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THE EDITOR'S CORNER

Intraoral Scanners Have Arrived

The annual session of the AAO is always the highlight of my professional year. It's a chance not only to meet old friends and colleagues, but to make new friends and greet the up-and-coming members of the specialty. The lectures and continuing-education opportunities are generally rewarding, and this year's session in Philadelphia was especially good. But while the scientific presentations serve to introduce and evaluate new orthodontic techniques, it is the manufacturers' exhibits that give us a hands-on try at what's new. For all of us who fall into the experiential learning camp, this allows us to learn about and critically appraise the new products being brought to market.

Every few years, one new technology or another seems to dominate the exhibits. Almost a decade ago, it was cone-beam computed tomography (CBCT). To hear it told on the exhibit floor, CBCT would be the only way to evaluate patients radiographically in what was then portrayed as the "near future". Consequently, almost every graduate orthodontic program in the country obtained a cone-beam machine. After a few years, however, everybody noticed that we changed next to nothing about the way we diagnosed and treated most patients, and the pendulum swung back toward the time-tested two-dimensional cephalometry and panoramic radiography. The added expense of CBCT and concerns (whether factual or not) about increased radiation exposure seem to have been the driving factors.

If you recall, the previous big thing on the technology front had been temporary anchorage devices (TADs, or miniscrews). This was the overriding theme for a few annual sessions; at the time, it seemed that almost every other article we received for consideration in JCO involved the use of miniscrews. Unlike CBCT, even though the initial excitement seems to have peaked, TADs have gone on to become mainstream tools in our clinical armamentarium.

This year, the rage at the annual session was intraoral scanners. When I heard several manufacturers' representatives assert that these scanners would replace impres-

sions in the near future, I was reminded of the claims being made about CBCT not long ago. There is no doubt that intraoral scanners are a promising technology. They do indeed resolve the age-old dilemma of how to store the thousands of study models accumulated over the life span of any practice. Based on evidence presented by the manufacturers, the images generated by intraoral scanners seem to be as accurate as the study models produced from polyvinyl siloxane impression material. These images can be interfaced with other computer-driven technologies, such as aligners and full-facial digital renderings—opening up amazing possibilities with respect to our diagnostic views of a patient's entire orofacial complex. What's more, the technology satisfies the cravings that many of us have for cool new gadgets.

I spent a substantial amount of time in Philadelphia checking out the various scanners that are currently on the market. They seem to differ in two major areas: first, whether a powder is applied to the teeth prior to the scan, and second, the size of the intraoral portion of the scanner itself. Some companies offer online "cloud" storage of the images with monthly data fees, similar to mobile-phone plans but much more expensive. Others provide downloadable images that can be stored on servers in individual practices.

Although I watched several apparently experienced and skilled assistants take scans in a reasonable amount of time, there is a definite learning curve involved in using these devices. Because there is no similarity whatsoever to taking an impression, I had no transferable prior knowledge. The quickest I could scan an entire arch was about 20 minutes. Admittedly, I am an old dog trying to learn new tricks, but this seemed a little excessive to me. The other major issue with intraoral scanners is their cost. The least expensive I could find ran between \$15,000 and \$20,000 for the equipment, with ongoing service and data plans for about \$400 per month. That would buy a lot of alginate, model storage issues aside.

The next couple of years will tell the tale of intraoral scanners. I expect that they are here to stay, especially considering their ability to interface with other digital technologies in orthodontics, oral surgery, and restorative dentistry. If the past is the best predictor of the future, however, I expect to see their use increase substantially and peak fairly soon, followed by a gradual decline to a baseline level of acceptance.

Here at JCO, we welcome the submission of rigorous independent studies of the efficacy of intraoral scanners. I look forward to what the next few years will bring.

RGK