Press release



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Leading global International Dental Show in Cologne impacts the future

Dental innovation: strong combination - gain for the IDS visitors

The International Dental Show (IDS) 2025 in Cologne showcased a host of innovations. They ranged from digital technologies and their extension in the direction of Cloud computing and Artificial Intelligence (AI), through to aids for classic dental medicine and dental technology methods. The combination between trusted and innovative products proved to be especially strong.

For example, the imaging techniques (i.e. X-rays, fluorescence images, intraoral scans) make the assessment of oral hygiene easier. In particular fluorescence intraoral scanners can be implemented as caries scoring systems. Diseases are recognisable at an early stage enabling a targeted prophylaxis to be initiated in a timely manner before the symptoms occur.

Combined diagnostics - Al-supported evaluation

Software assistance proves to be valuable here. This enables caries to be detected more accurately, the acceleration of a cephalometric analysis through the automatic designation of orientation points in the X-ray or the preparation of decisions for extractions and orthognatic surgery. The dentist can fall back on Artificial Intelligence with fully-automated X-ray imaging for the caries diagnosis.

In this way, AI can already recognise caries on bite wing X-rays better than a human being. Based on a panorama X-ray, current software makes a preclassification, depicts it in a classic odontogram and in a detection list: "Bridge from 47 to 45, caries on 44, 43 intact, etc." - the dentist "only" needs to check this and where necessary correct it.

A coloured depiction of the findings generated at the same time is easier to discuss with the patient than a black and white X-ray. Moreover: All of these evaluations are available electronically and can thus be shared among colleagues.

Combined image information for the backward planning

The matching together of intraoral scans, 3D X-rays and computer tomography scans serves as the basis for today's backward planning, particularly in the area of implantology. This is now also enhanced by magnetic resonance imaging (MRT), an imaging method that does not emit ionising radiation. This particularly makes it easier to diagnose secondary and occult caries compared to conventional methods.



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This will above all enable the dimensions of carious lesions to be determined more accurately in future.

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The MRT could also player a bigger role in periodontal diagnostics. Because it detects bone loss earlier than bleeding-on-probing and X-rays.

Combined prophylaxis method - many ways lead to the same goal

There is a trend towards convenient multifunctional systems in the field of professional prophylaxis: An ultrasonic handpiece and a powder jet handpiece in one, all of which provide the highest level of treatment comfort. As follows for instance: The ultrasonic handpiece oscillates elliptically and can, just like the powder jet handpiece, be finely adjusted to twelve different settings (amount of water, dosage applied). The water temperature can also be set to four different levels for a pain-free procedure.

Beyond this, there is a choice of hand instruments, ultrasonic systems and airpolishing devices for the professional, mechanical removal of plaque including subgingival debridement. And contra-angles with a particularly narrow neck and small head as well as the matching polishing cups enable easy access, even to "difficult" regions of the oral cavity.

Many different ways lead to the desired goal: One for example is using a set of modern hand instruments, one of which has a solid material tip that promises especially good precision. This enables both the decontamination of periodontal pockets and the smoothing of the root surfaces.

The periodontology teams already profit from modern digital technology during the diagnosis stage. In this way, the depth of the pockets is determined in the traditional way using a probe, digitally-supported special models allow automatic documentation. Diagnostics can also be carried out without chairside assistance using such "computer PA probes".

Dental restorations: Special as well as universal materials

Tooth-coloured filling materials are becoming increasingly more significant in line with the patients' wishes for improved aesthetics. And they are becoming increasingly more diversified: Classic composites for the incremental technique, bulk-fill composites for a fast filling "in one go", fibre-reinforced composites for high-volume treatments; glass-ionomer cements for fillings without the adhesive technique; fluoride-releasing compomers as well as ormocers and self-adhesive composite hybrid resins. These are enhanced by recent specialities such as nano-hybrid ormocers, where silicon dioxide forms the chemical basis for both the filling material (nano and glass ceramic filling material) as well as - and this is new - for the resin matrix.

New universal composites facilitate the daily work. They can be implemented in both the anterior and posterior regions, can be placed in an up to 4 millimetre cavity and then hardened and guarantee comfortable handling thanks to a special



filler technology. A simplified choice of colours comprising of just four shades makes it easy to achieve aesthetic results.

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Sectional matrix systems are frequently used to hold the restoration material in position. They can even fulfil the most demanding requirements of Class II and are increasingly safer and more comfortable to use. Nickel titanium rings offer both stability and elasticity. A PEEK reinforcement increases the tooth separation pressure as well as the longevity of the entire system. Retention extensions improve the retention and an advanced soft silicone ensures that the ring fits the tooth.

Different products, which have only now made the implementation of minimally invasive and aesthetic restoration measures possible, are used for the adhesive bonding. These include so-called universal adhesives. They are widely indicated and partly also function when the dentine is too wet or too dry. There is also the concept of self-bonding composites. They bond without a separate adhesive.

In the related area of molar incisor hypomineralisation (MIH) similar methods are used to restore destroyed teeth, however the aetiology of the disease is a totally different one. Here, there is, in the meantime, a validated, minimally invasive treatment concept including infiltration and tooth bleaching.

A hydrogen peroxide gel with a particularly stable consistency is now available for patients, who are looking for an effective home bleaching method. This enables it to be stored at room temperature. When it is then implemented, the patient only needs 15 to 30 minutes for the tooth bleaching process. Of course, this type of bleaching is accompanied by professional dental consultation - to ensure good chances of success and a high degree of safety.

Combined continual and reciprocal file movement

Endo motors with more and more "safety" functions are being introduced in the dental practices. It is a similar principle to the ABS system, the brake assist system and the electronic stability programme in cars: The endo team can fall back on the support of different assistance systems. These include the automatic torque control system; it is connected to an automatic stop should the critical torque limit be exceeded. An automatic stop also occurs if the apex is reached. In a special mode, continual and reciprocal movements are combined with each other and alternated depending on the situation. This relieves the files time and again, reducing the risk of breakage.

Sensorless motor controls (a further development compared to conventional brush and sensor-based motor controls) ensure fast reaction times to undesirably high rotational speed and torque deviations or break-offs. The ensuing possible "immediate reaction" allows a stable setting for the files. And the dynamics of a continual electronic length determination during the active processing in combination with a - if necessary - automatic change of rotation direction helps the dentist always keep the file on the desired target.

Aim of the work preparation: full cost control



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The innovative trends at IDS focusing on dental technology already begin with the work preparation and thus with an elaborate step that requires high concentration and which is difficult to reconcile with economic success. Here, advanced software contributes towards keeping the laboratory costs down. Even beginners can professionally implement the current programmes immediately because the explanations on the monitor are so straightforward. In this way, even large-span tasks with different components and contact points (i.e. restoration of an entire jaw) can be carried out in a few steps without prior knowledge of special software.

For example, the required information arrives at the laboratory in the form of an intraoral scan. In addition to this, the creation of an analogue model remains indispensable and is the first choice for complex cases such as implant-supported, large-span bars and telescopic work. In the next stage, the scanbodies play a key role in the CAD construction for implant-supported prosthetic restorations. Here the crucial question is: "Which of them are already on file in our software? This forms the basis for the decision as to what expansions or new software one possibly has to invest in to round off or reform the laboratory's spectrum of offers.

Software that allows virtual articulation is generally suitable for the CAD construction. It is becoming part of the normal everyday routine in more and more laboratories, in some cases also thanks to the progress in Cloud computing. Because in this way a continually larger selection between different programmes exists.

A new level of software-supported aesthetic design

Special software for micro-layering combines monolithic fabrication with ceramic veneering. Not least thanks to a photo import function and "colour mapping", a fully anatomical 3D representation with photorealistic colouring appears on the monitor.

Once the design has been completed on the screen, the question as to the type of production of the respective restoration arises. Here the number of options is increasing: casting or milling, grinding or additive production. And, in detail, there is a high number of current improvements.

Ability for continuous milling in dental technology

For example, four-axle CAD/CAM milling machines comply with the desire for top performance in continuous operation with spindle water cooling - targeting the operating area between the tool and the workpiece. This means it is more frequently possible to do without additional abrasives; they only remain absolutely necessary when processing titanium (as a rule for abutments). Advanced 5x dry mills especially impress with a more efficient processing of the hardest materials (namely cobalt chrome).

The users are faced with more and more options, particularly in the additive manufacturing section. In the metal printing section these include the laser metal fusion technology (LMF), the selective laser melting method (SLM), selective laser



sintering (SLS), direct metal laser sintering (DMLS) and lasercusing. All of the cited methods are used to produce crowns, bridges and denture bases ("digital model casting bases") from non-precious metal dental alloys.

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Practically all conceivable geometrics can be realised. This makes different steps superfluous: For instance a separation between the bridge elements or a milling cutter radius correction. Instead the dental technician enjoys plenty of space and can integrate retentions for plastic veneers and undercuts into every object without further ado.

Combination: Manufacturing options and new business models

The production of large volumes makes the additive manufacturing of dental technology items really effective. Up to 100 crowns fit on a standard construction platform with a 100 millimetre radius, which can then be printed in five hours - in three hours indeed using a double laser system. Apart from crowns, the printable items also include bridges, bars and supraconstructions as well as all implant-supported items like single abutments, telescopic crowns, primary and secondary parts, orthodontic appliances, model casting dentures with clasps and partial dentures.

The business models are also shifting due to the additive construction of metal structures. In the individual case it often has to be decided where the items should be produced: in one's own laboratory, in the cooperation lab, at the central manufacturers or industrial service.

In the area of additive manufacturing of plastics, restorations can be printed out of high-filled composites using the DPS technique (digital press stereolithography). The liquid resin is classically found in a tray that contains a vertically movable construction platform. Initially it is moved up to the surface of the liquid so that a thin layer of resin forms on top of the construction platform. The thin layer is hardened according to the "construction plan" by applying light to certain points. The construction platform then moves down slightly so that another thin initially still liquid layer of resin collects on top of the hardened layer. This is hardened and the construction platform moves down a bit further and the procedure is repeated again and again.

As an alternative to the tray, the resin can be administered in vacuum-sealed capsules. This can simplify and accelerate the work process and also works in a large range of viscosities particularly with highly viscous ceramic-filled resins.

The speed is a huge advantage here. This means supplying several teeth (or several patients) after fillings have failed will become a "totally normal" therapy option. Because several crowns, inlays, onlays and veneers can be produced simultaneously within a few minutes and delivered to the respective practices.

As well as metals and plastics, ceramics can also be manufactured using additive production. In this way, in the course of a pilot project a subperiosteal jaw implant has already been printed and inserted into the patient's mouth in one single



intervention without bone augmentation.

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A novel digital workflow especially for total prosthesis is available. It involves a twostep milling process. It combines a tooth-coloured PMMA disc with a classic denture resin and eliminates time-consuming bonding. An efficient aesthetic design can be achieved based on tooth libraries. The full dentures are ready after possible (minor) manual adjustments.

Combination between comfort and reduced risk of disease

Grinding dust that occurs when making such adjustments to dentures, splints, etc. can be effectively removed directly at the point of origin using a novel batteryoperated suction system. Thanks to its low weight, the corresponding device can simply be moved from one treatment room to another and is also suitable for mobile implementation.

A special device is offered for the regular, professional cleaning of full dentures, and generally of removable dentures as well as of orthodontic appliances and splints. Twenty minutes - the cleaning procedure is completed and the patient goes home with a greater sense of well-being and reduced risk of bad breath or pneumonia.

Treated in a single session - combination of everything in the Cloud

The number of production options is increasing in the practices: Crowns, inlays and more can be produced "chairside" for treatment in one single session or quickly sent over to the practice laboratory. As such, the patient is often treated in one single session. This is becoming of great importance for more and more people and it is even also possible for (three-unit) bridges made of zirconium oxide. A well-interlinked digital procedure including fast milling systems and speed sintering furnaces is advantageous. Alternatively, the dentures can be produced using the 3D printing technique.

However, the biggest innovative power across all different areas of dentistry lies in the consolidation of all relevant information in secure Cloud systems. Uploading files instead of sending them per e-mail of Wetransfer, downloading software and thus benefitting from the progress in Artificial Intelligence - this idea is no longer a vague vision today, but (almost) tangible reality.

How different Cloud services are designed depends on the interior of the respective devices and their connectivity. This can be discussed in detail in the course of technical discussions at the exhibition stands. In the case of some Cloud services the focus lies on the predictive maintenance of the supply systems of a practice (i.e. compressors, suction systems, waterlines). For example, the competent external technician will automatically inform the practices about having maintenance carried out on time and alarm them if there are signs of a problem that needs repairing.

Other services have developed from digital practice administration. They now make suitable software for increasing patient satisfaction, a climate-friendly operation or improvement of the practice's economic situation available. Other Cloud platforms



place the focus on safe and convenient data transmission between the laboratories, clinics and practices. The aim is the immediate availability of all required data for a seamless digital workflow, for example from the intraoral scan through to the milled or printed crown or bridge - all regardless of the location and software licenses.

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Attachments in 3D printing - biofeedback from the splint

Many different developments are coming together in the field of orthodontics. For instance, there are the first 3D printed attachments. Their advantages include high precision, durability and colour stability. These attachments are among other things used for correcting slightly misaligned teeth prior to restorative treatments.

For children and youths as well as for patients with narrow jaws, a specially developed splint for relief from acute CMD symptoms is now available. It fulfils several functions at the same time, offers both neuromuscular relief, helps correct adapted postures and balances occlusal interferences. Beyond this, it can also be used as diagnostics for recognising CMD-related symptoms at an early stage.

For the bruxism therapy, special splints bring along an integrated biofeedback mechanism. If the wearer grinds his teeth while sleeping they vibrate and subtle tone (similar to a mobile phone) at precisely the right intensity so they don't wake the bruxers, but gently encourage them to stop grinding their teeth. This protects the teeth, implants and jaw bones against damage and prevents resulting painful symptoms. An integrated data retrieval enables a precise analysis of individual grinding patterns and opens up new possibilities of stress prevention and patient awareness.

A peculiarity that refers to teeth grinders or occlusal splints and which also applies to gum shields: The high precision of a classic elastomeric impression is not required here. Hence, at this point the effort is reduced by taking a squeeze bite. Thanks to the pre-formed wax bites with an "ideal" size and thickness and without an intermediate layer, they only have to be heated slightly. Hence, the user has better control of the centres during the bite registration and because the bite is shorter and narrower, it frequently doesn't have to be trimmed.

From purist chairs through to the highly-combined unit

The devices deserve separate consideration. This begins with treatment units, a variety of peripheral devices through to dental care facilities and laboratory production systems.

In the case of dental chairs the philosophies range from the purist chair, which all of the peripheral devices needed can be pushed over to, through to highly integrated units. These can be equipped as a standard with diagnostic functions ex-factory (i.e. transillumination, fluorescence mode and intraoral camera). Or the installed micromotors allow the recognition of combined materials (esp. composites) in treated teeth via an integrated fluorescence-supported identification method, allowing more targeted working and shorter (filling) therapy times.



Other dental chairs are optionally equipped with endodontic (i.e. endo motors for continuous and/or reciprocal file movement, endometric length measurement, file library) or implantological elements. If necessary, such systems allow the personalised settings of individual dentists to be saved and convenient voice control.

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Graphic images on an integrated monitor make explaining the situation to the patient easier and if required a massage function makes the session more pleasant.

Sustainable prophylaxis and therapy, sustainable economising

The team's efforts to ensure sustainable, environment and climate-friendly operations becomes increasingly more important both for the environment and also for the identification of the entire team and the patients with a practice. It is thus good news that innovations are continually introduced in this section.

For example, in the hygiene section for bottle disinfection: Completely plastic-free natural fibre cloths from certified forestry are combined with alcohol solutions without aldehyde and perfume. Or for the disinfection of suction systems: Instead of aggressive cleaning agents that only ensure the optical cleanliness, the hygiene teams rely on special preparations for the practice and laboratory. Even a neutral pH value (=7) is possible - full effect, gentle on the devices.

The energy consumption of a suction system can also be influenced. Modern executions disposing of the so-called radial technique (instead of side channel compression) are significantly more energy efficient. This reduces the practice's CO2 footprint and also has a positive effect on the economic outcome.

Moreover, digital technology can also improve the sustainability: Appointments can be pooled using a digitally-supported practice administration (i.e. check-ups for parents and their children). The practice website can inform the patients about attractive means of arrival by bus and the train. Both reduce the number of arrivals and departures by car and thus the CO2 footprint of the practice.

Regarding order placements today there is often a "climate-optimised dispatch " option: Where possible, several consumable materials are delivered in one package, instead of separately in dribs and drabs. The practice can support this concept using forward-looking warehousing methods and AI-supported software - in the practice or at the dealers or manufacturers. All parties involved are in the same boat here and can discover new potential for a more sustainable economic management every day.

In combination a benefit for the IDS visitors

The concepts, methods and products exhibited at the International Dental Show 2025 enabled the dentists, dental technicians and their teams to update their knowledge on state-of-the art techniques fast. Depending on the region and positioning of the individual practices or laboratory, the selection of the suitable devices, instruments and further auxiliary aids varied.



Dental practices and laboratories can definitely make a targeted investment decision on the well-founded basis of information gained from a visit to the 41st IDS 2025 in accordance with the high goals of the World Health Organisation WHO, the Global Dentists Association FDI and the regional dentists associations and in this way make contemporary dental medicine available to all people. This is a realistic claim for the entire world today!

In this connection, the dental industry showcased the entire spectrum of therapy options from solid basic care through to high-end dentistry at IDS - trusted and innovative products and technologies for the entire world. Because dentistry has a different alignment in the industrialised nations of the northern hemisphere than in emerging countries with highly qualified dental care and the support of their governments, as in Vietnam, Egypt or Indonesia for instance.

The situation in extremely poor countries is different again. However, one positive thing that was also tangible at IDS: The political will to accommodate the needs of the wider population for adequate dental care exists almost everywhere.

With the aid of the information gained at IDS, the practices and laboratories are now optimising their equipment and their positioning. Ultimately, the patients will profit from the new concepts, techniques and products they integrate into their daily work.

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