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DENTAL TRIBUNE

The World's Dental Newspaper · Asia Pacific Edition

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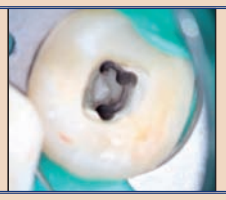

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India targets fluorosis problem with new identification system

DT Asia Pacific

NEW DELHI, India: The Indian Council of Medical Research (ICMR) in New Delhi has said that it has tested a new and simpler system that could help to identify dental fluorosis in the population. The tool is based on photographic information from patients with the conditions gathered from several districts in India, and can be used by health workers without prior knowledge in dentistry.

First tests conducted with the new system by an ICMR Task Force among schoolchildren in the South Delhi and Hisar districts turned out successful, with little difference found in regard to detection rates of dental specialists and field workers unfamiliar with fluorosis, the Council said. With this tool, the organisation hopes not only to help health workers nationwide to detect the condition its early stages but also to gather reliable national data on the prevalence of flourosis, which is considered to be a major public health problem owing to the excessive intake of fluoride through drinking water in most parts of India.

(DTI/Photo Gary Yim, Hong Kong)

Girl in Mumbai getting water from a well. Children in particular are suffering from the negative effects of water fluoridation.

Although representative data in the country is lacking, results from different studies suggest a high prevalence in areas with high water flouridation. If the condition is not detected, it can lead to skeletal fluorosis, a condition that causes bone to lose its flexibility through the accumulation of osseous tissue. It has also been associated with renal failure, atherosclerosis and other diseases.

Fluorosis is commonly identified through Dean's Index, a five-stage classification system developed in the late 1930s by H. Trendley Dean, one of the most prominent advocates for water fluoridation in the United States. Alternatives include the Thylstrup-Fejerskov Index, developed in Denmark in the 1970s, and the US National Institutes for Dental Research's Total Surface Index of Fluorosis. DT

Anniversary newspaper published

Worldental Daily, the daily newspaper of the Annual World Dental Congress (AWDC) of the FDI World Dental Federation which will be published by the organisation in partnership with the Dental Tribune International Publishing Group (DTI) for the tenth time in 2014. The anniversary edition will be available at the FDI's 102nd AWDC in Greater Noida near New Delhi, India, in September.

DTI produced the first edition of *Worldental Daily* for the AWDC in Montréal, Canada, in 2005. Since then, the newspaper has been available to congress attendees at every AWDC including those in Dubai, Hong Kong and Istanbul. Every edition of the newspaper is made with support of local partners and printed overnight, so that visitors can keep constantly up-to-date with what is happening during the event.

In addition to *Worldental Daily*, DTI publishes daily newspapers under its *today international* brand at almost every major dental event around the globe, including the IDS in Cologne or the IDEM in Singapore. DT

(DTI/Photo Gerhò, Italy)

Picture shows a new dental application for Google Glasses introduced by the Italian company Gerhò at Amici di Brugg in Rimini in Italy. The tool allows dentists to manage their practice via the novel head-mounted internet device. BUSINESS, page 6

Pioneers receive benefits

The government in Singapore has introduced new health care benefits under the Community Health Assist Scheme for the country's pioneer generation that include subsidies for selected dental services like crowns or root canal treatment. The package will apply to almost half a million elderly people. DT

Bond teeth creator prosecuted

The General Dental Council in the UK has fined Luis Fairman for unlawfully using the title of dental technician. Fairman created the iconic metal teeth of infamous James Bond villain jaws, which were worn by actor Richard Kiel in the films "The Spy Who Loved Me" and "Moonraker". DT

Dental sector opened

The Philippines has announced modifications to its Negative Investment List that, among other things, will remove barriers for businesses from the ASEAN region to invest in specialised dental clinics and other health care related businesses.

According to the new regulations, which took effect in April, foreigners are now allowed to own between 67 and 70 per cent of a health care related business that is based in the South East Asian country.

Foreign direct investments to Indonesia currently exceed domestic direct investments by almost 100 per cent. In 2013, foreigners invested more than 270 trillion (US$22 million) in the Philippines economy. DT

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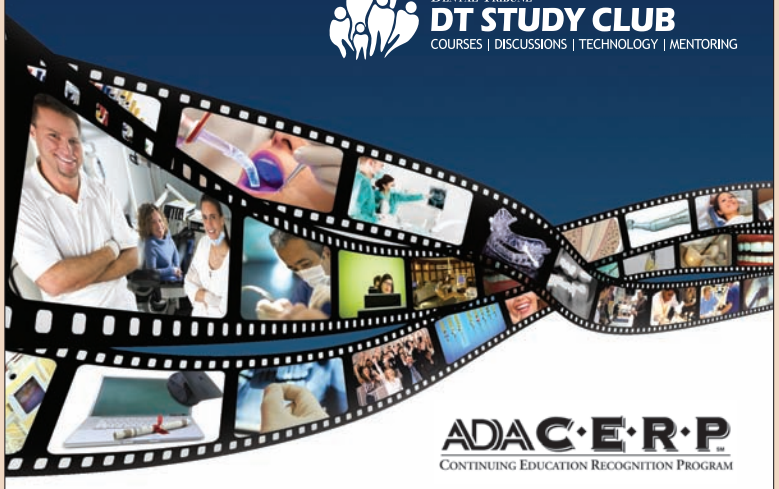

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28 APR
SINUS LIFT PROCEDURES IN THE DAILY PRACTICE
Daniel Rothamel
06:00 PM (CEST)

Sinus grafting procedures are an established therapy to gain bone height in the posterior maxilla. Depending on the remaining bone height, they can be performed with simultaneous or two-stage implant placement using osteotomes, a trans-alveolar or lateral-window approach.

Numerous studies have shown predictable results using autogenous bone but also bone substitute materials. However, within the last decade, the role of autogenous bone as the "golden standard" for sinus grafting procedures has been increasingly discussed, since same results can be obtained using bone substitute materials without additional donor-site morbidity and additional stress for the patient.

In the webinar, different approaches of sinus grafting procedures, the selection of different bone substitute materials, clinical and histological results and a sufficient complication management will be discussed.

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21 MAY
ORAL HEALTH CARE FOR HIV+ PATIENTS
David Reznik, DDS
08:00 PM (EST)

It has been 32 years since the first reports of Acquired Immunodeficiency Syndrome (AIDS) were reported to the United States Centers for Disease Control and Prevention. The dental team has been and continues to be an important part of HIV primary care since the early days of the epidemic when up to 80% of all HIV+ patients would present with an oral manifestation related to disease progression. Recognition of the oral manifestations of HIV infection are important tools in accessing a patient's overall well-being as they are important indicators of disease progression for those known to be HIV positive. For those with unknown HIV status, the presence of these lesions may signify HIV infection or other systemic conditions.

This presentation will enable the participants to accurately diagnose and manage the most common oral opportunistic infections seen in association with HIV disease. Topics to be covered will also include proper dental management for people living with HIV disease including a discussion of important lab values and when, if ever, premedication prior to invasive dental procedures is required.

1h CE FREE COURSE

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Dental routine practised among early inhabitants of China

DT Asia Pacific

JINAN, China/OXFORD, UK: Early ancestors of humans who lived in Eastern China almost half a million years ago might have regularly used toothpicks, anthropologists have recently suggested in the specialist journal *Quaternary International*. In several fossil teeth recovered from a Middle Pleistocene site in Yiyuan near the capital Beijing, they found interproximal grooves, which they believe signifies the habitual use of sticks made from hard material to remove residual food particles from teeth.

According to the scientists, the findings are the first evidence of the habit ever recorded in Eastern China. Along with other Pleistocene fossils from the country, it also confirms the hypothesis that the earliest use of tools was by the *Homo* genus, they said. To date, it remains unclear, however, whether the grooves found in the enamel and root surfaces of the teeth indicate a therapeutic purpose.

"It has been suggested that the use of toothpicks is unique to the genus *Homo*, and tooth-picking could have accompanied the dietary shift to heavier reliance on animal protein. Thus, in Yiyuan teeth, the proposal that tooth-picking with a hard needle-like stick was used to remove food particles caught between teeth to relieve gum pressure is likely to be very plausible," the authors commented in the article.

(DTI/Photo E.G.Pott)

Photo shows an artistic depiction of an early homonin *eating plants.*

In total, the researchers examined seven teeth from three individuals under a binocular microscope and scanning electron microscope. Two of the teeth exhibited interproximal grooves of different depths, which are characteristic signs of tooth-picking. Similar markings on the teeth of other *Homo* species found in different sites around the world have previously been reported.

The remains from the Yiyuan site, which included cranial fragments and was excavated by archaeologists in 1981, have been assigned to the *Homo erectus* species, which is widely considered to be a direct ancestor of modern humans and other human species, such as Neanderthals. Archaeological findings indicate that the species inhabited large parts of Asia, Africa and Europe between 1.8 million and 40,000 years ago. DT

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Probiotic bacteria found helpful in orthodontic patients

DTI

SONGKHLA, Thailand: A new study has provided additional evidence that probiotics are beneficial against a number of oral conditions. Researchers in Thailand recently found that *lactobacilli* in particular could help reduce levels of *mutans streptococci*, which can cause dental caries, especially in cleft lip and palate patients with fixed orthodontic appliances.

The study included 30 cleft lip and palate patients who had been undergoing treatment between June and August 2011 with fixed orthodontic appliances for at least three months with attachments on at least 20 permanent teeth. For a period of four consecutive weeks, half of the patients consumed milk powder with probiotic *Lactobacillus paracasei* SD1 in 50 ml of water once a day, while the remainder received the same amount of milk powder in water but without probiotic bacteria.

From an analysis of participants' saliva samples, the researchers observed a significant reduction in salivary *mutans streptococci* after the four-week period in the first group. In addition, a significant increase in salivary *lactobacilli* was noted in this group.

The results suggest that especially orthodontic patients, who usually need treatment owing to irregularities in tooth size and misalignment of teeth, could benefit significantly from probiotic intervention because fixed appliances facilitate the colonisation of bacteria such as *mutans streptococci* and render this group more susceptible to dental diseases. However, further long-term studies with a larger sample size are needed to clarify the mechanisms of probiotic bacteria in reducing oral microbial counts, the researchers concluded. DT

Australia to cut dental spending

DT Asia Pacific

CANBERRA, Australia: The Australian government intends to scrap over half a billion Australian dollars worth of subsidies for dental health care from its next federal budget. Among other cut-backs, the proposed plans will see the end of the Dental Flexible Grants Programme, which was originally introduced to help dentists set up in outer metropolitan areas. This way, the government aims to save almost A$229 million (US$211.5 million) over the next four years.

Another A$390 million (US$360 million) is to be put aside by delaying a federal–state partnership programme that was intended to support local governments in providing public dental health care services. Dental and oral health clinic developments at Charles Sturt University in Sydney will also be halted.

In return, the government said it will put A$2.7 billion (US$2.49 billion) into new programmes, such as the Child Dental Benefits Schedule.

The measures are part of a larger cut-back of federal medical subsidies that will require patients to pay more out of pocket for visiting a doctor or basic medical services, such as having an X-ray taken. According to the government, the savings from these measures will go into a A$2 billion (US$1.85 billion) medical research fund to advance therapies for systemic conditions, such as cancer.

Overall, the government expects to accumulate A$80 billion (US$73.9 billion) in combined savings from the health and education sectors over the next ten years.

Representatives from dentist and patient organisations have already criticised the plans, which they think will further burden the already extensive waiting list for public dental treatment. President of the Australian Dental Association Dr Karin Alexander told ABC News that she expects that the waiting list could double or treble owing to the cut-backs.

It is estimated that up to half a million people are currently on a public waiting list for dental treatment. DT

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Dear reader,

Daniel Zimmermann
DTI

As you might already have noticed, this issue of *Dental Tribune Asia Pacific* is dedicated to the topics of practice hygiene and infection control. In compiling the material, we have aimed to provide not only an overview of all the current issues in this field but also recommendations on updating your hygiene routine to prevent cross-infections in your own practice.

With more patients seeing their dentist than their regular GP, the dental profession is and will remain at the forefront of every new major outbreak. Although a cliché, it is the little things that really make a difference. Most preventative measures do not require the investment of much extra effort or money if they are practised on a daily basis.

I wish you an enjoyable and insightful read. DT

Yours sincerely,

Daniel Zimmermann
Group Editor
Dental Tribune International

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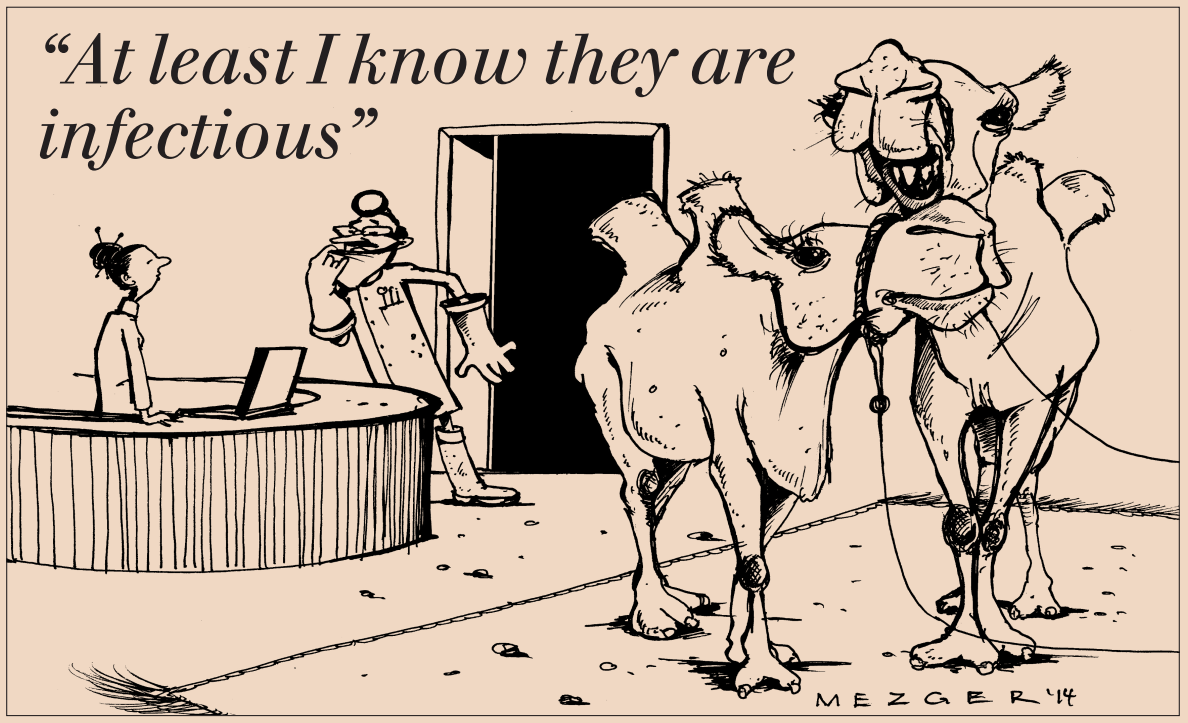
For quick access to our contact form, you may also scan the following QR code.



The world is very small

Dr Raghu Puttaiah
USA

The Middle East Respiratory Syndrome (MERS) is a respiratory condition associated with a specific strain of coronavirus called MERS-CoV. The clinical scenario includes severe respiratory illness, fever, cough and shortness of breath, leading to death in about a third of those infected. While MERS was first reported in 2012 on the Arabian Peninsula, cases have now been reported in over three dozen countries, spanning Asia, Europe and North America. While this disease has been noted to spread from those infected to their caregivers or those living in close contact, it has not yet been found to spread in community settings as seen during the severe acute respiratory syndrome (SARS) outbreak in Asia that saw over 8,000 people infected, resulting in about 9 per cent mortality. Only two cases have been detected in the US, both of whom had a recent history of travel to Saudi Arabia.

The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) are concerned about the potential of MERS to spread globally and therefore are providing information and control measures similar to those provided during the SARS and influenza A (H1N1) outbreaks. With respect to dentistry, if there is a vaccine available for any infectious disease of public health concern, we must take it before it affects us. With regard to infection control, if we as dental care providers feel ill or feel that we are about to fall ill, we must not go to work but stay away from people, including co-workers and patients, until the symptoms resolve. We should also inform patients prior to their appointment that, if they are not feeling well, they should reschedule the appointment.

Basic infection control measures, such as frequent handwashing, wearing a mask, and following standard and additional precautions, the last being specific to MERS, must be adhered to strictly. The world is very small with respect to travel and the spread of disease from one continent to another can happen within a day. Keeping abreast with rapidly changing information on diseases such as MERS from reliable sources, such as the CDC, WHO, Association for Professionals in Infection Control and Epidemiology, and Organization for Safety, Asepsis and Prevention, is necessary for the dental team. DT

Contact Info

Dr Raghu Puttaiah is the owner of OSHA4Dental, a dental safety and education company based in Plano in the US. He can be contacted at rputtaiah@bcd.tamhsc.edu.

It is not dirty teeth

Prof. A.K. Susheela
India

India is currently facing a serious health crisis due to fluoride toxicity, particularly in children. Besides the major forms of fluorosis that affect teeth, bones and soft tissue, the disease has several other ramifications, such as interfering with thyroid hormone production. It has also been found to contribute extensively to mental retardation and bone deformities. Moreover, it can hamper oral iron absorption and haemoglobin production in pregnant women, resulting in low birth weight in babies.

Overtly visible dental fluorosis is the easiest way to identify excess fluoride ingestion. In the mild, moderate and severe forms, the accompanying discolouration extends away from the gingivae, is bilaterally symmetrical and horizontally aligned. Often, however, discolouration on the enamel surface is still misdiagnosed as dirty teeth. While the Dean and Thylstrup–Fejerskov indices are available for fluorosis classification, simpler criteria that are easy to understand could help to address misdiagnosis.

Determining such criteria could also form a good academic exercise for students of dentistry and medicine. DT

Contact Info

Prof. A.K. Susheela is Executive Director of the Fluorosis Research and Rural Development Foundation in New Delhi in India. She can be contacted at frnrdf@gmail.com.

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VISIT US AT China Dental Show 25.–28.09. 2014 SHANGHAI

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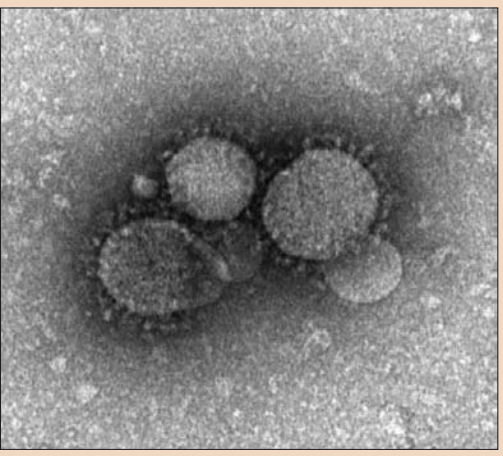
Association for infection control updates dentists on new infectious disease

Digital toolkit on MERS Coronavirus available from OSAP



Negatively-stained transmission electron micrograph of a MERS Coronavirus. (Photo courtesy of Center for Disease Control/Maureen Metcalfe & Azaibi Tamin, USA)

DTI

ANNAPOLIS, Md., USA/GENEVA, Switzerland: The Middle East Respiratory Syndrome (MERS), a recently discovered highly transmissible disease, has caused uncertainty among health care professionals worldwide. Despite the World Health Organization rating the situation as non-epidemic, the Organization for Safety, Asepsis and Prevention (OSAP) in the US has launched a toolkit intended to bring oral health professionals up to date with the new threat.

The material, which is available for download on the organisation's website, is meant to be a quick reference for information on the disease. It also gives recommendations on how to identify early symptoms, which are similar to those of the common flu, and how prevent it from spreading to other patients or health care personnel.

"The MERS situation in the US represents a very low risk to the general public at this time. However, dental clinicians are an important part of the health care system and should be knowledgeable of MERS and other transmissible disease," Executive Director Therese Long commented. "OSAP will keep its online MERS toolkit updated and continue to offer it as a free downloadable tool for dental health care workers."

She added that the disease and its impact on dentistry will be the focus of the organization's upcoming annual symposium, which will be held next week in Minneapolis in the US.

To date, more than 600 cases of infection with the MERS coronavirus have been confirmed by the WHO, of which the overall majority was reported to have occurred in the Middle East, particularly in Saudi Arabia. It also announced that it has tested an individual from the US as positive, which still needs to be confirmed by laboratory tests.

Owing to the sharp increase in infections during the last two months, the organisation has advised health care professionals worldwide to heighten infection control measures. A strain of the coronavirus related to the bird flu bug that wreaked havoc in Asia a couple of years ago, the new disease was first identified in 2012. Similar to severe acute respiratory syndrome, it is thought to have been transmitted from animals to humans, with the main source of infection suspected to be camels. DT

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Rimini show confirms that the future of dentistry is digital

DTI

RIMINI, Italy: The use of digital technology seems to be changing dentistry forever and nowhere has this been more obvious than in Italy last month, where numerous manufacturers from Italy and abroad showcased their latest devices and materials to thousands of dental professionals at this year's Amici di Brugg dental show.

Besides Henry Schein's ConnectDental pavilion, a booth dedicated entirely to the company's combined portfolio for an all-out digital workflow and other services such as Sirona's Digital Dental Academy, a new application designed for Google Glass draw special attention from visitors. Specifically designed to work on the head-mounted device, Dental Glass is intended to improve workflow in dental practices by projecting information directly in the clinician's field of view, similar to a pilot's head-up display. This way, clinicians can remotely access patient records, among other data, display radiographic images, or manage appointments through voice recognition software or a touchpad located at the earpiece, according to the Italian developer Gerhò, a subsidiary of the Breitschmid group. The manufacturer said that the app will also allow the capture of photos and video in high-definition format through its built-in camera.

Google Glass is currently only available in the US. When the device will be released to European markets is still unclear owing to some technical limitations and the lack of distributors, according to reports. The technology, however, is currently being experimented on for its future use in general and dental medicine. Last year, for example, *Dental Tribune* reported on the first maxillofacial surgery broadcast with the device, which took place at Hospital de Molina in Murcia in Spain.

Completely digital solutions however are already available in dental offices. BIOLASE, for example, offers such solutions and has expended great effort on its Total Technology Solution in recent years. In addition to its complete range of dental lasers, the US dental technology company now offers sophisticated imaging equipment and CAD/CAM solutions, such as the GALAXY BioMill System, which allows digital fabrication of restorations chairside.

"The adoption cycle of new technologies is growing increasingly shorter and more advanced technologies like the Waterlase will rapidly find their way into dental practices. Dentists that do not upgrade their equipment will likely begin to lose patients, become uncompetitive and lag behind," CEO Federico Pignatelli explained to Dental Tribune International (DTI) at the show.

DTI CEO and publisher Torsten R. Oemus confirmed this forward-looking corporate strategy by emphasising the strong points of the digital revolution: "Turning dental offices into high-tech playgrounds is indeed becoming a global trend, which reaps rewards for patients and dentists alike. Technology is what differentiates a modern dental office from a conventional one, increases patient flow, and advances diagnostic and treatment outcomes, which ultimately leads to increased revenues."

He invited dentists who are unsure about how digital technologies could benefit their practice to attend the Digital Dentistry Show, the first edition of which will be held in autumn 2014 at the International Expodental show in Milan in Italy. Focusing entirely on digital products and applications for dentistry, the unique expo format will not only showcase the latest products and solutions by leading providers in the field, but also offer education in the form of lectures and webinars from 16 to 18 October. Information about what to expect from the event and how to register is available on the events website. DT

AD

Infection control has never been more essential

An update on practice hygiene measures and protocols

Dr Safura Baharin
Malaysia

Demand for dental treatment has been increasing in recent years as people have become more aware of their oral health and the benefits of good dental aesthetics. Maintaining and practising stringent cross-infection control procedures therefore have never been more essential to ensure the health and safety of dentists, dental hygienists and assistants, as well as other supporting staff who may be indirectly involved in the treatment process.

Dental professionals are at high risk of cross-infection. A report published in 1999 has shown that in developing countries, for example, the number of dental staff contaminated during treatment is increasing by almost 6 per cent each year.[1] Research has shown that infectious micro-organisms can be transmitted by blood or saliva via direct or indirect contact, aerosols, or contaminated instruments and equipment.[2] As stated by the US Centers for Disease Control and Prevention (CDC) in their 2003 guidelines, the transmission of infectious disease can occur in four ways: direct contact with blood or body fluids, indirect contact with contaminated objects or surfaces, contact with bacterial droplets or aerosols, and inhalation of airborne micro-organisms.[3]

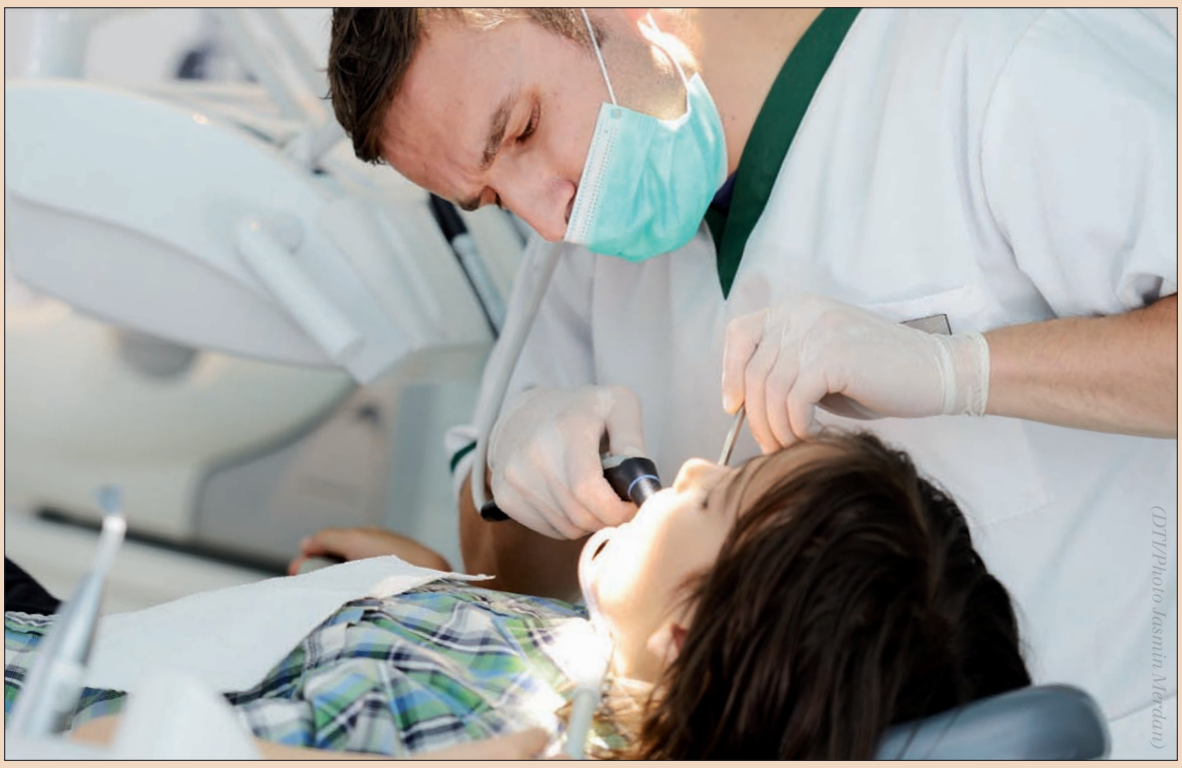
The most likely mode of transmission in dentistry is through inhalation of bacterial aerosols or splatters. Their potential health hazards are well documented and acknowledged.[4–9] Both can be host to a large variety of micro-organisms and viruses, which can be infectious to susceptible individuals. During treatment, the dentist's face and patient's chest are most affected by splatter, as the majority of the splatters are radiated towards them.[10, 11] According to studies, the most contaminated area on the dentist's face during treatment is around the nose and inner corner of the eyes.[11]

Splatter consists of large particles of greater than 100 µm generated during the use of dental equipment, such as turbines, ultrasonic scalers, or water and air syringes. Owing to this, splatter tends to travel in a trajectory, thereby contacting objects in its path. Aerosol consists of smaller particles that can remain in the air for a long time and travel with air currents. Most dental aerosols are less than 5 µm in diameter; therefore, they are able to penetrate and stay within the lung, causing respiratory or other health problems. Among dental procedures that produce high aerosol concentration are ultrasonic scaling, tooth preparation using high-speed handpieces, and dental extraction involving bone removal via a dental handpiece.[8]

The World Health Organization (WHO) has reported a rise in airborne infections worldwide. Tuberculosis in particular has increased in the developing world ***(Tab. 1)***.[12] It has been stipulated that the risk of exposure to tuberculosis in susceptible DHCP is greater than in healthy individuals. Bennett et al. concluded that dentists and their assistants, who are exposed for approximately 15 minutes during peak aerosol concentration, have a slightly higher risk of exposure to Myco - bacterium tuberculosis than the general public does.[9] During this period, the DHCP inhales about 0.014 to 0.12 µl of aerosolised saliva, which may contain viable pathogens that can have a detrimental effect on the health of susceptible DHCP.

With all of this in mind, it is the responsibility of DHCP to adhere strictly to recommended infection control guidelines and policies. Several measures should be taken to reduce and control airborne contamination in the dental clinic. For example, it has been demonstrated that the use of a mouthrinse, high-volume evacuation or a combination of both methods significantly reduces the number of colony-forming units in aerosols emitted during ultrasonic scaling.[13] Routine use of rubber dam isolation provides a clean and dry area for placement of dental restorations,

→ DT page 8



During treatment the most contaminated areas are around the dentist's nose and his or her inner corner of the eye.

Country	Estimated # of cases	Estimated rate (per 100,000 population)
Pakistan	410,000	231
Bangladesh	350,000	225
Indonesia	450,000	185
India	2,200,000	176
Myanmar	200,000	377
Malaysia	24,000	80
Thailand	80,000	119

Table 1: *Tuberculosis in Asia.*[12]

PPE	Recommendations	Rationale
Surgical mask	• Should cover both nose and mouth • Change when wet (from sweating, sneezing, breathing or other contamination) • Use particulate filter respirators (N95) when airborne isolation precautions are necessary (transmission-based precautions for patients with tuberculosis)	• Splatters and aerosols may contain bacteria and viruses that can infect a susceptible person in the dental clinic. • To protect dentists' and assistants' oral and nasal mucosa from blood and saliva splatter • Some of these micro-organisms are small enough to penetrate the mask and are then then inhaled by the DHCP and infect the lungs. A special mask may therefore be needed (N95 and FFP3 respirators).
Protective eyewear	• Should be worn all the time • Preferably with lateral protection that is wide enough to cover the eye • Must be rinsed and disinfected when contaminated between patients	• Splatters from dental procedures may come into contact with the conjunctiva and cause irritation or infection. • Some materials used during dental treatment, such as sodium hypochlorite, may cause severe irritation and damage if accidentally splashed into the DHCP's eyes or face. • To protect the mucosa of the eyes from splatters
Face shield/visor	• Select a face visor with acceptable visual quality (clear, no reflection or refraction) and no fogging	• Splashes or splatters generated during dental treatment, especially when using an ultrasonic scaler or high-speed handpiece, are concentrated towards the dentist's face. • Wearing a face shield also reduces the amount of splatter contaminating the face area. • To protect the face from splatters and aerosols during dental procedures
Gloves	• Worn when in contact with blood or body fluids • Double gloving may reduce the risk of exposure in high-risk patients (HIV, hepatitis B or C virus) • Should be worn for the duration of the dental treatment and changed between patients • Hands must be washed before wearing gloves	• To prevent transmission of infection from the patient to the DHCP and vice versa • To prevent the contact of blood and saliva with the dentist's hands
Protective clothing, such as gowns or jackets	• Change daily or when visibly contaminated with blood or oral fluids • Wash separately from domestic and non-medical clothing • Preferably long sleeves with a tight cuff	• To protect daily clothing from contamination from splatter or aerosols • High occurrence of blood-contaminated splashing in the direction of the dentist during surgical procedures • Areas commonly contaminated are the right forearm, abdomen and thorax[8]

Table 2: *Recommendations and rationale concerning personal protective equipment.*

← DT page 7

prevents salivary and blood splatter, and protects the patient's mouth and airway.

Using personal protective equipment (PPE), such as surgical masks (with at least 95 per cent efficiency against particles 3 to 5 µm in diameter; changed for every patient or every 20 minutes in an aerosol environment or 60 minutes in a non-aerosol environment), safety glasses with lateral protection to prevent contact with eyes, as well as disposable gowns and gloves to reduce the penetration of or contact with bacterial aerosols and splatters, is vital ***(Tab. 2)***.

Regular maintenance of the air-conditioning system is recommended too, as good ventilation has a diluting effect on the airborne microbial load, especially at night when the clinic is closed.[14] Air samples taken at different times at a multi-chair dental clinic showed that bacterial aerosols are more concentrated during treatment and that there is higher concentration of circulating bacterial aerosols at the beginning of the day, which may be related to reduced ventilation.[14] Residual bacterial aerosols can be removed through air filters or ultraviolet light.

Using personal protective equipment such as surgical masks, safety glasses as well as disposable gowns and gloves is vital.

As splatters can travel as far as the door or supply counter in the middle of a multi-chair dental clinic,[14] all clean, unused instruments and equipment should be kept in closed cabinets or drawers to prevent contamination.

Other important measures that must be taken to prevent cross-infection include adequate sterilisation of dental instruments, disinfection of work surfaces before and after each dental procedure, disinfection of all dental materials and work sent out to the laboratory, and regular maintenance of the dental water lines and equipment, which has the potential to harbour bacteria. All dental water lines should be purged at the beginning of each day for between 5 and 10 minutes and flushed thoroughly with water, as residual water may become contaminated overnight and biofilm may develop along the inner side of the tube. Purging will result in a significant decrease in bacterial counts.[15, 16]

The Canadian Dental Association recommends running high-speed handpieces for 20–30 seconds after each treatment to purge all potentially contaminated air and water. This procedure has been proven to reduce the bacterial load in the water line significantly.[17] Blood cells, as well as bacterial and viral particles, can survive inside handpieces even after disinfection. They must therefore be sterilised between patients.[18, 17]

The clinic floor should be disinfected and cleaned with an antimicrobial disinfectant solution at least twice per day to eradicate any bacterial residue from splatter or aerosols.

It is a well-known fact that private dental clinics sometimes employ dental assistants who have not received certified training. Improperly trained personnel, however, may lead to poor infection control practices. It is the responsibility of every dentist to educate and train his or her assistants in the standard procedures. Furthermore, DHCP immunisation status should be up to date.

It remains a difficult task to eliminate the risk of exposure to dental aerosols. The best way to reduce the risks, however, is to employ routine cross-infection protocols recommended by the health authorities, such as the CDC, WHO and ministries of health. To date, various infection control reports and procedures have been published to inform and educate dental health care personnel (DHCP) about the importance of practising adequate infection control. DT

Editorial note: A complete list of references is available from the publisher.

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Dentistry is not immune to threats posed by antibiotic resistance

Dr Sharon Liberali
Australia

The administrative aspects of dentistry continue to become more demanding with increasing amounts of time spent in fulfilling mandatory accreditation requirements. It can often feel overwhelming, taking us away from the clinical practice of dentistry, and there is a risk that, owing to high clinical demand, short-cuts may be taken.

However, infection control must be considered to be a central part of quality dental care. A purported commitment to high standards and the pursuit of clinical excellence is meaningless when low priority is given to quality issues in the field. Failure to address all infection control requirements increases the risk of disease transmission, ultimately compromising patient safety.

The importance of infection control in clinical dental practice simply cannot be understated. While the tasks associated with the decontamination and sterilisation processes of reusable instruments are now routine, consideration must be given to the less obvious components of the infection control process that can unwittingly compromise the health of our patients. Identifying when patients may potentially be infected with bacteria or viruses, how these bacteria or viruses may be transmitted in the health care setting, and when we need to apply transmission-based precautions are increasingly gaining significance.

Three-dimensional illustration of an MRSA bacterium. (DTI/Photo courtesy of Michael Taylor)

The microbial threats facing us today pose significant health risks, and the situation is not likely to improve. The WHO's first global report on antibiotic resistance[1] was released on 30 April 2014. It has identified that highly resistant organisms are now commonplace and that antibiotic resistance is a serious worldwide threat to public health. Dentistry is not immune to this.

Multi-resistant bacteria are primarily transmitted either by direct contact or indirectly via contaminated surfaces. Currently, the most problematic health care-associated multi-resistant organisms include those highlighted in the WHO report: methicillin-resistant *Staphylococcus aureus* (MRSA), *Escherichia coli* and carbapenemase-producing Gram-negative bacteria (e.g. *Klebsiella pneumoniae*).

Almost everything in a dental clinical setting can serve as a reservoir and/or a vector for opportunistic pathogenic organisms.

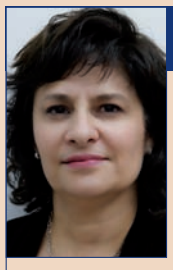
This includes, but is not limited to, work surfaces, computer keyboards, the hands of health care workers, and dental equipment and/or devices. Surfaces in particular play a significant role in the acquisition, persistence and spread of infections.

Clinically important micro-organisms that can cause health care-acquired infections have been shown to persist in every health care environment for considerable periods. This facilitates the spread of the organism throughout a health care facility, including the dental setting, especially when patients with multi-resistant organisms are not identified, and compliance with hand hygiene and surface cleaning or disinfection is poor.

Viruses from the respiratory tract (e.g. the influenza virus) can persist on surfaces for several days, while blood-borne viruses (e.g. hepatitis B virus and HIV) can persist for more than one week. Herpes viruses (e.g. herpes simplex virus Types I and II) commonly encountered in the dental office can persist on surfaces anywhere from a few hours to as long as seven days. Bacteria can persist for much longer. Most Gram-positive bacteria (e.g. MRSA) can survive for months on dry surfaces, and many Gram-negative species (e.g. *E. coli* and *K. pneumoniae*) can also survive anywhere from weeks to months and can thereby be a continuous source of transmission if no regular preventive surface disinfection is performed.[2]

The WHO's report highlighted that health care workers can help tackle antibiotic resistance by enhancing infection prevention and control. Every member of the dental team must follow the standard procedures required to prevent the transmission of micro-organisms, including hand hygiene, personal barrier protection, instrument disinfection and sterilisation protocols, as well as surface decontamination strategies. Work surfaces in the dental operatory that are in the contaminated zone must be cleaned after every patient by wiping the surface with a neutral detergent, while work surfaces outside the contaminated zone must be cleaned after each session or when they become visibly soiled. The dental team should be fully aware of the risk of dissemination of potentially hazardous micro-organisms and ensure that efficient cross-infection control procedures are properly maintained. DT

Editorial note: A complete list of references is available from the publisher.



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"Almost everything in a dental clinical setting can serve as a reservoir and/or a vector for opportunistic pathogenic organisms."

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