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BLUE LASER SCANNER

Read about the new intra-oral scanning technology soon to be introduced by Taiwan's Metal Industries Research and Development Centre.

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INTERVIEW

Staying ahead of the curve: iData Strategic Analyst Manager Jeff Wong about market potential and how current trends are shaping the global dental industry.

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INLAY RESTORATION

In this case report, Dr Gerhard Werling introduces the use of the VITA ENAMIC hybrid ceramic for aesthetically pleasing inlay restorations.

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Cancer risk: Ill-fitting dentures

By DTI

MUMBAI, India: Chronic mucosal irritation resulting from ill-fitting dentures may be a risk factor for the development of oral cancer, researchers from the Department of Head and Neck Oncology at Tata Memorial Centre in Mumbai concluded after reviewing existing literature on the relationship.

In addition to a variety of factors that are known to increase the risk of oral cancer, including tobacco and alcohol use, poor diet and neglected oral hygiene, chronic mucosal trauma has been associated with the disease in the past. However, the connection between such trauma, which can be caused by sharp teeth, dentures or implants, among others, and the occurrence of oral cancer has not been scientifically established thus far.

In the current study, the researchers systematically reviewed 22 articles that described the role of chronic irritation in causing oral cancer. The results suggest



Chronic irritation caused by ill-fitting dentures may increase the risk of developing trauma-related cancer, a literature review in India has found.

that chronic mucosal irritation resulting from ill-fitting dentures may be considered a risk factor for carcinogenesis in the mouth. According to the researchers, trauma-related cancers might be seen more often at the lateral border of the tongue and at the alveolus. However, no association was found for the duration of denture use and cancer formation.

Referring to mechanisms behind the relationship, research has suggested different scenarios, the researchers wrote. It has been proposed that persistent mechanical irritation causes DNA damage and may eventually result in cancer formation. Another possible mechanism is that chronic mucosal trauma results in inflammation, thereby releasing chemical

mediators such as cytokines, prostaglandins and tumour necrosis factor, which may result in carcinogenesis.

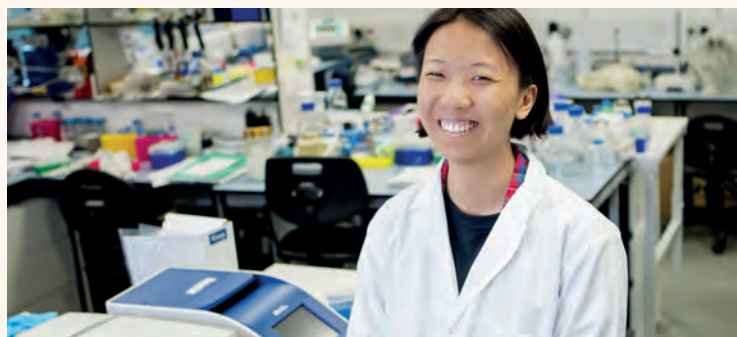
The study, titled "The role of chronic mucosal trauma in oral cancer: A review of literature", was published online on 30 March in the *Indian Journal of Medical and Paediatric Oncology*.

P. gingivalis in focus

MELBOURNE, Australia: The latest findings on the bacterium *Porphyromonas gingivalis* will be in focus at PgMelbourne2017 from 14 to 16 May. The conference, hosted by the Oral Health CRC (Cooperative Research Centre) at the University of Melbourne, is the third in a series of international conferences on P. gingivalis and related species in oral and systemic diseases. P. gingivalis is recognised as being a key factor in the development and progression of periodontitis. It can also influence the host response and the behaviour of other oral bacteria.

A definite point of discussion at PgMelbourne2017 will be the recent development of a vaccine for chronic periodontitis by researchers at the Oral Health CRC. This vaccine aims to reduce or even eliminate the need for antibiotics and surgery for the condition and clinical trials are to commence in 2018.

More information about the conference is available at www.pg-melbourne2017.com.



Yan Gao is the first Chinese master's student to visit Plymouth University in the UK as part of an agreement with Capital Medical University in Beijing. During her six-month stay, she will be working on a research project focusing on the role of stem cells in craniofacial tissue and bone regeneration.

Two new MALO CLINICS

The MALO CLINIC group has signed a partnership agreement with Data Pacific Medical Group that will result in the establishment of two new dental clinics in Macao. According to Dr Paulo Malo, founder and president of the group, the first will open this year at Centro Médico Pedder and a larger one will follow in 2018 in the islands.

Digital face reconstruction

In creating a digital reconstruction of the face of a woman who lived 13,640 years ago in what is today Thailand, researchers used measurements of skulls, muscle, skin and soft facial tissue derived from contemporary populations worldwide. While the approximated face shows characteristics of Late Pleistocene skulls, it is surprisingly modern-looking, the researchers said.

Early-life stress

While low birth weight, for example, has been established as a primary marker of early-life stress, the findings of a new study have suggested that lower-face asymmetries, assessed according to the asymmetry of occlusion, are a marker of environmental stress and cerebral lateralisation during early development too.

In the study, researchers at the University of Washington assessed data on 6,654 US adolescents collected between 1966 and 1970. Retrognathic asymmetries (17 per cent), the most common lower-face asymmetry in the US population, were found to fluctuate randomly between the left and right sides of the face. Such randomness indicates early-life stress, said lead author Prof. Philippe Hujoe, from the university's School of Dentistry.



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AD

Drug-related oral health problems investigated



Lead researcher Dr Hooman Baghaie from the University of Queensland.

By DTI

BRISBANE, Australia: People with substance use disorders are more prone to dental caries and periodontal disease than the general population, as well as less likely to receive regular dental care. Hence, the oral health of these patients is a particular challenge for dentists. A new review study has now aimed to examine drug-associated oral health problems

and ways for dental professionals to improve these patients' oral health.

Drug use is associated with problems such as xerostomia, an increased urge to snack, clenching and grinding of teeth, and chemical erosion due to applying cocaine to teeth and gingivae, research has shown. In addition, lifestyle-associated factors can worsen the oral health in patients

with substance use disorders. These include high-sugar diets, malnutrition, poor oral hygiene and lack of regular professional dental care.

In order to lift the burden of oral health-related problems, a cautious dental approach is needed when treating these patients. However, according to lead researcher Dr Hooman Baghaie from the University of Queensland, there are simple measures that both dentists and doctors can take to improve these patients' oral health.

"Dentists should screen their patients for substance use, notice any advanced dental or periodontal disease inconsistent with a patient's age and consider referral to medical doctors for management," Baghaie said. In addition, dentists should be aware of issues concerning treatment and consent when the patient is intoxicated and be alert to the possibility of resistance to painkillers, he emphasised.

Generally, doctors and clinicians who care for people with

substance use disorders should screen for oral disease and warn patients of the oral health risks associated with xerostomia and cravings for sweet foods, Baghaie added.

The review combined the results of 28 studies from around the world, which collectively provided data on 4,086 patients with substance use disorders. The findings indicated that one in 20 people between the ages of 15 and 64 use drugs each year, with approximately 10 per cent of this number having drug dependence or substance use disorders.

The findings mirror those of increased dental caries and periodontal disease in people with severe mental illness, eating disorders and alcohol use disorders, compared with the general population.

The study, titled "A systematic review and meta-analysis of the association between poor oral health and substance abuse", was published in the May 2017 issue of the *Addiction* journal.

Hong Kong: Access to dental subsidy scheme to be widened

By DTI

HONG KONG: The age limit for the Community Care Fund scheme, which subsidises dental care for Hong Kong's elderly population, among other assistance programmes, is set to be lowered from 75 to 70, fund task force chairman Dr Law Chi-kwong has announced. However, a general lack of services for this vulnerable group remains a problem in the city.

Last year, the age requirement for the scheme was already lowered from 80 to 75, giving an additional 24,600 senior citizens access to funding. However, even with this and the recently announced expansion of those eligible for aid, the sheer lack of public dental services in Hong Kong is still a limiting factor for adequate treatment for the elderly, according to experts.

Although the lower age limit will enable more

people to obtain public dental care, the general capacity to provide services will remain the same. As reported by the *South China Morning Post*, out of the 39 government dental clinics across the city, only 11 offer emergency services to the public. This imbalance is worsened by the fact that most of the government clinics provide only very basic services

free, such as pain relief and tooth extraction, and are open to the public only for limited sessions per week, the paper wrote. As a result, elderly patients are often forced to queue in the early morning hours to beat the crowds to see a dentist.

"Dental care servicing in Hong Kong has never been subject to

any serious review or any long-term planning," Law said in this regard. "This is something that needs to be thought about." However, the problem will probably not be solved in a few years, he stressed.

Just as in other Asian cities, Hong Kong's population is ageing rapidly. However, while countries such as Japan and South Korea have three and four dentists per 1,000 elderly residents, respectively, Hong Kong's dentist-population ratio is only two to 1,000.

In the population eligible for funding, problems such as tooth loss, untreated dental caries and periodontal disease are more prevalent than in the general public.

Figures from a 2011 oral health survey by the Department of Health indicate that about 40 per cent of those aged 65-74 have fewer than 20 teeth remaining and about 5.5 per cent have none.



While more people have been granted access to dental care, the continued shortage of dental service providers for the elderly in the public sector remains a challenge in Hong Kong.

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New cost-effective blue laser intra-oral scanning technology

By DTI

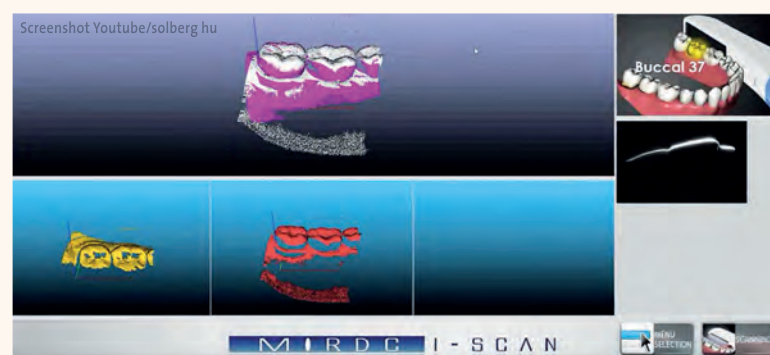
TAIPEI, Taiwan: Taiwan's Metal Industries Research and Development Centre (MIRDC) has introduced a new blue laser line intra-oral scanning technology. According to the developers, the device is built with mostly Taiwanese electronic components and will be significantly cheaper than similar scanning devices from international competitors.

Through software, the device uses a triangular measuring method to focus a high-coherence laser light on to the object to be scanned. In this manner, it is able to accurately construct a dental model, taking precise measurements within an area of 22 × 18 mm, which reduces the margin of error, the developers said.

The blue laser line was introduced at a press conference held at the Ministry of Economic Affairs in the capital city of Taipei in April. According to the ministry, the technology has attracted nearly NT\$70.61 million (US\$2.4 million) in investments and generated nearly NT\$200 million (US\$6.6 million) in market value so far.

Developed by the MIRDC, a non-profit organisation established in October 1963 to research and develop leading technologies for use in the metal and related industries in Taiwan, the blue laser line was transferred to several Taiwanese companies, including EPED, ARIX CNC Machines, Gillion Technology and Ain Tec Industrial, Taiwan News reported online.

The scanner, which is currently being tested in clinical trials, is to be introduced to the market later this year. According to the MIRDC, similar oral scanning devices made in Germany, Denmark and the US, for example, cost about NT\$1.2 million–1.6 million (US\$39,900–53,200). The MIRDC's partners, however, hope that the commercialised product will sell for US\$30,000 to hospitals and dental clinics.



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Many Asian countries are experiencing a great deal of growth

An interview with Jeff Wong, Strategic Analyst Manager at medical market research firm iData



Jeff Wong in talks with Dental Tribune.

dict that the trend will continue. Of course, there will always be a couple of smaller companies that will end up becoming fairly large themselves and remain independent. However, we expect that many of the successful emerging companies will be acquired at some point. One advantage that the larger competitors have is the amount of resources they have. They can always stay ahead of the curve. If they see somebody come to the market with something unique, they have

every year, but many are also either acquired or close down. There are definitely certain regions that are experiencing a great deal of growth, for example many Asian countries. At the same time, traditional markets such as Italy, Brazil and the US are doing very well. These markets are well penetrated at this point, so in terms of market growth it will definitely slow down. However, there is still substantial growth opportunity for the lower-priced competitors, while the traditional pre-

So, you are saying that larger companies are looking for smaller businesses to acquire in order to bring new technology to market?

Not only on the technology side, but also to compete on the pricing level as well.

In the current political climate, the Chairman of the Association of the German Dental Industry has issued a warning about protectionism and trade barriers. What are companies doing in this regard?

By DTI

The ever-progressing digitalisation, changing regulations and a tendency towards mergers are currently shaping the dental industry. At the International Dental Show in Cologne, *Dental Tribune* met with Jeff Wong, Strategic Analyst Manager at international medical market research and consulting firm iData, to talk about how—major and emerging—competitors have reacted to these trends.

Digitalisation is one of the main trends that is changing the industry. Other than that, what developments are dominating the dental market?

Yes, digitalisation is still the up-and-coming trend and everybody is trying to get into that market now. On the product side, I would say it is 3-D printing and intra-oral scanning. Three or four years ago, there was only a handful of competitors in both of those areas. This year at IDS, almost

“Digitalisation is still the up-and-coming trend.”

everybody is presenting some new product in these fields—knowing how fast these markets develop, everybody wants to participate.

What consequences will this have for the market in general?

Especially in these two areas, where the level of imitation is high, with so many competitors, it will definitely start diluting the market shares among the existing companies. However, if these participants start focusing on specific regions or niche audiences, I think there will still be a great deal of benefit.

What about the recent merger trend—is that something we will see more of in the future?

From what we have seen in other industries, we definitely pre-

dict that the trend will continue. Of course, there will always be a couple of smaller companies that will end up becoming fairly large themselves and remain independent. However, we expect that many of the successful emerging companies will be acquired at some point. One advantage that the larger competitors have is the amount of resources they have. They can always stay ahead of the curve. If they see somebody come to the market with something unique, they have

What role do the emerging markets play? What regions will become more significant in the future?

Regarding digital dentistry, I would say much of the development is linked to implantology and prosthodontics. The key countries where those areas are big as well are Brazil and Italy. Even though the penetration of digital dentistry might be relatively higher in those areas compared with others, I would say they have the greatest opportunities for growth.

What are the main trends in implantology?

In terms of implants, dozens of new companies are popping up

every year, but many are also either acquired or close down. There are definitely certain regions that are experiencing a great deal of growth, for example many Asian countries. At the same time, traditional markets such as Italy, Brazil and the US are doing very well. These markets are well penetrated at this point, so in terms of market growth it will definitely slow down. However, there is still substantial growth opportunity for the lower-priced competitors, while the traditional pre-

Do you think this will lead to those companies buying local competitors? Or what will their strategy to succeed be?

I think the strategy of most of the larger key competitors will be continuing acquisition. However, the strategy of some of the larger regional companies, for example in Brazil, is to continue going and to expand their global presence instead of being acquired.

In addition, many of the current key participants—with the regional regulations changing from country to country—are being forced to acquire new companies in order to be able to operate in the region.

At this stage, I think, companies are mainly waiting to see what will happen. Nevertheless, in light of what is happening in other industries regarding the whole Brexit issue—for example, European Union chiefs have warned airlines, including easyJet and Ryanair, to relocate their headquarters to the EU if they wish to continue their routes within continental Europe after the Brexit—if that can happen in the airline industry, who is to say it cannot happen in the dental industry. Again, for example in Mexico, which has a major dental tourism industry, if that is going to be affected in terms of procedural volumes, it is definitely going to affect the dental manufacturers as well.

Thank you very much for the interview.

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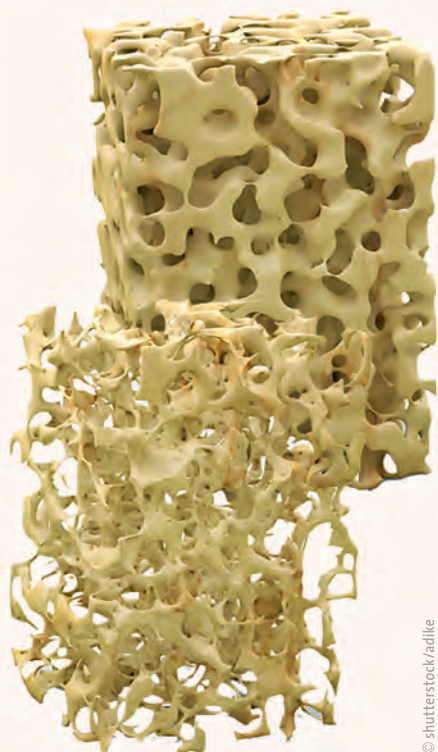
Osteoporosis: Resolvable magnesium implants may promote bone formation

By DTI

MALMÖ, Sweden: According to new research from Sweden, a ground-breaking method for stimulating bone formation around implants could soon be available. In testing the cellular and molecular effects of magnesium-based implants in the early healing stages of implant integration, the researchers found that the release of magnesium promoted rapid bone formation and the activation of osteogenic signals near implants placed in osteoporotic bone.

"We observed that the implant material disappeared, having formed calcium and phosphate, which are similar to bone structure," lead researcher and doctoral student Silvia Galli from Malmö University's Faculty of Odontology told public broadcaster Sveriges Radio. By using magnesium-based implants that dissolve completely over time instead of titanium ones, osseointegration in osteoporotic patients thus might be enhanced.

The use of magnesium-based implants could be a potential method for restoring skulls after facial fractures through promoting new bone tissue formation as the implant dissolves over time. According to Galli, the amount of metal used in the implants is so insignificant that it leaves the body without a trace of the traumatic event having taken place and without any side-effects for the kidneys, or the need for a second surgical procedure to remove the implant, for example.



Magnesium implants that dissolve over time may enhance bone formation in patients with impaired bone healing, such as people suffering from osteoporosis, a Swedish study has found.

Thus far, the method has only been tested in animal models and will need more research before proceeding with clinical tests on

human patients. Prof. Lars Magnus Bjursten from Lund University emphasised in the radio interview. However, he said that it is

important to always look for alternatives, particularly in orthopaedics, and magnesium seems to be a useful material.

Whether the method could potentially assist osseointegration around dental implants was not addressed in the current research project.

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“The Asian market is one of the most important growth markets for Adentatec”

Introducing German dental manufacturer Adentatec



given priority to patient health. Its products thus undergo biocompatibility and corrosion resistance tests, among others, and

optimally cover traditional casting technology and the new CAD/CAM technologies, such as milling and selective laser melting.”

tomers. “At this year’s Sino-Dental, we would like to introduce the further developed cobalt-chromium milling system SOFT-

“We are very well positioned with our products and can optimally cover traditional casting technology and the new CAD/CAM technologies.”

By DTI

Based in Cologne in Germany, Adentatec is a global dental company specialised in the manufacture and distribution of non-precious dental alloys. Its medical devices are exclusively produced in Germany and certified to the highest standards (CE marking, US Food and Drug Administration, and China Food and Drug Administration). Adentatec is committed to the strict implementation of the quality and process requirements

of DIN EN ISO 13485 and DIN EN ISO 9001 in relation to the entire manufacturing chain.

The company was established in 1997 and initially manufactured and distributed sand-blasting material, dental plaster and consumables to dental laboratories. In 2003, Adentatec began production of dental alloys, for which it implemented a quality management system. As a manufacturer of medical products, the company has always

are manufactured from high-quality raw materials to ensure consistent quality.

Over the last decade, the company’s export business has increased steadily. Consequently, Adentatec now has more than 20 agents worldwide who represent its product range. “The Asian market is one of the most important growth markets for Adentatec in the future,” Sales Director Julia Grabensee said. “We are very well positioned with our products and can

CAD/CAM discs on cobalt-chromium and titanium bases

The company’s brand-name casting alloys, such as SYSTEM KN, SYSTEM MG and SYSTEM NE, have long been in use and been proven over many years. In 2009, Adentatec expanded the range to CAD/CAM discs on a cobalt-chromium base (SYSTEM NE-BLANK and SYSTEM SOFT-BLANK). The high-quality discs are available in many sizes and compatible with all open milling systems. Among the noteworthy features of SYSTEM SOFT-BLANK are its high corrosion resistance and biocompatibility in accordance with DIN EN ISO 10271 and 10993-1. Owing to a special heat treatment, it is especially soft and homogeneous and has a high strength. The system is available in many diameters and heights, for almost every type of machine.

In addition, the CAD/CAM product portfolio was extended in 2012 with titanium milling discs (SYSTEM TI 5-BLANK) especially for the production of implant-supported restorations.

With the company’s planned exhibitions at Asian dental shows this year, Grabensee is confident it will win over cus-

BLANK. Based on our experiences at the recent International Dental Show in Cologne in March, we expect a great deal of interest, particularly because of the significant improvements regarding new milling properties and more improved compatibility with veneering ceramics,” she said.

Just last year, the company expanded its product range with a metal-free alternative, the new ceramic-filled CAD/CAM high-performance polymer SYSTEM PEEK-BLANK. Owing to the material’s good physical properties and low weight, the patient will enjoy wearing comfort and be assured of a strong material, the company said. SYSTEM PEEK-BLANK meets all of the biocompatibility requirements of DIN EN ISO 10993 and is an ideal option for removable dentures, particularly for allergic or sensitive patients. According to the company, it has been particularly optimised for implant-supported restorations, secondary structures on telescopic crowns, two-piece abutments, gingiva formers, denture bases and many other indications.

More information about Adentatec and its product range can be found at www.adentatec.com.

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Change requires motivation

The iTOP approach to oral prophylaxis



Prof. Denis Bourgeois

By DTI

Despite advances in oral health care, patients and dental professionals remain uncertain about good oral hygiene, particularly regarding interdental cleaning. Prof. Denis Bourgeois, Dean of the University of Lyon's dental faculty in France, has presented scientific evidence that interdental brushes are efficient tools for interrupting the biofilm between teeth. In order to use these correctly, dental professionals need to offer a certain level of individual instruction to their patients. How can this be achieved easily?

According to Bourgeois, the majority of his studies have found a positive significant difference in the plaque index when using an interdental brush compared with floss. In general, interdental brushes were found to be more effective in removing plaque compared with brushing alone or the combined use of toothbrushing and dental floss. Establishing the accessibility and widths of the interdental spaces should therefore be part of the routine examination of all patients. An interdental brush that is sized correctly for each space is easy to handle and atraumatic, yet effective. However, this routine examination needs to be taught.

In fact, one major problem with interdental cleaning has always been patient ability and motivation. "Interdental cleaning does not readily become an established part of daily oral hygiene," according to Bourgeois. Damage to the interdental papillae and abrasive trauma to the dental surface result from a lack of motivation and instruction. From a clinical perspective, it is therefore necessary to emphasise individual instruction and selection of high-quality oral hygiene products. The ultimate goal should be a high level of cleanliness with little or no harm to

either soft- or hard-tissue. Oral prophylaxis should therefore be taught individually to dental professionals and not in lectures. By correcting and repeating the right cleaning technique, prevention of oral and systemic disease can be achieved.

Change through motivation: The iTOP programme

The iTOP (individually trained oral prophylaxis) programme covers the necessary techniques, knowledge and instructions for dental professionals. This established educational system provides simple and practical training for dental staff, who can then apply this approach to their dental hygiene delivery and teach an effective prevention technique to their patients. All iTOP seminars are led by independent dentists and dental hygienists who have completed the courses themselves. Only iTOP facilitates individual training with regular check-ups and corrections to the prophylaxis techniques learnt.

The iTOP trainers use the principle of "Touch to Teach" in their seminars. "Only someone who has experienced it in his or her mouth knows the exact pressure of an interdental brush and understands the importance of oral hygiene and can thus teach this to others," said Dr Jiri Sedelmayer, founder of iTOP. Through the iTOP approach, which combines efficient tools with a thorough knowledge of cleaning techniques, dental professionals and patients can achieve optimum and sustainable oral health. In 2016, 200 seminars were held in 44 countries.

Four-day English-speaking course in Vietnam

The next iTOP teacher will take place in Ho Chi Minh City in Vietnam from 24 May 2017. The four-day course offers theoretical and practical training. The intense theoretical part includes presentations by several international iTOP lecturers covering the main topics of this prophylaxis approach in more detail.

In the practical part, certified instructors will demonstrate the requisite instruments and techniques using the "Touch to Teach" principle. Around 22 participants from seven countries are expected to attend. "Our iTOP seminars will allow you to experience motivation and education from the patient's perspective and transmit this knowledge to your patients in an individual and tailored way.



After the iTOP seminar, you will simply rediscover the meaning of oral health," said Dr Ana Stevanovi, Head of Education at

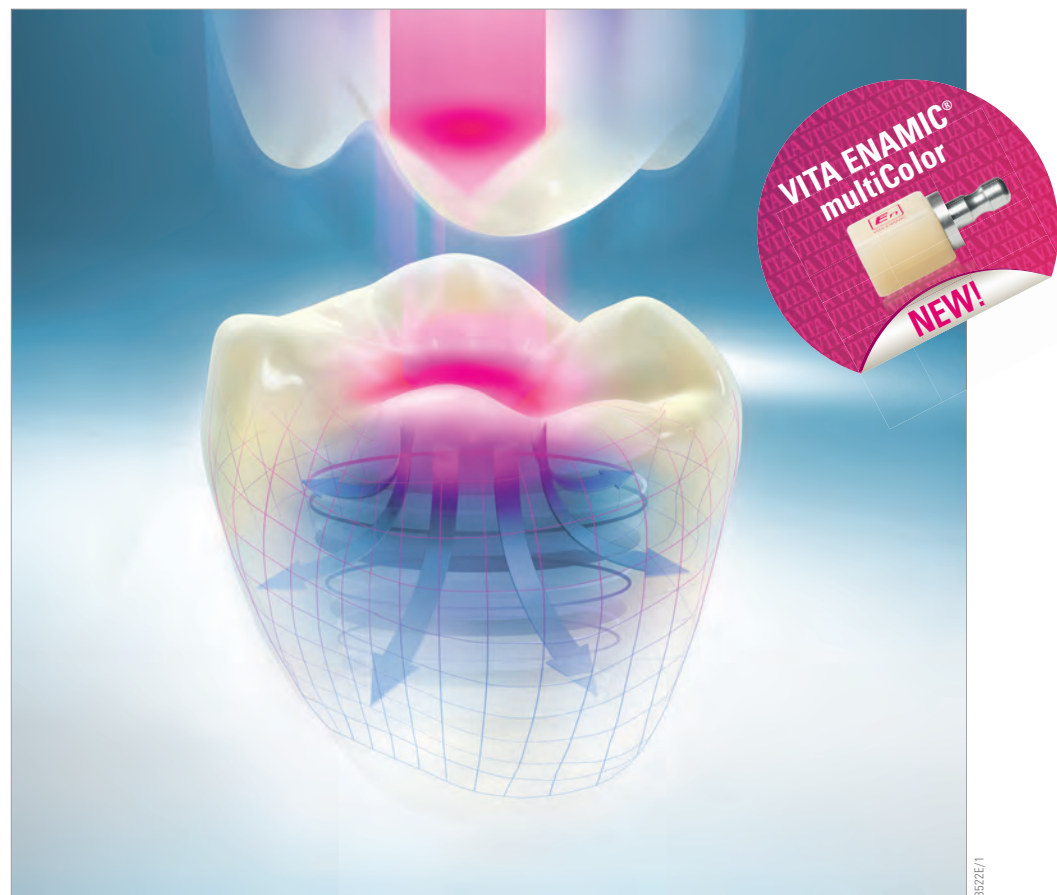
iTOP. Introductory and advanced iTOP seminars in Ho Chi Minh City are being offered on 30 and 31 May as well as 1 June.

Dental professionals interested in attending can obtain more information at info@itop-dental.com.

AD

VITA ENAMIC® redefines load capacity.*

The first hybrid ceramic with dual network structure for unsurpassed absorption of masticatory forces



VITA ENAMIC®

- enormous load capacity since masticatory forces are absorbed
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*) In addition to a high degree of elasticity, this innovative hybrid ceramic guarantees outstanding load capacity after adhesive bonding.

Stronger together

An interview with Jean-François Tivoly, CEO of the TIVOLY group, and Christian Fontaine, CEO of FFDM Pneumat



Fig. 1: The Tivoly family: Jean-François Tivoly, Jamy Tivoly, Edouard Tivoly and Marc Tivoly (from left).

By DT France

In October 2016, the TIVOLY group acquired the FFDM group. The two companies specialise in the design and production of cutting tools. Both trace their origins to the same familial and industrial culture dating back to the early twentieth century. The acquisition is part of TIVOLY's development strategy, aimed at strengthening its industrial base and consolidating its position in aeronautics and its investments in expanding markets like medical devices. FFDM will benefit by having a stronger base for its investments, especially in research and development. The aim is to renew and strengthen their respective offerings and to put the THOMAS brand at the forefront of the dental market, in the context of tightening regulation and increased competition from Asian products. *Dental Tribune France* met with TIVOLY CEO Jean-François Tivoly and FFDM Pneumat CEO Christian Fontaine.

What are the secret ingredients that make a partnership successful?

Christian Fontaine: The founding of both of these family companies was based on a commitment to the service of society. Lucien Tivoly, for example, built his first factory to manufacture the cutting tools essential to the arms industry during the First World War, and FFDM was established during the Second World War. One war may have separated us, but we share common values. Throughout our history, we have always striven for progress and concentrated our efforts on becoming a centre of excellence regarding our core business. Our teams have the ability to listen and share a spirit of open-mindedness that fuels intuition. We are, in fact, creating added value, by using an approach that focuses on adapting our products and services to the needs of today's consumers. Our aim is not simply to anticipate their expectations, but to surpass them.

For example, in the era of smartphones, no tool is available to dismantle, clean and repair these devices, so we created a toolkit to address the problem. It is difficult for dental surgeons to remove posts of any kind from root canals, so FFDM, along with Prof. Pierre Machtou, improved an existing kit, the Gonon kit, which is now used in innumerable dental practices around the world. Whatever the problem, our expertise and knowledge of precision tools for the machining of materials can always provide a concrete, tailor-made solution. The exchanges that will inevitably be created between the teams in charge of research and development will definitely enable us to serve new markets linked to our craftsman origins.

Mr Tivoly, could you briefly introduce us to your company?

Jean-François Tivoly: TIVOLY is a family business that was established in 1917 and has its headquarters in Savoy. It is a highly

international industrial company that designs and manufactures cutting tools (drills, milling cutters, taps, etc.) and the related accessories. TIVOLY is a publicly traded company (Euronext) and its annual turnover is €85 million (one full year with FFDM).

TIVOLY is structured around two business units. The first, the consumer unit, supplies tools for the construction, DIY and industrial maintenance markets. The second, the industrial unit, offers machining solutions for industry, for example the aeronautic and automobile industries. At present, FFDM's dental offering is part of the industrial unit at group level, but with a view to these activities being expanded, it seems logical to create a medical unit at group level, encompassing dental products at first, but eventually including all of the other areas we have planned for the future. TIVOLY is aiming for strong growth, strengthened over the

next few years by its products and international positioning. To speed this growth up further, TIVOLY making other acquisitions is a possibility, on condition that these are part of its strategy.

Which indicators make you believe medicine is the field of the future?

Tivoly: Dentistry, which is an FFDM specialty, is part of the broader field of medicine. Globally, it is widely believed that this area will continue growing. Indeed, populations always continue to increase in number and age. In many areas, such as India, Africa and China—where we have a factory—living standards are improving, and as the proportion of income spent on necessities decreases, more income is left over to invest in health.

However, there is strong competition in the medical equipment field, with many companies of various sizes—some quite modest—in France. The market and technolo-

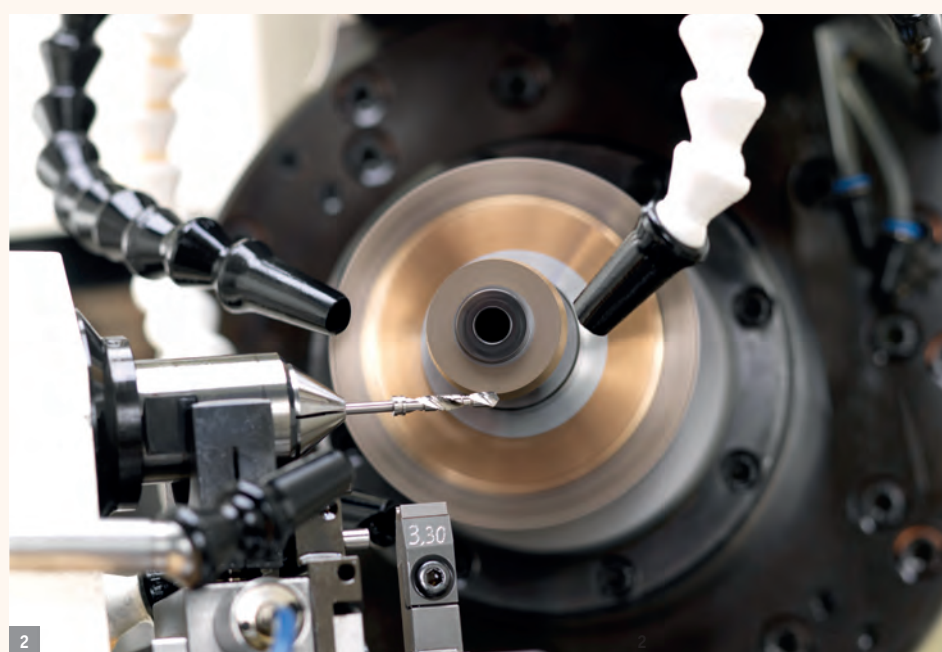


Fig. 2: Grinding and sharpening of an FFDM implant drill.—Fig. 3: Production of implant drills.



Fig. 4: The TIVOLY factory in China.—Fig. 5: TIVOLY's 'surgical' smartphone kit.

gies are developing simultaneously. Thus, it is evident that there are many factors that may influence the future. All of these can be viewed as opportunities and that is why medicine is the field of the future.

Mr Fontaine, could you tell us about FFDM?

Fontaine: FFDM, with its THOMAS brand, is a French company that has been active in the dental field for over 70 years, along with the companies NICHROMINOX, Anthogyr and MICRO-MEGA. This seniority explains our strong international presence. We are present in over 65 countries with our own brands and/or under the trademarks of our distributors, and more than 80 per cent of our annual turnover comes from exports. The first dental products produced by FFDM were milling cutters in 1946, sold under our THOMAS brand or private labels (under our clients' brands). Our THOMAS range was then expanded through the manufacture and sale of con-

ventional endodontic files, marketing Gonon extraction kits, etc.

Parallel to developing in the dental industry, FFDM has expanded its knowledge base into the industrial area through the design, production and sale of cutting tools and assembly solutions, also under the THOMAS trademark, and the design, manufacture and sale of machinery and assembly solutions under the Pneumat trademark. Today, we are recognised as a major and essential partner.

Getting back to the dental field, we have designed dental implant drills for about 20 years. This activity has been a strong lever for our company's growth. We currently work with some 50 implant companies across the world, many of which are very well known, demonstrating our expertise and quality products in this domain. We have more than doubled our turnover in the past decade, owing to a highly sustainable investment and devel-

opment policy. More recently, we have invested over 10 per cent of our annual turnover. We now have an assemblage of modern, high-performance machines at our disposal. We will continue following this approach in the future, so we can provide our clients with an even better service.

Now, we have a stakeholder that is a family-managed manufacturer just like FFDM has been since it was founded. It was surprising to discover the similarity of the industrial paths that the TIVOLY group and FFDM have taken. We are now part of a group that employs over 500 members of staff, with commercial and manufacturing plants in many countries, spanning three continents. Jamy Tivoly, the grandson of the founder, was recently honoured with a distinguished national award in recognition of his remarkable industrial career.

How do you see the future, and what are your plans?

Fontaine: Currently, our implant drills are sold exclusively to implantology companies. The drills are made according to specifications from these companies (we are subcontractors; our brand name never appears on the instruments). We intend to offer a range of standard drills to be sold under our THOMAS trademark with our own CE marking. The aim is to sell these directly to distributors and practitioners to boost the THOMAS brand and give it greater visibility. With standard drills, another advantage for interested implantology companies would be that they would not have to take care of the CE marking themselves, as this would be an additional service we would offer them.

We plan to strengthen our technical and regulatory services to help our clients with their new products throughout all the stages of registration. We also intend extending our product ranges (mainly the endodontic range) so we can provide complete solutions to our clients.

We also have our sights set on other markets, like cutting tools for the ancillary orthopaedic segment. We have strengthened our collaboration with well-known dentists to gain greater visibility on the market. We have achieved this in the past with Prof. Machtou with immense success.

Online sales is also an area we are looking into. Through integration into TIVOLY, which guarantees committed and transparent management, we now have the financial capacity to implement all of our development projects, both industrial and commercial. TIVOLY's commercial and industrial sites in Europe, Asia and North America will give us access to facilities that are closer to our clients and to our markets.

Thank you very much for the interview. Combining your respective expertise should enable you to achieve even greater things. We hope you enjoy many successes together.

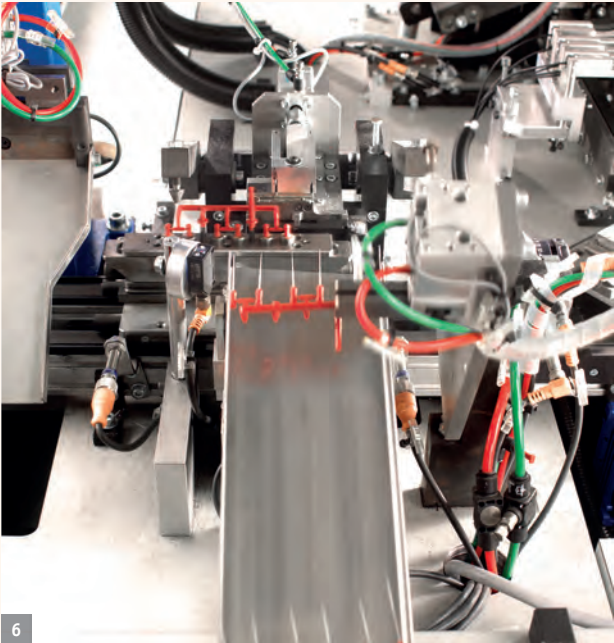


Fig. 6: Plastic moulding of root canal instruments.—Fig. 7: Implant drills being cleaned.—Fig. 8: Drilling into metal with a TIVOLY drill.