

FOCUS ON: Endodontics

Clifford J. Ruddle, DDS, discusses innovations in endodontics.

Q: What is the most urgent challenge facing the specialty of endodontics?

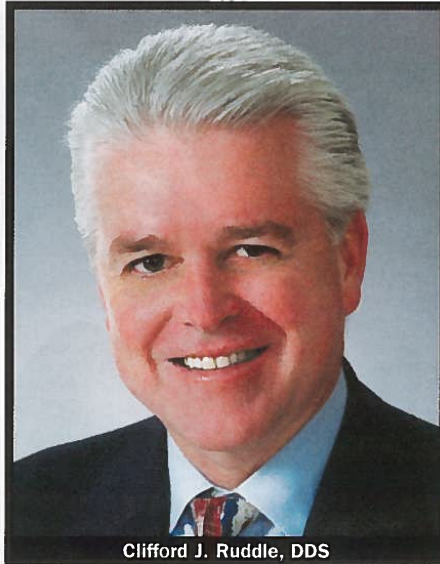
A: The biggest and most urgent challenge facing international endodontics is the need for superb, relevant, and focused education. Although many dentists believe they have received good endodontic training, oftentimes this training occurred many years earlier. We should all appreciate that good is the enemy of great. Meaningful continuing education (CE) should be conducted in an environment and a manner that inspire. Relevant CE should close the gap between prior training and what is currently possible. Further, focused CE should measurably improve confidence, elevate performance, and create opportunities. CE should help dentists improve and expand the level of care they provide their patients. Education and networking with like-minded dentists decreases the learning curve, accelerates growth, and fosters camaraderie and professionalism.

Q: What are the greatest controversies in endodontics today?

A: The source of virtually all endodontic controversies is unmistakably linked to our published literature. But let me make a clear distinction. The field of endodontics has excellent evidence-based scientific literature. However, the evidence-based clinical literature contains an abundance of misinformation, misconceptions, and perpetuated endodontic myths. In most instances, this unreliable clinical literature may be attributable to the era of publication, study design flaws, ignorance, or bias bordering on scientific misconduct. To support my assertion, simply peruse the peer-reviewed clinical literature and you will note there is no consensus on virtually any procedural step that comprises start-to-finish endodontics.

Here are some examples: there is no agreement regarding the best and most reliable diagnostic schemes. We do not agree as to the size of the access cavity for any given tooth; yet, canals are frequently missed and restrictive access preparations lead to many subsequent iatrogenic events. We do not agree on the sequence of the preparation, glide path management, working length, patency, best shaping files, or sequences. There is enormous controversy regarding how large to prepare the most terminal extent of the preparation, or what many term the *apical foramen*.

There is no consensus on apical one-third taper, yet taper influences 3-dimensional cleaning and filling root canal systems. Regarding intracanal irrigants, again, there is no consensus whatsoever on the frequency, volume, strength, temperature, or the time required for any given reagent to fulfill its intended purpose. There is ongoing de-



Clifford J. Ruddle, DDS

bate regarding the factors that influence disinfection, such as active versus passive irrigation, sonics versus ultrasonics, metal insert tips versus flexible snap-on polymer tips, hard- versus soft-tissue lasers, to mention a few.

We do not agree on the materials and methods for filling root canal systems, including gutta-percha versus resin-based materials, cold lateral versus warm vertical, carrier-based filling methods, and more. When an endodontically treated tooth fails, we have no agreement whether to nonsurgically retreat, perform surgical correction, or extract. The debate on endodontics versus implants becomes foolish if the treatment choice is actually based on knowledge, training, experience, and what is ethically best for the patient. Regrettably, many of these identified controversies serve to sabotage our potential for greater success and predictability.

Q: What are some of the important technological advancements that have most influenced clinical endodontics?

A: Surprisingly, during the decades preceding the mid-1980s, the existing armamentarium used to perform clinical endodontics never truly made any significant or meaningful change. Then, from about 1985 to 1995, clinical endodontics was confronted with a series of staggering changes. In this decade, 4 game-changing technologies emerged that forever altered the future course of clinical endodontics: namely, the dental operating microscope, ultrasonic insert tips to refine instrumentation, Ni-Ti rotary files for shaping canals, and a

superb multipurpose material: mineral trioxide aggregate, or ProRoot. Essentially, in just one decade, each one of these technologies led to a new and more predictable kind of endodontics.

Q: Could you identify the most recent and relevant technologies that are influencing clinical endodontics today?

A: Absolutely! Really exciting are the new reagents, devices, and methods that have recently emerged to improve cleaning a root canal system. Specifically, this means clinicians have the potential to eliminate all the pulp; smear layer; and when present, bacteria and their related breakdown products; from both the instrumentable and uninstrumentable portions of a root canal system. Dentists understand a root canal system must first be cleaned in order to be subsequently filled.

Another technology being integrated into an ever-growing number of dental practices is cone beam computed tomography (CBCT). Beyond implant procedures, CBCT is seriously expanding and improving endodontic diagnostics pre-treatment, during treatment, and when analyzing post-treatment disease. In time, it is my belief CBCT will be deemed as essential to the successful practice of endodontics, in much the same way the microscope has evolved in clinical importance during the past 30 years.

Regarding canal preparation, in the past 2 years, we have witnessed the emergence of a novel single-file and single-use shaping technique as a result of innovative reciprocation technology. Additionally, many of the more recent Ni-Ti shaping files are produced utilizing heat treatment technology, which vastly improves the resistance to cyclic fatigue, as well as enhancing flexibility. I am really enthusiastic regarding the emergence of new fifth-generation shaping files. These files have an offset cross section that produces a unique asymmetrical rotary motion that, in my opinion, will set a new standard for preparing canals.

In the not to distant future, patients will benefit from the pioneering work being done in regenerative endodontics, tissue engineering, and revascularization. The emergence of this field will forever change interdisciplinary treatment planning.

Dr. Ruddle is founder and director of Advanced Endodontics, an international educational source, in Santa Barbara, Calif. He is an assistant professor of graduate endodontics at Loma Linda University and University of California, Los Angeles, is an associate clinical professor at University of California, San Francisco, and is an adjunct assistant professor of endodontics at the University of the Pacific, School of Dentistry. Additionally, he maintains a private practice in Santa Barbara. He can be reached at (800) 753-3636 or at endoruddle.com.