Following a sucrose rinse the plaque pH is reduced from approximately 6.7 to less than 5.0 within a few minutes. Demineralisation of the enamel takes place below the critical pH of about 5.5. Plaque pH stays below the critical pH for approximately 15-20 minutes and does not return to normal until about 40 minutes after the ingestion of the sucrose rinse. Once plaque pH recovers to a level above the critical pH, the enamel may be remineralised. Once plaque pH recovers to a level above the critical pH, the enamel may be remineralised.

Anatomy and histology

The type of salivary secretion varies according to gland. Secretions from the parotid gland are watery in consistency, those from the submandibular and sublingual glands, and particularly the minor mucous glands, are much more viscous, due to their glycoprotein content. The histology of the gland therefore varies according to gland type.

All of the salivary glands develop in a similar way. An ingrowth of epithelium from the stomatodaeum extends deeply into the ectomesenchyme and branches profusely to form all the working parts of the gland. The surrounding ectomesenchyme then differentiates to form the connective tissue component of the gland i.e. the capsule and fibrous septa that divide the major glands into lobes. These developments take place between 4 and 12 weeks of embryonic life, the parotids being the first and the sublingual and the minor salivary glands being the last to develop. The minor salivary glands are not surrounded by a capsule but are embedded within the connective tissue.

Formation of saliva

The fluid formation in salivary glands occurs in the end pieces (acini) where serous cells produce a watery seromucous secretion and mucous cells produce a viscous mucin-rich secretion. These secretions are formed by the formation of interstitial fluid blood in capillaries, which is then modified by the end piece cells. This modified interstitial fluid is secreted into the lumen. From the lumen it passes through the ductal system where it is further modified. Most of the modification occurs in the striated ducts where ion exchange takes place and the secretion is changed from an isotonic solution to a hypotonic one. The composition of saliva is further modified in the excretory ducts before it is finally secreted into the mouth.

Physiology of saliva formation

Composition and flow rate

The composition of saliva varies according to many factors including the gland type from which it is secreted. Salivary flow rate exhibits circadian variation and peaks in the late afternoon. Normal salivary flow rates are in the region of 0.5–0.6 ml/min when unstimulated and 1.5–2.0 ml/min when stimulated. Approximately 0.5–0.6 litres of saliva is secreted per day. Many drugs used for the treatment of common conditions such as hypertension, depression and allergies (to mention but a few), also influence salivary flow rate and composition.

Saliva as a diagnostic fluid

Caries risk assessment

A number of caries risk assessment tests based on measurements in saliva have been developed, for example tests which measure salivary mutants streptococci and lactobacilli and salivary buffering capacity.

High levels of mutants streptococci, i.e. >105 colony forming units (CFUs) per ml of saliva, are associated with an increased risk of developing caries. High levels of Lactobacilli (>105 CFUs per ml saliva) are found amongst individuals with frequent carbohydrate consumption and are also associated with an increased risk of caries.

Buffering capacity – Higher buffering capacity indicates better ability to neutralise acid and therefore more resistance to demineralisation.

In addition to showing promise for the prediction of periodontal disease progression and caries levels, analysis of saliva has been employed in pharmacogenomics, as well as the evaluation and assessment of endocrine studies. Saliva not only plays a pivotal role in the maintenance of a healthy homeostatic condition in the oral cavity, but contributes to one’s overall health and wellbeing. Components from saliva interact in different ways with the dentition to protect the teeth. Patients who lack sufficient saliva suffer from many oral diseases, of which caries is only one. To alleviate discomfort they are advised to use saliva stimulants and substitutes which have the function of lubricating the oral surfaces. Chewing gum is increasingly being viewed as a delivery system for active agents that could potentially provide direct oral care benefits, as it promotes a strong flow of stimulated saliva.


*Underwriting costs for this Saliva and Oral Health edition were provided by Dr. Michael Dodds and The Wrigley Company.

“Pediatric dental community has evolved”

By Dental Tribune Middle East

Dubai, UAE: Recently the Emirates Pediatric Dental Club was formed spearheaded by elected President (with the support of Crest & Oral-B) Dr. Dina Debaybo – Assistant Clinical Professor of
Pediatric Dentistry at the Faculty of European University College. We interview Dr. Dina Debaybo to find out the plans for the coming year for the newly found EPDC.

DTME: Dr. Dina, Congratulations on your president elect position and the great achievement of forming the Emirates Pediatric Dental Club. Could you introduce yourself shortly?

Dr. Dina Debaybo: I trained as a dentist at Saint Joseph University in Beirut Lebanon then moved to Dubai in 1996 where I held different positions in Dubai Health Authority and the Ministry of Health for 16 years. An experience that really shaped me as a professional and the Ministry of Health for 1991 where I held different positions (CAGS) and a Masters’ (MSc) in pediatric dentistry. Upon graduation I moved to Dubai in 2001 where I held different positions in Dubai Health Authority and the Ministry of Health for 16 years. An experience that really shaped me as a professional in skills, ethics and values. I met exceptional leaders such as Dr Tariq Khoory (Head Dental Services, Dubai Health Authority (DHA) and Dr Aisha Sultan (Head of Dental Chapter Emirates Medical Association EMA and Head of Dental Services, Ministry of Health in Northern Emirates). I then got involved in establishing the Dubai campus of the Boston University School of Graduate Dentistry project in Dubai Health Care City. It was an eye opener on academics in post graduate education. In 2010 I joined the First Pediatric Dentistry Center in the UAE, established by Dr Elhami Nicolas as part of the Nicolas and Asp Dental Centers, where preventive and comprehensive services are offered within the scope of practice of the American Academy of Pediatric Dentistry (Guidelines of the ABD).

DTME: Please elaborate on the process behind the formation of the EPDC and its members?

The pediatric dentistry community has evolved and blossomed within the last 4 years with the establishment of the post graduate pediatric dentistry programs in the UAE and with the influx of specialists from overseas. Joining efforts with the mission to provide quality care to younger ones can better be rendered by gathering all efforts and joining in the path of excellence. Each child in the UAE has a fundamental right to his complete oral health care. The Emirates Pediatric Dental Club has a dutiful obligation to ensure that all children living in UAE receive high-quality and accessible oral health care.

DTME: What are the plans for the coming year 2014 for you and the EPDC?

The plan for our members is to provide advanced specialized continuing dental education for pediatric dentists. We are looking forward to working closely with The European University College for their hosting of the European Academy of Pediatric Dentistry (EAPD/MENA Middle East chapter and North Africa) chapter from 27th until the 29th of March 2014. We are also planning to have collaborative sessions during the Asia Pacific Dental Congress (APDC) from 14th until 17th June 2014. Also on the agenda is a side event to AEEDC from 5th until 7th of February 2014. On a larger scale we will be trying to establish a close netted cooperation with the already established GCC Pediatric Dentistry Associations since we do face the same prevalence and incidences of oral health diseases in children.

DTME: What are some of the biggest challenges for Prevention and Oral Health awareness in the Emirates?

Evidence based research has provided us with data relevant to the caries index in the UAE. The index of caries in 6 year old children is 8 to 9. More explicitly, it reveals 8 to 9 carious primary teeth in the oral cavity of a 6 year old. The basic need of chewing is to soft diet. Multiple episodes of emergencies due to dental pain are witnessed, whereby children miss school and experience severe episodes of spontaneous pain at night. Speech problems arise since the phonicetics of letters rely on the pala tal surfaces of upper and lower anterior teeth. Esthetic issues aggravate already challenges of bullying at school with missing front teeth or unaesthetic image of large anterior dark lesions. At last but not least, loss of space due to premature extraction of primary teeth and loss of maxillo-dental diameter have seen an influx of rise in orthodontics needs.

How does the EPDC plan to elevate the level of dental hygiene awareness and promote preventive oral health measures across UAE?

We know that changing habits is very challenging. In order for it to be successful it has to follow the bio-pysch-social model where the habit is treated as a community based initiative where we work closely with government entities (Dubai Health Authority and Ministry of Health) to help in their already established extensive oral health programs starting with pregnant mothers, moving to pediatricians during infants vaccine visits, involving nurses and working closely with school health programs. It will also involve including preventive treatment programs for permanent teeth as soon as they erupt (Fissure sealants). We will attempt to help out in the different levels of this chain reaction. Close cooperation has already been established with large oral health private players on the market who plan to help us out as part of their citizen responsibility initiative of giving back to the community (Procter & Gamble, Johnson and Johnson and Glaxo Smith Kline corporations).

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Would you like to share additional information with the readers?

The establishment of the Pediatric Dentistry Chapter of the Emirates Medical Association is aimed at making a difference in children’s lives, all children, healthy and less healthy children. The community is faced with new challenges with Children with Special Needs. Behavioral issues under the larger umbrella of Autism Spectrum Disorder is adding more difficulties to families. Working closely with all community groups is our daily endeavor. We will keep trying and learning in the long journey towards a caries free community. Sincerest thanks for your close interest in Pediatric Dentistry.

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