum Intervention cavities
- Splinting (fixation of mobile teeth)

Application of G-ænial Universal Flo

(Courtesy Dr Javier Tapia Guadix, Spain)

G-ænial Universal Flo offers superb invisible aesthetics without any compromises. Thanks to its broad range of 15 shades and 3 different levels of translucencies, it is possible to achieve aesthetic restorations in an easy and smooth manner.

1 Pre-operative view of tooth 22 to be restored. The shade selection takes place before preparing and drying the tooth, using the G-ænial composite shade guide. A conservative preparation is performed which consists mainly of removing the old restoration and preparing a large enamel bevel. **2** The enamel is being selectively etched for 10 seconds and rinsed. Afterwards, G-ænial Bond (GC) self-etching bonding agent is applied; followed by waiting for 10 seconds, hard blowing for 5 seconds and light-curing 10 sec. The selective etching technique offers the advantages of a high bond strength to enamel without post-operative sensitivities on dentin. **3** A silicon key is used to

build the palatal wall using the Outside Enamel Shade AE (Adult Enamel). This enamel shade has been selected according to the age of the patient, since the value and the chroma of enamel is varying with time. **4** An Inside Shade AO2 is used to replace the deep dentin which is more opaque and chromatic. Note the thin nozzle which allows a direct and precise application of the flowable composite onto the cavity. **5** The ideal consistency of the flowable material makes it possible to sculpt it with a brush in order to recreate the dentin mamelons. **6** Application of the Standard Shade A2 that replaces dentin. Note that the occlusal part is left for the enamel shade since there is naturally no dentin

in this area. **7** Final enamel layer AE application. The composite is slightly over-built in order to perform a final contouring and anatomic shaping with burs and finishing instruments. **8** Final result after polishing and removal of the rubber dam. The unique composition of G-ænial Universal Flo makes it particularly easy to obtain a high gloss in a few steps. **Conclusion:** Although flowable composites have always been indicated for small restorations or lining, the new composition and the particular viscosity of G-ænial Universal Flo has now made it possible to restore successfully and aesthetically an anterior tooth in a class IV configuration.



Minimum intervention dentistry

The EQUIA system unites EQUIA Fil, a new generation of glass ionomer, and EQUIA Coat, a highly-filled resin coating material that brings glass ionomer technology to the next level

Inside

Product innovations: EQUIA

Prevention-centered care

Professor Sophie Doméjean, France

Ready to realise the full potential of MI Dentistry

Professor Avijit Banerjee, United Kingdom

Simpler is better

Dr Matteo Basso, Italy

Technique tips for EQUIA

Watch technique video
using GC EQUIA





Trends in restorative dentistry

Prevention-centered care

France

Sophie Doméjean is a Professor of Conservative Dentistry and Endodontology at the University of Auvergne in France. She was recently interviewed about her perspective on the direction that dentistry was taking and she shared her treatment strategies for restorative procedures and her preferred materials.

My restorative approach

I adapt my restorative strategies according to numerous factors at the tooth level, overall mouth level and patient level: cavity design, cavity size, cavity depth as well as occlusal status, caries risk level and patient demand. As a result, for long-term, direct restorative fillings, I use

composite resin, amalgam and glass-ionomer cements depending on the biological, mechanical and aesthetic considerations of each case. I dislike the term 'permanent' restorative fillings because to my knowledge, no restoration - whatever the material or the technique used - has been shown to be permanent in the true sense of the word.

Restorative options to offer

Globally there is an incredible increase in demand for aesthetic dentistry and for tooth-coloured restorations. This is part of a cultural evolution in which people want to look younger or at least healthier and chose to have invisible restorations. For me,

the question about amalgam-free restorations has to be considered separately. The specific demand for 'amalgam-free' restorations is linked to the fear of mercury contamination and its potential neurological side effects and there are many controversial debates about amalgam. Due to environmental concerns, the use of mercury has been restricted in several countries and there is a tendency to eliminate dental amalgam from the recommended range restorative materials. However, the Scientific Committee on Emerging and Newly Identified Health Risks or SCENIHR (European commission) concluded in 2008 that: dental health can be adequately ensured by both amalgam and alternative materials; all the materials are considered safe to use; and they are all associated with very low rates of local adverse effects with no evidence of systemic disease.

Minimal intervention approach

When carious lesions come to cavitation, the need for restorative dentistry and restorative materials is obvious. Nevertheless, the concept of minimally invasive dentistry has to lead the treatment strategy. I believe an excavation strictly limited to the lesion and a minimally invasive preparation of the cavity should replace the traditional concept of large amalgam cavity preparation. The alternative techniques to amalgam restorations are based on adhesion; they allow

"Yes, there is a need for the development of quality, cost-effective biomaterials but more importantly, there is a need for prevention of oral diseases."



About Sophie Doméjean

Professor Sophie Doméjean graduated from University of Auvergne (France) in 1993. She worked in general dental practice for five years before returning to University of Auvergne to study for an MSc in Nutrition and Food Sciences in 2000. Her current research interests

are in Cariology, and in particular caries risk assessment and decision-making in caries management. She obtained her PhD degree in 2008 and became Professor in Conservative Dentistry and Endodontology in 2010. She has published articles, in French and international journals, both in her research area and in other aspects of Minimal Intervention Dentistry. Her research has led to collaboration with colleagues in numerous European countries and in the USA.

less invasive cavity preparations and maximise dental tissue preservation.

Advances in direct filling materials

When it comes to economic factors, I think we need to be very careful. Some will tell you that 'time is money', but we have to keep in mind that dentistry is part of medical sciences and that our first goal is to improve oral health. Directly linking the demand for faster dental procedures to economic reasons is inappropriate. Although, I do understand the need for faster dental procedures for practitioners working without a dental assistant. 'Faster' can greatly impact restoration quality, for example in young patients or for sites that are difficult to isolate from saliva (erupting teeth).

With direct filling materials my concerns are more about effectiveness and efficiency. When considering a specific material, two questions are essential: "Does it work in dental practice?" and "Is the cost-effectiveness adequate?" There is a crucial need for quality clinical research and systematic reviews to compensate for the paucity of current research evidence.

Furthermore, I support the World Health Organisation statements (Switzerland, 2009) and especially the two following points: "In an environmental health perspective it is desirable that the use of dental amalgam is reduced. This may be achieved effectively by strengthening the prevention of dental caries and by encouraging better use of quality alternatives to dental amalgam" and "It may be more important to examine tooth survival and to preserve tooth structure than filling survival. Health services will need to be reoriented to focus on disease prevention and minimise intervention". Yes, there is a need for the development of quality, cost-effective biomaterials but more importantly, there is a need for prevention of oral diseases.

Trends in restorative dentistry

Ready to realise the full potential of MI Dentistry

United Kingdom

Avijit Banerjee is a Professor of Cariology and Operative Dentistry at King's College London Dental Institute at Guy's Dental Hospital. He recently evaluated the key trends in restorative dentistry and what he regards to be effective treatment strategies.

I believe Minimum Intervention dentistry is a prevention-based, patient-centred care philosophy that has been discussed for many years, but the profession is finally in a position to realise its full practical potential in general dental practice in the UK and worldwide. I also feel developments in materials science are creating aesthetic, biomimetic materials with the potential not only to adhere and

make a seal, but also to 'heal' diseased dental tissues by encouraging remineralisation, anti-bacterial effects and blocking enzymatic degradation of tissues, will change the face of operative management of disease in the forthcoming years. The third technological breakthrough is the development of high-quality digital intra-oral imaging that obviates the need for conventional clinical invasive impression-taking or even surgical biopsy for the diagnosis of oral diseases. Developments in their optical resolution, ability to scan accurately the soft tissues and their potential ability to take longitudinal measurements of changes in oral surface topography as well as

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microscopic cellular changes, will offer this technology a significant foothold in operative clinical dentistry and oral diagnostics.

Preventive care implementation

The provision of restorative dental care to the UK population is primarily through the Government-subsidised National Health Service (NHS), through locally negotiated contracts between the relevant Health Authority and the dental practice, based on numbers of patients treated and their overall clinical need. The other aspect of service provision is from the private sector with specialist care provided in Prosthodontics (including implantology), Periodontics and Endodontics.

The NHS contracts are under review at the moment and there is a definite push towards preventive dental care, but how far the changes will go, waits to be seen! In the next decade it is clear that the use of the dental team, vital in providing comprehensive minimum intervention care, will be positively encouraged, with the roles of the dental care professionals (nurses, hygienists, therapists, oral health educators, technicians and practice managers) being clarified, emphasised and possibly extended.

Post-graduate CPD training is fairly extensive and comprehensive in the UK with many overlapping courses available to all practitioners and DCPs alike. There is perhaps a lack of

education in MI Dentistry for the more experienced practitioner who was not taught this care philosophy at dental school originally and who works within a different financial business model based on payment for procedures carried out. This is now being rectified in the form of a newly developed flexible-learning Masters programme in Advanced Minimum Intervention Dentistry run by King's College London, UK, due to commence in 2014 where clinical teaching and practice management will underpin its curriculum.

Glass ionomer solution

With EQUIA, the combination of GC's EQUIA FIL with EQUIA Coat resin surface protector is a valuable combination to improve the clinical surface finish and overall surface longevity of the final restoration. A useful, if not absolutely necessary adjunct for the daily use of GIC, the combination comes into its own when treating high risk patients and those with dry mouth or re-enforcing the GIC restoration surface in areas of increased wear.



About Avijit Banerjee

Professor Avijit Banerjee qualified from Guy's Hospital Dental School (UMDS) in 1993. He currently holds the position of Chair in Cariology & Operative Dentistry /Hon. Consultant in Restorative Dentistry at King's College London Dental Institute at

Guy's Hospital, London, UK where he is also Deputy Director of Education (Clinical Skills). He is a specialist practitioner in Restorative Dentistry, Prosthodontics and Periodontics. Avijit is an internationally renowned researcher and lecturer in the fields of Cariology and MI Dentistry and is the primary author of Pickard's Manual of Operative Dentistry (9th ed, OUP), the definitive text in the subject.

Trends in restorative dentistry

Simpler is better

Italy

Dr Matteo Basso is a practising dentist in Italy and recently shared his thoughts on minimum intervention dentistry and the rise in aesthetic dental materials.

Probably the biggest trend in restorative dentistry we are noticing right now is the simplification of restorative techniques. After years of development of products and techniques we now have the possibility of creating beautiful restorations but through very complex techniques, with many steps and sometimes a great deal of time. The current global economic climate, together with the need for faster and easier procedures, has sparked an interest in dental materials that can give the same optimal results of previous techniques, but with easier steps and procedures. This often means saving time and money, without compromising of the quality of the final result.

Another interesting trend is

the popularity that one-step 7th generation adhesives are gaining worldwide. Many dentists are already satisfied with their 7th generation adhesives, but in recent years, studies have proven their superior performance, changing overall opinion of their capabilities in respect of 5th or 6th generation adhesives.

Daily practise

I use the GC EQUIA system almost every day. For class I and II restorations I find it gives me the aesthetic outcomes and easy handling that I require. What I like most about this material is that it interacts with dental hard tissues, promoting remineralisation, while at the same time being durable in load bearing areas, all in a very easy and quick manner.

Italy has always been at the forefront of major developments in restorative dentistry. Many Italian opinion leaders have developed

Figure 1. Female patient, age 37, reports transitional sensitivity and pain from chewing or cold on tooth 46. The vitality test with a cold pellet applied on the vestibular side of the tooth was positive. Clinically, a light dark shadow on the occlusal part of the tooth is visible, and an intraoral x-ray confirmed the presence of a deep cavity.



Figure 2. Initially, a composite restoration was planned and the rubber dam was placed. After the removal of decayed tissues, a wide, deep cavity was visible. On the bottom of the cavity, a thin layer of dentin was still separating the vital pulp from surface. Since the adhesive layer of a composite system was suspected to be chemically aggressive on vital pulp, the EQUIA system was selected in addition to its ability in promoting remineralization.



Figure 3. A round metal matrix (Automatrix, Dentsply) was placed, an EQUIA Fil A2 capsule was prepared, and the material was placed in one single step-bulk-filling the cavity with a single application. Preliminary shaping was performed with hand metal instruments. After polymerization, the metal matrix was removed and final shaping



with rotary instruments (Duragreen and Durawhite stones, Shofu) was performed. As final protection, a layer of EQUIA Coat was applied with a brush, to improve final mechanical properties of the EQUIA restoration.

Figure 4. Final restoration. The presence of an efficient contact point, good esthetic and good shape of occlusal surface has been verified.

“Probably the biggest trend in restorative dentistry we are noticing right now is the simplification of restorative techniques”



About Matteo Basso

Dr Matteo Basso, DDS, PhD, MSc, graduated with honours in Dentistry and Oral Prosthetic Rehabilitation at the Università degli Studi in Milan, Italy. He then went on to obtain a PhD in Implant Dentistry, Specialty in Oral Surgery. He is the head of the Centre of

Minimally Invasive and Aesthetic Oral Rehabilitation at the University Dental Clinic of the Galeazzi Orthopaedic Institute in Milan, as well as a Board Member of the Research Centre for Oral Health. In addition he is also Professor of Dental Ergonomics and Marketing for the Graduation Course in Dentistry at the University of Milan, Italy.

materials and techniques with enhanced aesthetic results. Nowadays, dentists here are aware of the best techniques and procedures and patients are increasingly demanding. No compromises will be accepted by patients and it is practically impossible to change this trend, driven by the patients' high expectations. However, dentists are constantly seeking better products that will give them the same results but with easier, faster and (why not?) cheaper techniques.

Many CDP courses for dentists here in Italy are based on indirect restorations, especially CAD-CAM ones. The interest of dentists is focused on new technologies and computer-assisted procedures. There are not huge gaps in courses for restorative dentistry, but themes are probably decided on the basis of what the market is pushing more, and less space is given to development of more classical procedures.

I have always been interested in the development of new techniques and principles, and I'm involved in testing the efficacy of clinical procedures for restorative dentistry on a daily basis. The main aim is to save as much dental tissues as possible, performing minimally invasive procedures and trying to address early lesions. In my clinic we have developed many different protocols which are used by dentists with great success.

Figure 1. Female patient, age 35, previously treated for periodontal problems and with orthodontic appliances for correction of anterior spaces related to the absence of lateral incisors. A small but deep cavity on the proximal side of tooth 11 was diagnosed.



Figure 2. Due to the presence of residual periodontal pockets and the cavity being located in a difficult area for tooth cleaning, the EQUIA system was selected as restorative material. A retraction cord was used to displace the gum and to better show the margins of cavity.



Figure 3. In order to facilitate the injection of material and control the excesses, a plastic matrix was used and palatally fixed with a wooden wedge. EQUIA Fil capsule shade A2 was prepared and material was applied between the matrix and tooth surface. After application, the plastic matrix was pressed against the tooth surface, to better adapt the EQUIA Fil inside the cavity, and polymerization was accelerated by the use of polymerization LED curing light. A final layer of EQUIA Coat was applied.



Figure 4. Final restoration. The presence of an efficient contact point, good shape and aesthetics have been verified.

At a glance



Product Spotlight

The EQUIA system is available in a variety of single and combination packages, consisting of capsules of EQUIA Fil and a bottle of EQUIA coat. EQUIA Fil is delivered in the following Vita®* shades: A1, A2, A3, A3.5, B1, B2, B3 and C4 and SW (Standard White).

*Vita® is a registered trademark of Vita Zahnfabrik, Bad Säckingen, Germany.

With EQUIA, aesthetic bulk placement is now possible in posterior restorations. EQUIA presents the following features:

- Easy bulk placement and chemical adhesion of EQUIA Fil
- Restorative procedure: on average less than 3.5 minutes.
- Intelligent synergy effect with EQUIA coat which strengthens the restoration
- Unique features, biomimetic fillings with fluoride release
- Aesthetic yet economical

EQUIA sets up a new standard in restorative technology and offers an additional option to meet all patients' expectations.

GC EQUIA

EQUIA is a unique restorative system which combines a new generation of glass particles (EQUIA Fil Capsules) and a highly-filled resin coating material (EQUIA Coat). EQUIA allies quick and easy handling with good physical

properties and aesthetics.

One single layer of nano-filled EQUIA Coat not only protects the restoration against moisture contamination and acid erosion but also exponentially increases the physical properties of the EQUIA filling, including wear resistance and fracture toughness*.

Over the last 5 years the clinical performance of EQUIA has been highly appreciated by clinicians worldwide. The performance of this posterior restorative material has been demonstrated in various clinical studies, one of which followed 151 fillings in vivo during two years. EQUIA is indicated in the following clinical situations:**

- Class I, non-stress bearing and small stress-bearing class II restorations
- Repair of old restorations
- Class V and root surface restorations
- Core build-up
- Deciduous teeth

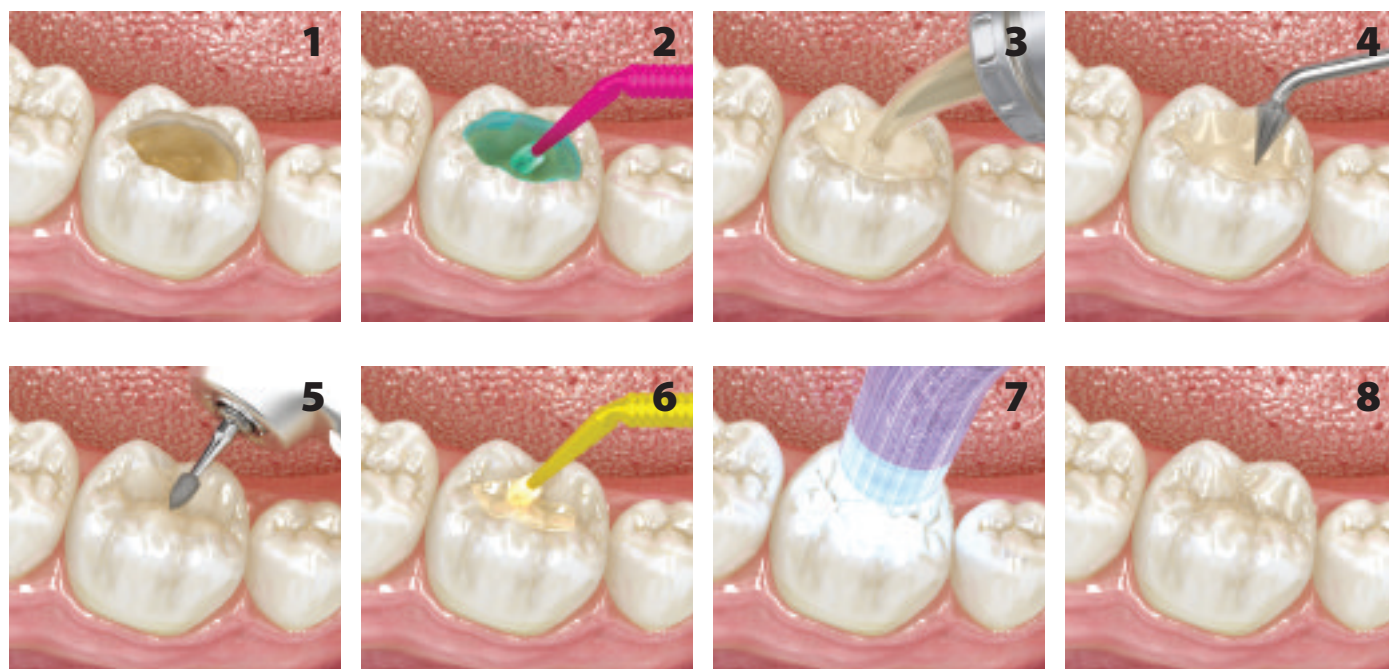
*Data on file

**Please refer to the IFU for details

Step by Step application of EQUIA

With its high moisture tolerance, almost no shrinkage stress and no reported post operative tooth sensitivity, EQUIA makes a hassle-free one-step bulk placement in large cavities a reality – without the use of time consuming, messy and complicated bonding and etching procedures.

- 1** The tooth to be prepared is isolated with cotton rolls and suction (no rubber dam is needed). The cavity is prepared using a conservative approach. Infected dentin is removed, while affected dentin can be retained in order to avoid pulp exposure. Margins should be cleaned down to sound dentin and enamel
- 2** Use (Optional) of GC Cavity Conditioner for 10 sec. After washing off the conditioner, the cavity is gently dried to remove excess moisture without desiccating the tooth. Prepared surfaces should appear moist (glistening).
- 3** EQUIA Fil capsule is mixed for 10 seconds and placed in bulk directly in the cavity.
- 4** Preliminary contour can be performed within the setting period (Working time: 1'15"). Care should be taken to avoid contamination and dry-out during that time.
- 5** Final finishing under water spray using superfine diamond burs can be started in about 2'30" after start of mixing.
- 6** Dispense and immediately apply EQUIA Coat. No air blow is needed at this stage. Floss can be used to apply on approximal surfaces.
- 7** Light-curing for 20" as the final step. There is no need for any polishing procedure.
- 8** Excellent results in just about 3.5 minutes





EQUIA

A whole new LEVEL in Glass Ionomer Technology



Over the last 5 years, the clinical performance of **EQUIA** has been highly appreciated by clinicians worldwide. Together with various ongoing studies worldwide, **EQUIA** is proving itself as a long lasting restorative alternative for your daily, routine practice*. This is only one of the impressive strengths of **EQUIA**. Find out more about the new dimension in restorative dentistry on www.gceurope.com

*in the given indications

GC UNITED KINGDOM Ltd.
Tel. +44.1908.218.999
info@uk.gceurope.com
<http://uk.gceurope.com>

