Redefining endodontic education

L. Stephen Buchanan discusses new ways to help dentists learn

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In an interview, L. Stephen Buchanan, DDS, FICD, FACD, of Dental Education Laboratories discusses his new TrueTooth™ replicas and how they can be used by all dentists to master technique, his new website offering videos of clinical cases, and his upcoming speaking engagement at the ADA meeting in San Francisco.

What is new with you?

I'm glad you asked. Check out these 3-D-printed tooth replicas (Figs. 1, 2). I wanted to do this 20 years ago, but I had to wait for stereo-lithography to advance to the sophisticated level it is today before it was possible to make these at a high enough resolution (0.1 mm layers) to accurately re-create the experience of working inside a tooth. Now that we can, procedural training in dentistry will never be the same again.

That's a pretty bold statement.

It is a bold statement, but it's true. Before this, our best training experiences — short of working on a patient — were in extracted teeth. While it is convenient to practice endo procedures in teeth without their previous owners to deal with, working in extracted teeth is limiting in many ways, and I've often thought we could do better.

In extracted teeth, we have the problems of hidden anatomy and a one-off experience, meaning that if you botch practice in an extracted tooth containing a root canal morphology that represents a certain procedural endodontic challenge, you are done. You don't get to try and try again until you learn that specific skill. You had one opportunity to learn a new trick, but you now have to randomly cross similar morphology in another extracted tooth to give another try, or hope for the best if it is encountered in a patient before you figure it out.

With these clear and solid-color TrueTooth replicas, course attendees and dental students can attempt a procedure again and again — in exactly similar replicas — until they learn that particular skill cold.

How do these new tooth replicas compare with other, similar tools?

Compared to clear plastic endo blocks we have traditionally used, they are better in every way:

• They are printed with a heat-resistant polymer, so they do not melt and gum up high-speed burs or grab rotary files.
• They have real root canals inside them. They are replicas, not models.
• All the other models I've seen have over-sim-
plified, soda-straw-like canal morphology — ridiculous with overly large terminal diameters.

The true complexity of roots and the root canal systems inside them has never been re-created in any type of training model.

With 3–D-printed training replicas, we can make the same, exact, perfect tooth form over and over, so dentists can practice again and again until they get consistently good results with a given technique in a given anatomic challenge. We even have a patent pending process for these TrueTooth replicas to have simulated pulp tissue that dissolves with sodium hypochlorite irrigating solutions. If you irrigate these replicas effectively, you will see one or more lateral canals filled upon completion.

That’s very cool. I guess it wasn’t that bold a statement. What else is new with you?

We also have an all-new website, www.DELendo.com, which just went live at the beginning of September. I’m very proud of the diligence and creativity my team at Dental Education Laboratories applied to this project.

This time, besides the quality of the site design, the most significant parts of DELendo will be the case contributions of others. And with streaming video servers in place, you will see clinical case videos from some of the best endodontists in the world.

It sounds like DELendo is a cross between YouTube and Apple TV.

Yes. We have lots of exceptional free content, but we also have five–to 15-minute educational lectures, OnTopic™, and fully edited clinical case videos, called From The Op™, by myself and others, available for a small viewing fee, which helps offset some of our production costs.

The site offers small, inexpensive, bite-sized educational segments. This is how the Internet is changing education. More and more, we will see courses designed for the way people prefer to learn — in chunks. It is a different way to look at educational curricula, but the feedback we are getting is over the top positive.

I’ve described our new TrueTooth procedural replicas, and our interactive streaming video site, DELendo, but in terms of new methods of training dentists, we’ve taken it even further. By year’s end we will be launching the first remote procedural training course ever given in dentistry, called DIY/CE™, which stands for “do-it-yourself continuing education.”

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So now a dentist can take a hands-on course in his or her own office?

Yes, but the advantage of this concept is not just...
the dollar savings from avoiding the air travel, hotel and course costs. One of the coolest aspects is that procedural training can be done with your assisting staff there, so they are training simultaneously as you are. The feedback from dental students and dentists who have trained in DEL’s TrueTooth training replicas has been enthusiastic, with unanimous agreement that printed tooth replicas are superior to extracted teeth for endodontic procedural training because they are:

- Readily available — no more collecting teeth before training
- Clean — no biohazards to deal with
- Exactly the right anatomic challenge for teaching every type of procedure
- Reproducible — so learning how to manage a particular procedural challenge can be accomplished in a more iterative and in a less random manner.
- Ideal for board exams and dental school practical exams, because grading becomes standardized.

You’re one of the featured speakers at the upcoming ADA Annual Session. Can you give us a preview of what you’ll be presenting?

Sure. My all-new presentation is titled “The Art of Endodontics: Everything Has Changed but the Anatomy.” What’s different? Quite a bit, actually. Attendees will see fresh clinical footage — shot with a state-of-the-art HD1080p video camera — that is painted onto the screen at a resolution that resembles looking through the microscope. They will see new procedures, such as rotary negotiation, guided-bur access preps, single-file GTX shaping, single-cone backfilling and many more. In the spirit of “Everything Has Changed,” most of the video clips were chosen from recent clinical cases.

Sounds like you’ve put a lot of effort into your new lecture.

Yes, it’s a top-to-bottom redesign of my full-day presentation. For the past year and a half I have been working on “Everything Has Changed,” but it was worth it when I recently presented at the University of Texas at Houston. Course reviews from attendees averaged 4.75 points out of 5, with comments like, “Best endo lecture I’ve ever seen.” At Dental Education Laboratories, our mission statement is to meet and exceed our course attendees’ expectations. Hearing and reading that kind of response makes it all worthwhile.

What is your favorite thing to hear from a course attendee?

That’s easy. My favorite compliment is to meet a former student and hear him or her say that attending one of my courses changed their experience performing endo procedures from being their least favorite to the best part of their practice.

When are you presenting in San Francisco?

My all-day lecture at the ADA meeting is scheduled for Saturday, Oct. 20, and I’ll be teaching a hands-on course on Sunday morning, Oct. 21, where we will be using TrueTooth replicas.

L. Stephen Buchanan, DDS, FICD, FACD, was valedictorian of his class at the University of the Pacific School of Dentistry, and he completed the endodontic graduate program at Temple University in Philadelphia in 1980. He began pursuing 3-D anatomy research early in his career, and, in 1986, he became the first person in dentistry to use micro CT technology to show the intricacies of root structure. In 1989 he established Dental Education Laboratories, through which he has lectured and conducted participation courses around the world. Buchanan holds a number of patents for dental instruments and techniques, including variably tapered shaping instruments for use in endodontics. He pioneered a system-based approach to treating root canals. He is a diplomate of the American Board of Endodontics. He maintains a private practice limited to endodontics and implant surgery in Santa Barbara, Calif. Contact him at 1515 State St., Suite 16, Santa Barbara, Calif. 93101, (800) 528-1590 or (805) 899-4529, info@endobuchanan.com, www.DELendo.com, www.endobuchanan.com.

Fig. 2 A TrueTooth 3-D replica available from www.DELendo.com.