Study: IPS e.max lithium disilicate material the most durable ceramic tested to date

In particular, unlike previous laboratory tests that only assess a material’s physical properties to meet minimal standards, the mechanical mouth simulator stressed the restorations using clinically relevant directed loads over thousands of cycles (similar to how people chew) until failure occurred.

Failure was considered to be chip-off fractures of the veneering ceramic in the case of the zirconia crowns or fracture/chip through the lithium disilicate crowns. The research found that none of the IPS e.max CAD lithium disilicate crowns failed below 1,000 N and 1 million cycles.

In comparison, the veneered zirconia crowns tested demonstrated limited reliability, with approximately 50 percent of the crowns tested failing from veneer chip-off fractures by 100 K cycles at 200 N, which is similar to previous research findings. Also, 90 percent of the veneered zirconia crowns tested failed by 100 K cycles at 550 N.

Overall, in comparison to the veneered zirconia systems that were tested, the IPS e.max CAD lithium disilicate full-coverage crowns can be expected to demonstrate excellent clinical performance relative to chip-off or fracture based on the findings of the NYU College of Dentistry.

Dentistry mouth motion simulator testing. The failures reported in this study mimic those reported in clinical studies, suggesting that IPS e.max lithium disilicate is the most robust all-ceramic system tested to date.

(Edited by Fred Michmerhuizen, DTAL.1)

Union health ministry look into dental council decision

The Union health ministry has set up a four-member technical committee — director general of health services Dr R K Srivastava, Dr Naseem Shah, Dr O P Kharbanda from the department of dentistry at AIIMS, and Dr Ashok Aneja from PGI Chandigarh — to investigate the decision taken by Dental Council of India (DCI), to decline the permission given to around 45 new dental colleges on grounds of not having necessary faculty to run a dental college and enough clinical material to teach student, according to a report published in newspaper The Times of India. Besides, DCI has not renewed the registration of nearly 42 existing dental colleges as well.

Presently, the country has near about 280 dental colleges, producing roughly 15,000-20,000 dentists each year. According to the Council’s senior members, dental education has become a productive business that is diluting quality dental schooling in India. The DCI chief Dr Anil Kohli told in an interview to TOI, “India does not require new dental colleges”. “There is hardly any employment opportunity for dentists in India. We must not open new dental colleges anymore but accredit the old ones under three categories — doing well, can improve, and had colleges coming under the last category should be shut down.”

The DCI has now made it obligatory for professors teaching at the UG level to stay in the same college for at least one year, while those teaching in the PG level must do so for three years. It has also made continuing medical education mandatory for 20 hours a year and 100 hours for five years.
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Reduction in Germs at 30 minutes post use

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“HC reform legislation ... does not include provisions to meaningfully improve access to dental care”

An interview with Dr Ronald L. Tankersley, President of the ADA

The health-care reform bill recently approved by the US Congress aims to improve access to health care for over 50 million Americans. However, dental groups say that the legislation significantly neglects oral health. Dental Tribune Group Editor Daniel Zimmermann spoke with Dr Ronald L. Tankersley, President of the American Dental Association, about the historic decision and its effect on dentistry in the US.

Dr Ronald L. Tankersley

The health-care reform bill recently approved by the US Congress aims to improve access to health care for over 50 million Americans. However, dental groups say that the legislation significantly neglects oral health. Dental Tribune Group Editor Daniel Zimmermann spoke with Dr Ronald L. Tankersley, President of the American Dental Association, about the historic decision and its effect on dentistry in the US.

Daniel Zimmermann: The American Dental Association did not support the health-care reform bill recently approved by Congress. Could you explain the rationale for your decision? Dr Ronald L. Tankersley: As America’s leading advocate for oral health, our decision was primarily based on the oral-health provisions of the bill. We could not support the health-care reform legislation because it does not include provisions to meaningfully improve access to dental care for millions of American children, adults and elderly by properly funding Medicaid dental services.

You say that the reform does not do enough to assure that low-income families receive adequate oral health care. On the other hand, millions of people will finally be able to buy health insurance regardless of their social status or pre-existing medical conditions.

While countless other groups can weigh in on the health-care reform’s overall merits & flaws, people look to the ADA for a determination of its effect on oral health care. And when the government is willing to spend close to a trillion dollars over the next ten years, but not spend a dime on improving access to Medicaid dental services for those most in need, somebody has to raise an objection. If we didn’t do that now, how could we expect lawmakers to take our concerns seriously in the future? That was the basis of our decision.

You have also rejected the idea of workforce pilot programmes. Could you tell us the reason for this? The ADA’s opposition to the alternative dental models pilot programme was limited and based upon our long-held belief that certain surgical procedures must be performed only by licensed dentists.

The big losers of this reform are going to be the insurance companies. What effect do you think the reform will have on the dental profession itself? Although the ADA could not support the final legislation, we did recognise that it contained many worthwhile provisions pertaining to oral health. These included increased funding for public-health infrastructure (including Centers for Disease Control and Prevention programmes), additional funding for school-based health-centre facilities and Federally Qualified Health Centers. We also recognised increased Title VII grant programme opportunities for general, paediatric or public-health dentists and funding for the National Health Services Corps loan repayment programmes. These provisions, which the ADA supported and lobbied for, will have a measurable, beneficial effect on dentistry and dental patients.

In your opinion, what should be changed in the reform bill to make it feasible for dentists and advance patient care? When it comes to improving access to oral health care, our message remains: fund Medicaid, the Children’s Health Insurance Program and other dental public health programs sufficiently.

These programmes are only capable of fulfilling their roles if they receive adequate funding. Many states spend less than 0.5 per cent of their Medicaid dollars on dental care—an astonishingly low rate, considering the importance of oral health to overall health. Further, poor dental reimbursement rates paid to dentists mean that many of them can’t participate in Medicaid, which is one of the reasons that many states fail to provide oral health care for even half of their eligible children.

The federal government can and must do more to ensure states are able to come up with their share of these benefits. Republicans and other interest groups have announced that they will oppose the reform bill. Where will you position yourself once the law has come into effect? The ADA will continue to lobby for improvements to Medicaid dental benefits and will be watching closely as federal agencies implement provisions of the law. We want to ensure that the provisions we support are carried out correctly, and will work to change the provisions we oppose.

Thank you very much for the interview.
Beyond endodontics: Roots Summit 2010

Clausia Salwiczek

BARCELONA, Spain: What do Barcelona and endodontics have in common? For me, the answer was nothing, until last week’s Roots Summit. From now onwards, I will forever connect Gaudí, Paella and La Sagrada Familia with root canals.

It is certainly not an exaggeration to say that Roots Summit 2010 had all of those lucky enough to attend falling in love with endo all over again. Organised by Drs Noemí Pascual and Nuria Campo and their team, the meeting was a grand success. Long hours in the dark, yet always crowded lecture hall, despite the perfect weather, were followed by a wonderful social programme with a distinct Spanish touch.

Dr Fred Barnett, who lectured on Trauma injuries: Long-term treatment planning based on Dx and Pulpar generative technique, commented: “Congratulations to Nuria and Noemí for organising a fantastic Roots Summit. The venue was awesome and the lectures top notch. Roots should be proud of their efforts.” The impressive list of international speakers included Dr Giuseppe Cantatore from Italy, Drs José María Malfaz and Enrique Martínez Merino from Spain, and Drs Hans-Willi Herrmann and Jorg Schröder from Germany, to name a few.

Dr Sashi Nallapati from Jamaica held two very interesting lectures on rare and challenging cases: Dense invaginatus: An endodontic challenge. Many in the audience had never encountered such cases and, thus, were absorbed in these presentations.

In fact, many of the lectures were very entertaining and of extremely high quality with regard to the content as well as presentation. “It was great to see presentations that staggered me with the quality of the material and the multimedia that were shown,” commented Dr Glen van Ass, who lectured on Microscope centred practice: Ergonomics and documentation. “Video through the operating microscope and still photos from some of the experts was incredible. It is impressive to see the quality of the work that these teachers and talented clinicians can provide in a humble yet confident manner.”

The meeting was sponsored by major industry players, like VDW, Zeiss, Dentsply Maillefer, SybronEndo Europe and Kodak. Dr John Schoeffel from the US, who introduced EndoVac—an endodontic irrigation technology system—in his lecture, also presented the product to interested attendees at the Discus booth. EndoVac enables safe irrigation to apical termination with an abundant supply of fresh irrigant. Unlike positive pressure systems that use cannulas to deliver irrigants into the canal, the EndoVac is a true apical negative pressure system that draws fluid apically by way of evacuation.

“It’s not often that meetings inspire and rejuvenate people and make them look forward to future meetings,” commented Dr Nallapati. “To me, certainly, this Roots Summit has done all that. And that is a testimony to the wonderful effort of Nuria, Noemí and their team.” Attendee Dr Mahalaxmi Sekar agreed, saying that he pitied all those who had missed this event in Barcelona.

A majority of the lectures, for which continuing education credits can be obtained, were recorded live and will be made available for review on www.dtsstudyclub.com. For more information on how to register and how to obtain credits, please contact Ms Julia Wehkamp at julia.wehkamp@dtsstudyclub.com.

The date and venue for next year’s meeting are yet to be decided. But one thing is for sure: this year’s attendees are counting down the days.

Scientists link dental X-rays to cancer

Lisa Townsend

LONDON, UK/LEIPZIG, GERMANY: A dental X-rays and increased numbers of thyroid cancer. After factoring X-rays taken of 500 patients in a hospital in Kuwait, they found that men and women who had had up to four dental X-rays were more than twice as likely to have developed the disease than those who had never had any dental X-rays. For those patients who had had between five and nine X-rays, their risk rose more than four-fold.

Although thyroid cancer is one of the least deadliest cancers, incident rates have almost doubled in countries like Australia in recent years.

The findings are consistent with previous reports of increased risk of thyroid cancer in dentists, dental assistants, technicians and X-ray workers, suggesting that sensitivity of the thyroid to radiation is not necessarily related to direct irradiation of that organ but to any exposure to ionizing radiation. Besides thyroid cancer, significant risks have been also observed for leukaemia and cancers of the breast.

The researchers warned that the results of their study “should be treated with caution” because the data was based on self-reporting by the participants and the fact that other factors could be contributing to the increase in thyroid cancer cases. Further research is required to confirm the exact effect of dental X-rays, they added.

“It is important that our study is repeated with information from dental records, including frequency of X-rays, age & dose at exposure,” Dr Anjum Memon, Senior Lecturer and consultant in Public Health Medicine at Brighton and Sussex Medical School, who led the study, said.

“If the results are confirmed, then the use of X-rays as a necessary part of evaluation for new patients, and routine periodic dental radiography, particularly for children and adolescents, will need to be reconsidered, as will a greater use of lead collar protection.”

(Edited by Daniel Zimmermann, DTI)
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Three essential lessons for every new dentist

By Sally McKenzie, CEO

After years of schooling, thousands of dollars in tuition, hours upon hours of clinics and exams, and tests and on and on, finally you entered the working world as a dentist. Just you and the patients.

Wouldn’t it be great if it could really be that simple?

It’s likely that it didn’t take you long to realize that once your tour in dental school was over, the learning process had only just begun.

Moreover, there are at least three key lessons that were probably barely touched upon in the dental school curriculum.

Lesson No. 1: How to deal with people

I’m not talking about the patients. You’ve been trained to manage them. I’m talking about the people you see every day, the ones you work with elbow to elbow, those you depend on to represent you, to make sure you have enough money to pay your bills, to keep your schedule on track, etc.

Obviously, I’m talking about your team. Your success as a dentist is directly dependent upon your employees’ success. Unfortunately, one had hiring decision can cost you a small fortune — estimates range between 1.5 to 5 times annual compensation — it can also damage patient relations, staff morale and overall effectiveness of the practice.

Given what’s at stake, pay close attention to Lesson No. 1:

Do your best to hire the best and never hire under pressure. Follow these steps and take a clear and measured approach to ensure that every employee you hire is the best fit for your growing practice.

Assess the systems before you bring in a new employee. If you’re hiring an office manager, look at business systems first. Are the business systems, schedueling, collections, recall, etc., working efficiently? If not, this is your chance to fix them, to integrate new protocols and establish up front how you want these handled in your practice.

Take 15 minutes. Set aside 15 minutes to think about what you want the person in this position to do. Make a list. Consider what you are looking for in this individual.

Write a job description. Once you’ve given some thought to the position, update or write a job description for the job tailored to attract the employee you need. Include the job title, job summary and specific duties. This clarifies what skills the applicant must possess and explains what duties she/he would perform.

Cast a wide net. Develop an ad and place it on multiple websites & in different publications. Promote those aspects of the job that will have the greatest appeal, including money. Sell the position.

Keep the copy simple but answer the reader’s questions — job title, job scope, duties, responsibilities, benefits, application procedures, financial incentives and location. Direct prospects to your website to learn more about your practice and the position.

Read the resumes; don’t just scan them. Highlight those qualities that match the position’s requirements. Look for longevity in employment. Be careful of those applicants that only note years, such as 2008–2009. Chance are this person was hired in December of ‘08 and fired in January of 2009.

Watch for sloppy cover letter. The applicant may have poor attention to detail. Flag resumes with “yes,” “no,” or “maybe.” The “yes” candidates are the first to be considered.

Pre-screen applicants on the phone. Address your most pressing concerns up front. If there are gaps in employment history, now is the time to find out why. Ask the applicant what salary range she/he is expecting.

Listen for tone, attitude and grammar on the phone, particularly if the position requires handling patient calls. Based on the applicant’s phone demeanor, would this person represent your practice well?

Prepare for the interviews. Conduct interviews using a written set of standard questions for each applicant so you are able to compare responses to the same questions.

Avoid asking any personal questions. Ask follow-up questions based on the applicant’s responses. Jot down personal details to keep track of who’s who. The candidate is likely to be on her/his best behavior in the interview. If the applicant doesn’t impress you now, it will not get better after she/he is hired.

Test for the best. Take advantage of the opportunity to see how the candidate performs in a job that is similar to the one he or she is hired.

Use performance reviews to motivate and encourage your team to thrive in their positions. Base your performance measurements on individual jobs. Focus on specific job-related goals and how those relate to improving the total practice.

Used effectively, employee performance measurements and reviews offer critical information that is essential in your efforts to make major decisions regarding patients, financial concern, management systems, productivity and staff in your new practice.

Lesson No. 5: Keep your hands in the business

Certainly, it doesn’t take long to recognize that there are many hats for the dentist to wear. The hat that says “The CEO” is just as important as the hat that says “The Dentist.” It is critical that you completely understand the business side of your practice.

There are 22 practice system and you should be well-versed in each of them. If not, seek out training for new dentists. The effectiveness of the practice systems will directly, & profoundly, affect your own success today and throughout your entire career.

For starters, routinely monitor practice overhead. It should breakdown according to the following benchmarks to ensure that it is within the industry standard of 55 percent of gross income:

- Dental supplies: 5 percent
- Office supplies: 2 percent
- Rent: 5 percent
- Laboratory: 10 percent
- Payroll: 20 percent
- Payroll tax & benefit: 5 percent
- Miscellaneous: 10 percent

Keep a particularly close eye on staff salaries. Payroll should be between 20 and 22 percent of gross income. Tack on an additional 5 to 5 percent for insurance benefits. If your pay roll costs are higher than that, they are hammering your profits. Here’s what may be happening:

- You have too many employees.

"Give ongoing direction, guidance and feedback to your team so they know where they stand."

Recognize the strengths and weaknesses among your team members. All employees bring both to their positions. The fact is that some people are much better suited for certain responsibilities and not others. Just because “Rebecca” has been in the dental school curriculum for five years, doesn’t mean she’s effective in those areas. Look at results.

Be careful of the most common pitfall in leading employees: Assuming someone is a valuable employee if she were assigned those duties. Don’t be afraid to restructure responsibilities to make the most of team strengths. In addition, be open to maximizing those strengths through professional training.

Give ongoing direction, guidance & feedback to your team so that they know where they stand. Give praise often and appraise performance regularly. Verbal feedback can be given at any time, but it is most effective at the very moment the employee is engaging in the behavior that you either want to praise or correct.

Nip problems in the bud and you’ll avoid bigger horrors in your side. If an employee is not fulfilling her/his responsibilities, address the issue privately and directly with her/him. Be prepared to discuss the key points of the problem as you see it as well as possible resolutions.

Use performance reviews to motivate and encourage your team to thrive in their positions. Base your performance measurements on individual jobs. Focus on specific job-related goals and how those relate to improving the total practice.
You are giving raises based on longevity rather than productivity/performance.

The hygiene department is not meeting the industry standard for production, which is 33 percent of total practice production.

The recall system, if there is one, is not structured to ensure that the hygiene schedule is full and appointments are kept.

Maximizing productivity.

Hand-in-hand with practice overhead is production, and one area that directly affects your production is your schedule. Often times, new dentists simply want to be busy, but it's more important to be productive. Follow these steps to maximize productivity.

First, establish a goal. Let’s say yours is to break $700,000 in clinical production. This calculates to $14,853 per week, not including four weeks for vacation. Working 40 hours per week means you’ll need to produce about $564 per hour. If you want to work fewer hours, obviously per-hour production will need to be higher.

A crown charged out at $900, which takes two appointments for a total of two hours, exceeds the per hour production goal by $86. This excess can be applied to any shortfall caused by smaller ticket procedures. Use the steps below to determine the rate of hourly production in your practice.

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2. Next, determine the procedure value per hourly goal. To do this, take the cost of the procedure (for example, $900) divide it by the total time to perform the procedure ($900 ÷ 120 minutes). That will give you your production per minute value ($7.50). Multiply that by 60 minutes ($7.50 x 60 = $450). Compare that amount to the dentist’s hourly production goal.

It must equal or exceed the identified goal.

Now you can identify tasks that can be delegated and opportunities for training that will maximize the assistant’s functions. You also should be able to see more clearly how set up and tasks can be made more efficient.

A career in dentistry is one of the most personally and professionally fulfilling fields you can choose. With the right team, clear leadership and effective business systems, you can enjoy tremendous personal success and lifelong financial security for you and your family.
Current concepts in gutta-percha removal for re-treatment

Second and final part by Dr Roheet Khatavkar & Dr Vivek Hegde

5. Specialized Rotary Instruments Designed for Retreatment

At present, 5 manufacturers have introduced the specially designed instruments along with their set of NiTi rotary instruments as retreatment instruments.

A. ProTaper Universal Retreatment Kit (Dentsply Maillefer)

The ProTaper Universal retreatment kit consists of three instruments which are identified as:

- D1 File: is a 50/0.09 NiTi file (marked with one white ring) of 16 mm in length used for removal of filling material from the coronal third of the root canal.
- D2 File: is a 25/0.08 NiTi file (marked with two white rings) of 18 mm in length used for removal of filling material from the middle third of the root canal.
- D3 File: is a 20/0.07 NiTi file (marked with three white rings) of 22 mm in length used for removal of filling material from the apical third of the root canal.

All instruments have a non-working round tip to follow canal path for effective removal of the obturating material without modifying the original curvature or shape of the root canal.

B. R-Endo (Micro-Mega)

R-Endo instruments are made up from a round blank, and their cross-section is characterized by three equally spaced cutting edges. The instruments neither have radial lands nor active tip. These instruments are recommended to be used at a speed of 500-400 rpm along with gutta-percha solvent. The R-Endo retreatment kit consists of a series of six files named as Rm, R6, R1, R2, R3, and R8.

- Rm File: is a stainless steel 25/0.04 hand instrument with a 17 mm length and a 12 mm working tip. The file is used in a quarter-turn motion and to dig or break the hard layer of filling material. This instrument allows the centring and alignment of the next instrument.
- R6 File: is a 25/0.12 NiTi file with a 15 mm working length and 10 mm cutting tip. It is used for eliminating the possible interference or dentine overhang, and flaring the access space in order to increase the solvent quantity. The short length of this instrument allows removal of only 2-3 mm of filling material from the orifice level of the root canal.
- R1 File: is a 25/0.08 NiTi file with a 15 mm working length and 8 mm cutting tip. This file is designed for removal of filling material from the coronal third.
- R2 File: is a 25/0.06 NiTi file with a 19 mm working length and 12 mm cutting tip. This file is designed for removal of filling material from the middle-third of the root canal.
- R3 File: is a 25/0.44 NiTi file with a 25 mm working length and 16 mm cutting tip. This is to be used in the last for removal of filling material from the apical-third of the root canal.
- R8 File: is a 50/0.04 NiTi file with a 15 mm working length & 10mm cutting tip. This instrument is designed to be used in cases that require further enlargement of apical diameter of the root canal.

C. Mtwo Retreatment Kit (Soredan and Martina)

The Mtwo instruments have an S-shaped cross-section, an increasing pitch length in the apical-coronal direction. The Mtwo retreatment kit consists of only two instruments with cutting tips, i.e., Mtwo R 15/05 and Mtwo R 25/05, designed to reach the apex. They also have the advantage of shaping the root canal in an under-prepared tooth, simultaneously.

During the use of all retreatment files, the file penetration is carried out by exerting very slight apical pressure. The instruments should be withdrawn frequently, to inspect & remove the debris from its flutes, before continuing. In case of resistance felt during rotation, hand files should be used to confirm canal permeability. These files remove gutta-percha effectively by thermosoftening the gutta-percha with frictional heat.

They can be used in the combination with gutta-percha, solvents to soften and remove the obturation material.

6. Heat Transfer Devices

A. Heat Carrier Tips

The number of heat transfer devices like the System B, EndoTec, EndoTwin, E&O Master, Touch’N Heat, DownPak, etc. is available for the warm vertical technique of obturation. The heat generated on the tip can be used for softening of the gutta-percha mass, thereby, aiding in retrieval of the mass. These devices are more effective in well prepared canals.

Alternatively, the hand spreaders can also be used in the similar manner, however, the amount of heat transferred to these instruments is not consistent and they retain the heat for a longer period of time as well.

B. Ultrasonic Tips

Ultrasonic tips available for ultrasonic condensation of gutta-percha or specialized re-treatment tips can be used for gutta-percha removal. These tips work on the same principle as the heat carrier devices, by softening the gutta-percha and finer tips of these instruments may be used to work around the curvatures.

7. Soft Tissue Lasers

The studies, conducted on effectiveness of the Nd: YAG laser for removal of gutta-percha, have shown that it is capable of softening gutta-percha. The addition of solvents have not shown any improvement in their efficiency in terms of time required for removal of gutta-percha from the canal walls. The use of Nd: YAG laser at lower settings (100 mJ, 15 Hz, 1.5 W) produces fairly clean root canals, but an incomplete elimination of gutta-percha from dentinal walls occurs. At increased power levels (100 mJ, 20 Hz, 2 W), the laser seems to be more effective on the canal walls, cleaning them better.

Conclusion

The major factors associated with the endodontic failure are the persistent microbial infection in the root canal system and /or in the peri-radicular area. It is important to remove as much sealer and gutta-percha as possible during retreatment, to uncover remnants of necrotic tissue or bacteria that might set as the antigenic source.

The new technologies, such as loupes and surgical microscopes, enable the clinician to have better visual access while treating difficult cases. Nonetheless, complete removal of gutta-percha from the canal wall is still a difficult task. Also, the complexity of the root canal system further complicates the process of retreatment, requiring a different approach to tackle the problem in each case. Every retreatment case should be treated as a fresh case and should be dealt with accordingly in order to provide a predictable degree of success for the endodontic therapy.

About the authors

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Crown or same-day onlay?

Take a look at the advantages of indirect laboratory-processed composite resin posterior restorations

By Lorin Berland, FAACD

“The trend in dentistry today is clearly toward more esthetic and less invasive. Indirect resin and ceramic inlays and onlays are not only compatible with this trend, but fulfill very nicely the restorative void between fillings & crowns,” wrote Ronald D. Jackson, DDS, FAGD, FAACD (Cosmetic Tribune, Dec. 2008).

Regarding durability, aesthetic inlays & onlays are not new anymore. They have a track record and it is good. With today’s materials, longevity is mainly a matter of diagnosis, correct treatment planning and proper execution of technique.

The problem with replacing old amalgams with tooth-colored composites is they are difficult, inconsistent and unpredictable.

Yet, the warranties on these 50-, 40-, 50-year-old silver fillings is running out. We have to remember that amalgam technology is more than 150 years old. At that time, people lost their teeth a lot earlier and died a lot earlier, too. Now, however, we have a large segment of the population that is more older than 50 & growing & they want to keep their teeth feeling good and looking good.

Let’s think like our patients. Our patients want to replace these old amalgams, but they want to do it conservatively, consistently, efficiently, predictably and economically — and they want to do it in one visit.

So, what are the advantages of indirect laboratory-processed composite resin posterior restorations?

Restorations fabricated in this manner look better, under go less shrinkage, help restore the strength of the tooth, have minimal porosity and excellent marginal integrity, and they have smoother surfaces that are kinder to the gums and result in less plaque accumulation. They are very durable and can be done in one visit.

Patients appreciate avoiding the inconvenient, uncomfortable and expensive second appoint-
Fig. 1: #30 pre-op.
Fig. 2: FenderWedge in place.
Fig. 3: Caries detector.
Fig. 4: Prep with liner.

Fig. 5: Identical hydrocolloid impression.
Fig. 6: Basting the poured impression.
Fig. 7: Silicone model.
Fig. 8: Model with undercuts waxed.

Fig. 9: Finishing the onlay.
Fig. 10: Onlay finished and polished.
Fig. 11: Expasyl prior to seat.
Fig. 12: Expasyl and FenderMate prior to seat.

Fig. 13: Adapting FenderMate.
Fig. 14: Seating onlay.
Fig. 15: Final onlay.

(Photos/Provided by Dr. Lorin Berland)
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The prep

This patient came in with a dental emergency. The filling had fallen out of his broken, lower right molar the day before he was going overseas for three weeks on business. He wanted a “quick & permanent solution” (Fig. 1).

The tooth was anesthetized. Next, a FenderWedge (Directa Dental) was used to further isolate the involved tooth, protect the adjacent interproximal surface and pre-wedge the teeth for optimal contacts (Fig. 2).

The Isolite (Isolite Systems) was placed to obtain a dry & illuminated field. We used caries backed w ith a short flame carbide (Kerr Dental) was gently packed into the sulcus, creating a dry space between the tooth & tissue without any risk of rupturing the epithelial attachment (Fig. 11).

The aluminum chloride dries the tissue, reducing the risk of sulcal seepage & contamination. The FenderMate (Directa Dental) was then inserted beneath the interproximal floor to slightly separate and isolate the adjacent teeth & to help facilitate seating the onlay (Fig. 12).

The Expasyl (Kerr Dental) was rinsed off thoroughly and FenderMate (Directa Dental) was adapted to the adjacent interproximal surface with a condenser (Fig. 15).

The enamel and composite core were then etched for 15-30 seconds. A single component fifth generation adhesive (OptiBond Solo Plus Universal, Kerr Dental) was applied in two coats and air-thinned until there was no more movement. Flowable composite (Premise Flowable, Kerr Dental) was dispensed into the prep of the tooth prior to inserting the onlay into the tooth.

The FenderMate (Directa) was removed and the onlay was further seated using a condenser with gentle pressure. Complete seating was facilitated using the contra-angle pac-ker/condenser (Fig. 14).

An explorer is helpful in removing excess flowable before curing. The restoration was cured from all angles, starting at the interproximal gingival floors where leakage is most likely to occur.

Occlusal flash and excess flowable composite was “buffed” with a short flame carbide while the interproximal margin were adjusted with bullet or needle carbides.

A Bard Parker #12 scalpel was used to remove interproximal cement.

Once the proper occlusion was established, a diamond-impregnated point and/or cup was used to polish the restora- tion (Fig. 15).

Conclusion

There are certainly clear advantages for both the patient and the dentist when doing indirect composite resin restorations. These restorations have helped me save my patients’ teeth, time and money. Over the last 20 years, I have tweaked, updated and modified these restorations in terms of techniques, mate- rials and equipment.

These restorations not only save time and conserve healthy tooth structure, they are a valuable service to provide to your patients.

Wherever you practice, however you practice, these restorations are durable, esthetic, economical and very much appreciated!™
Think all toothpastes work the same?

Colgate Total™ is proven to help prevent gingival inflammation¹

Colgate Total™ contains a Triclosan + Copolymer formula that helps fight gingival inflammation in two ways:²,³,⁴

1. Kills plaque bacteria for a full 12 hours² to help reduce plaque by up to 98% and gingivitis by up to 88%³

2. Triclosan reduces inflammatory mediators, such as PGE₂⁴, that may be associated with systemic health.


Colgate Total
YOUR PARTNER IN ORAL HEALTH

www.colgateprofessional.com
Antibacterial
WHY do we need to

Nowadays there is a wide range of medical and preventive toothpastes in the market. These toothpastes differ in their composition, mechanisms of action and, thus, have a definite application.

Fluoride-containing toothpastes are generally used for reducing dental enamel solubility and assists in straightening. They are primarily indicated as prophylaxis for caries.

Low abrasive toothpastes contain specific ingredients that prevent the pain impulse and are used for dental hypersensitivity.

Toothpastes preventing inflammation of the gums contain antibacterial ingredient to fight against the main source of gum diseases i.e. germs. Bacteria in the plaque is the key reason for both inflammations of the gums and caries, so antibacterial toothpastes have effective complex exposure providing protection of gums and teeth. A clear example is Colgate® Total toothpaste containing triclosan as an antibacterial ingredient and sodium fluoride for providing protection over caries.

Daily mechanical removal of plaque at home and the resulting effects on the growth of bacteria in the plaque are the significant components of a comprehensive treatment thereby preventing inflammations of the gums and periodontium. Antibacterial ingredients of the toothpastes used for therapy and prophylaxis of the given diseases have bacteriostatic and/or bactericidal effects, thus, reducing pathogen and opportunistic plaque bacteria counts. The numerical reduction is accompanied by the reduction of bacteria-derived inflammatory mediators causing dental and gum tissue lesions.
toothpastes use them?

Toothpaste containing triclosan and copolymer has shown to be highly effective in treatment and prevention of inflammation of the gums. Its unique formulation was patented under the brand name Tricogard™ and is included in Colgate® Total toothpastes.

Triclosan has a wide range of antibacterial activity. It is effective at low concentrations and has anti-plaque effect. Moreover, triclosan has a direct influence on the inflammatory process by suppressing inflammatory mediators. Triclosan is safe, with low allergenic capacity and no occurrence of pigmentation of the dental enamel. However, it was shown that triclosan in its pure form is washed out of oral cavity in 1.5-2 hours. The copolymer, included in Tricogard™ complex, retains triclosan on the dental surface and gums up to 12 hours and thus prolongs its antibacterial activity. Thus, Colgate® Total toothpaste may control plaque bacteria growth throughout the day and night, arresting the main source of the appearance and progression of the periodontal diseases. Moreover, long-term application of Colgate® Total toothpaste does not result in derangement of the natural balance in the oral cavity microflora, so it has shown to be safe and clinically proven for daily oral hygiene. Additionally, this toothpaste contains fluoride needed for dental enamel strengthening.

In conclusion, Colgate® Total toothpaste due to its unique formulation has a complex effect on the main reasons for inflammations in the oral cavity - dental and gum diseases. It may also be used as preventive measures as well as for complex treatment of inflammatory diseases and is considered to be a justified choice for daily oral hygiene.
Only Colgate Total® has a unique Triclosan plus Copolymer formula delivering 12-hour antibacterial protection¹

A powerful combination

- **Triclosan** is an effective broad-spectrum antibacterial that helps prevent and reduces plaque, a cause of periodontal inflammation²,³
- The **Copolymer** helps ensure the delivery and retention of triclosan on the surface of teeth and gingiva for clinically proven 12-hour antibacterial protection¹,⁴
- **Extensively Researched**: Proven effective over a range of patient benefits in more than 60 well-controlled clinical studies with over 16,000 patients⁵
- **Brushing with Colgate Total®** is more effective in reducing plaque and gingivitis than brushing with regular fluoride toothpaste²,³

Importance of a Diet Diary

A diet diary is an essential piece of evidence in to a patients teeth and for the health, says Dilhani Silva

Dietary analysis consists of two elements. "Enquiry into lifestyle. 
"Enquiry into dietary components themselves.

Information about the diet itself is of little value unless it is taken in context with the patient's lifestyle. Only dietary recommendations tailored to the patient's life are likely to be adopted. The diet record should include all the food and drinks consumed the amount and the time of eating or drinking. Every morsel eaten & every drop that has been drunk. The diet record should include all the foods & drinks consumed, the amount in readily estimated units and the time of eating or drinking.

Analysis of the diet itself may be performed in a variety of way. The patient can be asked to recall all foods consumed over the previous 24 hrs. This is not very effective, relying on a good memory and honesty, and is unlikely to give a representative account. Relying on memory for more than 24 hrs, is too inaccurate. The most effective method is to keep a written record of their diet for four-five consecutive days, including leisure days. The need for the diet record should be counted and discussed with the patient. Also the consistency of the food because dry & sticky foods take longer to be cleared from the mouth. Sugared drinks taken immediately before bed are highly significant because salivary flow is reduced during sleep and clearance time is greater. Identify foods with a high sugar content because patients often do not realise that such foods are in significant, e.g., baked beans, breakfast cereals, potato ketchup, & plain biscuits.

If the diet sheet shows the main problem for the patient is too many sugar contains drinks and frequent drinks & carbonated drinks & frequent snacking of biscuits and cakes. Most meals or snacks contain high sugar item & some more than one. The patient needs to be educated in safer diet.

The patient should be educated in the relationship between caries & high frequency in consumption of sugar. The dental profession has been aware for over half a century that the frequency of sugar intake is far more significant in the development of caries than the amount consumed at any given time.

Advice based on Diet Diary

- Particularly those containing sugar. It is important to give the same advice to other health professionals such as dieticians and health visitors, who are concerned with other aspects of health, such as obesity, but it is rare that the patient opt to have a healthy diet having concerns about their teeth rather than size.
- Dental profession has suggested that plain crumps, peanuts & cheese are tooth-friendly alternatives to sweet, biscuits & confectionary. When reading labels, it can be seen that some nuts contain hidden sugars, and this should be pointed out to the patients.
- Should always check & liaise with the patients medical condition. Some must have been a told by their health professionals to avoid such foods for other health reasons. Advice always must be balanced and accurate.
- Particularly school children & adolescent require frequent intakes of carbohydrates to sustain energy. In such cases it is essential to mention frequent snacks such as pasta, bread & toast, bread sticks fruit and raw vegetables. Public has raised awareness of hidden sugar & salt with the current trend towards healthy eating. It is important to be able identify hidden sugars (e.g. Glucose, fructose, dextrose, maltose, lactose & molasses) to look for these on food labels.
- Also the relationship with such food can contribute to obesity & heart disease as well as caries and behavioural disorders.
- The use of artificial sweeteners is increasing as the public becomes more diet conscious, since their low calorific value means that they are virtually non-cariogenic & non fattening. Sweeteners can be of synthetic or natural origin. (e.g. xylitol, a plant extract).

Facts-The advice below can elaborate on it more

- Reduce the amount of sugar
- Check manufactures’s labels and avoid foods with sugar such as sucrose, glucose & fructose listed. Natural sugars (e.g honey, brown sugar) are as cariogenic as purified/added sugars. When sweet foods are required, choose those containing sweetening agents such as saccharin, aceral, xylitol & aspartame. Diet formulations contain less sugar than their standard counterparts. Reduce the sweetness of drinks & foods. Become accustomed to a less sweet diet overall.
- Restrict frequency of sugar intakes to meal times as far as possible
- Try to reduce snacking. When snacks are required select safe snacks such as cheese, crisps, fruit or sugar free sweets, such as mints or chewing gum (which not only sugar but also stimulates salivary flow and increases pH). Use artificial sweeteners in drinks taken between meals.
- Speed clearance of sugar from the mouth
- Never finish meals with a sugary food/drink. Follow sugary foods with a sugar free drink, chewing gum or a protective food such as cheese. The dietary advice is almost always provided using the health belief model of health education. How ever it is well known that education about the risks and consequences of life style, habits & diet is often ineffective. It is important to judge the patients likely compliance & provide dietary advice which can be used to make small but significant changes rather than attempting to eradicate all the sugar from diet. As the diet improves, the advice can be adapted & extended. Advice must be acceptable, practical and affordable. In this case the patient has already suffered consequences from their poor diet this may help change behaviour. The patient must be made aware that damage to teeth continues up to 20 mins to 2 hrs of sugar intake. The statement should be restated with Stephen curve without difficulty.

The Stephen Curve describes the change in dental plaque pH in response to a challenge. The type of challenge does not matter but it is usually some element of the diet. Characteristically the Stephen Curve reveals a rapid drop in plaque pH, followed by a slower rise until the resting pH is attained. The time course varies between individuals and the nature of the challenge. The initial drop is usually rapid with the lowest pH being attained within a very few minutes. However, pH recovery can take anything between 15 & 40 minutes depending to a large extent on the acid-neutralising properties of the individual's saliva.

The patient should be advised to use fluoride containing toothpaste. During the period of dietary change it would also be beneficial to use a weekly fluoride rinse as well. This could be continued for as long as the diet is felt to be unsafe. Oral hygiene instruction is also important in view with elaborating importance of diet.

The Committee on Medical Aspects of Food Nutrition Policy established in 1986 in the UK. It is the panel on Dietary sugars to look at the role of the sugars in the diet. Make sure all the patients are very welcome to do their own research. Amongst the panel recommendations:

- The frequency of sugary snacks and drink consumption should be minimised.
- Food and drinks that predispose caries should be limited to main meal times. This is specially important for older dentate people, children and adolescents.

Conclusion

According to the UK Department of Health ‘Eating a healthy, balanced diet which contains plenty of fruit and vegetables and is low in fat, salt and sugar and based on whole grain products, is important for promoting good health.’

Food is the fuel which provides energy for the cells of living organism to grow, reproduce and eliminate waste: and if the cells of the body are to function efficiently, all the nutrition substances must be consumed in the correct proportions.
Aesthetic and functional restorations with Panasil impression materials

Fig. 1: The correct application of the gingival retraction technique depends on the health of the surrounding periodontium. An average of approx. three weeks is required following preparation and tipping of the temporary restoration to ensure formation of a stable, compact tissue. — Fig. 2: The good periodontal biotype enabled placement of a second retraction cord, which was placed carefully over the first cord to dispense the gingiva horizontally around the entire circumference of the tooth. — Fig. 3: The second retraction cord was removed prior to application of the impression material. The effect of retraction and exposure of the preparation margin are clearly visible. — Fig. 4: Panasil initial contact light was applied to the sulcus using a dispenser fitted with an application tip. The very fine tip of the dispenser was placed immediately next to the sulcus and moved smoothly around the prepared tooth. — Fig. 5: The pressure of the dispenser, fluidity and excellent thixotropic properties of the material ensure that the material flows uniformly onto the surface of the tooth, including sub-gingivally. A feature of Panasil initial contact light is its good fluidity, even when residual moisture is present.

De Ugo Teresani Gotti & Giancarlo Riva
Italy

A 70-year old female patient presented to our practice complaining of pain in the region of the upper canine. Clinical examination detected a crown fracture of tooth 11 at the cemento-enamel junction with partial exposure of the pulp. The treatment plan submitted to the patient involved initial endodontic treatment, followed by aesthetic, functional restoration of the upper canine with an all-ceramic zirconia crown.

The patient was first referred to a specialist, who performed root canal treatment to eliminate the germs and their metabolites from the root canal. The tooth was restored using a quartz-fibre post and a composite core restoration. The tooth was also prepared by a fibre post and a composite core preparation margin, which must be restored using a quartz-fibre post and a composite core.

Fig. 2: The gingival retraction technique is of crucial importance when taking an impression of the preparation margin, as a fluid-free sulcus is essential for producing a good impression. Various gingival retraction techniques are used in clinical practice. The technique we used in this case consisted of mechanical-chemical retraction with a double cord. The retraction cords were placed with the aid of an applicator, whereby the first retraction cord (thickness 0.006 mm), which was impregnated with an astringent 25% aluminium chloride solution, was placed below the preparation margin. The second, unsaturated retraction cord (thickness 0.0) was then placed stress free on the first cord.

The gingival retraction technique has a significant impact on the impression of fluid into the sulcus during impression-taking. Pure cotton-wool retraction cords without a styptic agent are ineffective in preventing the inflow of fluid into the sulcus. Successful isolation of the sulcus can only be achieved using chemical agents, while purely mechanical techniques using only cotton-wool retraction cord lead to increased formation of sulcus fluid.

The clinical success of a fixed restoration depends on a precise impression of all the details of the prepared tooth. In summary, it can be stated that the accurate fit of crowns and fixed partial dentures depends on the impression. Inaccuracies during impression-taking can only be corrected with difficulty or not at all during the subsequent fabrication stages, which has an effect on the marginal adaptation of the restoration we fabricated.

The one-step putty-wash technique was used in this case for fabricating the restoration. It has been proven in in vitro studies that impressions fabricated using this technique exhibit a higher detail definition than two-step putty-wash impressions. As the initial contact of the impression material with the oral mucosa is the critical moment clinically, we focused on a material that becomes hydrophilic with increased relative humidity and maintains its hydrophilicity throughout the entire working time. We therefore selected the impression materials Panasil tray soft and Panasil initial contact light (Kettenbach). Panasil initial contact light was applied to the sulcus using a dispensing gun fitted with an application tip (Figs. 4 & 5), while a non-perforated metal impression tray with a reinforced edge was coated thinly with Panasil adhesive beforehand using a brush (Fig. 6), prior to being loaded with Panasil tray soft (Fig. 7).

The flowability of the light material, viscosity of the tray soft and the pressure produced by the dispenser ensure that the impression material flows uniformly onto the tooth surface, including infra-gingivally.

Another characteristic of this material is that it is easily removed from the mouth, which may be a problem when using polyether materials. The thixotropic properties (position stability) of Panasil initial contact light prevent the material flowing into the oral cavity when the impression tray is inserted into the oral cavity. The intra-oral working time of 1 minute and intra-oral setting time of 2 minutes and 50 seconds are very practice-friendly. The combination of Panasil tray soft and Panasil initial contact light is impressive: the products ensure perfect reproduction of all details of the tooth in the
impression (Figs. 8, 9 & 10).

**Technical procedure**

The most commonly used material for fabricating models is dental stone, owing to its compatibility with all types of impression materials, low expansion and high compressive strength. The use of Class IV dental stones that have a volumetric expansion of approx. 0.08% is preferred, e.g. Tewerock and Tewestone (Kettenbach; Figs. 11 & 12). Careful pouring of the impression using vacuum-mixed dental stone ensures precise reproduction of all the details (Fig. 15). A precise, stable working model should be fabricated that can reproduce the anatomical features (occlusal surfaces, proximal contact points). The gingival section was removed under a stereomicroscope to expose the preparation margin (Figs. 14 & 15).

It is difficult to recreate the natural aesthetics with metal-bonded restorations, particularly when there is little space available. Apart from the search for materials with improved aesthetic characteristics, development concentrates on new technologies, e.g. fabrication with semi-finished products using the CAD/CAM technique, which eliminates certain working stages that are normally completed manually. In this case, the patient was treated with a zirconia crown, which was veneered using low-fusing porcelain. Zirconia, with a flexural strength of 900 MPa and a fracture resistance of 9 M Pa, has better mechanical properties than conventional porcelain blocks, which is partly stabilised with yttrium, which further enhances its mechanical properties.

In addition to aesthetics and fracture resistance, an important requirement for the long-term success of a restoration is also a high degree of marginal adaptation (Fig. 16). The majority of researchers agree that marginal gaps of 100 µm are clinically acceptable with regard to the service life of a restoration. In our opinion, however, the overall goal should be to attain a marginal adaptation in the region of 20 to 50 µm.

**Clinical finishing**

Cementation is the final stage of prosthetic treatment. It should be noted that while the luting cement does not provide the dentist with the possibility of correcting inaccuracies in the restoration, it does contribute to clinical success. The luting cement influences the functional performance of a prosthodontic restoration; should the wrong cement be selected or used incorrectly, it can have an adverse effect on the service life of the crown. A high mechanical compressive strength is one of the most important properties.

As luting material is distributed in very thin layers, it must be capable of withstanding compressive loading in order to prevent fractures. We used glass ionomer cement that has not only a high compressive strength, but also the advantage of fluoride release. A comparative study of various cements established that the glass ionomer cement we used in this case produced the lowest film thickness of 20 µm. A follow-up examination was completed one week after permanent cementation to check the integration of the prosthodontic restoration into the tissue. The clinical procedure was completed with a further follow-up examination to check the occlusal relationship, which in most cases cannot be completed satisfactorily when fitting the restoration, owing to stress to the patient. The correct use of a temporary restoration & an adequate morphological design of the permanent restoration contributed to good adaptation of the incisor tooth papilla, as was established at intervals of 30, 60 and 90 days (Fig. 17).

**Editorial note**: A complete list of references is available from the publisher.

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*About the author*

De Lugo Torquati Gritti and Giancarlo Riva are founders of the international laboratory association “Dental Excellence-International Laboratory Group”. They currently live and practice dentistry in Milan, Italy.
tend the FDI Congress in New Delhi, in 2004, as a representative of the British Dental Association. I wasn’t sure what to make of it at first, it seemed very complex. But after this experience, I reflected on the opportunities FDI involvement presented and quite liked it—the complexity of it, it was something completely new, I wanted to understand it, what we could do, how I could help raise the profile of my home association there. There is a symbiotic relationship, representing BDA at FDI and bringing benefits back to dentists in the UK.

You were recently invited to join FDI Dental Amalgam Task Team (DATT). What is the rationale behind the formation of DATT? It is fascinating work—the way these colleagues have communicated with one another around the world, all cooperating, & the quality of debate is superb. The FDI Council mandated that a Dental Amalgam Task Team be established to ensure that the international dental community & issues regarding dental amalgam were properly & accurately represented in United Nations discussions regarding mercury and would be based on the best available science. For details see UNEP Intergovernmental Negotiating Committee www.unep.org/hazardous-substances/Mercury/Negotiations/ING1/tabid/55241/language/en-US/Default.aspx.

In regards to dental amalgam, it is not a health issue because the material is safe w ith respect to human health. However it is the prime issue. FDI can represent this at the world level for the dental profession. Another example is GCI and how it fits together, there is serendipity—the strategy for dealing with caries sees a reduction in need for amalgam.

There is a huge opportunity to make a real difference through FDI. For some associations from more advanced countries, part of FDI’s work is the duty to help colleagues in developing areas. There is a global responsibility which is enhanced now by amalgam issue—this shows that we are one world, working together for better oral health.

What plans does the FDI Dental Practice Committee (DPC) have for 2010? I have been a Member of DPI for just over a year. It is nice to meet with colleagues and see how we approach problems differently. It can be difficult to produce the consensus statements due to different legal systems and philosophies of care, so when we produce a statement it is even more satisfying. Benefits of being part of the DPC include meeting more of the people involved in FDI work, and feeling more that I am part of the team.

Looking at purpose of the committee, there will be fewer but more focus projects with the DPC collaborating with other committees to contribute to FDI strategic objectives. We are looking at the dental team, risk management in dental practice, indemnity, infection control and waste management.

Also we have been approached by colleagues at the Indian Dental Association, which is a positive development.

Where do you see your work taking you with FDI? I am enjoying what I am doing now. It means a juggling act with FDI involvement, the BDA where I am chair of the Representative Body, running dental practice, and European work. Dr Stuart Johnston qualified in 1972 from Cardiff Dental School and has worked in his own practice for the last 52 years. He is the DPC member on the FDI Dental Amalgam Task Team (DATT).

Eight months after the successful 2009 FDI Annual World Dental Congress at the Suntec Internatio nal Convention & Exhibition Centre, Singapore, FDI returned to Singapore to participate in the biennial International Dental Exhibition and Meeting (IDEM) that took place from 16 to 18 April 2010.
procedures, while enhancing the results for patients, were showcased by 352 exhibitors from 51 countries.

Participants equally benefited from a Consumer Education Forum, organized by the Singapore Dental Health Foundation, in conjunction with IDEM Singapore. The forum sought to update the public beyond the basic principles of good oral care, exploring topics such as the relative advantages and disadvantages of implants, what patients should ask their dentists about implant and the intriguing Teeth-in-an hour. Participants went away with valuable insights into the challenges and limitations of dental implant procedures.

IDEF Singapore 2010 also saw the introduction of ‘Let’s Talk Business seminar’ in which participants deliberated on how they can leverage technology to transform the delivery of dental treatments. Looking forward, the theme and speakers for IDEM 2012 Scientific conference have been chosen. IDEM 2012 will focus on Advances and Controversies’. It will have the following personalities as keynote speakers: Dennis Tarnow from the Columbia School of Medicine, New York; and Dr Michel Magne and Dr Pascal Magne from the University of Southern California, Los Angeles.

Social Events Schedule for FDI 2010 Congress now available

The social programme for the 2010 FDI Annual World Dental Congress which will be held from 2-5 September in Salvador, Brazil is now accessible for participants to familiarise themselves of what awaits them in the exotic Bahia state. The programme has been carefully developed to show the various aspects of the local culture.

Visit the FDI website to access the social programme.

Successful Live.Learn. Laugh project

Initiative pilots adoption of a province-wide oral health programme in the Philippines

During the 1 March 2010 ceremony marking the end of the 3 year Live.Learn. Laugh Philippines demonstration project, Governor of the province of Batangas, Vilma Santos-Recto, affirmed her plans to expand the Batang May K (BMK) project to ten more municipalities of the Province of Batangas.

Batang May K – Empowering children to Healthy Habits, was a project under the Live.Learn. Laugh partnership of FDI World Dental Federation and Unilever Oral Health in association with the Philippine Pediatric Dental Society and Philippines Dental Association (PDA).

The BMK project aimed at improving the oral and overall health status of pre-school children in day care centres in Batangas through tooth brushing, hand-washing, fingernail cutting, healthy diet, mass de-worming and waste management.

During the ceremony, outstanding day care centers and workers in the province received awards for good implementation of the project’s components, improvement in their centers and their promise to sustain the project.

As a catalyst for the 3 year Live.Learn. Laugh Philippines project, following a National Oral Health Survey reported that 97.1% of six year old children suffered from dental caries and 84.7% from dental infections, the Philippine Pediatric Dental Society instigated a project to empower children to healthy habits.

Friday 23 April 2010 saw the official opening on the new FDI World Dental Federation head office and the start of a new chapter in FDI’s evolution. FDI secretariat have been settling in to the new location since the move from Ferney Voltaire, France, last Sept.

The move from France to Switzerland reflects the diversity of FDI membership. Geneva is international crossroads with its multicultural population, in a country with four official languages, located in heart of Europe and well connected to rest of the world. Also significant is the fact that Geneva is a Capital of Health, with FDI neighbours including the World Health Organization, World Heart Federation, International Federation of Red Cross, and Medecins sans frontiers. Furthermore the consolidation of FDI businesses under a single entity provides more simplified management & a favourable taxation environment.

Attending the ceremony were FDI Council members and staff, FDI members, corporate sponsors, partners and other NGOs. Mr Stéphane Gruber, Délégué au Service de la Promotion Economique du Canton de Genève, and Mr André Klopmann, Chargé des ONG internationales, Canton de Genève, represented the Canton de Genève.

A ribbon-cutting ceremony was performed by FDI President, Roberto Viana; FDI Executive Director, David Alexander; and for the Canton de Genève, André Klopmann. Guests enjoyed a brief tour of the office on the 5th floor having a sneak peak of FDI’s new “home” and FDI’s colourful windows.

The Grand Opening ceremony coincided with FDI Council meeting. Despite the Iceland volcanic ash incident which made traveling difficult, a good number of guests could still attend the ceremony. However, some aspects of the event were postponed, such as the bidding for the 2015 congress. This has now has been scheduled to take place in September in Salvador.

Excerpt from FDI President’s speech

Roberto Viana: “I feel proud that FDI World Dental Federation—one of the world’s oldest international health profession organizations—has found a new home in this city, with neighbours including the World Health Organization, United Nations, and World Trade Organization.”

“...From our new home in Geneva, we are well positioned to collaborate with our many partners in health, continuing to serve as the worldwide, unified voice for oral health; to promote oral health globally; & to deliver excellence in continuing professional education & access to care to communities worldwide.”

Grand opening of FDI head office in Geneva, Switzerland
Restoring anterior esthetics with zirconia

Dr Ratnadeep Patil & Dr Dimple Bharadwaj-Bhonele, Smile Care clinic, Mumbai, India

Introduction

Metal free restorations are now widely used and accepted due to their highly aesthetic potential and their excellent biocompatibility properties. In order to improve strength and fracture toughness, several new ceramic systems and techniques have been developed. Many ceramics, such as spinel, alumina, and ceramic reinforced with lithium disilicate, have been proposed for the construction of metal-free restorations. These materials have precise indications for fixed partial dentures (FPD), on the contrary zirconia has become popular because of its transformation toughening.

Case presentation

The patient, a 30-year-old female, wanted to improve her smile as well as address the constant fracture of her composite veneer on 11, 12, 15, 21, 22, and 25 (Fig.1). The clinical examination revealed fracture of composite veneer on, and attrition of her anterior and wear facets on her posterior teeth. During the treatment planning session, the patient was given an option of porcelain fused to metal-free restoration. The patient opted for metal-free restoration.

Considering the patient occlusion force, which was probable the reason for constant fracture of her veneers, zirconia was chosen as the material of choice. The abutments were prepared, finish line margins were placed at the gingival level (Fig. 2, 3, 4, and 5). The final full arch impression was made with a combination of heavy and light viscosity polyvinyl siloxane. The shade was determined with a shade guide (Vitapan 3D Master, Vita, Germany). The patient was sent home with prefabricated provisional restoration biasacryl material (Fig. 6), taking care that the margins were not over-extended as the final soft tissue aesthetics depend a lot on the form of provisional.

The temporary crowns were cemented with non-eugenol temporary cement (Tempbond NE, Kerr, Romulus, Mich.). The complete 6 unit Y-TZP based framework was milled from single block of zirconia (ZirkON). The framework was clinically checked for the fit, lalial profile and clearance for the veneer ceramic at the bisque trial. The final restoration was cemented with self-adhesive cement RelyX U100 (3M ESPE).

Discussion

Natural look of soft tissue in contact with FPD is influenced by 2 factors: mucoal thickness and the typology of restorative material. Metal-free restorations allow preserving soft tissue color more similar to the natural one than porcelain fused to metal restorations (Fig. 8a-c). Among the metal-free restorations, zirconia oxide material has the highest flexure strength with a range of 900 to 1200 MPa. This is approximately twice as strong as alumina oxide ceramics currently available and 5 times greater than the standard glass ceramics. Even more important is the fracture toughness of the material which is the ability of the material to resist propagation of internal fracture—an important indication of a material’s clinical reliability. Due to zirconia’s inherent strength, the material can be cemented to the prepared abutment with resin modified glass ionomer or self-curing resin cements successfully with the potential to enhance aesthetics. Further, with these cements the clean-up of the excess cement at the margin is easy, and elimination of excess cement is always clinically beneficial. In case of short or extremely-tapered preparations, bonded resin cement may be best.

Conclusion

When beginning with aesthetics all ceramic offer a promising alternative for the restoration of anterior teeth, and short-term clinical evaluations have demonstrated high success rates. The choice of material ultimately depends upon the clinical situation. The dentist needs to determine how much retention the preparation provides, the occlusion, the aesthetic demands, and the location of the restoration in the mouth.

References


About the authors

Dr Ratnadeep Patil has maintained a successful private practice specializing in esthetic and implant dentistry in Mumbai. He is a Diplomate, International College of Oral Implantologists and an active member of the International Association of Dental Research. He has authored a clinical textbook ‘Esthetic Dentistry-An Artist’s Science’ and has been actively involved in conducting continuing dental education programs with a special focus on smile designing, practice management and implant dentistry.

Dr Dimple Bharadwaj-Bhonele She graduated from College of Dentistry, Manipal University, Karnataka, India, and, further, completed her masters in oral surgery from K.U.L, Leuven, Belgium. She works with Dr Ratnadeep at the Smile Care clinic, and has been involved in clinical activity and continuing dental education programmes and clinical research.
Interview: 'Public dental services in South Africa have fallen by the wayside'

Despite the achievement of being the first African country to host the FIFA World Cup, South Africa is a nation with many challenges, such as high rates of crime & HIV/Aids infections. In addition, the country also has high levels of tooth decay, especially in young children. During his visit to South Africa, Dental Tribune International Group Editor Daniel Zimmermann was able to speak with Prof. Sudeshni Naidoo from the Department of Community Dentistry, Faculty of Dentistry, University of the Western Cape (UWC) in Cape Town about oral health challenges and the impact of the HIV/Aids pandemic on dental professionals.

Daniel Zimmermann: Prof. Naidoo, very little is known about the current state of oral health in South Africa. Would you describe the current situation for our readers?

Prof. Sudeshni Naidoo: The last National Oral Health Survey was conducted a long time ago, back in 1989/1990. We conducted another survey approx. 10 years later but only on children up to 15 years of age. Therefore, it is really difficult to comment on the oral health situation in South Africa at the moment.

Other research has been documented, of course, for example through the South Africa Demographic & Health Survey in 2003, which interviewed respondents regarding oral health. What we found from these studies is that oral health varies a lot in South Africa, especially between populations in rural & urban areas, where we found significantly higher levels of tooth decay. One of the reasons for this is the migration of a large number of people moving from the rural areas to the big cities after the abolishment of Apartheid in 1994. These peri-urban populations have experienced rapid deterioration in oral health owing to changes in their diet.

I am sure that we were to conduct a survey now, chances are high that the level of decay would still be on the increase.

Early childhood caries (ECC) is one of the major oral health problems in developed and undeveloped countries alike. Is this true in South Africa too?

ECC is a significant problem throughout the country, but especially here in the Western Cape Province, which has the highest rate of children with ECC, also known as ‘ramnant caries’. Again, this is related to diet and poor habits. Mothers often feed their children on a diet high in sugars or put large amounts of sugar in feeding bottles. One of the common things we use here, for example, is condensed milk and that often leads to rapid decay.

I have to admit that we have not comprehensively sought for a manner in which to address the problem. One of the things we certainly have to do is integrate oral health messages into the general health messages that are formulated and propagated by the Department of Health.

As far as ECC is concerned, it is imperative for us to cooperate with antenatal clinics and seek to educate mothers & mothers-to-be regarding prevention and the way in which to look after their children’s teeth.

Is oral health awareness generally poor?

To give you an answer to this question, I have to return to the latest South Africa Demographic & Health Survey. In this survey, we found that over 90 per cent of the respondents gave the response “yes” to questions like “Do you have a toothbrush?” or “Do you brush your teeth?”. We were a little bit concerned with this high positive response because we knew from smaller studies that low-income households usually cannot afford toothbrushes or toothpaste, and a single toothbrush are sometimes shared between six/eight family members.

School-based prevention programs in Asia, for example, have shown promising results for the improvement of personal dental hygiene. Could such programs be considered a model for South Africa?

Absolutely. However, the problem with implementing these programmes in South Africa is the lack of coordination. Several programmes have already been implemented in various parts of the country in the last few years, but they have not been done so in any uniform way.

During the Apartheid era, we had vertical oral health care programmes and the funding for oral health was ring-fenced. However, after the decentralisation of the health care sector and the introduction of the District Health Care System in the mid-1990s, every province received a budget for general health funding instead of specific programmes & therefore, oral health services in the public sector have fallen by the wayside.

We really need to start thinking about bringing all these programmes back, particularly with a view to the fact that we have not seen any significant reduction of caries levels in our dental clinics. The experiences of other developing countries with regard to implementation of such programmes could be helpful in this respect.

What other measures should be implemented to improve the situation in South Africa?

Besides poor oral health awareness, our main challenges are the huge disparities in various parts of the country and the gap between the public and private sectors. We have private clinics both in medical and dental care that rival some of the best in Europe and North America. In our public sector, however, we have a long way to go to reach anywhere near the kind of services that you might expect to get in Scandinavia, for example.

At the moment, almost 70 per cent of our population seeks treatment in the public sector and cannot afford the private medical care that is available in the country.

Personally, I do not see the number of oral health care workers drastically increasing in the next five to ten years. So what we need to do is to piggyback on other activities that will help us to enhance and improve the oral health status of people in South Africa, such as linking oral health messages into general health messages and being very actively involved in the general health preventive programmes that are currently being implemented. We also have to convince our medical colleagues that the mouth is the gateway to health and that oral health has an impact on his/her general health and consequently, quality of life.

We also need to revisit our water fluoridation legislation. Water fluoridation efforts have been stalled in recent years and even though it is legislated that we incorporate it into our public water supplies, several municipalities have blatantly refused or have been unable to implement water fluoridation measures.

South Africa currently has the highest number of people living with HIV/AIDS in the world. What impact does the pandemic have on health care workers in the country?

The HIV/AIDS pandemic has indeed had a devastating impact on the public health care sector & has overloaded the health care workers, including dentists. In some parts of the country it is estimated that up to 75 per cent of our in-patients in public hospitals are there on account of some HIV/AIDS-related illness.

In addition, South Africa has one of the lowest levels of people infected with Tuberculosis in the world, with the centre again being here in the Western Cape Province.

I do not think this is something that is going to go away in the next 10 to 20 years because even though we have improved on the number of people receiving antiretroviral medication, there are still hundreds of thousands of people who are in need but do not have access to it.

Is there sufficient awareness of the disease amongst oral health care workers?

Awareness amongst our health care workers has definitely improved. I think the transition from an HIV/AIDS-denialist to a much more open presidency in the past few years has definitely been a positive development. In fact, this month key government officials, including the President underwent HIV/AIDS tests, with the results given out in public.

Unfortunately, the reason many oral health care personnel are aware of HIV/AIDS is still largely due to risk and the fear of contracting the virus. To my knowledge, however, there is not a single documented case of transmission within a dental setting. What we certainly do here at the UWC Faculty of Dentistry is to tell our students that while the risk is present, it is also miniscule. In addition, they receive a good grounding, not only on prevention measures but also on care and management of patients infected with HIV/AIDS, such as detection and management of the oral manifestations of HIV.

There has also been a great focus on the ethical issues related to the management of patients with HIV/AIDS within Continuing Professional Development programmes. Health care workers who want to register with the Health Professions Council, for example, have to prove that they have earned 50 CPD points per year. So I think our oral health care workers are pretty much up to date on these issues.

Thank you very much for this interview.
Miniscrews—a focal point in practice

Six-part series by Dr Björn Ludwig, Dr Bettina Glaal, Dr Thomas Lietz & Prof Jörg A. Liasson—Part V

Therapeutic auxiliary elements

Down in the jungle

The number of dental suppliers worldwide that offer miniscrews has expanded to an estimated 45 and this number is still growing. Two trends are apparent from the range of products that are currently available.

There are companies that supply miniscrews only in combination with the required insertion instruments. However, miniscrews are only a means to an end where bone anchorage is concerned—an aspect that is far too often overlooked. This is because if the desired therapeutic outcome is to be achieved, appropriate auxiliary devices must also be used (eg springs, elastic chains, wires). For the purpose of a treatment, this means that a range of suppliers must be approached in order to obtain all the elements required for the actual procedure. A potential problem under these circumstances is that the miniscrews and the auxiliary elements may be incompatible. Very few suppliers of miniscrews also offer a complete system.

Such a system consists of diagnostic and therapeutic auxiliary products, in addition to miniscrews (Table 1). In the case of a complete system, it can be assumed that the head of the miniscrew will be compatible with the auxiliary element. The building-block principle can be used to construct an individually tailored appliance from the various elements. The greater the range of auxiliary elements that is available, the more freedom and flexibility these elements afford in a range of applications.

Suppliers of miniscrews whose core business is the orthodontic sector usually also offer the necessary auxiliary products in their ranges. It is both convenient and time-saving for the user when the appropriate products are offered together or are available in sets.

Auxiliary elements for direct chairside use

These auxiliary elements can be divided into three main groups:

- basic elements
- semi-finished elements
- finished elements

Classification is determined by the extent to which the user has to process or manipulate the element before it can be used.

Basic elements

These consist solely of orthodontic wires (particularly wires with square profiles but also those with round profiles) of various grades and materials. The wires are used to fashion individual auxiliary elements, which can be more or less time-consuming depending on the type of appliance required. The wires (particularly those made of stainless steel) are quite reasonably priced.

Round profile wires are mainly used as ligatures, in other words, simply as fixing elements, but if appropriately twisted, they can also be used for traction purposes (Fig. 1). Three-dimensional monitoring of round profile wires is not possible as they offer little resistance to torque. Square profile wires, however, can be subjected to 5-D inspection because they are torsion free & highly stable & provide (depending on their dimensions) for a very rigid attachment between miniscrew and appliance (Fig. 2). It is advisable to use a grade of wire that fills the slot of the miniscrew.

In some cases, it may be necessary to bend a square profile wire. This can be advantageous in mesialisation when a hook can be provided on the pin for attaching a spring or elastic chain and for attachment to the main arch of the appliance. For this purpose, the wire should be bent at a right angle. Bent wires can also be used in another situation. A ligature or a drop of adhesive is used to fix a square profile wire in a miniscrew slot. Depending on the reciprocal forces and the quality of fixation, the wire (square or round profile) can start to slip within the slot. This can readily be prevented by bending the wire, at least if a pin with a cross-slot is used (Fig. 5a).

In these two situations, however, a grade of wire that fills the slot can only be used if the edges of the slot at the point of cross-over are removed. Of the 16 mini-screws with cross-slot bracket heads currently available, this convenient detail is only found in OrthoEasy (FORESTADENT; Fig. 5b) and the tomas-pin (DENTALBUM; Fig. 5c).

Semi-finished elements

These auxiliary elements are generally components that are supplied in a functional form but must be adapted to individual circumstances. One example is the uprighting spring (Fig. 4a), which can be used after only a few adjustments. Depending on how the spring is set, lower molars can be straightened and concomitantly intruded or extruded. This auxiliary element is particularly useful in pre-prosthetic procedures in which teeth need to be moved to provide an optimal baseline (Fig. 4b). Crimpable tubes to which square profile wire has been welded (Figs 5a & b) can be used to attach miniscrews to a pre-existing MII (multi-bracket) appliance. If a fixed anchorage becomes necessary during treatment, this can be easily implemented using these wire elements without needing to remove the appliance or parts of it. During En Masse Retraction, crimpable tubes with attached wire can be used to fashion individual hooks (Fig. 6). These can thus be used to ensure that the traction force (provided by spring or elastic chain) is applied near the centre of resistance.

There are three companies that offer pre-prepared wire elements, such as the L and U wires (FORESTADENT) and the tomas T wire (DENTALBUM). These elements facilitate the attachment of bands & brackets (Fig. 7a). The tomas T wire (Fig. 7b) with its three arms provides
for a wide range of possible application combinations. For the purpose of mesialisation, for example, one arm can be bent to form a hook. Another can be attached to the main arch by means of a cross tube. Another variant devised by Dr S. Baumgärtel is the fixation of the anterior teeth to a para-median miniscrew (Fig. 7c).

**Finished elements**

This group covers a whole range of auxiliary products for use in many different applications (Table 5). All of these require little or no time for preparation and can be used directly without adaptive adjustments. However, these products are also accordingly priced relative to type and grade of finish.

**Crimpable hooks**

For the purposes of En Masse Retraction, it is often an advantage when the force provided by spring or elastic chain is applied at the same level as the centre of resistance. This can be readily implemented using ready-made hooks, which are crimped to the arch of the appliance (Fig. 8).

**Compression springs**

Compression springs are also ready-made elements and are sold by the metre. The springs can be used for distalisation and mesialisation. One problem is ensuring continuous activation as the spring effect is lost. Stop element can be incorporated to avoid needing to remove the whole appliance whenever this happens (Table 5). These are available as crimpable elements and as screw stops. The latter have the advantage that they can be quickly adapted to a wide range of situation. When such stops are used, the effort required for the repeated activation of springs is considerably reduced.

**Coil spring elements**

Coil springs are not new in the field of orthodontic treatment. They are generally too small to be attached to miniscrews (Fig. 7b). A firm attachment to the screw head can only be achieved using ligatures or ready-made hooks that allow attachment of the spring to the head. For this reason, several suppliers now offer coil springs (Table 5) with at least one eyelet that is compatible with the head of their miniscrew (Fig. 8). These springs are generally made of NiTi and can be used in many different applications. New on the market are the

![Figs. 4a & b: Uprighting and space closure of a tipped molar by using an uprighting spring. Clinical situation (a) and X-ray (b).](image)

![Figs. 5a & b: Situation after 13 months of uprighting and space closure, clinical situation (a) and X-ray (b).](image)

![Figs. 6: A round profile wire attached to a crimpable tube can be used to prepare individual hooks (for example for use in En Masse Retraction).](image)

![Figs. 7a-c: Using the L-anchor (FORESTADENT), it is possible to attach a miniscrew to a bracket or band quickly (a). With its three arms (b), the tomas T wire (DENTARUM) can be used to create a wide range of attachments between a screw, an MB appliance or the teeth (c). (Photo 7c: Dr S. Baumgärtel, USA)](image)

**Semi-finished elements which need to be individually adjusted**

<table>
<thead>
<tr>
<th>Element</th>
<th>Device</th>
<th>Application</th>
<th>Characteristics</th>
<th>Product name</th>
<th>Available for</th>
<th>Example applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power arm</td>
<td>“En Masse” Retraction</td>
<td>Crimpable tubes with a welded-on wire for individual hook formation. They can be used in certain situations to attach the main arch or a segment to the pin.</td>
<td>tomas®-power arm</td>
<td>tomas®-pin A-1</td>
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<td></td>
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<tr>
<td>Wire elements</td>
<td>Direct anchorage</td>
<td>Prebent/ready-to-use wire elements for attaching pin head and the orthodontic appliance</td>
<td>tomas®-wire</td>
<td>tomas®-pin OrthoEasy® M.A.S. BENEFIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uprighting springs</td>
<td>For the uprighting of molars and, depending on setting, simultaneous intrusion or extraction</td>
<td>NiTi spring, attachable to a steel wire</td>
<td>tomas®-uprighting spring Titanol® Uprighting spring</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Table 2 (Graphics: DENTARUM, FORESTADENT; Layout: DTI) |
Nikodem springs (Fig. 9a). These flat coil springs made of NiTi were originally developed for the alignment of displaced canines. However, they have also since been found to be effective in intrusion and En Masse Retraction treatments (Fig. 9b).

Elastic chains are widely used traction elements. In contrast with NiTi springs, however, these rapidly lose their effectiveness. For this reason, a chain is only placed around the head of a miniscrew so that it can be more easily removed later. Depending on head design and the direction of the force applied, it is possible for the chain to become accidentally dislodged from the screw head.

For connection to a miniscrew, a suitable abutment must be employed. In hybrid PSE, for example, two arms of the expansion screw are welded to the abutment. The laboratory abutments available from FORESTADOR are slotted stops allowing application of a variety of auxiliary elements (Table 5).

All the elements discussed above can be prepared and inserted, with varying amounts of time expenditure, directly at the chairside. In recent years, the range of applications for miniscrews has also been extended to skeletal adjustment treatments, such as palatine suture expansion (see Dental Tribune Asia Pacific, 5(2009): 24).

An innovative approach is the BENEFIT-System (Mondial). Analogous to prosthetic implants, an implant is placed in the bone. Instead of the widely known system where the head is firmly bonded to the thread, there are different abutments (Table 5) available. These will be threaded to the bone screw. This way, many installations can be prepared in the laboratory, for example, distalisation, anchoring, and retention PPE, saving chair time. For many mechanisms, such as molar uprighting or intrusion, impression is not necessary and the BENEFIT implant can be directly used.

**Conclusion**

Depending on the task at hand, it may be necessary to use various auxiliary elements. Most of the connection elements discussed are not new and have already been used successfully in orthodontic treatment for some time. For this reason, most of them will already be available in every practice, but often not where they should be. In order to be effective and not waste time searching for tools, it is advisable to have the most important auxiliary elements to hand in a tray. You can either create a DIY version of the tray or purchase one of the ready-made trays available on the market.

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**Table 3**

<table>
<thead>
<tr>
<th>Element</th>
<th>Device</th>
<th>Application</th>
<th>Characteristics</th>
<th>Product name</th>
<th>Available for</th>
<th>Example applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimpable hook</td>
<td>&quot;En Masse&quot;</td>
<td>Retraction</td>
<td>Crimpable tube with welded hook or attachment of elastic elements (elastic chains, springs)</td>
<td>formax®-crimp hook</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
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<tr>
<td>Compression springs</td>
<td>Distalisation, mesialisation</td>
<td>&quot;En Masse&quot; Retraction</td>
<td>Supernastic NiTi compression springs</td>
<td>formax®-compression spring Compression Springs TruFlex® Nikuki Titanium Spring</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
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<tr>
<td>Coil springs</td>
<td>Mesialisation, &quot;En Masse&quot; Retraction</td>
<td>Supernastic NiTi coil springs with an eyelet that fits the pin head</td>
<td>formax®-coil spring Nikodem spring Coils springs Vector-TAS™ Delta Spring Ortho Aligning Closed Coil Springs</td>
<td>formax®-coiled coil spring OrthoAligning Closed Coil Springs</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
<td></td>
</tr>
<tr>
<td>Hook for elastic chains or springs</td>
<td>Mesialisation, &quot;En Masse&quot; Retraction</td>
<td>Hook compatible with pin head. Provides for secure attachment of elastic chains and springs</td>
<td>formax®-hook Monkey hook Monkey hook Screw hook</td>
<td>formax®-hook Monkey hook Screw hook</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
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</tr>
<tr>
<td>Sliding hook</td>
<td>Mesialisation, &quot;En Masse&quot; Retraction</td>
<td>Square tube with extension arm for attachment of elastic elements (elastic chains and springs)</td>
<td>formax®-stop screw formax®-skirted stops Crimpable stop Crimpable stop</td>
<td>formax®-stop screw formax®-skirted stops Crimpable stop Crimpable stop</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
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</tr>
<tr>
<td>Stop elements</td>
<td>Indirect attachment</td>
<td>Tubing or channel (eg. for activation of compression springs without removing the appliance)</td>
<td>formax®-cross tube Cross tube</td>
<td>formax®-cross tube Cross tube</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
<td></td>
</tr>
<tr>
<td>Cross tube</td>
<td>Indirect attachment</td>
<td>Cross tube for the connection of two miniscrews</td>
<td>formax®-cross tube Cross tube</td>
<td>formax®-cross tube Cross tube</td>
<td>formax®-pin OrthoEasy® Orthodontics Mini Implant Dual-Top® Anchor Screw AbsoAnchor</td>
<td></td>
</tr>
<tr>
<td>Abutments</td>
<td>Distalisation, palatine suture expansion (PSE)</td>
<td>Can be mounted on screw heads. Represents a crossover of laboratory-prepared appliances (eg. for distalisation, PSE etc.)</td>
<td>Labor Abutment BENEFIT-Standard abutment BENEFIT-Abutment with Slot BENEFIT-Abutment with slot BENEFIT-Abutment with slot BENEFIT-Connecting plate with floating screw</td>
<td>Labor Abutment BENEFIT-Standard abutment BENEFIT-Abutment with Slot BENEFIT-Abutment with slot BENEFIT-Connecting plate with floating screw</td>
<td>Labor Abutment BENEFIT-Standard abutment BENEFIT-Abutment with Slot BENEFIT-Connecting plate with floating screw</td>
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**Fig. 8:** Use of crimpable hooks (formax crimp hook, DENTALUM) makes it possible to transfer the point at which force is applied to the level of the centre of resistance. The eyelet of the coil spring fits the mini-screw head exactly. (Photo: Dr. Morea, Brazil)

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**Fig. 9a, b:** The Nikodem spring (a) is available with varying numbers of coils. It can be used for the alignment of displaced teeth, for intrusion and En Masse Retraction (b). (Photo 9b: Dr. Nikodem, USA)

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**About the author**

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References:
If cold means pain
it is a sign of
Sensitive Teeth

Fast relief from pain of sensitive teeth