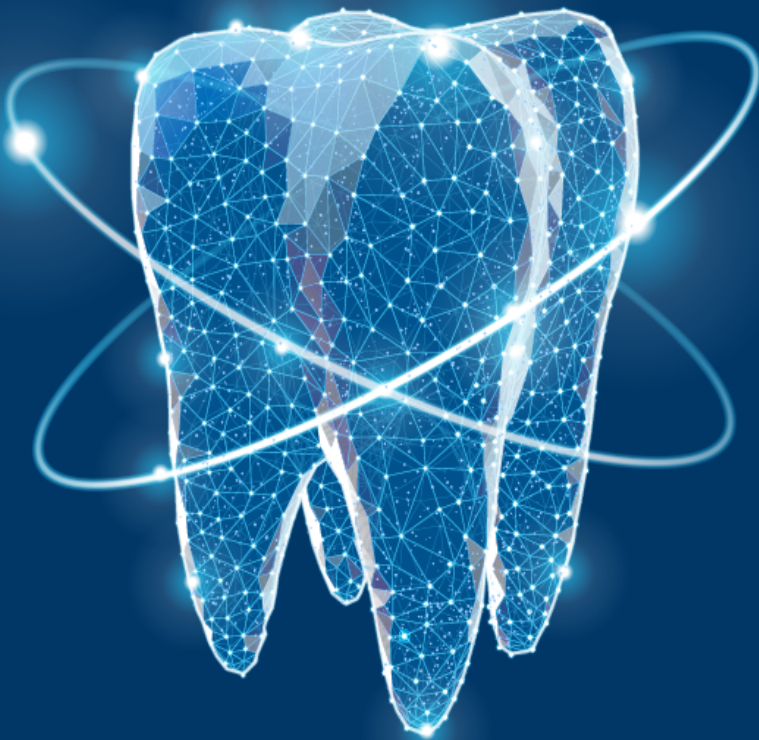


3D PRINTING: THE FUTURE OF DIGITAL DENTISTRY



As the world moves in an increasingly digital direction, so too does dentistry. Technologies such as CAD/CAM and intraoral scanners have revolutionized the way clinicians treat patients and can streamline processes, improve treatment outcomes and increase production. Ultimately, digital innovations expand the scope of what's possible in any given dental office, on any given day. Now, 3D printing systems – many designed specifically for dentistry – supply these benefits, and at a fraction of the cost of many other practice investments.



**Timothy
Anderson, DDS**
Missouri River Dental

Timothy Anderson, DDS, of Missouri River Dental in Bismarck, North Dakota, is an avid technology enthusiast and self-described “tinkerer.” He always has been deeply interested in the laboratory side of dentistry and was an early adopter of both dental CAD/CAM and digital scanning. So, when 3D printers first became commercially available several years ago, he was immediately on board. Before long, he grew enamored with the technology, realizing that it was remarkable not only in terms of its efficiency, accuracy and simplicity but also profitability. In his



eyes, however, the technology did not “take off” as fast as it could have: “3D printing is a tripartite process,” he explains. “Parts one and three – the data collection and production aspects – were both very good from the start. But the design segment, the step that bridges the two, was initially lacking.”



Over the past few years, however, the 3D printing process has evolved significantly. While its use in the dental office has always been “extremely profitable” (partnering with his lab technician to design splints paid for Anderson’s first printer shortly after purchase), the primary “hurdle” he cites was the design software. Previously, available software was relegated to a limited set of third-party options with varying reliability. Now, 3D printing software supports what he refers to as true office integration and a seamless digital ecosystem. Couple that with improvements made to resins and printing speeds, and it’s easy to see how 3D printing now opens the door to a world of possibilities for clinicians. What historically took weeks or months and cost extensive lab fees to accomplish can now be done in the span of a day or two – in-office and at a far lower cost.

“Recently, my team and I produced 21 models in just over two hours,” Anderson remarks. “I’m floored at how far the technology has come in such a short amount of time and know it will only continue to improve into the future.” Streamlined workflows enabled by advanced 3D printer capabilities also allow Anderson and his team to take on bigger cases, as well as trial ideas in-office without consulting an outside lab technician.

Many dentists remain averse to new technologies, hesitant that they may disrupt existing workflows, and, as a result, not achieve a desirable return on investment. But, in the case of 3D printing, Anderson says these fears are unfounded. As mentioned, modern 3D printers open up a broad range of new treatment options, but “even if all you produce are splints, surgical guides, digital dentures, or aligners, it’s a profitable game. The cost of entry is so low relative to other pieces of capital equipment and it provides instant ROI.”

Like many experts, Anderson recognizes that digital is gradually becoming the standard for dentistry and investing in 3D printing is an invaluable step toward embracing this trend. “I truly believe that we are at a point where every office can and should integrate a 3D printer,” he states. “It’s only going to get better, and easier, from here.”



3D PRINTERS TODAY

Learn about a selection of the most cutting-edge tech on the market, sure to meet the needs of your practice and exceed patient expectations.

Current 3D printers available for dentistry incorporate a diverse array of technologies and provide a range of capabilities suited for different applications. There are, however, a few core consistencies that can be found across all devices. At the most basic level, every 3D printer is the

same in that it creates three-dimensional objects via a process known as additive manufacturing. These objects are built by repeatedly layering liquid resin, which is then hardened using a UV light.

A TEAM AND PATIENT CENTERED TECHNOLOGY

Anderson emphasizes that 3D printing isn't a "doctor-driven" technology. "My dental assistants are true 'design assistants,'" he says. "They're involved in every facet of the 3D printing process."

A team-driven approach, paired with the benefits of increased speed and cleanliness compared to traditional methods of appliance creation, boosts overall practice efficiency and frees staff to focus on patient care.

Patients also are taking note of the new technology: "Our new office is designed around a central lab space," Anderson explains. "When patients look in, out of all the machines, they tend to notice and ask about the printers – the least expensive equipment in the lab." He believes that it's the larger cultural "buzz" around 3D printing that draws them in, but what truly resonates on a deeper level is the realization that this technology is "working for them," delivering reliable results in shorter timeframes.

DIGITAL LIGHT PROCESSING

The most common class of dental printer uses digital light processing (DLP) to solidify the resin object. Benefits of DLP printers include a small footprint; simple, streamlined workflow; and support for a broad range of resin materials. For example, one 3D printer contains industrial grade DLP technology that allows the light source to move into six different positions. By maintaining equal distance from the build object, DLP, in this instance, can ensure exceptional print quality and accuracy regardless of object placement on the platform – a necessity when producing high-precision appliances such as crown and bridge models with dyes.



OPEN MATERIALS

As Dr. Anderson mentioned, one of the benefits of the current generation of 3D printers is the improved quality and variety of resin materials. Initially, virtually all printers on the market were only compatible with proprietary resins. Now, a number of manufacturers offer an "open" system that allows the use of third-party materials.

IMPROVED PRINT SPEED AND QUALITY

Another advantage of the latest 3D printers is their ability to quickly and reliably print greater volumes of quality appliances. This helps practices optimize production, expand service offerings and provide same- or next-day dentistry, which translates to increased patient satisfaction and ROI. One printer, for example, delivers an impressive throughput of 30 full arch dental models in a single batch, and another uses DLP to create economical and accurate prints, while intelligent illumination sequence and mechanical z-axis movement speed up the printing process. These capabilities, combined with a long-lasting resin tray that ensures transparency and stability, enable units like this to produce smoother, more homogeneous surfaces than their predecessors.

Ready to explore how 3D printing can advance your practice?

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