Press release

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Workflows and materials - designed for users, finely-tuned by manufacturers

Technical review of IDS 2019

The players of the dental industry have taken in many technological impulses over the past years. For instance, just think about the example of CAD/CAM, of digital imaging processes, of 3D printing or innovative materials. The International Dental Show 2019 showed how these trends are being translated into new processes and products.

The current technological developments bring opportunities for the practice as well as for the laboratory and allow new forms of cooperation between dentists and dental technicians in a wide range of sections. This also allows attractive opportunities for their teams to develop more strongly. The committed assistant can for instance develop further in the field of professional teeth cleaning with innovative processes and to an extent gain a larger, autonomous field of activity. The dental technician is both a classic craftsman, traditional precious metal technician or ceramist, etc. and at the same time takes over a wide selection of additional tasks in the section of forward-looking technologies (i.e. EDV Manager, CAD/CAM specialist, 3D printing expert).

New prophylaxis formulas, new filling materials
In spite of all digital technologies there are however sections with classic and yet very successful working methods. This includes the dental filling therapy. Material innovations are currently making these even safer and more convenient. In this way, mixed nanocomposite resins, which contain for example zirconium oxide as well as silicon dioxide or possibly hydroxyapatite can be used to fill even the tiniest of cavities or used to support the reconstruction of dental enamel.

Novel materials now unite the simplicity of a glass ionomer with the service life of classic composites - and they are moreover aesthetic. This enables a cavity to be treated without adhesive and retentive preparation in just one layer. Thanks to their thixotropy, other composites promise to fill cavities of all classes with a significant time saving. Other materials indeed achieve the switch through temperature modulation: Extraoral warming initially turns them into a fluid, enabling an optimal draining off and air pocket-free application, even in areas that are difficult to see. Later, the consistency can be moulded. Furthermore, using a special system the fixation and the core build-up can be united in one single step, because only one composite - instead of two - are needed. And for top aesthetics, innovative alternatives of generating colours that are not created using added pigments, but instead using selectively generated structural "colours from light".

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Your contact:
Volker de Cloedt
Tel.
+49 221 821-2960
Fax
+49 221 821-3544
e-mail
v.decloedt@koelnmesse.de

Koelnmesse GmbH
Messeplatz 1
50679 Köln
P.O. Box 21 07 60
50532 Köln
Germany
Tel. +49 221 821-0
Fax +49 221 821-2574
www.koelnmesse.com

Communicative polymerisation lamps that now also think for themselves are available for the hardening process. For example, an automatic lighting assistance recognises when the lamp is moved inside the patient's mouth. By vibrating it notifies the user of such errors and automatically extends the amount of time the lamp stays on for. If the position changes too much, the device actually even switches itself off autonomously and the process can then be repeated correctly.

Furthermore, various new matrices facilitate the filling therapy. These include among others a self-spanning model with an additional, adjustable band for four-surface fillings. This minimises papillary bleeding and the dental roll holder is integrated. Another new matrix is designed especially for front teeth and allows the restoration of the interproximal edges and cervical region in just one step - also when using cofferdam or gingiva retraction thread.

So that oral diseases don't even occur, IDS 2019 presented diverse innovations in the prophylaxis area. These include toothpaste for the home bathroom, which remineralises weakened dental enamel with fluoride and calcium and protects it against future acid attacks; the formulation with a special copolymer ensures that the remineralising components are deeply enclosed in the enamel. A further new toothpaste relies on the combination between the amino acid arginine and a dual zinc system - a new formula for the protection against plaque and gingivitis as well as against tooth decay, dental hypersensitivity and halitosis. And an innovative toothbrush promises such a good cleaning process that the results are on a par with a professional tooth cleaning.

The safety is increasing in the hygiene section. Among others this is attributable to the first examination glove in Germany with anti-microbial properties. The effect targets gram-positive bacteria including MRSA and VRE - among others an important component in preventing nosocomial infections (NI) from spreading.

Intraoral scanners still on the rise
If prosthetic treatment is necessary, today the dentist can fall back on extensive digital tools to support the diagnosis and treatment planning. Here, the significance of intraoral scanners is particularly increasing and they are even more accurate than ever before. The dental surfaces are recorded directly in the required resolution. The scanners take very little time to do so, offer a high definition also in the depth and thus provide a significantly increased detail accuracy of the 3D model.

The intraoral scan delivers a decisive prerequisite for downstream steps of the digital workflow. An imaging process that will no doubt be additionally used more frequently in future, is the cone beam computer tomography.

Traditionally digitally pioneering - now innovative implant design
All data gained from imaging processes forms the input for software for the treatment planning, whereby the implantology has been a prime example for years. The documentation of implants and sterilisation processes is now even more simple - thanks to specialised software. Treatments can simply be planned per PC or a mobile device and transferred over to the respective device. Automated documentation processes bring the practices more security. They support the device

management and provide information about the services. Resources can thus be implemented with more foresight and more efficiently.

New developments also among the implant designs: A fully-conical implant unites a progressive, functional design with the high-performance material Roxolid and the clinically tested SLActive surface - and it is beneficial for the bone management, because it supports immediate restoration protocols regardless of the bone class.

After being inserted, another new implant system leaves the prosthetic connection geometry open: "conical" and "platform" - both are possible on just one implant. A depth stop system additionally provides an individual and safe surgical preparation.

Special healing abutments made of PEEK (polyether ether ketone) will ensure an improved aesthetics in future. An intraoral scan can be done without interrupting the "biological sealing" through the moulding process - the tissue level remains intact! And PEEK will no doubt also gain even more significance as a material for implants.

The laboratory: Manager of the dental workflow
The actual production steps for prosthetic provisions mainly take place in the laboratory. This applies for the classic dental technology as well as for CAD/CAM and 3D printing. The chances for the laboratory thus lie in a flexible management of different workflows. A modern processing station now also integrates a fully-automated (practically autonomous) warehouse management system as well as a cleaning unit for wet and dry operation. The effort and the complexity in the material and tool administration is dramatically reduced which at the same time saves a great deal of time.

On top of this, there are numerous improvements in the details, particularly regarding achieving the "desired aesthetics". Polychromatic hybrid ceramic blocks with a 6 millimetre thicker basal layer in the neck region offer for example even more individual leeway when positioning the crown in the virtual CAD/CAM blank. Within the available 18 millimetre total height, colour saturation and translucency can be reproduced on the PC in an even more patient-friendly way - an advantage above all for long front teeth and abutment crowns.

New materials and software for the digital workflow in the 3D printing section too: At IDS 2019 new benchmarks were set here in terms of speed and simple handling. The respective software is to a large extent individualisable - for the safe and above all validatable creation of a wide range of medical products.

Thanks to Cloud-based software, aligner bars can now be completely produced in the digital workflow. Linking up X-ray data, 3D models and patient photos enables the predictability of clinical results. The platform processes all of the common intraoral scanners as open system STL files and offers the treating dentist two options for the creation of the prescription, alongside the external production also the option of producing it directly in the practice.

More comfort through new dental units

Ultimately, all of the innovations aim to satisfy the needs of the patients. He requires a painless, safe and fast therapy - and it should be comfortable too. A new concept in the section of dental units contributes towards this: in concrete terms: the pneumatic parallel shift of the dental appliance. A pneumatic cylinder silently pushes the dental appliance attached to a guide rail in any desired position, either manually or as a programmable unit. As soon as the chair is steered into the upright position, the dental appliance automatically moves backwards. Two joints ensure that the appliance is aligned ideally for the user and the armrests accommodate the movements of the patient.

The innovations mentioned here together with many others presented at the International Dental Show 2019 vividly and tangibly demonstrated the developments in dentistry recognisable today in their entire scope. It has already highlighted future progress - which are both an essential decision-making tool for the investment decisions of dentists and dental technologies.

Note for editorial offices:
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Your contact:

For details and information on the dental industry:
VDDI/GFDI - Press Office
Burkhard Sticklies
sticklies@vddi.de

Your contact for IDS:
Volker de Cloedt
Communications Manager

Koelnmesse GmbH
Messeplatz 1
50679 Köln
Germany
Tel. +49 221 821-2960
Fax +49 221 821-3544
Email: v.decloedt@koelnmesse.de
Internet: www.koelnmesse.de