



## SETTING BENCHMARKS – DESIGNING THE FUTURE





## Setting benchmarks, designing the future

### Dear Reader

The future is not predictable, which sounds quite logical. And yet we often view the future as a linear progression of the past. When in fact we should be more open to new ideas and question our habits. This is particularly true in times of change where all of us – dentists, dental technicians and the industry alike – are faced with challenges while being offered opportunities at the same time.

Technical progress as a result of digitalization or Industry 4.0, together with new insights from materials research, have expanded therapeutic concepts in dentistry. However, changes in the health and dental market are not only driven by new technologies, but increasingly by framework conditions. Mergers and cooperative ventures are the answer to the globalization of value creation chains.

At the same time, the market for implants continues to grow and offer potential. Dental implants have become firmly established and in many cases offer preferable dental solutions in terms of function, convenience as well as quality of life. Alone the age group of 50 to 79-year olds in Germany represents around 30 million persons. If we can manage to convince only a part of these to have implant restorations, then none of us have to worry about our future.

We at CAMLOG are fortunate in that we continue to grow in a difficult environment. To put new ideas into practice, to develop new concepts and to engage in new market segments, we need qualified specialists and also more room for further expansion. As a consequence, we laid the cornerstone for a new administration building in Wimsheim in the summer. The new building will give the unique spirit of our company even more space and manifest the character and philosophy of CAMLOG. It allows us to create new jobs to promote a dialog-oriented and transparent exchange with our customers.









Not only do we want to meet the growing challenges of the future, we want to continue setting benchmarks in our industry.

Sincerely

Michael Ludwig  
Managing Director  
CAMLOG Vertriebs GmbH



# CONTENTS

	<b>COVER STORY</b>	
	• Impressions from the 6 <sup>th</sup> ICC – excellent atmosphere in Krakow, Poland's capital of culture	4
	<b>SCIENCE / CLINICAL RESEARCH</b>	
	• 6 <sup>th</sup> International CAMLOG Congress – science with practice relevance	8
	<b>CASE STUDY</b>	
	• Full rehabilitation of abraded dentition with implants in the esthetic region	12
	• Allegedly the same, but do not work the same: individual two-part abutments Part 2: Topography of the surface in the sub-mucosal region	20
	<b>PRODUCTS</b>	
	• LODI – The Locator® Overdenture Implant System – for stabilizing overdentures	25
	• The iSy® Implant System – three-year experience of a user	26
	<b>NEWS</b>	
	• CAMLOG makes room for expansion – new administration building with more space for new ideas and concepts	28
	• Dr. Alex Schär was elected Honorary Member of the "Academy of Prosthodontics"	29
	• CAMLOG is Platinum Sponsor of the new training program of the University of St. Gallen and Fluentis GmbH	30
	• DGI expands its e.Academy service – CAMLOG and Straumann with long-term commitment as "Exclusive Sponsors"	31
	<b>PRACTICE MANAGEMENT</b>	
	• Analysis – step one for a good strategy	32
	<b>EVENTS</b>	
	• CAMLOG Start-up-days – career start with a plan	34
	• Strong teeth at last – with COMFOUR™	36
	• The 5 <sup>th</sup> CAMLOG Dental Technicians Congress in Essen – the place where new ideas are born and fascinating impressions last	38
	<b>LIFESTYLE</b>	
	• 2030 – "German Requiem" for combustion engines	40





## IMPRESSIONS FROM THE 6<sup>TH</sup> ICC

EXCELLENT ATMOSPHERE IN KRAKOW, POLAND'S CAPITAL OF CULTURE

For most of the delegates to the 6<sup>th</sup> International CAMLOG Congress it was their first trip to Krakow and they were more than impressed by the city. After all, Krakow reflects over 800 years of history. Including one of the largest medieval market places in the world, the Rynek Główny. This is where life pulsates, where people congregate, talk and celebrate until well into the night. Houses and buildings of all styles of architecture,

churches and museums, open air events and jazz clubs all add up to an impressive display for visitors to this charming city.

### Krakow – a charming host

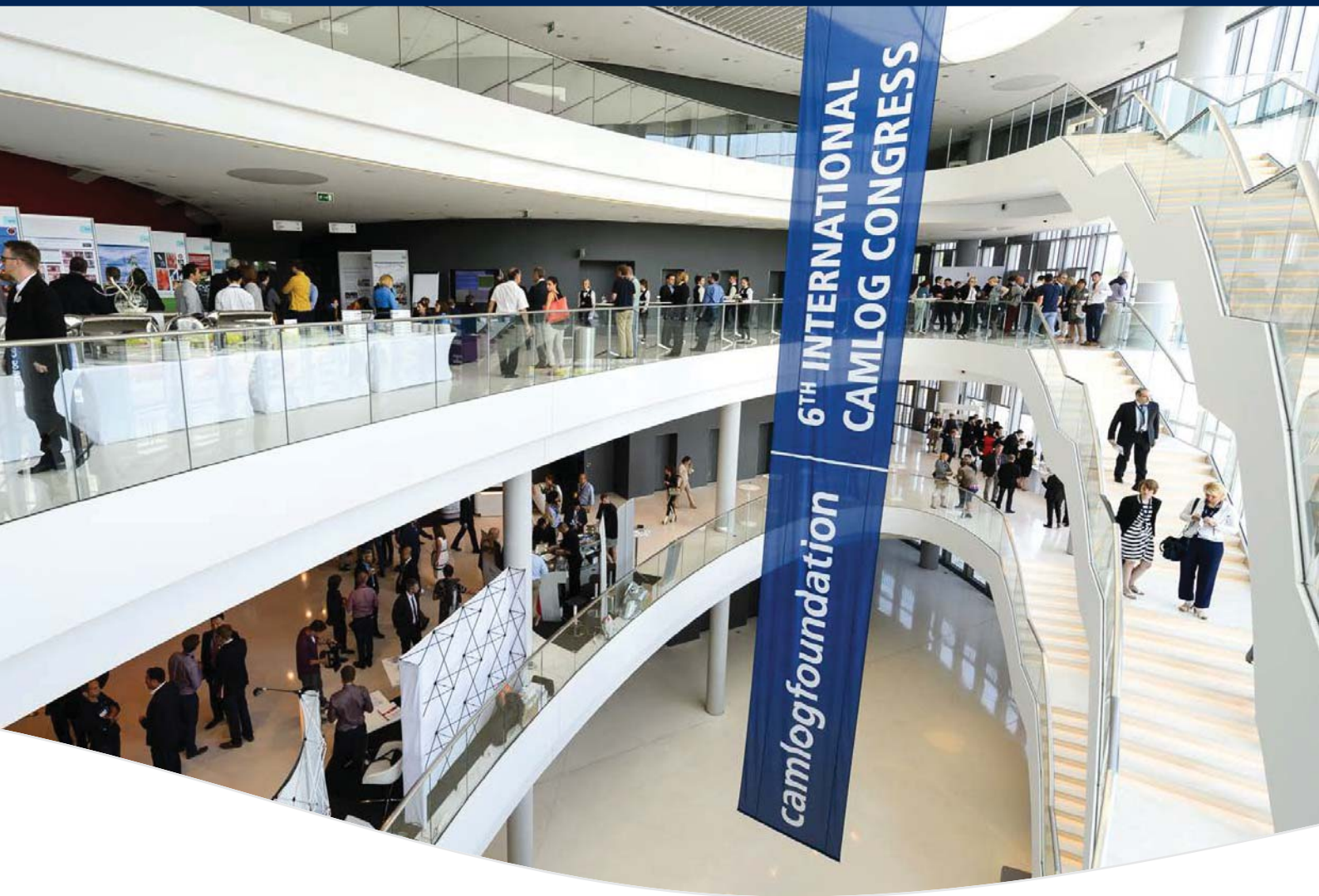
The special atmosphere of the city, which is part of the Unesco World Heritage, is characterized by a mixture of culture and high life, history and modern-day life, the future and legends. The metropolis

on the banks of the Vistula was bathed in sunshine over the congress weekend and added to the good spirits of the congress delegates who had arrived from all corners of the world.

Built in 2014, the brand-new, state-of-the-art congress center proved an ideal location for the 6<sup>th</sup> International CAMLOG Congress. And offered considerably more than your average congress center. The







modern building meets all the requirements for the highest standards for acoustics and stage technology. The 6<sup>th</sup> International CAMLOG Congress was opened by the Krakow Court Ballet with boisterous, colorful, cheerful and pensive traditional dances. This was followed by a Polish hip-hop band which transported us into the present before leaving the stage to the two congress presidents, Prof. Piotr Majewski, Poland, and Prof. Frank Schwarz, Germany.

### The legendary CAMLOG Party

Following sessions on the topics: "Basic principles of treatment planning", "Challenges and handling in the esthetic and posterior region" and "Finding the balance in daily practice", the Friday evening of the congress ended with a special feature on the virtual homo sapiens. Later on in the evening, the museum tram took the delegates

attending the CAMLOG Party – held under the motto "CAMLOG Hard Rock" – to the former tram depot in Kazimierz. The en vogue Jewish quarter has retained its very own atmosphere. Full of bars and cafes, it is popular among students and artists, as well as being the place to be for night owls and party people looking for all-night entertainment. Having arrived at the depot, the party guests, who had dressed for the occasion of the motto,







were welcomed by an unbelievable cacophony, the roaring sound of dozens of Harley Davidson motorbikes. An AC/DC cover band did its own to encourage the arrivals. Rocker accessories were distributed among the guests, adding that extra spice to some of the party outfits. From a culinary point of view, nothing was left to chance. Buffets and food trucks also offered local specialties and drinks. Five different live bands rocked the tram depot well into the morning hours. Even the biggest party poopers got carried away by the fantastic atmosphere

and turned into dancing kings and queens. A party night to remember.

Saturday morning saw the presentation of clinical research results for daily practice with a focus on the transmucosal region. This was followed by the award of the CAMLOG Foundation Research Prize. The prize was awarded to research scientists who had published their studies during the two years running up to the congress. Controversial topics were discussed during the last session. The audience was encouraged to actively join in the discussion.

The numerous positive feedbacks have shown us that the ICC was a major success in terms of being a network platform and stimulant. Besides information and insights, the congress gave delegates ample time and room for discussion, the exchange of knowledge and new contacts.

We look forward to welcoming you again to one of our next events!







5 minutes of impressions!  
Scan the QR code or call up the brief URL  
<https://youtu.be/3OQ8WBgYG8c>.







## 6<sup>TH</sup> INTERNATIONAL CAMLOG CONGRESS SCIENCE WITH PRACTICE RELEVANCE

Dr. Jan H. Koch

This year's 6<sup>th</sup> International CAMLOG Congress took place from 9 - 11 June in Krakow under the motto "Tackling everyday challenges". Over 1,300 delegates from all over the world and 76 internationally renowned speakers and moderators had traveled to this exceptional event. Krakow and the ICE Congress Center proved to be the perfect location for this congress, which unified successful research and practice and addressed the key topics of tissue stability, treatment planning and Digital Dentistry.

How are durable, esthetic implant restorations achieved with good predictability? What has to be considered in terms of hardware, and what for surgical and prosthetic methods? What role do diagnostics and planning play? How can peri-implant hard and soft tissue be kept stable? Experienced and also young clinicians provided convincing answers to these and other questions.

### Vertical position takes precedence over connection type

A five-year randomized controlled study from the universities of Kiel, Mainz and Coimbra showed that with Platform Switching, the bone level in the mandibular posterior region increased by 0.2 mm on average, measured after prosthetic restoration. As **Ass. Prof. Salomão Rocha** (University Coimbra,

Portugal) explained, for a given external flush closure, there is a minimal decline in the bone level averaging 0.1 mm. Measured at the time of implantation, the difference in level amounted to 0.5 mm in favor of Platform Switching – within an implant system with tube-in-tube connection (CAMLOG® SCREW-LINE Promote® Plus). An investigation with CONELOG® SCREW-LINE – a system with conical connection and integrated Platform Switching – showed 0.2 mm growth from the prosthetic restoration, i.e. only a slightly higher bone gain (after three years). As explained by **PD Dr. Maximilian Moergel** (University Mainz, Germany), with CONELOG® the bone level is kept more reliably at the height of the implant shoulder with sub- or epicrestal positioning than with supracrestal positioning. As emerged two years ago at the 5<sup>th</sup> International CAMLOG Congress

in Valencia, the vertical implant position could therefore be more important for bone stability than the type of connection.

### Soft tissue protects bone

**Ass. Prof. Tomas Linkevicius** (University Vilnius, Lithuania) demonstrated that thick soft tissue protects the underlying bone against decay. According to his study, a peri-implant mucosal thickness of less than 2 mm above the alveolar ridge is critical for bone stability. Compression with autogenic or allogenic connective tissue is effective against bone decay – even with platform matching. In contrast, in case of thin tissue, increased bone decay also has to be expected if Platform Switching is used. In order to avoid bone decay, **Dr. Monika Puzio** (University of Wroclaw, Poland) recommends augmenting with connective tissue grafts





Ass. Prof. Tomas Linkevicius



Dr. Monika Puzio



PD Dr. Gerhard Iglhaut, Prof. Myron Nevins, Ass. Prof. Tomas Linkevicius, Prof. Mariano Sanz, Prof. Frank Schwarz



Dr. Stefan Ulrici



Prof. Bilal Al-Nawas



Prof. Dr. mult. Robert Sader

if the buccal connective tissue is less than 2 millimeters – analogous to the crestal jaw bone.

**Abutments with attachment**

Thick connective tissue closure in the region of abutment emergence could also contribute to regulating the bone decay. According to **Prof. Myron Nevins** (Harvard University, Boston, USA), a thick soft tissue cuff prevents apical migration of the sulcus epithelium. This was confirmed by a study presented by **PD Dr. Gerhard Iglhaut** (Memmingen, Germany) in which an implant system with laser-structured implant neck was investigated (Laser-Lok®, BioHorizons).

**iSy – acquiring patients with a new concept**

According to a retrospective analysis of iSy by CAMLOG conducted in three practices, there is a very good survival rate for implants of 97.6 percent. Based on standardized protocols and the supplied components for preparation, impression-

taking and temporary restoration, the system is not only very efficient to use, but also particularly cost-efficient. CAD/CAM solutions, e.g. with DEDICAM, are consistently integrated. This allows new patient groups to be acquired for which cost also plays an important role: according to **Dr. Stefan Ulrici** (Leipzig, Germany) "iSy is an implant system, but above all a concept."

**Short implants versus augmentation**

In case of limited bone height in the lateral mandible, short implants are a successful solution, according to **Prof. Bilal Al-Nawas** (University Mainz, Germany). Al-Nawas views immediate implantation critically, especially in case of inflamed alveoli. In a retrospective study, 32 percent of the implants inserted at positions of endodontically failed teeth developed peri-implantitis. **Prof. Dr. mult. Robert Sader** (University of Frankfurt am Main, Germany) also made the case for using the shortest possible implants to avoid augmentation. A current systematic

literature study shows that short implants (≤ 8 mm) in the posterior region are of equal standing to longer implants in terms of survival, marginal bone decay and prosthetic complications. On the basis of finite element and micro-CT studies, Sader formulated the thesis that the peri-implant bone around short implants develops a more dense trabecular structure than around longer implants on account of the higher force applied per unit area. In a specifically initiated clinical study, his team is currently testing the prospects for success of CONELOG® SCREW-LINE 7-mm implants in the posterior region of the maxilla to avoid a sinus lift.

**Is peri-implantitis avoidable?**

To be in a position to diagnose the bone loss due to peri-implantitis, **Prof. Mariano Sanz** (University of Complutense / Madrid, Spain) proposed taking an informative X-ray image at the time of prosthetic restoration. Additional probing is indicated in all recall sessions to detect inflammatory processes. Early treatment of mucositis symptoms is the





PD Dr. Markus Schlee



Prof. Frank Schwarz



Prof. Irena Sailer

best way of preventing peri-implantitis. Professor Sanz also considers a favorable peri-implant soft tissue architecture as a key preventive factor. This in turn depends on the configuration of the transmucosal zone and hence on the implant-abutment connection. **Prof. Katja Nelson** (University of Freiburg, Germany) investigated various implant systems for their sealing and mechanical stability in the ring accelerator at the European Synchrotron Radiation Facility (ESRF). According to her results, there is, for instance, no significant difference between conical and flat-to-flat connections with regard to the size of the microgap and the stability of the connection. What can be observed, however, is that thin implants deform relatively strongly and also permanently under load and lead to unfavorable stress applied to the crestal bone. Furthermore, overloading of the implant wall often leads to fractures, particularly in the posterior region.

According to Nelson's observations this applies primarily to conical and to a lesser extent to flat-on-flat connections, as the load is passed to the implant shoulder. **PD Dr. Dietmar Weng** (Starnberg, Germany) views the microgap as a means of entry and exit for microorganisms and thus as a primary cause of peri-implant inflammation. A minimized gap, which he attributes to primary conical connections, may therefore be more important for bone stability than the horizontal offset in Platform Switching.

### The battle – heated discussions on controversial topics

The highlight of both days of the congress was the closing session. Different opinions

were hotly discussed in "debates". The audience had the opportunity to pose questions at any time via app, which were then addressed in the panel discussions. For example, **PD Dr. Markus Schlee** (Forchheim, Germany) cast doubt on the etiologic leading role of the biofilm. Other speakers evaluated this similarly in their contributions. Often it was unclear why some patients suffer from peri-implantitis and others don't. As the available therapy methods would have an uncertain prognosis, Schlee prefers explanation and, where appropriate, repeated implantation in many cases. **Prof. Dr. Frank Schwarz** (University of Düsseldorf, Germany) contested this in that there has yet to be a study published in which bone decay without biofilm-induced inflammation could be detected. From a therapeutic standpoint various methods have been proven to be successful. Depending on the situation, implant surfaces need to be smoothed with rotary instruments. All speakers agreed that a whole series of factors favor peri-implant inflammation, including periodontitis, quality and quantity of soft tissue, implant position, cement residues in the sulcus (remedy: the use of floss) and the surface properties of the implant, abutment and restoration. The etiological role of host factors, such as systemic disposition, is less well researched. In case of doubt, Professor Myron Nevins is of the opinion that implants should be avoided and a bridge placed where possible.

### Digital Dentistry pre-congress

A pre-congress was staged for the first time in advance of the International CAMLOG Congress, and was devoted entirely to the topic of Digital Dentistry.

Implantation and prosthetics can be planned on the computer in new dimensions, standardized methods and material quality allow improved predictable outcomes. But this only works with the suitable technology and sound knowledge, as experts from universities, practices and laboratories showed in Krakow.

### The future is open and digital

Where does the digital path lead? For instance, will we only work with virtual models in the future? Moderators **Prof. Dr. Irena Sailer** (University of Geneva, Switzerland) and **MDT Christian Hannker** (Hüde bei Diepholz, Germany) received differentiated answers in lectures and panel discussions. The team of **Dr. Peter Gehrke** and **Carsten Fischer** (Ludwigshafen and Frankfurt am Main respectively) were convinced that "analog work steps will stay with us for a long time". The digital future clearly belongs to open systems with unadulterated STL files. The first closed systems have already disappeared from the market. Those who combine components should however know all providers and partners and communicate with them competently. In the view of **Prof. Dr. Florian Beuer** (Charité Berlin, Germany), all participants should overcome their mental blocks in order for digital techniques to proliferate. Copying analog processes digitally does not lead to the desired objective. In Krakow, many examples showed how analog and digital complement one another and open up completely new possibilities. Despite all visions, at the end of the congress Professor Sailer formulated an understated conclusion: "Digital technology has come on a long way, but we haven't arrived yet."





Dr. Mario Beretta, Prof. Irena Sailer, PD Dr. Michael Stimmelmayer and Dr. Giano Ricci



Ass. Prof. Salomão Rocha, PD Dr. Maximilian Moergel and Prof. Gerald Krennmair for Stefan Krennmair



Workshop



### Hands-on workshops

Numerous delegates took the opportunity of attending the practical workshops on the day before the congress. Renowned speakers explained scientifically proven surgical and prosthetic techniques and treatment concepts for daily routine in dental practice. The workshops provided excellent opportunities for a fruitful exchange between the speakers and industry partners. The insights gained then led to further in-depth discussions amongst colleagues on the following two days of the congress.

### Young generation

One of the aims of the CAMLOG Foundation is to support young scientific talent. This takes place through the invitation to participate in the Research

Awards and the chance to take part in the poster competition in which over 60 posters from nine countries competed this year. For the first time, the participants had the chance to present their posters orally. The well frequented Speakers Corner generated keen interest and while some contributors were already accomplished speakers, others were given the opportunity to present for the first time.

### CAMLOG Foundation Research Prize

Worth a total of EUR 20,000, the prestigious CAMLOG Foundation Research Prize was again awarded during an international CAMLOG congress. Publications were selected by the jury, which investigated the influence of Platform Switching on the changes in the bone and the success

rate of immediately loaded fixed dentures in the mandible. The prize was awarded to young, talented research scientists who had published their studies during the two years running up to the congress. **Ass. Prof. Dr. Salomão Rocha**, Coimbra, Portugal, won the first prize. The second prize was awarded to **PD Dr. Maximilian Moergel**, Mainz, Germany, and third prize to **Stefan Krennmair**, Wels, Austria.

### Conclusion

Yet again, the 6<sup>th</sup> International CAMLOG Congress provided a successful combination of top-level science, relevance to dental practice and a captivating mood. The congress brought a wealth of information to bear on current questions directly applicable for daily practice. Particularly fascinating was the exchange between experts, many of whom are successful in their own practices, as well as in research.

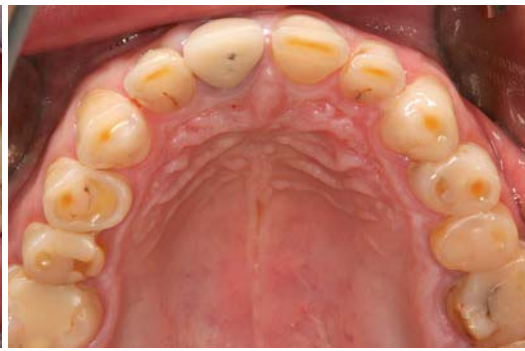


Jan H. Koch, Dr. med. dent. (DDS)





**Fig. 1:** The front view of the initial situation demonstrates clear abrasions with loss of the length-width ratio of the incisors.



**Fig. 2:** Pronounced abrasion with exposure of dentine on all teeth led to a loss of vertical jaw relation.



**Fig. 3:** Pronounced abrasion in the mandible with exposure of dentine and an insufficient composite restoration can also be observed.



## FULL REHABILITATION OF ABRADED DENTITION WITH IMPLANTS IN THE ESTHETIC REGION

Dr. Christopher Hermanns, Jan Märkle and Dr. Ralf Masur, Unterschleißheim.

Both implant restorations in the esthetic region as well as full rehabilitation of abraded dentition are demanding challenges in the field of surgery and prosthetics. In the case of this patient, the complex task was the restoration of the esthetic appearance, stable occlusion and the correct vertical dimension, taking biological principles into account. Is a "conventional" stepwise procedure in both surgery and prosthetics an important element for success in this case? Unfortunately, the too frequently propagated ideally immediate implementation of all treatment steps in the shortest of times, can lead to a "therapeutic boomerang" in complex cases such as these. Proven materials, such as autologous bone, biological paradigms and experienced treatment procedures are the foundation for predictable therapeutic outcomes.

### The patient case

The 30-year old patient, male, smoker, presented for the first time in our practice in September 2011. His primary wish was a new restoration of tooth 11. The patient had been experiencing complaints with this tooth for 2-3 years. The tooth had been endodontically treated and crowned after a hockey accident, and a few years later the root tips were resected due to acute pain. Furthermore, his girl friend, a dental assistant, recommended wearing a splint as he ground his teeth at night. During further examination the patient mentioned frequent headaches, and he was also unhappy with his appearance.

### Findings

Clinical examination revealed moderate dental hygiene, an apical fistula for tooth 11 as well as advanced substance loss of all teeth. On this basis, tooth 11 was regarded as not being worth saving. The pronounced signs of abrasion both in the maxilla and mandible led to an unfavorable length-width ratio of the incisors and thus to a loss of vertical jaw relation (Figs. 1 to 4). Compensatory mandibular advancement resulted in an end-to-end bite (Fig. 5). Although one frequently refers to abrasion dentition, this case is a loss of substance due to attrition, to be precise, as a consequence of bruxism [1]. The periodontal findings

indicated generalized slight gingivitis at a probe depth of max. 3 mm. The X-ray showed the expected apical radiolucency in regio 11 as well as several carious lesions in the posterior region (Figs. 6 and 7). In terms of medical history, it should be mentioned that the patient is a heavy smoker.

### Treatment planning

Together with the patient we discussed various therapeutic options. Due to financial restraints we decided on an implant restoration in regio 11 as a first step, followed by an initially temporary restoration under functional consideration of the remaining dentition. For the above mentioned reasons we refrained from





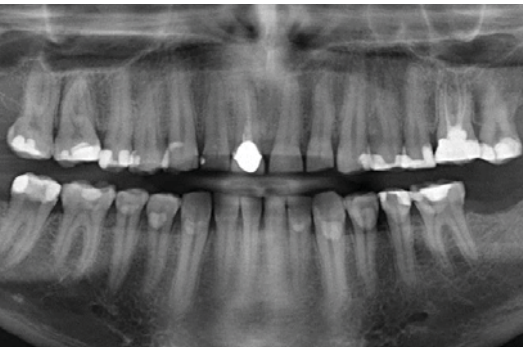
**Fig. 4:** Abrasion and the resulting reduced clinical crown height can be observed in the posterior region.



**Fig. 5:** The end-to-end bite was caused by compensatory advancement of the mandible.



**Fig. 6:** The X-ray of tooth 11 shows apical brightening.



**Fig. 7:** Initial situation in the orthopantomogram: multiple fillings with caries in the marginal region.



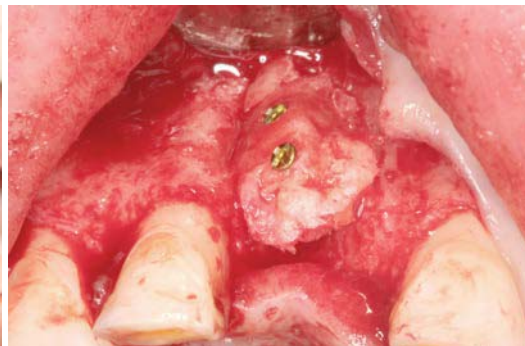
**Fig. 8:** Due to the fistula on tooth 11 a two-stage augmentation procedure was selected. Representation of the clinical situation three months after extraction.



**Fig. 9:** A buccal bone defect can already be detected occlusally in the soft tissue.



**Fig. 10:** The buccal bone defect in regio 11 is illustrated.



**Fig. 11:** An autologous bone graft was harvested from the tuber region to reconstruct the horizontal deficit.



**Fig. 12:** The precise fixation of the graft with two micro-screws is checked via X-ray.

replacing tooth 37. Splint therapy [2] should be performed in cases of advanced loss of vertical reaction with existing craniomandibular dysfunction to provide gradual adaptation of the masticatory system.

Final restoration of the posterior teeth and the implant should take place after a temporary phase of up to 12 months. The patient was fully informed of every step so that he could understand the benefit

of therapy at every point in time. Regular prophylaxis and follow-up sessions were a precondition.

**Surgical phase**

Due to the acute fistula on tooth 11 a two-stage augmentation procedure was selected. The lacking integrity of the vestibular lamella after extraction, combined with pronounced pressure of the M. orbicularis oris, led to an osseous

buccal defect after healing (Figs. 8 to 10). Defects of this magnitude can be treated reliably and with long-term stability using autologous bone grafts. In this case, a bone graft from tuber region 18 as well as particles of cancellous bone were used for build-up (Figs. 11 and 12). A classical interim prosthesis without pontic was chosen as temporary restoration. The pontic-like shaping leads to a thinning of the gingiva, making dense primary wound closure difficult (Fig. 13).





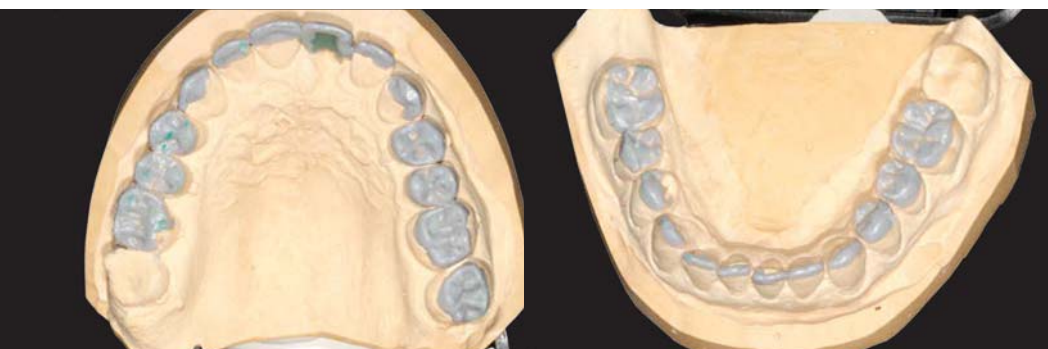
**Fig. 13:** The temporary restoration was performed in a classical manner with a flipper without pontic support.



**Fig. 14:** Implantation was performed three months after regeneration of the graft. After a further three months, the gingiva was shown to be attached with sufficient thickness.



**Fig. 15:** Shaping of the buccal contours can be seen clearly from occlusal.



**Fig. 19:** Diagnostic wax-up of the maxilla and mandible according to functional and esthetic aspects.



**Fig. 20:** Situation after insertion of the reposition onlays in the maxilla...

After a healing period of three months and successful augmentation, a CAMLOG® SCREW-LINE Promote® Implant with a length of 13 mm and a 3.8 mm diameter was inserted. As the patient was a heavy smoker, submerged healing was chosen. Exposure of the implant was performed after a further three months (**Figs. 14 to 16**). A connective tissue graft was inserted to improve the contours, however the patient's heavy consumption of nicotine led to a partial loss of the connective tissue graft. Accordingly, healing could not be regarded as being ideal, particularly with regard to the mesial surface of tooth 12 (**Fig. 17**). As the patient was unable to guarantee a 10-day smoke-free period, we decided against a new intervention and for gingiva forming with a long-term temporary restoration.

### Prosthetic phase I

The objective of the first prosthetic phase was finding the ideal jaw relation for the patient as well as setting the physiological bite level using semi-permanent repositioning onlays.

The implant in regio 11 was restored with an occlusally screw-retained long-term temporary restoration. Over the course of functional therapy, this allowed the shaping of soft tissue through successive application of flow composite (**Fig. 18**). The initial protective splint was now replaced with a deprogrammer according to J. Kois. The patient was advised to wear this splint as often as possible. After a wear period of six weeks and concomitant physiotherapeutic treatment, the jaw relation was determined with the aid of the Kois splint [3]. This acted as basis for a diagnostic wax-up for the dental technician (**Fig. 19**).

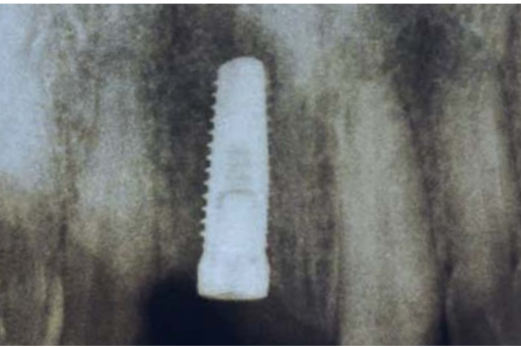
A detailed treatment plan was prepared following successful analysis of the model. The diagnostic set-up not only provided information on the desired bite elevation and occlusal design, but also on esthetic aspects. With a corresponding mock-up on the patient, one could demonstrate how the esthetic parameters such as tooth length, facial profile and physiognomy would change. Successful initial functional therapy with improvement of patient-

specific complaints is regarded as a *conditio sine qua non* for subsequent restorative therapy [4].

In this case there was considerable relief of headaches. We therefore decided to elevate the vertical dimension and stabilize the ideal jaw position for the patient via semi-permanent reposition inlays. A two-stage procedure, as described by the Hamburg working group of PD Ahlers, was chosen [4]. The envisaged bite elevation of 4 mm in total was implemented in both jaws. In the region of the anterior teeth, the size ratios were implemented according to the rules of the "golden ratio". This also simplified the esthetic design of the implant crown in regio 11.

The lab-fabricated PMMA reposition inlays were bonded successively to the opposing quadrants in the maxilla and mandible. Extension of the anterior teeth and the temporary implant crown in regio 11 was performed chairside using silicone matrices and flow composite (**Figs. 20 to 24**). In order to protect the restoration and for better adaptation of the neuro-muscular





**Fig. 16:** An X-ray check was performed three months after implantation of the CAMLOG® SCREW-LINE Promote® Implant.



**Fig. 17:** Situation two weeks after exposure. Poor wound healing and partial loss of the connective tissue graft due to nicotine consumption.



**Fig. 18:** Screw-retained temporary crown with reduction of the interdental space 11/12 and shift of contact point to cervical-palatal.



**Fig. 21:** ...and adhesive extension of the anterior teeth in the maxilla with significant improvement of the length/width ratio.



**Fig. 22:** Top view of the reposition onlays in the maxilla.



**Fig. 23:** Lab-fabricated reposition onlays in the mandibular posterior region and wax-up on the plaster model.

system, the patient wore a protective splint at night. The test phase was accompanied by regular check-ups and hygiene sessions. The new bite position and height were accepted quickly by the patient. During the 13-month temporary phase there was no fracture or loosening of the temporary restorations, signs of abrasion were only marginal.

**Prosthetic phase II**

The gradual application of composite and the corresponding pressure on the soft tissue led to a stabilization of the gingiva around the temporary implant crown. Despite delayed wound healing and the heavy consumption of nicotine, a complete closure of the interdental spaces by the papillae was to be expected due to the shift in contact points to cervical palatal [5].

The therapeutic goal of the second prosthetic phase was the final restoration of the implant in regio 11 as well as the other teeth in the maxilla and mandible. Due to the numerous fillings and caries of

the tooth necks, we decided on complete crowning of the posterior teeth after consultation with the patient. The anterior maxilla was to be restored with partial crowns, the anterior teeth in the mandible were to be built up with composite.

The main task of the subsequent sessions was the best possible transfer of the new jaw position into final restorations. To achieve this, the individual teeth on one side were first prepared and restored with chairside-fabricated temporary restorations, and then the other side.



**Fig. 24:** Situation after insertion of the reposition onlays in the mandible.





**Fig. 25:** Impression taking in the maxilla of the implant and the prepared teeth.



**Fig. 26:** The posterior teeth in the mandible were to be restored first. The anterior teeth were to be built up later.



**Abb. 27:** The raw-fired crowns on the master model prior to try-in in the mouth.



**Fig. 31:** Increased pressure of the hybrid abutment on the peri-implant tissue is clearly visible.



**Fig. 32:** Function and esthetics were checked during the raw-fired try-in of the crowns in the mouth.



**Fig. 33:** The emergence profile of the implant restoration needs to be adapted to the cervical profile of partial crown 21.

In a subsequent session, the other teeth of the corresponding quadrants were ground (**Figs. 25 and 26**).

This way, the supporting regions were never completely disbanded [4]. Centric bite compound registers were lined step-by-step and served to correctly transfer the adjusted bite position.

Impression taking of the maxilla and mandible was performed only after healing of the marginal gingiva. The shaped emergence profile of implant 11 was copied onto the impression post with autopolymerizing material.

For checking the precision of the fit and occlusion, the posterior crowns (IPS e.Max Press; Ivoclar Vivadent, Schaan/Liechtenstein) and the anterior partial crowns (Creation CP, Creation Willi Geller, Meinigen/Austria) were checked on the patient prior to glass firing (**Figs. 27 to 33**).

The emergence profile of implant crown 11 was still to be widened somewhat by the laboratory and adapted to the gingiva pattern of the adjacent tooth

21 (Abutment: DEDICAM, CAMLOG; crown: Creation CP, Creation Willi Geller, Meinigen/Austria).

Variolink II (Ivoclar Vivadent, Schaan/Liechtenstein) was used for final cementing, anterior teeth in the mandible were then built up with composite (Tetric EvoCeram, Ivoclar Vivadent, Schaan/Liechtenstein) (**Figs. 34 to 38**). To protect the new restoration the patient was given a splint for the night.

### Follow-up

Follow-ups were performed at short intervals initially. The patient soon grew accustomed to the new restoration. As the patient continues to smoke, he attends our practice three times per year for prophylaxis.

As a result of the good doctor-patient relationship, close cooperation with the dental laboratory and a reliable treatment strategy, a perfect result was achieved. In particular, the modified lip appearance with extension of the anterior teeth and the desired closure of the diastema were met with positive approval in the patient's social environment. **Figures 39 to 42** show

the final images of the definitive work after more than 2 years in situ.

### Discussion

The case study focuses on the essentials and gives an idea of the complexity and effort for a complete restoration on natural teeth and an anterior tooth implant. Despite the difficult initial situation with a missing buccal lamella, it was possible to realize adequate implant restoration with a harmonious gingiva pattern.

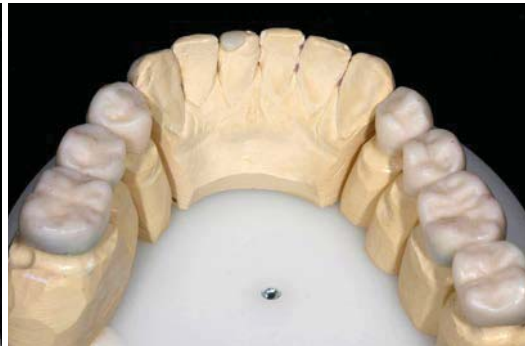
Autologous bone remains the gold standard among augmentation materials and allows reliable reconstruction of buccal defects. Shaping of the soft tissue with a long-term temporary restoration and the application of composite according to standard principles resulted in reliable harmonization and formation of the papillae [5].

The peri-implant hard and soft tissue in particular, are the decisive parameters for a stable long-term outcome. It remains to be seen whether this also applies to smokers in the sense of a biological "protective barrier" [6]. The implant has now been in-situ for four years.





**Fig. 28:** The extension of the anterior teeth was realized palatal with minimal preparation.



**Fig. 29:** Functionally adapted IPS e-max press crowns in the maxilla and mandible.



**Fig. 30:** Try-in of the customized zirconium oxide abutment on a titanium bonding base.



**Fig. 34:** A stable situation is observed two weeks after insertion of the definitive crowns and build-up of the mandibular front.



**Fig. 35:** The clinical situation in the maxilla following check of function and occlusion.



**Fig. 36:** The inserted crown restoration in the mandible.



**Fig. 37:** Functional control two weeks after insertion of the restoration from left lateral...



**Fig. 38:** ...and from right lateral.



**Fig. 39:** Follow-up two years after insertion showed a harmonious gingiva profile.



**Fig. 40:** The situation two years after insertion of the full-ceramic restoration in the maxilla is absolutely stable.



**Fig. 41:** Occlusion is adjusted correctly in accordance with functional criteria. No chipping of the crowns can be observed.



**Fig. 42:** Harmonious gingiva contours and stable papillae were observed at implant crown 11.



The loss of tooth substance in this case was caused by bruxism. The etiology of bruxism is subject to controversial discussion in the literature. Social stress and burden at the workplace are often described in this context [7].

The additional effect of acids, for example due to excessive intake of acid-containing drinks or food, can enhance the occurring attrition. A variety of methods are described for corresponding diagnosis, many of which are quite elaborate and involve high costs (e.g. polysomnography) [8].

Due to the apt self-description by the patient and the clinically present hard tooth substance defects, we decided not to employ further diagnostics in this case.

A long-standing myoarthropathy led to a massive loss of physiological bite height and represented both functional and esthetic impairment for the patient.

The indication for prosthetic restorative treatment is given according to the DGFDT (German Society of Functional Diagnostics and Therapy) bulletin (2013). In addition, pre-treatment based on functional analytic measures with occlusion splints and/or long-term temporary restorations to simulate the modified jaw relations, is recommended prior to final therapy.

The presented patient case confirms this stepwise approach. The patient adapted well to the rather extended temporary

phase – due to financial restrictions – of adjusting the patient-specific bite position and height. The fact that no loss of the temporary restorations occurred and that no repairs were necessary, appears to confirm this approach.

Direct insertion of onlays/veneers made of lithium disilicate would have been a therapeutic alternative to the two-phase final restoration with full crowns. This type of restoration is quicker and more gentle on teeth, but would not have proven expedient in this case due to unstable occlusion, extensive fillings and carious lesions [3,9].

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#### Dr. Christopher Hermanns

After training as a dental technician in 2004, Dr. Christopher Hermanns studied at the Friedrich-Wilhelm-University in Bonn. In 2010, he passed his state examination and received his doctorate in the same year. Until 2011, he worked in general practice in Munich and then joined the Masur Implant Center in Unterschleißheim. Since 2012, he manages the joint practice with Dr. Ralf Masur and Jan Märkle. Dr. Christopher Hermanns received the Focus on Implantology (BDIZ) and is a specialist for implantology (EDA) since 2016. He is active as national and international speaker on implant dentistry and prosthetics.



#### Dentist Jan Märkle

Jan Märkle studied dentistry at the University of Würzburg. In 2001, he received his licence to practice dentistry and worked in private practice until 2005. From 2003 to 2004 he absolved the Curriculum Implantology (DGI) and founded the joint practice with Dr. Ralf Masur in 2005 with a focus on implant dentistry, periodontology and prosthetics. Since 2012, Dr. Ralf Masur, Jan Märkle and Dr. Christopher Hermanns jointly run the implant center in Unterschleißheim. Jan Märkle is a member of numerous associations and is active as speaker on implant dentistry and prosthetics, both internationally and nationally.



#### Dr. Ralf Masur, M.Sc.

After studying dentistry at the University of Erlangen-Nuremberg, Dr. Ralf Masur received his licence to practice dentistry in 1992 and received his doctor's degree in the same year. After two years in private practice he spent one year in the Department of Implantology at Harvard University in Boston. Until establishing his practice with a focus on implant dentistry and periodontology in 1995, he worked at the Institute for Periodontology and Implantology in Munich. Dr. Ralf Masur is active as an international and national speaker in the field of implant dentistry and prosthetics. Since 2001, he is a specialist for implant dentistry (EDA). In 2005, he established a joint practice with Jan Märkle in Bad Wörishofen. Dr. Ralf Masur runs seven implant centers and is an active member in numerous national and international associations. He is a specialist for orthodontics and received a Master of Science in this field.



## Conclusion

This case demonstrates that even extensive restorations, both surgical and prosthetic, can be mastered in a predictable manner by using proven methods and materials. The close cooperation between dentist, patient and dental laboratory, without which such a result would not have been possible, needs to be emphasized yet again.

Our thanks go to the IDEAL Dental, laboratory in Bad Wörishofen for their excellent technical performance.

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## ALLEGEDLY THE SAME, BUT DO NOT WORK THE SAME: INDIVIDUAL TWO-PART ABUTMENTS

### PART 2: SURFACE TOPOGRAPHY IN THE SUBMUCOSAL REGION

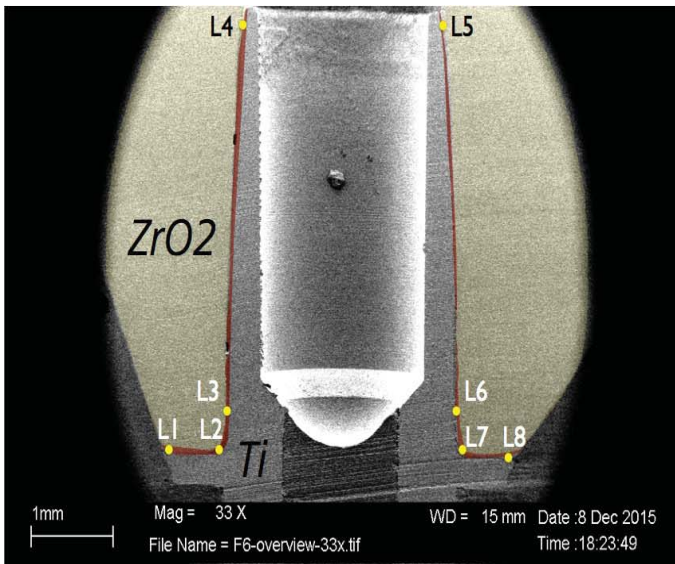
Dr. Peter Gehrke, Ludwigshafen, DT Carsten Fischer, Frankfurt a. M.

The authors have been involved with CAD/CAM abutments for more than ten years and their work and publications have contributed to the paradigm change in the manufacturing of implant abutments. In this series of articles they summarize their experience in surface topography. After describing fabrication precision and bonding of two-part abutments in the first part of the publication (logo 14), the second part focuses on the surface topography of abutments in the submucosal region. The third part is devoted to hygiene measures for abutments.

Presently there is great debate on the manufacturing of customized abutments – and that is a good thing! The topics fit, cleaning and surface topography of the individual structures are highly controversial. These aspects must be considered more and more in daily routine. We need reproducible rules,

for example, for the fabrication and bonding of titanium bases (see Part 1, logo 14), for surface topography in the submucosal region (Part 2) and for a safe hygiene protocol (Part 3, logo 16). This article answers questions on: what are the decision parameters for a production concept – in-house or outsourced – which

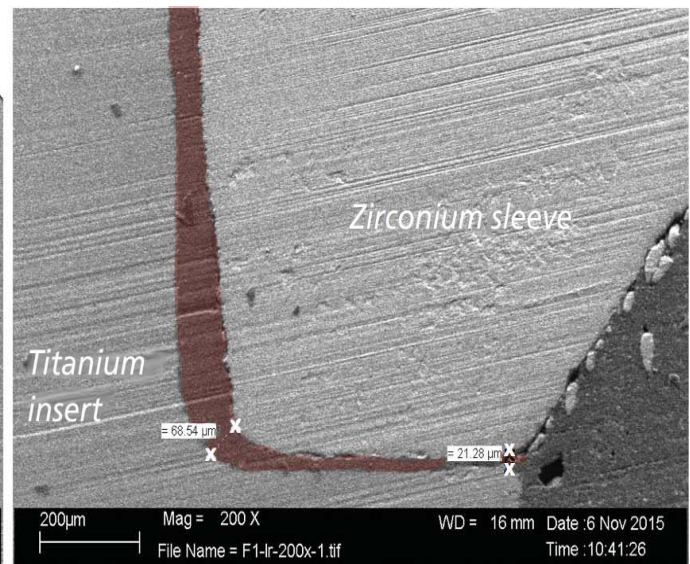
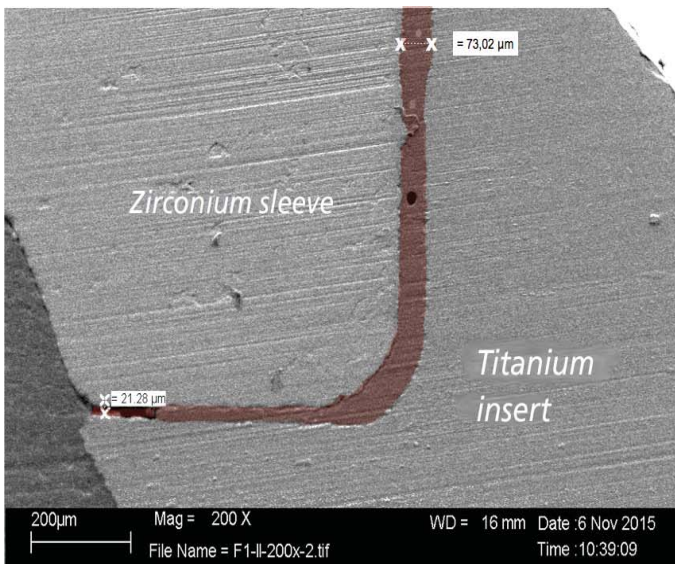
lead to fulfillment of the desired outcome quality? Does the industrially fabricated abutment need to be reworked? Are there concrete specifications on the roughness of the abutment in the submucosal region and how can these be complied with?



**Fig. 1:** Overview of scanning electron microscope (SEM) cross-section for a DEDICAM hybrid abutment. Colored white: ZrO<sub>2</sub>-CAD/CAM abutment on titanium base. Colored red: internal bonding joint with the measuring points L2 - L7 and the external bonding joint (contact with mucosa) with measuring points L1 and L8.



**Fig. 2:** Magnification of the external bonding gap (L1) with a size of 0.21µm. The gap of the bonding joint is therefore more than half as small as for adhesive mounting of crowns on teeth, where a bonding joint of 50µm is regarded as being ideal.



**Figs. 3a and 3b:** DEDICAM-fabricated (left image) and lab-fabricated (right image) zirconium oxide sleeve. Both approaches can achieve high-precision results.

### Precision and bonding gap

State-of-the-art dental technology is able to fabricate precision-customized abutments with modern milling machines and advanced know-how. However, one should take into account: the procedure or the quality of the result respectively, depend on numerous influencing factors, for example, calibration of the milling machine, milling cutter or sintering process. Predictability and reproducibility are of utmost importance, both for fabrication in the own lab or in centralized fabrication (e.g. DEDICAM). For us, the competent "extended workbench" of an

external partner delivers equally perfect results – day by day. The guarantee for maximum safety of a hybrid abutment lies in the fit of the abutment sleeve on the titanium base. Next to bonding itself, the bonding gap plays an elementary role. To achieve a secure bond according to our studies, the bonding gap must be small.

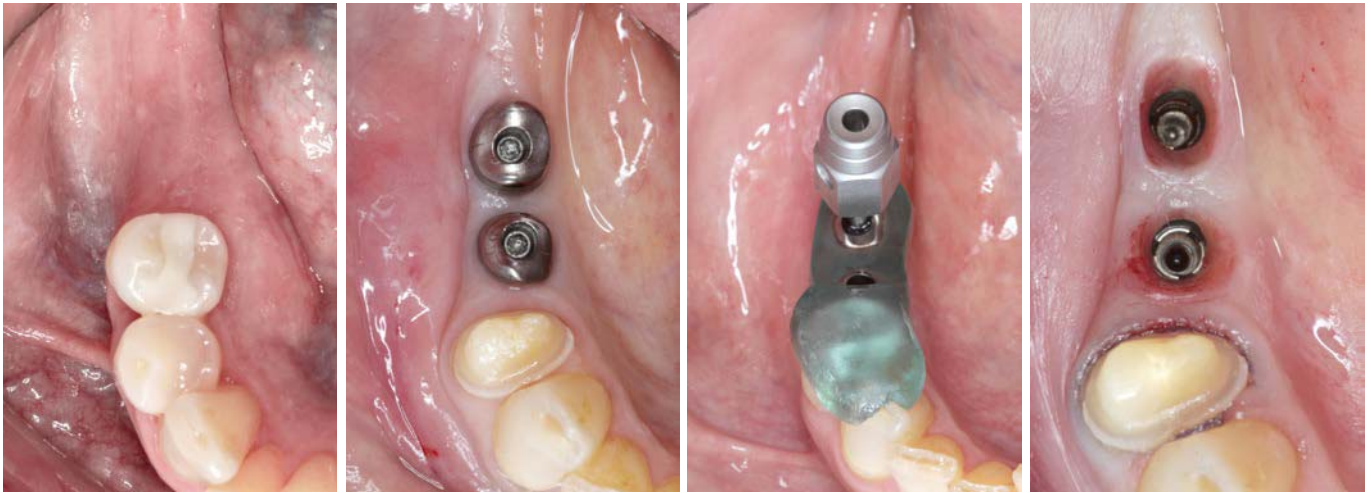
In a clinical investigation we compared the bonding gap between the titanium base and the zirconium oxide sleeve of in-house fabricated abutments with DEDICAM structures. Images taken under a scanning electron microscope (SEM)

showed the discrepancies which can occur if perfect lab conditions deviate (**Figs. 1 to 3**) [3].





Case study: Dr. Rafaela Jenatschke, Frankfurt a. Main / DT Carsten Fischer, Frankfurt a. Main



**Figs 4a to 4d:** Sequences of prosthetic implant restorations for posterior teeth with customized implant components for forming the emergence profile. For us, the forming of the emergence profile with customized gingiva formers is a necessary step in the protocol on the route to an optimal esthetic result.

Case study: Dr. Rafaela Jenatschke, Frankfurt a. Main / DT Carsten Fischer, Frankfurt a. Main



**Figs. 4e to 4g:** After forming, the definitive zirconium oxide CAD/CAM abutments and the ceramic crowns are inserted. The protocol described in the article for ideal surface topography and surface cleanliness was applied when fabricating the customized hybrid abutments.

### The effect of micro-design on the health status of soft tissue

Two aspects need to be discussed when looking at the surface topography of the basal region (**Fig. 4**).

1. Surface topography: Whether milled in the lab or coming from centralized manufacturing, there is always a risk that the abutments are too rough in the basal region. On the other hand, surfaces which are too smooth are contraindicated.
2. Surface cleanliness: Contamination of the surface can occur in centralized manufacturing (coolants, milling chips etc.) as well as during further processing

in the lab (excess adhesive, wear from rubber polishers etc.). Pre-assembled abutments can also be contaminated.

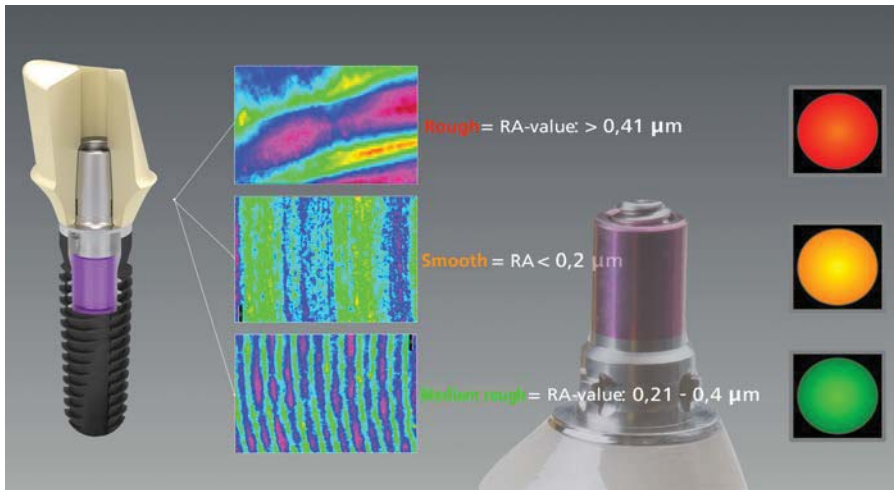
This tandem of facts makes it necessary to subject all customized CAD/CAM abutments to subsequent reprocessing. This needs to follow controlled and validated processes, as described in the following. We are of the opinion that this should not only apply to customized abutments, but to all prosthetic implant components – including pre-assembled catalog items.

It is the responsibility of the treatment team to assess the biocompatibility of the materials used, both from a dental and a material point of view. We have

examined different abutment surfaces and observed considerable differences in manufacturing quality. The surface quality of individual abutments is to be assessed in terms of the following aspects: plaque deposit, bacterial adhesion, potential for accumulation of peri-implant mucosa.

### Surface topography

Optimal adhesion of the peri-implant mucosa is desirable for a successful long-term result. A decisive role is played here by the surface of the implant abutment in the transmucosal region. The goal is solid adaptation of the peri-implant mucosa. However, we also know that this region is fragile and can react sensitively to toxic or mechanical influences. Using

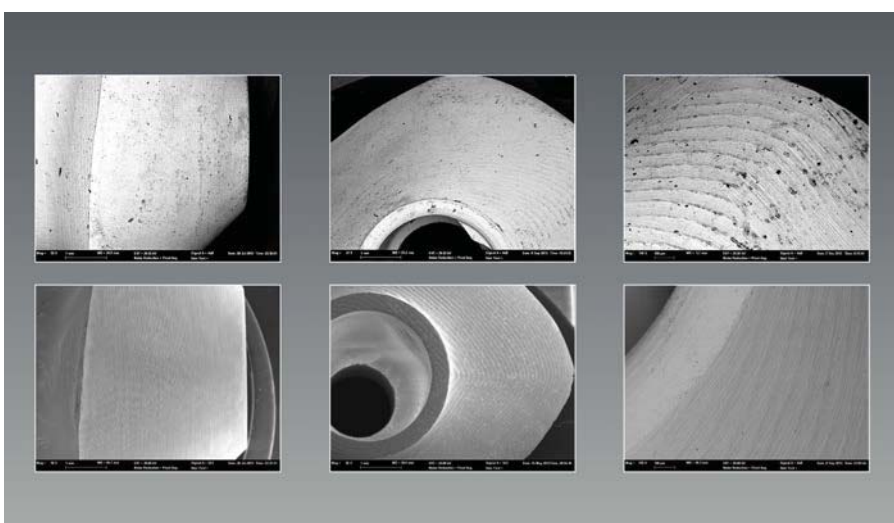


**Fig. 5:** The traffic light system for the classification of roughness in the basal region could be established as follows [1]:

- Rough = > 0.41 µm** (red: increased risk of plaque accumulation)
- Smooth = < 0.2 µm** (amber: reduced accumulation of fibroblasts)
- Medium rough = 0.21 – 0.4 µm** (green: perfect)



**Fig. 6:** Reworking of the surface in the basal, submucosal region with special rubber polishers. The desired residual roughness of 0.2-0.4 µm was achieved.



**Fig. 7:** The three images in the top row show contaminated components. The bottom three images show the same surface after applying the validated cleaning process presented here.

optical profilometry (focus variation microscopy), we examined the micro-design below the shoulder of CAD/CAM abutments of various manufacturers in a study. The objective was to define the ideal topography and surface roughness respectively.

Today, we can presume that there is a threshold value at which bacterial and plaque accumulation on the surface is low while at the same time promoting the accumulation of fibroblasts (**Fig. 5**). If the surface is too rough, this bears the risk of increased plaque accumulation. However, if the surface is too smooth, the fibroblasts of the peri-implant mucosa cannot "attach" optimally. Therefore a medium roughness value (in µm: Ra = 0.21-0.40) is regarded as the ideal surface. During the investigation on CAD/CAM fabricated abutments, a ten-fold higher surface roughness was detected in parts. In other words, this requires reworking to achieve the mean roughness value. According to our validated processing protocol (see surface cleanliness), the CAD/CAM hybrid abutments offer optimal roughness and demonstrate good conditions for the desired accumulation of peri-implant tissue.

### Consequence for lab and practice routines

In order to generate perfect surface finishing for all prosthetic implant abutments, we have defined a documented, validated work protocol. According to this protocol we machine the basal region of the abutment with special diamonded rubber polishers (Serius Ceramics, Frankfurt/Main) and so obtain a surface of between 2 to 4 microns of residual roughness, the proven standard for optimal tissue accumulation (**Fig. 6**).

### Surface cleanliness

It has been proven that contamination can occur on implant abutments – regardless of being customized or pre-assembled – which leads to questions regarding a long-term stable outcome (**Fig. 7**). The following applies as a matter of principle: customized abutments are medical devices which are classified as being semi-critical (Robert-Koch-Institute, RKI). In other words, professional cleaning must be



performed. Evaporating is not sufficient, and could, in fact, be counterproductive (Fig. 8). This requires rethinking and readjusting the dental work processes. The third part of the article (logo 40) will present a validated 3-step cleaning protocol which leads to a clean and perfectly hygienic abutment surface [2].

### Abutments are medical devices

We should be aware that implant abutments are medical devices which have to meet certain criteria. Dental technicians in particular, are faced with a new range of tasks which they should take on responsibly. It should be

determined in advance between the team partners dentist and dental technician, who is responsible for which step, and how documentation is to be performed.

### Conclusion

After the first article covered manufacturing and the second article the surface quality of implant abutments, the third part will discuss the following questions: which tasks are assigned to the dental technician in the finishing of pre-assembled or customized implant abutments? Which formula ("cooking recipe") leads to the desired goal? Which steps does a clean abutment surface

according to RKI guidelines bring with it? These are all new work steps for dental technicians which need to be incorporated into a state-of-the-art laboratory concept.

This information is summarized by the authors on a video which can be viewed on the Sirius Ceramics YouTube channel. The intention, status quo and the validated procedure are presented in an interesting and understandable manner.



Scan QR code  
and view video



**Fig. 8:** Simple evaporating of the CAD/CAM abutment is common practice, however, this does not comply with the hygiene requirements for a semi-critical medical device. A clean result according to the RKI guidelines is not obtained.

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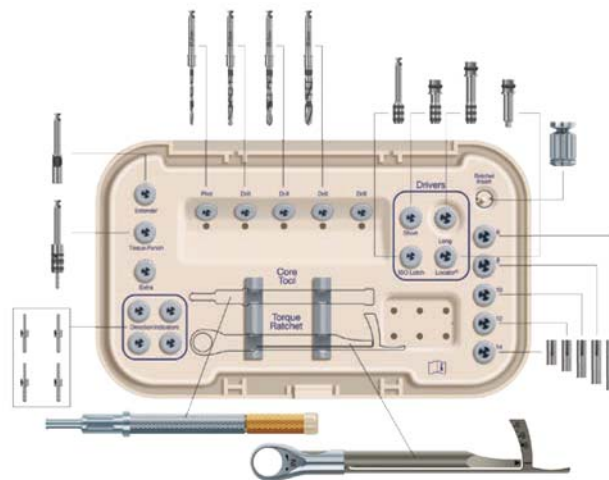


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### Carsten Fischer

Self-employed as dental technician with his own business since 1996, and active as international speaker since 1994. Publications in numerous countries (Brazil, Argentina, Japan, Australia, Europe). 2012-2015 part-time assistant at the Goethe University Frankfurt. Carsten Fischer is a member of advisory boards and has acted as advisor in the dental industry for many years. He focuses on CAD/CAM technologies, the ceramic double crown, customized abutments and full ceramic materials. In 2013, his contribution was honored as best lecture by the Working Group Dental Technologies, ADT. Carsten Fischer is lecturer at the Steinbeis University, Berlin, and speaker for various organizations (DGI) and Vice President of the EADT.



**LODI surgery kit (Premium)** including all surgical LODI instruments (without drills Ø 1.8 und 2.6 mm)



## LODI – THE LOCATOR® OVERDENTURE IMPLANT SYSTEM FOR STABILIZING OVERDENTURES

CAMLOG extends its implant portfolio and will distribute the diameter-reduced implants by Zest Anchors as of November 2016. The LODI implants are two-piece Locator implants for stabilizing overdentures in a severely atrophied mandible.

For many years now, CAMLOG has been distributing the patented Locator® Abutments by Zest Anchors for the CAMLOG®, CONELOG® and iSy® Implants with great success. The stabilization of overdentures with two or four implants in the mandible is an evidence-based treatment concept. Owing to the progressive atrophy of the mandibular bone in edentulous patients, it is often not possible to insert two-piece implants with a standard diameter without elaborate surgery. This is why many clinicians are looking to a diameter-reduced implant system for minimally invasive treatment.

CAMLOG has decided to include the diameter-reduced implants in its portfolio and distributes the LODI implants by Zest Anchors since November 2016. This underlines the good cooperation with Zest Anchors and CAMLOG also benefits from their outstanding experience in the field of overdenture anchorage.

The LODI system is a two-piece Locator® Implant. It is available in two diameters (2.4 and 2.9 mm), two gingival heights (2.5 and 4 mm) and three implant lengths (10, 12 and 14 mm). LODI is supplied as a complete set. This includes an implant, a Locator® Abutment, a retention housing

and various replacement males. The Locator® Insertion tool is used to screw the Locator® Abutment to the external implant thread and tightened with 30 Ncm. It can be changed if required. The surgery set is arranged clearly and follows the drill protocol. LODI implants are suitable for immediate restoration. The use of a gingiva punch for minimally invasive insertion of implants reduces the time required for surgical intervention.

By expanding our implant lines, we are in essence meeting the demands of our customers and their patients for a cost-efficient treatment option. The fixation of full dentures in a severely atrophied jaw with diameter-reduced implants has a positive effect on the patients' quality of life. The wear comfort also improves speech and esthetics. This in turn, increases the self-esteem and social competence of the patients.

Information on the LODI system is available from our sales employees.



**Included in complete set:**

- 1 Implant
- 1 LOCATOR® Abutment
- 1 LODI lab kit







## THE ISY® IMPLANT SYSTEM

### THREE-YEAR EXPERIENCE OF A USER

Nomen est omen, iSy is an intelligent system of extremely lean design and with an emphasis on time-saving and cost-efficient treatment. This objective is underlined by a well-arranged selection of prefabricated standardized abutments as well as combination options of digital and conventional therapeutic methods, online ordering and e-learning support. Nearly four years after the launch of the iSy implant system, the logo editorial team had the opportunity of speaking with Dr. Maximilian Blume from Mainz about his experience with the iSy concept, and wanted to know to what extent iSy has meanwhile become a part of his implant routine.



Dr. Maximilian Blume

#### What convinced you first with iSy?

**Dr. Blume:** I learned of the system at the Oral and Dental Department of the university clinic in Frankfurt some three years ago. As part of our implant consultation sessions I worked together with numerous manufacturers of implants and was therefore able to make good comparisons of the systems. What intrigued me about iSy was the simplicity given by the reduced number of components as well as the manner in which current trends and scientific insights could be implemented with the system. As a consequence, iSy offers the opportunity of providing very high quality implant dentistry in a large number of indications, both from a prosthetic as well as surgical point of view.

#### The transgingival concept saves time, and thus, money in the surgical part – but is it without problems in practice or does it result in limitations?

**Dr. Blume:** I have never felt this to be a disadvantage and have chosen the indications accordingly. The implant has a tapping thread and a slightly tapered outer geometry which allows for predictable primary stability. The gingiva former included in the system generally closes flush with the gingiva, so that burden is hardly transferred to the implant postoperatively. The fact that subgingival healing has now been added as an option to the system, certainly increases the scope of indications.

#### Has the lean iSy concept really made your treatment and practice management more time and cost-effective?

**Dr. Blume:** As we work together closely with our referrers and, of course, follow their wishes in terms of systems, we continue to work with a number of different implant systems. According to all our experience to-date, iSy leaves a good impression with patients as well as in the hygiene chain and storage. The prosthetic work procedure in particular, has proven very convenient indeed.

#### Is iSy primarily a standard system for less demanding situations?

**Dr. Blume:** Quite naturally, the system displays its strengths particularly in the restoration of single tooth gaps with transgingival healing and Locator® restorations. Nonetheless, iSy was a highly innovative concept right from the beginning in my opinion and allowed the clinician considerable creative freedom. This system covers a broad band of modern implant dentistry, especially with regard to CAD/CAM processes. In terms of temporary immediate restoration, I believe the iSy system is superior to other systems.

#### Due to its simplicity, would you recommend the system to beginners in implant dentistry and what needs to be taken into consideration?

**Dr. Blume:** I can recommend the system, it is well thought-out, intuitive, easy to integrate into practice workflows and clearly structured - certainly a good tool. But no implant system can be a substitute for solid practical training. Even an "easy" implant is a surgical intervention, and one should be able to manage its possible complications.

**What are your preferred areas of use for iSy?**

**Dr. Blume:** In our practice we use it mainly for posterior single tooth replacement with transgingival healing. As a rule, prosthetic restoration is performed with screw-retained hybrid crowns, in other words, lithium disilicate ceramic crowns bonded to a titanium base. This concept is of high quality, both esthetically and functionally. The second main indication in our practice is the restoration of edentulous jaws with Locator® Abutments, an indication for which this system is predestined.

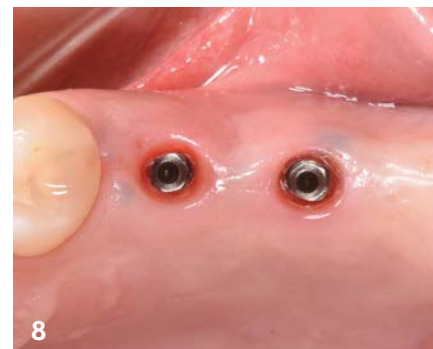
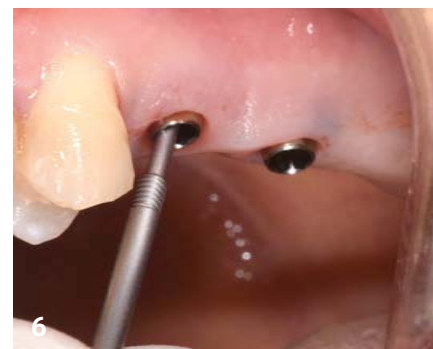
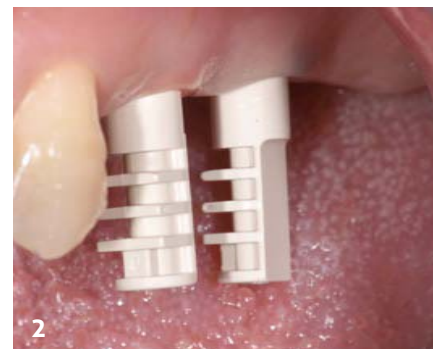
**Where do you see the special advantages for prosthetically oriented dentists and possibly, dental technicians?**

**Dr. Blume:** The individual steps follow a logical concept and the components are exactly matched. From a prosthetic view, the system offers advantages. Also, the technical workflow is simple and yet precise. Following the extension to the system, the prosthetic design options have become more diversified.

**The digital process chain in dentistry is closing rapidly – can you foresee additional advantages for yourself and the use of iSy?**

**Dr. Blume:** Of course one can restore analog quite conventionally with iSy, but the implant is also fully CAD/CAM compatible. Same as with a model, it can be scanned intraorally and is available in most digital libraries. In general we take impressions the conventional way with polyether. Our lab scans the model, designs, mills and customizes the crowns or bridges. I think it is an up-to-date concept and allows achieving excellent results.

**Thank you for your time and for speaking to us.**



**The iSy way – from impression taking to the final restoration**





Visualization of the new building

## CAMLOG MAKES ROOM FOR EXPANSION

### NEW ADMINISTRATION BUILDING WITH MORE SPACE FOR NEW IDEAS AND CONCEPTS

In the late summer, the CAMLOG Group celebrated an important milestone by laying the cornerstone for a new administration building in Wimsheim. Employees, together with international business partners, investors and numerous representatives from industry and politics attended the celebration. The new building offers some 5,000 square meters and creates space for more than 100 office workplaces, a training center and a cafeteria.

Jean-Marie Wyss, Managing Director of the ALTATEC GmbH, which is part of the Group and exclusive manufacturer of CAMLOG products, opened the ceremony. Attendees included Stanley Bergman, Chairman and CEO of Henry Schein, Inc., the parent company of the CAMLOG Group, who praised the success of CAMLOG and the performance of the CAMLOG team.

"CAMLOG has grown in leaps and bounds in the space of only a few years and today represents the gold standard in implant dentistry" said Bergman. "This success is largely due to people who worked tirelessly to satisfy CAMLOG's customers, and we from Henry Schein offer CAMLOG

our congratulations to this extension" These words could only be confirmed by Michael Ludwig, Managing Director of CAMLOG Vertriebs GmbH: "Our customers are delighted with the quality of our products as well as our work. The new building will give the unique spirit of our company even more space and manifest the character and philosophy of CAMLOG. The building which we are constructing shows who we are and what we want. It is a place of action for our talents, ideas and our productivity. Our new building will help us to address our future together and to follow new paths in sales and all areas of customer service and customer orientation."

The new building in Wimsheim is a significant milestone for CAMLOG. The company continues to expand its leading market position in the dental industry.

"To be successful, you need a strong foundation. And this, regardless, as to whether this relates to a new building or a career", said Dr. René Willi, Member and Delegate of the Board at CAMLOG Holding AG. "This highly modern building will strengthen our ability to serve our customers, to expand further, and to strengthen the performance of our employees. Together we are creating an excellent base here to create new jobs and to drive the expansion of CAMLOG further."

Dr. Alex Schär, Chief Technology Officer at CAMLOG Biotechnologies AG (l.), appointed as Honorary Member by President Prof. Dr. David A. Felton (r.)



## DR. ALEX SCHÄR WAS ELECTED HONORARY MEMBER OF THE "ACADEMY OF PROSTHODONTICS"

At the last meeting of the "Academy of Prosthodontics" in Palm Springs, California, Dr. Alex Schär was elected as Honorary Member. It is the oldest and most prolific prosthetic organization worldwide and will celebrate its centenary in 2018. Only a small circle of invited experts with subsequent qualification can become members. Currently, the Academy counts 79 active members, 15 associate members, 49 life fellows and only six honorary members. These include Professor Per Ingvar Brånemark, who was elected honorary member in 1984.

Dr. Schär was elected on the basis of his references in the field of biomechanics and the development of dental implant dentistry as well as prosthetic components. A quote from his letter of nomination: "His interests in prosthodontics for implant therapy are recognized worldwide and he is a leading expert in this field." Recognition of this expertise was the basis for his nomination. What is also impressive, is that Dr. Schär was voted unanimously by all members of the Academy.

### About the Academy for Prosthodontics

Founded in 1918, the Academy for Prosthodontics is the oldest organization

in dental prosthetics. Its members are all renowned clinicians, trainers and technical experts from across the globe. The Academy focuses on solid growth by attracting young dentists who know their job and share their knowledge with other members and specialist groups.

### Or to be more precise:

In 1918, respected dentists with a dominant interest in prosthetics queried the current state of development in dental prosthetics. They analyzed the degree to which the various techniques and concepts were used in the different parts of the country. Furthermore, they were of the opinion that the anatomical, physiological and technical

aspects of prosthetics not only had to match but should also be developed and expanded further. The Academy for Prosthodontics was founded in the same year (1918). In 1990, the Academy established a Foundation with the objective of promoting science, teaching and research in dental prosthetics as well as offering dental services to those in need. The nomenclature for prosthodontic terminology was prepared by the Academy and is updated and expanded regularly.

Further information on the Academy is available at:

[www.academyofprosthodontics.org](http://www.academyofprosthodontics.org)



# FLUENTIS



More information on the seminar for entrepreneurs can be found at:

[www.kmu.unisg.ch/dent](http://www.kmu.unisg.ch/dent)



Universität St.Gallen



## CAMLOG IS PLATINUM SPONSOR

OF THE NEW TRAINING PROGRAM OF THE UNIVERSITY OF ST. GALLEN AND FLUENTIS GMBH

To have your own successful dental practice these days requires more than just dentistry and industry expertise. Increasingly dentists are faced with business affairs in their professional routines. The University of St. Gallen and Fluentis GmbH have developed a suitable training program for this topic.

Changing patient expectations, pressure from competition or new methods of restoration are just some of the factors which contribute to a growing demand for business know-how in practice management. The Institute for small and medium-sized companies at St. Gallen University and Fluentis GmbH have taken up on this topic and will be offering a tailor-made training program for dentists in Switzerland starting in February 2017.

In its role as Platinum Sponsor, CAMLOG is convinced that dentists will also need training in the areas of management, organization, marketing and business administration to have successful practices. This will be the only way to differentiate themselves from competitors and to meet the changing environment.

### From practitioners for practitioners

The practice-oriented training program is directed exclusively at the needs of dentists. The objective is to convey business administration knowledge to dentists,

which they can apply immediately in daily routine. The seminars are run by speakers with practical experience as well as experts on the subject. In addition, this allows an exchange of personal experiences of the participants with other dentists.

### Integrated management of a dental practice

The seminar for entrepreneurs consist of five modules of one whole day each, spread over five months, and covers the following subjects:

- Practice management: my role as an entrepreneur
- Personnel management: managing, supporting and challenging personnel
- Process-oriented organization: perfect organization of the dental practice
- Financial practice management: optimizing turnover, minimizing costs
- External image of the practice: patient orientation and practice marketing

plantologie plus e.Learning

en Präsenzkursen: wiederholen, auffrischen, vertiefen  
 unabhängig von Ort und Zeit  
 praxisorientiertes Wissen



## DGI EXPANDS THE USE OF ITS E.ACADEMY

CAMLOG AND STRAUMANN ARE COMMITTED LONG-TERM AS "EXCLUSIVE SPONSORS"

DGI continues to expand the use of its e.Academy, a high level e-Learning Program. It now complements the learning offers for students enrolled in the DGI Steinbeis Masters courses of implant dentistry and periodontology. The e.Academy is supported by CAMLOG Biotechnologies AG and the Institute Straumann AG, who have committed themselves long-term as exclusive sponsors of the e.Academy.

With its DGI e.Academy, the German Association for Implant Dentistry (DGI) has already been offering a high-level training opportunity for online-based, time and location-independent learning at your own rhythm and speed. A mixture of texts, videos, graphics, together with elaborately produced 3D animations, facilitates learning. Each model is assigned the same number of education credits as a two-day face-to-face training.

The e.Academy has been an integral component of the DGI Curriculum Implantology since June 2016. Now it is available free of charge to students taking a Masters course. Established implantologists who wish to update their knowledge can also benefit from this offer, even if they are not members of the Association. However, there are favorable conditions for DGI members.

Currently six e.Tutorials on various aspects of hard and soft tissue regeneration, on augmentation and bone healing, on surgical and technical complications during implantation as well as on peri-implantitis are available. Once finished, there will be 18 e.Tutorials. A multi-step quality assurance process ensures the high scientific and clinical standards of the contents. The condensed knowledge of leading experts in implant dentistry acting as authors or publishers, is supplemented by own electronic suites with additional information from CAMLOG and Straumann.

The two companies accept and comply with the strict compliance requirements set out by the DGI. These were part of an official tender.



**Deutsche Gesellschaft  
für Implantologie**

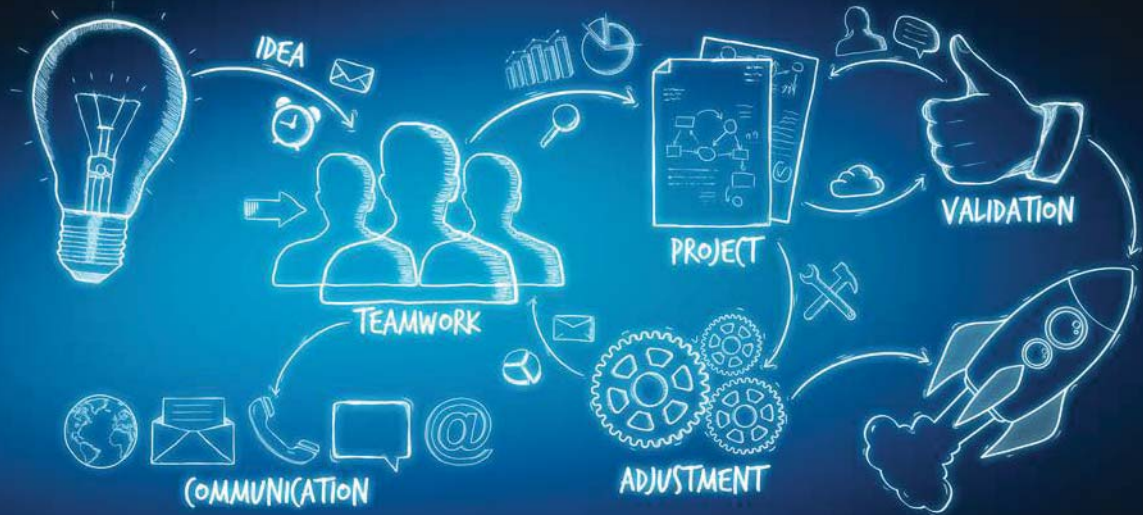
"CAMLOG feels obliged to sustainable commitment", says Michael Ludwig, Managing Director of CAMLOG Vertriebs GmbH. "We are therefore very proud to support the pioneering future project of the DGI e.Academy and thus underline our own competence."

For further information please go to [www.dgi-ev.de](http://www.dgi-ev.de)





Andrea Stix, M.Sc., MBA  
 Consultant for Communication Strategy and Practice Marketing  
 Syst. Business Coach, Reiss-Profile-Master, NLP Coach



## ANALYSIS

### STEP ONE FOR A GOOD STRATEGY

A strategy is always preceded by a vision. A vision is made up of two elements: one is a clear concept of what is to be achieved in the opinion of the business over a longer time period. The other is a consideration of the substantive core that makes up a company, that is, its fundamental values and beliefs. Particularly for smaller to medium-sized owner-operated companies such as dental practices, it is essential that these beliefs correspond to the personal values of the owner or the practice partners. Therefore both elements need to be determined professionally for solid strategy planning. Ideally the analysis is already conducted during start-up to be more effective in terms of planning, thus saving time and costs. However, various analytical tools to check or adapt the strategy and concrete plans for measures can be used at a later date. In this article, I will be looking at which tools can be used for sensible planning and development of a practice strategy.

#### Recognizing market potentials

The so-called SWOT analysis is suitable for analyzing the future viability of a dental practice. This was developed in the 1960s at the Harvard Business School. "SWOT" is an acronym and stands for Strengths, Weaknesses, Opportunities and Threats. The SWOT analysis is used both for determining the current position of the company on the market and evaluating market potentials. The goal of this process is to carefully analyze the opportunities and risks of the environment, and to become aware of own strengths and weaknesses. The SWOT analysis can be used as a meaningful basis for deriving strategy development for a business. During my work as a consultant I have often found that SWOT analyses are not

conducted properly, so that their results are hardly meaningful.

The strengths and weaknesses of the practice to be analyzed relate to internal business areas – the results are therefore unique. The opportunities and risks are external and relate to the market environment of the practice. The results should therefore be analog to comparable practices in the region. However, external opportunities are often mistaken for internal strengths. These must be considered strictly separate. The conclusion of the analysis provides meaningful combinations for maximizing the benefits from the strengths and opportunities and minimizing possible losses from the weaknesses and risks or dangers.

A SWOT analysis is the easiest form of a practice analysis. It is recommended to repeat this every two to five years. It has proven very effective, if the analysis is conducted in a workshop as a team with the entire practice personnel. It is also useful, if the employees obtain feedback from friends or family on the external image of the practice. This is sensible in that it preempts the potential risk of own subjectiveness and allows outlining a realistic as possible picture. The social desirability of all answers should therefore be communicated openly to the team to produce an effective result. The SWOT analysis can also act as basis for future marketing planning.

SWOT analysis		internal	
		Strengths	Weaknesses
external	Opportunities	<b>Matching strategy</b> Utilizing opportunities which fit well to the strengths of the practice.	<b>Conversion strategy:</b> Eliminating weaknesses to utilize new opportunities, i.e. converting a threat into an opportunity.
	Threats	<b>Neutralization strategy:</b> Utilizing own strengths to fend off threats and thus "neutralize" them.	<b>Defensive strategy:</b> Do not allow own weaknesses to become a threat.

### Recognizing competitive potentials

Another useful analysis is to examine the competitors in the regional environment. This is where I evaluate the strongest competitors in my consultancy work, for example, in terms of price-performance ratio, patient loyalty, location and other elements which could act as clues for developing one's own practice strategy. I often notice that the immediate competition is not on the radar of the practice owners. It is however essential to take a look at the practices in the direct vicinity through the eyes of potential new customers in order to identify and understand one's own position.

Well functioning strategies in a prospering market can be imitated with me-too strategies. But quite the opposite is also true, where practice concepts are developed which are diametrically opposite to those of the competition. Similar strategies for tapping into new potential are also possible, on the premise of highlighting specific unique characteristics in an eye-catching manner. Entirely new and stand-alone concepts may also prove to be the means of choice. Knowledge of the market conditions is essential in any case.

The direct market environment can be analyzed to provide a location study. Based on real market data, the customer structures are evaluated in order to reliably identify and assess potential target groups for the practice. For example, this can provide insights on the geographical localization as well as sociodemographic background of existing regular patients. It is also possible to draw conclusions about potential new patients. With the aid of the

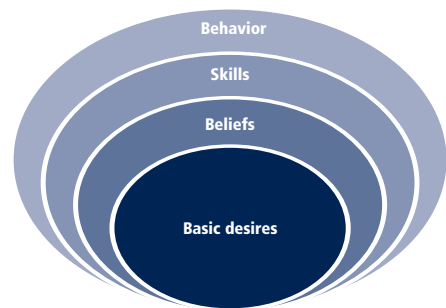
location study, insights can also be gained on the market penetration and customer concentration in the various areas within the catchment area of the practice. These insights could well be the basis for further planning as well as for the external image of the practice.

### Recognizing potentials based on your personality

The so-called "Reiss profiles" are ideally suited for recognizing personal drivers and motivations. The Reiss profile is a renowned tool in personality psychology which analyzes the individual characteristics of the 16 basic desires which form the personal drivers and motivation structure of a person, and which is therefore very effective when used for strategic planning. The Reiss profile was developed by Prof. Steven Reiss, Professor for Psychology and Psychiatry, and has been successful on the market internationally for over 30 years. It is one of the few tools in personality analysis which is based on science, offers a high retesting reliability, as well as criterion, convergence and factor validity. It is a leading tool for the subject of needs, values and motives and allows deriving precise measures for quick and effective target achievement in various fields of action. In contrast to other tools, it focuses on individuality and does not attempt to categorize. This is the reason why I prefer to use the Reiss profile in my strategic consultancy to provide that additional extra in terms of sustainability and efficiency.

### Understanding personal motives

The human personality can be explained using the so-called "onion method".



The four levels interact outwards from within: our basic desires determine our dogma, the so-called beliefs. These in turn have an influence on which skills we acquire during our lifetime. These competences play a major role in defining our behaviors. The Reiss profile exclusively analyzes the stable characteristics of a personality's core – the basic desires.

As already mentioned in the beginning, the use of these analytical tools is especially meaningful when establishing or taking over a practice, as this can provide decisive pointers for successful self-employment. These instruments can provide useful services at all times, as the strategy always needs to be adapted over the entire time frame of private practice, as does the definition of goals and measures.

These tools are important aids for strategic communication planning. However, as even the best strategy is only worth as much as its subsequent implementation, I will take a closer look at the topic of "Motivational management using the Reiss profile" in my next contribution.





## CAMLOG START-UP-DAYS

### CAREER START WITH A PLAN

Under the motto "Log in to your future", over 230 young dentists attended the CAMLOG Start-up-Days in Frankfurt am Main. The two-day congress focused on the needs of young dentists who were at the beginning of their professional career. This gave young dentists the opportunity of exchanging personal experiences with long-standing owners of dental practices and to find encouragement for their own career as dentists.



"We want to inform, inspire and motivate the next generation for their professional future and career", is how Michael Ludwig, Managing Director of the CAMLOG Vertriebs GmbH, explained the innovative further education format. On the first day of the congress, experienced practice owners gave practice-oriented presentations with a wealth of information about the challenges of starting up a practice, practice management as well as giving useful tips to the delegates. On the second day, the young dentists were able to join the action: in nine different workshops they were given valuable fundamental knowledge in the areas of business administration, practice concepts, personnel management, marketing and implant dentistry. In addition, CAMLOG raffled eight consultation days among the delegates.

#### A successful practice – getting it right

The different success stories of the speakers showed: there is no panacea. The two moderators, Dr. Kathrin Becker M.Sc., Düsseldorf, and Dr. Dr. Nils Weyer, Esslingen, summarized some of the factors which are important for success as follows: start with a practice concept which offers growth potential as well as dedicated employees and mentors, but also perseverance and the ability to cope with defeats.





At the start of the event, Michael Ludwig made particular reference to a success factor in his presentation of the CAMLOG success story: highly dedicated employees. Professional personnel management is an important task if one intends to find and keep competent employees in the long term. Another tip for greater success: observe the trends. For example, advancing digitalization in dentistry and the ageing population should be taken into account for a practice concept.

### Founding a practice – yes or no?

Coach Frank Caspers, Ginsheim-Gustavsburg, showed how personal success can be actively created and specifically influenced by applying one's own thinking. Dr. Andreas Kraus, Peiting, values his creative freedom to be his true self in his practice. He started with a clear concept and allowed organic growth of the practice over time. The vision of how a practice concept can work out, was presented by Dr. Angela Dergham, M.Sc., Stuttgart: dentistry in the hands of specialists in a practice with several colleagues.

Orthodontist Dr. Oliver Zernial, Kiel, specialized in implant dentistry in his referral practice. In order to differentiate himself from other referral practices in his regional environment, he focused on certain surgery techniques.

To achieve economic success, Dr. Stefan Ulrici, Leipzig, streamlined and standardized workflows. This makes

implant restorations accessible to as many patients as possible, also by employing the advantages of the iSy implant system.

According to Dr. Ralf Masur, M.Sc., Wörishofen, potential develops best in cooperation with colleagues. This makes it easier for him to discuss complex implant cases within the treatment team, where he plays an equal role. His tip: the vision "Implants for everybody" can only be realized with an implant system which offers a fair price-performance ratio.

### Business administration, team management and implant dentistry

The topics of the workshop were extremely diverse: tax consultant Oliver Drifthaus, Leinfelden-Echterdingen, and Manager for strategic practice concepts, Bernd M. Wagner, Wimsheim, covered business administration. Structures for reliable performance should be incorporated into workflows right from the start. Dr. Martina Obermeyer, Munich, spoke on the topic of challenges for self-employed dentists. Her tip: prudent financing to have security in case of possible pregnancy and parental leave. A good team and marketing are major factors for a successful practice. Business Coach Sandra Steverding, Wimsheim, explained the important aspects for professional personnel management and Andrea Stix, M.Sc., MBA, Wimsheim, developed the cornerstones of a brand building process together with the young dentists.

In the workshop on implant dentistry, the young dentists were first confronted with

basic knowledge. Whereby PD Dr. Michael Stimmelmayer, Cham, underlined that surgery was simply a matter of routine. In the following hands-on workshops, the participants were able to gather first practical experience. Under the guidance of Dr. Stefan Beuer, M.Sc., Landshut, the dentists inserted an implant in a plastic jaw. Dr. Tobias Schneider, Seefeld, was in charge of the scalpel session, for example, practicing the incision for a mucoperiosteal flap. Dr. Jörg-Martin Ruppin, Peißenberg, and Danny Dorn, Wimsheim, demonstrated the handling of gingiva formers and impression posts.

### Get together

The end of day one of the congress turned out to be a highlight, quite literally: the young dentists were given a sensational view of the metropolis on the Main River from Windows 25 of the Japan Tower as well as making the most of the opportunity of expanding their network in a relaxed club atmosphere.





## STRONG TEETH AT LAST – WITH COMFOUR™



**Fig. 1:** Prof. Lutz Ricken explains his philosophy for using the COMFOUR™ System.



**Fig. 2:** Prof. Ricken inserted four CAMLOG® SCREW-LINE Implants at this live surgery course; the distal implants were placed at approximately 30° angles.



**Fig. 3:** Dental technician Tolga Kütük finished the metal-reinforced immediate restoration "intraoperatively".

Edentulous patients in Germany are still largely not restored with implant-supported dentures. According to the fifth German Oral Health Study (DMS V) which was published in August 2016, the proportion of implant-supported dentures in the age group 75 - 100 years was 8 percent. With the COMFOUR™ System and correspondingly matched treatment concepts, it is possible to restore patients with an occlusally screw-retained immediate temporary denture and to replace this after an appropriate healing time with a fixed denture. CAMLOG offers a nationwide series of live surgery courses with renowned speakers for this type of restoration. The logo editorial team joined one of these courses held by Prof. Lutz Ricken in Bad Wildungen.

According to the DMS V, some 145 million teeth (without wisdom teeth) are missing among the about 8.2 million people aged between 75 and 100 years. On a more gratifying note, the proportion of edentulous patients has dropped considerably versus the nine year old version of the DMS IV. Nonetheless, some 32.8 percent of people in this age group (equals 2.7 million) were still completely edentulous. The percentage for an edentulous maxilla is 47.1 percent, for an edentulous mandible 34.4 percent. 8.0 percent of the investigated patients (0.66 million) had implant-supported dentures. This demonstrates that the potential for implant-supported dentures is considerable. Next to removable dentures on implants, more and more patients are deciding in favor of an occlusally screw-retained restoration with the COMFOUR™ System.

Professor Ricken has been involved with this concept since 2009. Many of the several hundred patients he has already restored in this manner are well over 80 years old and the implant survival rate of this immediate restoration concept with a placement of more than 1,300 implants exceeds 99 percent in his practice. This makes the concept highly successful and it meets the patient's wish for strong teeth, attractive esthetics, short treatment periods and moderate costs due to the reduced number of required implants compared with other concepts for fixed restorations.

Rethinking to surgically oriented implants is not easy, states Professor Ricken. Often bone had to be sacrificed so that the "transition line" lies above the smile line and for the 16 mm long implants to be placed 3-dimensionally in an optimal

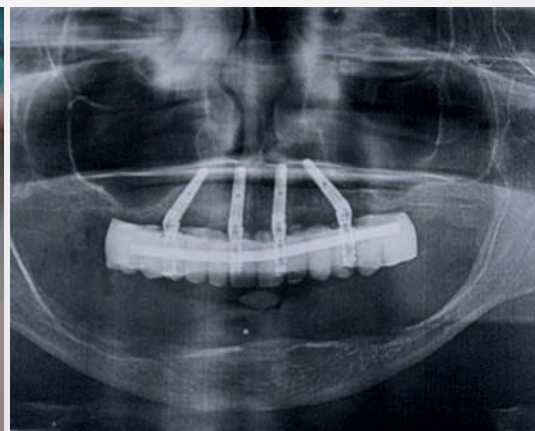
manner. Professor Ricken does not use a surgery template due to the problem of fixation in an edentulous jaw. As a rule, the patient is under full anesthesia for 2.5 hours per jaw and wakes up with a fixed immediate temporary denture. This is obtained with the aid of a deep drawn splint from the existing denture, metal-reinforced and finished by the dental technician during treatment. The connection to the intraoperative screw-retained COMFOUR™ Abutments or bar abutments has a perfect fit via titanium caps. The COMFOUR™ Abutments are screwed in once and no longer removed. After a healing period of six to twelve weeks the patient can receive definitive restoration at abutment level with COMFOUR™ accessories. Strong teeth at last – with COMFOUR™ and in a single session!



**Fig. 4:** Co-speaker Peter Breil (CAMLOG) explained the technical aspects of the COMFOUR™ System.



**Fig. 5:** After successful insertion of the temporary restoration, the occlusion was checked and adjusted.



**Fig. 6:** The result of surgery in the OPG illustrates the successful polygonal support of the temporary restoration.







## THE 5<sup>TH</sup> CAMLOG DENTAL TECHNICIANS CONGRESS IN ESSEN

THE PLACE WHERE NEW IDEAS ARE BORN AND FASCINATING IMPRESSIONS LAST

The word fascination does not automatically spring to mind in the Ruhr area. That is, until you have seen the Colosseum Theater in Essen, and visited the location for the 5<sup>th</sup> CAMLOG Dental Technicians Congress on 13 May 2017. Under the motto "Fascination of implant prosthetics", experienced experts will be speaking on new developments and materials as well as digitalization and its effects on technical dentistry.

What makes Essen and the Colosseum Theater the ideal location? In the past, the Ruhr metropolis stood for technical progress like hardly any other city in Germany. CAMLOG picks up on this heritage and will therefore hold the 5<sup>th</sup> CAMLOG Dental Technicians Congress in the former "8<sup>th</sup> Mechanical Workshop" of the Friedrich Krupp AG – today a listed and inspiring building which stimulates new thinking.

### Focus on patients

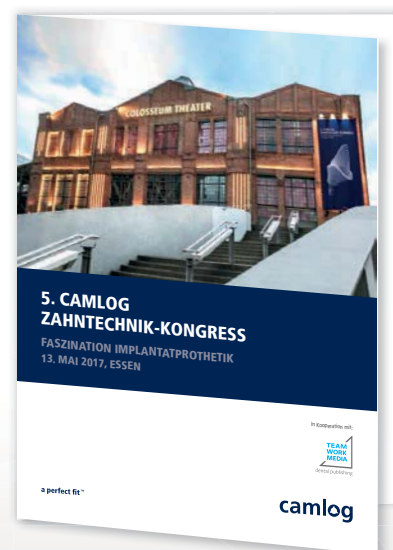
Digitalization was already the top topic at the last congress in the year 2015. And the megatrend goes on and on. Digitalization and the resulting options for customized patient restorations are focus points of the congress. The wishes and needs of patients are also a major focus and are related to throughout the entire program. In their presentations, the speakers will be dealing with three core questions each, which they will analyze and answer on the basis of their experiences. Raise your questions too, and discuss them with the experts!

### Presentation extraordinaire...

...will be held this time by Urs Meier, one of the most prolific referees in the soccer world. Whether in a stadium in front of over 60,000 spectators, as advisor to the UEFA or as commentator for the ZDF (German TV station) – Urs Meier knows how to handle enormous pressure daily. In nearly 900 professional matches as a referee, he has demonstrated how to analyze complex situations and take decisions in fractions of a second. In his presentation "You are the decision" he encourages his audience to take decisions with joy and without fear. Something you can look forward to!

### Successful networking!

Next to an interesting program with brilliant experts you have the ideal opportunity of making new contacts and refreshing your knowledge. New ideas for a successful future and meeting up with colleagues from all over Germany again are guaranteed!



The complete program and further information on the 5<sup>th</sup> CAMLOG Dental Technicians Congress can be found at [www.faszination-implantatprothetik.de](http://www.faszination-implantatprothetik.de)





### THE MODERATORS



Dr. S. Marcus Beschnidt



MDT Gerhard Neuendorff

### PRESENTATION EXTRAORDINAIRE



Urs Meier

### THE SPEAKERS



DT Carsten Fischer



Dr. Peter Gehrke



PD Dr. Jan-Frederik Güth



MDT Hans Joit



DT Andreas Nolte



MDT Jochen Peters



MDT Udo Plaster



MDT Otto Prandtner



MDT Sebastian Schuldes, M.Sc.



MDT Josef Schweiger



Dr. Ferenc Steidl



DT Martin Steiner



MDT Jürg Stuck



MDT Sascha Wethlow





Jan Peters  
Writer Kaiseraugst/Switzerland



## 2030 – "GERMAN REQUIEM" FOR COMBUSTION ENGINES

In a country where pioneers such as Nicolaus August Otto, Wilhelm Maybach and Karl Benz made their ingenious inventions, started and rigorously promoted developments which, in the true sense of the word, still "keep the world on the move" today, it can surely be expected that it will continue to set benchmarks for individual mobility. Today, German engineering skills, which were largely responsible for the reputation of "Made in Germany", are faced with an even greater challenge, that of leading automotive engineering into its next age with a quantum leap – that of sustainable environmental compatibility.

We do not need polar explorers and highly specialized glaciologists to tell us about drill cores from the depths of polar ice layers suggesting there can be no doubt that meteorological events are taking place which require our dire attention. The past few years, with their accumulation of extreme weather conditions such as heatwaves, severe weather and floods, even in our (still) "moderate" climate zones, have clearly demonstrated that massive changes are taking place in atmospheric circulation, the consequences of which cannot even be closely predicted due to the number of factors involved. For example, the permafrost soils of the Arctic Tundra contain unbelievable quantities of CO<sub>2</sub> which will be released into the atmosphere when they melt, as already being observed today, which will lead to a massive increase of the greenhouse effect and raise the average temperature.

And although it is occasionally stated that this tends to be the rule rather than the exception in the evolution of Earth, this still cannot discount the fact that mankind's effect on climate through industrialization and motorization represents a phenomenon so far not seen.

### Driver climate treaty

There was considerable unrest recently, when the German Federal Council announced that there should/would be no more vehicles with combustion engines in Germany after 2030. This is based on the Paris Climate Treaty signed by the Federal Republic of Germany at the end of 2015. The treaty stipulates that the world should be CO<sub>2</sub>-neutral as of 2050. This implies: carbon dioxide should not be emitted in quantities greater than those which can be absorbed through the photosynthesis of plants, for example. The German Federal Council comments: "Since not all industrial sectors will be free

of greenhouse emissions by the year 2050, we expressly support the goal of having virtually emission-free mobility within the EU by the year 2050." And the "abolition" of pollution-emitting combustion engines in Germany by 2030 shall represent a decisive contribution.

As things stand today, "emission-free mobility" can only be achieved if the global fleet of vehicles is more or less fully converted to electric vehicles by 2050. The energy required for propulsion would then have to be generated entirely from renewable resources such as the sun or wind.

### Where does Germany stand?

It would by far exceed the limits of our short "article of encouragement" to list all the possible technical options here. Three major issues in E-mobility no doubt include battery technology (range!), the costs of



batteries and the still more than scarce provision of charging stations in Germany. From an anticyclical view, one could argue that the battery disaster presently suffered by Samsung also offers opportunities of considerably advancing development to achieve a breakthrough.

A look at the pipelines of our leading automotive manufacturers in Germany indicates that the challenges have been understood and accepted. For example, Daimler Benz has assured us that they will have more than ten fully electric vehicle models on the market by 2025. And the competitors from Munich, Wolfsburg, Rüsselsheim and Cologne are not far behind.

### **Let's get our act together!**

Didn't somebody just recently sing the daunting line "Things continue beyond the horizon" ("Hinter'm Horizont geht's weiter")? Instead of being faint-hearted, maybe we should place our trust in old rocker Udo Lindenberg's text line and combine it with proven German engineering virtues to catapult the automobile into a new era. The gentlemen Nicolaus August Otto, Wilhelm Maybach and Karl Benz have already demonstrated par excellence and "Made in Germany" how this can be achieved.