



ENDODONTIC STANDARD OF CARE

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As one evaluates the current position of clinical endodontics as a healing art, one is struck by the vast differences in how endodontics is understood and practiced from country to country, region to region, city to city, office to office, and from dentist to dentist within each office. Yet, rationale treatment approaches are available, precise treatment techniques have been perfected, relevant technologies have been identified, and success rates approaching 100% are achievable. Today, the best of what endodontics has to offer is only sporadically embraced by the dental profession.

The reluctance to investigate the newer and proven technologies, instruments, and materials is oftentimes related to the belief the armamentarium currently utilized is adequate. Further, the skepticism to learn the more recently developed techniques is frequently associated with the hope the more traditional methods are just as good. The apprehension to change may be attributable to concerns regarding the time, cost, and potential disruption required to integrate the relevant technologies and materials that promote practice-building techniques. Reluctance, skepticism, and apprehension are creating an increasing gap between training and possibility, and serve to limit the level of care provided to patients.

Another factor that influences the standard of care is the needless extraction of endodontically involved teeth and the promiscuous placement of dental implants. This growing controversy should not be about whether implants are good or bad; rather, does the clinician truly understand, appreciate, and respect the potential of interdisciplinary dentistry to predictably preserve critically essential teeth? Implants represent a potential benefit for patients when endodontic treatment or retreatment is ethically judged to be inappropriate. However, a tooth should not be needlessly condemned because of deficiencies in training and ability, or due to the absence of critically essential technology.

Who should place and teach implants has been a debate for many years and is receiving additional attention as a growing

number of endodontists announce their intentions. Any dentist who has knowledge, training, and experience in this treatment modality may ethically place an implant. However, placing a few implants does not make an expert or teacher; additionally, being a teacher in one discipline does not make an expert in another discipline. The integrity of the teacher is related to knowledge, clinical expertise, valuable experience, ethics, and the humble acceptance that there is always much more to learn. There is an old expression, "Knowledge is the process of passing from the unconscious state of ignorance to the conscious state of ignorance. Ignorance does not know that it does not know. True knowledge does not know and knows it."

COMPETENCY • PROFICIENCY • MASTERY

Dentists receive basic training in the art and science of endodontics in dental school. Graduating from dental school followed by passing a licensing examination certifies a dentist is competent to practice dentistry in a defined geographical region. It should be fully understood and completely appreciated this level of training provides only basic competency for the most routine procedures. The dental profession has recognized this minimal training as evidenced by a growing number of regulatory boards that require dentists to take accredited continuing education (CE) courses to maintain practice certification. Importantly, certified CE courses serve to move training from basic competency to improved proficiency. Specifically, certain hands-on courses and mentorship programs represent the most effective methods to elevate proficiency. Additionally, colleagues can sharpen their proficiencies through study clubs, publications, educational materials, and internet interactions. The jump from proficiency to mastery is an endless journey requiring commitment, discipline, and continuous training. Competency, proficiency, and mastery represent levels of skill which, in combination, serve to influence, improve, and ultimately redefine the standard of care.

STANDARD OF CARE

The standard of care has been defined by the judicial system as a reasonable degree of knowledge, skill or care typically exercised by dentists under similar circumstances. The standard of care is a flexible standard that accommodates individual variations in treatment. A major tenet of the standard of care model is *treatment that serves the patient's best interest and protects their health*. The standard of care is the recognized level of care provided by competent practitioners specifically trained in that area of specialization. Endodontics is recognized by the American Dental Association (ADA) as a dental specialty. The American Association of Endodontists (AAE) is the recognized certification board of this specialty. The AAE has developed and provided the dental profession and the public the endodontic guidelines for the standard of care. The standard of care is a dynamic model that progressively changes, improves, and is being redefined by a number of factors.

FACTORS INFLUENCING THE STANDARD OF CARE

There are specific factors that influence the endodontic standard of care. As more clinicians become aware of the importance of performing a comprehensive full-mouth endodontic examination, then fewer flare-ups will occur following the so-called "routine" dental procedure. Specifically, an ever-increasing number of dentists are performing vital pulp tests prior to initiating any dental procedure. Recent advances in anesthetics and delivery methods have provided a major breakthrough in pain management and are serving to fulfill the expectation of pain-free endodontics. As more dentists achieve profound anesthetic on virtually each patient, then pain-free endodontic treatment will become the new standard of care. Routinely using a rubber dam is the current standard of care in nonsurgical endodontic treatment as this procedure isolates a tooth and improves treatment safety and success.

Other factors that are driving the endodontic standard of care are the technologies, instruments, materials, and techniques that have been shown to improve treatment predictability and success. As an example, the dental operating microscope affords superior vision through magnification and lighting. Research has shown that this technology improves success in conventional, nonsurgical, and surgical endodontic procedures. The AAE has mandated that all endodontic post-graduate residents be trained and competent in the use of a microscope. Currently, many endodontists and a growing number of general dentists routinely use the microscope to perform endodontic procedures. With time, as we have seen in medicine, the operating microscope will define a new and higher standard for endodontic care.

Other technologies, instruments, and materials that serve as state-of-the-art adjuncts to treatment, but do not by themselves establish a new standard of care, include, but are not limited to: apex locators, digital radiography, nickel-titanium (NiTi) rotary and hand files, electric speed and torque control motors, ultrasonic generators and related instruments, obturation devices, regeneration materials, barriers and

restoratives. These technologies, instruments, and materials are driving new practice building techniques. As the most relevant and successful techniques become routinely used by most clinicians under similar circumstances, then the standard of care will change, be redefined, and dentists will be held to a higher standard.

Another factor that influences endodontic outcomes is the access preparation. Although there is no agreement as to the size of the access cavity, it is universally understood that this procedure should provide straightline access to the orifice(s) and maximize remaining tooth structure. The standard of care for shaping canals and cleaning root canal systems is rapidly changing and is being redefined. Iatrogenic events such as blocks, ledges, transportations, and perforations can be largely attributable to working short, the sequence of canal preparation, and the instruments selected and their methods of use. Most of these undesirable events are decreasing with the integration of NiTi rotary files into daily practice. Although NiTi rotary instruments occasionally separate during use, this upset will diminish as improvements are made in file designs, manufacturing, and electric torque control motors, and as dentists become more experienced utilizing this technology.

There is ongoing debate regarding the type, strength, temperature, and frequency of irrigation and its potential to three-dimensionally clean. Lingered controversy continues regarding working length, patency files, the sequence of preparation, and the ideal percentage taper that ensures root canal systems can be three-dimensionally cleaned and obturated. During the past decade, countless international dentists have learned to more advantageously sequence canal preparation procedures and integrate NiTi rotary instruments. A body of evidence-based research and clinical experience have shown that preparing canals with NiTi rotary instruments has significantly decreased the frequency of iatrogenic events and helped clinicians more predictably fulfill the mechanical objectives for canal preparation. Clearly, the standard of care is being changed, will continue to improve, and will ultimately be redefined.

Another factor that has dramatically influenced change in the past ten years is the method of obturation. Although most dental schools still teach lateral condensation, it has been reported more than 60% of all practicing dentists in North America use some form of warm gutta percha to obturate a root canal system. The time will come when the lateral condensation technique, like the silver point technique, will no longer be utilized. Recently, new materials have been advocated to replace gutta percha. Although interesting, the conflicting results reported in peer-reviewed journals send the unmistakable message that more research is ultimately needed.

Technology has contributed to many clinical advances in the field of nonsurgical retreatment. Microscopes, in conjunction with ultrasonics, have driven many "microsonic" techniques which have made nonsurgical retreatment the treatment of choice for the majority of all endodontic failures. These technologically driven procedures have become routine in

most specialty practices. Mineral trioxide aggregate (MTA), commercially known as ProRoot, is, in most instances, now the material of choice for repairing roots nonsurgically and surgically. Remarkably, cementum grows over this nonresorbable and radiopaque material, thus allowing for a normal periodontal attachment apparatus. Research, published studies, and clinical results support these technologies and materials, and have served to increase the expectation that nonsurgical retreatment success is both possible and attainable.

The field of surgical endodontics has also made enormous progress in the past decade. Surgical refinements may also be attributable to advances in technologies, instruments, and materials. There have been excellent procedural improvements in soft tissue management, osteotomies, resections, and crypt control. Importantly, the ultrasonic handpiece and related instruments are to surgical endodontics what the high speed handpiece and rotary cutting burs have been to restorative dentistry. The ability to precisely follow and ultrasonically prepare several millimeters of the most apical extent of a resected canal has significantly improved success rates. Again, in many instances, ProRoot is the endodontic material of choice for surgical repairs compared to the previously used surgical restoratives. In summary, state-of-the-art technologies and materials are driving innovative new techniques that are supported by an abundance of evidence-based research and long-term clinical success.

CONCLUSION

Dentists are encouraged to perform endodontic treatment consistent with the most proven advancements is clinical endodontics. Ethical clinicians who have their patients' best interests at heart will fully communicate the treatment options, chairtime and costs, and the possible outcomes. This process will enable the vast majority of patients to choose the treatment that best fulfills their wishes. Additionally, before initiating treatment, the clinician should consider all the potential risk factors that will influence success, then decide if a patient should be referred to another practitioner or specialist. The message is clear: the standard of care is a model that is dynamically evolving and will ultimately serve to improve patient care. Ethical practices are inspired to move their practices from good to great and are motivated to elevate the standard of care they provide patients. ▲