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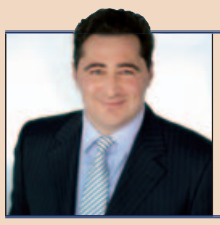

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Therapy of craniofacial defects successful

Daniel Zimmermann
DTI

HONG KONG/LEIPZIG, Germany: At a meeting on regenerative medicine and stem cell research in China, clinicians from Spain presented what could be a breakthrough in the treatment of craniofacial defects. With the help of Bone Repair Cells (BRCs) developed by the US company Aastrom Biosciences Inc., patients experienced new bone formation and nerve recovery in cases of severe mandibular osteoradionecrosis and osteomyelitis. Bone Repair Cells are derived from a small sample of the patient's bone marrow, which is processed using Aastrom's proprietary Tissue Repair Cell (TRC) technology to generate larger numbers of stem and early progenitor cells with enhanced therapeutic potential.

Dr Jose Mendonca during his presentation in Dalian in China. His research on stem cells for the treatment of craniofacial defects has shown promising results. (DTI/Photo Courtesy by the China Medicinal Biotech Association)

"The outcome of these treatments with BRCs has been very satisfactory. We observed early bone formation in the afflicted areas that eventually resulted in complete healing," said Dr Jose Mendonca, Director of the Head and Neck Surgery Unit of Hospital POLUSA in Lugo in Spain and previously a Clinical and Research Fellow in Oral and Maxillofacial Surgery at the UCLA School of Dentistry. "Unexpected therapeutic results from treatment with BRCs include peripheral nerve regeneration or repair, new skin formation and proliferation in blood vessels in ischemic areas. The results open a promising pathway for the treatment of some patients where conventional therapies fail or do not exist."

Ethical approval for compassionate use of TRC-based products was granted by the Spanish Ministry of Health.

In May 2008, Aastrom announced the re-prioritisation of its clinical development programmes to focus primarily on cardiovascular applications, thus discontinuing further patient enrolment in the US Phase III ON-CORE bone regeneration clinical trial. The company does not anticipate new clinical bone activity or reactivating the Phase III ON-CORE trial at the present time but will continue to treat patients on a compassionate-use basis in Spain. "Our bone programme remains open for partnering. Encouraging compassionate-use treatments such as those noted by Dr Mendonca strengthen our bone programme portfolio, especially in the EU," said Dr Sheldon A. Schaffer, Aastrom's Vice-President of Corporate Development and Intellectual Property. DT

Philippines to hold world record medical day

The Philippine Charity Sweepstakes Office has announced that it will run the world's largest single-day medical mission in early September. The mission, which is part of the organisation's 75th anniversary celebrations, aims to provide simultaneous medical and dental treatment to a record number of beneficiaries in the country's 42,000 districts, also called barangays.

According to the organisation's director Jose R. Taruc V, the agency will attempt to gain world prominence by gaining entry into the Guinness World Records, while reaching out to marginalised members of society who need quality medical assistance. He said they intend to achieve this world record by clustering barangays and mobilising their 25 district offices nationwide, as well as enlisting the support of local government units (including the police and the military), church groups and other non-governmental organisations. DT

This photo shows a Ganlea holotype fossil jaw (lateral view) recently found in Myanmar. The findings support a new theory that humans may have been evolved in Asia. (DTI/Photo Laurent Marivaux)
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Dental pain afflicts redheads more

A recent US study has found that genetics may be behind the increased incidence of dental pain in people with red hair. The study identified a new melanocortin-1 receptor gene found in skin, hair and eyes that plays a role in processing pain, anxiety and fear in the human brain. DT

New implant coating shows improvement

A research team in Israel has developed a new way to electrochemically deposit synthetic hydroxyapatite onto dental implants. Instead of spraying the coating with plasma, the implant is placed into a bath of electrolyte solution, to which an electric current is applied. DT

Millions of new HIV infections

A new report by the organisation UNAIDS has called on countries in Asia and the Pacific region to scale up HIV prevention programmes and structural interventions for men with high risk sexual behaviour. The report released at the *9th International Congress on AIDS in Asia and the Pacific* in Bali, Indonesia, notes that men who buy sex constitute the largest infected population group—and most of them are either married or will get married. This puts a number of 50 million women, often perceived as 'low-risk' because they only have sex with their husbands, at risk of HIV infection.

Despite being in a relationship, at least 75 million men regularly buy sex from sex workers in Asia, and a further 20 million men have sex with other men or are injecting drug users, according to UNAIDS figures. DT

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Malaysia takes on shortage of dentists

Malaysian National News Agency

Health Minister Datuk Seri Liow Tiong Lai (second from right) shakes hand with nurses after launching the International Nurses' Day Celebration and Seminar in May. (DTI/Photo file)

PENANG, Malaysia: As a first step to establishing a National Oral Health Center, the Health Ministry of Malaysia has announced the formation of a Center of Excellence for dentistry in several hospitals nationwide. The centre will be opened in stages later this year and cover various disciplines, such as mouth-cancer screenings and dental surgery, Health Minister Datuk Seri Liow Tiong Lai told reporters at the Malaysian Dental Association's AGM held in George Town last week.

The Health Minister added that the centre will be crucial for dental experts in his country to enhance their specialties in-line with current technological advancements. As oral health is becoming more complex, there is need for expertise and specialisation, he said. This year, the government has already given out 36 scholarships to students in selected fields of dentistry compared to 29 last year.

Malaysia is facing a shortage of dentists and needs to increase their numbers in order to cope with the increasing demand for dental care. According to ministry figures, only 60 per cent of posts for dental officers in the Health Ministry were filled in 2008 and only 56 per cent of all dental specialist posts. The Health Minister said that his ministry aims to triple the number of dentists and increase the ratio of dentists to the population from slightly over 1:8,000 to 1:4,000 by the year 2017.

On 31 December 2008, there were 3,410 dentists in Malaysia, of which 241 were specialists. DT

(Edited by Daniel Zimmermann)

Ancient teeth question origin of men

Daniel Zimmermann
DTI

HONG KONG/LEIPZIG, Germany: Humans may have been evolved from primates in Asia, fossils found in Myanmar suggest. The jawbones and teeth of the primate related to a family of Asian anthropoids are ten times older than Lucy, the famous African hominid, and challenge common theories that the ancestors of humans came from Africa.

According to paleontologist Dr Chris Beard from the Carnegie Museum of Natural History in Pittsburgh, USA, the jawbones found in 2005 featured greatly enlarged canine teeth that distinguish the animal, also called *Ganlea megacanina*, from prosimians, a family of earlier and primitive primates that did not evolve into monkeys or apes. Heavy dental abrasion also indicated that *Ganlea* used its canine teeth to open tough tropical fruits and extract the nutritious seeds contained inside, a type of feeding adaptation that has never been documented among prosimian primates.

"These findings show that early Asian anthropoids had already assumed the modern ecological role of modern monkeys 38 million years ago," Dr Beard said. Recent paleoanthropological research has been focusing on evidence that anthropoids originated from prosimian primates and some scientists also argued that primates such as *Ganlea megacanina* were not anthropoids at all. DT

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Micronesia study confirms oral health benefits of xylitol

Claudia Salwiczek
DTI

Recently, the use of a xylitol syrup rinse was confirmed to be effective protection against tooth decay. Researchers, who conducted a study in the Republic of the Marshall Islands where the caries rate is two to three times that of the typical American or European community, found that 16 ml of xylitol syrup could prevent up to 70 per cent of decayed teeth. The findings were presented in the July issue of the *Archives of Pediatrics & Adolescent Medicine*, and demonstrate the first evidence (to the authors' knowledge) that xylitol is "effective for the prevention of decay in primary teeth for toddlers."

Scientists in Finland first discovered the beneficial uses of xylitol in dentistry in the early 1970s. Studies led by Profs. Kauko K. Mäkinen and Arje Schein at the Institute of Dentistry at the University of Turku proved that xylitol, which occurs as a sugar in the fibres of many fruits and vegetables, inhibits the adhesion of the caries-causing oral bacterium *Streptococcus mutans*.

Xylitol is widely used in a number of dental care products, including chewing gum, toothpaste and mouth rinses. DT

Xylitol is widely used in oral care products like chewing gum. (DTI/Photo Yellowj)

Beijing targets health

The government of Beijing has announced a ten-year plan for raising the average life span of its citizens through increasing health awareness and the improvement of health care services. Further objectives are to reduce obesity rates in primary and middle schools, as well as to lower mortality rates amongst pregnant women and babies, city officials told reporters at a press conference in August. Improved dental hygiene will also be a point of focus, they said.

Living conditions and lifestyles have changed rapidly in major Chinese cities like Beijing and Shanghai. An unhealthy diet rich in sugars, low exposure to fluoride in general and a lack of tradition in personal care and oral hygiene are major factors in increasing dental caries incidence rates. Growing tobacco consumption and excessive use of alcohol have also increased the risk of periodontal disease and oral cancer. Beijing has invested US$2 million in recent years on caries prevention programmes but needs to do more to improve oral health status amongst its citizens. According to the third national oral epidemiological survey in 2008, over 90 per cent of people in the city suffer from some form of oral disease.

Fang Laiying, director of the Beijing Municipal Health Bureau, said that the municipal government hopes to improve the health of locals comprehensively through the plan's implementation. He said the incidence of chronic, non-infectious diseases has been on the rise in recent years, including high blood pressure, diabetes and coronary disease. The municipal government will work intensively to achieve the plan's objectives, through popularising health information, such as correct toothbrushing, and advocating healthy food, tobacco control and more exercise. Efforts will also be made to further dental health care, eye care, personal health awareness, and safeguard the health of mothers and infants.

Laiying added that a committee for health promotion with personnel from 16 governmental departments had been set up by the municipal government to oversee the efforts of urban districts, suburban counties and relevant government departments in implementing the plan. The funds necessary for implementing the plan will be provided for in the city monetary budget, he said. DT

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Dear reader,

Daniel Zimmermann
DTI

A friend of mine recently had a bacterial infection. In telling me about his problems, the first thing he mentioned was that he had experienced symptoms of dry mouth and matured biofilm. He had also suffered from hypersensitive teeth.

My friend's example, though trivial in nature, is a good example by which to demonstrate the way the oral cavity functions as a window to our inside world. The latest research has shown that it can be a very reliable indicator of our inner state of health. Every day, the salivary glands secretes over 1.5 litres of saliva into the oral cavity, carrying with it valuable information. These biomarkers can be from sites of disease, or the salivary glands themselves can produce surrogate biomarkers of disease. The good news is that the information provided by these can be obtained non-invasively, painlessly and with no embarrassment to the patient—without needles or cringing.

Owing to these salivary properties, a dental examination today is no longer only about teeth and gums. Dentists should be aware that they are probably the first to detect signs of systematic diseases in their patients. Take HIV/Aids for example: despite new, effective medication, the latest infection rates still demonstrate a continued increase in poor and developing countries alike. According to a recent report by UNAIDS, for example, an estimated 50 million women in Asia alone are at risk of becoming infected with HIV/Aids by their intimate partners in the next decade. Early detection could significantly reduce morbidity here.

Oral fluid testing technologies are under development and already in use in several dental offices in Europe and the US. It will be years, perhaps even decades, before these tests are a regular part of every visit to the dentist, but there is no doubt that they will play a valuable part in the management and control of worldwide epidemics, such as HIV/Aids or cancer. DT

Yours sincerely,

Daniel Zimmermann
Group Editor
Dental Tribune International

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ASEAN agreement penalises Filipino dentists

Dr Leo Gerald R. de Castro
Philippines

The ASEAN member countries' decision on foreign reciprocity or the Mutual Recognition Agreement comes at the heels of the economic global recession. The need for economic survival for everyone amidst these stressful times has become a primary concern; hence, it is likely that many view this agreement as addressing a most important issue.

"In-depth consultation [...] should have taken place prior to forging ties with our ASEAN neighbours"

On a broader aspect, I see cooperation at work amongst the member countries because we come to the assistance of professionals in need of employment and patients with professional health care needs wherever they may be. The Philippines boasts of quite a number of dental professionals every year and we see this as an opportunity for us to alleviate the growing need for health workers in the ASEAN region. This reciprocal act of employing health workers internationally signals the need to apply a standardised guideline procedure to the delivery of health services, thus raising the level of care to a level consistent with that in the rest of the world. This minimises errors and maltreatment.

However, as a member of the academe, a part of me views the agreement as a noble programme; yet, the other part disagrees because not all member countries are on an equal footing. The accumulation of Continuing Professional Education (CPE) units is an obligation of the professional in his or her desire to further his or her skills. This ensures patients of a high level of quality of treatment. Unfortunately, not all participating countries in the ASEAN region have established guidelines set by the professional regulating bodies of their particular governments on this matter. Unlike countries such as Singapore, Taiwan, Japan and Korea, to name a few, who had these guidelines long before this agreement took place, the system in the Philippines was stopped for almost ten years, owing to a bill filed by a senator who argued that earning CPE units be optional rather than mandatory. Recently, owing to the passage of the new dental law in the Philippines, the acquisition of CPE credit units became mandatory again, for which we are so thankful, but unfortunately, the almost ten-year lull took away precious credit units earned by our dentists.

As a certain amount of CPE units is required of an applicant, it is possible that dentists from countries with no clear set of rules on their acquisition and recording may be denied employment, simply because their governments have not taken steps to ensure that all credit units earned by attending seminars, symposiums, conventions and the like have been properly recorded in the educational programme of their professional regulating bodies.

I feel that in-depth consultation with the various heads of professions involved in this agreement should have taken place prior to forging ties with our ASEAN neighbours. This could have led to further ironing out of kinks in the programme, thereby making it a better-laid out foreign reciprocity programme, which is fairly beneficial to all the health care providers in our region. DT

Contact Info

Dr Leo Gerald R. de Castro is President of the Philippine Dental Association (PDA). He can be contacted at oralimplants@hotmail.com.

Lifelong oral health for all

Christopher H. Fox
USA

Continuing the mission of advancing research and increasing knowledge for the improvement of oral health worldwide, the International Association for Dental Research (IADR) has organized the 9th World Congress on Preventive Dentistry (WCPD) in Phuket, Thailand. The objective of the WCPD is to provide an international forum for the presentation and exchange of current information on the prevention of oral diseases, and to facilitate the transfer of this information into practice.

Under the theme, *Community Participation and Global Alliances for Lifelong Oral Health for All*, particular attention will be paid to involvement of communities and organizations in initiating, planning, implementing and evaluating oral health programme. The programme will bring together the latest preventive science with health policies and best practices for community implementation and evaluation, and will build on previous declarations and resolutions, such as the WCPD 2005 Liverpool Declaration and the WHO 2007 World Health Assembly Oral Health Resolution, with a bias toward action.

The theme will be presented in four sessions: *Global Actions for Oral Health Related to General Health, Community Participation for Oral Health Promotion and Evaluation, Fluoride and Health,* and *Oral Health Literacy*; and two symposia: *Management of Early Childhood Caries* and *Comprehensive Oral Care for the Elderly*. IADR Immediate Past President and Chair of the Scientific Committee J.M. (Bob) ten Cate said that the WCPD theme closely aligns with the mission of IADR. He added that good oral health is an integral part of overall health, and the WCPD programme will help raise awareness of oral health issues and solutions. He said that IADR is pleased to provide a global platform for researchers, the practicing community, and public health practitioners to identify best practices in implementing effective community-based oral health policies, identify research gaps, and evaluate public health interventions.

The congress will culminate with a declaration, resulting from the ideas shared and progress made among participants. DT

Contact Info

Christopher H. Fox is the Executive Director of the International Dental Association of Dental Research. He can be contacted at cfox@iadr.org.

FDA says mercury dental fillings not harmful

Reuters

WASHINGTON, DC, USA: The US Food and Drug Administration said recently silver-coloured dental fillings that contain mercury are safe for patients, reversing an earlier caution against their use in certain patients, including pregnant women and children. While elemental mercury has been associated with adverse health effects at high exposures, the levels released by dental amalgam fillings are not high enough to cause harm in patients, the FDA said, citing an agency review of roughly 200 scientific studies.

In 2006, Moms Against Mercury and three other groups sued the FDA to have mercury fillings removed from the US market. Later that year, an FDA panel of outside experts said most people would not be harmed but that more information was needed.

But Susan Runner, acting director for the FDA division that oversees dental devices, said there was no "causal link" between amalgam fillings and health problems. "The best available scientific evidence supports the conclusion that patients with dental amalgam fillings are not at risk," she told reporters on a conference call. Over the past 20 years, the agency has received just 141 reports of problems in patients with the fillings, she added.

That conclusion counters a statement the agency made last June that the fillings may cause health problems in pregnant women, children and fetuses.

The FDA's decision could impact makers of metal fillings, which include Dentsply International Inc and Danaher Corp's unit Kerr, as well as distributors such as Henry Schein Inc and Patterson Cos Inc.

According to the American Dental Association (ADA), about 30 per cent of fillings given to patients are mercury-filled, with a growing number of patients instead opting for lighter, tooth-coloured options such as resin composites. The ADA, which represents the dental industry, backed the FDA's decision not to restrict mercury fillings, saying alternatives are also considered "moderate risk" by the FDA. "The FDA has left the decision about dental treatment right where it needs to be—between the dentist and the patient," ADA President Dr John Findley said in a statement.

But Charlie Brown, a lawyer for Consumers for Dental Choice, said poorer people or those who receive their health care through large institutions such as the US military are more likely to receive the cheaper, silver-coloured fillings and are at greater risk for harm.

"Most consumers, and most dentists, have already switched to the main alternative, resin composite," said Brown, whose group was part of the lawsuit settlement last June that called on the agency to issue more specific rules. His group is now weighing its legal options, he said.

Moms Against Mercury President Amy Carson said she was disappointed in the FDA's reversal. Her group, along with several others, filed a new petition with the FDA on Tuesday, again calling for a ban on mercury fillings, she added. DT

(Edited by Daniel Zimmermann)

To the Editor

Re: 'Americans support dental coverage in health-care reforms' (Dental Tribune Asia Pacific No. 6, Vol. 7, page 5)

Here's the problem with Medicaid as it now stands. It is based on formularies of the late 1960s. In the late '60s, my monthly S.S.D. [Social Security Disability] payments would have been a tidy sum. Medicaid's 'spend-down' or 'surplus' rules are based on these old formularies. With my S.S.D. payments being what they are, the so-called monthly 'spend-down' I would have to pay is currently US$265.00. Ergo, I have to pay US$265.00 before Medicaid pays for anything—like dental work. As a result, I have had no routine care for several years and now need six extractions, a full upper plate and partial lower plate. I recently had a dental emergency that took me to a hospital emergency room and their clinic performed the extraction. When I asked about the ball-park cost of what I would need to restore my teeth, the estimate was US$1,120. (This is one of the best estimates I've received). I would have to go into my rent budget for three months to do this—and then face eviction. I would have been better off if I never worked a day in my life or came to this country as an illegal immigrant; they are covered. That's what one gets for working twenty-five years and becoming disabled, I guess. Seem fair to you?

Carol Dobson, 11 Jul., 2009

AD

Universities of Kent students celebrate graduation in 2008. (DTI/Photo Courtesy by The University of Kent)

UK universities say no to British applicants

Universities in the UK are reported to exploit a government policy that keeps British applicants out, while leaving no restrictions in terms of international applicants. According to newest figures released by the Higher Education Statistics Agency in London, the number of domestic higher education (HE) students enrolling at UK universities has stalled lately, while that of students coming to study from overseas has continued to rise.

After the US, Britain is currently the second most popular choice of destination for HE students. More than one university student in seven is from outside Britain, and those from outside the EU bring in 8 to 10 per cent of the total income of British universities, paying almost £1.9 billion in tuition fees last year.

The government has refused to fund enough places in order to accept extra applicants from the UK, even though the statistics are dampening hopes of the current administration of reaching the target of 50 per cent of 18- to 30-year-olds with a university education by 2010. Even after clearance, some 20,000 to 40,000 are expected to be left with no place at all this autumn.

Currently, there are 8,500 students enrolled in UK dental schools, of which 750 are from outside the EU. DT

AD

Nanotech makes fillings last longer

Paula Hinely
USA

HONG KONG/LEIPZIG, Germany/AUGUSTA, GA, USA: A US research project is currently investigating a new technique that may extend the longevity of dental fillings. Dr Franklin Tay, Associate Professor of Endodontics at the Medical College of Georgia School of Dentistry, has been awarded a two-year US$250,000 grant from the US National Institute of Dental and Craniofacial Research for the investigation of the prevention of the ageing and degradation of resin-dentine bonding. This is to be accomplished by feeding minerals back into the collagen network through guided tissue remineralisation (GTR), which is a new nanotechnology process of growing extremely small, mineral-rich crystals and guiding them into the demineralised gaps between collagen fibres.

Dr Tay's idea originated from his examination of the way crystals form in nature, such as in egg and abalone shells. The crystals, called hydroxyapatite, bond when proteins and minerals interact.

Dr Tay will use calcium phosphate, which is the primary component of dentine, enamel and bone, and two protein analogues, also found in dentine, to mimic nature, while controlling the size of each crystal. In theory, the crystals should lock the minerals into the hybrid layer and prevent it from degrading.

"Instead of dentists replacing teeth with failed bonds, we're hoping that using these crystals during the bond-making process will provide the strength to save the bonds," Dr Tay says. "Our end goal is that this material will repair a cavity on its own so that dentists don't have to fill the tooth."

According to research presented in the *Journal of the American Dental Association*, half of all composite resin tooth-coloured restorations fail within ten years, and about 60 per cent of all operative dentistry is conducted to replace them. If Dr Tay's concept of GTR is successful, he will create a delivery system with which to apply the crystals to the hybrid layer following the acid-etching process. DT

(Edited by Claudia Salwiczek, DTI)

"These are exciting times in which we live"

An interview with Prof. Thimios Mitsiadis, Head of the Institute for Oral Biology at the University of Zurich, on stem cell research in dentistry

DTI: Prof. Mitsiadis, which factors determine the formation of enamel?

Prof. Thimios Mitsiadis: This is a very complex process, which is determined by the dental epithelium at a very early stage and different to that of the skin epithelium that covers the body. There is a multitude of transcription factors, one of which is Ptx2, which governs the formation of oral and dental epithelium. Based on this, there are other transcription factors. At the moment, we only know of Tbx1, which co-forms the ameloblasts. Of course, there are further transcription factors that we do not yet know much about and that are regulated by certain growth factors. The transcription factors occur within a very tight time frame to form enamel. It is a highly complex process from the beginning to the final formation.

Which factors may disrupt the formation of enamel?

Dental enamel can be damaged from the start because there are genetic factors that disrupt the correct formation of enamel. However, epigenetic factors that occur during the course of a pregnancy, for example, result in a deterioration of dental enamel through discolouration.

In addition, we are currently examining the effects of fluoride. Fluoride protects the tooth but may also lead to its decomposition during the process of dental enamel formation. Other epigenetic factors, such as the consumption of alcohol, can affect the formation of dental enamel.

Dental erosion is a growing problem, which is certainly driven by the increase in life expectancy. However, statistics demonstrate that younger patients are also increasingly being affected. What is the cause of this development from your point of view?

Yes, it is a fact that loss of enamel has been detected mostly in elderly people. In my opinion, two factors have to be considered here. Nowadays, we know much about prevention, but in the past many people did not take care of their teeth sufficiently. General health conditions and other diseases were considered more important. Research and medication in these areas have improved significantly. Over time, however, we realised that we had not paid sufficient attention to our many dental problems.

Another possible reason is migration. We tend to travel more and live in various countries. For example, I was born in Greece, but now live in Spain with my Spanish wife. My children, therefore, possess features of both nations. This may result in abnormalities and deterioration of enamel.

What innovative perspectives have arisen from these new findings?

These are exciting times in which we live. It is evident that in the near future—in about 20 to 30 years—we will be able to create new tissue with the aid of microbiology and genetics. Clinical studies that examine the use of dental stem cells for the regeneration of jaw bone are already underway. This is proof that progress in this regard is being made. We just need more information on how to achieve natural protection.

What progress has been made in stem cell research for the formation of enamel?

We recently formed a European consortium with researchers working with stem cells in Germany, Finland, Switzerland, Italy and France. The consortium's objective is to isolate stem cells from teeth, the face and the head, and to use them to generate products. With stem cells, for example, natural implants could be produced. There are also tests being conducted in Italy to recreate teeth, but in my opinion this is far too complex to be realised at the moment. At this stage, we should only concentrate on creating tissue as a replacement for damaged or destroyed material, such as dentine and dental tissue.

Thank you very much for the interview. DT

This interview originally appeared in DT Germany No. 4, Vol. 7, 2009. Translation was provided by Annemarie Fischer, Germany.

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Ihde Dental debuts at FDI Congress in Singapore

The German Swiss dental manufacturer Ihde Dental has announced to participate at the FDI World Dental Congress in Singapore for the first time. The company, which can look back on a 50-year tradition in the production of dental materials for dental offices and laboratories in Germany and Europe, has been producing implant systems since 1996. Currently, they offer eight lines of implants and accessories for all indications in oral implantology.

According to implantologist and owner Dr Stefan Ihde, the company's implant lines can be safely used for all indications with some lines designed to permit immediate loading. The KOS implant, for example, allows this attractive treatment modality to be employed in such a way that it is particularly appreciated by patients. The implant is inserted transgingivally; the definitive restoration can be delivered within only five days.

In addition, Dr Ihde has been specialising in developing and improving the concept of disk implants, resulting in several integrated lines of basally osseointegrated (BOI) implants and their specific applications. This implant type is suitable for use in situation with a minimum vertical bone supply, eliminating the need of harvesting bone grafts from the iliac crest or performing comprehensive bone augmentation surgery.

All implant lines are continuously expanded, improved, and updated in order to incorporate and accommodate the most current scientific findings in oral implantology. Ihde Dental also closely cooperates with well-renowned oral implantologist to ensure that their implants meet all the requirements of everyday clinical practice.

All implants are produced in Europe, meeting the most stringent German and Swiss quality standards. Ihde Dental is present in more than 20 countries through its network of qualified resellers, who, according to Dr Ihde, are committed to excellent service for their customers.

"We will continue to follow the consistent path of international expansion with Asia being an important key region for us," explains export consultant Gert Wieners. "This is why we have decided to present our product range at the FDI World Dental Congress in Singapore this year."

Export consultant Gert Wieners. (DTI/Photo Courtesy by Dr Ihde Dental)

Visitors of this year's FDI Congress will find be able to find Dr Ihde Dental at the World Dental Exhibition at booth L17. More information about the company's implant lines and other product offers are available at *www.ihde-dental.de* and *www.implant.com*. DT

Dental CAD/CAM technology offers productivity, increases worldwide

Constantine Gart
& Dr Kamran Zamanian
USA

NEW YORK, NY, USA and VANCOUVER, BC, Canada: CAD/CAM technology is undisputedly one of the most important developments in dentistry today. Especially on the lab side, CAD/CAM technology is expected to increase productivity, enabling labs to meet the growing demand for dental prosthetics and other restoratives.

This growth is a result of the aging population and the increasing demand for improved dental aesthetics. CAD/CAM technology has met challenges in satisfying dental laboratories' expectations of what this technology will bring to their businesses. However, the technology is evolving at a rapid pace, as new trends and technological capabilities are emerging, representing the potential to surpass what it had initially offered dental laboratories.

Zirconia is the primary driver of CAD/CAM adoption, as the material can be milled into a crown or bridge only through an automated device, most often a CAD/CAM system. Zirconia's biocompatibility and high aesthetic qualities have led to a rapid increase in its use for dental prosthetics.

For example, the number of all-ceramic dental prosthetic units is projected to grow at a CAGR of 10.8 per cent and 10.5 per cent in the United States and Europe, respectively, over the next five years. This is well above the growth rate of other materials, such as porcelain fused to metal (PFM), which will see relatively flat growth.

While a large and growing portion of dental technicians prefer to use all-ceramic over traditional materials, all-ceramic acceptance has been met with resistance from dentists. All-ceramic materials have had above-average failure rates, with limited long-term clinical data to validate their durability and reliability. As a result, conservative dentists have continued to rely on traditional material such as PFM. However, the use of zirconia has greatly improved the overall durability of all-ceramic material, as zirconia is a stronger material than porcelain. Despite the initial resistance, it is expected that zirconia will continue to gain popularity as CAD/CAM manufacturers invest in research and development of zirconia for durability as well as to encourage its use through the education of dentists and lab technicians.

While zirconia has traditionally been the primary driver of CAD/CAM adoption, cost and production efficiencies are becoming more important factors. CAD/CAM technology is becoming more flexible in the type of services that it can offer dental laboratories. This is especially crucial as the number of dental technicians worldwide is projected to drastically decline in the future, due to the large number of older and retiring dental technicians. In addition, there are fewer dental technicians entering this field due to insufficient monetary compensation. This reduction in work force numbers, coupled with the increasing demand for dental restorations brought on by the aging population, will create greater demands on dental laboratories' production capacity for prosthetics and other restorations. Dental laboratories in the United States and Europe are also under strain due to competition from countries with very low labor costs such as China, Morocco, Turkey and Costa Rica.

The vast majority of dental laboratories around the world employ less than five dental technicians. Many of these laboratories hardly have enough volume to warrant the purchase of an expensive CAD/CAM system with in-house milling capabilities. To reach the smaller players in the market, CAD/CAM manufacturers such as 3M ESPE, DENTSPLY and Nobel Biocare have offered scanning units to dental laboratories, enabling the labs to scan and outsource the digital restoration to be milled at other locations (either a centralized milling facility or dental laboratories with in-house milling capability).

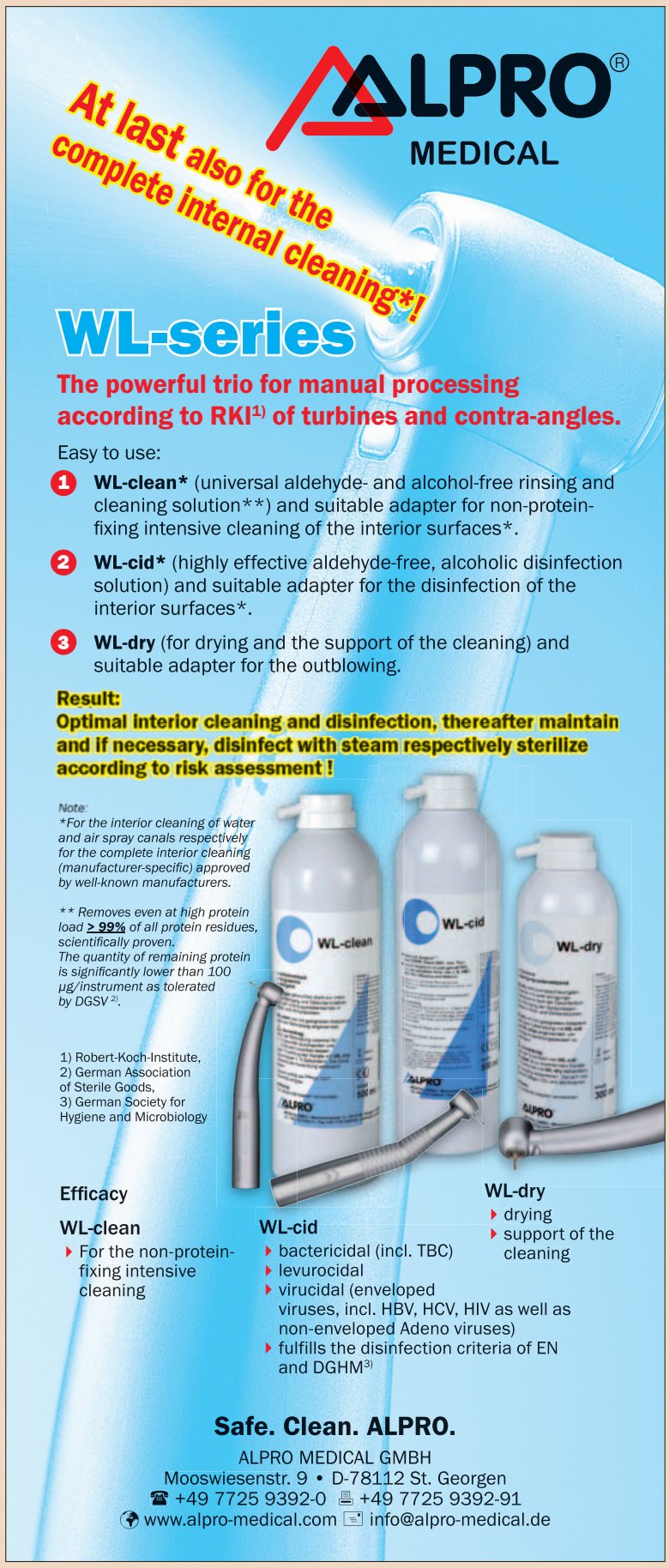
This purchasing option allows large dental laboratories that generate sufficient volume and revenue to invest in a full CAD/CAM system with in-house milling capability, whereas small to medium sized dental labs have the option of investing in a lower cost scanning unit, simultaneously eliminating the continuing production costs of dental copings and frameworks. Full CAD/CAM systems typically involve one scanner unit and one milling unit in-house. A stand-alone scanner CAD/CAM system consists of only a scanner unit, which sends the digital impression to either a centralized milling facility, or a dental lab with milling capability. The growing popularity of the two purchasing options is evident in the US and European markets, as there is an approximate ratio of one full CAD/CAM system to two stand-alone scanners in the total installed base.

CAD/CAM systems are becoming increasingly more affordable to dental laboratories as their prices continue to drop. For example, in the U.S. market, the average selling prices (ASPs) of full systems and scanners are expected to drop at CAGRs of 4.9 per cent and 4.3 per cent, respectively.

Manufactures and distributors are offering financing programs to help laboratories acquire the systems and, in some cases, are giving the system away for free on the condition that the labs manufacture a certain number of proprietary prosthetics. Likewise, the cost of the copings and frameworks milled by CAD/CAM systems are rapidly dropping; this, coupled with rising gold prices, has reduced the price of a zirconia crown almost to par with a gold crown. This has made zirconia milled framework a strong alternative to the traditional gold crown.

There are many dentists that only use PFM restorations and abstain from zirconia. To address this issue, CAD/CAM technology is expanding beyond its initial capability of milling only zirconia material and dental devices, to include other materials, such as: non-precious alloys, titanium, acrylic, resin, and even final abutments. This technological capability gives labs greater versatility in meeting customer needs by offering a greater breadth of materials and dental restorations.

The acceptance and integration of CAD/CAM technology into dental laboratories appears to be inevitable. Despite the many challenges that this technology has faced, ranging from uncertainty regarding the viability of zirconia material for dental prosthetics, to the technology's economical feasibility, CAD/CAM technology has progressed and continues to adapt in order to offer greater versatility in services to both small and large dental laboratories. DT

(Edited by Fred Michmershuizen, DTA)

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