Charcoal-based dentifrices under review

By DTI

DUBAI, UAE: For dental professionals wanting to learn about the latest in cosmetic and aesthetic dentistry, the ninth edition of the Dental Facial Cosmetic Conference and Exhibition in Dubai will be the place to be this year. The main event is being staged together with the sixth Global Conference Dental Hygienist Seminar of the American Academy of Implant Dentistry on 3 and 4 November at the InterContinental Dubai Festival City hotel. Before, during and after the congress, attendees will be able to participate in a range of hands-on courses in various disciplines (0–3 November). According to the organiser, the Centre for Advanced Professional Practices (CAPP), the capacity of the courses is limited in order to provide participants with the best possible opportunity to practise in small groups. The list of available courses can be found on the event website.

As part of the event, the Dental Hygienist Seminar on 3 November will offer scientific lectures and hands-on courses focusing on various aspects of the profession. Among the speakers will be President of the International Federation of Dental Hygienists Robin Watson, from Australia, who will be discussing contemporary approaches to maximising efficiency in periodontal assessment. Mary Nowotny from New Zealand will be presenting a paper on diagnosis and integrating oral cancer screening into dental practice.

An industry exhibition will be held alongside the scientific programme and be free for registered attendees. Dental professionals can register online now or on-site during the event. The opening hours of the show are from 9 a.m. to 5.30 p.m. on both days.

More information can be found at www.cappmea.com/aesthetic.
“Good design will pay off”
An interview with Drs Mona Patel and Marcus Riedl

By DTI

Just as in dentistry in general, where aesthetic aspects are becoming ever more important, dentists today are pursuing intentional design of their dental practices. With the launch of four new design lines, Dentsply Sirona Treatment Centers presents dentists with the opportunity to enhance workflows and treatment efficacy through clever and cutting-edge solutions while conveying their individual style. Dental Tribune spoke with German dentist Dr Marcus Riedl and Dr Mona Patel from the US, both of whom have ensured careful design of their practice environment based on their needs and preferences with a Dentsply Sirona line, about the role of aesthetics in daily dental practice.

**Dental Tribune:** Design can convey emotions and distinguish a dental practice from others. In your opinion, what relevance does design have in this regard?

**Dr Mona Patel:** In the US market, it has not played an important role for a long time. Now, with the newer generation of dentists, design is increasingly significant. I think it is just as important as the type of equipment that one purchases or the insurance one carries, because image is everything. In my opinion, the design of the practice is a direct reflection of how one provides care as a dentist. This correlation was not present in previous generations, but it is now.

**Dr Marcus Riedl:** I can speak for Germany and I think design aspects were mostly neglected in the past. Now, the influence of design in our practices is increasing. One has to consider that we spend almost half of our lives in our practice, so we should feel comfortable. For example, I love the mountains, skiing and the atmosphere of the Alps. Incorporating this love for nature into the design of my practice gives me a holiday feel at work.

**Dental Tribune:** When deciding on a particular design or the overall look of your practice, what did you put special emphasis on?

**Patel:** Dental anxiety is a huge component of what we have to manage, so we need to create an environment that first and foremost has a calming, spa-like feel and reduces our patients’ anxiety when they walk through the door. Second, in my practice, I wanted the design to be evidently smart, because that reflects my meticulous personality. I equipped the whole office with Dentsply Sirona products—in fact, it was the first all-Dentsply Sirona office in the US. I wanted to showcase the high-tech equipment and design a nice, simple office around that—not to compete with the equipment, but to enhance it.

**Riedl:** For many of our patients, the design aspect is just an outer shell, since they come to us for the content. When they come into the office, they do not see any units at first. As for dental phobia, in my opinion, reducing anxiety mainly is the responsibility of the staff. However, a calming atmosphere is a great support, of course.

**Patel:** In healthcare, whole-body awareness and preventative health are becoming ever more important. A practice today is not just about treating tooth pain, but about establishing a dental home, creating a place where patients can establish a relationship with their dentist and their hygiene team.

Dentsply Sirona has developed four different design worlds: Embellished Elegance, Cheerful Patterns, Honest Materials and Pure Shapes. Which one did you decide on and why?

**Patel:** We chose Honest Materials because our practice has all this enhanced digital technology, which can be intimidating. I wanted to balance this digital aspect of our practice with natural and organic materials. We have a lot of birch and wood—clean, sleek, simple and balanced materials that hopefully move the focus from the equipment. My design in general is very monochromatic, nothing too messy or cluttered.
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Riedl: We too choose Honest Materials, mainly because I like nature. In our previous office design, we used the colours white, grey and green. In order to preserve our corporate identity, we wanted to keep these and combined them with a lot of wood and glass, because we wanted to convey the nature aspect to our patients. Technology is cold and patients do not want to be confronted with it directly, so we created the look of a mountain lodge. Our floors are even called “valley station”, “middle station” and “mountain station”, for example.

Do you feel that patients appreciate the effort?
Riedl: Some do, some do not. Patients who share the same values as we do feel more comfortable than those who think the design is unnecessary for dentistry or think it makes the cost of their care more expensive.

Patel: Good design does not have to be expensive. Nevertheless, for some reason, if one puts a great deal of effort into the design of one’s practice, it is perceived as though one put a lot of money into it, which is not always the case.

Would you say that the investment in the design is also reflected in the success of the practice?
Patel: In the US, many things are based on return on investment. It is easier to convince oneself to invest in a CEREC or CBCT device, because one sees an immediate return on investment. However, trying to convince oneself to invest in the design with nicer cabinetry or floorplans, where there is not a direct return on investment, is more difficult. But, I am a firm believer that if one works in a beautiful and happy place, it reflects one’s standards and that is the greatest return on investment. Patients see that. If one sees that love is in every detail, the financial aspect fades in importance; the design fulfills one as a person and one’s patients appreciate the resulting work.

Riedl: Sometimes, it is about the little things. For example, my wife puts fresh flowers in every corner of the practice, which I love. However, design polarises. It divides our patients into at least two groups. Those who are interested in and impressed by our design appreciate it, of course. Others do not. I believe that treatment units and high-end equipment establish a sense of professionalism, quality and exclusivity. No patient can judge a dentist’s quality and knowledge at first sight, but, in the eyes of the patient, design and technology often are equivalents for quality, so good design will pay off.

There are countless treatment units on the market and they differ a great deal. What did you consider when deciding on a system?
Riedl: The treatment units are our workbenches—very expensive ones (laughs), but workbenches nonetheless. It has to be stable, easy to use, intuitive, ergonomic and comfortable for the patient, as well as for the dentist and the assistants—and, of course, easy to clean. It has to aid our treatment and therefore our daily work as a dentist. It is like the assistance systems in one’s car or a smartphone. A good design, of course, is welcome too. That is why the Teneo was our system of choice.

Patel: I was designing a new office, so I had a clean slate to work with. I did a great deal of research and comparisons. For me, the look and the design were important, as were functionality, integration, longevity and being able to sanitise it easily. I was instantly drawn to the Teneo, because, as I said, I do not like clutter. The fact that everything was integrated was an instant attraction to me. I found solutions to all my wishes in the Teneo. It was an easy decision to make and we designed the office around the units.

Thank you very much for the interview.
Non-ablative melanin depigmentation of gingiva

By Dr Kenneth Luk, Hong Kong

Melanin depigmentation of gingiva using various laser wavelengths have been reported for over ten years.1–5 Layer by layer, the mucosa is ablated to the basal layer of the epithelium where the melanocytes are located. The use of lasers has been compared with the use of a scalpel and diamond bur (Fig. 1).6–9 By combining the optical properties and absorption characteristics of the 810 nm laser wavelength with specific power parameters, a non-ablative technique was developed (Fig. 2).10, 11 Another similar non-ablative technique, described as micro-coagulation, using a 20 W, 980 nm diode laser has also been reported.12 The 445 nm blue wavelength was introduced to the dental market in 2015. By using a 320 μm uninitiated fibre delivering 1 W in a continuous wave (cw) of 445 nm, the same non-ablative procedure and result can also be realised.

The author used the 810 nm wavelength (elexxion claros 810 nm diode laser, elexxion) with the power parameters of 30 W, 20 kHz and 16 μsec, yielding an average power of 10 W. Under local anaesthesia, a non-initiated 600 μm fibre was used. The fibre was placed at a distance of 2–5 mm from the pigmented mucosa. Coagulation was observed with immediate effect upon irradiation. A constant movement must be performed in order to avoid thermal damage deep in the tissue. Water irrigation can be used as a coolant during the treatment. There is no surface ablation of the pigmented mucosa; rather, the haemoglobin and melanin absorb the laser energy (Fig. 2). This technique (Figs. 3–6) achieves a treatment time of 2 min compared with the ablative technique, which requires up to 30 min in an area extending from the first premolar to the first premolar of one dental arch. The wavelength of 445 nm is much better absorbed by melanin and haemoglobin than 810 nm is (Fig. 7). Hence, a much lower power density may be used to produce the same effect.

Eight years postoperatively, there was mild relapse of pigmentation, but the patient was satisfied with the cosmetic appearance, and requested removal of the melanin pigmentation on her mandibular anterior segment (Fig. 8). Pigment removal in the requested sites using a 445 nm diode laser was discussed. The same technique would be used and the patient consented to the treatment.

The SiroLaser Blue (Dentsply Sirona) with an emission wavelength of 445 nm was used at 1 W in cw, delivered through a 320 μm fibre. The depigmentation technique used was the same as described for the 810 nm wavelength. Under local anaesthesia, the non-initiated 320 μm fibre delivered the energy at a distance of 2 mm to the pigmented area with constant movement. Immediate change to the pink colour without surface ablation of the pigmented mucosa was observed. The procedure took approximately 40 s to complete from the mandibular left to right canine region.

In this case, the mucosa turned pink without any signs of surface mucosal ablation other than one spot between teeth #31 and 32 (Fig. 9).

Fig. 1: Depigmentation by ablation.—Fig. 2: Depigmentation by absorption of melanin and haemoglobin.—Figs. 3–6: Depigmentation of upper arch: pre-op (Fig. 3), immediate coagulation (Fig. 4), three weeks post-op (Fig. 5), eight years post-op (Fig. 6).
tion of blood vessels imparted a pink appearance. There was very mild postoperative discomfort for about 1 h after loss of the anaesthetic effect. No analgesics were required, as the feeling of discomfort disappeared rapidly. Laser peeling of the mucosa between teeth #31 and #41 was noted during photograph taking at the one-day postoperative review (Figs. 10 & 11).

The three-day postoperative photograph taken by the patient showed that the peeling had disappeared, with new gingival mucosa formation (Fig. 12). The two-week postoperative appointment showed complete recovery of the gingival mucosa and no melanin pigmentation (Fig. 13).

Discussion

There is little information available on this new wavelength. From Figure 7, the absorption coefficient is estimated at \(7 \times 10^2/\text{cm} \) for haemoglobin and \(10^3/\text{cm} \) for melanin. Penetration depth is calculated at 140 \(\mu\text{m} \) for haemoglobin and 10 \(\mu\text{m} \) for melanin. The penetration depth of haemoglobin and melanin with an 810 nm wavelength is 2 mm and 0.1 mm, respectively. Furthermore, the scattering curve showed a higher tissue scattering effect with 445 nm than with 810 nm. In comparison with near-infrared diode lasers, the absorption of collagen and scattering increases in the blue light spectrum. In view of this, together with the high absorption of 445 nm by haemoglobin and melanin, 1 W in cw was used. A power density of 88 W/cm\(^2\) (Fig. 14) delivered at 88 J/cm\(^2\) fluence at a 2 mm distance was calculated. Although the power density of 1,697 W/cm\(^2\) (Fig. 15) delivered at 543 J/cm\(^2\) fluence of the 810 nm was higher than the 445 nm delivered, the eight-year postoperative review showed a stable gingival contour with no recession (Fig. 6).

An understanding of the optical properties of the wavelength, its power parameters and the laser–tissue interaction is important for the clinician to achieve the desired treatment outcome.

Conclusion

The use of a 445 nm blue diode laser at 1W in cw is effective in non-ablative depigmentation of oral mucosa. This non-ablative technique provides immediate aesthetic results in a very short procedure time. To the author’s knowledge, this is the first case presented using the 445 nm wavelength for melanin depigmentation.

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Dr Kenneth Luk completed a Master of Science in Lasers in Dentistry at RWTH Aachen University in Germany and runs his own clinic, Laserdontic, in Hong Kong. He can be contacted at laserdontic@me.com.
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