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SIROWORLD 2016

An Interview with Cliff Ruddle, DDS, FACD, FICD

In connection with Dentsply Sirona's annual meeting, SIROWORLD, Dentsply Sirona interviewed Dr. Cliff Ruddle, a featured speaker and well-known leader in the field of endodontics. In this interview, Dr. Ruddle discusses topics surrounding his presentation at SIROWORLD, including 3D disinfection, new technology and the future of endodontics.

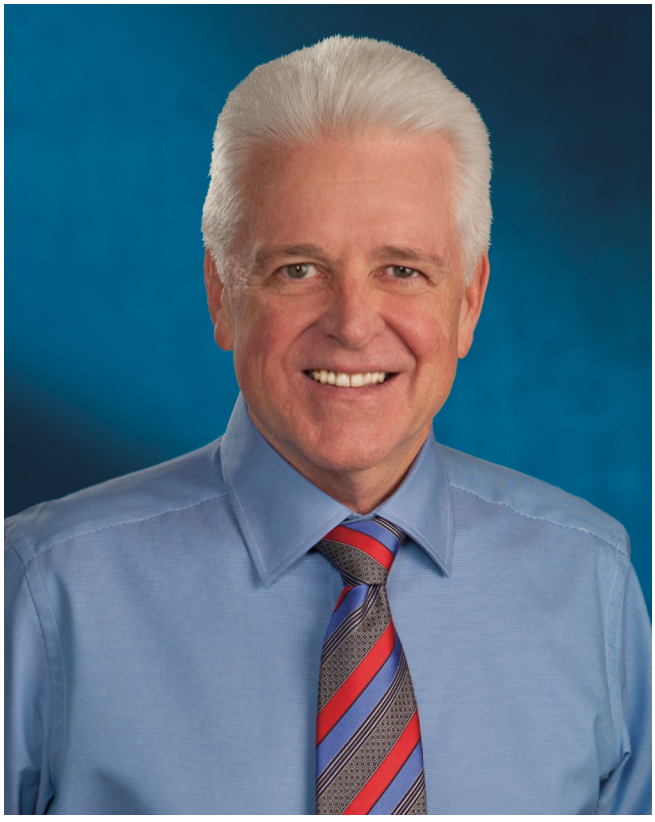
DS: *What are the more important technological advancements that have most served to influence clinical endodontics?*

RUDDLE: Surprisingly, over 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 1985-1995, clinical endodontics was confronted with a series of staggering changes. In this decade, four game-changing technologies emerged that forever altered the future course of clinical endodontics: namely, the dental operating microscope, ultrasonic insert tips to refine instrumentation, NiTi rotary files for shaping canals, and a superb multi-purpose regenerative material, mineral trioxide aggregate (MTA), or ProRoot. Essentially, in just one decade, each one of these technologies led to a new and more predictable kind of endodontics. Recently, we have seen the emergence of new technologies for diagnostics, such as CBCT, and for 3D disinfection, as well as new materials for filling root canal systems.

DS: *The topic of your upcoming lecture is endodontic disinfection. Could you identify the most relevant technologies that are influencing clinical disinfection today?*

RUDDLE: Absolutely! Dentists understand a root canal system must first be 3D cleaned in order to more predictably fill this system and promote long-term success. For example, the EndoActivator System provides a safe, easy, and affordable method designed to clean a root canal system. This technology is comprised of a cordless handpiece and variously sized noncutting, flexible, and unbreakable polymer tips. When these tips are activated within a shaped and reagent-filled canal, sonic energy produces a vigorous hydrodynamic phenomenon. During use, the action of the EndoActivator tip frequently produces a cloud of debris that can be observed within a fluid-filled pulp chamber. Research published in multiple peer-reviewed journals has shown this technology is able to eliminate pulp tissue from the uninstrumentable portions of the root canal space, remove the smear layer, and dislodge biofilms within curved mesial canals of molar teeth.

Further, a really exciting device and method has recently emerged to improve cleaning a root canal system. Specifically, at the Arizona Center for Laser Dentistry, Dr. Enrico DiVito and his team ingeniously developed Photon Induced Photoacoustic Streaming (PIPS). More than 20 peer-reviewed



published papers have shown this laser-activated disinfection method completely cleans both fully shaped and minimally shaped canals prepared to only a size 20/04 file. The uniquely designed and tapered PIPS tip is placed stationary in the pulp chamber only. When activated, PIPS creates non-thermal photoacoustic shockwaves, which travel 3D, even into the anatomically complex apical regions. Scientific evidence confirms PIPS eliminates both planktonic and biofilm contaminates and sterilizes more than 1000 µm deep into the dentinal tubules, without damaging root canal morphology.

DS: *There is an old saying that goes, "If it's not broke, don't fix it." With that in mind, what traditional concepts do you prefer to use during the treatment process?*

RUDDLE: More than 30 years ago, Dr. Herbert Schilder's article entitled, "Cleaning and Shaping the Root Canal," was published. In what has become a classic article, Schilder presents brilliant concepts and defines the 5 mechanical objectives for shaping canals and cleaning root canal systems. When properly performed, these objectives improve the potential for 3-dimensionally cleaning and filling root canal systems, while fulfilling the biological objectives for the retention of critically essential teeth.

Schilder's genius was his strategy of pre-enlargement, in which he used his innovative envelope of motion method with a series of instruments to carve the shape and sequence the preparation. There are strategic advantages to removing restrictive dentin from the coronal two-thirds of the canal before initiating procedures in the deeper and typically more complicated apical region of this same canal. Schilder's shaping objectives remain the standard against which all other preparation techniques are measured. Schilderian endodontics continues to serve as a powerful beacon of light to guide any clinician on the journey toward greater clinical confidence and success.

DS: *Let's briefly go back to the technology question. There seems to be a staggering number of new file systems that have come to the market for shaping canals. Would you explain this phenomenon and explain how a dentist can actually separate the marketing misinformation from clinical reality?*

RUDDLE: It is true that there has been a rather recent and relentless parade of new file systems that have come to the endodontic marketplace. Internationally, there are about 40-50 identifiable file systems currently available for preparing canals. This flood of so-called "new" file systems is causing considerable confusion for many general dentists and endodontic specialists, alike. This confusion may be largely attributable to opportunistic dental companies disseminating unsubstantiated claims through frenzied marketing hype.

Obviously, clinicians should seek out a file system that offers safety, efficiency, and an economy of files at an affordable price. It is important to note that Dentsply Sirona's ProTaper Gold and WaveOne Gold rotary and reciprocating mechanical shaping files, respectively, are the number one sold and most utilized systems in the world for shaping canals. Yet, to have confidence in selecting a shaping file system, dentists can attend professional meetings, participate in hands-on workshops, interact in various web-based educational platforms, watch clinical videos, and read dental journals. What I believe to be the most powerful influence on making choices is for dentists to find an endodontic educator who is highly respected and has successfully trained thousands of international colleagues. There is an old expression, "Model success. Success leaves clues."

DS: *Being told that you need a root canal can be scary. What do you do when a patient is particularly fearful of root canal treatment?*

RUDDLE: Infrequently, but on occasion, patients present in dental offices expressing concerns regarding root canal treatment. Oftentimes, these patients have heard stories, had a bad experience, or been exposed to misinformation they have attained from so-called holistic or biologic dentists, the Internet, or from other unsubstantiated sources. My approach is to try to answer all the questions and reassure these patients. As we communicate with our patients, the key is to focus on speaking about the enormous capacity of modern-day endodontics to deliver predictably successful results in a non-defensive and confident manner. Distinguish between modern-day science, available technologies, and techniques vs. antiquated research, outdated technologies, and less than optimal techniques that have been utilized over the past decades. Keep on your radar that certain patients are genuinely concerned and require a little extra attention and education in order for them to feel comfortable proceeding with endodontic treatment.

DS: *Can all teeth be saved by endodontic treatment?*

RUDDLE: Endodontic treatment can approach 100% success discounting teeth that are nonrestorable, have hopeless periodontal disease, or have radicular fractures. Endodontic failures can be attributable to inadequacies in shaping, cleaning and obturation, iatrogenic events, or re-infection of the root canal system when the coronal seal is lost after completion of root canal treatment. Regardless of the etiology, the sum of all causes is micro leakage and bacterial contamination. It is important to note that lesions of endodontic origin will almost always routinely heal following the extraction of pulpally

involved teeth because the extraction not only removes the tooth, but more importantly serves to eliminate 100% of the contents of the root canal system.

During the last decade, significant procedural refinements have created greater promise for our profession to fulfill the public's increasing expectations for predictable results. Properly performed, endodontic treatment is a strategic cornerstone of restorative and reconstructive dentistry. With proper case selection and understanding of the potential for health associated with endodontically treated teeth, the naturally retained root should be recognized as the ultimate dental implant.

DS: *You are looked at as a well-known force in international endodontics, as well as a source of inspiration for many dentists. From where do you get your inspiration?*

RUDDLE: This is an easy question. My father and mother were fantastic role models who most influenced me and taught me life's great lessons. I was taught that inspiration is found through hard work, focus, and perseverance. These traits or characteristics definitely apply to endodontics. In the world of endodontics, my interest as a dental student was first kindled by Dr. Ron Borer at the University of the Pacific in San Francisco. As a post-grad endo student at Harvard School of Dental Medicine, my mentor, Dr. Alvin Arlen Krakow, really ignited this fire within me and gave me a vision of what endodontics could be when properly performed. Prof. Herbert Schilder created the endodontic inferno that passionately burns inside me to this moment. Certainly, I have learned from John West, Pierre Machtou, Gary Carr, and Steve Buchanan, to name a few. I have learned from many, but this is most important, it's my family, friends, and colleagues who empower me, inspire me, and encourage me to be the best I can be.

DS: *You have been involved in dentistry for over 40 years. How do you stay engaged and what advice do you have for dentists about this?*

RUDDLE: It's true that I've been involved in dentistry for more than 42 years, have travelled a few million miles, and met so many fantastic dentists from around the world. What we have all learned is that we see patients in considerable pain, and through training, can perform a little endodontic procedure that can immediately and definitively alleviate pain. This ongoing opportunity to make a meaningful difference in a patient's life is empowering and inspiring.

I would like to say to all practicing dentists, you are part of a massive machine called oral health. There are about one million international dentists who show up to work every day and produce billions of healthcare dollars every year. As a single dentist in this dental marketplace environment, it is easy to get caught up in this massive machine and feel or become irrelevant. I think it's important for all professionals to do something, yes anything, to stay engaged, make themselves matter, and be relevant. Count something. For example, count MBIIs, mid-mesials in mandibular molars, or filled portals of exit per root canal. Through these observations, write something and share your experiences with others. Further, I believe integrating the most relevant new technologies keeps us engaged, interested, and eager to perform what we do: namely, endodontics. So I would like to challenge my friends with a little quote from the Scottish Himalayan Expedition, "Whatever you can do, or dream you can, begin it. Boldness has genius, power and magic in it."

DS: *You are viewed as a leader in endodontic education. Why has education become one of your primary focuses?*

RUDDLE: 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 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.

DS: *Your educational platforms have always been open to both general practitioners and endodontists, alike. What is your attitude about sharing your knowledge?*

RUDDLE: I would like to share with the reader what my Pop used to say, "You cannot antagonize and influence at the same time." It is essential to teach basics, develop talent, and spark the greatness that virtually every human has locked inside them. Genuine teachers want their students to go beyond them. I believe we can disagree, yet remain humble and kind, even when there is strong opposition. As I get older, it's less important to be right; rather, it is more important to me to make people more successful. So I believe we teach, demonstrate, and inspire our students. We must give students a learning environment that is comfortable, safe, and fun, and also that fosters confidence, growth, and moves them closer toward their full potential.

DS: *How do you see the evolution of endodontics today?*

RUDDLE: Great question and very exciting! The evolution is moving toward reaching the clinical goal for endodontics: namely, complete disinfection. Think about this…the reason we access teeth is to get into the pulp chamber so we can find the orifice(s). The reason we negotiate and secure a glide path is so we can shape canals. The reason we shape canals is so we can three-dimensionally clean and, importantly, fill root canal systems.

So the goal of clinical endodontics is 3D disinfection. Considering the current position of endodontic disinfection, future technological methods will provide massive improvement. There is relentless focus on using mechanical, light, or sound methods to improve fluid dynamics in both the instrumentable and uninstrumentable aspects of the root canal system. Further, improvements are coming with the reagents, themselves. For example, a specific light-activated reagent can release singlet oxygen, which in turn, can implode and kill bacteria.

With regard to shaping canals, we are going to see an evolution toward smaller-sized final shapes. Although I am not an advocate of underprepared canals, I do agree that shapes, in general, can be more conservative in the body of the canal, especially within teeth that exhibit external root concavities. The evolution in shaping files will progress toward improvements in file designs, materials, and heat treatment, regardless of whether the clinician chooses to fully prepare or minimally prepare any given canal. In fact, the files of the future may be stainless steel, metallurgically enhanced NiTi, or not be metal at all.

As we improve cleaning, we can absolutely improve filling root canal systems with innovative, engineered, biological obturation materials. For example, in just the last year, Healthdent Technologies has launched new nano gutta percha master cones (GPMCs) that exhibit an extended heat wave and demonstrate superior sizing and formulation benefits. Further, Healthdent is designing new, revolutionary carrier-based obturators, using scaffold materials to enhance integration at the interface between the material, itself, and dentin. New regenerative materials will encourage bone growth and be more biocompatible, dimensionally stable, and biologically inert. So we will see vast improvement in both materials and the delivery systems for both fully or minimally prepared canals.

The future of endodontics is so bright, you better put your shades on! ▲