

Solving the problem of microorganisms - today!

The problems of periodontitis and periimplantitis and the general need to reduce microorganisms within dentistry are acute today and today is the time to come up with the right answer for our patients.

Dr. med. dent. Hans H. Sellmann

■ You are already familiar with the right answer or, to be precise, the right answers, since there is no universal solution or device to fight oral microorganisms. However, there is already a wholly adequate range to choose from, including familiar and proven oral medications (Chlorhexamed®), SRP, local delivery devices, and lasers. Thinking about these various options provides the perfect opportunity to introduce the newly improved alternative – the FotoSan system. Oral medications (mouth rinses and gels) are only effective for a short time, given the high sulcus fluid rate (the rapid replacement of sulcus fluid). Scaling and root planing (SRP), the traditional method, is not very popular with our patients – there also remain doubts about how it can incorporate an effective form of pocket disinfection. With local delivery devices (locally used antimicrobial substances), it only makes sense to use these after very precise testing to establish the microorganisms spectrum – the big issue here is resistance.

But what about laser? This has proven to be highly effective, particularly when combined with photodynamic disinfection. Since this is familiar ground, a brief summary will be sufficient: Photodynamic therapy (PDT) is a procedure for treating tumours and other tissue changes (in this case biofilm) using a combination of light

with a light-sensitive substance, known as a photosensitizer, and the oxygen present in tissue. With this procedure, a suitable sensitizer or one of its metabolic precursors is administered, which starts to accumulate in the target tissue. Then, light with a suitable wavelength is beamed onto the target tissue. Thanks to the photo-physical processes involved, toxic substances are generated which specifically damage the target tissue. This process enjoys success in the fields of ophthalmology, oncology, and dermatology, where it has long been used as standard. It also supports a wide range of applications in dentistry.

If only laser were not so costly.

LAD?

The thing is, you don't need a laser at all. For over 10 years now, photodynamic or light-activated disinfection, although I prefer the term 'microorganism reduction', has been performed with success. For quite a while now, there has been a significantly cheaper but just as effective light source available for this procedure in the form of an LED lamp. Wherever we need to fight inflammation in an oral setting, we are able to successfully administer LAD with



▲ F1: An almost futuristic, but sophisticated, ergonomic design – the new FotoSan630 LAD pen LED.

the FotoSan 630 device. I have previously written about its predecessor, the 'old' version of this device. I felt a little uneasy at first – a bit like when you've just bought the latest model of a digital camera, then along comes the next version.

FotoSan 630

So what does the new model offer that the 'old' one didn't?

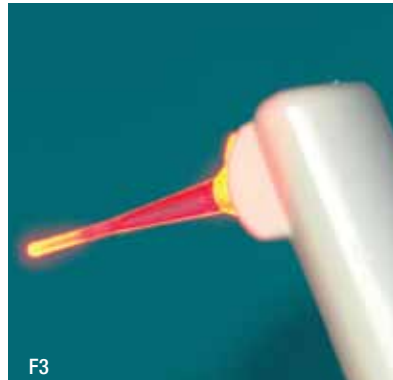
It provides:

- ▶ Improved ergonomics
- ▶ Longer battery life (now 750 seconds)
- ▶ Adjustable tips for improved access, particularly in the molar area
- ▶ More specific tips for various applications

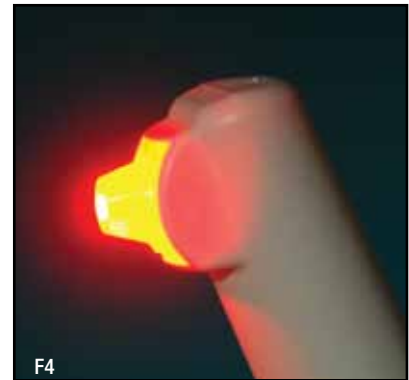
These various 'features' may make using the new FotoSan630 an enjoyable experience, but we still find the 'old' FotoSan device continues to



F2



F3



F4

- ▲ F2: The endodontic tip (plastic): graceful and flexible to penetrate deep into the prepared root canal.
- ▲ F3: An extremely powerful LED with an intensity of 2000-4000 mW/cm² at a wavelength of 620-640 nm (85%), peaking at 630 nm, ensures action is effective for photodynamic disinfection.
- ▲ F4: The blunt tip (plastic): is placed directly onto the gingiva and the light penetrates it really well.

deliver excellent performance. The many colleagues who now use the device would vouch for this.

Root canal treatment:

Prepare and rinse the root canal in the usual way. Then fill it with the FotoSan agent LOW viscosity, the liquid included with the starter kit. Next, apply light to each canal for 30 seconds using the disposable endo tip on the lamp. After this, dry and fill the root canal as usual.

Periodontal treatment:

First perform subgingival scaling and root planing (SRP). Then apply the photosensitizer into the pockets, having selected your preferred consistency (medium or high viscosity – the starter kit contains all three). Next, expose the pockets to light for 10 seconds using the perio tip. Then light for another 10 seconds from the gingival side using one of the blunt tips. The blunt tip should be pressed firmly against the gingiva.

Periimplantitis treatment:

Proceed in exactly the same way as for periodontal treatment.

Gingivitis and pericoronitis treatment:

Apply the photosensitizer (medium or high viscosity) to the sub gingival area. Apply light for 10 seconds using the blunt tip, pressing it firmly against the mucosa.

Caries treatment:

FotoSan/LAD is particularly suitable for the adjuvant treatment of deep caries. Once you have removed as much of the softened, carious dentin substance as possible, apply the photosensitizer and light for 10 seconds. Then treat the cavity in the normal manner, possibly using some form of capping medication, and apply the underlying and superficial filling layers (alternative restoration).

Viruses, fungi, protozoa

According to the manufacturer and on the basis of the relevant studies, light-activated reduction of microorganisms (disinfection) is not only effective against bacteria, but also against other microorganisms such as fungi and protozoa. The photosensitizer used has much less affinity for mammalian cells, on which it does not act at all, thereby ensuring the treatment has no side effects.

Please note:

- The photosensitizer must be able to come into contact with the microorganisms requiring elimination. As such, the biofilm in the pocket really needs to be stirred up beforehand. It is not just a case of placing the photosensitizer against it.
- Light must also reach the photosensitizer in order to activate it. A range of different tips are provided with this in mind.

“For over 10 years now photodynamic or light-activated disinfection has been performed with success”



F5

- ▲ F5: Retrieving the photosensitizer from the syringe with a disposable blunt cannula supports precise dosage. The photosensitizer comes in three different viscosities. Low (liquid), medium (thin gel) and high (thick gel) viscosity.

Self-testing

We performed our own test to check how effective FotoSan is.

- Tooth 44 showed signs of non-specific inflammation. Oral hygiene was otherwise good.
- We tested for periodontopathogenic microorganisms.
- Irrespective of the result, we cleaned and rinsed out the pocket.
- Using a blunt cannula, we then applied the photosensitizer directly into the pocket.
- Immediately afterwards, we ‘beamed’ light in the pocket for 10 seconds using a disposable perio tip inserted into the pocket. We also beamed light from the outside again using the blunt tip. Both tips are fea-



▲ F6: Our patient scenario: the sensitizer is applied into the periodontal pocket around bridge abutment 44. ▲ F7: Light is applied into the periodontal pocket using the periodontal tip. ▲ F8: and light is applied from the outside directly on the gingiva using the blunt tip.

tured in the images (F3 and F4).

During the following days, a visible reduction in inflammation (the colour changed from dark red to a very pale pink) very quickly became apparent.

We then performed a further test for periodontopathogenic bacterias. Compared with the 'initial' test, these had significantly reduced in number.

Payment issues

Neither BEMA (Bewertungsmaßstab zahnärztlicher Leistungen – German tariff list for dental services) nor GOZ (Gebührenordnung für Zahnärzte – German ordinance on dentists' fees) make reference to antimicrobial light-activated disinfection and thus light-activated therapy for reduction

of microorganisms. This means, in accordance with GOZ paragraph 6, subparagraph 2, it is not subject to financial restraints. Alternatively, in accordance with paragraph 2, subparagraph 3, it can be treated as a form of elective treatment. You set your own increment rate based on the time taken up when this measure is used and calculate your fees accordingly.

Summary

Although light-activated disinfection may be a totally new method (in terms of dentistry), its effectiveness has already been recognised by scientific studies. Rather than an (expensive) laser, it can also be performed just as effectively using a significantly cheaper procedure

based on a LED device/FotoSan. I recommend you start by getting the information you need from your local distributor and if necessary, getting a member of the sales force to demonstrate the device to you.

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