



How to Successfully Balance the Art, Science, and Business of Dentistry With 3D Printing

Success in private practice is only assured when there is an appropriate balance between art, science, and business. All dentists strive to do beautiful dentistry based on good science. But the business side of dentistry demands consistency and evolution of techniques as better systems improve efficiency. Just as we no longer use analog X-rays and have replaced them with cone beam technology, analog impressions are being replaced by intraoral scanners and 3D printing of models.

3D printing is a must in modern dental practice because it allows for higher quality results, permanent records, and better patient outcomes. Clinicians may be reluctant to invest due to concerns over training or convincing their staff. What they may not recognize is the return on investment they can experience with 3D printing. The advent of scan and model fabrication technologies presents a new horizon where patients are more comfortable and involved in understanding their changing dentition. Digital workflows are simpler, more predictable, and more profitable.

Increasing Patient Satisfaction and Practice Profitability With a Digital Workflow

New patients are essential to the growth of a practice. Reputation is crucial to attracting them, yet usually derives from word of mouth and online reviews. Location, the convenience of scheduling, cost, technology, and services offered will attract patients. What keeps them coming back is how they feel and whether that includes a welcoming environment that leaves them with a sense of safety, respect, and competency.

A digital workflow is powerful and cost-effective because it reduces the number of appointments a patient must attend. It also gets appliances back to them in a timely manner. The dentist's clear respect for the patient's time is combined with greater comfort. Patients dread having gag-inducing impression material in their mouth. Bypassing the process with a sleek intraoral scanner will reduce the patient's anxiety making it a better experience. In short, there is more control over cases and an enhanced ability to do same-day dentistry.

The gains to the practice are equally superb. Digital scans and 3D printing make it easy to reproduce models. Though there is a learning curve to 3D printing, it has become an increased necessity to rely on in-office production, especially with the COVID-19 pandemic. The practice saves on lab bills because they can print models for making retainers and occlusal guards. Patients are happier and everyone thrives knowing there is less stress and better results.



Demystifying the 3D Printing Process

3D printing is easier than most dentists realize. With a single day of training, the dental practice team and clinicians will be up to speed and able to start using their 3D printer immediately. They will learn many simple steps to become capable of making 3D printed models or delivering an appliance. These steps include using an intraoral scanner to generate an STL file, converting the STL file to a printable file, 3D printing the workpiece, washing extra resin off, curing the piece, and removal of supports. The 3Demax system from DMG is an integrated system that includes the 3Demax printer, 3Dewash, and 3Decure, all of which require no guesswork.

It's important to always begin with an excellent intraoral scan. A digital file lasts forever, which is one great benefit. Plus, case acceptance will soar because it's easier to educate patients with a visual representation of their dentition and a demonstration of how their teeth change over time. Once the clinician has a good scan, they can create a design file and using nesting software such as Netfabb create a printable file. DMG is currently developing their own DentaMile connect software which can design splints.

Once a printable file is created, it is relatively easy to print. The STL file is imported to Netfabb and the model positioned on a virtual build plate. The user can add a base to the model and then send the file to the 3D printer via a USB or Wi-Fi. The 3D printer calculates the time to print, which is an average of 20 minutes for horizontal models. Next, the resin reservoir is filled with the appropriate material and stirred. Printed models must be removed from the build plate and washed to clean away excess resin. The 3Dewash is easy to use, with its pre-set wash programs it takes the guesswork out of wash times. The final component is the 3Decure for even curing via pre-set programs with 360-degree illumination.

Leveraging 3D Printing Technology For Consistency and Successful Cases

There are many different applications for the unique resins produced by DMG. Each adds versatility to the 3D printing system. LuxaPrint Model is the go-to resin for making retainers, aligners, and occlusal guards with the printed models. These models are stronger than stone models and can produce countless retainers without breaking. Another option is LuxaPrint Ortho Plus, a good choice for occlusal guards and splints. LuxaPrint Ortho can be used to make surgical guides.

LuxaPrint Ortho Flex is flexible, making it perfect for bleaching trays and flexible splints. LuxaPrint Tray is designed for custom impression trays, while LuxaPrint Gingiva is used for gingival masks and LuxaPrint Cast is designed for easy-burn castings of copings and framework.

The 3D printing system from DMG has additional qualities that make it supreme for a dental practice. It relies on Digital Light Printing (DLP) technology, rather than stereolithography. This factor combined with their patented force feedback technology gives the 3D printer a nearly 50% faster print speed and greater reliability. It is also a validated system that creates a date- and time-



stamp. They also utilize radio-frequency identification (RFID) for their materials, which is a safeguard that reduces the chance of errors by allowing the 3D printer to digitally recognize the material in use.

Their 3Dewash unit is designed to be easier on dentists and their team by enabling the system to pump in and out alcohol for the correct amount of washing time. This is a real lifesaver because the team can safely let the model sit in the 3Dewash overnight without risk of damage. The system even tells the user when it is time to change the alcohol solution. The 3Decure unit is equally as efficient and safe as it uses a vacuum system to speed up curing. Overall, the 3D printing solution from DMG is designed to grow with you.

Making a 3D Printing System Work in the Dental Practice

New technology has a learning curve and complexity that will encounter resistance from the dental office team. For this reason, it's necessary to keep the system as simple as possible. The 3D printing solution from DMG is a comprehensive, integrated system with a small footprint that doesn't sacrifice build plate size. New software and resins are always on the horizon, and the 3Demax printer is built to allow for future developments without the need to upgrade. DMG continues to provide support in the form of education, training, and troubleshooting.

Drs. Jeffrey Hoos and Julia Latham use 3D printing regularly in their practice to reduce the number of appointments their patients need. One example of their usual cases is a patient needing fixed orthodontics whose braces are ready to be removed. They take out the wires and conduct an intraoral scan with brackets still on. At this time, they also place a fixed lingual bar if needed so that it is included in the scan. It is much easier to use a scanner than take an impression on a person with braces. They then remove the brackets digitally using Meshmixer. The file is placed in nesting software, sent to the printer, and the models printed. Fabricated retainers are then delivered to the patient at the same appointment where brackets are removed.

The 3Demax printer from DMG helps dentists achieve a perfect balance of the art, science, and business of dentistry. The dental practice sees greater success and experiences more satisfied patients while maintaining its own in-house system. The future of dentistry is 3D printing, and the future is here.