

# DSD'R MAGAZINE

issue no. 1 / summer 2019

*The journey of continuous  
improvement: inside a DSD Clinic*

*Unlocking the real power of the  
new DSDApp*

*Treatment planning around  
the world*



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# Greetings DSD followers!

Thank you for noticing our new magazine! We are always looking for ways to enhance our communication with you, and our hope is that this publication will inform and inspire! Let's dive right in...

## On the move

The theme for this issue of DSD'r magazine is STEP. Why? Because all you need to do to change your current position is to move forwards and take a step. We have the privilege to connect with dentists from all over the world through our popular courses every month. I love to hear about your success stories; the one thing your stories all have in common is that they began with a single step. You were unsatisfied with your situation, so you took action. And it paid off, big time! I salute you!

Whether you were new to DSD and took a step to attend one of the Residency courses,

Or you undertook to become a DSD Master,

Or enrolled as a DSD Clinic,

Or you pursued the pathway to become a DSD Instructor...

These steps, however small, when taken with intention, direction, and collaboration result in dramatic changes over time. Inside this issue you can read articles that show you how it can be done.

In this issue you can read about

- The latest innovations in the DSD App and how to get access to them
- How a DSD Clinic transformed its business with DSD
- Highlights from the DSD Planning Centre in Madrid
- Our upcoming courses schedule and how you can book your seat

If you are unsatisfied with your current position, whether it be with your clinic, your role or your career path or even how you feel about dentistry as a whole, I would urge you to make 2019 the year that you take a step and move forward. You won't regret it!

Warmest wishes,

*Christian*



***“These steps, however small, when taken with intention, direction, and collaboration result in dramatic changes over time”***

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**DSD'R**  
MAGAZINE

# The journey of continuous improvement: inside a DSD Clinic

An interview with **Dr Sheena Sood** about her journey on the DSD pathway and her insights gained along the way

If you spend just a few minutes in the company of Dr Sheena Sood, it would come as no surprise that she decided to put her CEREC milling unit in her waiting room. "It's very pretty; it's in a nice little enclosed case. I got my custom colour to make it pretty." She also has a waterfall and a massage chair and when a new patient gets the clinic tour, they get to see it all. "We make sure patients are comfortable and then they come in and they're like, 'Oh wow, there's technology here which is super cool.'"

Nobody needed to explain to her the importance of differentiating your business, but when she first heard Christian Coachman explain the DSD concept, something clicked for her. Fast forward nearly two years and Dr Sood is a DSD Master and runs a thriving DSD

Clinic in Vancouver, Canada. We caught up with her recently to ask her what got her so inspired and how her dentistry (and business) has changed as a result.

## **Getting outside the bubble**

One of the things that made a big impression on Sood at her first DSD Residency course was her fellow course participants. "I thought North America was the centre of dentistry; of learning and teaching. Then I found myself in Madrid with no Americans and only two other Canadians; everyone else was from all over the world. And it was really interesting to see Christian and the team, and what they were doing, and what kind of dentistry was occurring everywhere else (outside of my little North American bubble). I was very inspired by that."











She explains that this global professional connection she has discovered through DSD continues to motivate her. “We live in worlds that are our own little offices, so to have that connection with other dentists from around the world is very nice. And it is very interesting to see how clinics in different countries do dentistry,” she adds.

***“I had a sense of intuition that this was right for me and then embraced it to the best of my ability.”***

### **Embracing the learning curve**

After attending her first Residency, she returned to Vancouver with a mission. “I had a sense of intuition that DSD was right for me and then embraced it to the best of my ability.” In the early days, she found the DSD App to be a particularly useful tool. “Originally we were taking photos in the app, so it focused my mind and my team on the DSD protocols,” she continues.

She also went on to attend four more Residencies (in Miami, São Paulo and Madrid) and brought along two team members to one of them; her DSD Coordinator and Lead Hygienist. “Honestly, the reason I keep going back is because I learn something new every single time. It’s about fundamentally changing of your thinking and some of that is very





subtle; it needs time. And to be surrounded by like-minded people and their energy means you start to pick up more and more. Then going back to my office afterwards meant I was able to refine the system each time.”

“In total, it was less than a year from when I attended the first Residency to becoming a DSD Clinic. At the time it felt like things were moving slowly, but looking back I can see it happened really quickly. I always like things to go quickly, once I've bought into an idea.”

### **Clinic transformation**

Sood confirms that the changes she was able to bring about to her clinic to enable DSD workflows happened relatively quickly because her team and office is well established. “I was very lucky to be in a position that I could do

a lot of the new DSD work without having to worry so much about other things that other dental practises have to.” She also credits having brought her two key team members along to a Residency as being instrumental in transforming her office into a DSD Clinic.

“The team members themselves haven't changed. But I think their vision of what is possible has changed,” she explains. The DSD Coordinator and Lead Hygienist also ensured that the rest of the team understood the DSD concepts. “Watching the emotional patient reaction videos was another great tool to inspire the team and keep them engaged in the learning process.”

She adds that the DSD Coordinator had the most to learn from the process, having to train to not only to fully understand the DSD

concept and how to integrate it, but also how to use the 3D printer, how to print models, how to make the mock ups, and how to submit cases to the DSD Planning Center.

"She had to learn how to help me with the technical presentations, understanding how to take the video, how to use the ring light, what's the best light to take records and what we need in those records. Every time we take videos, we would sit together after and evaluate them to see where we could improve; checking the camera angles, lighting, room set-up, how to take the scan and introducing the concept to the patient."

### **Seeing cases differently**

She emphasises that alongside the clinic changes and team up-skilling, her patient communication style is also radically different from what it was before.

"I see cases so differently now. When someone comes to me with what should be something simple, I see so much more. I've become more patient; so instead of immediately jumping into talking about solutions, I'll take meticulous records and send it to the Planning Center. Then we create the technical presentation and give the patient the opportunity to consider

the options and make better choices. This also allows us to provide better care because we have the whole plan in place ahead of time. It's much more effective because every little detail is clearly planning out. It has been a journey of continuous improvement."

### **Like driving a car**

She admits to not feeling at all confident about doing DSD at the beginning. "It was just practise, practise, practise. You just have to keep practising because it's a whole bunch of new skills to learn. For me it's like learning to drive a car. When you first start out, you are so focused on thinking about what you are doing; your hands are on the wheel, foot on the gas, foot on the brake, using your signal, checking the mirrors. But eventually you become so good at driving, that you begin to enjoy the view, you notice the surroundings because the driving has become natural."

This intense focus certainly paid off as DSD treatment at her clinic has never been in higher demand.

### **So what's next?**

While she's already enjoying the view, her focus now is on further refining the integration

## **Sheena's tips for making the most of using the DSD Planning Center**

- Understand that using the DSD Planning Center is a separate skill you have to master in your DSD journey
- Expect to do a lot of troubleshooting, but always trust the process
- Build in extra time for each case for troubleshooting and learning
- Make sure your records are very very good! The better the records you submit the better the end result
- Communicate as much as possible with the photos and scans
- Make sure the video always has the patient discussing his/her wants
- Always explain 'why' so the Planning Center team knows



of the technology and the workflow. This includes finalising the set-up of her DSD room and getting a new website. She also has her sights set on building a new clinic that is entirely focused on DSD.

What is your one tip you would give anyone who is thinking about becoming a DSD Clinic? Be patient and persistent and above all focus on the care.

### **What is the best part about being a DSD Clinic?**

1. Providing better more predictable treatments and the joy of emotional dentistry; an awesome fun tool to allow me to provide comprehensive care that patients want and are excited about
  2. Increased growth
  3. Interaction with other dentists and professionals that share your vision
  4. The support to help me better at skills I lack - marketing, keynote to make presentations, training on technology
  5. The responsive help from around the world by the entire DSD team (the App, Planning Centre, marketing etc) whenever I have a question or problem
- How do you become confident in delivering

***“I've become more patient; so instead of immediately jumping into talking about solutions, I'll take meticulous records and send it to the Planning Center”***

DSD? Practice, practice, practice - the dentistry is the same to a degree as is patient management and team management. But practicing the DSD workflow and technique over and over and working through obstacles is important. As I started to see the benefits and the process working, I became more confident and was able to continually refine it. Repeatedly attending Residency courses is another huge help; there is so much information it takes time to learn it especially the subtleties. Plus being surrounded by the DSD energy helps keep me motivated. 🌐

what your goal is with each case

- Commit to making it work; don't give up if you hit some hurdles
- Always be very clear in all your communication
- Have FAITH and TRUST in the process: in order to be an early adopter you have to believe in something which doesn't exist in what you already know or have seen



# Aspire to become a DSD Clinic

The ultimate goal of a DSD Clinic is to bring more smile design patients through your door. We have created this clinic pathway for dentists because we understand the investment in time and energy that is required to adopt DSD protocols in an existing dental practice. We want to see everyone thrive using our systems and processes, so we have compiled a supportive and structured entry into DSD through this program.

We take immense pride in our DSD Clinics and their achievements. We welcome new clinics who have done the groundwork and shown they are committed and ready to implement the necessary changes to their practice infrastructure.

In a nutshell, a DSD Clinic involves:

- Your clinic with the DSD stamp
- Co-branding: You keep your brand identity plus DSD elements
- Guided implementation of the DSD Concept
- Access to DSD know-how, software, platforms and tools

## How to become a DSD Clinic?

This outlines the journey you can take to becoming a DSD Clinic. Each stage is carefully planned to give you enough training and knowledge to advance to the next level.

### Step 1:

- Complete the DSD Residency Module 1 course
- or**
- DSD Instructor course

### Step 2:

- Schedule a DSD Consultancy
- Audit
- Report
- 2 day training

### Step 3:


- Become a DSD Master by sending 3 cases using the DSD Protocol
- Become DSD Clinic





## DSD Clinic benefits

Once you achieve DSD Clinic status, you will gain exclusive access to DSD's key products that will supercharge all the systems and processes that you've put in place up until that point. We help you to improve your Patients' experience and differentiate you from your competition. By Implementing the DSD Digital Workflow and using the DSD Protocol, you can add value to your patients and optimize results and processes.

- Area exclusivity: We never have more than one DSD Clinic in a specific geographical area, giving our Clinics a competitive advantage
- DSD Clinic co-branding: Attract patients with your new Clinic status
- Patient brand: We have developed a strong patient-facing brand that you will be able to use in all your materials
- Patient storylines: Using the latest digital technology we are created a series of DSD explanations to patients which can be embedded as digital experiences onto your own website seamlessly
- DSD Planning center: Every Digital Smile Design case that you undertake in your clinic has our full support through the DSD Planning center, an interdisciplinary team of dentists, implantologists and orthodontists, experts in Digital Smile Design. The DSD Planning Center helps to the DSD Clinics to develop a unique Digital Treatment modalities such as DSD 2D & 3D, Mockup, Guided Surgery and Restorations.
- DSD App: Harnessing the best of mobile technology and digital connectivity, the DSD App gives the entire clinic team the ability to carry out the Digital Workflow stages to a high degree of accuracy, while at the same time improving patient communication
- Access to DSD Marketing Agency: additional resources available for promotion of DSD campaigns
- Tier program discount 





# 7 reasons DSDApp improves your communication and planning

Unlocking the real power of the new DSDApp

By *Dr Lindiane Rigo*, DSD Education Coordinator USA

Performing facially driven smile designs in accordance with the most modern concepts of natural esthetics and orofacial analysis to an interdisciplinary treatment planning has never been so easy. Following the structured digital smile design concepts the simple DSDApp workflow allows you to offer a chairside solution to improve communication taking dental planning to a new level. The DSDApp evolved and became the first ever 3D App available in dentistry with an open output that can be continued in any CAD software to allow a full digital dentistry process. With all the advances in dental technology the challenge is to bring all sources together, DSDApp can help you to organize patient documentation, sharing with your team to a better communication and having all files available to your fingertips for 2D and 3D smile design anywhere.

There are 7 main reasons DSDApp can improve the way you communicate and plan in dentistry:

**1:** Guide your staff to create a standardized and complete patient documentation. The DSDApp allows for photo and video documentation and also has direct connections with outside devices such as scanners and CBCTs, making it very easy to digitalize the patient and bring all the info together in one place.

**2:** Organize patient documentation by creating an easy link to all devices and a documentation history in a friendly timeline. The DSD Cloud permits automatic saving process without having to waste space in the devices. By downloading the App in iPhones and iPads you have easy access to all documentation from all patients anywhere.

**“The DSDapp allows for photo and video documentation and also has direct connections with outside devices such as scanners and CBCTs, making it very easy to digitalize the patient and bring all the info together in one place.”**

**3:** Sharing patient info safely and easily with your team members and lab has always been a challenge. With the DSDapp sharing and chat features, one professional can create a direct connection with the whole team, labs and the DSD Planning Center. This not only improves team collaboration, visual communication, decision making process but also interdisciplinary treatment planning.

**4:** The DSD Planning Center platform is now available in the app, bringing to your phone all products, online e.commerce platform and the VIP DSD Concierge Chat. With DSDApp you have this communication under control to speed up the process and improve communication.

**5:** The DSDApp presents the most automated and intuitive 2D smile design process, allowing the team to perform it in less than 5 min, creating motivational chairside smile simulations, connecting this initial design with the DSD Planning Center to guide the 3D design, transforming the smile simulation into mock ups and natural restorations.

**6:** The first ever 3D app in dentistry, brings the solution with an intuitive and simple 3D smile design workflow. Allowing dentists to perform it chairside, export STL files to printers and CAD/CAM systems, bringing the motivational mock up experience to one appointment and/or connecting the 3D design to the DSD Planning Centre and DSD Lab to

transform them into identical DSD Natural restorations. With the 3D version of the DSD App, you can perform as much you wish of the 3D design process and outsource to the planning centre as much as required on each situation. The planning center can design the smile and the doctor can fine-tune or make modifications in the same platform.

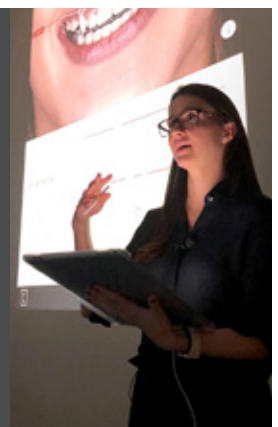
**7:** One of the most exciting steps of the DSD workflow is the DSD Motivational presentation to the patient. The DSD App brings to amazing solutions to facilitate this process: The “Before & After Layout” and “The DSD Presentation” tools, creating fast, easy and visually attractive presentations of the smile transformation. With the before & after layout tool you can develop easy and artistic collages of the smile transformation bringing side by side photos and images and using cool frames and textures to create the most impressive images. The DSD Presentation tool allows the user to connect with the full patient documentation, outside files and the DSD Planning Centre presentation, hand pick the images and videos and create within seconds a powerful presentation with cool transitions, music and effects to present to the patient.

The new DSDApp improves all steps of dental workflow, giving you the freedom to choose what works the best for your practice. The goal is to have an easy to use tool, so that your focus is on the patient and not on the technology. 📱

## **DR LINDI RIGO, DSD Education Coordinator USA**

- Brazilian educated dentist based in New York City and specialized in aesthetic and digital dentistry.
- Obtained her Doctor of Dental Surgery degree from the University of Passo Fundo, Brazil and Master's degree in Restorative Dentistry from the Federal University of Florianopolis, Brazil.
- Involved with DSD and the DSD Concept since 2016 and currently part of the DSD Education team. Responsible for overseeing DSD Education development, including leading the DSD APP Academy.

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# Treatment planning around the world in a day

Streamlining and advancing  
treatment planning with the  
DSD Planning Center

The DSD Planning Center is the clinical hub of Digital Smile Design's global operations. It enables every DSD Clinic to produce the highest accuracy treatment planning for their smile design projects. Using the most advanced software and DSD Protocols and Quality Control system the Center ensures that dentists enjoy the benefits of Digital Interdisciplinary Dentistry. Leading the operations is DSD Planning Center Director, Dr Francis Coachman. He recently spoke to DSD'r about what the Center has been working on and what it's goals are for 2019. >>

**How was 2018 for the DSD Planning Centre?**

**Dr Francis Coachman:** It was probably the most important year for the Center so far. Actually, every year has brought significant progress since its start in 2014, so this was kind of expected, but 2018 was a very special year. We grew our team and increased our case numbers. It was also the first year in our new office, and most importantly, we were able to implement our vision and philosophy. I would say that the big highlight of the year was the team; the team members are such a pleasure to work with and their energy is amazing!

***“It’s a great honor and pleasure to be able to help dentists from all over the world to see and understand much clearly what their patients need and want.”***

**Can you share some of the most impressive cases that have come through the DSD Planning Center?**

**Dr Francis Coachman:** This is very hard to say. There are so many cases, from the simple complex ones, and I wouldn't be able to pick one or two. The most rewarding part of our work is knowing that all the patients that come to us via our clients, will get a better treatment because of what we do. It's a great honor and pleasure to be able to help dentists from all over the world to have a better understanding of what their patients need and want.

**What are the main things you would like dentists to know about the DSD Planning Center?**

**Dr Francis Coachman:** It's essential to understand that DSD and digital dentistry is not magic. However, in collaboration with DSD, dentists can visualise and understand their patients' problems on an entirely new level. This will help them to improve their treatment planning, which is one of the biggest problems in dentistry nowadays. But they still need to do their job and work hard to deliver excellent treatment. So the Planning Center is here to enhance what dentists already know and improve dentistry by always thinking about achieving the best outcomes for our patients.

At the same time, we understand that starting with digital dentistry is a steep learning curve. It's a process that requires substantial effort, patients and most of all education and training. That's why we always recommend dentists to attend one of our four-day DSD Residency courses before starting to use the Center.

**What does every DSD Clinic need to do in order to make the most of using the DSD Planning Centre?**

**Dr Francis Coachman:** Simply put: start using us! The only way to really get the best out of the Planning Center, after going down the educational path is to use us. Through the interaction and collaboration you will soon understand what to order and how to use each of our services for each case.

**Take us through a typical day at the DSD Planning Center**

**Dr Francis Coachman:** The day-to-day work at the Planning Center is very intense. Our team includes 20 smile designers and together we enjoy great energy and teamwork. The team is divided into the tech division (3D engineers) who do most of the prep work and smile



design, while our dentists ensure the quality control of the designs and treatment plans. Then we have more 10 people in various administrative roles such as finance, education, and customer support.

Our goal is for the team members to work to the best of their abilities, so we structure our days around priority tasks with built-in flexibility for creativity and innovation. It is certainly a challenge to work with so many different dentists in various locations every day, each with their own work style and preferences. But thanks to these interactions we are constantly learning and improving our services. It's also becoming clear that DSD is creating a universal dental language as a result, and this is very special to us.

### **What do you personally enjoy most about your work at the DSD Planning Center?**

**Dr Francis Coachman:** In addition to our team, to work and interact with all our clients is a very enriching experience. We learn from every client every day. It is human relationships what most matter at the end. And even though we don't see our clients face-to-face, it certainly doesn't feel that way. It's a very powerful relationship.

### **What can DSD followers expect to see from the DSD Planning Center in 2019?**

**Dr Francis Coachman:** We are always evolving and creating new solutions, so it's going to be a busy year! What I can already share with you is that we are developing a new website that will integrate all DSD solutions, including the Planning Center, App and DSD main website with all the educational content.

We will also roll out exciting new products, such as the Smile Express, which is motivational smile design and printed Mockup Shell delivered to the dentist in a maximum of 72 hours. Another very important step will be the launch of the Planning Centers in Brazil and China. We already opened the DSD China office last year, and we are on the final stages of training of the Planning Center team. Watch this space!

### **What do you most look forward to this year?**

**Dr Francis Coachman:** DSD is expanding and becoming even more streamlined operationally. I look forward to seeing this trend continue, and being able to spread DSD all around the world, helping the dental community, and especially being more affordable to everyone, so as many patients possible can get the benefits of the DSD concept. 🍷

## ABOUT **Francis Coachman**

Dr Francis Coachman received his DDS degree from the University of Sao Paulo-Brazil. He then obtained a degree in Surgical Anatomy of the Face from the Institute of Biological Sciences at the same university and a certificate in Implantology from Senac Dental School. He is an accredited fellow in Zygomatic Implants from Nobel Biocare and has a vast experience in complex implant/prosthetic cases. He is a co-founder and member of the DSD-Digital Smile Design Team. He is the director of the DSD Planning Center in Madrid, Spain.

Find out more at [www.dsdplanningcenter.com](http://www.dsdplanningcenter.com)



# Facially-driven treatment planning of computer-assisted guided surgery: a case report

**Christian Coachman, DDS, CDT,\* Lauren Bohner, DDS, MSc, PhD,\*\* Newton Sesma, DDS, MSc, PhD\*\*\***

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**Digital resources are used for the computer-assisted implant planning. The present case report describes a facially-guided implant planning for computer-guided surgery and installation of immediate interim prostheses. Data collection included photographs, scanned intraoral casts and CBCT scans. A smile frame was created based on reference lines and superimposed to intraoral casts in order to guide the virtual waxing. The virtual waxing was superimposed to the CBCT scans to determine the implant positioning.**

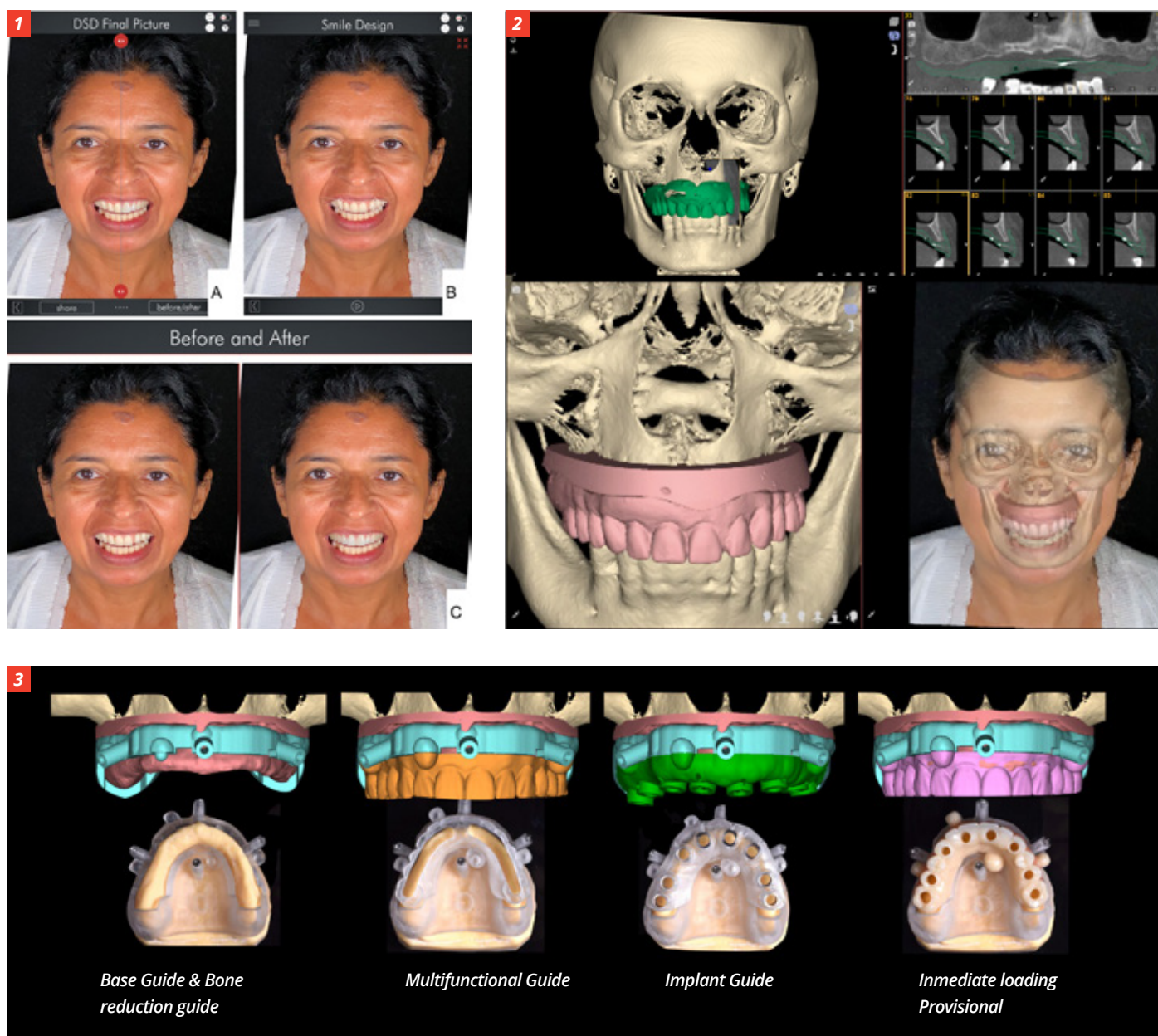
## Introduction

Advancement of digital technologies, such as intraoral scanners and cone beam computed tomography (CBCT), allows planning the implant therapy virtually based on a prosthetically-driven implant planning concept.<sup>1</sup> In this sense, both surgical and prosthetic needs are considered on the treatment planning, enabling the execution of implant therapy with greater predictability and safety.<sup>2</sup>

In cases involving complex rehabilitation procedures, not only the maxillofacial relationship, but also facial characteristics play an important role to determine the implant

planning.<sup>3,4</sup> Thus, the digital workflow may be improved by creating a virtual patient to simulate the treatment planning, which facilitates the communication between the professional and the patient. The main requisite to reproduce the patient virtually consists on the combination between digital files of dentition acquired by intraoral scanners and hard tissue scanned by CBCT to extraoral facial soft tissues.<sup>5,6</sup>

Furthermore, facial expressions must be considered in order to improve the esthetic and functional treatment outcomes when designing the wax pattern.<sup>7,8</sup> Thus, digital smile design (DSD) is used to determine the ideal tooth



**Figure 1.** Digital smile design. (A,B). A smile frame was created in bidimensional photographs based on facial reference lines and ideal tooth proportion concept. (C) 3D Digital wax-up was performed and presented to the patient.

**Figure 2.** Superimposition of photographs, intraoral scans and CBCT scans.

**Figure 3.** (A) Multifunctional guide. (B) Bone reduction guide. (C) Surgical guide. (D) Provisional denture

proportion based on reference lines and facial expressions showed on photographs.<sup>9</sup>

Nonetheless, the greatest challenge today is still to combine facial references from bidimensional photographs to the tridimensional virtual cast, on which the wax pattern will be designed. In this sense, the Nemo Smile Design software (Nemo Smile

design, Nemotec, Madrid, Spain) has been currently used to overcome this difficulties allowing the superimposition of DSD with virtual casts and CBCT scans.<sup>4,10</sup> The present case report shows how the smile frame created on photographs can be used to improve the esthetic results of computer-guided implant planning.



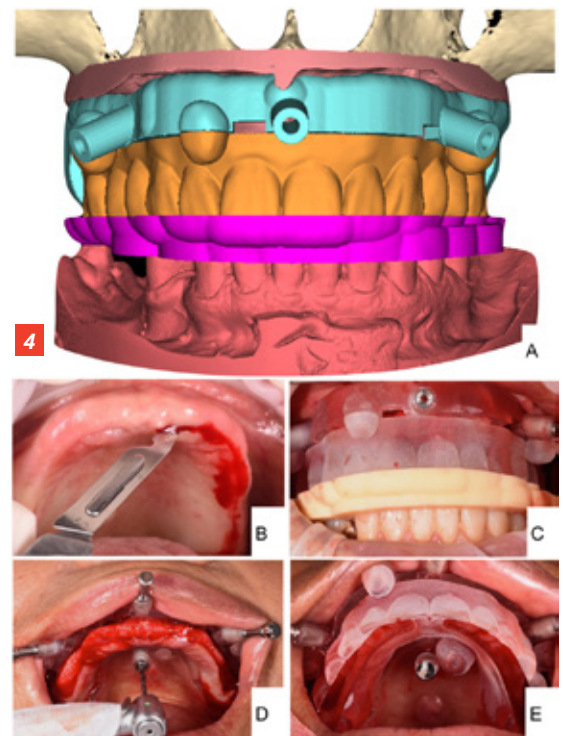
### Case report

A 28-year-old woman attended to the private dental office with esthetic and functional needs. Anamnesis and clinical examinations showed an edentulous maxilla rehabilitated with a conventional denture and a partially edentulous mandible. Excessive alveolar bone in the maxilla and consequently reduced inter-arch space were observed.

After presenting to the patient the different treatment options, it was chosen to rehabilitate the occlusal harmony by replacing the old denture by an implant-supported fixed prosthesis. Prior to the rehabilitation procedure, it was required to correct the maxillary arch height in order to increase the prosthetic space.

Thus, impressions of the maxillary and mandibular arches were taken and digitized by a laboratory scanner. In addition, interocclusal registration, photographs and CBCT scans (double scan technique) were taken to provide data for the treatment planning. Following the Digital Smile Design (DSD) protocol, a smile frame was created based on the ideal tooth proportion using the DSDapp 3D (Figure 1a,b). Further, a virtual waxing was performed based on the superimposition of the scanned maxillary arch and the smile frame (Figure 1c). As the position of the teeth was harmonized with the face and smile of the patient, the positioning of dental implants was determined by the digital wax-up. For the superimposition and analysis of photographs, intraoral and CBCT scans (Figure 2), a software program (Nemo Smile design, Nemotec, Madrid, Spain) was used.

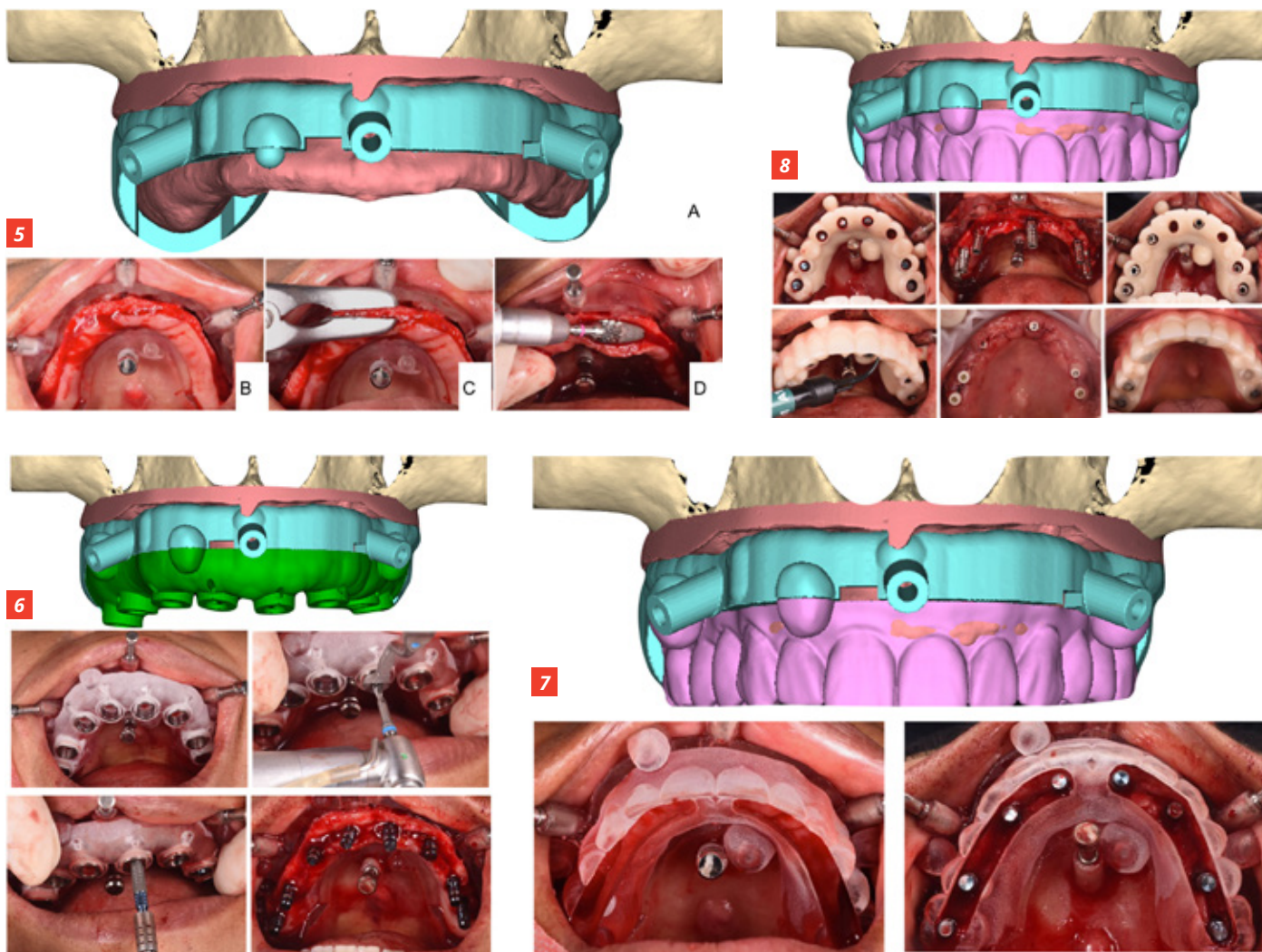
After defining the treatment planning, three surgical guides were used during the surgical procedure: a multifunctional guide, a base/bone reduction guide, and a surgical guide. The surgical guides were virtually designed and printed using 3D printing technology (3D System, ProJet 3600 MJP). Additionally, a



**Figure 4.** A multifunctional guide is used to guide the position of the base guide and drilling the pins. (A) CAD showing the base guide (blue), multifunctional guide (orange) and bite registration (pink). (B) A surgical incision is performed to release the mucosa. (C) Multifunctional guide is used to guide the position of the base guide with the aid of a bite registration. (D) Pins are drilled to fix the base guide. (E) Base guide and multifunctional guide attached to the mouth.

computer-aided designed/computer-aided manufacturing (CAD-CAM) interim prosthesis was fabricated in a milling machine (IA Roland dwx-50), as shown in Figure 3.

Surgical procedure was performed with local anesthesia and vertical releasing of the soft tissue. A multifunctional guide was attached to the base guide and used to determine the position of the anchor guide pins (Figure 4). The same base guide was used as bone reduction guide for steoplasty (Figure 5). The implant guide was then attached to the base guide and used to orient the implant positioning determined by the prosthetically-driven virtual planning (Figure 6). After checking implants positioning using the multifunctional guide (Figure 7), an immediate provisional denture was captured on titanium copings. (Figure 8) and the provisional



restoration was immediately loaded (Figure 9).

### Discussion

The present case demonstrated the benefits provided by digital resources to facilitate the treatment planning in rehabilitation with dental implants. Complex rehabilitations usually involve occlusal discrepancies that need to be surgically corrected and frequently are associated with an unsatisfactory esthetics. In this case, the excessive bone height of the maxillary arch prevented the installation of a complete denture with appropriate vertical dimension without pre-surgical treatment. The osteoplasty was digitally planned and transferred to the surgical procedure using a bone reduction guide. Likewise, the positioning of dental implants was virtually determined

**Figure 5.** The same base guide is used as bone reduction guide to determine the alveolar ridge osteoplasty. (A) CAD of the base and bone reduction guide (blue). (B). Bone reduction guide positioned in the mouth. (C,D) Alveolar ridge was surgically reduced.

**Figure 6.** Implant guide is used to orient the implant position determined on the virtual planning (A) CAD of the implant guide (green) and base guide (blue). (B) Implant guide fixed to the base guide in mouth. (C) Perforation of the implant bed. (D) Implants placement. (E) Implants placed on the prosthetically-guided position determined by the virtual planning.

**Figure 7.** Multifunctional guide can be used to check the implant position. (A) CAD showing the multifunctional guide (purple) fixed to the base guide (blue). (B) Multifunctional guide positioned on the mouth. (C) Multifunctional guide is used to check the implant position.

**Figure 8.** A provisional denture is milled for immediate loading. (A) CAD. (B) Provisional denture positioned in mouth. (C) Temporary abutments were fixed to the implants. (D, E) After positioning the provisional denture in mouth, titanium copings were attached to the restoration and (F,G) the prosthesis was immediately loaded.

considering the requirements of the future prosthesis.

Prosthetically-driven implant planning allows to associate the surgical and prosthetic treatment planning for the manufacturing of the prosthesis. The technique comprises a virtual planning, on which a surgical splint is digitally designed. Thus, it is possible to transfer the virtually planned placement of dental implants to the surgical procedure.<sup>2</sup> Using this technique, dental implants are placed with a greater safety and predictability than the conventional surgical procedure.<sup>11</sup>

Digital resources also allows a facially-guided treatment planning, which harmonizes the virtual waxing according to facial references and with the smile.<sup>4,10</sup> The use of photographs associated with virtual casts and CBCT is a reliable procedure and improve the treatment outcomes of the rehabilitation procedure.<sup>12</sup> The use of the DSDapp 3D integrated with the Nemo Smile design software to merge DSD based on face with virtual casts and CBCT scans are useful on clinical practice to simulate



**Figure 9.** Immediate post-operative situation.

the treatment planning and to facilitate the communication between the team's professionals, and with the patient.<sup>6</sup>

## Conclusion

Technological resources and multiple patient-related data sets were digitally integrated in the present case report improving the treatment planning of implant therapy and producing more predictable clinical outcomes. 🍷

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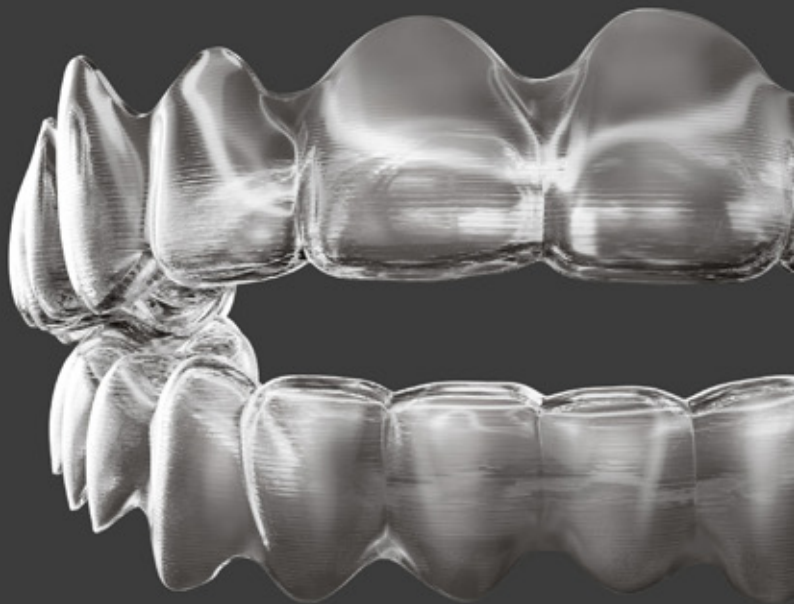
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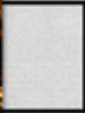
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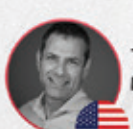


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