NEWS

World Oral Health Day

Calls attention to high risk of oral diseases

The figures are stark: the average density of dentists to head of population in Africa is 1 to 150,000; in industrialized countries, the average is 1 to 5,000. In Ethiopia, the lack of access is even more dramatic with a density of only 1 dentist per 1 million people. This information derives from the Oral Health Atlas developed by FDI World Dental Federation, which provides a clear picture of dental health around the world.[1] Even in countries with fast growing populations of dentists, unequal access to dental care is a major obstacle to optimal oral health.

"Developing countries face great challenges in their quest for optimal oral care", stated Dr Tin Chun Wong, FDI President. "Oral health is integral to general health and a basic human right, and we must ensure cost-effective solutions become available to all. Promoting better research and obtaining valid data will help us achieve this objective."

The damage to oral health due to poor access to care is exacerbated by the fact that many developing countries are disproportionally affected by a number of oral diseases. The combination of high risk of oral disease and low access to care, results in many patients not getting adequate treatment in time.

World Oral Health Day
20th March

World Oral Health Day is celebrated every year on 20th March. The theme of World Oral Health Day 2014 was 'Celebrating Healthy Smiles'. It reflects the major contribution oral health makes to our lives. Around the world, FDI member dental associations, schools, companies and other groups will celebrate the day with events organized under this single, unifying and simple message. For more information, visit: www.worldoralhealthday.org

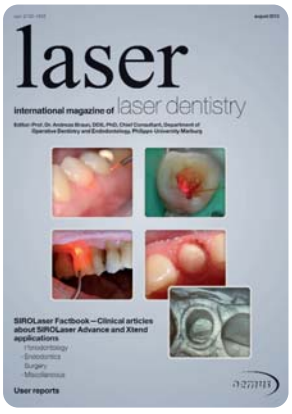
1 Beaglehole, R., Benzian, H., Crail, J., and Mackay, J. (2009) The Oral Health Atlas. Mapping a neglected global health issue. FDI World Dental Federation. Cointrin, Switzerland.

SIROLaser Factbook

Comprehensive information on diode lasers

Sirona reports on the wide range of applications of diode lasers in a special edition of the English-language laser international magazine of laser dentistry. The "SIROLaser Factbook—Clinical articles about SIROLaser Advance and Xtend applications" includes research by well-known experts as well as informative field reports from experienced users of laser technology.

Compact and informative: Sixty pages full of solid expertise and practical applications await the readers of English texts collected by Sirona in "SIROLaser Factbook—Clinical articles about SIROLaser Advance and Xtend applications." Academic articles and real-life user reports by well-known experts provide information on the many uses and treatment options of diode lasers with a wavelength of 970 nm. Interesting facts and figures, study results, documented case studies with descriptive pictures, and recommendations for further reading complete the compendium.



"Anyone with an interest in laser dentistry should read the SIROLaser Factbook," says Ingo Höver, product manager at Sirona. The book is especially meant for beginners, says the laser specialist. "However, experienced users will also find it worth reading. I am sure that they will be surprised to learn the many possibilities of diode lasers and the range of applications that are open to them with models like the SIROLaser Advance or SIROLaser Xtend."

Scientists discover that

Microorganism prevents mouth infection

A U.S. research project has shown that Pichia, a beneficial fungal yeast, inhibits growth of the harmful fungal yeast Candida, which also causes oral thrush. The researchers hope that the findings will contribute to the development of a therapeutic agent to fight the painful mouth infection, as well as other fungal infections.

The study involved testing the mouths of twelve healthy individuals and twelve patients diagnosed with HIV for the presence of fungi and bacteria. HIV-infected participants were selected for comparison because oral candidiasis is the most common oral complication in these patients, the researchers explained. Using DNA analysis, the researchers observed no differences with regard to bacteria between the two study groups. "However, what changed significantly was the composition of the fungal community," said senior author Dr Mahmoud A. Ghannoum. "We found that when Candida is present, Pichia is not, and when Pichia is present, Candida is not, indicating Pichia plays an important role in treating thrush."


[PICTURE: ©JEZPER]

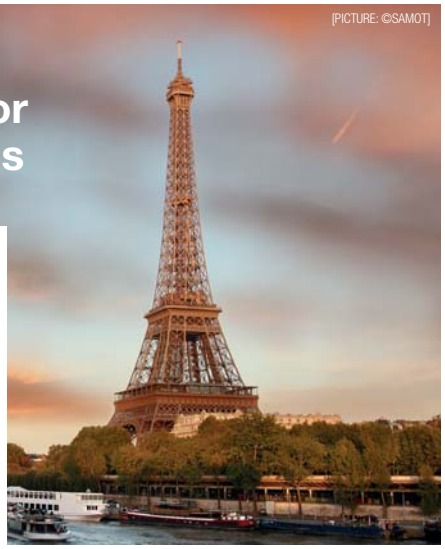
In the second phase of the study, the researchers conducted laboratory experiments on the fungi. When they grew Candida in test tubes in the presence of Pichia, there was a striking reduction in Candida growth.

"One day, not only could this lead to topical treatment for thrush, but it could also lead to a formulation of therapeutics for systemic fungal infections in all immunecomprised patients," Ghannoum said. "In addition to patients with HIV, this would benefit very young patients and patients with cancer or diabetes."

The study, titled "Oral Mycobiome Analysis of HIV-Infected Patients: Identification of Pichia as an Antagonist of Opportunistic Fungi," was published online on March 13 in the *PLOS Pathogens journal*. It was conducted by Case Western Reserve University and the University Hospitals Case Medical Center.

WFLD will hold

14th World Congress for Laser Dentistry in Paris


[PICTURE: ©SAMOT]

This event will gather dental specialists for all around the world and the scientific program has been designed with different speakers trying to cover all the different fields regarding laser use in dentistry and the appliance if laser in implantology. The combination of scientific studies, substantiating the scientific evidence of treatments performed with laser, as well as the clinical experiences of recognized professionals are a huge attraction and a not-to-miss congress.

Nowadays WFLD is present on five continents, in almost 50 countries with the mission of propagating science with no economic interest. The WFLD World Congress and Paris, as a city, come together to make a great scientific event. Do not miss what may be one of the best congress in laser dentistry from 2 to 4 July in Paris. Submit your abstract and register already on the congress website www.wfld-paris2014.com.

Congress President :
Ass. Prof. Dr Frederick Gaultier
Chairman of the scientific committee :
Prof. Dr Jean-Paul Rocca
Chairman European Divison of WFLD :
Prof. Josep Arnabat
WFLD Chairman of International and legal affairs :
Prof. S. Nammour

Prolonged breastfeeding may increase

Risk of cavities in primary teeth


[PICTURE: ©VIETROV DMYTRO]

In order to establish an association between breastfeeding and severe early childhood caries, researchers examined the oral health status of 715 infants from low-income families in Porto Alegre.

They found that the prevalence of caries was highest in children who were breastfed at 24 months or beyond compared with babies who had been breastfed until twelve months or younger. In addition, they observed that high-frequency breastfeeding increased the association between long-duration breastfeeding and caries.

Exclusive breastfeeding up to six months of age is recommended by the World Health Organization. However, the organization also recommends continuing breastfeeding along with appropriate complementary foods up to two years of age, even though several case studies have linked prolonged on-demand and nocturnal breastfeeding to early childhood caries, primarily because breast milk is considered a critical source of energy and nutrients.

The study, titled "Association of Long-Duration Breastfeeding and Dental Caries Estimated With Marginal Structural Models", was published online on Feb. 19 in the *Annals of Epidemiology*. It was conducted by scientists at the University of California, San Francisco, in collaboration with the Universidade Luterana do Brasil and Universidade Federal de Ciências da Saúde de Porto Alegre.

New studies link BPA to

Breast and prostate cancer

Bisphenol A (BPA) is a widely used chemical in plastics, such as food containers, and is also found in dental composites and sealants. Now, two recently published studies have suggested that BPA may play a crucial role in cellular transformation and disease progression in prostate cancer patients, and may promote breast cancer growth.

The first study, titled "Exposure to Bisphenol A Correlates with Early-Onset Prostate Cancer and Promotes Centrosome Amplification and Anchorage-Independent Growth In Vitro," was conducted at the Cincinnati Cancer Center and included 60 urology patients. Overall, they found higher levels of BPA in prostate cancer patients compared with study participants without the disease. The difference was even more significant in patients under the age of 65, the researchers reported. In addition, they observed that exposure to low doses of BPA increased the percentage of cells with centrosome amplification two- to eightfold, said Dr. Shuk-mei Ho, principle investigator and director of the cancer center. The study was published online on March 3 in the *PLOS ONE journal*.



In the second study, researchers at the University of Texas at Arlington found abnormal amounts of HOTAIR expression in breast cancer cells and mammary gland cells exposed to BPA. HOTAIR is a molecule that can suppress genes that would normally slow tumor growth or cause cancer-cell death. The findings suggest that BPA disrupts the normal function in such molecules and is linked to tumor growth in breast cancer patients. The study, titled "Bisphenol-A and Diethylstilbestrol Exposure Induces the Expression of Breast Cancer Associated Long Noncoding RNA HOTAIR In Vitro and In Vivo," will be published in the May issue of the *Journal of Steroid Biochemistry and Molecular Biology*.

Could chewing gum prevent

Implant failure in the future?


[PICTURE: ©OLLYY]

About 6 to 15 per cent of patients suffer from peri-implantitis, inflammation that destroys soft and hard tissue surrounding the implant after placement. It is known that the concentration of matrix metalloproteinase-8, an enzyme that is also responsible for periodontitis, increases significantly when inflammation around the dental implant arises. Prof. Lorenz Meinel from the Institute of Pharmacy and Food Chemistry at the University of Würzburg explained that this increase could be identified through a special chewing gum using a small peptide chain that is bound to a bitter-tasting compound. Once enzyme concentrations in a patient's saliva exceed a certain level owing to complications with the implant, the peptide chain will snap, releasing the bitter compound. In the future, special chewing gum could be part of post-operative care in addition to routine check-ups. Patients would have to contact their dentist upon recognising the bitter taste.

In addition to the development of the chewing gum, the researchers are considering developing a coating that uses the peptide chain system and can be applied to the implant directly.

The project will be carried out in collaboration with Swiss dental implant manufacturer Thommen Medical and various other European companies and scientific institutions. The research has received funding of € 1 million for two years from the European Union.

Mothers' oral bacteria may predict

Likelihood of early childhood caries

In their study, researchers at the University of California collected dental and salivary bacterial samples at three- to six-month intervals from low-income Hispanic mothers and their children from pregnancy through 36 months postpartum to calculate the child caries incidence. In total, the study included 243 mother–child dyads.

Over the course of the study, the researchers found that salivary levels of mutans streptococci and lactobacilli were greater among mothers of caries-affected children compared with caries-free children. Overall, they observed that the incidence of caries was twice as high in children with mothers who had higher levels of bacteria.

According to the American Dental Association, cariogenic bacteria, and mutans streptococci in particular, are transmitted soon after the first teeth erupt. The association thus recommends that parents, including expectant parents, visit a dentist to decrease the mother's mutans levels to decrease the child's risk of developing early childhood caries.


[PICTURE: ©BOTAZSOLTI]

The study, titled "Maternal Oral Bacterial Levels Predict Early Childhood Caries Development", was published online in Dec. 19, 2013, in the *Journal of Dental Research* ahead of print.

Crucial role of schools in

Promoting oral health

Although dental caries rates among children have declined in several high-income countries over the last decades, the opposite trend has been noted for low-income countries. A survey conducted at the University of Copenhagen has shown, however, that school programmes can contribute significantly to a gradual reduction of inequalities in dental health.

Through analysis of data from the World Health Organization's Global School Health Initiative, a programme that was launched in 1995 in 61 countries to improve the health of students and other members of the community through schools, the researchers observed that about 60 per cent of the countries give formalised instruction on how to bush teeth. However, not all countries have access to clean water and the necessary sanitary conditions, which constitutes a major challenge for the health and school authorities in Asia, Latin America and Africa in particular. Dental health inequalities may also arise in high-income countries.


[PICTURE: ©AN NGUYEN]

Overall, the survey showed that schools have a central role in promoting health and preventing diseases because healthy school environments that offer children education on dental health are generally well placed to set children on a path to a healthy lifestyle throughout their lives, Petersen explained. The study, titled "Promoting oral health of children through schools—Results from a WHO global survey 2012", was published in the December issue of the *Community Dental Health* journal.

Saliva may indicate

Susceptibility to depression in boys


[PICTURE: ©SUZANNE TUCKER]

For the first time, researchers at the University of Cambridge have identified a biomarker for major or clinical depression in human saliva. An examination of saliva samples of hundreds of teenagers revealed that boys especially may be at the greatest risk of depression.

Following a group of boys and girls over 12 to 36 months by measuring levels of cortisol in their saliva, as well as collecting self-reported information on symptoms of depression, the researchers found that boys with depressive symptoms and elevated morning cortisol were 14 times more likely to develop clinical depression compared to boys with neither.

However, the connection was not as distinctive in female participants. Girls with high cortisol and depressive symptoms were four times more likely to develop depression, suggesting differences between the sexes in how depression develops.

The study, titled "Elevated morning cortisol is a stratified population-level biomarker for major depression in boys only with high depressive symptoms", was published on 18 February in the Proceedings of the National Academy of *Sciences of the United States of America* journal.

Calculating risk of infection

In mere minutes from a droplet of blood

Neutrophils are a vital part of the body's immune system. Recognized as the most abundant type of white blood cell present in human blood, neutrophils function primarily as the body's first line of defence against infection and inflammation. Within minutes of stimulation, neutrophils migrate from the blood to tissue where they accumulate at sites of infection. One of the most common lab tests ordered on a regular basis is the counting of neutrophils in the blood (absolute neutrophil count).


[PICTURE: ©DMITRY LOBANOV]

"However, simply counting the neutrophils may not be enough in many cases. If neutrophils do not migrate well and cannot reach inside the tissues, this situation could have the same consequences as a low neutrophil count," says Dr Daniel Irimia, Assistant Professor at the BioMEMS Resource Center at Massachusetts General Hospital. The team recently designed miniaturized silicon-based devices that can be used to measure neutrophils' migration patterns from just a finger prick of blood in a few minutes. He also says, "The device was designed such that probing neutrophil mobility becomes extremely easy to perform."

By being able to measure the risk for infections that a particular patient has at a particular time from just a droplet of blood in a matter of minutes is a significant improvement and one that will improve current treatment. For more information on this research, refer to: www.worldscientific.com/doi/pdf/10.1142/S2339547813500040.

Gingival implant supports

Reduction of cluster headache

Cluster headache is one of the most severe forms of headache. It is usually unilateral and occurs mostly around the eye or in the temple. Attacks last up to several hours. In many people, cluster headache leads to a significant loss of quality of life. A new type of cluster headache treatment is the stimulation of the sphenopalatine ganglion (SPG). The ATI Neurostimulation System stimulates the SPG in order to break the pain cycle. The neurostimulator, which is the size of an almond, is inserted through a small incision in the gingiva and programmed by the physician. As cluster headache occurs unilaterally, the implant is inserted on the relevant side. The surgery is performed under general anaesthetic and takes about an hour.


[PICTURE: ©OLLYY]

The patient can control his or her therapy independently via a remote control. When a cluster attack occurs, he or she holds the device against the cheek to activate the implant. This stimulates the SPG and abates the attack. In many patients, the frequency of attacks decreases permanently.

The effectiveness of the ATI Neurostimulation System has been clinically proven in the most comprehensive medical study on cluster headache. With the ATI neurostimulator, 82 per cent of all attacks—even medium to severe—can be treated effectively, the manufacturer, Autonomic Technologies, stated. In 46 per cent of patients, the attack frequency was reduced significantly—from an average of 14 down to two attacks per week. The ATI Neurostimulation System has been introduced at nine clinics in Germany and is in use in Belgium.