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Case by CDT Daniele Rondoni and Dr. Enzo Attanasio.



Initial situation: Young female patient with misshaped and misaligned maxillary incisors. Digital smile design is used to reveal the ideal proportions and positions of the anterior teeth.



Guided tooth structure removal with the aid of a silicone index. The minimum wall thickness of the selected material – KATANATM Zirconia YML – is 0.4 mm.



Lateral view of the master cast with the six veneers individualized with the liquid ceramic system CERABIEN[™] FC Paste Stain.



Tooth-like translucency of the veneers on the model.



Intra-oral try-in with two different shades of the PANAVIA[™] V5 Try-in Paste: A2 is used in the right and Clear in the left quadrant. It was decided by the dentist to use A2 shade.



Lateral view of the cemented veneers. The result is a natural surface texture, which contributes to a natural appearance of the restorations.



CDT DANIELE RONDONI

Born in Savona in 1961 where he lives and has worked in his own laboratory since 1982 with his collaborators. Graduated from the dental technician school IPSIA "P. Gaslini" in Genoa in 1979. He continued his education by attending relevant workshops for the "Italian dental school" and broadened his professional experience in Switzerland, Germany and Japan. Since 2011 Kuraray Noritake Dental International Instructor.



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Embracing the world of automation *p.44*

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EDITORIAL

Stronger together

MATT EVERATT Editor-in-chief

e are now a couple of months into the newly elected government's term, and we have been told that we are in for some tough times. I do wonder what this means for laboratories, as most are listed as small businesses or sole traders. Only time will tell...

DIGITAL ADVANCEMENT

This month, we have a big focus on digital dental technology, with some great firsthand experiences being shared by technicians, for technicians. These articles share how labs have made the transition from analogue to digital and how automation is having a positive impact on dental labs.

There are some very cool things happening in dental technology at the minute, and there is definitely more to come! Thanks once again to all of those who have contributed articles.

HEAVY TOPICS

In this issue, I have written an intentionally provocative article related to General Dental Council (GDC) registration and the decline of dental technicians. I hope this piece will spark much needed debate and push the GDC to take action.

I had hoped to report back on the topic of illegal manufacture. We are now several years into the investigative journey started by the likes of the late Larry Browne, but we still await answers from our professional organisations and the GDC.

OPTIMISTIC FUTURE

Despite these heavy and gritty topics, I am very optimistic about the future for dental technicians, clinical dental technicians (CDTs) and laboratories. We, as a group, are communicating with each other more so than at any time I remember. We seem to be openly discussing business, pricing, registration, tips on manufacturing and

technical help.

Together we are stronger, and we will make our corner of the profession a great place to be for ourselves and for future generations.

ENDING ON A HIGH

Closing on another high note, with this edition announcing the 2024 *Laboratory* Leading 20, I hope you will join us in this celebration of everything that is good about our dental technicians, CDTs and labs. I hope to bump into a few of you over the coming weeks at the awards and forthcoming dental exhibitions. Enjoy this issue, and please do get in touch if you would like to contribute any articles or technical cases in future editions.

Laboratory

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Diving into digital

ince the last issue, the General Dental Council (GDC) has reported a decline in the number of registered dental technicians for 2024, while all other DCP professions have grown. This paints a worrying picture of the future of dental technicians and highlights the urgent need for the GDC to address this trend - Matt Everatt dives into this issue on page 32. The GDC's new CEO has since visited a lab to better understand the role of technicians and the challenges labs currently face (page 19). Like many, I hope this proactive step is an indication of light at the end of the tunnel and a newfound commitment to supporting dental technicians.

In this issue, you will also find a selection of articles shining a light on digital dentistry. They cover all stages of digital adoption, from the perspective of someone who embraced digital tools as a student (page 25) to an experienced technician and CDT who was reluctant to even acknowledge new technology (page 29). For those in a similar boat, Ashley Byrne shares some practical steps to transition from analogue methods on page 33, helping you on your way to digital success. As he emphasises, it is not a quick transition, but rather takes small, measured steps before you can relish the benefits of digital workflows.

If you are interested in finding out just how impactful digital workflows can be, Angela Stoilova's technical case on page 16 illustrates the sheer accuracy, quality and simplicity that it can bring to even the most complex cases. But it's not all about CAD/CAM - over on page 44, Tom Smith shares how automation has 'drastically' changed his lab for the better, resulting in increased capacity and throughput in all areas.

For those who are not fully convinced by digital workflows, many of the articles highlight the benefits of a dual approach combining both analogue and digital methods. However, if you are have a unshakeable hate for the d-word, there are plenty more articles to enjoy.

For example, don't miss Laura Rowell's technical case on page 12 which underscores how important communication is in balancing patient preferences with your own expectations. On page 24, Andrea Johnson offers a touching and honest reflection on her career and the hurdles she has faced, while Gabi Pollard shares a refreshing look into her first impressions of dental technology as a recent graduate on page 20.

Finally, we are delighted to announce the Laboratory Leading 20 for 2024! Over on page 10, you will find the full list of inspiring indivduals who are making a positive impact and driving dental technology forward. I hope you will join us in celebrating and recognising these names and their contributions. Interested in publishing an article? Get in touch!

LUCY VEAL



Editor of Laboratory



ENHANCED CPD

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LAB UPDATE

Laboratory's Lab Experts panel

Presenting **Laboratory's** editorial board – the Lab Experts helping to nurture connection, passion and quality within dental technology



CRAIG MARK BROUGHTON

Clinical dental technician and managing director, CMB Dental Laboratory



ASHLEY BYRNE Associate director, Byrnes Dental Laboratory, part of the Corus group



MASSIMO CICATIELLO

Orthodontic dental technician and owner, Napoli Ortodonzia



MATT EVERATT

Editor-in-chief of Laboratory and S4S Dental Laboratory director



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Managing director and co-owner, Hive Dental Laboratory



EMILY PITTARD

Clinical dental technician, clinical director and co-owner, Hive Dental Laboratory



KASH QURESHI

Clinical dental technician and managing director, Bremadent Dental Laboratory



DANIEL SHAW

Maxillofacial prosthetist and laboratory manager, Chesterfield Royal Hospital



BRIANA SLACK

Dental technician, S4S Dental Laboratory



LOLA WELCH

Senior dental technician, Quoris 3D

di



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Fewer dental technicians in 2024, GDC reports

he number of dental care professionals (DCPs) on the UK register has increased this year, the General Dental Council (GDC) reports. This follows the recent annual renewal period in July, which recorded 75,905 DCPs on the register – a 5.7% increase from 2023, with 4,101 new registrants. The regulator reported that all DCP professions saw an increase in registrants with the exception of dental technicians, who had 88 fewer compared to 2023. However, the number of registered clinical dental technicians saw an increase of 19 registrants.

In addition, the professional title with the highest percentage increase was dental therapist, which saw 22% more registrants join the UK register.

The renewal period also saw a decline in removals, with just 4.3% of DCPs not renewing their registration. This is notably lower than the average of 6.3% from the past four years.

Dental nurses had the greatest number of removals, with 2,875 not renewing their registration. Removals can occur for various reasons, including voluntary

removal, non-payment, retirement and notification of death

USEFUL BENCHMARK

The GDC noted that while this data provides a benchmark for

the number of UK-registered DCPs, it does not give insight into working patterns or whether the DCPs are providing private or NHS services.

This data is expected to be published in autumn 2024.

The regulator also stated: 'While the register is constantly changing, what we invariably see (for both the dentist and DCP registers) is that over the course of the year, the number of registered professionals changes due to new registrations, and as professionals leave the register for a range of reasons.

'Last year, we have made it easier for dental professionals to restore their name to the registers so that they can continue to practise in the UK.

'This important change means that dental professionals who have been off the register for less than 12 months and have always complied with CPD, are able to sign a declaration that it is up to date, rather than send us a copy of their full CPD record.'

Smoking could be banned in open-air spaces

he government is considering banning smoking in a number of open-air spaces, according to leaked Whitehall documents. This includes areas such as pub gardens and outside restaurants, hospitals, sports grounds and playgrounds.

These measures are being proposed as part of a tougher version of former Prime Minister Rishi Sunak's Tobacco and Vapes Bill, which was dropped before the election.

In July this year, King Charles confirmed that the newly-elected Labour government will revive the bill, which includes implementing a smoking ban by making it an offence to sell tobacco products to anyone born on or after 1 January 2009.

It also includes provisions to reduce youth vaping, such as the regulation of the flavours,

contents and packaging of vaping products. Health experts have reportedly welcomed the leaked proposals, while some ministers have voiced concerns about the impact on the hospitality sector.

Reform UK leader Nigel Farage told *The Sun:* 'It'll be the end of pubs.'

'RANGE OF MEASURES' BEING CONSIDERED

A spokesperson for the Department of Health and Social Care said: 'We do not comment on leaks.

'Smoking claims 80,000 lives a year, puts huge pressure on our NHS, and costs taxpayers billions. We are determined to protect children and non-smokers from the harms of second-hand smoking. 'We're considering a range of measures to finally make Britain smoke-free.'

Dr Layla McCay is the director of policy at the NHS Confederation. In response to the leaked proposals, she told BBC Radio 4: 'I'm obviously in favour of measures that help abolish smoking.

'We have seen from the previous government – and from this current government and indeed from wider society – this strong commitment to move towards abolishing smoking.

'It is absolutely the health challenge of our time. It's the leading cause of preventable illness in the UK, so we are heartened to see progress is being made and that the intention is moving forward to really address one of Britain's main drivers of health inequalities.'

Laboratory

Vaping as damaging to young people as smoking

aping is just as harmful as smoking tobacco when it comes to the health of young people, according to latest research.

Carried out by researchers at Manchester Metropolitan University, the study compared vapers and smokers in an exercise test. The team found similar results in both groups, both participants being less fit and more out of breath than people who do not vape or smoke.

Presented at the European Respiratory Society (ERS) Congress in Vienna, Austria, the study asked 60 people in their 20s to have their lung capacity recorded while using a static exercise bike. Of the 60 participants, 20 had used vapes for at least two years, 20 had smoked for at least two years and the remaining 20 were non-smokers.

Researchers analysed the heart, lungs and muscle responses of participants at

more challenging levels until they reached their maximum. They were also given blood tests and an ultrasound scan to analyse how well their arteries were functioning.

Both vapers and smokers showed signs that their blood vessels were not working as well as the non-smoking and non-vaping group, according to the blood tests and ultrasound scans.

Both the smoking and vaping group were more out of breath, experienced intense leg fatigue and had higher levels of lactate in their blood.

LONG-TERM IMPACT OF VAPING

Co-author Dr Azmy Faisal is a senior lecturer in cardiorespiratory physiology in the department of sport and exercise sciences at Manchester Metropolitan University, UK.

He said: 'Previous research has shown

that vaping is linked to lung inflammation and damage, and harmful changes to the blood vessels.

'Although some research suggests that vaping could be used to cut back or quit smoking, we don't yet know what longer-term vaping use does to our bodies.'

This comes as a new study found that secondary school students diagnosed with mental health issues such as depression are twice as likely to have vaped. Conducted as part of the Our Futures vaping prevention programme led by the University of Sydney's Matilda Centre, more than 5,000 students aged 12 to 14 took part in the study.

Researchers found that almost one in 10 (8.3%) reported having used e-cigarettes before. The Matilda Centre previously found the average age a teenager begins to vape is 14.

Covert surveillance to be used 'sparingly', says GDC

he General Dental Council (GDC) has released new legal and ethical framework on the use of covert surveillance during fitness to practise (FtP) investigations.

The updated guidance, according to the GDC, highlights its commitment to transparency, legality and the protection of individual privacy during both FtP and illegal practice (IP) investigations.

The new guidance reads: 'Where investigations can be conducted without the use of covert surveillance, they must be. The least intrusive method of investigating should always be preferred.'

WHAT IS COVERT SURVEILLANCE?

Surveillance involves monitoring, observing, recording or listening to people, their movements, conversations or other activities and communications, with or without use of a surveillance device. Covert surveillance is where it is carried out in a manner calculated to ensure that anyone subject to the surveillance is unaware that it is taking place. It can be either directed or intrusive:

- **Directed:** is planned, covert, but not intrusive surveillance, and is likely to result in the obtaining of private information about a person
- Intrusive: relates to the location of the surveillance – carried out in residential premises and/or private vehicles – and not to the type of information expected to be obtained. It is assumed intrusive surveillance will likely always result in obtaining private information.

Private information refers to details relating to a person's private or family life. Generally, it includes any aspect of a person's private or personal relationship with others, such as family and professional or business relationships. It may also include personal data, such as telephone numbers and address details.

'A LAST RESORT'

Stefan Czerniawski, GDC executive director of strategy, said: 'Covert surveillance will be used sparingly and only as a last resort, ensuring that any investigative practices are necessary, proportionate and respectful of privacy.

commitment to enhancing public trust and patient safety. 'The GDC is committed to protecting the public and ensuring public confidence in dental professions. 'The updated Covert Surveillance Guidance is one element of ensuring transparency, legality, and the protection of individual privacy.'

'This guidance supports our

LAB UPDATE

2024 Laboratory Leading 20

B ack for its second year, we are delighted to share the *Laboratory* Leading 20 for 2024 – a list that celebrates skill, influence and dedication in the UK dental laboratory sector.

_aboratory's

This initiative shines a spotlight on the exceptional work that is being done in dental technology, as well as its impact on the wider profession.

Laboratory Leading 20 is our way of recognising the extraordinary individuals who are driving the future of dental labs and setting new standards.

These are the people who are raising the bar, inspiring others and leaving the lab community in a better place for future generations.

Curating this list from the pool of talented nominations was no easy task. Each name reflects hours of discussion and careful consideration Curating this list from the pool of talented nominations was no easy task. Each name reflects hours of discussion and careful consideration by our team. And just like last year, there is no single metric for making the cut. This list represents an assortment of accomplishments, skill and influence – there is more than one way to measure success.

While not everyone will agree with the entire list, let us assure you that no name on here was chosen lightly.

SHAPING THE FUTURE

Lucy Veal, editor of *Laboratory*, said: 'Welcome to this year's *Laboratory* Leading 20!

'We are so excited to be releasing this list following its successful launch last year. This list celebrates the inspiring individuals who are making a positive impact on the profession, pushing the boundaries with their technical skills, and shaping the future of UK

And with all the challenges currently facing dental laboratories, celebrating these achievements is more important than ever

revealed

Celebrating influence, skill and impact in dental technology – welcome to the

dental technology.

'For me, one of the main takeaways from this initiative has been seeing how eager the community has been to uplift and celebrate each other.

'It is a true reflection of how enthusiastic and supportive UK dental technology is – and that's what *Laboratory* Leading 20 is all about.

'And with all the challenges currently facing dental laboratories, celebrating these achievements is more important than ever.

'I hope you will join us in recognising these outstanding individuals – congratulations to those who made it, and thank you to all who sent in nominations.

Laboratory

Laboratory Leading 20 for 2024!



DEEPA BHARAKHDA Dental technician and mentor, uplifting the community through the sharing of knowledge



BETH BROWN Dental technician and educator improving standards in technical work through accessible training



ASHLEY BYRNE Pioneering lab owner and thought leader pursuing the agenda for sector modernisation



STEVE CAMPBELL Past-president of the Dental Laboratories Association and influential figure in the community



RICHARD EGAN Leader, mentor and trainer on BPS dentures, passionate about sharing



NINA FRKETIN Dental technician championing female technicians through the Nightshift initiative

knowledge



JULIA GLANCEY Dental technician devoted to improving the standards of dental team communication



CHRIS GOLZE

Trendsetting mouthguard specialist and outspoken voice in the lab community



CDTA UK policies advisor, championing scope of practice expansion for CDTs

ANDREA JOHNSON CEO and chair of Den-Tech, a charity helping to provide treatment to vulnerable people

TOM LAVERY Chief executive officer of fast-growing laboratory chain ALS

CAROLINE PERSUAD Pioneering CGDent faculty member championing dental care and denture provision for elderly patients



EMILY PITTARD Outspoken advocate for change as education associate for the GDC and CGDent board member

KASH QURESHI Champion of CDTs, helping to enhance the reputation of dental technology in the wider profession



PHIL REDDINGTON

Well regarded international lecturer and keen advocate of digitisation in laboratories



Associate dean (CPD) at King's College London and director of Londec



DAVID SMITH

Past GDC council member and DLA chair working to build new educational pathways into the profession



PHILLIP WEARS Lab owner committed to promoting sustainability in

dental technology

LOLA WELCH

multiple brands

Key opinion leader for

technical excellence

championing aesthetic and



EBONI-ROSE WILLIAMS

Young dental technician dedicated to enhancing student learning



Exceeding expectations all around

Laura Rowell shares a full upper denture case in which clear communication was key to managing the patient's preferences



LAURA ROWELL Clinical dental technician, Havering Denture Studio

his patient presented to me with a partial upper denture that she had been wearing for more than five years. It had two teeth missing and numerous anterior teeth added to it (Figure 1). The denture also had a big fracture line running across the palate, which is what triggered the patient's decision to have a new denture made (Figures 2a and 2b).

Upon clinical inspection, I noted that the patient had a very resorbed upper ridge in comparison to the position of her remaining natural lower teeth. There was also a free end saddle on the lower left-hand side with no teeth past the LL4.

The ideal scenario for this patient would be a new full upper denture as well as a lower partial denture in order to improve occlusion. I explained the reasons why this would be the preferred treatment plan to my patient, but they had a wish list of their own:

 No lower opposing denture, as the missing posterior teeth did not

bother them

CLAIM

YOUR CPD

GDC anticipated outcome: C

CPD hours: One Topic: Dentures

Educational aims and objectives: To present a full upper acrylic denture case detailing the importance of communication.

This article qualifies for one hour of enhanced CPD. Turn to page 46 to answer the questions.

- 'Gum fit' upper denture, as they liked the look of their current denture that had no anterior flange
- They hate denture adhesive and wanted the fit of their new denture to be as good as the existing denture.

In the end, the agreed upon treatment was a new full upper acrylic denture with as minimal amount of anterior flange as possible.

CHALLENGES

The two main difficulties in this case were the lack of opposing dentition and the anterior tooth position. Firstly, I needed to get as much occlusion as possible on the teeth that had opposing natural dentition.

Secondly, because the patient's natural lower teeth were quite far forward compared to the heavily resorbed upper ridge, the upper anterior teeth would ideally be brought forward to try and avoid a class 3 biting position if possible.

In an ideal situation I would be able to bring these teeth further forward to improve both the aesthetics and the function of the anterior teeth, but I was limited because the patient wanted a gum fit finish.

TECHNICAL WORK

As a clinical dental technician, I am in full control of both the clinical and technical processes for my patient. I started off with primary impressions, using an intraoral putty for the upper edentulous impression as the ridge was heavily resorbed. The opposing impression was taken in alginate.

I fabricated a close-fitting light-cured special tray to take a functional upper impression using silicone (Figure 3).



FIGURE 1: Initial situation. Patient presentation with existing denture

Laboratory





FIGURES 2A and 2B: Patient's current denture showing additions, missing teeth and cracked palate



FIGURE 4: Try-in showing just a small amount of anterior flange

Occlusion was never going to be balanced because of the lack of opposing teeth on one side. Therefore, I needed a good functional impression (not taken in occlusion) to be able to aid retention as much as possible.

When I made the bite block, I added a small amount of flange to see if/how the patient would tolerate it in the mouth and if it would help with retention.

The bite block had great retention and I was able to record all necessary measurements. At this stage, I discussed

As soon as I put the denture into the patient's mouth, the suction was immediate and I knew that the anterior tooth position was not going to be an issue



FIGURE 5: Try-in showing missing opposing occlusion

having a small amount of anterior flange to improve retention and aesthetics with the patient, which she was open to.

When setting up the denture, I managed to achieve the anterior tooth position that I desired. The teeth I selected were already quite long, but by having a small amount of anterior flange I was able to lengthen the teeth by a few extra millimetres (Figure 4).

TRY-IN

At the try-in appointment I was able to check the tooth length in the mouth. The patient and I were both happy with the lip support and the amount of overjet I had managed to achieve. I also checked the occlusion in the mouth, and I was satisfied that I had managed to achieve as much occlusion as possible.

However, during the try-in appointment I grew concerned about the fit of my try-in as it was very loose in comparison to the



FIGURE 3: Functional silicone impression



FIGURE 6: Try-in showing side with good occlusion

bite block. Although the try-in looked lovely in the mouth and I had managed to achieve some good contact, I started to question whether the upper teeth might have been brought forward too much.

Despite only increasing the overjet slightly in comparison to her existing denture, the anterior teeth were now quite far forward in relation to the upper ridge (Figures 5 and 6). I did consider resetting the teeth closer to the ridge, but this would create a class 3 tooth position for the patient.

I explained to the patient that I was slightly concerned that, while we had achieved the desired 'look', we might be compromising on the stability of the denture. That being said, this patient had amazing adaptability to her existing denture so I was prepared to finish the dentures as they were knowing that if the patient wasn't able to adapt overtime, we might have to make some changes.

TECHNICAL



FIGURES 7A AND 7B: The new denture's fit and occlusal surfaces

FINAL DENTURE

On the day of the fit appointment, I was slightly apprehensive as to how well the denture was going to fit (Figures 7a and 7b). However, I did not need to have worried because as soon as I put the denture into the patient's mouth, the suction was immediate and I knew that

Occlusion was never going to be balanced because of the lack of opposing teeth on one side the anterior tooth position was not going to be an issue.

The patient was very pleased with the look of the final denture. I had managed to keep it fairly similar to their previous set with the size and mould of teeth selected (Figure 8).

They also found the small anterior flange comfortable, and the occlusion was much better compared to their existing denture (Figure 9).

In addition, the suction on the finished denture was so strong that I had to show the patient how to press on the back of the anterior teeth to break the seal to allow her to remove the denture.



FIGURE 9: Patient's finished denture in situ at fit appointment



FIGURE 8: Finished denture ready to be fitted

REFLECTIONS

On reflection, I managed to achieve great functional impressions that really helped the final fit and instant suction that the patient achieved. I was also pleased with the tooth selection as I managed to keep the teeth very similar to the existing denture but with a more flattering mould. The tooth length was very close to the original denture, but I managed to tweak the tooth position enough to achieve better aesthetics.

In an ideal world, I would have loved to have made this patient a partial lower denture. I also think from a technical point of view it would have made it a much easier job and result in better occlusion for the patient. But this case taught me that not every job is going to be the ideal scenario. Sometimes all you can do is explain the options to the patient, but ultimately it is their decision and you just have to do the best with what you have to work with.

Keeping good patient communication going throughout the various appointments is key. Sometimes things won't always work as well as you had hoped. With this patient I knew that if the final denture was loose at the fit stage, I had already prepared them for this outcome and they knew that we had different options to try.

Luckily for both me and the patient that was not the case.





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Simplifying surgical guides and implant planning

Angela Stoilova shares a complex full upper arch restoration case in which a digital workflow is critical for an accurate, predictable and successful outcome



ANGELA STOILOVA CAD/CAM and implant planning technician, Vivo Dental Lab

ith the dental industry becoming more and more technologically advanced, Vivo Dental Lab and I believe that the understanding of digital implant planning is as crucial now as it has ever been.

This case study delves into the comprehensive digital workflow involved in the implant planning and designing of a full upper arch immediate fixed restoration.

The process emphasises careful implant planning, precise prosthesis design and the creation of a surgical guide to ensure a successful outcome.

INITIAL DATA COLLECTION AND ANALYSIS

The restoration process begins with the collection of essential data provided by the dentist, including full-face photographs, a CBCT scan and STL files of the patient's intraoral scan. This information is fundamental for the initial planning phase.

In this case, the CBCT scan was imported into an implant planning software



CLAIM

OUR

CPD

GDC anticipated outcome: C

CPD hours: One

Topic: Implant planning

Educational aims and objectives: To present a complex full upper arch restoration case that utilises a digital workflow.

This article qualifies for one hour of enhanced CPD. Turn to page 46 to answer the questions.



FIGURE 1A: The alignment of the STL files and CBCT scan within the software



FIGURE 1C: The patient's gummy smile

for detailed analysis in which I rigorously checked the accuracy of the data, ensuring that all the details of the bone structure were present and there were not any imaging and scattering artifacts.

The STL files were also examined, making sure the full anatomy, including the dentition and the soft tissues, were recorded. This is vital for the correlation of the STLs with the CBCT and the designing of the surgical guide. I also checked the quality of the photos ensuring they follow the DSD protocol, as this is key for designing the prosthesis.

IMPLANT PLANNING

After the initial data collection and analysis, I aligned the STL files and CBCT scan within the software (Figure 1a).

My focus then shifted to evaluating the patient's bone structure to determine the optimal placement for the implants. In this case, the patient's bone structure was deemed adequate to proceed with the planned placement of six implants and the design of a full arch of 12 teeth (Figure 1b). By



FIGURE 1B: The patient's bone structure with the planned placement of six implants



FIGURE 2A: The patient's photographs aligned with the digital model to ensure prosthesis would complement facial features

analysing both the patient's photographs and bone structure, it was determined that only minimal bone reduction and removal of excess gum tissue were required. As a result, this enabled optimal implant placement as the patient had a gummy smile (Figure 1c).

My findings were then shared with the dentist for their review and approval.

It is important to note that communication between the dentist and technician is fundamental at this stage in order to understand the procedure of the surgery, as well as the final result and expectations of the patient. The biggest advantage of a digital workflow is that now that we can cross-reference the implant positions with the prosthesis.

The next step involves designing the ideal teeth set-up for this patient.

DIGITAL PROSTHESIS DESIGN

Designing the prosthesis is a critical step,

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FIGURE 2B: The teeth digitally extracted, simulating the surgical process of the extraction of the teeth



FIGURE 2C: The design to match the essential aesthetic criteria, including the midline, smile line, and tooth length



FIGURE 2E: The final design

requiring careful consideration of both the patient's anatomy and aesthetic goals. I designed the prosthesis using Exocad, a specialised design software.

The patient's photographs were aligned with the digital model to ensure the prosthesis would complement the patient's facial features (Figure 2a).

After alignment, I created a model where the teeth were digitally extracted, which will simulate the surgical process of the extraction of the teeth on the day of the surgery and provide a clear visualisation of how the final restoration will interact with the patient's mouth (Figure 2b).

During this phase, I made the design ensuring it aligned with the key aesthetic parameters, such as the midline, smile line and tooth length (Figure 2c). This is essential for creating a prosthesis that will not only fit well in the patient's mouth but will also enhance the patient's overall appearance.

After finalising the design, I reintegrated the digital design of the prosthesis into the implant planning software to verify that the implant positions would adequately support the prosthesis (Figure 2d).

If any discrepancies were found between the planned implant positions and the prosthesis design, adjustments were made to optimise the implant position in relation to the prosthesis, while liaising with the dentist and getting their final approval to finalise the case.

This process of planning and designing ensures a functional and beautiful final result. The prosthesis is finalised by ensuring there is enough palatal support, and there are holes incorporated in the prosthesis with the correct implant position (Figure 2e).



FIGURE 3: Surgical guide

CREATION OF THE SURGICAL GUIDE

With the prosthesis design and implant position finalised and the dentist's final approval in writing, my next focus was on creating the surgical guide. This is crucial for ensuring precise implant placement during surgery. In this case, the surgical guide was designed with the support of only two remaining molars at the back of the arch and full palatal guidance, which will ensure the correct placement of the guide.

I placed three fixation pins spread around the arch, which will ensure stability during the implant placement process. The dentist was then made aware of which teeth will be extracted and which need to be kept for the surgical guide (Figure 3).

IMPLANT PLACEMENT AND TEMPORARY RESTORATION

On the day of the surgery, before the surgical guide is used, the dentist needs to extract any teeth that are not providing support to the surgical guide. Once these teeth are extracted and the guide is fully seated, the dentist secured the fixation pins. Following this, the dentist could confidently proceed with the drilling protocol and implant placement, knowing that the guide would ensure precise implant placement. After successfully placing the implants, the guide was removed from the patient's mouth and the temporary restoration I made was adapted to the patient's mouth.

The prosthesis was then passed on to the Vivo Dental Lab on-site technician who



FIGURE 2D: The digital design of the prosthesis with the implant planning software to verify that the implant positions would adequately support the prosthesis



FIGURE 4: The bridge in the patient's mouth

finalises the contour and polishes the bridge. After all the adjustments were done, the dentist screwed the bridge into the patient's mouth and it will now be left for three to six months for the implants to integrate with the bone (Figure 4).

CONCLUSION

This case study highlights the importance of a comprehensive digital workflow in modern dental restoration procedures. By integrating CBCT scans, STL files, DSD photos and advanced design software, the guided surgery team was able to plan and execute a highly complex restoration with precision and efficiency. The surgical guide played a critical role in ensuring accurate implant placement, while the digital design tools facilitated the creation of a prosthesis that met the highest standards of functionality and aesthetics.

The use of digital technology in dental restoration not only improves accuracy and predictability but also enhances the patient experience by reducing treatment times and improving comfort. As dental technology continues to evolve, digital workflows will become increasingly vital in delivering high-quality patient care.

The future of dental restorations is undeniably digital. Embracing these technologies allows dental professionals to achieve superior results, ultimately benefiting both the patient and the practice. Look out for part two of this article in *Laboratory* to see the final results of the case.

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A step in the right direction?

General Dental Council CEO Tom Whiting recently visited Byrnes Dental Lab to learn more about dental technology – **Ashley Byrne** shares how it went



ASHLEY BYRNE Associate director, Byrnes Dental Laboratory

arlier this year, at a General Dental Council (GDC) stakeholders' meeting, I presented on the pressing issues facing dental technology, such as a shrinking workforce, outdated educational offerings and a general lack of awareness about the vital role dental labs play in restorative dentistry. This presentation highlighted the challenges our industry faces and sparked a wider conversation.

In response, Tom Whiting, the newly appointed CEO of the GDC, expressed a keen interest in seeing firsthand how modern dental laboratories operate and understanding their place within the broader dental landscape.

GENUINE INTEREST

In mid-August, Tom and Joanne from the GDC arrived at Byrnes Dental Lab with open minds and a genuine interest in our field. We began the day with a presentation that not only outlined the crisis in dental technology, but also emphasised the critical role labs play in the delivery of restorative care.

Tom was highly engaged, asking numerous questions about the industry, listening attentively, and fostering discussions on how the GDC and dental technology could better collaborate in the future.

Following the presentation, we conducted an intensive, hands-on tour of the lab. I made it clear that Byrnes represents one of the more advanced labs, with many others in the industry being smaller and less digitally equipped. We demonstrated both analogue and digital workflows, showcasing the breadth of what dental labs can achieve.

Tom interacted openly and candidly with our team, who did not shy away from asking tough questions about the challenges they face, from the complexities of overseas registration to the outdated



nature of much of the education available to new technicians.

HONEST DIALOGUE

We highlighted the benefits of modern workflows and how labs can significantly improve chair time efficiency, enhance patient satisfaction and offer innovative solutions to the broader challenges facing dentistry. Tom continued to show a desire to deepen his understanding of dental technology, asking insightful questions throughout the tour, which covered all aspects of our operation.

After a thorough tour, we paused for a brief lunch, during which Tom expressed a keen interest in learning more about the personal challenges we had faced with the GDC. He asked me directly, if I were in his position, what I would prioritise for change.

In the afternoon, we held a Q&A session involving several members of my team, representatives from the Dental Laboratories Association (DLA), and questions sourced from various social media channels. Tom addressed as many



queries as possible and committed to following up on those he couldn't answer immediately. For someone so new to the role, Tom's approach to engagement and openness to feedback left a strong impression on all of us.

He took extensive notes and emphasised his commitment to maintaining an honest and transparent dialogue.

FORWARD-THINKING LEADERSHIP

As we wrapped up the day, Tom took time to summarise his key takeaways, ensuring he had grasped all the concerns and suggestions raised by our team. I was incredibly impressed with his approach; he was personable, genuinely interested and attentive to the voices of those on the front lines of dental technology.

In summary, our collective agreement was that the GDC needs greater transparency and a clearer understanding of the vital role dental technicians play within the industry. Tom's visit demonstrated his forwardthinking leadership and his commitment to a more engaged and collaborative future for the GDC. It was clear that he recognises the challenges ahead but is ready to tackle them with a hands-on approach that values real-world insights.

I am optimistic about the direction Tom will take the GDC, and I am grateful to him for dedicating his time to truly understand dental technology. This visit was an invaluable step toward strengthening the relationship between the GDC and dental technicians, and I look forward to seeing the positive changes that will follow.

First impressions from a dental technician

Gabi Pollard discusses how she has found dental technology so far and some of the challenges she has experienced along the way



GABI POLLARD Dental technician, Blackpool Dental Lab

y name is Gabi Pollard, and I am a 20-year-old graduate from the University of Bolton with a foundation degree in dental technology, which I gained this year.

I am fortunate to be working at Blackpool Dental Lab, where I completed my apprenticeship under the mentorship of my boss, Liam. Over the past four years, I have gained invaluable experience and grown my skill set at our removable prosthodontics lab.

WHERE IT BEGAN

My journey into the field of dental technology began during my college years, but it wasn't planned. Initially, I was enrolled in a course that did not align with my career aspirations, and I found the online format of college, caused by COVID-19, challenging because of my preference for practical learning.

Consequently, I decided to leave college and accepted a position at a

I find hands-on learning incredibly fulfilling

dental lab, despite my initial uncertainty about the field. As I immersed myself in the work, I discovered a genuine passion for dental technology, which grew with each skill I acquired.

What I appreciate most about being a dental technician is the creativity and artistic skill required when making denture restorations. Whether it's contouring, composite work or setting up teeth in a natural manner, I find hands-on learning incredibly fulfilling.

I also value the communication aspect of the job – especially receiving feedback from clinicians – which helps improve the quality of our restorations.

Additionally, I cherish the strong camaraderie among technicians – a bond that was particularly evident during my time at university, where we shared experiences and supported one another; a spirit that continues to this day. Likewise, speaking to fellow technicians via social media is a huge benefit to our profession!

INITIAL CHALLENGES

As a new dental technician, one of the biggest challenges I've faced is feeling overwhelmed by the sheer volume of information. This was particularly daunting during my time at university. Having primarily worked in removable prosthodontics, I found it intimidating



when I was first asked to create an orthodontic appliance or a crown and bridge restoration.

However, with the guidance of the amazing lecturers, I gained substantial knowledge and discovered that I thoroughly enjoyed both disciplines.

Another challenge I've encountered is being a young female in a predominantly male-dominated industry. However, it

Laboratory





I believe that CAD/CAM technology will play an increasingly significant role in dental technology

has been extremely encouraging to connect with other female technicians with social media and other work environments.

Reflecting on my journey, I feel fortunate to have completed an apprenticeship degree, which provided me with a solid understanding of the industry and prepared me well for my career after graduation.

Like many, I began by making models, which I did for several months before progressing to bites and special trays. Since then, I have been trained in every aspect of constructing and finishing dentures and believe I will keep my focus solely on denture work.

THE FUTURE

Looking ahead, I believe that CAD/CAM technology will play an increasingly significant role in dental technology. Even during my brief experience with CAD/CAM at university, I recognised its many benefits for crown and bridge work as well as dentures.

The material benefits, accuracy and ease of use it offers could have a profound impact on our industry. I also hope that more people will be drawn to this profession in the future. Social media could be a powerful tool in this regard, as I frequently see posts from technicians across various platforms.

In the future, I'm eager to continue expanding my skill set through various courses, particularly those focused on composite techniques, to enhance the realism of my work. Additionally, I hope to further my studies by pursuing the clinical dental technician university course, although I plan to gain a few more years of experience in the lab first to ensure that I'm fully prepared.

l intend to keep documenting my progress on my dental Instagram page and connecting with other technicians.

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A letter to my **younger** self

Andrea Johnson shares the barriers she has overcome throughout her life and what they taught her



ANDREA JOHNSON Co-founder and chair, Den-Tech

hat most people may not know about me is that I grew up in a single parent family in a very deprived area. I was exposed to many interesting aspects of life and have had many experiences that are not appropriate to discuss here. But the main reason I mention it is because it impacted the way people treated me and the way that made me feel and respond to that treatment.

LOW EXPECTATIONS

One of the most frustrating things was that people always had low expectations of me due to my background – not my family as such, but everyone else. I was always in the top group at school and tried my best, but no one ever spoke to me about what I would do in my future. No one ever even mentioned the idea of going to university, for example. And when I went to see the careers adviser, they couldn't understand why I had gone to see them because I already had a job. I was 15 years old.

I have worked since the age of 13 as my mum could not afford to give us spending money. I had several paper rounds, worked in the local shop, was the neighbourhood's local babysitter, had a part-time cleaning job and looked after my younger siblings so that my mum could work. The assumption was that I would just continue in that vein for the rest of my life.

Even my friend's mum, although always polite to me, was not happy with her daughter associating with someone such as me. All of this had a massive impact on my confidence and feeling of self-worth.

I had a tattoo on my back so there was 'something about me worth looking at'. Someone questioned me about it once, saying: 'What about if you want to wear a cocktail dress at a ball or something similar? Would it not bother you that you couldn't cover it up?'.

I responded with: 'People like me don't get to go to things like that, so it doesn't matter'.

THE SEARCH FOR SOMETHING NEW

But I wanted to continue to learn. I am always hungry to develop myself, so went I on a Youth Training Scheme (YTS) in retail work. Long story short, I drifted through various retail and manufacturing jobs for many years. I managed to get supervisory and lower management roles but always felt that I could do more.

One day, after getting made redundant for the third time, I thought: 'That's it. I need out of this. I need to do better.'

By this time though, I was married, with a house, a three-year-old child and a dog to look after. I needed something totally different, but it had to come with on-the-job training. I couldn't afford to not work.

That is when I fell into dental technology. I went back to college one day a week as a

mature student. I was the oldest in the class, but I didn't care. My life was finally starting in the direction I wanted it to. A new career and a new me.

FINDING MY CALLING

Since I started my career journey in dental technology, it has given me so many opportunities, many of which have been very hard won. But they were there for those who wanted to fight and work for them.

It has allowed me to become a reasonably well-respected member of the dental community through my various roles such as lab manager, chair of the Orthodontic Technicians Association, chair of Den-Tech, council member of the Dental Technologists Association, adviser to the General Dental Council, an invited panel member with various bodies, adviser and fellow of the College of General Dentistry, Healthcare Leadership Academy cohort director, plus many more.

BELIEVE IN YOURSELF

Looking back, the advice I would give to my younger self would be to believe in yourself and don't let other people's perceptions of you define who you are.

If you want something in this world, you go out and get it. You fight for it and don't give up until you get it. This is your life and your dreams, so who cares what other people think? You are as good as you want to be. Life is hard – be harder.





Digital from the get-go

Having picked up digital dentistry from the start of her career, **Eboni-Rose Williams** shares the advantages this has given her



EBONI-ROSE WILLIAMS Dental technician

y interest in digital dentistry began when I was eight months into a placement, making special trays and bite blocks during my first year of university. When a teacher told me that special trays could be made with a 3D printer, this sounded like magic to me!

I struggled making special trays, undercuts were always a problem (we used wet tissue as a spacer) and every other week I would have bur burned thumbs...

When I started my digital journey, I was clueless. I started with just an old 2012 Macbook. But I did it! I cracked the art of making special trays and proudly got Michael Gregory's approval!

I did this all in my second year of university during the summer break. I also had the great opportunity of working in a private prosthetics laboratory where I learnt 3shape, CAD and 3D printing. After six months, I became more comfortable using it and saw my work improve through lots of practice and patience.

QUICKER, EASIER, REWARDING

I have pursued a digital approach to stay up to date in the field. Due to digital design time being significantly quicker than analogue, I find it easier to practise and improve. Digital dentistry can complement technical, hands-on analogue skills; it should not be viewed as a replacement for them.



Polished 3D printed denture without stains

I like exploring how workflow might be aided by the combined application of digital and analogue techniques. Personally, I have utilised CAD and 3D printing to make learning materials for myself to practise my analogue skills.

Digital dentistry offers a challenging yet rewarding learning experience that I thoroughly enjoy. I see it as a tool to aid our lab lives, improve communication and to do our least favourite jobs... like special trays and casting models. Yes, secondary models are essential for dentures, but for whitening trays, for example, it frees up time for the dental technician.

DIGITAL DENTISTRY AND RECRUITMENT

Having had the opportunity to learn analogue alongside digital as a student, I feel there is less of a difficult learning curve or transition. Students have the advantage of becoming skilled in more than one specialism due to the large range of CAD applications. Furthermore, as beginners, the lack of years of muscle memory and mastering analogue techniques make learning digital design easier to pick up.

Digital dentistry is having a very positive impact on recruitment and inspiring others to join the industry. I have noticed that the majority of my peers are excited to use CAD and want to excel in it. The career opportunities seem exciting once proficient in digital designing, which I think is encouraging more students to learn CAD and choose it as a specialism. As a result, this is encouraging more students to pursue dental technology.

A PLACE FOR ANALOGUE

Analogue methods will always be needed and required to make high quality appliances. For example, if digital equipment breaks, analogue methods or outsourcing as a back-up plan is essential.

I have also noticed that the best CAD technicians have many years of experience with analogue. Therefore, it is important to get the basics correct by hand before trying to master digital alone.

Yes, dental software can design a full-full denture in 30 seconds itself, but a good technician needs to check that the teeth are on the ridge and within the neutral zone. However, a great technician will ensure that it does not have a negative smile line and that the central incisal edge is 7mm from the incisive papilla etc... all things learned with experience at the bench.

With this in mind, since digital dentures are quicker to construct and learn from, understanding anatomical landmarks and the ideal denture using digital may be easier. After learning digitally, students can feel more comfortable with anatomical considerations and utilise the design as a guide while making an analogue denture. However, analogue techniques will still be needed for quality control, detailed personalisation and in case of digital failures or breakages.

DUAL APPROACH

Dental technology is a very artistic job, and analogue seems to have superior aesthetics. However, Lucitone 3D printed dentures look just as fantastic. I believe digital dentistry is there to complement and aid workflow, not replace us.

The art of customising a digital denture with composite or stains, as well as matching the colour of a crown to the existing teeth, requires our technical skills. It will be a while until CAD can catch up to replicating natural dentition straight from mill or print. At the very least, quality control from technicians will always be required.

To conclude, I believe that digital dentistry is exciting and essential to embrace. A balanced approach that utilises the strengths of both digital and analogue methods is the way forward. I am optimistic for the future of dentistry with the integration of both approaches.

CONNECT WITH @ @digidental.technology EBONI-ROSE

CAD meets canvas

Charlie Barbour discusses creativity in the realm of digital dentistry and how, for him, it extends beyond the lab



CHARLIE BARBOUR CAD/CAM technician, Bristol Crown

PLEASE INTRODUCE YOURSELF

My name is Charlie Barbour, and I'm currently working as a CAD/CAM technician at Bristol Crown, part of the ALS Dental group.

Since starting in the lab, I have been solely focused on crown and bridge. I spend my days working on the more complex of cases that come through the lab, primarily those involving implant work. I'm just a couple of months shy of nine years in the dental industry, and my passion for striving for perfection and expanding my skill set as a technician is stronger than ever.

Outside of the lab? Well, it's still all about teeth!

HOW DID YOU GET INTO DENTAL TECHNOLOGY?

My path into the industry was quite unconventional; I was in the right place at the right time. After finishing school, I wasn't entirely sure what I wanted to do with my life. I pursued several different avenues, but none of them sparked fulfilment. I tried becoming a pilot, then considered radiotherapy, but both career moves came to an end. Eventually, I went back to my roots and enrolled in art college, which started me on the journey to where I am today.

After completing college, I landed a place at Bristol University studying creative product design. However, I wasn't keen on three more years of drawing classes, so I withdrew and headed straight to the engineering apprenticeship office. They had a listing for Bristol Crown, and the rest is history. I hadn't even known this side of dentistry existed, but I was absolutely thrilled to discover that I could combine my passion for design with helping to make a difference in people's lives.



WHY DO YOU ENJOY CAD/CAM?

I love the variety. I love making things and solving problems. Every day in the lab is different, which helps to keep things fresh. What captured me the most is working with cutting-edge technology every day and pursuing ways to streamline workflows while maintaining high-quality, natural restorations.

There's so much potential for innovation in this sector, and the advancements are only getting better each year.

WHAT ROLE DOES CREATIVITY PLAY IN CAD/CAM?

Creativity is paramount as a technician, though this can sometimes be forgotten in the busy environment of a lab.

In my view, creativity can be lost in the process of CAD. With design software pre-loading tooth models, it's easy for people to gloss over the fact that we're matching a patient's dentition. In my time running the milling machines at our lab, I've seen work from various labs at different levels, but one thing stood out – many cases were produced using the same libraries, with little variety. When I got the chance to design, I wanted to change this.

At that point, I didn't have a deep knowledge of anatomy, so I brought a unique perspective by stepping back and carefully examining the shapes in front of me, aiming to create something that seamlessly blended with its surroundings.

My advice? Look closely at the teeth, study their shapes, and break down each part to gain a better understanding of what you're trying to replicate. Most of my designs are now 'custom', meaning I strive to create something unique for each and every patient.

TELL US ABOUT THE ART YOU CREATE OUTSIDE OF THE LAB

The art I create is a natural extension of the way I learn. I'm a very visual person, and I find that recreating something in my own way is the best method for understanding form and function.

I study anatomy and then recreate it in a medium I'm most comfortable with. As I progressed, I started making more complex designs that encompassed more information, which seemed like a great way to learn in an easily digestible format.

Laboratory





WHAT INSPIRES THIS ART?

It stemmed from a university project set by my tutor at Cardiff Metropolitan University. We were tasked with drawing some anterior teeth, and I was hooked. I hadn't picked up a pencil in years, so it really brought me back to what I love doing. As dentistry moves towards digital, I also transferred this passion into a digital format. When you look at dental resources, they tend to be quite bland. I was determined to change this.

I'm a visual learner – I want what I'm looking at to draw me in and inspire me. This has been integral to how I produce my art. I keep it simple, using a small colour palette with highs, lows and mids. By keeping it simple, you can create an image that captures the form and gives you a quick understanding of the shape. I contrast this with solid block colour backgrounds to make the subject matter pop.

WHAT IMPACT DO YOU HOPE YOUR ARTWORK HAS?

My main goal is to inspire and educate. I want to bring colour and life into the lab – something that can be referenced and learned from.

Take a look at the walls of your lab. Are they white-washed? Filled with stock dental photos? That's exactly how mine were. I want vibrancy and passion to reflect back into the lab, helping my colleagues share the same love for what we do that I have.

WHAT ARE YOUR AMBITIONS FOR THE FUTURE?

Just as I was when I started in the lab, I'm focused on improving. Alongside my artwork, I've been experimenting with and developing high-quality tooth libraries for each stage of life. I want to help change the way we approach design in dentistry as it progresses into the digital space. Helping people is rewarding, and seeing my peers improve around me would mean a job well done for me.

My main aim? To be at the forefront of design and become one of the best in the world. And if I can inspire the next generation of CAD/CAM technicians to incorporate analogue design methods into their digital workflow, all the better.

FIND OUT MORE

Check out Charlie's art by visiting www.redbubble.com/people/CIMBdesign

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From sceptic to fanatic

Dean Ward shares why you should embrace digital dentistry, not fear it

DEAN WARD

Clinical dental technician and director, Innovate Dental Laboratory

igital: one word I hoped I could avoid! I could see in the past how much digital software had revolutionised dental technology in crown and bridge workflows and how dentists had started to adapt to it in their practices. I honestly thought it wouldn't impact dentures during my career, but I soon heard on the grapevine that there was a new milling machine that could mill dentures – I discredited it as 'not possible'.

Rather than looking into it, I walked away because fear had kicked in! Then Ivoclar and 3shape's software came about and I thought: 'No way this is real!' I buried my head in the sand and told myself it's not ever going to happen.

EATING MY WORDS

We then had reps from various companies visiting and showing me how successful it could be. 'A load of rubbish', I thought, and I went back to my wax knife.

The moment soon arrived when I had to eat my own words. On a biofunctional prosthetic system (BPS) course taught by Chris Egan, he showed us the usual analogue workflows, then followed by the digital copy set. I was blown away! They looked average at best, but the patient was absolutely over the moon – this was the moment I considered myself sold.

I asked myself what I was scared of, and the answer was simple: I didn't want to be replaced by a machine. Little did I know at the time it wasn't going to work out like that.

THE PIVOTAL MOMENT

During the COVID-19 pandemic, I had some time to look into software and 3D printing. I decided to buy a setup that worked for my lab. Why? I was scared of being left behind.

Will dentists send scans or even try digital dentures? The answer was simple: no, not the ones I was currently working with. Once I had advertised that we were offering digital services, I soon got messages from likeminded clinicians that wanted to join us on the learning journey – this was the most pivotal moment in my journey into digital because my hand was forced into coming up with solutions. You will see people smiling and showing pictures of nice digital cases, but we have all lost our cool with an error code or two.

That's enough of my back story, but I think it will build common ground and reassure those starting on their digital journey.

A COMPLETE FLIP OF OUR WORKFLOW

We now print around 60-70% of our daily work, as some cases need an analogue impression. Dentures are not a one-size-fitsall workflow – they need good understanding from the clinician and technician to modify workflows to suit each case. With each case, I ask myself three questions: Is it better? Is it more efficient? Or is it both? If these are answered by 'yes', then I choose digital. If it's just to save time, I revert to analogue or a hybrid flow. I didn't want to be replaced by a machine. Little did I know at the time it wasn't going to work out like that

DIGITAL ADVANTAGES

Here are some of the advantages I have found as a technician:

- Chrome partial dentures: this is a game changer. I print the model and design a verification jig for the design at the same time, allowing the dentist to see if the scan is accurate. I have a 100% success rate working like this
- 2. Broken/lost teeth: this was my biggest annoyance, but it doesn't happen anymore. If it did happen, it's as simple as pressing reprint
- **3. Patient satisfaction:** this is the one I had to see with my own eyes. I've done more than 10 cases that are analogue versus digital, and digital has won every time
- **4. Health:** printing has its own risks, of course, but as a lab owner, they are so much easier to manage







- 5. Reduced chair time and appointment numbers: this isn't to save money, it's to save time and be more efficient
- 6. Quality of work: I like to think I can make a nice, comfortable, well-functioning denture that's successful. The digital cases I now provide are more comfortable and accurate. They need more work aesthetically, but now in my clinical dental technician (CDT) work I've learned that patients usually put aesthetics at the bottom of their lists of requirements
- 7. Scanning: I now scan all of my clinical cases before fit. I then have the denture, bites and models on file. I've used this several times to remake cases or modify later down the line. This means less clinical and lab time/costs
- 8. Impression accuracy from intraoral scanners: I've had more than one chrome case where they have not fit. These have been from dentists who I trust to deliver the best impressions – when scanned and printed, they are perfect.

TOP TIPS FOR A DIGITAL SET-UP

- Do your research: don't follow the crowds – get what suits your lab
- Go on courses: try a few to play with software and printers before committing. Reps and companies are happy to help and let you have a play before committing

- Be open minded: I won't lie and say it's easy, but once you're producing successfully, you will see huge benefits
- Speak with your clinicians: I have found that some dentists are happy with analogue workflows and some are itching to move into digital. Building relationships with like-minded clinicians allows you both to grow and get feedback from the other person's experience
- **3shape or Exocad?** Get what works for you and your laboratory at the best price you can.



EVIDENCE?

It's easy to say that I'm having great success from digital dentures, but I don't want it to be sprinkled in fairy dust. Pretty cases on Instagram aren't evidence enough for me. I want to prove that real cases have been successful and that patients prefer the digital cases we have provided for them.

On the Impressionclub digital dentures course, myself, Rupert Monkhouse and Ricardo Soares discuss everything we have done so far with success – and the odd failure. We have tried everything and found out what works for us, what doesn't and then taken patient feedback. Some of the dentists that have come on our digital course have been convinced of its advantages.

One notable dentist was Dr Mike Gregory, self admittedly a digital sceptic and very experienced and skilled in analogue dentistry. Mike left the course having changed his opinion in some areas, but still to be convinced in others. That was a big one. Clinicians that are changing their opinions aren't doing it based on our thoughts, they need evidence.

PRINTED OR MILLED?

One of my bugbears in dentistry is people telling me how something has to be done – it should depend on your situation. My personal preference is milled. They are more expensive,

Laboratory

but I find them more accurate. I use printed for try-ins and this can be taken away by the patient and verified after a week or two of being worn. This is a huge advantage to dentists as patients can change their mind. Working in this way helps to manage expectations and proposed outcomes.

Printed are more difficult to adjust chairside at the try-in appointment, but you can trim them and redesign. Printed also have lower aesthetics in my opinion, but if it's your thing, you can go to town on either and make them look good. The truth is that patients barely notice aesthetics, based on my experience. The quality of manufacture, fit and function always seem to be their biggest requirements.

Printed cases are ideal for NHS scan-to-fit cases. Whether you believe that's ethical or not, it's happening – and successfully.

PATIENT COMMUNICATION

Sending a patient away with a printed try-in is a game changer. I have done this with several clinical cases, and some have asked for changes while some have not. From a clinical perspective, this is huge as all patients are different, and some will want the opinion of family. Doing an analogue try-in only gives the patient that appointment to make a decision.

When some people return at fit day, they have sometimes changed their mind and requirements, meaning we then don't meet the patient's expectations. Digital try-ins allow the patient's family/spouse/friends to reassure the patient and it makes for a more transparent process.

EFFICIENCY

I love watching the printers working away while I go home. I love the fact that a denture is milled, and I did not have to use plaster to process it, knowing nothing will go wrong during processing. I love that I can offer patients and dentists a copy with either the printed try-in or a replica milled version. We have all these things on file, so if the patient loses or fractures a denture, we don't have to start over again.

Clinically, I use a Trios 5 and it is a game changer. I will not take a partially dentate primary impression again. This takes great skill, and I admire that, but I can scan the same thing in less than two minutes. As a technician, I know where I need to scan to build my special tray. The Trios 5 also takes the shade for me in all areas of the teeth, giving me another tool to show patients.

WHAT'S NEXT?

The million-dollar question! It's moving so rapidly that, for the first time, I can see analogue being dominated by digital. I never thought I would say it, but it's my preference – I just need the evidence to be convinced.

I also believe facial scanning will be a common feature in the near future as the



equipment is affordable and offers so much information.

Printing will improve too, with the likes of Stratasys allowing us to print in exact colour templates. As a result, this will remove the time-consuming need to customise digital dentures.

SUMMARY

I hope this article has made sense of the journey into digital from my perspective. There are people doing great things in digital dentistry who I am aspiring to. These people, both clinically and technically, are paving the way to something really exciting.

I think the key word in this article for me is 'fear'. I was scared of being replaced, being put on the dental scrap heap by younger, more computer savvy technicians, but this is definitely not the case. And with the new breed of technicians coming through the ranks, nowadays sharing tips and helping each other out is much more accessible.

I see fear in older technicians like myself, but that wealth of analogue knowledge can't ever be replaced by a machine. If both can work together in a symbiotic relationship, then the outcomes are unbeatable.

OVERALL ADVANTAGES

- Accuracy
- Comfort
- Patient function
- Time-saving
- Cost effective
- Environmentally friendly
- · Able to produce second set
- Patient communication
- · Expectation management of patient
- Cleaner environment for technicians
- Can open doors with new clients on the same journey.

POTENTIAL PITFALLS

- · Expensive to set up
- Frustrating for both beginners and the more experienced
- Time-consuming early on
- Scary! At least for me it was
- Limits people you can work with clinicians and technicians need to be on the same page.

FIND OUT MORE

about the digital denture course by visiting www.impressionclub.co.uk/courses/ the-digital-denture-course

LIFE IN THE LAB

Is this the end for technicians?

Matt Everatt predicts when dental technicians will cease to exist, and whether the workforce's steady decline is reversible



MATT EVERATT

Editor-in-chief of *Laboratory* and director of S4S Dental Laboratory

ollowing the new CPD cycle and payment of the ARF, the General Dental Council (GDC) has released the latest figures on the number of registered dental care professionals. Every group has increased in numbers with the stark exception of the dental technician! We have declined yet again.

In 2008, there were 7,460 dental technicians in the UK, supporting a workforce of 36,281 dentists – a ratio of 4.86 dentists to every technician. Fast forward to 2024, and the numbers tell a much grimmer story: 4,935 technicians to 45,204 dentists, representing a shocking ratio of 9.16 dentists for every dental technician.

This steady decline in the dental technician workforce raises serious questions about the future of dental care in the UK, and if the trend continues, we can predict a point in which there will be no dental technicians left in the profession at all.

WHEN WILL DENTAL TECHNICIANS DISAPPEAR?

Year on year, the number of dental technicians has fallen. Since 2008, the UK has lost 2,525 technicians – a 34% reduction in just 16 years. Meanwhile, the number of dentists has increased by nearly 25%.

This imbalance between the two professions is not only unsustainable but will also likely lead to catastrophic effects

The profession has lost an average of 157 dental technicians per year between 2008 and 2024

on the quality and availability of dental prosthetics and appliances.

If we look at the figures, the downward trend in dental technicians is linear and, unfortunately, predictable:

- 2008: 7,460 dental technicians
- 2024: 4,935 dental technicians.

The profession has lost an average of 157 dental technicians per year between 2008 and 2024. If this trend continues, the UK could see the number of dental technicians fall to zero in approximately 31 years from 2024, which would be around the year 2055.

IMPLICATIONS FOR DENTAL CARE

The prospect of reaching a point where there are no dental technicians is deeply concerning. Dental technicians are the backbone of restorative and cosmetic dentistry, providing vital services such as fabricating dentures, crowns, bridges and orthodontic appliances. Without enough skilled technicians, dentists will struggle to meet the needs of their patients, leading to longer waiting times, reduced quality of care and increased costs for patients.

While automation and technology have made strides in dental manufacturing, the intricate work of skilled dental technicians cannot be entirely replaced by machines. The individual customisation and precision that they provide remain unmatched by any current technology.

WHAT IS CAUSING THIS DECLINE?

Several factors have contributed to the decline in dental technicians:

- Low pay and high pressure: many dental technicians have left the profession due to low pay and increasing regulatory pressures from the GDC
- Lack of recognition: dental technicians are often undervalued compared to their dentist counterparts, leading to a lack of motivation among younger professionals to enter or stay in the profession

Without intervention, we may see the end of dental technicians in the UK

- **3. Education and training:** fewer students are enrolling in dental technology programmes, leading to a shortage of new technicians entering the workforce
- **4. Regulatory burdens:** onerous regulations imposed by bodies like the GDC are discouraging new entrants and hastening the exit of seasoned professionals.

CAN THE DECLINE BE REVERSED?

Addressing this decline will require significant changes in policy, education and professional recognition:

- Increased investment in education: more incentives are needed to encourage students to pursue careers as dental technicians, such as scholarships, apprenticeships and better access to continuing education
- Regulatory reform: the GDC needs to re-evaluate its approach to regulating dental technicians, adopting a more proportionate and supportive stance that encourages rather than penalises
- Professional recognition: dental technicians need greater acknowledgment for the vital role they play in patient care. Increased wages, better working conditions and public awareness of their contributions could help reverse the attrition.

The steady and predictable decline of dental technicians in the UK should sound alarm bells across the dental profession. The year 2055 is not far off.

Without intervention, we may see the end of dental technicians in the UK – a loss that the dental profession and patients alike cannot afford.

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LIFE IN THE LAB

How do you get into digital?

Ashley Byrne explains how to digitalise your lab as pain-free as possible



ASHLEY BYRNE Associate director, Byrnes Dental

regularly write about digital workflows, and in my laboratory, crown and bridge and implant workflows now involve at least one digital stage in 100% of cases.

From intraoral scanning (IOS) to model printing, milling frames and bars to full-contour zirconia, I estimate that about 75% of all lab work stages are digital. I take it for granted that this is now the normality of the workflow, and I simply can't imagine going back to the days of pouring models, waxing diagnostic cases or casting metals.

The evolution is mind-blowing, and I absolutely love it. Over 95% of my posterior restorations are full-contour zirconia, and my fracture and failure rates are at an all-time low. There couldn't be a better time to be almost fully digital. In fact, I forget sometimes just how far we've come – so much so that the struggles of digitising our workflow are now a distant memory.

WHY CHANGE?

However, that challenge is back in full force at my lab as we embark on digitising dentures. It's a stark reminder of how difficult it can be to transition from analogue to digital, especially after years of doing things the traditional way. I almost forgot the struggle of implementing digital crown and bridge workflows, and now we're tackling all stages of dentures.

It's not easy to change something that's been working for years. You encounter failures, resistance from your team, outdated methods that aren't mainstream, limited materials, and frustration all around – even from clients. Then, you hear the classic: 'Why change something that already works?'

Maybe we don't need to change dentures. Perhaps we can continue flasking, using stock teeth and processing with heat-cured PMMA. But consider this: we're facing a dwindling number of skilled technicians while denture wearers are on the rise. Do we really think gen Z will be content flasking



and packing when computer-based solutions are on the horizon? If we resist change, we risk becoming like Kodak, Blockbuster and Blackberry – companies that thought they didn't need to evolve and suffered the consequences.

DIGITAL MEANS SURVIVAL

When I first started printing digital dentures, I experienced a staggering 54% fracture rate within the first year. My clients, team and even my accountant were asking: 'Why are you doing this? The old method has always worked!'. But now my fracture rate on printed dentures is just 0.9%, compared to 2.1% with traditional PMMA.

Digital dentures have become more successful, fast, clean, lean and use fewer toxic materials. My clients love them, patients appreciate the option of ordering spares, and guess what? My gen Z team enjoys making dentures again. Like crown and bridge, we must change this process if we want to survive.

START SMALL

This article isn't just about digital dentures, milled zirconia or IOS scanners. It's about navigating change as smoothly as possible. Change can be daunting – people naturally resist it – but minimising the pain of that transition is key to achieving a successful outcome. I've gone through it with crown and bridge, implants, and temporary and copy dentures, and trust me: the positive results make the struggles worth it.

The key to successful change lies in small, measured steps toward a clear long-term goal. I see labs that are still 100% analogue trying to overhaul everything at once – implementing IOS, designing their own



work, and then milling or printing. It's too much at once. Instead, start by designing cases from either an IOS or a model, and outsource the printing or milling initially. Perfect that, then consider bringing in your own printer.

Once that's mastered, move on to milling. Start with single teeth or small dentures rather than diving into complex cases. The saying 'Rome wasn't built in a day' holds true here.

IT'S NOT ALL SMOOTH

At my lab, we live by the motto 'fail hard and fail fast'. What that means is starting with cases that have time. Don't switch over on rush or critical cases. If something fails, you will still have time to fix it manually – but fail quickly. Always have a back-up plan, because things will fail. Software crashes, machines break down, staff get sick, and materials don't always perform as expected.

As you embark on these changes, talk openly about failures. Everyone has been through it.

If you're reading this and you're still 100% analogue, don't hesitate to reach out. Labs are always willing to help each other during the transition. I've learned through my own mistakes, and I'm happy to help others avoid the same pitfalls.

CELEBRATE MILESTONES

Finally, celebrate the small wins along the way – whether it's your first IOS case, your 100th milled crown, or your 200th printed denture. Celebrate these milestones. Bury the failures and focus on the positives, and you'll find that your team will ultimately thank you for the changes. The pain of transition will soon be long forgotten.

LIFE IN THE LAB

Five things I can't work without

Deepa Bharakhda shares five things that allow her to reach the highest standards of craftsmanship in the lab



DEEPA BHARAKHDA Senior prosthetic technician, Dencraft Dental Laboratory

ith more than 15 years of experience in dental technology, I have had the privilege of working across various facets of the field. As a senior prosthetic technician, my journey has been driven by a passion for crafting aesthetic dentures that not only restore function, but also enhance the beauty of a smile.

Currently, I apply this passion and expertise at Dencraft Dental Laboratory in Leicester, where I have a special interest in implantretained dentures, acrylic hybrids and bespoke private dentures.

My career has been a blend of hands-on experience and active engagement within the dental community. I have been fortunate enough to have shared my insights as a speaker at numerous dental shows, give back to the community through Den-tech and push the boundaries of what is possible in dental technology as a co-founder of Nightshift. Welcome to my five things I cannot work without!

1. TOOLS

A technician's best friend? An essential toolkit, of course! I rely on six indispensable tools: the wax knife, ash 5, lecron wax carvers and a scalpel. They are my go-to instruments for everything from try-ins, carving wax and cutting soft or hard splints.

Each tool plays a crucial role in helping me achieve the precision and artistry required for high-quality work. Whether I'm shaping a wax, contouring and stippling or refining a splint, these tools enable me to create prosthetics that meet the highest standards of craftsmanship and aesthetics.

2. COLOURED WAXES

In my work on aesthetic cases, it's crucial for me to use coloured waxes during try-ins to give patients a realistic preview of their final



dentures that not only function well but also look natural. 4. STAINING KIT

> The Bredent Staining Kit is an essential tool on my bench space, allowing me to bring dentures to life with realistic characterisations through staining.

Whether I'm working on partials or full dentures, this kit adds subtle touches that elevate the

final result, transforming standard dentures into lifelike restorations. It's a must-have for any technician aiming to achieve a truly natural appearance in their work.

5. CAFFEINE

As a dental technician, caffeine is practically my lab assistant! It's the secret ingredient that keeps me going, fuelling my focus and creativity throughout the day. Whether it's an early morning start or a late-night session in the lab, a strong cup of coffee or tea keeps me energised and sharp.

The precision and attention to detail required in crafting dentures and prosthetics demand concentration, and caffeine helps me maintain that edge. It's more than just a boost – it's a ritual that marks the rhythm of my work, enhancing both my productivity and the quality of the results I deliver. In many ways, caffeine is the unsung hero of my daily routine.

These materials have become essential in my prosthetic cases, allowing me to create

dentures. My go-to waxes are from Kemdent,

as its wax sheets provide a high-gloss finish

when flamed and buffed with a sponge bur.

in red and pink, to accurately highlight

are essential for achieving a lifelike and

their new smile with confidence.

3. COMPOSITES

perfect for dentures.

I also rely on Renfert Geo waxes, particularly

attached and unattached mucosa, replicating

the natural appearance of gums. These tools

convincing result, helping patients visualise

I'm a big fan of using composites for their

as well as Anaxdent flows and Anaxgum

ability to accurately reproduce tissue colour

and add a lifelike quality to dentures. I've been

working with Ivoclar Nexco pastes and stains

pastes, all of which deliver stunning results.

Ivoclar Nexco pastes offer a bit more opacity

that I find ideal for full arches, while Anaxgum

pastes have a beautiful translucency that's

enhancing the visual appeal.

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BUSINESS

Build a business that thrives

Justin Leigh discusses the importance of having a business development plan and the key steps to making one



JUSTIN LEIGH Founder, Focus4growth

n the competitive landscape of dental laboratories, many labs operate without a clear business development strategy. These labs often rely on a steady flow of work from existing dental clients, focusing primarily on maintaining client satisfaction through the quality of their work. This approach is actually the most common way for a lab to operate, but it overlooks the critical role that proactive business development can play in long-term growth and success.

THE STATUS QUO

For many dental labs, the concept of business development is limited to maintaining current relationships with dentists and hoping for referrals. This passive approach often works to some extent, as satisfied clients may recommend the lab to their colleagues.

However, these referrals typically happen organically, without any deliberate effort from the laboratory. While maintaining high-quality standards is essential, relying solely on this strategy

IN AN INDUSTRY WHERE INNOVATION AND ADAPTABILITY ARE CRUCIAL, STAYING AHEAD OF THE CURVE IS ESSENTIAL FOR LONG-TERM SUCCESS leaves the lab vulnerable to market fluctuations and client attrition. The dental laboratory market is currently experiencing a shortage of

available labs and technicians, which may lead some to believe that business development is unnecessary. With a surplus of demand, it might seem that labs can afford to sit back and wait for the work to come to them. However, this mindset can be a trap. The labs that are truly thriving in today's market are those that have recognised the need for a proactive business development strategy.

PROACTIVE BUSINESS DEVELOPMENT STRATEGY

So, what exactly is business development for a dental lab? It goes beyond simply improving the quality of work and maintaining client satisfaction. Business development involves a comprehensive approach to growing the laboratory, which includes:

• Enhancing the laboratory's operations: continuously striving to improve the quality of work, fostering a collaborative team environment and ensuring that all team members are

Laboratory

engaged and motivated

- Client relationship management: while maintaining strong relationships with current clients is crucial, it's equally important to have a systematic process for nurturing new relationships with prospective dental clients
- **Risk mitigation:** a proactive business development strategy helps mitigate the risk of losing key clients. If a significant client reduces their workload due to retirement, reduced working hours, or other reasons, the lab could face a sudden drop in revenue. A well-developed strategy ensures that the lab is not overly reliant on any single client
- Growth and sustainability: labs that prioritise business development often find themselves in a position where they have more work and clients than they need. This surplus allows for strategic growth, including the ability to raise prices, improve profitability, and reinvest in the laboratory's operations and people.

THE RISKS OF IGNORING BUSINESS DEVELOPMENT

Ignoring business development can leave a dental laboratory exposed to several risks. One of the most significant risks is over-reliance on a few key clients. If a lab loses one of these clients, it could lead to a substantial drop in revenue, potentially threatening the lab's viability. Additionally, without a pipeline of new clients, the lab may struggle to replace lost business, leading to a drop in revenue, stagnant growth and an inability to invest in improvements.

Seasonality can also impact labs during periods where their clients are away and revenue reduces. A business development plan could predict these slower periods and plan for them with the laboratory team taking time off during quieter periods and engaging prospective clients for 'trial work'.

Moreover, without a focus on business development, labs may miss out on opportunities to expand their services, enter new markets, or adopt new

technologies. In an industry where innovation and adaptability are

crucial, staying ahead of the curve is essential for long-term success.

THE BENEFITS

On the other hand, a structured approach to business development offers numerous benefits. By actively seeking out and engaging with prospective clients, labs can create a steady flow of new business. This not only ensures a stable revenue stream, but also allows the lab to be selective in the clients it takes on, focusing on those that align with its strengths and values.

A well-executed business development strategy also allows a lab to create a situation where demand exceeds supply. When a lab has more clients than it can handle, it can raise prices and choose to work with the most profitable and rewarding clients. This scenario not only boosts profitability but also positions the

IGNORING BUSINESS DEVELOPMENT CAN LEAVE A DENTAL LABORATORY EXPOSED TO SEVERAL RISKS

lab as a leader in the industry, known for its high standards and quality of work.

A focus on business development drives internal growth and improvement. As the laboratory grows and revenue increases, it creates opportunities for team members to advance in their careers, invest in new technologies and continuously improve the quality of their work. This positive feedback loop fosters a thriving, sustainable business that is well-equipped to navigate the challenges of the market.

IMPLEMENTING A BUSINESS DEVELOPMENT STRATEGY

To reap the benefits of business development, dental labs need to implement a structured strategy. Here are some key steps to consider:

 Identify target clients: consider factors such as location, the types of services they offer, and their patient demographics. By focusing on a specific target market, you can tailor your business development efforts to

THIS POSITIVE FEEDBACK LOOP FOSTERS A THRIVING, SUSTAINABLE BUSINESS THAT IS WELL-EQUIPPED TO NAVIGATE THE CHALLENGES OF THE MARKET

meet their needs more effectively 2. Develop a value proposition: clearly

- articulate what sets your lab apart from competitors. This could include the quality of your work, your turnaround times, your customer service, or your use of cutting-edge technology. Your value proposition should be compelling enough to attract new clients and retain existing ones
- **3. Build relationships:** business development is about building and nurturing relationships. Attend industry events, network with dentists, and leverage your existing client base for referrals. The more visible and connected your lab is within the dental community, the easier it will be to attract new clients
- 4. Create a follow-up process: don't just rely on initial contacts; have a follow-up process in place to keep prospective clients engaged. This could include sending follow-up emails, scheduling meetings or offering to visit their practice to discuss potential collaborations
- 5. Monitor and adjust: business development is not a one-time effort. Regularly review your strategy to see what's working and what isn't. Be prepared to adjust your approach based on feedback, market changes or new opportunities that arise
- 6. Invest in marketing: a strong marketing presence is crucial for business development. This could include a professional website, active social media profiles, and regular content that showcases your lab's expertise and success stories. Consider creating case studies, testimonials and before and after images to highlight your work.

FOR MORE INFORMATION

contact justinleigh@focus4growth.co.uk.

Visit **bit.ly/GO-INSPIRE** or **bit.ly/Coaching-Leaders-Book** to purchase Justin's books.

COMPANY

Ultimate customisation with a reduced inventory

Dental technicians from across the globe discuss Initial Zirconia Coloring Liquid from **GC** and why it works for them



PATRIC FREUDENTHAL Dental technician, Unique Dental (Sweden)



IÑIGO GARCIA GONZALEZ Owner, Labigar Dental Laboratory (Spain)



JOÃO PAULO MARTINS Dental technical instructor, University College London (UK)



STEFAN ROOZEN Dental technician (Austria)



DIEDERIK HELLINGH Business unit manager prosthetics, GC Europe (Belgium)

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WHAT WAS YOUR FIRST THOUGHT WHEN YOU HEARD ABOUT THE NEW INITIAL ZIRCONIA COLORING LIQUID?

João Paulo Martins: It was great news as I am a zirconia colouring liquids user.

Patric Freudenthal: Yes, and it was exciting to get a colouring liquid that matches the Initial concept.

Stefan Roozen: I think it is a very good fit for the Initial IQ ONE SQIN philosophy.

WHAT SPECIFIC PROBLEM OR NEED DOES INITIAL ZIRCONIA LIQUID HELP YOU WITH?

Stefan Roozen: I find it particularly advantageous for the storage. This is because every multi- or mono-shade can be achieved with one type of zirconia disk. This way, we can avoid a large accumulation of blocks and disks. Iñigo Garcia Gonzalez: With these liquids we are able to produce a standard colour starting from translucent white zirconia. On top of that, you can also do specific



Left: white zirconia, unsintered. Middle: sintered with Initial Zirconia Coloring Liquids. Right: finished with the Initial IQ ONE SQIN concept (courtesy of Stefan Roozen)

colourings that you cannot achieve with pre-coloured zirconia.

Diederik Hellingh: The Initial Zirconia Coloring Liquid allows the replication of natural tooth colours and effects prior to sintering, meaning the restorations can be finished even faster with the Initial IQ ONE SQIN system. Together, they facilitate a highly aesthetic outcome, with natural looking shade nuances radiating from within in an absolutely efficient manner.

WHAT FEATURES OR ASPECTS OF GC PRODUCTS DO YOU FIND TO BE MOST APPEALING?

Patric Freudenthal: I particularly like the effect colours. They are really good. Iñigo Garcia Gonzalez: I like the simplicity of the set. We can rely on the ABCD system and various effect colours and markers to choose your identification.

Diederik Hellingh: We work closely with opinion leaders to quickly respond to the most important needs in the lab. Each Initial product on its own facilitates the workflow in a certain way, but used together, you reach maximal efficiency in the most qualitative way.



Initial Zirconia Coloring Liquid set

TO ME, IT IS NOT SO MUCH ABOUT TIME, BUT RATHER THE CONTROL YOU HAVE OVER THE CHROMA AND VALUE

CAN YOU DESCRIBE A SITUATION OR SCENARIO WHERE YOU IMAGINE THIS PRODUCT BEING PARTICULARLY USEFUL?

Patric Freudenthal: It's good for any case that requires customisation. Even when using multilayered zirconia, it can be useful to 'pimp' it with colours.

Stefan Roozen: It's nice to create a base colour for white zirconia, especially the white 3Y-TZP zirconia. Furthermore, I also find it useful for creating effects, such as adding chroma in the cervical area or on the canines, or for a bluish, absorbent effect at the incisor part.

João Paulo Martins: It's useful for every case! Whether it's a full arch or a

Laboratory



You can either paint (left) or dip (right) with the same set of colouring liquids



crown... and it's definitely useful for colour matching a single central incisor.

MOST LABS USE MULTI-LAYERED ZIRCONIA DISKS - IS THERE STILL A NEED FOR COLOURING LIQUIDS?

Patric Freudenthal: Yes, absolutely! Iñigo Garcia Gonzalez: If you just want something standard, probably not, since you can use multilayered zirconia. But colouring liquids give many more customisation options.

João Paulo Martins: I always use them, even on multilayered zirconia.

DO YOU PREFER THE PAINTING OR THE DIPPING TECHNIQUE (OR A COMBINATION OF BOTH)?

Iñigo Garcia Gonzalez: I prefer to paint. It is more controllable, and the intensity can be gradually increased with the number of strokes.

João Paulo Martins: Me too. Stefan Roozen: I use both, depending on the veneering technique I'm using. With a full layering, I use the dipping technique. When I micro-layer with ONE SQIN, it depends on the case. And for my monolithics, I use the painting technique. It's useful to be able to do both with the same system.

Diederik Hellingh: Following our 'less is more' Initial IQ philosophy, we have developed a single product for both application methods: the painting technique for ultimate customisation and the dipping technique for fast, consistent results. Depending on the case, both techniques have their benefits.

DO THESE COLOURING LIQUIDS IMPROVE YOUR WORKFLOW?

Patric Freudenthal: It improves the aesthetic outcome of the zirconia and makes the mono- or micro-layering easier. Stefan Roozen: These colouring liquids provide a good base colour, which facilitates the further characterisation. Then, you can use de Initial Zr-FS or the ONE SQIN concept to finish it.

João Paulo Martins: I have always worked with colouring liquids. To me, it is not so much about time, but rather the control you have over the chroma and value. Diederik Hellingh: The development was focused on obtaining every shade quickly and easily. With fewer liquids and a simple dilution chart, customers can achieve all 16 V-shades in no time. For greater gains with a smaller inventory.

IS THERE ANYTHING ELSE YOU'D LIKE TO SHARE ABOUT INITIAL ZIRCONIA COLORING LIQUID?

Patric Freudenthal: For large frameworks, the staining technique for a white zirconia is rather time-consuming, but then the dipping technique could work. Oh, and the pink gingival colour is one of the best I've ever tested and worked with.

Iñigo Garcia Gonzalez: The advantages of white zirconia and multilayer zirconia can be combined. The biggest advantage of white zirconia is not needing a large stock. And the advantage of multilayered zirconia is its pre-colouring and the increase in translucency towards the incisal part. My intention is to start from A1, B1, C1 and D1 multilayered disks. A2, A3, B2, B3 and so on can be reached with the colouring liquids. As a result, our stock is reduced but we have this transition in translucency towards incisal and a degree of pre-colouring.

FIND OUT MORE

Contact your local GC laboratory specialist at gc.dental/europe/en-GB/team





DentalCAD 3.2 Elefsina from exocad

Friedemann Stang discusses the new features of the Bite Splint Module



FRIEDEMANN STANG Supervisor of global support, exocad

or me, the Bite Splint Module is one of the most simple and effective modules in DentalCAD. Users can produce a bite splint digitally with much less effort than when done manually. The module supports efficient working and – as is typical of exocad products – runs stably.

With the current release of DentalCAD 3.2 Elefsina, new features have been added. Regardless of the type of bite splint to be designed, users now have additional tools that help them to work even better and more efficiently and are provided with further options.

AUTOMATIC MARGIN LINE DETECTION

My personal highlight among the new features is the automatic margin line detection. Based on previous tooth segmentation, the software now



FIGURE 1: The software now automatically recognises the path of the margin line of the bite splint



FIGURE 3: Bite splints can be created in the upper and lower jaw at the same time

automatically recognises where the margin line of the bite splint runs.

Users no longer have to draw this manually, and still have the freedom to modify the automatically generated margin line (Figure 1).

ADOPT INDIVIDUAL TOOTH ANATOMY

Another new feature is that the splints can be built up with the patient's individual tooth anatomy.

This is particularly helpful when designing splints for bite elevation, as the anatomical shapes can be copied directly onto the splint. For patients, a splint with personalised tooth anatomy means additional wearing comfort because it feels more natural (Figure 2).

SIMULTANEOUS DESIGN IN THE UPPER AND LOWER JAW

DentalCAD users can now create bite splints in the upper and lower jaw at the same time. This works for both simple



FIGURE 2: Splints can now be built up with the patient's individual tooth anatomy



FIGURE 4: The teeth can be automatically segmented in the scan

splints and complex splints with individual anatomy of the patient's teeth (Figure 3).

AUTOMATIC TOOTH SEGMENTATION

This new cloud-based feature is now available to users working in the exocad cloud. The teeth can be automatically segmented in the scan and thus provide the basis for the previously mentioned new features for automatic margin line recognition and the adoption of the natural anatomy (Figure 4).

FRIEDEMANN'S USER TIP: 'CURVE DETECTION PARAMETERS'

Users can choose from several options for defining a splint curve. This allows the 'right' curve to be defined individually according to the case and the specialist's requirements (Figure 5).

IN SUMMARY

Thanks to further automation, the new features enable even faster workflows, regardless of whether users design simple splints or specialise in complex splints. The Bite Splint Module is included in the DentalCAD Ultimate Bundle or is available as an add-on module.

FOR MORE INFORMATION

visit **exocad.com/our-products/dentalcad- elefsina**.



FIGURE 5: The curve detection parameters allows the 'right' curve to be defined

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DentalCAD[®] 3.2 Elefsina

More than 60 new features for maximum automation and speed make DentalCAD 3.2 Elefsina the first choice for dental CAD designers! Developed with your needs in mind—copy dentures to inexpensively produce new ones, fix imperfect intraoral scans, integrate compact milling machines and more. The new release also improves lab-dentist collaboration with the iTero-exocad ConnectorTM. Power up your results. Expand your indications. **Contact your reseller to upgrade now.** COMPANY

Zirkonzahn's doors are always open!

Zirkonzahn shares what dental technicians can explore at its headquarters in the Italian Alps

n the heart of the Italian Alps, with the fundamental values of discipline, innovation, trust and responsibility, the family-run company Zirkonzahn provides innovative solutions for the dental sector.

Under the motto 'Everything under one roof', all Zirkonzahn's milling materials, hardware equipment, software, implant prosthetic components and tools are conceived and developed in-house to guarantee constant controls over the production process, and therefore comply with the company's high-quality standards.

In its homeland in South Tyrol (Italy), Zirkonzahn has its headquarters, main education centre, a dental laboratory and operates five production sites, all located within a few kilometres from the head office.

EVERYTHING YOU NEED

Striving for perfection and purchasing raw materials only from specially selected suppliers, the company develops new visions and technologies, providing laboratories and clinics with dedicated, simplified instruments for a smooth and reliable workflow from A to Z, for the good of the patient.

Based on the accurate record of patient data, Zirkonzahn's workflow can be carried out 100% digitally and, depending on the dental laboratory's working procedures, analogue steps can also be included. Furthermore, the wide range of CAD/CAM equipment and materials are perfectly integrated with each other, ensuring better communication within the restorative team from patient registration to restoration delivery.

MULTILINGUAL EDUCATION AND SUPPORT

From Zirkonzahn, clients don't just buy 'a product'. They buy a whole work philosophy that includes a complete package of services and reliable support. With the company's multilingual helpdesk,



In order to offer all its customers the best possible support as well as optimal access to its training courses, Zirkonzahn has established additional offices and education centres in nine countries



Discover where it all began - curious dental technicians are always welcome in the Italian Alps!

customers can benefit from a comprehensive technical and dental technical support service with extremely short response time provided by a dedicated team ready to face and solve any problem.

For truly all-round support, Zirkonzahn offers a wide, well-structured and targeted educational programme including schools and both in-person and online courses, where participants are trained on the usage of equipment and materials with no knowledge gaps.



FOR MORE INFORMATION

Zirkonzahn's doors are always open to visitors. Contact Zirkonzahn to arrange a guided tour of its premises in South Tyrol and learn more about company's work philosophy and complete product range.

For more details, visit **www.zirkonzahn.com**, email **info@zirkonzahn.com** or call +39 0474 066 660. INDUSTRY INNOVATIONS

Sharpen your digital skills

Garry Needham discusses the new Metrodent training facility, which offers comprehensive, specialist digital training for technicians



GARRY NEEDHAM Managing director, Metrodent

etrodent has always promoted the education of dental technicians since the company's early days nearly 90 years ago as a full-service commercial laboratory training its own technicians from all corners of the UK. Today, it is running specialist courses in a purpose-built training facility at its head office in Huddersfield.

BESPOKE DIGITAL COURSES

Metrodent needed to facilitate the education of dental technicians who are now embracing 'new' digital design and manufacture. Therefore, the Metrodent training facility has been totally refurbished from an eight station 'analogue' laboratory that ran courses in all aspects of traditional dental technology including partial dentures, crown and bridge and advanced prosthetics. Now, it's a six to 12-station digital suite predominately running bespoke digital courses in the full range of Exocad software solutions for dental laboratories and surgeries.

COURSES INCLUDE:

- Basic Exocad overview of Exocad software and basic crowns, bridges, veneers, temporaries and wax-ups
- **Splint module/model creator** model design using model creator splint design and articulation using Xsnap and a virtual articulator
- Advanced Exocad full dentures, 3D
 printed, full arch try-in direct to multi-unit
 abutments, solid zirconia full arch upper
 thimble bar and individual crowns
- Full digital denture designing full dentures and removable partial dentures, lvotion, design and print
- **Exoplan** Exoplan implant planning and placement with a guide creator
- Implants and design screw/cement retained custom abutments, implant switch and bar design.





STATE-OF-THE-ART FACILITY

The facility is furnished with state-of-the-art equipment to take the digital workflow from start to finish, including scanning, 3D printing and advanced milling. Participants will be seated at a station with a high-spec PC with full digital software solutions.

Metrodent is proud to be an approved Exocad reseller and its digital team – David North and Andrew Ruickbie along with expert trainer Scott Hippey – are fully approved Exocad trainers in dental CAD, Exoplan and chairside CAD. Our courses will always be developed and expanded to fit the needs of the progressive UK dental technicians and the demands of an ever-advancing market. The Metrodent digital team is always at hand to help and support the new or advanced user and bring a reliable workflow to your laboratory.

FOR MORE INFORMATION visit www.metrodent.com/product/ exocad-configurator.

INDUSTRY

Embracing the world of automation

Tom Smith shares how automation can create a future-proof workflow

TOM SMITH Digital production manager, S4S Dental Lab

few years ago, the idea of automation in appliance production seemed almost impossible due to its custom nature. It was hard to envisage how automation could work when every appliance is so drastically different.

ADOPTING AUTOMATION

Over the last 18 months or so, automation has steam-rolled into our production environment, drastically altering how efficiently the company operates.

We have implemented automation in various ways from production-specific tasks to assisting with shipping and financial control. Regarding production, we have been able to replace our previous 3D printing fleet to allow for automated printing and model removal with the help of our Heygears A3D 3D printers and Formlabs Form Auto system.

Our new fleet can automatically remove models and continue to print overnight without additional input needed from technicians. This has allowed us to double our capacity without the need to alter our staffing levels or change our print fleet's footprint. But this is just for models alone – the automation of printing digitally designed splints also opens a whole new avenue for appliance design and potential new and more complex devices.

AI INTEGRATION

From a software standpoint, we have been able to automate our scan file preparation. Previously this was done by a team of technicians using CAD/CAM software. To become proficient in this task would take months and would require numerous software licenses, which was an expensive and unavoidable cost. The automated system, aptly named Scan-to-model from Heygears, uses AI to learn how the scans need to be designed so that they can be successfully printed and then used to manufacture the desired appliance.

With the manual CAD/CAM operation massively reduced, we have been able to lower our software expenditure. It has also allowed for an increase in throughput from every digital technician. This means that the capacity we have gained from implementing automated printers mirrors the capacity we gained from our automated scan preparation. This means an increased throughput in all areas!

INDUSTRY CHANGES

The introduction of automation has not only improved workflow efficiency, but also began to fundamentally alter the dental lab industry. Tasks that once took days can now be completed in hours. Automation also ensures consistency across multiple production runs. Human error, a significant factor in traditional manual processes, is drastically reduced. This makes repeatability considerably easier.

While automation reduces the need for manual labour, it also creates new opportunities for skilled technicians to engage in more complex and creative tasks, such as designing custom, complex appliances or optimising production workflows. However, this shift requires upskilling and continuous education, as





technicians must become proficient with advanced equipment and software.

What automation, robotics, AI and machine learning can offer the dental laboratory industry has only just begun to scratch the surface. There are far more gains to be made in the dental laboratory industry that will see customers able to receive work faster and order more bespoke appliances, which would have previously been laborious and not cost-effective.

POTENTIAL LIMITATIONS

However, it does come with its own set of challenges. The initial cost of a completely automated system can be high, which could price out smaller labs. There is also often a lengthy testing process and both software and hardware need to be regularly tweaked in the early stages of their introduction. But for the labs that can spare the space, processing power and associated costs, they will create a future-proof workflow that will only get better as computing power continues to improve.

In short, as the industry continues to evolve, embracing automation will be key to staying competitive. However, it is important to recognise the challenges that come with this technological shift. By doing so, dental labs can harness the full potential of automation, delivering superior dental solutions while maintaining the artistry that lies at the heart of dental craftsmanship.

M6 Teleskoper Blank Changer milling unit Zirkonzahn

With the new M6 Teleskoper Blank Changer milling unit, Zirkonzahn automates processes, accelerates procedures and increases the productivity of the dental workflow. The 5+1 axis simultaneous milling unit is equipped with a storage for up to 16 or 80 blanks (upgradable) as well as a Blank Changer which allows material blanks to be transferred autonomously from the storage



to the orbit and vice versa: once the structure is milled, blanks are reinserted back in their correct place. This means restorations made of different dental materials, colours and heights can be designed automatically.

The wet and dry processing function permits the milling of all common soft and hard dental materials. The built-in Teleskoper Orbit Selflock (Ø 125mm) allows the processing of material blanks with a diameter of 95mm, 98mm, 106mm and 125mm. Thanks to special holders and glass ceramics blanks, Raw-abutment blanks and mini zirconia blanks (size one) can be milled.

Zirkonzahn equips the M6 with the new Performance Spindle. Thanks to a specially developed Permanent Magnet Synchronous Motor (PMSM), this spindle can reach a maximum torque of 200Ncm at speeds of 6,000 to 50,000rpm with a peak power of 2.5kW. In addition, the milling unit is provided with a contamination-protected tool chamber that is separate from the milling chamber and features an automatic tool changer function. The two magazines with 30 slots each ensure a safe and tidy storage of up to 60 milling burs.

www.zirkonzahn.com

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www.adi.org.uk/association_dental_implantology_congress www.adi.org.uk

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ENHANCED CPD

Enhanced CPD

LAB/SEPT/OCT/ROWELL/PAGE 12

1. In this case, what triggered the patient's decision to have a new denture made?

- □ a. The existing denture had three teeth missing
- □ b. The existing denture had numerous anterior teeth
- added to it c. The existing denture had a large fracture line running
- across the palate
- $\hfill\square$ d. The shade of the existing denture was wrong

2. What was the author's preferred treatment plan for the patient in order to improve occlusion?

- a. A new full upper denture
- D b. A new lower partial denture
- □ c. A new full upper denture as well as a lower partial denture
- d. Full arch dental implants

3. What was on the patient's 'wish-list'?

- a. 'Gum fit' upper denture
- □ b. No lower opposing denture
- □ c. A good fit
- d. All of the above

4. What concerned the author during the try-in appointment?

- □ a. The try-in was very loose in comparison to the bite block
- □ b. There wouldn't be enough lip support
- □ c. The tooth length in the mouth was too extreme
- □ d. There would be poor contact

LAB/SEPT/OCT/STOILOVA/PAGE 16

- 1. What information does the author state as fundamental for the initial planning phase?
- □ a. Full-face photographs
- b. A CBCT scan
- C. STL files of the patient's intraoral scan
- □ d. All of the above
- 2. How many implants were planned to be placed in this case?
- 🗖 a. Two
- 🗖 b. Four
- 🗖 c. Six
- 🗖 d. Eight
- 3. How many fixation pins were placed around the arch to ensure stability during the implant placement process?
- 🗖 a. Two
- D b. Three
- 🗖 c. Four
- 🗖 d. Five
- 4. How long will the implants be left to integrate with the bone?
- a. Three to six months
- □ b. Three to six weeks
- □ c. Three to six days
- □ d. Three to six years



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