



Treat white spots



Stop incipient caries



Icon

Caries Infiltration

A woman with dark hair, wearing a white lab coat, is looking at a tablet computer. The background is a plain, light-colored wall. A teal arrow graphic points from the text box towards the woman's face.

It's just good having another treatment option

Take a glance through your patient records. How many classic »let's keep an eye on this« cases are there? But, ultimately, sitting around and waiting is no good for anybody, especially when you end up drilling anyway. Caries infiltration with Icon broadens your treatment options.

Wait? Drill? Or...

Modern dentistry is focused on prevention now more than ever. In early stages, caries can be treated with fluoride. As the caries progress deeper, however, a filling becomes necessary. Even minimally invasive treatment in proximal areas requires sacrificing lots of healthy tooth structure to reach the infected lesion.

Caries infiltration with Icon builds a bridge between prevention and minimally invasive therapy methods. Infiltration with the highly fluid resin enables an innovative treatment of incipient proximal caries as well as smooth surface white spots.

No drilling, no pain, no unnecessary damage of healthy tooth structure.

Challenges in the practice

■ Initial caries lead to changes in shade on smooth surfaces: white spots

Until now, there has never really been a satisfactory solution for treating these white spots, which often occur after removing dental braces.

■ Areas between teeth are at risk but difficult to access

Proximal areas are not only a problem when brushing. Caries can form here quite easily, which are difficult not only to detect, but also for the dentist to reach physically.



■ Drilling leads to the loss of healthy tooth structure

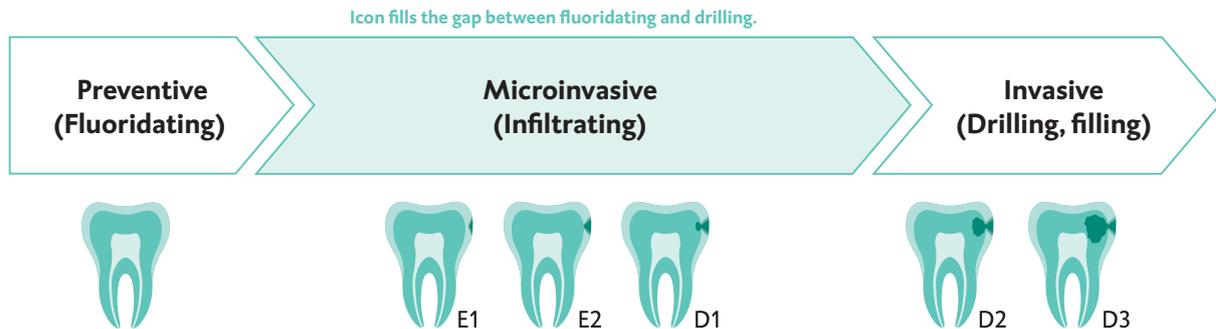
Invasive treatment leads to a large loss of healthy tooth structure. Particularly in cases of proximal caries, there is an unfavorable ratio of healthy tooth to caries that must be removed.

Can this problem be solved?

It can. You can.

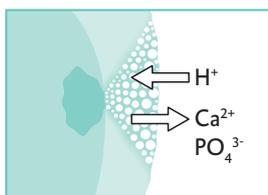
Icon: The answer

Caries infiltration with Icon fills the gap between prophylaxis and filling. In addition, this treatment optically blends in the lesion with the healthy enamel. This innovative method can therefore be used for esthetic treatments of front teeth, where appearance plays an important role.



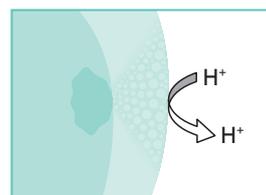
An ingeniously simple principle

The infiltration method works quite simply: After pretreatment with an etching gel, the infiltrant, a highly fluid resin, is applied to the affected area. Capillary action draws the infiltrant deep into the porous enamel, and it is then light-cured. This blocks the penetration of cariogenic acids. The incipient caries can be stopped – without drilling. Healthy tooth structure is preserved.



Incipient caries before treatment

Cariogenic acids attack the enamel and draw out minerals. The tooth becomes porous.



After treatment

By sealing the pore system, acids can no longer penetrate into the lesion, thus stopping the progression of the caries at an early stage.

This method is so compelling, that my only question is: why wasn't this being done sooner?

What sounds so simple was actually long hard work in research and development at the Charité Berlin, Kiel University (CAU), as well as at DMG. Many years and countless tests and studies were necessary before it was certain: Icon works.

General recognition

Award-winning

Among other awards, DMG received the »German Innovation Prize 2010« in the category »medium-sized enterprise« for Icon. DMG was also recognized as a »Selected Landmark 2009« by the initiative »Germany – Land of Ideas« (under the patronage of the Federal President of Germany). Icon was also awarded the »Innovation Prize 2009« by German dentists.



Deutschland Land der Ideen



Ausgewählter Ort 2009

Positive press

Treating initial caries gently, pain-free, and esthetically? Unsurprisingly, there has also been tremendous public interest. The response to caries infiltration in the public media, as well as trade press, has been overwhelmingly positive.

»As a minimally invasive procedure, it is very innovative and very pleasant for the patient.«

Dr. med. Gabriele Blatt, dentist, at br-online.de

Convincing studies

For years, numerous international scientific studies have examined the clinical effectiveness of caries infiltration. For more information on these studies and current results, please see page 12 and visit our website at www.dmg-dental.com/icon

»Advantage: Healthy tooth structure is hardly damaged, everything stays nice and white.«

Grazia

Practice tested, dentist approved

How do international dentists rate caries infiltration and their experiences in practice?

Here are a few opinions:

»For us dentists, Icon is the missing piece in the puzzle between prevention and restoration. What I especially like is how scientifically well-documented the method was before it was brought to market.«

Dr. Marcio Garcia dos Santos MSc, PhD (Dentist), Brazil

»The benefits Icon offer me personally are to be able to play an active and preventive role in dentistry!«

Dr. Hervé Tassery (Professor and Hospital Practitioner – University of the Mediterranean Marseille), France

»I have been using Icon for over 3 years. As a Pediatric Dentist, Icon's non-surgical restorations have really proved extremely successful in treatment of white spot carious lesions. Icon is definitely my choice for preventive dentistry.«

Dr. Richard Chaet (Pediatric Dentist), USA



Icon: How it works

The infiltration treatment consists of three easy steps:

Etching – Drying – Infiltrating

All the materials required are contained in every Icon package.

1. Icon-Etch

Icon-Etch prepares the tooth for infiltration. The HCl-Gel is applied to the affected area with the aid of our special applicator tip, removing the pseudo-intact surface layer. Only when this layer has been removed can the infiltrant penetrate into the pore system of the tooth.



2. Icon-Dry

For the next step of the infiltration process, a dry environment is necessary. To this end, the lesion is dried with Icon-Dry (ethanol) and air.



3. Icon-Infiltrant

The low viscosity infiltrant is applied, and penetrates deep into the enamel through capillary action and it is then light-cured. The infiltrated lesion has similar mechanical and visual properties to healthy enamel.



Advantages:

- Esthetic results on smooth surfaces
- Caries arrest at an early stage
- Preservation of healthy tooth structure
- Pain-free method, without anesthesia, or drilling



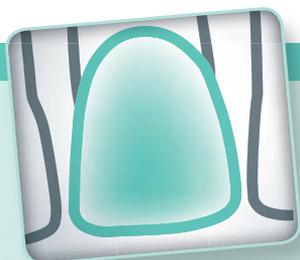
***Invasive therapy for an esthetic problem?
Until now, there hasn't been a simple,
suitable treatment option for white spots.***

Etching, drying, »filling« with a liquid resin: Infiltration delivers gentle and visible results quickly – and it's easy to explain to the patient. This is a win-win for both sides.



One method – many possibilities

VESTIBULAR TREATMENT



Icon smooth surface is used to treat white spots in vestibular areas. The principle is: Air and water entrapments in the tooth have a lower refractive index than intact tooth structure. This leads to unesthetic discolorations. Icon balances out this difference and the appearance blends in with the healthy enamel.

• White Spots



Icon is effective on **cariogenic white spots**, especially immediately after removing braces.

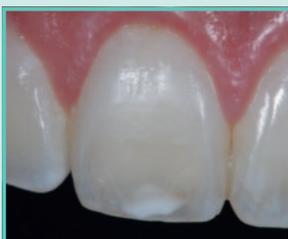
Even **brown spots**, which have developed over a longer period of time, can be treated esthetically, provided the surface is not cavitated.

• Enamel changes



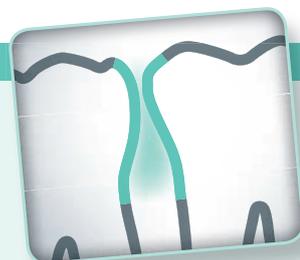
Cases of enamel changes like **fluorosis** or **Molar-Incisor Hypomineralization (MIH)** were able to be treated successfully, particularly in mild to moderate instances. Awaiting confirmation from clinical studies.

• Changes caused by trauma



Further enamel defects, such as those caused by **trauma**, can be esthetically improved with Icon. The success of the procedure is heavily dependent on how deep these defects lie within the tooth structure. The closer they are to the surface, the better the esthetic improvement. Awaiting confirmation from clinical studies.

PROXIMAL TREATMENT



Young adults have an especially high risk of lesions in the spaces between their teeth. Icon proximal allows these lesions to be treated early and microinvasively, before it is too late and the advancing caries makes an invasive intervention necessary.

• Initial caries

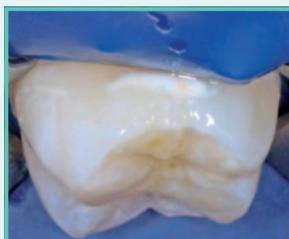


Icon can be used to effectively arrest the progress of caries that x-rays show have not advanced farther than the **outer third of the dentine (E1-D1)**.

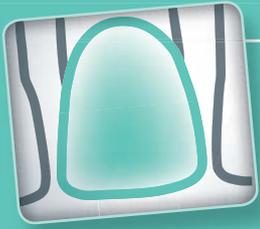


If x-rays show the lesion has advanced past the outer third of the dentine, treatment with Icon is no longer indicated. In this case, traditional invasive therapy is required.

• Directly accessible proximal surfaces



If, when a cavity is being treated invasively, an **incipient lesion is found on a neighboring tooth**, this lesion can be treated and stopped simply with Icon



VESTIBULAR TREATMENT



Icon and white spots



Fig. 1: Initial situation:
White spots after removing braces



Fig. 2: Result after treating with Icon-Etch



Fig. 3: Drying and visual check with Icon-Dry



Fig. 4: Application of Icon-Infiltrant



Fig. 5: Repeated application of Infiltrant



Fig. 6: Result directly after light-curing



Fig. 7: Result after polishing



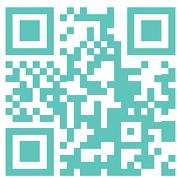
Fig. 8: Patient a week after treatment

- Fig. 1:** Cariogenic white spots occur frequently during orthodontic treatments with braces.
- Fig. 2:** Prior to treatment, teeth should be cleaned and a (liquid) rubber dam applied to protect the gingiva. Then, by etching with HCl-Gel (Icon-Etch) for two minutes, the pseudo-intact surface layer is removed.
- Fig. 3:** The lesion is dried with ethanol (Icon-Dry). The practitioner can preview the treatment results. If the whitish-opaque shade of the lesions is not noticeably reduced, the etching step should be conducted up to three times in total.
- Fig. 4:** The low viscosity resin (Icon-Infiltrant) is applied. Through capillary action, it penetrates deep into the enamel and fills the lesion.
- Fig. 5:** By repeating the infiltration step, it is ensured that the infiltration is complete and the surface is tightly sealed.
- Fig. 6:** Infiltrated lesions have similar esthetic and mechanical properties to healthy enamel.
- Fig. 7:** Using polishing discs smooths the surface and reduces the risk of discolorations.
- Fig. 8:** After one week, the tooth is completely rehydrated and the white spots are no longer visible, even at a normal conversational distance.

Tips from the practice

1. Re-etching »older« inactive white spots

- You can etch multiple times if there is a very thick pseudo-intact surface layer.
- If the white discoloration disappears within a few seconds when ethanol (Icon-Dry) is applied, then it is sufficiently etched.
- If the opaque discoloration remains, then the etching process should be repeated.
- **Up to three etching steps** for two minutes per lesion are possible.



How-to film on DMG's youtube channel

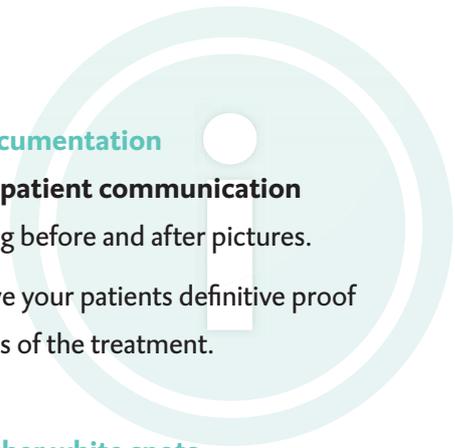
www.youtube.com/dmgdental

2. Before/after documentation

- **Optimize your patient communication process** by taking before and after pictures.
- These photos give your patients definitive proof about the success of the treatment.

3. Fluorosis and other white spots

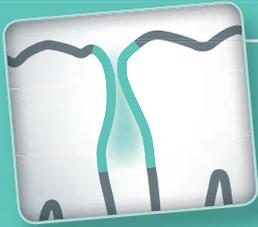
- Even non-cariogenic enamel changes can be treated with Icon.
- Experiences in practice show: Patients with **MIH-teeth** can be successfully treated, where it has proved useful to repeat the etching steps multiple times. Awaiting confirmation from clinical studies.
- **Fluorosis** and **changes caused by trauma** have been successfully treated. Infiltration on fluorosis has been confirmed in vitro. Awaiting confirmation from clinical studies.



The patient can see the improvement themselves. I don't have to say much else.

No unanswered questions: With white spots on smooth surfaces, both the patient and the practitioner can see the effect of caries infiltration for themselves. The vestibular application doesn't just solve an esthetic problem; it also gives reassurance for possible use in proximal areas.





PROXIMAL APPLICATION



Icon between teeth



Fig. 1: Initial clinical situation

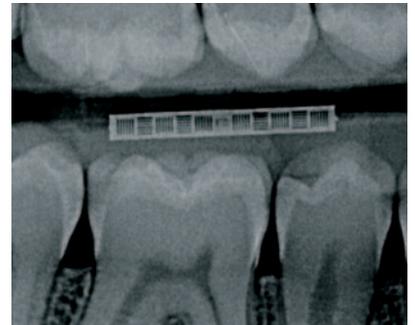


Fig. 2: Bitewing X-ray



Fig. 3: Separation with dental wedge



Fig. 4: Etching



Fig. 5: Drying



Fig. 6: Infiltrating



Fig. 7: Removal of excess



Fig. 8: Light-curing

- Fig. 1: The initial clinical situation provides no visual signs of proximal caries.
- Fig. 2: Only after x-ray images are taken can proximal caries be diagnosed and Icon indicated for use.
- Fig. 3: For proximal treatment, the affected teeth must be sufficiently separated. The wedges included in the kit are optimized for this purpose. The rubber dam protects the gingiva and assures optimal dryness.
- Fig. 4: The surface of the affected tooth is then etched with HCl-Gel using the specially developed foil applicator to fully remove the pseudo-intact surface layer.
- Fig. 5: The area is then dried with ethanol and air in order to provide the necessary dry environment for the concluding infiltration step.
- Fig. 6: The infiltrant, a low viscosity resin, is applied. Capillary action draw the infiltrant deep into the porous enamel.
- Fig. 7: Prior to light-curing, the area is cleaned with dental floss and air to remove any excess material.
- Fig. 8: The infiltrant is light-cured, and the treatment concluded with polishing strips. The infiltrated lesion has similar mechanical properties to healthy enamel.

Tips from the practice

1. Exact diagnosis with bitewing x-rays

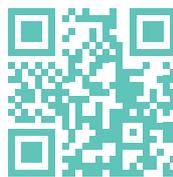
- Make use of bitewing x-rays for early diagnosis of proximal lesions.
- Check the necessity of x-ray images in advance, for example through the use of fiber-optic transillumination devices.
- A helpful accessory for these x-rays is the DMG Icon X-ray Holder System. It makes it possible to take multiple images in the same reproducible position, even over several sessions, and therefore simplifies the diagnosis and evaluation of the therapy's success.

3. Documentation in patient records

- Icon is not radiopaque.
- This is because certain filler materials are necessary to make it radiopaque. These materials negatively affect the infiltrant's flow properties and therefore its penetrative ability.
- In order to document the procedure properly, the patient card included in every package should be marked and filed appropriately.

2. Gentle tooth separation step by step

- It is best to proceed slowly with the tooth separation, a bit like stretching out a muscle. The tissue has to respond to the increase in pressure.
- Insert the wedge between the teeth until you feel resistance. The patient will experience this as a light pressure.
- Hold the wedge in position for several seconds.
- Softly push the wedge further until the widest part of the wedge creates enough separation between the teeth.



How-to film on
DMG's youtube channel

www.youtube.com/dmgdental

It's like with anything: the more often you do it, the more routine it becomes.

Even though minimally invasive infiltration is a relatively new form of treatment, the individual treatment steps – etching, drying, filling, and light-curing – all follow the familiar pattern of traditional methods. Infiltration will quickly become an important element in your practice portfolio. See for yourself.



A focus on caries infiltration in international studies

Numerous in-vitro and in-vivo studies confirm: Infiltration can arrest the progression of carious lesions at an early stage. Alongside the fundamental effectiveness, many other detailed aspects of the procedure have been researched. Here is a selection of some of the especially interesting results:

» *Icon works on primary teeth as well.* «

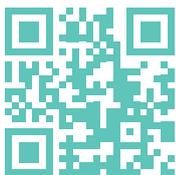
Ekstrand et al. demonstrated the effectiveness of caries infiltration in a randomized, controlled, split-mouth study on children.¹

» *Infiltration enables long-term esthetic shade matching.* «

A study by **Torres et al.** showed Icon-Infiltration to be the only application that enabled the lesion to match the shade of the healthy enamel, with the greatest effects coming after eight weeks.² Follow-up in-vitro studies showed that infiltrated teeth appeared lighter at first, but then came to match the natural tooth shade and remained shade stable.^{3,4}

» *Patients welcomed the method.* «

Howard Glazer was the first to document experiences of the treatment of white spots using infiltration. He reported that he received consistently good feedback from patients, who particularly welcomed the minimally invasive treatment and were satisfied with the esthetic results.⁵



Scientific documentation
and further information

www.dmg-dental.com/icon-downloads

Children are excited because we can treat with Icon before a cavity forms.

Clinically proven: Caries infiltration is also suitable for primary teeth. And the young patients are especially thankful that the drill stays switched off.

Sources

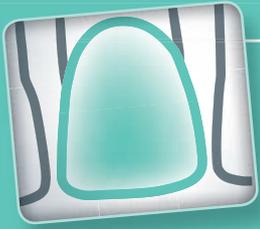
- 1 Ekstrand KR, Bakhshandeh A, Martignon S (2010); Treatment of proximal superficial caries lesions on primary molar teeth with resin infiltration and fluoride varnish versus fluoride varnish only: efficacy after 1 year; *Caries Res* 44(1):41-46
- 2 Torres CRG, Borges AB, Torres LMS, Gomes IS, de Oliveira RS (2011); Effect of caries infiltration technique and fluoride therapy on the colour masking of white spot lesions; *J Dent* 39:202-207
- 3 Perry R, Nobrega D, Harsono M (2010); Bleaching of Teeth Treated with Icon by DMG America, Data on file; DMG, Hamburg, Germany
- 4 Shah S, Cakir D, Ramp LC, Beck P, Burgess JO (2011); Color Stability and Stain Resistance of ICON Caries Infiltrant Resin; IADR Congress Abstract
- 5 Glazer HS (2009); Treating White Spots: New Caries Infiltration Technique; *Dent Today* 28(10):82, 84-85.





***I can
Icon.***





VESTIBULAR TREATMENT



Icon

Caries infiltrant – smooth surface



Starter Kit

2 Treatment units, each with:

- 1 Icon-Etch syringe @ 0.45 ml
- 1 Icon-Dry syringe @ 0.45 ml
- 1 Icon-Infiltrant syringe @ 0.45 ml
- 6 Vestibular-Tips
- 1 Luer-Lock-Tip

REF 220343



Package

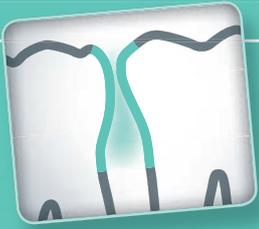
7 treatment units, each with:

- 1 Icon-Etch syringe @ 0.45 ml
- 1 Icon-Dry syringe @ 0.45 ml
- 1 Icon-Infiltrant syringe @ 0.45 ml
- 6 Vestibular-Tips
- 1 Luer-Lock-Tip

REF 220238

Treatable lesions per sales unit

| Sales unit | Starter Kit | Package |
|-------------------|-------------|---------|
| Treatment units | 2 | 7 |
| Treatable lesions | 4–6 | 14–21 |



PROXIMAL TREATMENT



Accessory: Icon X-ray Holder

| Holder system for preparing standardized bitewing x-rays | |
|--|------------|
| Starter Kit (10 x size 1, 10 x size 2) | REF 220508 |
| Refill 1 (20 x size 1) | REF 220509 |
| Refill 2 (20 x size 2) | REF 220510 |

Treatable lesions per sales unit

| Sales unit | Starter Kit | Package |
|-------------------|-------------|---------|
| Treatment units | 2 | 7 |
| Treatable lesions | 4 | 14 |

Icon

Caries infiltrant – proximal



Starter Kit

2 Treatment units, each with:

- 1 Icon-Etch syringe @ 0.3 ml
- 1 Icon-Dry syringe @ 0.45 ml
- 1 Icon-Infiltrant syringe @ 0.45 ml
- 6 Proximal-Tips
- 1 Luer-Lock-Tip
- 4 wedges

REF 220341



Package

7 treatment units, each with:

- 1 Icon-Etch syringe @ 0.3 ml
- 1 Icon-Dry syringe @ 0.45 ml
- 1 Icon-Infiltrant syringe @ 0.45 ml
- 6 Proximal-Tips
- 1 Luer-Lock-Tip
- 4 wedges

REF 220237

DMG
Chemisch-Pharmazeutische Fabrik GmbH
Elbgaustraße 248 22547 Hamburg Germany
Fon: +49. (0) 40. 84 006-0
Fax: +49. (0) 40. 84 006-222
info@dmg-dental.com
www.dmg-dental.com

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