Dental Technician Int’l Meeting was a success

By Dental Tribune MEA / CAPPmea

DUBAI, UAE: This May CAPP (Centre for advanced Professional Practices) hosted another meeting that was dedicated to the dental technicians from the MEA region and beyond. The meeting was a part of the annual congress, 13th CAD/CAM & Digital Dentistry Conference & Exhibition that was held in beautiful arena of Madinat Jumeirah Conference Centre on 04-05 May 2018. Dental Technician Sessions were an accomplishment not only for dental laboratory owners and dental technicians but also for the entire dental technology profession.

The event was spread over two very active days for all participants and welcomed 154 dental technicians. On the first day there were seven various tables where the hands-on trainings took place. The tables operated simultaneously with a rotation of several groups for each table. The trainings were held in small groups (90 seats available per session) in order to have the highest impact. Outstanding dental technicians presented various topics of a great interest to the dental technicians. The participants had an opportunity to interact immediately and ask their personal questions. The practical demonstrations, at the same time, provided inspiration and offer means of trouble shooting.

On the second day Saturday 05 May 2018, Dental Technician International Meeting scientific programme took place and a line-up extraordi- nary dental technicians who provided their best interpretations of the latest novelties in the dental technicians profession. Aiham Farrah, CDT, from Syria spoke about Flawless Lab-Fabricated Dental Restora- tions, followed by Philippe De Moyer from Belgium who had a lecture on Innovative Method in Guided Surgery to Prepare Immediate Loading and Place Dental Implant. Rik Jacobs from the Netherlands introduced 3D Printing on the Edge of Conversion and Eric Berger from France finished the day with his lecture on “Aesthetic Realization with VITA: Cut Back on VITA Block”.

The next edition of Dental Technician Meeting will be held on 12-13 April 2019 in Madinat Jumeirah Conference Centre.

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Materials and systems for all ceramic CAD/CAM restorations

By Drs. Christian Brenes, Ibrahim Duqum & Gustavo Mendonza, USA

Dental crowns have been used for decades to restore compromised, heavily restored teeth, and for aesthetic improvements. New Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) materials and systems have been developed and evolved in the last decade for fabrication of all-ceramic restorations. Dental CAD/CAM technology is gaining popularity because of its benefits in terms of time consuming, materials savings, standardisation of the fabrication process, and predictability of the restorations.

The number of steps required for the fabrication of a restoration is less compared to traditional methods (Fig. 1). Another benefit of CAD/CAM dentistry includes the use of new materials and data acquisition, which represents a non-destructive method of saving impressions, restorations and information that is saved in a computer and constitutes an extraordinary communication tool for evaluation.

The incorporation of dental technology has not only brought a new range of manufacturing methods and material options, but also some concerns about the processes involv--
Fig. 4: Full arch implant supported prosthesis milled from a matrix and used for single unit restoration. The first in-office ceramic material was introduced as a highly filled ultrafine particle size; this material was available in different shades. More recently, the introduction of IPS Empress CAD (Ivoclar Vivadent) and Paradigm C that according to the manufacturer (M ESPE) is a 30 to 45 percent leucite reinforced glass ceramic with a fine particle size.  

To overcome esthetic problems of most CAD/CAM blocks having a monochromatic restoration, a different version was developed as a multifaceted ceramic block, which was called VITA TriLute (Vident) and also IPS Empress CAD Multiblock, the base of the block is a dark opaque layer, while the outer layer is more translucent. The CAD software allows the clinicians to position or align the restoration into the block for the designed outcome of the restoration.  

Similar to IPS Empress but with a finer particle size, this material was designed to be used with the CEREC system (Sirona Dental) and was available in different shades. More recently, the introduction of IPS Empress CAD (Ivoclar Vivadent) and Paradigm C that according to the manufacturer (M ESPE) is a 30 to 45 percent leucite reinforced glass ceramic with a fine particle size.

In 2014, the Enamic (VITA) material was released as a ceramic network infiltrated with a reinforcing polysilicon network that has the benefits of ceramic and resin in one material, but no clinical data are available.  

Alumina-based ceramics  
Alumina blocks (Vident ImCoris ZI) were introduced in 2006 as a material that has the benefits of ceramic and resin in one material. However, no clinical data are available. The first one is a leucite based glass ceramic with a composition similar to Empress ceramic. IPS E-max was introduced in 2008 as a material with a flexural strength of 350 to 450 MPa (two to three times stronger than glass ceramics), the blocks are blue in the partially crystallized state and it has been introduced to fire a process in a porcelain oven for 20 to 25 minutes to complete the crystallization. The final result is a glass ceramic with a fine grain size of approximately 1.5 μm and 70 percent crystal volume incorporated in a glass matrix. In 2014, Vivadent released Spurinity, the first ceramic reinforced with zirconia (on average weight), this material is a zirconia reinforced lithium silicate ceramic (ZLS) available in a precrystallized or fully crystallized (Spurinity FC) state indicated for all kind of single all-ceramic restorations.

Zirconia  
Zirconia has been used in dentistry as a biomaterial for crown and bridge fabrications since 2004, it has been useful in the most posterior areas of the mouth where high occlusal forces are applied and there is limited interocclusal space.
The development of dental CAD/CAM systems in the 1990s saw the introduction of the InLab system developed by Dr. Werner Mörmann and the technician engineer Marco Brandstätter. In 1993, they launched the first digital dental system designed to allow dentists to design and fabricate in-office restorations. Since then, the continuous evolution of systems dedicated to this field has continued and has exponentially increased in the last decade.

CEREC systems have evolved into CEREC Bluescam scanner and CEREC Open. In 1998, Dr. Christian Brenes, who has dedicated his career to the technology, founded Christian@BlueskyBio (www.christian@blueskybio.academy).

The introduction of CAD/CAM technology in dental restoration is available. Table II shows some of the most recent systems that have been developed.

Table 2: Most popular dental CAD systems available for 2015.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>File output</th>
<th>Type</th>
<th>Milling materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>3Shape</td>
<td>Proprietary/STL</td>
<td>STL</td>
<td>Zirconia, wax, PMMA</td>
</tr>
<tr>
<td>Sirona</td>
<td>Proprietary</td>
<td>Wet/dry</td>
<td>Zirconia, Glass ceramic, ceramic, ceramics, lithium disilicate, chrome cobalt, wax, titanium</td>
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<tr>
<td>Dental Wings</td>
<td>STL</td>
<td>Wet/dry</td>
<td>Zirconia, Glass ceramic, ceramic, ceramics, lithium disilicate, chrome cobalt, wax, titanium</td>
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<tr>
<td>Planmeca</td>
<td>STL</td>
<td>Wet/dry</td>
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<td>Dental Wings</td>
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<tr>
<td>Sirona</td>
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<td>Wet/dry</td>
<td>Zirconia, wax, PMMA</td>
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<tr>
<td>CEREC Bluecam</td>
<td>STL</td>
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<tr>
<td>Procera</td>
<td>Wet</td>
<td>Wet/dry</td>
<td>Zirconia, wax, PMMA</td>
</tr>
</tbody>
</table>

The incorporation of new systems and materials, and different types of CAD/CAM systems, has revolutionised the way the dental profession works.

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