HK takes first step to regulate dental bleaching

HONG KONG: The government in Hong Kong has proposed new legislation that would make it illegal for beauticians to perform dental bleaching and other cosmetic procedures classified as high-risk medical procedures. In the new guidelines under the Medical Registration Ordinance, only officially registered dentists and physicians would be permitted to do so, representatives of the Food and Health Bureau announced.

In addition to tooth whitening, the legislation would apply to Botox injections, chemical exfoliation and hyperbaric oxygen therapy. It is expected to come into effect in a few months from now once it has been accepted by a Legislative Council panel.

Cosmetic procedures offered at beauty spas and salons have become a thriving business in China's Special Administrative Region, which has raised concerns about the safety of risky procedures undertaken by non-professionals. Several incidences have occurred in the recent past, including the death of a 46-year-old woman who had undergone blood transfusion therapy at a HK beauty centre in the Causeway Bay area last autumn. Since then, professional organisations like the Hong Kong Dental Association have repeatedly urged the government to address loopholes in current regulations that allow non-professionals to perform procedures that could potentially harm patients' health or place their lives at risk.

"Tooth whitening is a chemical procedure that can cause irreversible damage to human teeth if handled improperly," council member Dr Alfred Yung, told the newspaper South China Morning Post earlier in July. "Intra-oral treatment and dental procedures like tooth bleaching provided by non-dental or non-clinical professionals therefore pose a threat to public health and should be banned."

With the proposed guidelines, Hong Kong is following other countries in the region that revamped their tooth-whitening regulations. New Zealand, for example, recently restricted over-the-counter sale of tooth-whitening products with a high concentration of hydrogen peroxide. Earlier this year, Australia also changed its poison standard to stop the sale of tooth-whitening products containing more than 6 per cent of the harmful chemical in retail stores and pharmacies.

Malament on tour in India

Ivoclar Vivadent has announced that Dr Kenneth Malament, a well-known prosthodontist from New York in the USA, will be holding a three-day lecture series on the integration of aesthetic dentistry into routine and complex prosthodontics in India this month.

In addition to the science and controversies involving modern dental materials, he will be discussing the concerns and factors for prosthodontists when working with patients who insist on aesthetic procedures, the dental manufacturer said.

The lectures will take place from 26 to 28 November in the cities of Bangalore, Chennai and Mumbai. Dentists interested in attending can register through the Ivoclar Vivadent India website.

SA affects women most

The impact of obstructive sleep apnea, a serious disorder characterised by repeated interruptions of breathing during sleep, may be more severe in women than in men. Researchers in the US report that body responses, such as high blood pressure and sweating, are less pronounced in people with sleep apnea and in women in particular.
The general advantages of laser surgery, such as decreased bleeding, dry surgical field, reduced post-operative pain and less edema, have led to a continuous interest in laser applications for bone cutting as well as soft tissue procedures in a minimally invasive surgical approach. When combined with the use of the latest generation of implant materials and the development of bone expansion techniques, this unique new treatment paradigm for implantology has led to a simplification of the full implant procedure and enhanced methodologies for the treatment of peri-implantitis. Hard-tissue surgical procedures such as bone block harvesting, implant bed osteotomy, sinus lift with crestal or lateral approach, immediate post-extraction implants, or implant recovery are far less invasive when using a modern technique. In most cases, these complex surgical procedures can be completed with no flap or sutures and less or no use of drill and rotary instruments. This course focuses on a new procedure which has been created without the use of any rotary instruments. This procedure, which uses a dual wavelength approach focused on the Er,Cr:YSGG and diode wavelengths, can lead to immediate impressioning, better healing and quicker loading conditions. Comparisons with conventional surgical tools like piezo electric have shown a better and quicker post-operative result in soft tissues, pathological incisions, excisions, implant discovery, and other surgical treatments can be conducted without anesthetic and no sutures required, with excellent good three-dimensional control. The procedure incorporates a second wavelength with deep absorption in the tissues which will permit better issues in immediate post-extractive infected sites. This course will determine how the use of Er,Cr:YSGG laser and diode laser allows a minimally approach of all these procedures and a better and quicker healing.

The trial, conducted in collaboration with the University of Sydney’s Faculty of Dentistry, Western Sydney Sexual Health, and Sydney School of Public Health, is currently being conducted in the states of New South Wales, Victoria and Queensland. It seeks to examine knowledge of HIV, attitudes towards people living with HIV and the willingness of Australian dentists to conduct rapid HIV testing, lead researcher Dr. Anthony Santella told Dental Tribune Asia Pacific.

He said that studies on the willingness of dental patients to accept such testing were being carried recently. Depending on the test results, the team will also investigate how to implement them in practices that operate in neighbour-hoods with high HIV prevalence rates in cities like Sydney. This step is anticipated for next year.

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Motherhood clouded by dental problems

Motivations of dental students differ widely

In a nationwide study conducted by the Tokyo Medical and Dental University and the National Cancer Center, it is suggested that the more children a woman has had during her life, the more likely it is that she has fewer functional teeth.

In the study, female participants were compared with male participants, among whom no relation between their number of teeth and number of children was found. The researchers therefore suggested that there might be a number of pathological and socio-behavioural factors that may promote tooth loss among high-parity women. In order to address this, greater effort regarding the information made available and management of a woman’s dental health during pregnancy is essential, they recommended.

According to the researchers, it is the first study of its kind in Japan.

Motivations of dental students differ widely

Through a rare comparison, dental researchers from universities in China and Japan have gained new insight into the motivations of young people studying dentistry in both Asian countries. Among other findings, the study revealed that Chinese students appear to have chosen the profession primarily for its financial benefits and gain of personal prestige, while their fellow students in Japan reported that they had chosen the field to help people and out of personal interest.

According to the paper, money or social status was the decisive factor for enrolling in a dental school for almost every third dental student in China. Only one in five said that they had a higher motivation for studying dentistry. One in three admitted that they had chosen dentistry for no particular reason.

In Japan, however, more students appear to have actively chosen a career in dentistry. Family was also found to be a major motivation, which indicates that a significant number of dental students in the country are from a dentistry background and plan to continue their parents’ family business after they have graduated.

With regard to career choices, more than half of all dental students in Japan want to become a general dentist. This differs significantly from the Chinese students, who want to specialise or pursue a master’s degree. The researchers said that this could be because the income of general dentists is very low in the country even though there are too few dentists to treat its population of one billion adequately. They suggested that the country will need to reform its dental education system to address this gap by attracting students through better incentives.

The participants in the study, published in the latest issue of the International Dental Journal, were fifth- and sixth-year dental students from dental schools in Shenyang in China and Fukuoka in Japan.
Dear reader,

During a Greater New York Dental Meeting a couple of years ago, I had the rare opportunity to speak to one of the first dentists in the USA and worldwide to have introduced rapid oral HIV tests to dental practice. I can vividly remember her enthusiasm concerning the new technology in my interview with her. Since then, few of her colleagues have followed her example unfortunately. It is thus encouraging to see that Australia—the first country in our region to do so—is now evaluating the feasibility of implementing these tests in dental practices nationwide. However, even if these tests do gain acceptance by the dental community there, this measure is only a drop in the ocean. Particularly in the Asia Pacific region, millions of new HIV infections are expected to occur in the years to come owing to sex trafficking and other reasons. It will require more and continuous efforts by the medical and dental communities to slow the spread of the virus.

Yours sincerely,

Daniel Zimmermann
Group Editor
Dental Tribune International

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A controversial topic in dentistry

Cosmetic dentists around the world routinely perform various diagnostic and therapeutic procedures that involve occlusion. Smile aesthetics and occlusion has been, and is still to some extent, controversial, as there are numerous questions related to smile aesthetics and occlusion that have not been answered with scientific certainty and there are many diverse and polarized opinions regarding this.

In their undergraduate education, dental students are not fully trained in the science and art of both smile aesthetics and occlusion. When these new graduates enter into clinical practice and begin undertaking complex clinical cases, many become confused with the numerous theoretical recommendations and varied concepts about cosmetic dentistry and occlusion in academic and clinical dentistry. In order to understand the core relationship between smile aesthetics and occlusion, a clinician must be familiar with the pros and cons of all the popular concepts and theories regarding smile aesthetics and occlusion, and based on this select the most conservative treatment that is best suited to the patient and that will ensure health and function. With this in mind, two global educational academies, namely Minimally Invasive Cosmetic Dentistry, or MCD, and Teeth, Muscles, Joints and Airway Harmony, or TMJA, have been established with the aim of promoting healthy, comprehensive dentistry by disseminating the relevant knowledge and information regarding various concepts, theories and clinical protocols concerning smile aesthetics and occlusion.

I am pleased to mention here that recently the Faculty of Dentistry of Thammasat University in Thailand and the Vedic Institute of Smile Aesthetics in Nepal, along with three supporting partners, signed a memorandum of understanding to establish the MCD and TMJA Harmony International Training and Treatment Center at the Faculty of Dentistry of Thammasat University. This centre will coordinate with various like-minded clinicians, academics and researchers working in the field of cosmetic dentistry and offer structured, skill-based training in MCD and TMJA harmony dentistry especially for dentists in the Asia Pacific region.

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Contact Info
Dr. Sushil Koirala maintains a private practice that focuses primarily on MCD in Kathmandu, Nepal. He is also Editor-in-Chief of our sister publication Cosmetic Dentistry. He can be contacted at skoirala@vlink.com.np.

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A new paradigm

Nowadays, implant positioning is driven by prosthetic demands and requirements rather than the quality, quantity and morphology of the available bone and often we find ourselves confronted with the dilemma of whether the treatment plan should contemplate bone regeneration after a meticulous diagnosis.

Bone regeneration has embraced tissue engineering to overcome demanding cases. The concept lies in having a 3-D scaffold that holds specific signalling molecules in situ, which attract the host cells that form the tissue, that is, bone. The advent of digital technology in the form of 3-D printing has aroused the enthusiasm of clinicians and researchers, who are in the process of assessing its potential application to tissue regeneration. Currently, it is used as a diagnostic and surgical tool to improve overall surgical performance.

The maturation of tissue engineering in association with digital technology and its application to clinical surgical procedures will soon create a new paradigm.
An interview with Christopher H. Fox, Executive Director of the International Association for Dental Research

Christopher H. Fox

The adoption of the Minamata Convention in Japan recently made way for banning mercury-containing products on a world-wide scale. Provision was also made for phasing down the use of and trade in dental amalgam, Dental Tribune International had the opportunity to speak with the Executive Director of the International Association for Dental Research (IADR), Christopher H. Fox, who attended four of the intergovernmental negotiating committee sessions on behalf of the dental profession. The impact this could have on dentistry and the future of dental amalgam as a restorative dental material.

DTE: The recently adopted Minamata Convention on Mercury includes provisions on phasing down dental amalgam on a global scale. What impact do you think this will have on the dental community and particularly restorative dentistry in the long run?

Christopher Fox: I think it must be first pointed out that the Minamata Convention is a very broad treaty designed to reduce all use of and international trade in mercury, as well as the demand for mercury in products and processes. In addition, it is intended to address the need for the reduction of atmospheric emissions of mercury, as well as mercury releases on land and in water.

Dental amalgam is included in the treaty as a mercury-added product contributing to the global demand for mercury. In this regard, it is important to note that the treaty calls for phasing down the use of dental amalgam, as opposed to banning the use of it. This will give the industry and dental profession time to make a transition and preserve restorative dental choices for our profession and patients.

One of the provisions for phasing down dental amalgam is for countries to set national objectives aimed at dental caries prevention and health promotion, thereby minimising the need for any dental restoration. A greater emphasis on prevention and health promotion is indeed welcome and will provide the greatest benefit to populations.

Another provision promotes research and development of alternative restorative material materials. So, in the long run, dentistry and restorative dentistry, in particular, will have improved dental restorative materials from which to choose for their patients.

In the run-up to the Convention, what were the most discussed issues in formulating the treaty, and did the outcome meet the expectations of those involved in dentistry?

The most discussed dental amalgam issue was a ban versus a phase-down. Led by the Responsible Officer to WHO Global Oral Health Programme, Dr Poul Erik Petersen, a coalition of concerned dental organisations was able to show country negotiators that a ban would be detrimental to population oral health. Dental amalgam is a safe and effective dental restoration and remains the best option for many in many countries. In many clinical situations or health system situations. As complex negotiators, the outcome has met many people’s expectations, but there are those who would have preferred a phase-out of dental amalgam and those who would have preferred no limitations set on dental amalgam.

Another area of discussion was the need for best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land. Dentistry must be a good steward of the environment and implement best environmental practices for dental amalgam, as well as for all other dental materials, medical waste and consumables.

You mention that in the dental community amalgam is still considered to be effective and safe. So why phase down its use?

Dental amalgam is a safe and effective restoration. The US National Institute of Dental and Craniofacial Research funded two large-scale randomised clinical trials on the safety of dental amalgam in children and failed to find any adverse health effects. The reason for the agreed-upon phase-down is solely the environmental and public health effects of mercury in the environment, not which they work. In addition to the provision in the Minamata Convention calling for best environmental practices, there is a provision calling for dental amalgam separators and many more dental professional organisations are calling for their universal use.

Even if we were successful with our oral health promotion programmes however and could stop using dental amalgam tomorrow by the introduction of next-generation restorative materials, dental facilities would need dental amalgam separators and many more dental professional organisations are calling for their universal use.

According to the Convention, a number of products containing mercury will be banned from 2020. Do you believe that amalgam will still play a major role in restorative dentistry by then?

Seven years is a short time frame when we are relying on a research and development pipeline to deliver improved dental restorative materials. Without being too pessimistic, a typical research and development time frame from discovery to clinical use in the pharmaceutical arena is 17 years. So, I believe dental amalgam will still be with us in 2020, but I am optimistic it will play a much-reduced role in restorative dentistry.

Alternatives to mercury-containing dental filling material were discussed last year at an IADR-FDI workshop on dental materials. Is there any viable alternative, and what needs to be done to implement and sustain its use in the future?

The symposium at the recent FDI Annual World Dental Congress in Istanbul was actually a much-condensed summary of a two-day workshop held in December 2012 at King’s College London. In brief, yes, we can have much-improved, innovative dental restorative materials, but it is going to take a significant commitment from government funders, academia and industry. Keep in mind that even if a new material could be developed within a one- or two-year time frame, clinical safety and effectiveness trials and regulatory approvals will take significantly more time. Practising dentists have an important role here too, as they can participate in research networks evaluating new materials and identifying research questions, not to mention advocating for research funding with policymakers in their country.

For a more complete answer to your question, I would refer your readers to the proceedings, which have just been published in the November issue of the Advances in Dental Research, an e-supplement to the Journal of Dental Research.

With the advent of preventative dentistry, stem cell research and the sophistication of tooth replacements, will restorative materials become obsolete someday?

Thank you very much for the interview.

Christopher Fox

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The reason for the agreed-upon phase-down is solely the environmental and health effects of mercury in the environment, not the direct health effects of the use of dental amalgam.

Christopher H. Fox

“Reach a point where dental restorative materials are rare for everybody”

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Christopher H. Fox
Surgeons have demonstrated the medical applications of Google Glass, an advanced new device that can take pictures, record videos and surf the Internet, by using it for the first time for streaming of a dental procedure in real time.

In October, three dental surgeons at Hospital de Molina in Murcia in Spain conducted a historic maxillofacial surgery at a master class. The clinical procedure, performed by Drs Pedro Peña Martínez, Juan Francisco Piqueras Gómez and Alejandro López Gómez, was part of a 3-D diagnostics and treatment surgery course at the hospital’s dental clinic and was attended by dentists from all over Spain.

The clinic’s programme provides training to dentists, and achieved an international milestone by using Google Glass to transmit a complex maxillofacial surgery live for the first time.

The surgery was performed on a 70-year-old patient with a fully edentulous maxilla using a computer-guided implant technique pioneered by Dr Peña in Spain. The computer-guided surgery system allows surgeons to plan the clinical case.

A 3-D model of the patient’s maxilla is created, which shows the position in which the implants are to be placed. A surgical guide is then fabricated to place the implants. In an hour, the patient has a complete prosthesis on dental implants.

The advantages of this implant system are accurate diagnosis, reliable information on bone quality, predictable treatment, reduced surgery time by avoiding the need for incisions and bone exposure, and shorter recovery time.

Using Google Glass in such a procedure has the additional benefit of allowing direct communication between the surgeon and the audience. The surgeon at the master class can interact with and answer questions from attendees, all of whom are able to see the procedure via the Google Glass broadcast.

The Google Glass device is a head-mounted wearable computer available only on a trial basis. It displays information and can communicate with the Internet via natural language voice commands. It is part of Google’s Project Glass, a research and development initiative, which has worked on other futuristic technologies, such as driverless cars.

The technological advancement at the hospital was made possible by Droiders, a Spanish company that develops applications for Google Glass. According to representatives of the hospital, the procedure is an example of its commitment to providing high-quality training to professionals using the most advanced technologies. Dental publisher Ripano, who works with Drs López and Piqueras regularly, promoted the event and was on-site during the surgery.

The surgical procedure has attracted widespread media attention, as this new technology creates new possibilities for professional education in dentistry.

**World’s first maxillofacial surgery broadcasted with Google Glass**

Javier de Pison
DT Latin America

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Caries bug may contribute to composite degradation

TORONTO, Canada: Secondary caries has been identified as one of the major reasons for dental resin composite replacement. A Canadian study has recently provided new evidence that Streptococcus mutans, an oral bacterium that causes tooth decay, compromises the resin-dentin interface and thus contributes to dental resin composite and adhesive degradation over time.

In collaboration with the University of Toronto’s Institute of Biomaterials and Biomedical Engineering, researchers at the university’s Dental Research Institute studied standardised specimens of resin composite, and total-etch and self-etch adhesives that were incubated with Streptococcus mutans for 50 days. Electron microscopy scans of the specimens’ surfaces after the period found that all materials incubated with Streptococcus mutans showed increased degradation compared with controls.

In addition, a trend of increasing bis(hydroxy-propoxy-phenyl)-propane release, a Bis-GMA-derived biodegradation byproduct, throughout the incubation period was observed for all materials and this was more elevated in the resin composite material and self-etch adhesive specimens in the presence of the bacteria.

The study, titled “Cariogenic Bacteria Degrade Dental Resin Composites and Adhesives,” was published online on Sept. 11 in the Journal of Dental Research ahead of print.

Amalgam phased down in Africa

DAR ES SALAAM, Tanzania: As reported by Daily News, a Tanzanian online newspaper, the East Africa Dental Amalgam Phase-down Project has been successfully implemented in Kenya, Uganda and Tanzania. Among other objectives, the project will investigate supply and trade patterns, and encourage switching to alternatives to dental amalgam in the three countries. Under the co-ordination of UNEP Chemicals, the centre for all United Nations Environment Programme activities concerning chemicals, and the World Health Organization’s Global Oral Health Programme, the ministries of Environment and Health in Kenya, Tanzania and Uganda will be collaborating with the FDI World Dental Federation, International Dental Manufacturers and their respective national dental associations to explore essential conditions for a phase-down in the use of dental amalgam.

Over a period of a year, the project will investigate the current supply and trade of dental amalgam and materials alternative to amalgam. It will also assess the current waste management practices, create awareness of preventive dental care and encourage a switch to appropriate alternatives to dental amalgam among dentists and patients. In addition, the project is aimed at environmentally sound management of dental restoration material waste in selected dental facilities. However, Prof. Fehronia Koselenga Yalahakula, project co-ordinator in Tanzania and Associate Dean of the School of Dentistry at the Muhimbili University of Health and Allied Sciences, cautioned: “Even with the success of the pilot project, Tanzania faces inadequate funding to roll out to all dental facilities across the country.”

Amalgam, which contains up to 50 percent mercury, remains one of the most widely used restorative materials worldwide, although scientists have expressed concerns about its possible adverse health effects, especially among younger patients. The chemical has been linked to kidney, brain, and neurological damage, as well as damage to the digestive tract.
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Glidewell and SHOFU partner

KYOTO, Japan: In extending its portfolio of dental products to Japan, Glidewell Laboratories has recently granted SHOFU in Kyoto exclusive distribution rights for BruxZir Solid Zirconia and BruxZir Shaded. The materials, which are recommended for monolithic dental restorations, will be available to dentists throughout the country by the beginning of December, the US manufacturer said.

The partnership is Glidewell’s first entry into Asia’s largest dental market. Besides Japan, it currently distributes BruxZir Solid Zirconia in several other countries in the region, including Korea, where it was introduced to dental professionals late last year. The company also collaborates with dental laboratories in Australia though zirconia restorations are becoming very popular in the USA, and we expect these new regions to contribute greatly to the growth of BruxZir Solid Zirconia. SHOFU has an excellent global reputation and an exceptionally strong presence in Japan through its wide range of proven restorative products,” a company representative told Dental Tribune Asia Pacific. She said that her company plans to extend its relationship with SHOFU in the years to come to grow its respective business.

Introduceed to dental markets in 2009, BruxZir Solid Zirconia is indicated for crowsns, bridges, implants, inlays and onlays. Glidewell also markets the material as an aesthetic alternative to porcelain-fused-to-metal occlusal/buccal or full cast restorations. More than 3.6 million restorations have been placed worldwide since it was introduced five years ago, said. Recently, the material was named Top Long Term Performer by THE DENTAL ADVISOR in the USA.

According to the Millennium Research Group (MRG), a Canadian provider of strategic information to the health care sector, Brazil currently represents the largest of the BRIC markets and will continue to generate the highest proportion of revenues, accounting for over 50 per cent of all dental implant revenues. Dental implants have been available in the country for a long time and many Brazilians seek this treatment owing to a high level of aesthetic consciousness in the society.

With regard to market expansion, however, MRG predicts that the less mature Russian, Indian and Chinese (BRIC) markets will be the fastest-growing dental implant markets worldwide in the next few years. It is believed that they will reach $1.3 billion in 2021 owing to the rising number of dentists learning to perform implant procedures and the increased importance of local low-cost competitors for the international dental industry.

“Price competition will be less prevalent in China than in Russia, India or Brazil,” said MRG analyst Jeremy Seath. “Chinese dentists place greater emphasis on brand names and premium products because it improves the appearance of their practices to patients. The majority of patients undergoing dental implant treatment in China continue to be part of a wealthy social class and they are more likely to request higher-priced brands. As a result of this trend, the aggregate selling price in China was more than double that of the other BRIC countries in 2012.”

MRG also stated that low-cost products will gain more importance as price competition intensifies worldwide. Although the increasing availability of low-cost products will make dental implant procedures more accessible to patients, this trend will ultimately impede revenue, MRG suggested. Therefore, international competitors, particularly in Brazil, will be looking to meet growing demand for implants by acquiring local low-cost companies to offer low-cost products alongside their premium devices. In 2012, for instance, Straumann acquire a 49 per cent stake in Neodent, a leading dental implant company in Brazil.

“The report, titled “BRIC Markets for Dental Implants 2013,” can be accessed on MRG’s website.”

Asian biomedical companies combine research activities

BANGALORE, India/SINGAPORE: Indian Stelis Biopharma and Bio-Scalfold International (BSI) from Singapore have announced that they have signed a collaboration agreement that will see both companies combining their research activities in the development of medicine- and stem cell-loaded devices for the treatment of various medical and dental conditions.

Signed in late October, the new partnership is intended to begin this month and aims to develop devices for use in oral and maxillofacial surgery, among other applications.

In a press release, both companies said that initial collaboration will focus on bone morphogenetic protein-loaded scaffolds for use in orthopedics and in spinal fusion.

Therefore, a joint venture in Malaysia or Singapore is planned to seek investors to support the projects. Research activities will be jointly directed by the CEOs of both companies, Drs Anand Iyer and Margam Chandrasekaran. The financial details were not disclosed.

Formerly Rapid-Tech, BSI began developing biocompatible 3-D devices for use in the field of tissue engineering in 1999. Among other achievements, the company won the poster competition at the 2009 Annual World Dental Congress of the FDI World Dental Federation in Singapore with its presentation on Alvelac, a PLAG and poly/ethyl alcohol-based synthetic scaffold designed for the preservation of the alveolar socket after tooth extraction, which is currently available to dentists in Hong Kong, Taiwan and in the UK.

The company also has research partnerships with dental institutions in the region, including the Saveetha University dental school in Chennai in India.

A subsidiary of biomedical company Strides Arcolab from Bangalore, Stelis Biopharma specialises in the development and production of medicine- and stem cell-loaded biomedical devices. According to its own figures, the publicly listed company currently maintains operations in six countries, including India and Malaysia.
Detecting dental caries: Is there anything new?

An overview of the latest technologies and their clinical potential

Dental caries is still one of the most prevalent but preventable diseases in the world. There is increasing evidence that those with poor oral health have poorer general health outcomes as well. Whether this is a causative relationship or an association with other co-factors is yet to be determined.

Even though a large proportion of the population in developed countries have seen improvement in their oral health over the past three or four decades, individuals from certain groups, such as lower socioeconomic groups and the medically compromised, are still at high risk of developing dental caries. There has been a change in the philosophy around what is considered appropriate treatment, with a move away from the surgical model to a disease management model, often termed minimum intervention dentistry. As a result of the decline in caries experience, the sensitivity of caries diagnosis has been reduced. Early diagnosis is vital, as it allows intervention to remineralise or heal the carious lesion, and the specificity relates to its ability to detect the absence of disease. Probing provides no advantage over other detection methods, even when interpreted in conjunction with them, so it is recommended that only a ball-ended probe be used, especially to check demineralised surface integrity/roughness.

The development of the International Caries Detection and Assessment System (ICDAS) for the quantification of carious lesions has recently provided a valuable method for assessing and quantifying lesions, and the recent addition of an associated management system, the International Caries Classification and Management System (ICCMS), provides evidence-based management options for the various stages of the carious lesion, allowing for individual circumstances. ICDAS rates lesions from a score of 1, the earliest stage where the tooth needs to be dried to identify a white spot lesion, to 6, which represents an advanced lesion. Educational software is available (www.icdas.org) and recently software to aid in the use of ICDAS in epidemiological surveys has been released (www.icdas.org/software/tools).

Using a probe or explorer as a carries detection method persists in both clinical practice and undergraduate dental education but it may damage the surface layer of demineralised enamel, increasing the likelihood of the need for restorative intervention. Probing provides no advantage over other detection methods, even when interpreted in conjunction with them, so it is recommended that only a ball-ended probe be used, especially to check demineralised surface integrity/roughness.

The sensitivity of a detection method relates to its ability to detect the disease when it is present, and the specificity relates to the ability to detect the absence of the disease when it is not present. Occlusal caries detection is complicated clinically by surface morphology, past fluoride exposure, anatomical fissure topography, and the presence of plaque and stains. Commonly used methods for this type are visual and tactile inspection, radiography, transillumination and laser fluorescence. This method, namely DIAGNodent (KaVo), is promoted for use for both occlusal and interproximal lesion detection, with the technology based on the fluorescence of porphyrins excited by laser light at a wavelength of 855 nm (Figs. 2a & b). The sensitivity and specificity of laser fluorescence in detecting intra-dental lesions varies greatly, with false positives, the major limiting factor of the technology. In order to achieve the best results, the angulation of the tip should be consistent, and the results should be seen in conjunction with other detection methods, not as a stand-alone gold standard.
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Recently developed quantitative light-induced fluorescence systems (including QLF, Inspektor Research Systems, and SOPROLIFE, Acteon) utilise differences in auto-fluorescence and mineralisation techniques, especially control of ambient light, and the results must be seen in conjunction with other methods. SOPROLIFE uses a longer wavelength of 450 nm, and has settings for the diagnosis of carious dentine, as well as a treatment mode, which assists in determining which dentine should be removed.

A new system recently released uses laser-based photothermal radiometry (The Canary System, Quantum Dental Technologies), detecting luminescence and change in temperature to quantify mineralisation changes (Fig. 3). Further research is required on this technology.

The method of fibre-optic transillumination is based on the principle that sound tooth structure to transmit light more efficiently than a carious tooth. The method of fibre-optic transillumination can also be used to discriminate between affected and infected dentine. Like DIAGNOdent, QLF (wavelength 405 nm) functions similarly and has a higher index of light transmission than a carious tooth (Fig. 4). Further research is required on this technology.

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Dr. Fred Calavassy currently maintains a private practice in Sydney, Australia centred around his passion for comprehensive aesthetic rehabilitation. He is a fellow and clinical instructor for the prestigious Las Vegas Institute for Advanced Dental Studies, completing courses in aesthetic reconstruction and advanced neuromuscular occlusal philosophies. He continues teaching for LVI Australia as a featured clinical instructor.

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While dental implantology has seen tremendous growth in the last 20 years, education standards for the field, particularly at university level, are still lacking. A recent European consensus workshop on implantology education in Budapest in Hungary sought to discuss ways to ensure quality and effective education in implant dentistry. At this year's EAO congress in Dublin, Dental Tribune spoke with Dr Nikos Mattheos, one of the organisers of the workshop, the University of Hong Kong's Faculty of Dentistry about education standards in implant dentistry, and the reason the field does not qualify to be an independent specialty.

Dr Nikos Mattheos: It is true that the media image of implant dentistry has been affected, particularly at university level, are still lacking. The consensus workshop has also addressed this problem and does not see any need for implantology as a new specialty. It cannot reveal any details, as the detailed position paper will be published in early 2014, but the consensus is that implant dentistry is a multidisciplinary treatment modal- ity that at present does not fulfill many critical requirements for recognition as an independent specialty.

Unfortunately, the truth is that many clinicians and soci- eties are self-proclaimed implantologists or implant specialists, thus implying a specialist status. An established specialist, for example a peritontist, is someone who has completed an accredited three-year full-time programme, has achieved spe- cific knowledge and competen- cies as defined by the respective scientific and governing bod- ies, and can perform an array of treatments, for which he or she has undergone adequate training.

However, the term “implan- tolologist” is ill-defined and often misleading, as there is no widely accepted description as to what an implantologist is (competen- cies, scope of practice, etc.), nor any structured educational path- way defined for someone to reach such a status. So think the consensus is that among university lec- turers of implant dentistry will agree with the Irish dental council and will discourage the use of the terms “implant specialist” and “implantologist” in any con- text.

Thank you very much for the interview.

The term “implantologist” is ill-defined and often misleading, as there is no widely accepted description as to what an implantologist is (competen- cies, scope of practice, etc.), nor any structured educational path- way defined for someone to reach such a status. So think the consensus is that among university lec- turers of implant dentistry will agree with the Irish dental council and will discourage the use of the terms “implant specialist” and “implantologist” in any con- text.

Thank you very much for the interview.

An interview with Dr Nikos Mattheos, Hong Kong

“the term ‘Implantologist’ is ill-defined and often misleading”

Dr Nikos Mattheos. (DTE/Photo Daniel Zimmermann)
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All-ceramic anterior restorations

A clinical case involving a crown next to a veneer to a crown

Dr Sami Bissasu & Sihan Farah
Syria & UAE

Every intra-oral restorative treatment can change the character of a smile. Therefore, a controlled course of action is indicated. In prosthetic treatment, the achievement of a balanced smile is a very important step towards establishing a natural appearance.

A 22-year-old female patient and dental student presented at the clinic because she was dissatisfied with the appearance of the composite veneers on her maxillary anterior teeth. Moreover, she was unhappy with the inflammatory appearance of the surrounding gingiva (Figs. 1a & b).

The patient requested functional and aesthetic anterior restorations. Her dental history was recorded and she was examined intra-orally. In such aesthetically demanding cases, portrait photographs are essential. Ideally, these photographs should be taken from different angles. With the help of the photographs and additional information, the patient’s expectations and goals were discussed.

In the intra-oral exam, we found discolourations in the maxillary incisors, a lack of vitality, poor appearance and disproportionate dimensions of the composite veneers. Radiographs of the maxillary incisors revealed a good endodontic situation but little coronal tooth structure.

Preliminary impressions were taken to produce a study model, which would provide us with a physical reference on which we could draw lines, straighten long axes, adjust lengths and perform cosmetic contouring in relation to the adjacent teeth. Based on this initial planning, a diagnostic wax-up was made, followed by a silicone index, which is a proven and indispensable tool for the fabrication of temporary restorations and for use as a guide in tooth prepa ration.

Preliminary treatment and preparation

The treatment plan included the use of custom-shade fibre-reinforced composite post and cores owing to the previous extensive preparation of the canals, all-ceramic crowns for teeth 11 and 21, as well as all-ceramic veneers for teeth 12 and 22. The central incisors were prepared for receiving the post and cores. The final impressions of the canals were taken with condensation silicone.

The fibre-reinforced composite post and cores were fabricated in the dental laboratory and cemented after the try-in using the dual-curing composite system Variolink N (Ivoclar Vivadent).

The central incisors were prepared according to the general principles of all-ceramic crown preparation. For this, a 1 to 1.2 mm rounded shoulder was created subgingivally. The lateral incisors were prepared according to the general principles of veneer preparation. A 0.5 mm chamfer was created equi-gingivally with a 0.5 to 0.75 mm buccal reduction. In addition, a 1 mm bevel was prepared at the incisal edge (Figs. 2a & b). The final impression of the maxillary arch was taken using the addition silicone Virtual (Ivoclar Vivadent).

With the help of the silicone index, the temporary restorations were fabricated directly in the patient’s mouth. In this way, she was able to see her expected post-operative appearance.

During the following two weeks, the patient visited the dental practice regularly for monitoring of her periodontal and gingival situation. No signs or symptoms of discomfort were observed or reported. Furthermore, the healing of the gingival tissue was satisfactory in terms of colour and positioning.

The temporary restorations allowed the patient to become accustomed to her new anterior teeth. At this stage, however, it was still possible to adjust the shape of the restorations intra-orally and to implement these changes in the permanent restorations.

The combination of all-ceramic crowns and veneers simplified the material selection in this case immensely. It was decided to use lithium disilicate, a material that numerous studies have confirmed to be both robust and aesthetic. The final decision was to use IPS e.max Press (Ivoclar Vivadent).

From a saturation point of view, shade A1 was indicated. However, the brightness was higher than that of the LT (low translucency) A1 ingot, especially in the middle third. If a lighter ingot in Bleach shade (LT BLE) had been selected, the saturation would have been too high for the veneers. The HT (high translucency) Bleach ingots might have been an option had there not been the two crowns in the middle, which may have influenced the level of brightness. Therefore, the V1 (value 1) ingot worked perfectly here, since the data collected from the abutment colour and the thickness of the diagnostic wax-up were not contrary to the planned result.

It is generally recommended that the shade be selected in daylight. In this aesthetically demanding case, many photographs of the teeth were taken with the flash turned off and while holding lighter and darker shades next to the natural tooth at a similar angle. These were very helpful during the laboratory procedures.

In order to achieve a natural-looking restoration and to increase the light transmission and guarantee the shade match in depth, chroma, value and hue, an identical layout diagram had to be used for all the restorations (veneers and crowns). However, before this layering diagram was determined, the dentine background of the natural preparations from the patient’s mouth had to be transferred to the restorations. This approach ensured a perfect shade match through-out the fabrication procedure up to cementation.

The IPS Natural Die Material (Ivoclar Vivadent) was most helpful in this task (Fig. 1). Only then was the layering diagram created and were the required materials selected from the IPS e.max Ceram (Ivoclar Vivadent) range.

Washing firing was performed on the pressed frameworks. The cervical and proximal areas were characterised with IPS e.max Ceram Stains (Shade and Essence) for the first firing, which enabled not only an optimum shade match but also a lighter shade. For the second
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A thin layer of dentin body material was built up to adjust the long axes and even out the sizes.

The laterals were rotated 3 to 5 degrees on the long axis (mesial out and distal in), which imparted a soft aesthetic and youthful effect.

In general, the dental technician has to be aware that by changing the long axis the light reflective surface of one tooth in relation to another (central-lateral in our case) also changes.

The structure of the mamelons in the mandibular teeth was clearly visible in the photographs. The IPS e.max Ceram Mamelon materials enable the lifelike reproduction of these structures. The natural effect of the mamelons and the opalescence should be achieved by means of the halo effect.

From the incisal edge towards the tips of some mamelons, a mixture of Opal Effect 1 and Transpa blue was applied in the middle of the incisal area. Brighter IPS e.max Ceram Impulse materials (OE 5 and OE 4) were used to apply internal characteristics and contrast. The third firing cycle of the Transpa Incisal material served more to improve the shape of the restoration than to give it shade.

After firing, considerable time was invested in contouring, surface texturing and finishing.

After the restoration had been finished in the laboratory, the patient came in for a clinical try-in, during which photographs were taken from all angles (Figs. 4–6). The dental technicians had the opportunity to discuss the expectations of the dentist and the patient. At the try-in, it was observed that the left central incisor was a little off-set. This important aspect would have been missed had the restoration not been tried in.

The lip line in particular and the integration of the crown into the facial surroundings of the lips are crucial to the technician’s work. Subsequently, the necessary adjustments were made in the laboratory. In this case, a slight curving adjustment was made at the incisal edge to complement the feminine character of the patient’s face (Fig. 7).

Glaze firing is a critical step and its results are greatly influenced by manual polishing, glaze consistency and firing parameters.

The final restorations, now in line with the patient’s and dentist’s expectations, were delivered to the dental practice. The maxillary central incisor crowns were permanently seated with Variolink N (base and catalyst), while the maxillary lateral incisor veneers were placed with only Variolink N Base. Fine-grit diamond burs and finishing and polishing rubber heads from the OptraFine range (Ivoclar Vivadent) were used to remove excess cement and to eliminate any occlusal interference. The patient was highly satisfied with the result (Figs. 8 & 9).

During the follow-up appointment, another check-up was done and final modifications were made.

Conclusion

The analysis of the components inherent in a soft and delicate smile demonstrated that the lateral incisors (axis, inclination and rotation) have the largest effect on the personality and appearance of a person’s smile. It is important to note that if one central is slightly off-set from the other, an asymmetrical and natural look is produced. The dental technician and the patient may require some courage for this approach, but when the aesthetic parameters involved and the art of reproducing them are perfectly understood, the aesthetic result will reward all involved.

Contact Info

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Since the beginning of modern-day endodontics, there have been numerous concepts, strategies, and techniques for preparing canals. Over the decades, a staggering array of files have emerged for negotiating and shaping them. In spite of the design of the file, the number of instruments required and the surprising multitude of techniques advocated, endodontic treatment has typically been approached with optimism for probable success.

The breakthrough in clinical endodontics progressed from utilizing a long series of stainless-steel (SS) hand files and several rotary Gates-Glidden drills to the integration of nickel-titanium (NiTi) files for canal shaping. This generation of technology required numerous files for achieving the preparation objectives. Rather than identify the myriad of available cross-sections, files will be characterised as having either a passive or an active cutting action.

First generation
In order to appreciate the evolution of NiTi mechanical instruments, it is useful to know that first-generation NiTi files in general have passive cutting radial lands and fixed apical 40% to 50% over the length of the active blades (Fig. 2). This generation of technology was more curved.10 The intended region of the canal and affords a shorter sequence of files to produce deep Schilderian shapes safely (Fig. 4). During this time, manufacturers began to focus on other methods that could increase the resistance to file separation. Some manufacturers, for example, electropolished their files to remove surface irregularities caused by the traditional grinding process. However, it has been observed clinically and reported scientifically that electropolishing dulls the sharp cutting edges. As such, the perceived advantages of electropolishing were offset by the undesirable inward pressure required to advance a file to length. Excessive inward pressure, especially when utilising fixed-taper files, promotes a taper lock, the screw effect and excessive torque on a rotating file of the same size. It is also more limited in removing debris from the canal. Based on these experiences, innovations in reciprocating technology led to a fourth generation of instruments for shaping canals. This generation of instruments and its related technology have harnessed the hope again for a single-file technique.

ReDent Nova introduced the Self-Adjusting File. This has a compressible open-tube design that is purported to exert uniform pressure on the dentinal walls, regardless of the cross-sectional configuration of the canal. It is mechanically driven by a hand-piece that produces both a short 0.4 mm vertical amplitude stroke and vibrating movement with constant irrigation.11 Another emerging single-file technique is One Shape (MICRO-MEGA), which will be mentioned again in the section on the fifth generation of instruments. By far the most popular single-file concept is DENTSPLY’s WaveOne and RECIPROC (VDW). WaveOne combines the best design features of the second and third generation of files, complemented by a reciprocating motion that drives any given file in unequal bidual directions. The CCW engaging angle is five times the CW disengaging angle and was designed to be lower than the elastic limit of the file. After three CCW and CW cutting cycles, the file will have rotated 560 degrees, or one full circle (Fig. 5). The reciprocating motion allows a file to progress more readily, cut efficiently, and remove debris from the canal effectively.

In order to prevent taper lock and the resultant screw effect associated with both passive and active fixed-taper files, NiTi cutting instruments, EndoSequence (Brasseler) and BioFile (FkI Dentaire) provided file lines with alternating contact points. Although this feature is intended to mitigate taper lock, these file lines still have a fixed taper design over their active portion. The clinical breakthrough occurred when ProTaper Universal (DENTSPLY Tulsa Dental Specialties) utilised multiple tapers of an increasing or decreasing percentage on a single file. This revolutionary, progresively tapered design limits each file’s cutting action to a specific region of the canal and affords a shorter sequence of files to produce deep Schilderian shapes safely (Fig. 2). During this time, manufacturers began to focus on other methods that could increase the resistance to file separation. Some manufacturers, for example, electropolished their files to remove surface irregularities caused by the traditional grinding process. However, it has been observed clinically and reported scientifically that electropolishing dulls the sharp cutting edges. As such, the perceived advantages of electropolishing were offset by the undesirable inward pressure required to advance a file to length. Excessive inward pressure, especially when utilising fixed-taper files, promotes a taper lock, the screw effect and excessive torque on a rotating file of the same size. It is also more limited in removing debris from the canal. Based on these experiences, innovations in reciprocating technology led to a fourth generation of instruments for shaping canals. This generation of instruments and its related technology have harnessed the hope again for a single-file technique. 

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In the PTN shaping technique, PTN files are used at 300 rpm and a torque of 2–5.2 Ncm, based on the method used. The authors prefer a torque of 5.2 Ncm, as this level of torque has been validated as profoundly safe if clinicians perform meticulous glide path management procedures and utilise a deliberate outward brushing motion as they progressively shape canals.

ProTaper Next shaping technique

In the PTN shaping technique, all files are used in exactly the same way, and the sequence always follows the ISO colour progression and is always the same regardless of the length, diameter, or curvature of a canal. The PTN shaping technique is extraordinarily safe, efficient and simplistic when attention is focused on access preparation and glide path management. As required for any shaping technique, straight-line access to each orifice is emphasised. Attention is directed to flaring, flattening, and finishing the internal axial walls. For radicular access, the original ProTaper system offers the auxiliary shaping file SX, which is used in a brushing motion on the outside to pre-flare the orifice, eliminate triangles of dentine, relocate the coronal-most aspect of a canal away from external root concavities, or produce more curvature if desired.

Perhaps the greatest challenge in performing endodontic treatment is to find, follow, and predictably secure any given canal to its terminus. Negotiating and securing canals with small manual files requires a mechanical strategy, skillful touch, patience and dedication. A small hand file is used initially to scout, expand, and refine the internal walls of the canal. Once the canal can be reproduced manually, a dedicated mechanical glide path file may be used to expand the working width in preparation for shaping procedures. For clarification, a canal is secured when it is empty and has a confirmed, smooth, and reproducible glide path. With an estimated working length and in the presence of a viscous chelator, a #10 file is inserted into the orifice. Then it is determined whether the file moves towards the terminus of the canal easily. In shorter, wider, and straighter canals, a #10 file can usually be inserted to the desired working length. Once a #10 file has been confirmed to be loose at length, the glide path may be further enlarged with either a #15 hand file or dedicated mechanical glide path files, such as PathFiles (DENTSPLY Tulsa Dental Specialties). The glide path just described confirms that sufficient existing space is available to initiate mechanical shaping procedures with the PTN X1 file.

In other instances, certain endodontically involved teeth have roots with canals that are longer, narrower and more curved (Fig. 8a). In these situations, often a #10 file will not go to length initially. Generally, there is no need to use #6 and/or #8 hand files in an effort to reach the terminus of the canal immediately.

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encountering resistance, deliberate inserted passively into a pre-flared towards the working length. The X1 follow the glide path and progress voluminously with a 6 % solution slide and glide over the apical one-
is verified when a #10 file is loose confirm apical patency canal, establish working length, and has a smooth and reproducible glide page 23

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tional design is the mechanical concept of utilising a progressive percentage taper on a single file. The patient-protected ProTaper Universal NiTi rotary file system utilises an increasing or decreasing percentage taper on a single file. This design feature serves to min-
imise the contact between a file and dentine, which decreases the risk of taper lock and the screw effect while increasing efficiency.16 Compared with a fixed-taper file of similar size, a decreasing percentage taper de-
sign, strategically improves flexibil-
ity, limits the shaping in the body of the canal, and conserves two-thirds of coronal dentine.

Following this mechanical de-
sign, PTN also features progressive tapers on a single file. This design has contributed to the ProTaper system becoming the top-selling file in the world, the choice of endodontists, and the leading system taught to undergraduate students in dental schools interna-
tionally.15

Another critical design feature that is intended to benefit certain brand lines of mechanical shaping files is metallurgy. Although NiTi files have been shown to be two to three times more flexible than SS files of the same size, additional metallurgical benefits using heat treatment have been identified. Research and development has focused on heating and cooling tra-
nitional NiTi, either pre- or post-
machining. Heat treatment aims to create a more optimal phase-transi-
tion point between martensite and austenite. It should be appreciated that the best transition point is depend-
ent on the cross-section of the file. Research has shown that M-Wire, a metallurgically improved version of NiTi, reduces cyclic fatigue by 400 per cent when comparing files of the same 10 diameter, cross-
section, and taper.17 This third gen-
erational advancement is a strategic improvement to the overall clinical safety and performance of the PTN rotary file system. The third design feature of PTN is related to its offset (Fig. 9)

1. An offset design generates a trav-
eling mechanical wave of motion along the active portion of a file. This sweeping effect minimises the engagement between the file and dentine creating a facilitated removal of debris from a canal com-
pared with a file with a centred mass and axis of rotation (Fig. 10). Many instruments break as a result of excessive debris packed between the cutting flutes over the active portion of a file. More im-
portantly, an offset file design decreases the probability of laterally compacting debris and blocking the root-canal systems (Fig. 4).

5. A shaping file with an offset mass of rotation will generate a mechanical wave of motion ana-
logous to the oscillation along a sinuous wave (Fig. 10). Owing to this design, any PTN file can cut a larger envelope of motion com-
pared with a file of similar size with a symmetrical mass and axis of rotation (Fig. 4). The clinical advantage of this is a smaller and more flexible PTN file that can prepare a canal to a larger size as a larger and softer file with a centred mass and axis of rotation (Fig. 9).

Conclusion

Each new generation of shap-
ing files was intended to offer improvements on previous gen-
erations. Being a fifth-generation system, PTN was designed to bring together the most proven per-
formance features and the most re-
cent technological advancements. This system should simplify rotary shaping procedures by eliminating the number of files typically used to shape canals through the so-called hybrid techniques. Clin-
ically, PTN files fill the three sacred traits for shaping canals, which are safety, efficiency and simplicity, scientifically by further evidence-based research is needed to validate the benefits of this system.

Acknowledgement

It would like to recog-

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Dr Michael J. Scianamblo

Asia Pacific Edition

DENTAL TRIBUNE

Editorial note

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The authors would like to re-

cognise Dr Michael J. Scianamblo for his work in the field of critical path technology, which led to the development of ProTaper Next.  Dr Clifford J. Ruddle is Founder and

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Micro-invasive approach to controlling white spot lesions

Prof. Marcio Garcia dos Santos & Guilherme Martinelli Garone
Brazil

Caries infiltration is an effective treatment in controlling white spot lesions of non-cavitated active lesions in vestibular areas. Aesthetic improvement of white spot lesions is based on the masking effect of these enamel lesions by resin infiltration, which optically adapts the appearance of the lesions to the surrounding healthy enamel. Active lesions or post-orthodontic white spots immediately after removal of fixed orthodontic appliances often have a very thin surface layer. These types of lesions are therefore especially indicated for infiltration treatment and their aesthetic appearance can be improved easily and effectively.

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* The Dental Advisor, Vol. 23, No. 8, p 24

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