



EDITORIAL

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## Orthodontics and technology

### *Ortodoncia y tecnología*

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Dentists love technology and new gadgets. Orthodontists love them even more. We love technology because we love to stay up with what is new in the world. As orthodontists, we are exposed to this more than usual. Why? Our patients are at the age where they adopt new technology at a dizzying pace, and it is fun for us to try and keep up with them. I would wager that the average orthodontist looks and acts a lot younger than our fellow dentists who are not orthodontists. Our fascination and obsession with technology is good and bad. It is good because we have adapted a lot of new technology to make orthodontics faster, easier, less painful, and far more efficient than before. It is bad because we have adapted a lot of new technology to make orthodontics faster, easier, less painful, and far more efficient than before. How can the same reasons be both good and bad? Because it makes orthodontics look a lot easier than it is.

It is easy to put on brackets. With indirect bonding done by an outside lab it is even easier. We have always been good at delegation of our clinical work. We were probably the first to use dental assistants as more than someone holding the suction. So it was no big leap to delegating other clinical procedures. As long as you trust the lab then you are all set. Orthodontic specialists understand how critical it is to put the brackets in the right place – makes finishing easier and straight wire more effective and efficient. And therein lies the rub. It is the specialist alone who knows what a quality outcome should look like. Even if indirect bonding is used there are adjustments that must be made along the way, perhaps not in every case, but certainly in enough cases that some skill is required to finish the case. We see this in cases treated with clear aligners, where you can check the case at each step and change aligners if needed based on clinical experience and skill.

When I was a dental student many years ago, I remember thinking that the two things I would like to see eliminated from dentistry are injections and impressions. It is sad that the former has not changed at all for over one hundred years, despite all manner

of gadgetry and promises. But impressions are finally a thing of the past. The intraoral scanners really work and within a few years a routine piece of equipment in every dental office. But as usual, orthodontists will adapt first, and many already have. Why? Because we take more impressions on patients than anyone else. All it takes is one gagger to ruin an afternoon. Intraoral scanning is a godsend to our patients and that is the most important thing.

Now in thirty years of orthodontics, I have seen a lot of technology come and go. Most of the time technology looking for an application instead of the opposite, which is the way it should be. Cone beam CT is a perfect example. Orthodontic departments jumped in with both feet and without a lot of testing and research started to scan every patient. We were one of the first in the US but when the excitement faded and the real shortcomings of the machines became evident, everyone finally realized that it was not really that necessary on every patient, but did have a major benefit in the diagnosis and treatment of impacted teeth and difficult dentofacial cases.

Scanning also includes model scanners, which are an excellent device to add in an existing practice. We can now unburden ourselves with all those models we have stored in the office, in our home, in our garage, in storage, etc. If you are waiting until the cost of the intraoral scanner goes down the model scanner is a great way to transition the practice to a virtual model one. With the proper software, scanned models can also be analyzed for diagnostic purposes – crowding, arch form, etc. Scans of initial models can be used for the ABO clinical examination. Also with more sophisticated software, virtual models can be created from either the direct scans or the scans of the plaster

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that can be used to virtually move the teeth – a process that has been around for a while now from the commercial sector. One our faculty at USC, Prof Hong Sheng Tong, has perfected a way to attach the roots from a CBCT to the scanned models of the teeth enabling the orthodontist to position the entire tooth, not just the crowns!

More technology is on the way – in ten years the way we deliver our care will look a lot different. Three-D printing is just around the corner. I went to the national meeting of 3D printing in Burbank earlier in the year with a couple of residents. We were the only dental/ortho people there. It was interesting to talk to the actual people directly involved with creating the printers and the technology that makes them work. Like a lot of things, reality was far different from hype. The industry right now is where personal computers were around thirty years ago – before corporations and big business took over. We will probably be printing models (if you still need physical models) in our offices,

and retainers and other adjunctive appliances within a decade. At USC the engineers showed us a 3D printer that can make walls for a shelter from moon rocks!

Technology is fascinating and keeps orthodontic practice and education fresh and interesting. But we must always remember the patient. It is our primary duty to provide the best possible care in the best interest of the patient. Technological advances are wonderful, but they must be weighed against the cost of providing the care, and our ability to make dentistry and orthodontics available and accessible by everyone in society. The way we address this issue will have a bigger impact on the practice of orthodontics than any technological advances in the coming years.

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