

GC Tooth Mousse Portfolio

3RD EDITION





TOOTH MOUSSE INFORMATION

Everyday we are asked questions about new applications for Tooth Mousse. We have designed the Portfolio as an informal source where clinicians can obtain information from their professional colleagues regarding the many clinical applications and experiences of Tooth Mousse users. In this edition, we provide examples of how Tooth Mousse can **conservatively** enhance the final cosmetic outcomes of patients while addressing/relieving their sensitivity issues.

A new case of extensive tooth wear is also presented, illustrating the integral role of Tooth Mousse in the treatment plan, as well as applications of salivary testing to discern systemic problems and provide data for suggested lifestyle modifications.

Our centrefold contains a reprint from the UK Woman's Own magazine about a young mother, Corrina Hawkins, who suffered major problems with tooth brushing for more than 11 years due to a toothpaste allergy. Corrina finally obtained relief after her dentist recommended she try Tooth Mousse to relieve some of her sensitivity problems.

In the next Portfolio we shall deal with other important enamel problems such as hypoplasia.

We hope you enjoy!

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LITERATURE

There is a wealth of published material on CPP-ACP, the active ingredient of Tooth Mousse, with over 90 articles available.

Listed below are ten of the best:

- Additional aids to the remineralisation of tooth structure. Reynolds EC, Walsh LJ. Textbook: Preservation and Restoration of Tooth Structure - 2nd edition 2005, p111-118.
- Acid Resistance of Enamel Subsurface Lesions Remineralized by a Sugar-Free Chewing Gum Containing Casein Phosphopeptide-Amorphous Calcium Phosphate. Iijima Y, Cai F, Shen P, Walker G, Reynolds C, Reynolds EC. Caries Res 2004;38:551-556.
- Retention in plaque and remineralization of enamel lesions by various forms of calcium in a mouthrinse or sugar-free chewing gum. Reynolds EC, Cai F, Shen P, Walker GD. J Dent Res 2003 Mar 82:3 206-11
- Remineralization of enamel subsurface lesions by sugar-free chewing gum containing casein phosphopeptide-amorphous calcium phosphate. Shen P, Cai F, Nowicki A, Vincent J, Reynolds EC. J Dent Res 2001 Dec 80:12 2066-70
- Advances in enamel remineralization: anticariogenic casein phosphopeptide-amorphous calcium phosphate. Reynolds EC, Black CL, Cross KJ, Eakins D, Huq NL, Morgan MV, Nowicki A, Perich JW, Riley PF, Shen P, Talbo G, Webber FW J Clin Dent 1999 X(2):86-88
- Anticariogenicity of calcium phosphate complexes of tryptic casein phosphopeptides in the rat. Reynolds EC, Cain CJ, Webber FL, Black CL, Riley PF, Johnson IH, Perich JW. J Dent Res 1995 Jun 74:6 1272-9
- Anticariogenic complexes of amorphous calcium phosphate stabilized by casein phosphopeptides: a review. Reynolds EC. Spec Care Dentist 1998 Jan-Feb 18:1 8-16
- Remineralization of enamel subsurface lesions by casein phosphopeptide-stabilized calcium phosphate solutions. Reynolds EC. J Dent Res 1997 Sep 76:9 1587-95
- Anticariogenic casein phosphopeptides. Reynolds EC. Prot Peptide Lett 1999 295-303
- Incorporation of Casein Phosphopeptide-Amorphous Calcium Phosphate into a Glass-ionomer Cement. Mazzaoui SA, Burrow MF, Tyas MJ, Dashper SG, Eakins D, Reynolds EC. J Dent Res 2003 Nov 82:11 914-8

The full list of available references can be viewed on the Tooth Mousse download section at www.gceurope.com



MOUSSE FOR FLUOROSIS

Prof. Laurie Walsh, University of Queensland

GC Tooth Mousse has been recommended for a variety of new uses since it was first introduced to the dental world in December 2002.

As a material which is capable of regenerating subsurface enamel, there was immediate interest in an application for white spot lesion reversal.

Because of the similar situation with increased levels of subsurface water which can occur when enamel formation is altered, the potential for using Tooth Mousse in the reversal of fluorosis was soon realized. This application has attracted intense interest, and while other cases have been shown in previous editions of Tooth Mousse Portfolio, in response to the ongoing awareness in the different treatment methods for fluorosis, additional new cases are presented here.

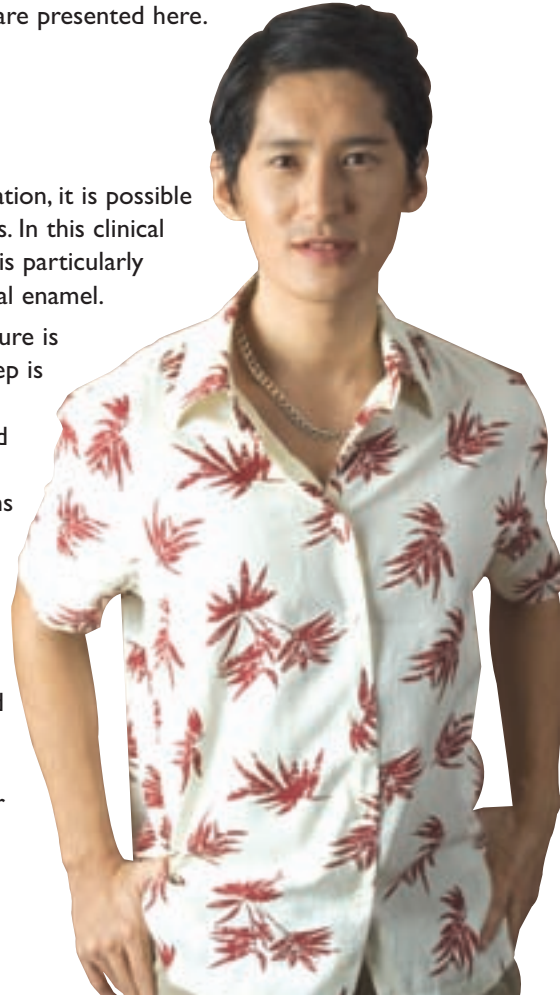
JASON

22 YEARS OLD

Using the process of subsurface remineralization, it is possible to reverse the visible appearance of fluorosis. In this clinical case, the pattern of fluoride-related opacity is particularly marked on the incisal edges and the proximal enamel.

As the penetration of ions into tooth structure is limited by diffusion, a surface preparation step is important to gain the greatest effect when using GC Tooth Mousse. Etching with an acid gel removes surface pellicle and makes the superficial enamel more porous, allowing ions to penetrate into the subsurface region.

When using phosphoric acid, a concentration of 30-40% is adequate both for this surface conditioning and for routine enamel etching. However, in cases of fluorosis, the etching time must be increased as the greater content of fluorapatite makes the enamel mineral more acid resistant. A maximum etching time of 1.5-2 minutes (per cycle) is recommended in such cases.





Obvious opacities from fluorosis.



A 2 minute etch with 37% phosphoric acid gel is undertaken, followed by gentle surface microabrasion with fine pumice in a conventional prophylaxis handpiece at 1000 rpm rotational speed.



After 3 weeks of applying GC Tooth Mousse each evening before bed, a reduction in the enamel opacity can be seen.



After 7 weeks of the same treatment, the opacities have been converted to normal translucent enamel.

Prof. Laurie Walsh

It is important to remember that increasing the concentration of phosphoric acid is not a useful means for reducing the etching time, since concentrations above 50% applied to enamel cause the formation of a monocalcium phosphate monohydrate material - which inhibits further dissolution of enamel. (Gottlieb EW, Retief DH, Jamison HC: An optimal concentration of phosphoric acid as an etching agent. Part I: Tensile bond strength studies. J Prosthet Dent 48: 48-51, 1982). In other words, etching of enamel with 65% phosphoric acid would be less effective than 35% in terms of achieving a more porous surface prior to applying GC Tooth Mousse, or for bonding of composite resin materials.



MOUSSE FOR IMPROVING ENAMEL

Prof. Laurie Walsh, University of Queensland

When considering the appearance of enamel surfaces, the pattern of surface reflection should be examined. In many patients, subtle grooves and other surface undulations on the labial surfaces of the incisor teeth cause diffuse scattering of light. Modifying this pattern can cause greater mirror-like (specular) reflection of the incident light from the labial surfaces. In simple terms, greater reflection of light makes the teeth appear lighter, so it is appropriate to describe this surface effect as tooth 'lightening' effect, as opposed to 'whitening' where the intent is to reduce internal tooth discolourations.

The procedure of tooth lightening has some similarities to polishing restorations, except that the levels of micro-roughness are different. In its natural state, the labial enamel surface has many irregularities at the microscopic scale. It is also covered by pellicle. To obtain the smoothest surface at the microscopic level, the first stage of the treatment involves etching for 30 seconds and gentle microabrasion. This can be repeated to obtain the desired level of surface optical change. In some cases graded abrasive pastes or conventional polishing discs can then also be used with good effect. Salivary promoted enamel remineralization occurring immediately after treatment can be greatly enhanced by application of GC Tooth Mousse. Continued daily use of GC Tooth Mousse as part of a home care regimen will optimize the tooth 'lightening' session.

One of the important benefits of using Tooth Mousse in the treatment protocol is to maximize the quality of the surface enamel, making it more resistant to subsequent acid attacks. By elevating calcium levels in the saliva and within dental plaque, the material can reduce the critical pH for dissolution of enamel minerals, making the teeth less prone to erosion. This is particularly important for the maxillary incisor teeth as their labial surfaces do not receive the benefits of extended contact with saliva, and are thus prone to mineral loss from erosion.

JULIE

28 YEARS OLD

This clinical case was a first for Tooth Mousse, but had a very satisfying outcome with a home care treatment program of a nightly application of Tooth Mousse before bed for a period of 4 weeks.

Julie's incisor teeth show subtle vertical grooving which causes scattering of light. The overall arrangement and shade of the teeth are quite acceptable. She was hoping to improve their appearance to boost her confidence for a forthcoming job interview, and was interested in non-restorative options as she suffered from needle phobia and an anxiety disorder.



This shows the initial situation



Immediately after 3 cycles of enamel etching and gentle microabrasion, with the teeth having been dried thoroughly, the pattern of vertical grooving is less obvious, and a gentle etching pattern can be seen on the teeth. GC Tooth Mousse can be applied immediately after this stage. The casein phosphopeptide proteins will bind to the enamel surface and the teeth will feel smooth.



At the review appointment 4 weeks later, the enamel surface has remineralized and the change in reflection is very apparent. The labial surfaces of the maxillary central incisors now give a mirror-like reflection of the incident (incoming) light. In such cases, the final visual effect is normally evident after the second or third week.



YOUR HEALTH

reprinted from 'Womans Own' UK edition*
April 2005

I COULDN'T CLEAN MY TEETH FOR 11 YEARS

An allergy to toothpaste meant Corrina Hawkins hardly cleaned her teeth since she was 12. Now at 23, Corrina has four crowns and almost all her teeth are filled.

By the time she was 17, she had lost her front teeth, and her smile glinted with fillings. Ever since her early teens Corrina's teeth have been slowly decaying.

But the truth is that until recently, the mum of two children, Tyler, six and Molly, two had hardly cleaned her teeth since the age of 12. Her mouth was so sore with recurring outbreaks of ulcers that she couldn't bear to put a brush anywhere near her teeth. Along with the ulcers, Corrina also suffered with a numb tongue.

'I started getting mouth ulcers when I was about 10. And not just the odd one like most kids. I'd wake up with a mouthful, and they were so painful.

'One lot would clear up and then another outbreak would start. My friends were used to me being unable to talk because my tongue was completely numb. At one point, the numbness lasted three days. I couldn't say a word the whole time.'

When her mouth was like this, Corrina couldn't even touch her gums with a toothbrush – let alone give them a decent scrub.

'It meant I was only brushing my teeth when the ulcers healed – which was every other week.'

Then, five years ago, when she was 18, her husband, Nick, urged her to investigate the cause of ulcers. Her dentist suggested that she keep a diary in order to figure out what triggered them. 'It didn't take long to realize that I was allergic to toothpaste', she says.

It's a reasonably common problem, although not many people suffer as badly as Corrina. Most eventually find a toothpaste that doesn't cause problems, according to a spokesman for the British Dental Health Foundation.



Over several months, Corrina tried every kind of toothpaste available. But when she couldn't find one that didn't give her mouth ulcers, she gave up looking and was forced to find ways around the problem.

'I could brush my teeth as long as I didn't use toothpaste. I also found I could tolerate fluoride mouthwash, so bad breath was never a problem. I used an abrasive polish weekly to make my teeth feel clean – although I couldn't use it too often or I would have damaged my teeth.

'Sometimes my mouth felt so awful I'd squeeze toothpaste on my brush, scrub my teeth for five minutes and then put up with the ulcers and numbness. It sounds terrible but I've probably only cleaned my teeth about 20 times in the last three years.'

But Corrina was careful to go to the dentist every six months.

'With each visit I'd have a couple more fillings. I knew I was facing losing all my teeth by the time I was 30.

'My mouth was a mess. I'd already had veneers on my front teeth, but they cracked so I had to have them removed and crowns fitted. It was really horrible. But I had no alternative. I couldn't cope with the pain and inconvenience of the ulcers and numbness.'

Then in November 2004, Corrina heard about a new gel called GC Tooth Mousse, which helps prevent tooth decay by reducing levels of acid in saliva.

The mineral-rich fruit-flavoured gel, being hailed as 'the first all-round conditioner for the mouth', is rubbed onto the teeth and gums.

Researchers claim the gel can halt, and even reverse early tooth decay, and dentists predict it can help treat dental decay without the need for drilling.

'A high level of acid in the saliva attacks the tooth enamel, starting the damage that ends with cavities and decay', explains Edinburgh dentist James Andrews.

'This new gel prevents tooth decay by reducing levels of acid in the saliva, as well as strengthening teeth by feeding calcium and phosphorus deep into the dentine.'

Before she started using GC Tooth Mousse, Corrina had her saliva measured. The results were shocking.

'A strip of testing paper showed my saliva was more acidic than lemon juice or vinegar – and about on a par with car battery acid! No wonder my teeth were in such an awful state.'

Corrina used the gel on her teeth and gums, and was careful to avoid food or drink for half an hour afterwards.

'I don't use it as toothpaste as such – but that's actually how it's working out because my teeth feel so much cleaner', she says.

Two weeks later, she had another saliva test and this time the strip of paper gave a very different result. 'I'd got rid of all the excess acid in my saliva – which should mean my teeth will be protected against further decay.

'In any case, my mouth feels good, and my teeth are looking shinier and whiter. I'm still not using toothpaste, but for the first time in ages, I really feel like smiling.'

* permission from author Jane Feinman



MOUSSE FOR MILD FLUOROSIS

Prof. Laurie Walsh, University of Queensland

DARRYL

21 YEARS OLD

In many cases of mild fluorosis, a single treatment sequence of etching/microabrasion followed by GC Tooth Mousse can achieve the desired result. Patients should be instructed that the visual effect occurs through a slow chemical reaction, and thus should expect to see changes over several weeks rather than instantly.



Darryl is completing his university studies and his lifestyle poses a number of challenges for effective remineralization. He has regular sporting involvements with competitive rowing, which places him at risk from dental erosion should his fluid balance situation not be kept in check.

Darryl's teeth have the benefit of being formed with optimal systemic fluoride exposure (in his case from fluoride tablets), and he has remained caries free to this point. Because of its higher acid resistance, Darryl's enamel should be less prone to tooth wear driven by erosive factors such as subclinical dehydration and the intake of acidic sports drinks, although he will, of course, still be prone to attrition in the normal pattern. There is good evidence that incisal, palatal, occlusal and non-occlusal erosion is less common in patients who have optimal systemic fluoride exposure, however in the mandibular molar sextants, prior fluoride exposure does not appear to protect against occlusal erosion. A useful reference is a paper on fluoridation in childhood* by Carolyn Teo.

*Prior fluoridation in childhood affects dental caries and tooth wear in a south east Queensland population. Teo C et al. Australian Dental Journal. 1997 Apr;42(2): 92-102.)



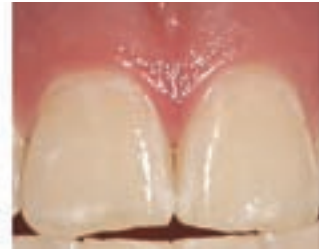
The pre-treatment view shows mild fluorosis with "snow-capped" anterior teeth.



At the end of the first appointment, three cycles of etching/microabrasion have led to a reduction in the area of the opacities. A two minute etching time was used for each cycle.



After four weeks of nightly application of GC Tooth Mousse, the remaining opacities have been replaced by enamel with a normal optical appearance.



This image shows the visual effect of the treatment on the maxillary central incisor teeth.



The effect of the treatment on the right anterior teeth.



MOUSSE FOR MORE FLUOROSIS

Prof. Laurie Walsh, University of Queensland

JANE

45 YEARS OLD

Jane has spent her life living on a large estate in the hill country. Although her home state is non fluoridated, the main water supply is run off from the surrounding limestone hills. Whilst she has maintained most of her natural teeth she has never been happy with the overall colour or appearance. Working a full 7 days per week for more than 20 years, Jane does not have time to attend many social events when she feels she needs to really be at her very best. However when her daughter announced her intention to get married, Jane felt she should visit her dentist to see what could be done about her oral appearance.

She was taken completely by surprise that the main problem was discolouration from too much fluoride. The most important thing for her was - could it be reduced without having to undergo lengthy, expensive and irreversible treatments?





The situation at baseline.



Immediately after three cycles of enamel etching and microabrasion, the discolourations are reduced in intensity (e.g. distal of tooth 11) and the enamel surfaces of the teeth are smoother in appearance.



Prof. Laurie Walsh

Some ten weeks after using GC Tooth Mousse each night before bed, there has been a pleasing change in the appearance of the teeth. A further complete course of treatment is warranted.

In cases of severe fluorosis, it is prudent to plan for several treatment cycles of etching and enamel microabrasion and to set realistic goals for what the treatment can achieve. In this case, Jane's consistent exposure to high fluoride concentrations in groundwater has led to severe fluorosis, with discolorations and areas where the surface enamel is defective or missing. One such non-carious defect (the mesial of tooth 12) has been restored in the past. In addition to banded 'mottling', there is a pattern of horizontal grooves present on most teeth, but particularly so on the maxillary central incisors.



MOUSSE FOR TOOTH WEAR

Prof. Ian Meyers, University of Queensland

JOE

67 YEAR OLD RETIRED SHIPYARD WORKER

- Diabetic, Heart Disease, Hypertension, Arthritis – taking multiple medications
- Sleep Apnoea – uses CPAP machine
- Moderate heartburn/gastric reflux
- Non smoker
- Large consumption of fruits, particularly pineapples and grapefruit
- Takes 3 teaspoons of vitamin C powder every morning
- Moderate consumption of black cola drinks in past
- Past history of moderate alcohol intake
- Previous endodontic treatment for sensitive anterior teeth
 - Some bruxism in past
 - Main complaints were sharp edges on teeth and poor appearance

Diagnosis

Joe had a long history of tooth structure loss with little being done to restore form and function. Previous treatment for sensitivity included some restorative work and some endodontic treatments. While the bulk of his tooth wear occurred in the past and he had no current tooth sensitivity, demineralization and tooth wear were still active. The multiple medications taken by Joe were a major factor in affecting his saliva profile.

Initial Saliva Test

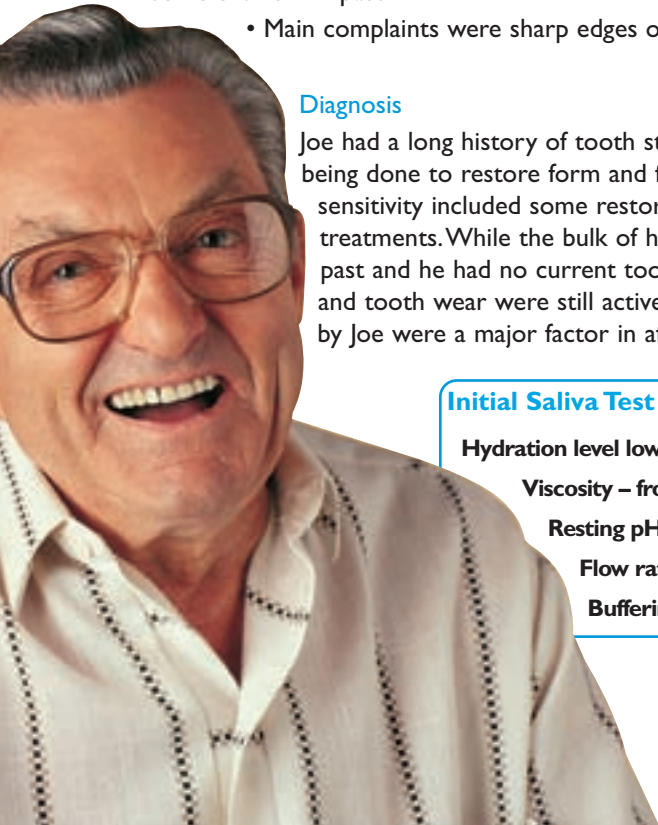
Hydration level low – minor salivary flow >60 sec

Viscosity – frothy

Resting pH – 5.0

Flow rate – 5 ml / 5 min

Buffering – 9



To help improve Joe's problem a home care program was designed to control his systemic problems.

The initial treatment was to reduce dietary acids and increase water consumption. Joe was also advised:

- To use a high fluoride content toothpaste (5000ppm)
- To use a bicarbonate mouth rinse after episodes of gastric reflux and apply Tooth Mousse at least once daily but more frequently after episodes of reflux

The anterior teeth were initially restored with Fuji IX GP to protect the remaining tooth structure and reduce the sharpness of the teeth.

Review of Joe's saliva after 4 weeks

Hydration level normal – minor salivary flow 30 - 60 sec

Viscosity – bubbly

Resting pH – 6.6

Flow rate – 6 ml / 5 min

Buffering – 9



There was improvement in the salivary parameters, but due to the multiple medications Joe was taking, it was considered that further improvements may not occur.

He was also advised to continue with his home care treatment due to the slightly acidic nature of his saliva and the need for constant monitoring.



Severe anterior tooth structure loss accelerated by the acidic oral environment and poor quality saliva



Incisal wear showing marked erosion prior to stabilisation and restorative treatment



Fuji IX^{GP} used to protect remaining tooth structure and reduce sharp edges on teeth



Full composite resin crowns placed over recontoured Fuji IX^{GP} cores

MOUSSE FOR ALL REASONS

Professional Information



Patient information



GC Asia Dental Pte. Ltd
Changi Logistics Centre
19 Loyang Way #06-27
Singapore 508724
Tel 65 + 6546 7588
Fax 65 + 6546 7577
<http://www.gcasia.info>
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