The not so **nasty** way of treating the deep caries lesion!
Contemporary, minimally invasive methods of managing caries
Disclosures

“I am not paid by any company to promote their products”

“I will try to be evidence-based rather than anecdotal in everything that I say”

“Some manufacturers fund my research”
What I plan to talk about:

- The “nasty” way
- Prevention, briefly
- When prevention fails and there’s a cavity
- Minimally invasive/chemical methods for treating a cavity
- Minimally invasive cavities using adhesive technology
- Deep caries in the asymptomatic vital tooth

With apologies to my endodontist friends!

Cost = £800

Nasty
By the way.....

There is nothing in the dental rule book which states that you cannot do cuspal coverage directly!

Cost *circa* £250
Another reason

Patients’ views of endodontic treatment

The help of Dr James Darcey is acknowledged

“I would rather have a baby than a root canal,” “This isn’t going to hurt, is it?”, and “No offense, doctor, but I don’t want it.” are among the unsolicited comments of patients that endodontists frequently encounter before the start of therapy. Other patients will express their apprehension by crying, hyperventilating, or becoming faint at the time of local anesthetic injection. Still others communicate apprehension by clenching their fists or becoming extremely loquacious.

In the fall of 1984 a public opinion telephone survey (1) of 1,000 people was commissioned by the American Association of Endodontists to measure awareness and attitudes about root canal therapy. Although only about one-fourth of the respondents had experienced a root canal procedure, three-fourths had an opinion concerning discomfort or pain associated with the procedure: 52% perceived root canal therapy as painful, 24% associated little or no pain with the procedure, and 24% did not know. Individuals who had actually experi-

Public Communications Inc. Public knowledge about endodontics: a survey conducted by the American Association of Endodontists, Chicago, 1984
Another reason...

Patients’ views of endodonic treatment

The help of Dr James Darcey is acknowledged

Lobb et al: 1 in 5 patients experienced problems but did not always seek help

Le Claire et al: Many patients apprehensive before endo, but 96% would have another RF
A Comparison of Anxiety Levels Associated with Root Canal Therapy and Oral Surgery Treatment

Marston Wong, DDS, MS, and W. Reed Lytle, DDS

Although the negative perception of root canal therapy is disproportionate when compared with oral surgery, it must be noted that one in seven experiencing root canal therapy still perceived it to be the most unpleasant dental experience.
Take home message

Although hearsay is an important factor, there is some evidence of adverse patient views regarding endodontic treatment.
Take home message

Although root fillings are a better option than extraction, root filled teeth survive less long than vital teeth.
Life expectancy in industrialised countries now 80 years

Therefore mean restoration longevity must be 73 years!

All restorations are temporary, except for the last one!

Message:
Start the restoration cycle as late as possible (primary prevention)
Keep as much sound tooth structure as possible (adhesion)
Increase the longevity of every restoration as much as possible (perfect seal and maintenance of restoration)
Caries prevention strategies

• Increasing fluoride exposure
• Decreasing level of *Mutans Streptococci*
• Increasing saliva flow, pH, buffering capacity
• Increasing availability of Calcium & Phosphate ions

➢ Topical fluoride – gel, paste, varnish, rinse
➢ Chlorhexidine rinse, varnish etc (F, Xylitol)
➢ Sugar-free chewing gum
➢ Casein Phosphopeptide-Amorphous Calcium Phosphate CPP-ACP
Fluoride, in all its presentations, is central to prevention.
“...the papers in this supplement detail the research techniques used to confirm the positive effects of stabilised stannous fluoride on tooth erosion”
The “F” word

Glass-ionomer Restoratives: A Systematic Review of a Secondary Caries Treatment Effect

R.C. Randall* and N.H.F. Wilson

Restorative Dentistry, Manchester University Turner Dental School, Higher Cambridge Street, Manchester, M15 6FH, UK. *Corresponding author

Abstract. It is generally accepted that glass ionomers inhibit secondary caries, but evidence for or against inhibition by glass ionomer restoratives is not conclusive.

28 papers included

No conclusive evidence for or against inhibition of secondary caries by glass ionomer restoratives

Fluoride is released by glass ionomers, but its effect is small. Fluoride released by F-containing composites is negligible.
Another paper in agreement!

Summary: F in the lab is good!
Casein is the predominant phosphoprotein in bovine milk. Casein phosphopeptides (CPP) can stabilise Calcium Phosphate in an Amorphous Calcium Phosphate complex (ACP).

The CPP-ACP complex was patented by the Univ. of Melbourne. They are the owner of the trademark Recaldent. Its use in remineralising dentine & enamel has been an “off-label” application (US Food & Drug Administration, 2007). Products containing it are Trident White chewing gum and GC Tooth Mousse and Tooth Mousse Plus.

11 RCTs accepted, but only 5 included in the meta-analysis

**CONCLUSION**

Within the limitations of this meta-analysis, the results of clinical trials support the short-term remineralising effect of CPP-ACP. Additionally the in vivo RCTs provide promising results for the long term use of CPP-ACP for caries prevention.
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<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year of publication</th>
<th>In vivo or in vitro</th>
<th>O$_3$ successful or unsuccessful</th>
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<tr>
<td>(Cochrane) Rickard et al</td>
<td>2004</td>
<td>In vivo</td>
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<td>NICE</td>
<td>2005</td>
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<td>Brazzelli M et al</td>
<td>2006</td>
<td>In vivo</td>
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<td>Azarpazooh A, Limeback H.</td>
<td>2008</td>
<td>In vivo</td>
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Photo Activated Disinfection

P.A.D. can achieve appreciable kills of oral bacteria, including *S. mutans*, when the organisms are embedded in a collagen gel or are present in carious teeth.

- Caries Res. 2004:38:530-536
Carisolv™

- Derived from Caridex
- Relies on Caridex data for safety
- Has approval for use in EC
- Red gel and transparent fluid
- Softens caries
- Perceived less need for LA

Carisolv™

Clear liquid
- NaOCL

Red gel (pH11)
- 3 amino acids: Leucine, Lycine, Glutamic acid
- Carboxymethyl-cellulose gel
- Na (OH)₂
- Colouring agent
Patient assessment of Carisolv™
Burke FJT, Hall AF, J.Dent.Res.1999

✓ 8 dentists, 62 patients, ethical approval
✓ Mean age 29yrs, range 6 to 76 years
✓ Most found treatment with Carisolv to be pain free
✓ Over half the patients thought treatment with Carisolv was faster than normal
✓ Sound, smell and taste of the procedure was acceptable to a large proportion of patients
✓ Cavity prep. with Carisolv had a significant preference over preparation with drill

Dentist assessment of Carisolv
Burke FJT, Hall AF, J.Dent.Res.1999

✓ Majority of dentists disliked the Carisolv procedure because it took longer (20 minutes in comparison with 5 mins.)
✓ Further refinement of the procedure indicated

Carisolv:
Patients liked it!
Dentists didn’t!
Comparative clinical study on the Carisolv caries removal method
Kakaboura A, Masouras C, Vougioklakis G
Quintessence Int. 2003:34:269-271

RESULTS
Patients found Carisolv more pleasant (82%) and preferable to drilling. 40% of drill patients needed LA, cf 8% with Carisolv. More time needed for Carisolv (12 mins vs 7 mins). Carisolv induced no gingival reaction.
An Evaluation of Polymer Rotary Instruments’ Ability to Remove Healthy, Non-carious Dentine

Catharina H.J. Hauman and Dusan V. Kuzmanovic

Abstract - The aim of this study was to confirm that Smartprep™ burs do not cut non-caries, healthy dentine.

Twenty non-carious extracted molars were trimmed with a diamond bur to remove enamel and to create a flat dentine surface. A new Smartprep™ bur (RA #4) was applied to each tooth for 30 seconds. As a control, a new number three round stainless steel bur was applied to each tooth. The mean dentine loss was 4.25 mg (range 1.4 – 9 mg) for Smartprep™ burs and 12.21 mg (range 7.6 – 16.5 mg) for stainless steel burs. The Smartprep™ burs remove significantly less dentine than stainless steel burs.

INTRODUCTION

The treatment of the progression of caries is of utmost importance. The use of rotary instruments is one of the most common methods for the removal of dental hard tissues.
Take home message

Some contemporary minimally invasive methods of cavity preparation are showing promise but need further development.
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Preventive resin restorations: three year results
Simonsen RJ. JADA 1980:100:535-539

6 to 8 year old patients
88 preventive resin restorations
98.9% success (complete retention)


332 restorations placed, Patients aged 6 to 14 years. 79 restorations assessed after 9 years, 54% success (complete retention), 25% had lost some sealant, 29% lost all sealant, 24% caries

CONCLUSION: The preventive resin restoration provided excellent long term results.
Amalgam restorations occupied 25% of the occlusal surface. Composite restorations occupied 5% of the occlusal surface.

No significant difference in median survival time between the amalgam and composite restorations.

150 pairs of restorations in 163 patients. 5 year follow up.

Welbury et al., Br. Dent. J. 1990:165:361
The evidence suggests that GIC protects pits and fissures of permanent molars against caries at same levels as resin-based sealants. However, there is a need for well-designed standardised RCTs, particularly including newer high viscosity GICs.

What about Glass Ionomer sealants?
Atraumatic perspectives of ART
Schriks and van Amerongen, 2003
403 children, 2 groups (750 rpm rotary instrument and ART)
• Discomfort scores determined by heart rate and anxiety (Venham scores)
• Children treated with ART using hand instruments alone had less discomfort than those treated with rotary instruments
UK dental practitioners’ understanding of ART

FJT Burke, S. McHugh, L. Macpherson, M-T Hosey, L. Shaw, S. Delargy & B. Dopheide

CONCLUSIONS
Although almost half of the respondents indicated that they were aware of ART, few had adopted it in its true form in their treatment of caries. More education of UK GDPs is indicated in minimal intervention techniques in the treatment of caries in the primary dentition.
Fuji VII is useful in these cases

- Command
- set glass
- ionomer

Now called Fuji Triage
Take home message

Glass ionomer performs adequately in ART, but needs further improvements in its physical properties.
There is positive evidence from the world of ART. 29 publications included on high-viscosity GIs: Survival of single-surface ART restorations in primary and permanent teeth, and the caries-preventive effect of ART sealants were high. Clinical relevance: ART can safely be used in single-surface cavities in both primary and permanent teeth. ART sealants have a high caries preventive effect.
The Infiltration Concept

Icon®
Made by DMG.
The potential for resin infiltration technique in dental practice

The use of resin infiltration to improve the appearance and texture of anterior teeth in dentures and restorations. The technique involves the infiltration of a resin into the surface of the tooth, which can improve the overall color and translucency. This can be particularly useful in situations where traditional treatments have not been successful or where the patient is looking for a more natural-looking result. The infiltration process can be customized to meet the specific needs of each patient, and the results can be maintained with proper care and maintenance.
Treatment of the smear layer

- REMOVE (Etch & Rinse/Total etch)
- LEAVE/PENETRATE (Self etch)
- UNIVERSAL MATERIALS (Etch & Rinse, Selective enamel etch, Self etch) (use for direct and indirect)
The first Universal Composition

• BisGMA
• MDP
• Vitrebond Copolymer
• HEMA
• Ethanol
• Water
• Filler
• Silane
• Initiators
Scotchbond Universal Adhesive

- Works with both Total- and Self-Etch technique, providing high flexibility in clinical procedures
- Provides procedural simplicity
- Total-etch or Selective-enamel etch for highest enamel bond strength, e.g. for incisal edges
- Self-etch for low post-op sensitivity, fast technique
For Scotchbond Universal, the concept of selective enamel etching should be employed.
Take home message

Dentine bonding is now reliable and effective and is central to minimally invasive dentistry. Selective etching of enamel appears essential. New Universal systems hold promise.
Saucer-shaped cavity preparations for posterior approximal resin composite restorations: Observations up to 10 years.
Nordbo H. et al. Quintessence Int. 1998;29;5-11

51 restorations, study commenced in 1987. Restorations in Ful-fil, Occlusin not using a dentine bonding system. Patients aged 13 to 17 yrs.

CONCLUSION: It is concluded that the saucer-shaped resin composite restoration represents a viable treatment modality for small cavities. The time may have come to include it in dental curricula as a routine operative treatment for small class II lesions.
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Ultraconservative and cariostatic sealed restorations: Results at year 10
Mertz-Fairhurst EJ, Curtis JW, Ergle JW,

Restorations assessed using USPHS criteria
- 12 failures from 85 sealed composites (14%) (caries only at margin of 1 restoration)
- 1 failure from 44 sealed amalgams (2%) (caries only at margin of 1 restoration)
- 7 failures from 41 unsealed amalgams (17%) (caries at margins of all 7 failed restorations)
Ultraconservative and cariostatic sealed restorations: Results at year 10

Mertz-Fairhurst EJ, Curtis JW, Ergle JW, Rueggeberg FA, Adair SW

JADA.1998:129:55-65

CONCLUSIONS

- Undermined enamel may be stronger than we believed
- Class I amalgams should be sealed after placement
- Bonded and sealed resin composite restorations placed over frankly cavitated lesions arrested the progress of these lesions over a period of 10 years
Phenotypic and genotypic selection of microbiota surviving under dental restorations

Paddick JS, Brailsford SR, Kidd EAM, Beighton D.

Applied & Environmental Microbiology 2005:71:2467-2472

METHOD

Ten carious lesions were treated, with infected dentine being sealed below dental restorations for 5 months. Samples of infected dentine taken at baseline and after the removal of the restorations.

CONCLUSION

We propose that during the interval between restoration placement and removal, the available nutrient significantly affected the surviving microbiota. The surviving microbiota was less complex than that isolated from carious lesions.
Two treatment groups: Ca (OH)2 or gutta percha

Complete caries removal in 4-7 year old children

Sealed with resin composite for 4 to 7 months

Cavities reopened and examined
Soft caries changed to hard or leathery

The bacteria disappeared

CONCLUSION
- Incomplete caries removal in deep caries lesions is able to arrest the caries process on a long-term basis, preventing pulp exposure and maintaining tooth vitality. The need for more invasive techniques such as endodontics may be avoided.

...and, the success rate is better than direct pulp capping (13% at 10 yrs). Barthel et al. Pulp capping of carious exposures: treatment outcome after 5 & 10 years. J.Endod.2000:26:525-528.
If the caries process is driven by the biofilm, the process should be arrested simply by sealing the cavity. The persistence of a few micro-organisms may be irrelevant. They may be opportunistic squatters adapting themselves to the new environment in which they find themselves.

This review makes uncomfortable reading for those of us teaching operative dentistry. There is no clear evidence that it is deleterious to leave infected dentine, even if it is soft and wet, prior to sealing the cavity. This cautious approach may be preferable to vigorous excavation because fewer pulps will be exposed.
Study selection: 28 studies (19 RCTs, 9 NRCTs) with 1782 patients (2555 lesions), most of them investigating primary teeth, were included. Risk of complications was highest when excavating until only non-stainable dentine remained, and lowest when not attempting to remove all softened dentine. Risk of pain significantly decreased if self-limiting chemomechanical excitation or fluorescence-assisted lasers were used instead of excavating until all dentine was hard. When not attempting to remove all softened dentine, the time used for excavation was shortest, whilst the greatest number bacteria remained.

Conclusions: Not attempting to remove all softened or stainable dentine might reduce the risk of complications. Data regarding self-limiting excavation is insufficient for definitive conclusions. Excavation criteria should be validated against clinically relevant outcomes. Clinical significance: Given current evidence, dentists might not need to attempt excavation until only hard dentin remains in proximity to the pulp. Instead, their choice of excavation criterion or method should be guided by clinical requirements and outcomes.
Complete or ultraconservative removal of decayed tissue in unfilled teeth
Ricketts DNJ, Kidd EAM, Innes N, Clarkson
Cochrane Database of Systematic Reviews 2006

4 studies, of 529 eligible, met the inclusion criteria, two stepwise excavation studies and two ultraconservative caries removal studies. Stepwise excavation: (Leksell 1996; Magnusson 1977), non reintervention studies: (Metz-Fairhurst 1987; Ribeiro 1999)

Partial caries removal in symptomless primary or permanent teeth reduces the risk of pulp exposure. No detriment found to the patient in terms of pulpal symptoms in this procedure & no reported premature loss or deterioration of the restoration.

CONCLUSIONS
Partial caries removal is preferable to complete caries removal
Insufficient evidence to determine whether it is necessary to re-enter and excavate further, but studies that have not re-entered do not report adverse circumstances.
Conclusions:
Stepwise and partial excavation reduced the incidence of pulp exposure in symptomless, vital, carious primary as well as permanent teeth. Therefore these techniques show clinical advantage over complete caries removal. There was no evidence of a difference in signs or symptoms of pulpal disease between stepwise excavation, and complete caries removal, and insufficient evidence to determine whether or not there was a difference in signs and symptoms of pulp disease between partial caries removal and complete caries removal, and in the risk of restoration failure.
Once a cavity has formed, the lesion continues to progress as a result of bacterial metabolism. The dentine is softened. The dentist should remove the infected dentine & leave affected dentine which is capable of remineralisation.

When restoring deep caries lesions in vital, asymptomatic teeth, vigorous excavation is likely to expose the pulp. This complete excavation is not needed and should be avoided.
Trevor’s view:

- Seal caries in when you feel that the pulp will be exposed in an asymptomatic, vital posterior tooth (occlusal cavities only).
- Fewer teeth will require RCT.
- Be sure to tell the patient about the concept and write it in the notes.
- Be sure that it is you who takes the next bitewing!
CONCLUSION

The seal’s the deal!

…but only proven for occlusal lesions
Another way of managing deep caries in a vital tooth.
Instructions for use

1. Gently tap the capsule to diffus the powder
2. Open the capsule and place it in the capsule holder
3. Gently tap on the cap of the monomer to allow mixing solution to desorb
4. Open the monomer by turning the cap, taking care no drop falls out of the bottle
5. Pour 3 drops of mixing solution into the capsule
6. Close the capsule and place it in your mixing machine
7. Mix for 30 sec.
8. Take out the capsule from the mixing machine
9. Open the capsule and take out Biobent™ with an instrument
10. Place Biobent™ on the operative site, Biobent™ sets in 1.2min from start of mix

Powder liquid ratio is critical
The evidence base is building

Response of Human Dental Pulp Capped with Biocement and Mineral Trioxide Aggregate

Alika Vovkivskii, DMD, PhD, *†| Mariya Nykina, DMD, PhD, †| Irina Bobkova, DDS, PhD, †| Elena Matveeva, DMD, PhD, †| Natasha Volosovych-Palchukh, MD, PhD, †| Katherine Vovkivskiy-Baikich, DMD, PhD, ‡| Irina Bobkova, DDS, PhD, †| Natasha Volosovych-Palchukh, MD, PhD, †| Marina Kuznetsov, DDS, PhD, †| Elena Matveeva, DMD, PhD, †| Vitaly Vovkivskiy, MD, PhD, †| Evgeny Vinogradov, DMD, PhD, †*†| Anna Pidopryhiv, DMD, PhD, †| Irina Bobkova, DDS, PhD, †| Natasha Volosovych-Palchukh, MD, PhD, †

The evidence base is building

In Vitro Microleakage of Biocement as a Dentin Substitute Compared to Fuji II LC in Cervical Lining Restorations

Anna Raspopova | Geoffroy Esmarch | Jacques Dejou | Irina Bobkova

Purpose: To evaluate the marginal sealing efficacy of Biocement at the cervical margin of composite crowns placed in tooth color (1) to evaluate a mid-composite, compared to a mid-composite adhesive (Fuji II LC). Materials and Methods: Thirty composite crowns were prepared on mesial and distal surfaces of 30 extracted human third molars. The teeth were randomly assigned into 5 groups of 6 each: Group A) Biocement, Group B) Fuji II LC + Bis-GMA + Silane + TMS, Group C) Fuji II LC + Bis-GMA + Silane + TMS, Group D) Fuji II LC + Bis-GMA + Silane + TMS, Group E) Fuji II LC + Bis-GMA + Silane + TMS. The materials were applied according to the manufacturer's instructions. The biocement was cured for 1 minute at 25°C and 70% relative humidity. The crowns were polymerized for 7 days at 37°C in a humid chamber. The crowns were removed and inspected under a stereomicroscope at 40X. The results were expressed as a score from 0 to 5: 0 = no leakage, 1 = slight leakage, 2 = moderate leakage, 3 = severe leakage, 4 = complete leakage, 5 = complete leakage. The data were analyzed with the analysis of variance (ANOVA) test and the Student-Newman-Keuls multiple comparisons test. Results: No statistically significant differences were found between the 5 groups, neither for the cervical marginal nor for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the cervical marginal or for the 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Bioactivity of Biodentine

Literature review of chemistry and interactions of calcium silicate cements

New optical technique, two-photon fluorescence introduced

“The local bioactivity of the calcium silicate materials has been shown to produce mineralisation within the dentine substrate, extending deep into the tissues”

“Local ion-rich alkaline environment is more favourable to mineral repair compared with glass ionomer materials.”

“The advantages of this for minimally invasive management of carious dentine are self-evident”
Biodentine vs Theracal

- The leaching of Calcium ions was much lower in Theracal than in Biodentine.
- Theracal did not exhibit any formation of Ca(OH)$_2$ on hydration.
- The presence of a resin matrix modifies the setting mechanism and calcium ion leaching of Theracal.
- The clinical implications of these findings need to be investigated.
**Biodentine™**

**Advantages**
- Maintains pulp vitality
- Biocompatibility
- Long working time
- Suitable for use with the “thumb” technique

**Disadvantages**
- Technique sensitive
- Long working time
- Idiosyncratic handling
- Mixing sensitive
- Finding it in the capsule
My conclusion: A “get out of jail” material
Information for patients with sealed caries restorations

Research indicates that, if the filling is sealed, the decay will not grow further and the tooth will survive. A subsequent X-Ray of the tooth will show where the decay was.

Your dentist will check, after 6 to 12 months, that it is not getting worse. However, if you change dentists and you have subsequent X-Rays, your new dentist could therefore advise that the previous dentist has left decay in a tooth, when, in fact, (s)he has done this based on good clinical research.
Information for patients with sealed caries restorations

Placing a well-sealed filling over the decay will ensure that it doesn’t come back.

There is a small chance that the tooth will die and a root filling will be needed.

That you have had deep decay in your tooth means that you have a problem with your diet and/or oral hygiene/tooth brushing. You will therefore need to address this – your dentist or his/her hygienist will give you advice.
In situ transformation of glass ionomer into an enamel-like material
Van Duinen, Davidson, DeGee & Feilzer
Am. J. Dent. 2004:17:223-227

Straightforward application of conventional glass ionomer restorative materials can lead to the formation of an extremely hard, glassy material, which remains in the fissures as a hard, enamel-like structure well integrated with the tooth.
What is it?

- Liquid silica and fluor/hydroxyapatite crystals (reduce solubility, improve flexural and compressive strengths)
- Fluoroapatite (aid to remineralisation)
- Fluoride aluminium-silicate glass
- Liquid silica
## GCP Fill physical properties

### Glass Carbomer® Properties

- Aesthetics are not as good as composites
- Aesthetics improve over time as fluoro/hydroxyapatite crystals grow
- For enhanced aesthetics, a composite can be bonded onto the Glass Carbomer using standard acid etch/bond techniques
- Using Fluoride toothpaste, the Glass Carbomer will be continuously recharged

<table>
<thead>
<tr>
<th>Property</th>
<th>Conventional Glass Ionomer (Fuji IX)*</th>
<th>Composite**/***</th>
<th>GCP Glass Fill*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexural strength</td>
<td>35 Mpa</td>
<td>60-150 Mpa</td>
<td>122.3 Mpa</td>
</tr>
<tr>
<td>Compressive strength</td>
<td>250 Mpa</td>
<td>195-320 Mpa</td>
<td>260 Mpa</td>
</tr>
<tr>
<td>Enamel shear bond</td>
<td>6.7 Mpa</td>
<td>10-30 Mpa</td>
<td>13.7 Mpa increasing over time</td>
</tr>
<tr>
<td>Acid solubility (pH=4)</td>
<td>0.13 %</td>
<td>0 % (n.a.)</td>
<td>0.03 %</td>
</tr>
</tbody>
</table>

*of D. Glavina, Department of Paediatric and Preventive Dentistry, School of Dental Medicine, University of Zagreb, Croatia.

**In vitro Comparative Study of Compressive Strength of Different Types of Composite Resins in Different Periods of Time, Sepideh Banava, Saman Salehyar - Dental Faculty, Tehran Azad Dental School, Tehran, Iran

***Manufacturers data (ANSI/ADA Specification 27 for permanent restoratives: Flexural Strength >50 Mpa)
Handling evaluation of GCP Fill by the PREP Panel

- 13 evaluators
- 580 restorations (35% Class I, 41% Class II & MOD, 18% in primary teeth, and others such as core build ups).
- 62% (n=8) of the evaluators stated they used GCP Glass Fill in deep cavities and that it had performed satisfactorily in the short term.
- Rated material on visual analogue scales
- Had they not had GCP Glass Fill available for use, over half of the evaluators would have used a glass ionomer or GI derivative instead.
Handling evaluation of GCP Fill by the PREP Panel

Difficult to use 1 — 5 Easy to use
3.5

Not viscous enough 1 — 5 Too viscous
3.2
Handling evaluation of GCP Fill by the PREP Panel

- Easy to use and good hardness
- “Heat caused mild discomfort & could be felt through gloves if holding a matrix strip”
- “If enough curing time then harder than RMGI”
- “Aesthetics secondary for decision to use ”
- “Better than GI or Amalgam. It’s great as a base plus composite. Patients did not object as they understood the therapeutic value”
GCP Glass Fill II behaved like a glass ionomer. Thermocure set a real advantage. "

“Great material for posterior teeth where I used RGMI in the past. Easy to use & shape although longer to cure it is still better than self-cures”

“Have used it for 2 years – excellent in deep cavities with minimal sensitivity and good results”
CONCLUSIONS

The satisfactory reception for this new type of posterior restorative material, requiring a different technique to posterior composite and RMGI materials, is indicated by the number of evaluators stating they would both buy and recommend the system to colleagues (62%). Its indication as a suitable material for use in deep cavities in vital asymptomatic teeth appears to have been upheld. In addition, there were no reported cases of post-operative sensitivity.
CONCLUSION: Shows promise but I will await the results of long term clinical trials.

http://shop.gcp-dental.com/
Conclusions:
Microtensile bond strengths of PBNT/composite restorations to caries-affected dentine in clinical cavities were statistically comparable to those to sound dentine.
Patients' preferences for selective versus complete excavation: A mixed-methods study

Rolf Schwindelke*, Roxana Mostabadkave, Isabella Otto, Christof E. Dörfer*, Silke Burket*

*Department of Operative Prosthetic Dentistry, Charité University of Berlin, Germany
**Department of Fixed Prosthodontics, University of Leipzig, Germany
***Department of Restorative Dentistry, University of Leipzig, Germany

ARTICLE INFO
Objective: Despite increasing evidence supporting selective versus complete tissue removal, the technique is not advocated by many dentists. The present study aimed to assess patients' preferences for selective versus complete excavation and to identify predictors of this preference.

Methods: A questionnaire was designed, including demographic, clinical, and preferences questions. The questionnaire was sent to patients following treatment, with dental and non-dental questions included. Statistical methods included descriptive analysis, multiple binary logistic regression, and multiple linear regression. The preferred treatment was assessed using questions about the outcome of the procedure, concomitant pain, and treatment satisfaction.

Results: The questionnaire was sent to 1,159 patients, of which 411 responded (35.6%). The majority of patients preferred complete excavation (65.1%). A multiple binary logistic regression analysis revealed that age, gender, and previous treatment experience were associated with treatment preference. In a multiple linear regression analysis, the effect of age and gender was not significant.

Fig. 1. Case vignettes for complete (left) and selective (right) carious tissue removal.
Do patients prefer complete or partial excavation?

Used to develop questionnaire

Sent to 150 patients

“better risk the nerve than have to come back”

“better a frightening end than endless frightening”

“better do it properly”

83% preferred complete excavation!!!!!!!

Shock!! Horror!!!!!!!!!

Preference for partial excavation was increased among respondents who had a University degree & emotionally stable personality. Negatively related to those with dental anxiety & those who frequently changed dentist.
CONCLUSIONS
Hall technique preferred by majority of children & carers
After 5 yrs, Hall PMCs showed more favourable outcomes for pulpal health & restoration longevity than conventional restorations. The Hall technique appears to offer an effective option for carious primary molar teeth.
Best treatment is the simplest treatment that adequately meets the patient’s needs. Adhesive dentistry can help with this.
Reasons to adopt minimal intervention
- Patients like it (if you advise them of your philosophy)
- Teeth like it (fewer die!)
- It’s easier for dentists (fewer die: better for their blood pressure!)
- Lawyers hate it (fewer dentists get sued!)
- We now have the materials to make this work
Perspectives

THE "DAUGHTER TEST" IN ELECTIVE
ESTHETIC DENTISTRY

We read with interest the excellent overview of the 2-year status of porcelain laminate veneers by Dr. Mark Friedman and agree with his statement "It is unfortunate that some members of our profession misrepresent porcelain veneer restorations as if they were completely innocuous to the dentition." It is not our intention to initiate a witch hunt on the porcelain veneer technique but to express considerable disquiet regarding the seemingly dentate patients adapt well to modest changes in vertical dimension without problems, a concept originally demonstrated by Andersson and later by Dahl. It is our view that, in many cases, long-term composite build-ups should be the preferred line of treatment and that those have shown demonstrable success with an excellent "fall-back position." These provide esthetic restorations—as demonstrated by the mock-up for a 43-year-old patient in the recent article by Chen.
“Whatsoever you would, that men should do to you, do ye even so unto them.”
The Bible: Matthew ch7 v12.

“In everything, do unto others what you would have them do to you.”
Peer reviewed for increased believability

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Case study 30 credits, Audit project 30 credits:
When completed, a total of 180 PG credits = MSc

Distance version commenced February 2013

Has been running for 14 years
Final take home messages

- Nothing lasts forever
- Prevention should always therefore be considered
- There is a demonstrable incidence of pulp death following tooth preparation
- Some minimal methods for caries treatment show promise
- Dentine bonding facilitates minimal intervention
- Sealing caries into a vital, asymptomatic tooth is no longer considered dodgy dentistry
- Pulp capping doesn’t work well
- The “daughter test” should always be remembered
Dentistry is changing!

Thinking “Minimal Intervention” treatment of deep caries is part of the process