

DENTAL TRIBUNE

The World's Dental Newspaper • Asia Pacific Edition

PUBLISHED IN HONG KONG

www.dental-tribune.asia

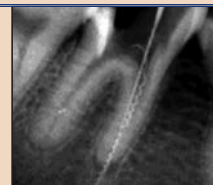
No. 5 Vol. 11



Dr Dan Fischer speaks
Ultradent president about
the new Edelweiss veneers
▶ Page 10



Diastemas
Correction with a minimally
invasive approach
▶ Page 12



Endo Tribune
News & trends from the
field of endodontics
▶ Pages 18–31

No long-term change found in caries prevalence in early South-East Asians

Archaeological findings question relationship between rise of agriculture and oral health

DT Asia Pacific

DUNEDIN, New Zealand/HONOLULU, Hawaii, USA: Crop cultivation like the growing of wet rice is still commonly believed to have had a significant impact on caries prevalence in South-East Asia over the last 4,000 years. In the dentition of infants and children found in archaeological sites in Thailand and Cambodia, however, clinicians and anthropologists have recently found no evidence to support the theory that oral health in this region declined over time owing to the intensification of agriculture.

While caries prevalence in the samples differed from site to site, there was no chronological relationship between them, the researchers reported, suggesting that agriculture and change in diet did not have a long-term impact on the oral health of South-East Asians as previously believed. However, caries prevalence in deciduous teeth was consistently found to be higher than in permanent teeth, which the researchers



Farmers in Mae Hong Son in Thailand harvesting rice. (DTI/Photo Peerakit Jirachetthakun)

believe could be due to the more-cariogenic food, such as fruit and root grubs, that children were given at a very early age before switching to less-cariogenic food like rice.

Children seemed to have increasingly relied on rice as the main source of food later in life, as caries levels in permanent teeth were found to be relatively low throughout all samples.

Among other sites, the researchers from universities in New Zealand and the US examined samples from Khok Phanom Di,

→ DT page 3

Fluoride reduces bacterial adhesion

Researchers from Germany have discovered that fluoride decreases the adhesive forces of oral bacteria and cariogenic pathogens in particular. Testing the adhesion of caries-inducing *Streptococcus mutans*, *Streptococcus oralis* and *Staphylococcus carnosus* to smooth, high-density hydroxyapatite surfaces, which were produced especially for the experiments and resembled tooth enamel in their composition, they observed lower adhesive forces after fluoride treatment of the surfaces in all bacteria species. Compared with untreated surfaces, the adhesion was only half as strong.

In contrast to prior studies that traced the cavity-preventive effect of fluoride back to effects on demineralisation, the findings suggest that the decrease in adhesive forces is a key factor of the cariostatic effect of fluoride. This could help improve dental fillings, dentures and implants in the future, the researchers concluded. DT



This toothbrush used by astronaut Buzz Aldrin on the historic Apollo 11 space flight to the moon was recently auctioned for more than US\$20,000. Read more about dentistry and oral health care in space in our exclusive interview with US dentist and former NASA contractor Dr Michael H. Hodapp. (DTI/Photo courtesy of Heritage Auctions, USA) ▶ WORLD NEWS, page 6

Mattheos to replace Lang at ITI

The International Team for Implantology in Switzerland has announced that Associate Professor Dr Nikos Mattheos from the University of Hong Kong Faculty of Dentistry is going to succeed Prof. Niklaus Lang as director of its Education Week Hong Kong. The annual course on implant dentistry is scheduled to be held in early September. DT

Increased cancer risk for early smokers

People who smoke a cigarette upon waking in the morning are significantly more likely to develop oral or lung cancer, according to new research. NNAL, a chemical compound found in tobacco products, was found to be as twice as high in participants who smoked within 5 minutes of waking compared with those who waited for at least 1 hour. DT

Taiwan, Philippines renew partnership

The dental associations of Taiwan and the Philippines have extended their partnership that provides basic dental services to Filipinos with no or limited access to oral health care. According to both organisations, the new programmes will start in July and primarily target people living in Luzon, the largest island of the country and inhabited by 46 million.

The agreement was signed during the 104th annual convention of the Philippine Dental Association in April and is the third renewal of the partnership that was established in 2006. Since then, both organisations have been providing support to and medical equipment for dental programmes conducted in various parts of the Philippines. DT



Distinguished by innovation

Healthy teeth produce a radiant smile. We strive to achieve this goal on a daily basis. It inspires us to search for innovative, economic and esthetic solutions for direct filling procedures and the fabrication of indirect, fixed or removable restorations, so that you have quality products at your disposal to help people regain a beautiful smile.

www.ivoclarvivadent.com

Ivoclar Vivadent AG
Bendlerstr. 2 | FL-9494 Schaan | Liechtenstein | Tel.: +423 / 235 35 35 | Fax: +423 / 235 33 60

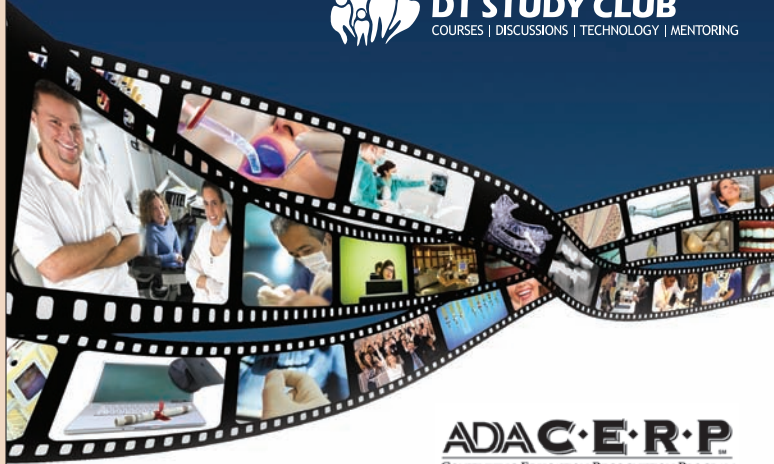
ivoclar
vivadent
passion vision innovation

AD

UPCOMING WEBINARS



DENTAL TRIBUNE
DT STUDY CLUB
COURSES | DISCUSSIONS | TECHNOLOGY | MENTORING



ADAC-E-R-P
CONTINUING EDUCATION RECOGNITION PROGRAM

DENTAL TRIBUNE AMERICA IS AN ADA CERP RECOGNIZED PROVIDER

30
APR

CBCT: AN INDISPENSABLE TECHNOLOGY FOR ALL DENTISTS

Steven A. Guttenberg, DDS, MD
07:00 PM (EST)

Dentists must have a good understanding of the anatomy of the jaws prior to treating acquired or congenital tooth loss, dental and osseous pathology and trauma, as well as orthognathic deformities, temporomandibular disorders and soft tissue and skeletally based sleep disease. CBCT offers a three-dimensional view of the maxilla, mandible, orbits and the dentition allowing all dentists to acquire more diagnostic information prior to invasive or noninvasive therapy. Numerous examples revealing Cone Beam to be an indispensable aid to every day dentistry will be presented.

1h
CE **FREE**
COURSE

REGISTER ON WWW.DTSTUDYCLUB.COM

06
JUNE

EVALUATION AND MANAGEMENT OF THE PATIENT WITH ORAL PRECANCER AND CANCER

Brian Schmidt, DDS, MD, PhD
8:00 p.m. (EST)

This course offers a description of the evaluation and management of the patient with oral precancer & cancer.

Participants will learn:

- Understand the clinical features suggestive of oral cancer
- Be familiar with new methods of detection and imaging of oral cancer
- Be familiar with oral cancer screening methods for your practice

1h
CE **FREE**
COURSE

REGISTER ON WWW.DTSTUDYCLUB.COM

BECOME A FREE MEMBER:

www.DTStudyClub.com

Clinicians use YouTube to explore origins of dental fear

DT Asia Pacific

HONG KONG/PERTH, Australia/ SHAH ALAM, Malaysia: With 800 million users per month currently, YouTube has become one of the most frequented websites on the Internet. Owing to its popularity, the video-sharing platform is increasingly used by scientists to research social patterns and behaviour. The latest study, conducted by paediatricians and public health experts across the Asia Pacific region, sought to investigate dental anxiety triggers in children and adolescents.

By analysing 182 videos with people expressing their views and experiences on the condition, they found that fear of the dentists not only has different manifestations and impacts but is also caused by yet underestimated factors like improper behaviour or work ethic of the clinician. Another major cause was reported to be the influence of parents and peers who shared unpleasant dental experiences with their children or used their fear of a dental visit for making them more compliant.

Commenting on their findings, the researchers stated that results do not only allow better insight of how the condition emerges and manifests over time but also that social media

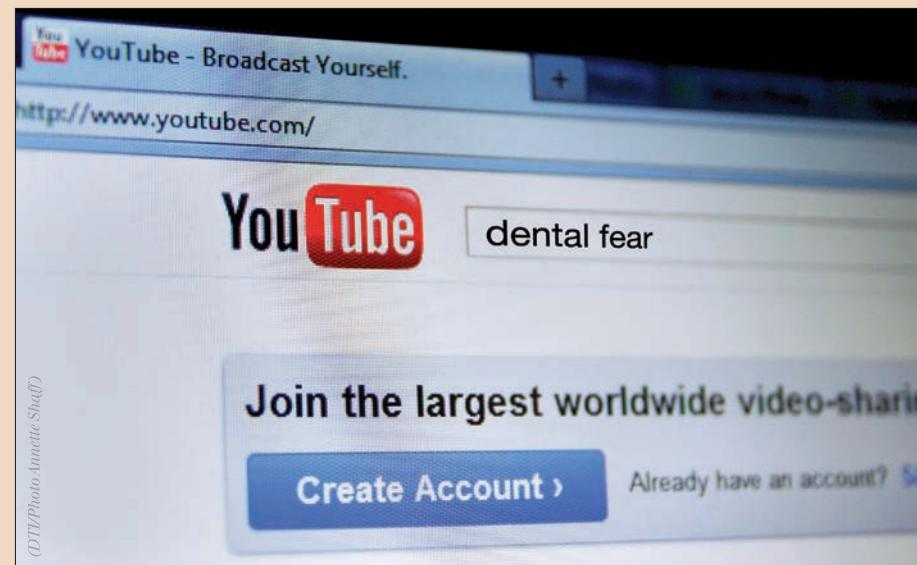
like YouTube can offer some value for understanding health issues better. However, they recommended to confirm their findings through more examinations incorporating in-depth interviews with patients and parents.

“Dental fear and anxiety in children is known to cause uncooperative behaviour during dental visits, delays in treatment, sleep disorders and psychological issues that can affect daily life,” said co-author Professor Nigel King from the University of Western Australia’s Faculty of Medicine. “The personal narratives and original sharing uploaded spontaneously by patients and the public to YouTube

provide a rich context to our existing knowledge of dental fear.”

Previous studies on children and adolescents have suggested dental fear to be caused primarily by negative dental experiences gained prior to treatment, among other reasons. According to a 2007 report from Sweden, approximately 1 in 10 children is currently estimated to suffer from the condition, however, other studies have considered this number to be higher.

Common treatment techniques for dental anxiety include the use of sedatives like nitrous oxide/oxygen or distraction methods. [DT](#)



International Imprint

Licensing by Dental Tribune International

Group Editor/Managing
Editor DT Asia Pacific

Daniel Zimmermann
newsroom@dental-tribune.com
Tel.: +49 341 48474-107

Clinical Editor

Magda Wojtkiewicz

Online Editors

Yvonne Bachmann
Claudia Duschek

Publisher Torsten Oemus

Copy Editors

Sabrina Raaff
Hans Motschmann

President/CEO

Torsten Oemus

Media Sales Managers

Matthias Diessner
Peter Witteczek
Maria Kaiser
Melissa Brown
Hélén Carpentier

CFO/COO

Dan Wunderlich

Marketing & Sales Services

Esther Wodarski
Nasrin Gazawi

Accounting

Karen Hamatschek

Business Development

Claudia Salwiczek

Executive Producer

Gernot Meyer

Ad Production

Marius Mezger

Designer

Franziska Dachselt

International Editorial Board

Dr Nasser Barghi, Ceramics, USA
Dr Karl Behr, Endodontics, Germany
Dr George Freedman, Esthetics, Canada
Dr Howard Glazer, Cariology, USA
Prof. Dr I. Krejci, Conservative Dentistry, Switzerland
Dr Edward Lynch, Restorative, Ireland
Dr Ziv Mazar, Implantology, Israel
Prof. Dr Georg Meyer, Restorative, Germany
Prof. Dr Rudolph Slavicek, Function, Austria
Dr Marius Steigmann, Implantology, Germany

DENTAL TRIBUNE

The World's Dental Newspaper - Asia Pacific Edition

Published by Dental Tribune Asia Pacific Ltd.

© 2015, Dental Tribune International GmbH. All rights reserved.

Dental Tribune makes every effort to report clinical information and manufacturer's product news accurately, but cannot assume responsibility for the validity of product claims, or for typographical errors. The publishers also do not assume responsibility for product names or claims, or statements made by advertisers. Opinions expressed by authors are their own and may not reflect those of Dental Tribune International.

Dental Tribune International

Holbeinstr. 29, 04229, Leipzig, Germany
Tel.: +49 341 48474-302 · Fax: +49 341 48474-175
Internet: www.dental-tribune.com E-mail: info@dental-tribune.com

Regional Offices

Asia Pacific

DT Asia Pacific Ltd.
c/o Yonto Risio Communications Ltd, 20A, Harvard Commercial Building, 105-111 Thomson Road, Wanchai, Hong Kong
Tel.: +852 3113 6177 · Fax: +852 3113 6199

The Americas

Dental Tribune America, LLC
116 West 25th Street, Suite 500, New York, NY 10001, USA
Tel.: +1 212 244 7181 · Fax: +1 212 224 7185

National University of Singapore to expand dental faculty and services

DT Asia Pacific

SINGAPORE: The National University of Singapore's Faculty of Dentistry is on the brink of a major expansion, *Dental Tribune Asia Pacific* has learned. Officials recently unveiled plans to transform the current facilities into an oral health-care centre, which will include the construction of a new, state-of-the-art building and extend the university's clinical offering.

In addition, the centre will facilitate research on regenerative biology and tissue engineering, among other fields.

The opening of the new centre is anticipated for 2017,

according to reports by the Singapore newspaper *The Straits Times*. It will allow the faculty to increase its annual intake of undergraduates to 80, the number needed to address the growing demand for dental services in the city-state, based

on Ministry of Health projections. While the estimated development expenses for the new facility were not disclosed, the university told the newspaper that it aims to raise US\$50 million for the project. The remaining development expenses will

likely be borne by the government.

Speaking to *Dental Tribune*, the faculty would not divulge any further details on the matter, saying that the expansion is still in predevelopment.

Teaching, research and clinical services at the faculty are currently hosted in different buildings at the university itself and the National University Hospital. Established in 1929 by the British, the faculty offers a number of dental programmes, including a Bachelor of Dental Surgery and Master of Dental Surgery.

According to university figures, over 200 dental students were enrolled at the faculty last term. **DT**

AD

← **DT** Page 1

an early settlement in central Thailand dated between 4,000 and 3,500 BP, and Muang Sema, which is believed to have been inhabited by people more than two millennia later. Fossil dentition from the same period from six other sites in Thailand and its southern neighbour Cambodia was also included in the research.

"The results show heterogeneity in caries prevalence that does not correlate with the chronology of the site, supporting the hypoth-



Fossil teeth like this found in Thailand were examined by the researchers. (DTI/Photo courtesy of Sian Halcrow, University of Otago, New Zealand)

esis that there was no decline in dental health with the intensification of agriculture in this region of the world," the researchers commented in the report. The relationship between oral health and agricultural intensification may therefore be considered to be more complex, they said.

Rice is believed to have first been domesticated in the Pearl River valley in China, and the earliest archaeological evidence of rice intensification in mainland South-East Asia dates back to approximately 4,000 BP. Until now, the crop remains one of the main sources of food and income for the majority of people living there. Thailand is the world's largest exporter of rice after India, producing over ten million tons a year. **DT**

Tetric® N-Collection

Complete nano-optimized restorative system



Explore our
latest Collection



Tetric® N-Collection

Tetric® N-Ceram | Tetric® N-Ceram Bulk Fill | Tetric® N-Flow | Tetric® N-Bond | Tetric® N-Bond Self-Etch

www.ivoclarvivadent.com

Ivoclar Vivadent AG

Benderstr. 2 | FL-9494 Schaan | Liechtenstein | Tel.: +423 / 235 35 35 | Fax: +423 / 235 33 60

Ivoclar Vivadent Marketing (India) Pvt. Ltd.

503/504 Raheja Plaza | 15 B Shah Industrial Estate | Veera Desai Road, Andheri (West) | Mumbai 400 053 | India
Tel.: +91 (22) 2673 0302 | Fax: +91 (22) 2673 0301 | E-Mail: india@ivoclarvivadent.com

Ivoclar Vivadent Pte. Ltd.

171 Chin Swee Road | #02-01 San Centre | Singapore 169877 | Tel. +65 6535 6775 | Fax +65 6535 4991

**ivoclar
vivadent®**
passion vision innovation

Dear reader,



Daniel Zimmermann
DTI

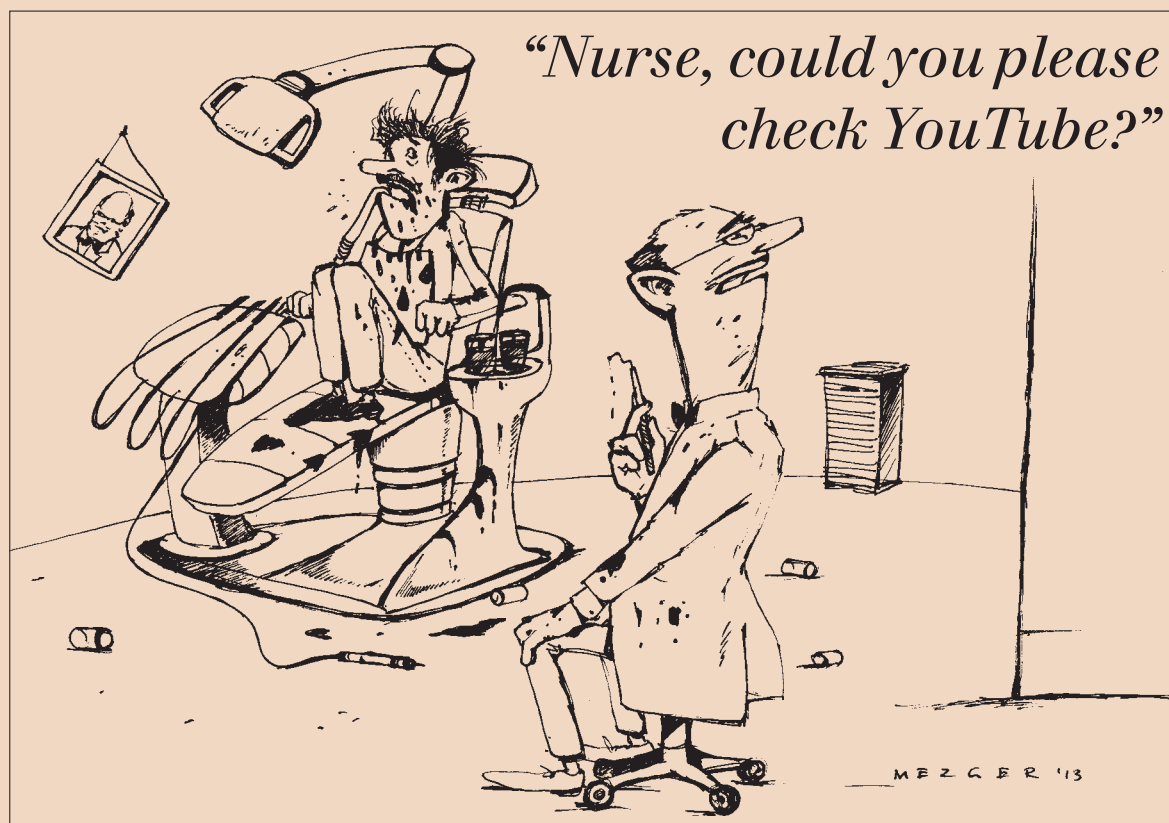
Have you visited Tokyo lately? In a few week or days, depending on where you get this edition, the next congress of the International Federation of Endodontic Associations (IFEA) is going to take place in the capital of Japan and for the first time, the Dental Tribune International Publishing Group will be represented not only by our Japanese licence partners Medical Tribune but also by Modern Dentistry Media from South Africa, who recently joined our network and will be organising IFEA's next congress in 2016. If you happen to be there, I encourage you to pay them a visit.

For all those readers missing out on the event, our newest endodontic supplement on *pages 19 to 31* could be worth a look, as promising concepts like intentional replantation and retreatment are discussed there by renowned experts in the field. In addition, Dr Gary Glassman will give you an extensive overview about endodontic irrigants and how they should be delivered. I hope these articles will be able to stimulate your interest in this often neglected specialty. [DTI](#)

Yours sincerely,

Daniel Zimmermann
Group Editor
Dental Tribune International

Dental Tribune welcomes comments, suggestions and complaints at feedback@dental-tribune.com



A threat to the dental professional



Dr Steen Sindet-Pedersen
UAE

The main purpose of the use of robots is to increase the precision, quality and safety of surgical procedures. Following the developments in industrial robot technology, robotics has found its way into the medical field and is used in a range of surgical disciplines. Robotics is not yet used in dentistry even though all the necessary technologies have already been developed and could easily be adapted. Some of the technologies are already used in dentistry, such as image-based simulation of implant surgery followed by the use of surgical guides, and creating digital impressions of preparations using an intra-oral scanner,

after which a milling device produces the restoration, but we have not yet seen any robot able to prepare teeth for crowns, inlays or bridges.

Such a robot would fundamentally be a dental drilling device coupled with a navigation device to determine the correct position of the device in relation to the patient. The robot would either be operated directly by a dentist or be preprogrammed to perform its functions based on imaging data (CT scan). Finally, an intra-oral scanner would be used to make digital impressions. This data would then be transferred to the lab to produce temporary crowns or bridges in a very short time using a milling machine and to manufacture the final restorations in much shorter time than with conventional procedures.

Robotics could offer dentistry improved accuracy, predictability, safety, quality of care and speed of treatment. One might wonder why robots have not yet been introduced to dentistry, as the functions needed are relatively simple. An explanation could be that it is an example of a disruptive technology, meaning that the current manufacturers of dental equipment might fear a negative effect on their current business and the alienation of dentists, as robots might be seen as a threat to dental professionals. [DTI](#)

Contact Info

Dr Steen Sindet-Pedersen is Professor of Oral-Maxillofacial Surgery at the European University College in Dubai, United Arab Emirates. He can be contacted at steensindet@hotmail.com.

Regenerative endodontics



Prof. Shobha Tandon
India

In the first part of this century, there has been an increase in understanding and experimentation with stem cells as a primary tool in the expanding regenerative medicine and tissue-engineering revolution. Regenerative endodontics is one of the significant developments among these biological approaches that will possibly involve a combination of disinfection and debridement of infected root-canal systems to regenerate apical tissue. Although the challenges of introducing these methods in the endodontic field are substantial, the potential benefits to patients and the profession are equally ground-breaking.

Regenerative endodontics can be defined as biologically based procedures designed to create or deliver tissue to replace diseased, missing or traumatised tissue of the pulp-dentine complex. Two concepts currently exist in regenerative endodontics: the first is the active pursuit of pulp-dentine regeneration to implant or regrow pulp, and the other is the formation of new living tissue from the stem cells present in the root, allowing root development. [DTI](#)

Contact Info

Prof. Shobha Tandon is Head of the Department of Pedodontics and Preventive Dentistry at the Babu Banarasi Das College of Dental Sciences in Lucknow, India. She can be contacted at shobhatandon2010@gmail.com.

AD



PROMEDICA

Highest quality made in Germany

- high quality glass ionomer cements
- first class composites
- innovative compomers
- modern bonding systems
- materials for long-term prophylaxis
- temporary solutions
- bleaching products ...

All our products convince by

- excellent physical properties
- perfect aesthetical results



Glass ionomer filling cement

- perfectly packable consistency
- excellent durable aesthetics
- also available as application capsules

Light-curing micro-hybrid composite

- universal range of application
- high filler content
- excellent physical properties
- fast and easy application



Dental desensitising varnish

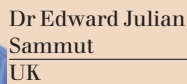
- treatment of hypersensitive dentine
- fast desensitisation
- fluoride release
- easy and fast application

PROMEDICA Dental Material GmbH

phone: +49 43 21/5 41 73 · fax +49 43 21/5 19 08 · eMail: info@promedica.de · Internet: www.promedica.de

PROMEDICA

The gingival biotype has important implications for increased susceptibility to recession



Ethnicity has been implicated in the susceptibility of patients to periodontitis and gingival recession. A new study from the US (Characterization of Dental Anatomy and Gingival Biotype in Asian Populations. Lee, Kim, Prusa & Kao, 2013) has added to the available evidence to further strengthen the notion that Asians are more prone to gingival recession and tooth loss.

The study examined 49 Asians from Japan, China, South Korea and Vietnam with an average age of 39. Data collection was carried out by three general dental practitioners, and seven index teeth were used. Tooth and root length were measured from dental panoramic radiographs, which were calibrated using 5 mm ball bearings. Gingival biotype was determined according to standard clinical protocols.

The results suggested that these 49 Asians had shorter roots and generally thinner gingival tissue compared with Caucasians. The authors used data from standard dental anatomy textbooks to obtain standard root lengths for comparison and data from European studies to obtain the Caucasian gingival biotype frequency.

will have completely different implications than such loss on a root that is 15 mm long will. Therefore, patients with short roots are more likely to experience tooth loss following attachment loss than patients with long roots would.

The gingival biotype has important implications for in-

to record data for all teeth in each patient.

Another limitation of this study lies in the measurement of root length from a dental panoramic film. It is well understood that projection on a panoramic film is subject to distortion, depending on the angulation of the tooth

such differences could contribute to differences of root length projection on panoramic films.²

The root lengths measured from the radiographs were then compared to standard tooth lengths from well-known textbooks, which obtained their data in turn from absolute measurements of extracted teeth. Therefore, the comparison made between the study population and the reference population is technically invalid because different methods were used to obtain the measurement.

Overall, the take-home messages from this study are that Asian patients may have thinner periodontal biotypes and may consequently be more likely to experience gingival recession. They may have shorter roots than average; therefore, if there is attach-

ment loss due to periodontitis, we must be very careful to prevent further attachment loss or tooth loss will soon follow.

Correct preventative advice and treatment must be a cornerstone of managing all patients, and this group even more so. **DT**

“...the residual attachment is an important prognostic indicator for teeth with periodontitis.”

creased susceptibility to recession. Various studies show that thin tissue is more likely to recede when subjected to micro-trauma such as that from overzealous toothbrushing, but it is important to remember that classic studies like that of Miyasato and co-workers in 1977 showed us that thin areas of keratinised gingiva are not necessarily more susceptible to inflammatory periodontal disease.¹ Therefore, we must separate the susceptibility to recession from the susceptibility to periodontitis.

We must bear in mind the limitations of this study, some of which were pointed out by the authors in their discussion. Firstly, this paper looks at a fairly small number of patients

“Correct preventative advice and treatment must be a cornerstone of managing all patients...”

While clinical periodontal measurements of probing depth and recession are used to work out the clinical attachment level, in many instances, the residual attachment is an important prognostic indicator for teeth with periodontitis. Indeed, one of the reasons for using periapical or panoramic radiographs rather than bite-wings to assess periodontal status is the simple fact that one can evaluate the root length. By combining the clinical and radiographic information, one can estimate how much of the root is still attached.

Clearly, 7 mm of attachment loss on a root that is 10 mm long

and we have no information about how they were recruited. Clearly, they cannot be taken as a representative cross-section of the Chinese, Koreans, Vietnamese and Japanese.

The study specifies that the subject examinations were conducted by general dental practitioners, and it would have been nice to see some information about how they were trained, hopefully by a periodontist.

We have also no information about the distribution of nationalities among the 49 subjects, or about the reason they went to see the dentist in the first instance. Were they all complaining of sensitivity for instance? The use of index teeth is well established but this normally applies to studies in which large numbers of patients were recruited. It would not have been difficult

¹M. Miyasato, M. Crigger & J. Egelberg, Gingival condition in areas of minimal and appreciable width of keratinized gingiva, *Journal of Clinical Periodontology*, 4/3 (1977): 200–9.

2 Y. Gu, J.A. et al., Comparison of craniofacial characteristics of typical Chinese and Caucasian young adults, *European Journal of Orthodontics*, 33/2 (2011): 205–11.

Contact Info

Dr Edward Julian Sammut is currently establishing his own specialist practice in Valletta in Malta while also working as a specialist in periodontics in practices in and around London in the UK. His areas of special interest include joint restorative and periodontal management of failing dentition, soft-tissue augmentation, and management of peri-implant disease. He can be contact at edward@sammutspecialists.com.

AD

DenTech China 2013

www.dentech.com.cn

The 17th China Int'l Exhibition & Symposium on Dental Equipment, Technology & Products

1st China International Forum on Dental CAD/CAM
The 3rd Shanghai Academic Conference on Implant Dentistry
The 7th Asian Dental Lab Outsourcing Exhibition

October 23~26, 2013

Shanghai World Expo Exhibition and Convention Center
Shanghai, China

Approved by: Ministry of Science and Technology of the People's Republic of China

Supported by: China Association for Science and Technology / Chinese Stomatological Association / Shanghai Stomatological Association

Organized by: China International Conference Center for Science & Technology / Ninth People's Hospital, School of Medicine, Shanghai Jiao Tong University / Shanghai UBM ShowStar Exhibition Co., Ltd.

Co-organized by: College of Stomatology, Shanghai Jiao Tong University / School of Stomatology, Tong Ji University / Shanghai Stomatological Disease Center

If you are interested in participating or visiting the Exhibition, please fill the form below and fax or post to: Shanghai UBM ShowStar Exhibition Co., Ltd.
9F CIROS Plaza, No. 388 Nanjing Road (W), Shanghai 200003, China
Tel: 86-21-6157 3955 / 6157 3953 Fax: 86-21-6157 7272 E-mail: sandra.shen@ubm.com / jingjing.xu@ubm.com

I am interested in DenTech China 2013, please send me more information on

☐

EXHIBITING

☐

VISITING

Name _____ Company _____

Address _____

Telephone _____ Fax _____

Zip _____ E-mail _____

Extracting a tooth should be the last resort in space

An interview with former NASA dentist Dr Michael H. Hodapp, USA

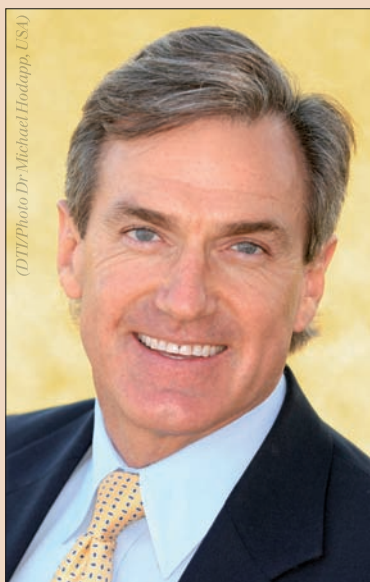
A toothbrush of Buzz Aldrin, a crew member of Apollo 11 and one of the first humans to ever walk on the moon, was recently auctioned for US\$22,705. Fifty years later, astronauts are still using everyday oral care products on their missions. DT Group Editor Daniel Zimmermann spoke with former NASA dentist Dr Michael H. Hodapp, USA, about his work, the possibility of dental emergencies in space and how to maintain good oral health on future long-term missions to Mars.

Daniel Zimmermann: *Do you know how many dentists are currently employed by the agency?*

Dr Michael Hodapp: Owing to the recent cutbacks to NASA's budget, they have closed the NASA dental clinic, so there are no dentists contracted by the agency at this point. Astronauts seek dental care from private practitioners, and are followed closely by NASA-employed flight physicians.

Dr Hodapp, how did you become involved with NASA?

In 1994, another dentist working for NASA informed me that a position had become available to care for the astronauts and their families at NASA, and asked me if I would be interested. After a series of interviews, I was appointed to the position. I served NASA as a contractor for over a decade before I went back into private practice in 2004. However, I am still called on occasionally as a consultant for dental issues aboard the International Space Station (ISS) and future exploration-class missions.



Dr Michael Hodapp served as contractor for NASA between 1994 and 2004.

How important is oral health for astronauts in general?

Oral health is a primary concern for astronauts and goes hand in hand with general health. All astronaut candidates

sult in departure from the ISS is a dental abscess.

Russian cosmonaut Yuri Viktorovich Romanenko had to go through two weeks of incapacitating tooth pain during the Salyut 6 mission in 1978. When were dental emergencies first included in mission protocol?

Unfortunately for Romanenko, according to reports, the Soviets did not have a dental contingency protocol at that time. The Russian space programme has since made provision for such emergencies, however.

During the US Mercury programme, the flights were so short that there was no need for an in-flight dental emergency protocol, and prevention was the primary focus. Owing to the extended time spent in space during the Gemini programme, a toothbrush was added to flight kits as a preventative measure.

“...even with the highest standards in prevention, the potential for a dental emergency in space still exists.”

are initially screened for dental issues prior to selection, and all those selected are expected to adhere to a meticulous oral hygiene routine and maintain good oral health. The primary goal is prevention. Yet, even with the highest standards in prevention, the potential for a dental emergency in space still exists. A recent analysis of all medical conditions determined that the one condition most likely to re-

Apollo missions then incorporated a digestible dentifrice and floss, as well as antibiotics. Instrumentation like forceps and temporary filling materials was first introduced when the Skylab space station was launched into orbit in the early 1970s and has been part of the emergency kits ever since.

How frequently are astronauts given pre-flight check-ups?

Once applicants are accepted, they undergo a thorough oral exam annually. The astronauts are classified into three categories: Class I astronauts have good oral health and are not expected to require dental treatment or re-evaluation for 12 months, Class II astronauts have some oral conditions that if left untreated are not expected to result in a dental emergency within 12 months, and Class III astronauts have an oral condition that if left untreated is expected to result in an emergency within a 12-month period. All astronauts are expected to retain a minimum Class II status, and only astronauts with Class I status prior to launch are considered for the ISS.

In addition to annual exams, astronauts undergo pre-flight exams 18 to 21 months before launch. During this exam, the astronaut undergoes a thorough clinical and radiographic exam,

There are two crew medical officers (CMOs) aboard every mission and they are trained to perform a number of dental and medical emergency procedures. On board, CMOs have the capability to treat with antibiotics and analgesics, administer anaesthetics, place temporary dental fillings, replace a crown with temporary cement, treat exposed pulp, and as a last resort, extract teeth. Any emergency treatment would include communication with ground support flight physicians, as the CMOs are not necessarily physicians or dentists themselves. However, since the ISS is in low earth orbit, a true emergency situation would likely result in a return to earth for proper treatment.

Future missions will take astronauts to other planets in the solar system, like Mars. What are the main challenges that these long-term flights pose regarding oral health?

We still do not know the long-term effects of space flight on the teeth, alveolar bone and periodontal health. It is well documented that during space flight bone mineral density decreases in weight-bearing bones. It is not clear how this affects the teeth and alveolar bone and whether crew members will be more susceptible to tooth decay or periodontal disease.

Skylab oral health studies determined that there were increased counts of caries-producing bacteria such as *Streptococcus mutans* among crew members. It was concluded that this was due to the dehydrated diet that astronauts consume. This could be a potential contributor to oral health issues during extended missions, especially if a crew member begins to lapse in proper oral health care.

Dental emergencies in space would be challenging to handle as well. A mission to Mars would require a one-way flight duration of six to nine months. Owing to the alignment of earth and Mars, the nominal mission would spend either 30 days or a year and a half on the Martian surface. Were an oral emergency to occur during the outbound flight, there would not be a safe-return-to-earth capability. Not enough fuel could be carried to counteract all the forces of launch that propel the crew on their voyage. In essence, all emergencies would have to be handled by the CMOs either in flight or on a planet with a little more than one-third of the gravity of earth.

No in-flight dental emergency has ever been reported by NASA. What kind of problems do you think are most likely to occur?

While the chances of a dental emergency occurring in space are low, the potential is always there. For instance, when astronauts move large objects, the inertia of mass and velocity can potentially cause facial injuries and result in either a medical or dental emergency or both. Besides breaking a tooth, other considerations include luxation, clenching, grinding, split teeth or the fracturing of a cusp while chewing. Even with most meticulous dental exam and hygiene programme, there is always a possibility that a tooth abscess could form due to trauma, hidden caries or a failing root canal.

Which dental emergencies are astronauts trained to handle by themselves?



Skylab inflight medical supplies support system with emergency equipment including a dental kit.

In space, "for every action, there is an opposite and equal reaction" has special meaning to the treating CMO and the crew member receiving treatment. Just the act of giving an injection would send the crew member and CMO darting away from each other if proper techniques were not followed. The luxury of gravity does not exist, and simple procedures can become major challenges without it. Consider for a moment trying to give CPR without the force of gravity holding you in place.

Working in the oral cavity poses special concerns, since the very act of breathing not counteracted by gravity would have a tendency to draw anything loosely held within the oral cavity back into the lungs.

There is also the concern of the limited medical skills of CMOs, and the one-way communication delay with ground support of 20 to 25 minutes. In other words, it could take 45 minutes for a flight physician to deliver instruction to the treating CMO. Prayers would be in order for the afflicted crew member.

What measures are being considered to overcome these problems?

Recent discussions in relation to exploration-class missions have proposed instrumentation for semi-annual dental exams and cleaning for each crew member, as well as additional equipment for the diagnosis and treatment of dental emergencies. Some of the equipment considerations include a high-definition intra-oral camera system, a method for detecting interproximal decay and osseous infections while limiting radiation, as well as a battery-operated dental handpiece and headlight.

Material considerations include an intermediate restorative material that is easy to use, does not require special equipment for mixing or curing, releases fluoride, and could last for the duration of an exploration-class mission. The US Navy is currently conducting research on a restorative material for field use that fits this description. A glass ionomer restorative material is also under consideration, although this would require special packaging to allow for controlled mixture by hand in a microgravity environment.

Discussion about medications indicated that all drugs would need to be freshly manufactured and would require special packaging to maximise shelf life, especially those medications that are sensitive to moisture and radiation.

Software considerations include training videos for the crew members to review and train to keep abreast during their travel.

President Obama speaks of sending humans to Mars as

"We still do not know the long-term effects of space flight on the teeth..."

early as 2030. Do you believe that these plans are realistic?

It is my understanding that there are no definitive plans for a manned mission to Mars in the near future. Recent cuts to NASA's budget have slowed progress for a manned mission to the red planet. Our closest neighbour is explored using

robotics, and there is much to learn about Mars prior to risking the lives of humans on such a distant journey.

However, planning and research for manned exploration-class missions is still being conducted, and the Orion project is still in progress. There are so

many hurdles to overcome before such a journey could be undertaken.

Currently, NASA is formulating plans for a three-month mission to rendezvous with a near-earth asteroid. This would be a scientific mission requiring a one-month flight to ren-

dezvous with the asteroid, conduct research and fly back to earth.

If NASA offered you the opportunity to go to space, would you accept it?

Since I was a young boy I have looked to the heavens and been fascinated by its beauty and have always dreamt of going into space. Given the opportunity, I would go in a heartbeat.

Thank you very much for this interview. 

AD

The 24th Congress of the International Association of Paediatric Dentistry

June 12(Wed)~15(Sat), 2013
coex Seoul, Korea

June 12 (Wed)

Pre-Congress Workshop

- Contemporary sedation
- Oral hygiene: Instruction and monitoring caries activity
- Clinical failures in paediatric dentistry
- Hands on seminars

Opening Ceremony & Welcome Reception (Auditorium, Coex)



June 13 (Thu)

Keynote Lecture

- New dental apps in caries prevention

Symposium

- Special smiles I

Lecture

- Minimal-invasive dentistry
- Materials I
- Genetic perspectives in paediatric dentistry
- Dental trauma

Clinical Practice: What's New?

UK Night Practitioner's Fam Tour

June 14 (Fri)

Keynote Lecture

- New horizons and challenges in paediatric dental sedation

Symposium

- Early caries detection
- Dental erosions in children
- Special smiles II

Lecture

- Materials II
- Limits and borders of laser use in children
- Pulp

Treasure Island: My strategy in private practice

Gala Dinner (Walkerhill Hotel)



June 15 (Sat)

Symposium

- Dental stem cells for regenerative dentistry
- Early childhood caries
- Dental education

Lecture

- Dental impaction
- Early orthodontics

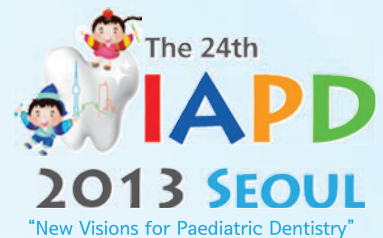
Clinical Practice: What's New?

Farewell Party (Sam Chung Gak)

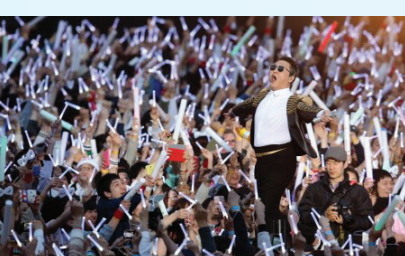
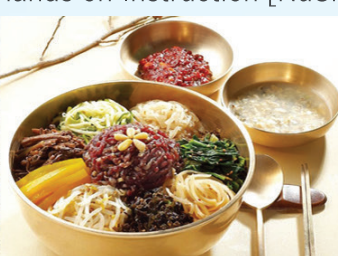


SCIENTIFIC PROGRAM

- **Main scientific program**
 - Plenary sessions - "New Dental Apps in Caries Prevention" Svante Twetman (Denmark) and John Featherstone (USA)
 - "New Horizons and Challenges in Paediatric Dental Sedation" Stephen Wilson(USA), Keira Mason(USA) & Leda Mugayar(Brasil)
 - 6 symposiums will be discussed with the following topics:
 - ① Early Caries Detection
 - ② Dental Erosions in Children
 - ③ Special Smile I : Dental Care for Special Children
 - ④ Special Smile II : Dental Care Systems for Patients with Special Needs
 - ⑤ Dental Stem Cells for Regenerative Dentistry
 - ⑥ Early Childhood Caries
 - Clinical Practice: What's New? regarding clinical topics of paediatric dentistry.
 - Treasure Island: My Strategy in Private Practice for private practitioners.
- **Pre-Congress program**
 - ① Contemporary Sedation in Paediatric Dentistry
 - ② Oral hygiene: Instruction and Monitoring Caries Activity
 - ③ When things go wrong - Clinical failures in Paediatric Dentistry
 - ④ Pre-Congress Hands-on Seminar: Clinical Application of Resin Infiltration [DMG]
 - ⑤ Pre-Congress Seminar: Anterior and Posterior Ceramic Paediatric Crowns - Hands-on Instruction [NuSmile]



The 24th
IAPD
2013 SEOUL
"New Visions for Paediatric Dentistry"



✚ IAPD 2013 Secretariat TEL 02-6000-2504 E-mail : info@iapd2013.org www.iapd2013.org



Tribune CME

6 Months Clinical Masters Program in **Implant** Dentistry

2 May 2013 to 10 November 2013, a total of 12 days
in **Heidelberg** (DE), **Como** (IT), **Maspalomas** (ES)



Live surgery and hands-on with the masters
in their own institutes plus online mentoring and
on-demand learning at your own pace and location.

Learn from the Masters of Implant Dentistry:



Registration information:

2 May 2013 to 10 November 2013, a total of 12 days
in Heidelberg (DE), Como (IT), Maspalomas (ES)

Find out more on www.TribuneCME.com

Curriculum fee: € 11,900

contact us at: tel.: **+49-341-48474-302** / email: **info@tribunecme.com**

Collaborate
on **your cases**

and access hours of
premium video training
and live webinars



University
of the Pacific

you will receive a certificate
from the University of the
Pacific



Latest iPad
with courses

all early birds will receive
an iPad fully loaded with
premium dental courses



100 ADA CERP
C.E. CREDITS

ADA C.E.R.P.® Continuing Education
Recognition Program

Tribune Group GmbH is the ADA CERP provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP does not approve or endorse individual courses or instructors, nor does it imply acceptance of credit hours by boards of dentistry.

KaVo Dental offers 3D eXam

Cone-beam X-ray system provides sound diagnostic data for a broad spectrum of treatments

DTI

BIBERACH, Germany/ SINGAPORE: KaVo has announced a digital 3-D cone-beam X-ray system called 3DeXam that is claimed to generate high-resolution 3-D radiographs at a lower cost and with less radiation compared with traditional computerised tomography.

According to the German dental equipment manufacturer, the volumetric diagnostic imaging system of KaVo 3D eXam provides clinicians with a detailed view of all oral and maxillofacial structures for sound diagnostic data that allows a thorough analysis of bone structures, as well as orientation of the teeth. Optimum implant placement can be assessed as well, the company said.

For the analysis of the bone morphology of the temporomandibular joint (TMJ), the TMJ cleft and joint function,



3D eXam can also capture 3-D images of the condyles as part of the surrounding structures. Furthermore, it replaces panoramic, cephalometric and individual-tooth images with a single volumetric image.

According to KaVo, 3D eXam has an average exposure time of only 8.5 seconds, which reduces exposure to radiation and the quality loss caused by patient movement. Owing to its high definition, 3D eXam provides excellent resolution even for small voxel sizes of 0.125 mm. [D]

Indian dental business receives large-scale investment

DT Asia Pacific

NEW DELHI, India: Indian private equity firm Asian Healthcare Fund (AHF) has confirmed that it will be investing significantly in one of the country's largest dental chains. According to CEO Ajay Kumar Vij, his company intends to pump INR400 million (US\$7 million) into Western Indian-based Total Dental Care, which runs dental clinics in Mumbai and Pune under the mydentist brand.

In addition to the investment from AHF, mydentist is also reported to have received INR100 million (US\$1.8 million) from its main investor, Seedfund, in Mumbai.

Founder and CEO Vikram Vora said in a statement that with the upcoming cash injection his company aims to increase the

number of mydentist clinics from 40 currently to over 120 across both cities. Opportunities for expansion into other parts of the country are also being evaluated, he said.

Mydentist is AHF's first investment since the fund was set up by Vij and the chairman of the Dabur group, Anand Burman, in 2010. According to Burman's company, it is intended to identify opportunities for investment in the country's booming health-care sector. Dabur is one of the largest consumer goods providers in India, selling foods, and personal and health-care goods like toothpaste. Last year, it reported revenues of INR52.8 trillion (US\$966.2 billion) worldwide.

In addition to Dabur, AHF is believed to have several other investors. [D]

Japanese corp close to market entry in the Philippines

Lion starts joint venture with Peerless Products Manufacturing

DT Asia Pacific

PASAY CITY, the Philippines: The Lion Corporation has announced that the launch of its Philippines Peerless Lion joint venture is in its final stages. The first products, ranging from toothbrushes to mouthwash, are anticipated to be distributed from the middle of this year, representatives of both companies disclosed during a convention held by the Philippine Dental Association in Pasay City in April.

The joint venture with Peerless Products Manufacturing, a producer of soaps and household cleaners based north of the capital Manila, will give the Tokyo-based oral health care giant access to a market worth P9 billion (US\$218 million), which Filipinos are estimated to spend annually on oral health care products. Currently, the toothbrush



Lion Corporation headquarters in Tokyo.

and toothpaste market in the South East Asian country is dominated by global companies like Colgate-Palmolive, GlaxoSmith-Kline and Unilever, according to a 2009 report by US market intelligence provider Research and Markets.

Lion, which also manufactures a number of beauty products and pharmaceuticals, will hold a majority share of 51 per cent in the new joint venture, while Peerless will hold 49 per cent. Both companies agreed to cooperate back in 2011.

Already active in most South-East Asian markets, Lion is also operating in South Korea and China, through affiliates. With its Systema, Kodomo and Zact brands, the company holds approximately one-third of Japan's US\$1.2 billion toothbrush and toothpaste market. Recently, it launched a new toothpaste targeting consumers suffering from hypersensitivity and periodontal disease, among other products. Last year, Lion gained ¥244.2 billion (US\$2.4 billion) from its consumer products business, of which 17 per cent was achieved through overseas sales. [D]

AD

PURE
NEWTRON

Discover B.OLED technology

www.pure-newtron.com

Satelec • A company of ACTEON group • 23/45 Sorachai Building 16th Floor
 Sukumvit 63 Road, Klongton Nua Wattana, BANGKOK • 10110 THAILAND
 Tel + 66 2 714 3295 • Fax + 66 2 714 3296
 E-mail : info@th.acteongroup.com • www.acteongroup.com