

# MAKING THE CASE

The Technology of Tomorrow Arrived Early. Here's Why It Matters to Your Practice.

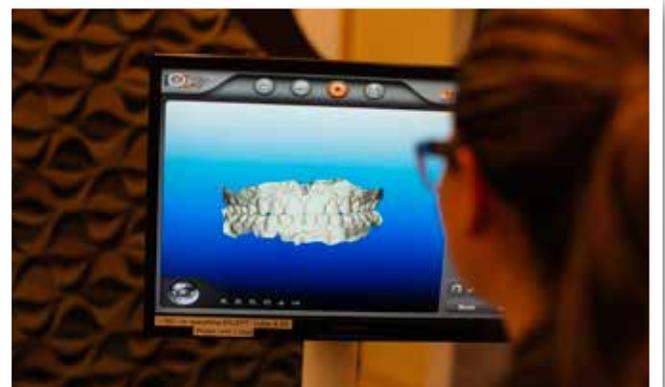
**T**he adoption lifecycle of new technology tends to follow a pretty standard script. It's driven initially by innovators and early adopters who enjoy new for the sake of new. This period typically involves a good deal of feedback between the technology's users and its makers. During this time bugs are worked out, enhancements are made and production efficiencies are established. At some point during this phase, the idea reaches a financial and intellectual tipping point where the costs and benefits of the technology are simply too significant for the rest of the market to ignore.

According to Dr. Tim Dumore, the tipping point for orthodontists to incorporate in-house 3D printing has already passed. Dr. Dumore is owner of Dr. Dumore & Team, a thriving practice located in Winnipeg, Manitoba. When he moved his practice a few years back, he and his team started looking at what they'd like to change. They zeroed in on paperwork, the physical filing of records and the storage of plaster casts. As they setup their new practice, they embraced every digital technology available to them.

Going digital wasn't without its challenges, even for a tech forward professional like Dr. Dumore. He admits, "the first three or four weeks I felt really uncomfortable

looking at digital models. I felt really disconnected from the process. I just wasn't getting it. But at some point, again it was about three weeks in, it clicked for me. I said to myself, yeah, I can do this. Because everyone on the team went through the same learning curve, we were able to help each other out."

The new practice is digital and as paper free as is humanly possible. The technology roster is impressive and includes many of the usual suspects: an iTero™ digital scanner, a soft-tissue laser, OrthoSoft™ practice management software. He also purchased a Vatech™ Cone Beam CT Scanner in anticipation of a growing role for 3D imaging in diagnosis. But it's the 3D





printer sitting in the corner that sets the practice apart technologically, clinically and financially.

“I started thinking seriously about a 3D printer sometime in 2012. I asked myself is this (the printer) something I just want because it’s neat, or can I make a business case for it? I was pretty sure the numbers would work. But on top of that, I figure I’m going to be doing this for a long time. So I want to do what I want to do.”

In early 2013, Dr. Dumore purchased a Stratasys Objet30 Pro, PolyJet printer. Like traditional printers, 3D printers are also categorized by the print technology they employ. PolyJet printing is an additive fabrication process, meaning that it creates 3D objects by adding layer upon layer. Although the Objet30 is one of Stratasys’ affordably priced printers, the precision and performance it delivers are impressive. The printer builds in 16-micron layers (0.0006 inch) with accuracy guaranteed to 0.1 mm (0.0039 inch), a tolerance range about the width of human hair. It’s a level of accuracy stone casts simply cannot match.

Unlike many technologies that can take a few years to offer a return on investment, Dumore found the Objet30 was profitable in its first year. “When we got our printer in early 2013, it cost us in the ballpark of \$40,000. That may sound like a lot of money, and it is a lot of money. But when we sat down and figured out how much cash we were spending on digital models, impression supplies, labor and Hawley retainers. It was a whack of cash. The printer paid for itself in the first year.”

The Objet30 printer is capable of printing seven different materials including clear, transparent, high-temperature and rigid opaque polypropylene-

like materials. Dr. Dumore prints with a medical grade, plastic resin. Another advantage is that the printed resin cast will stand up to the physical rigors of making an Essix style retainer, a process that can sometimes damage a plaster cast.

Dr. Dumore has been doing in-house indirect bonding for a number of years and says the 3D printer is ideal for IDB cases. “You take the digital impression to first obtain the diagnostic record. Then you just use the printer to create the cast. It’s just a regular IDB case from there. We like to give the resin cast to patients at the banding appointment, which they think is really cool.”

Typically the orthodontist won’t do print on demand for an individual model (although they can). Instead, they’ll gang their runs and do all of the printing in a single operation, which is usually performed in the evening. That means that five, ten or twenty models will be produced in a single session. The type of each case is



irrelevant to the printer, which is good since Dumore's office uses it in a variety of ways.

"We also use it for our final records by printing the models to craft the retainer. We give the printed models to the patients at the end of treatment. Not only is it fun, but if they ever lose their retainer we can give them a new one if they bring us the cast. If they lose the cast, we can print them another one. This digital precision ensures they'll get the same result whether we make the retainer the first day after treatment, or five years down the road after some relapse has occurred."



The Dumore Family: Jenn, Lucas (12), Danica (9), Thomas (17) and Tim

One of the more unique uses for the printer was as a publicity generator. The hit show *Big Bang Theory* featured the same printer in one of the episodes. Not one to miss an opportunity to make the most of every piece of technology at his disposal, Dr. Dumore sent out a tweet of his printer with the caption, "Our new 3D printer! Same technology *The Big Bang Theory* featured on their show".

For Dr. Dumore, the 3D business model already makes sense. As the price for 3D manufacturing continues to fall, capabilities rise and the software gets better at interpreting and executing clinically driven hypotheses, it will likely become a standard part of all dental and orthodontic practices, which according to Dr. Dumore, it already is.

The true test of any piece of technology's importance is what happens when you remove it. Dr. Dumore makes the case for 3D printing when he says, "We've had ours for about 18 months now, and already we can't fathom not having it."



## Dr. Tim Dumore

Dr. Dumore was born in Winnipeg, Canada and grew up in St. James. He attended Hedges Junior High and John Taylor Collegiate. He obtained his bachelor of science and completed his dental school training at the

University of Manitoba in 1991 and received his orthodontic training at the University of California, San Francisco.

Professionally, he has served with the Canadian Association of Orthodontists, the Midwestern Society of Orthodontists, and the Manitoba Orthodontic Society, and has acted as chairman of the Manitoba Dental Association Annual Convention Committee. He is a co-director of the Winnipeg Progressive Dental Study Club, an affiliate of the Seattle Study Club. He's married to his college sweetheart Jennifer and has three children: Thomas 19, Lucas 14 and Danika 11.

Photography by Pauline Boldt