From time to time, each individual faces decisions that demand emotional as well as intellectual intelligence. Professional dental decisions, however, also demand that clinicians do not compromise the quality of care that is rendered to the patient community, so that these same practitioners can properly protect and lead. Through a triad of decision-making parameters that is comprised of professional determination, objective intellectual study, and emotional intelligence, Dental Medicine has implored both clinicians and researchers to develop and advance technologies that will protect the populace, evolve the study of dental disease states, and improve the treatment modalities that are used on patients. In this era of Digital Dentistry, these technological advances have led to better treatment outcomes, more comfortable patients, and a healthier dental community.

Within Dental Medicine, there have been innovators who have questioned existing beliefs held within the traditionally accepted protocols and methods. This questioning has often led to disruption, while also introducing refreshing new theories and corollaries that improve the clinician’s ability to manage, treat, and better understand conditions that cause patients discomfort. Sometimes the innovators have reconfigured existing methodologies to accommodate new computer-based approaches. In the restorative disciplines, for example, the advent of CAD/CAM has modernized the artful creation of superstructures and crowns, where the well-accepted principles of waxing up teeth, are now being employed by computer technology. In other instances, the innovator may make adaptations to existing materials or create new ones that have only become available through scientific advancement, which make rendered treatments safer and more predictable for patients. An example of this type of innovation is the replication of Bone Morphologic Protein (BMP). Its use with bone grafting has increased the predictability of successfully grafting synthetic bone to human bone and has aided in successful osseointegration of implants that are placed into graft sites.

Yet, the most exciting innovators of the past 20 years have been those that have been involved with hard technologies that allow a clinician to integrate measurable data information into the explanation of a patient’s condition. These technologies enhance the clinician’s observations, improve treatment outcomes, and can monitor long-term stability or changes in a patient’s clinical condition. Dr. Robert Kerstein is an innovator who has extensively studied and helped to evolve an objective technology that utilizes at least three dimensions of measurement to quantitatively assess and qualitatively describe a patient’s existing occlusal scheme. Once the occlusal scheme has been defined with the T-Scan Computerized Occlusal Analysis system (Tekscan, Inc., S. Boston, MA, USA), the patient may be treated using the measured data, which when properly implemented, greatly improves occlusal adjustment and restorative outcomes and minimizes wear, tooth structural damage, and reduces pain within the Stomatognathic system. Similar to other biometric technologies, the clinician may utilize the T-Scan technology at any given
point in time to educate the patient about the state of their existing occlusal scheme or to identify the existence of either occlusal health or untoward degenerative changes, where future restorative decisions made depend upon the status of the existing occlusal scheme. In this way, occlusal measurement with the T-Scan system can both predict ongoing and future risk, diagnostically, as well as ensure treatment outcomes are predictable and optimal, when it is employed as a treatment performance adjunct.

Within the last 100 years, the question of how a human being functions has led to the development of the focused Dental Medicine discipline known as “Occlusion.” Occlusion is the study of the way the teeth, the Temporomandibular Joints, and the mandible and maxilla, all interrelate. This book represents the initial attempt to report on the last 30 years of struggle against a compromised set of beliefs and values that pervade Dental Medicine worldwide. These beliefs have resulted from the (incorrect) idea that visual inspection of intercuspating and excursing teeth, and the appearance of articulating paper markings or wax imprints can reliably describe masticatory function without there being any true measurement of the occlusion used as a basis for these beliefs. These traditional concepts have been applied quite unsuccessfully; when clinicians and researchers attempt to answer questions regarding occlusal contact quality and force quantity, the T-Scan technology readily answers in a recorded format, which allows the clinician to display, analyze, and make targeted accurate treatment decisions about clearly defined and problematic occlusal contact forces.

For most of the study of occlusion, the only tool available to measure or prove occlusal theories was articulating paper ink markings of occlusal contacts. Thirty years ago, the T-Scan I system was introduced, which provided a measured method of identifying what each articulating occlusal contact ink mark meant in terms of force content, time order, and time duration. This innovation gave Dental Medicine not simply an intellectual method of understanding occlusion but also a sophisticated digital method that aided the clinician when rendering occlusal treatment to patients.

During this modern-day technology era in Dental Medicine, the science of Occlusion is undergoing an awakening that is being led by the collaborators who created this book. It is this author’s opinion that this awakening is actually a revolution. As in other revolutions that change thought processes, whether in science or in governmental policies, there are leaders. In this occlusal revolution, it is this author’s contention that the leader must be identified as Dr. Robert Kerstein. I am pleased to point out that Dr. Kerstein has consistently, since 1989, published many peer-reviewed research studies using T-Scan data, which have answered a number of previously unanswered occlusal science questions. Moreover, he has influenced multi-disciplinary groups that are represented here by the many authors from all over the world, whom advocate within their own sphere of influence the need for widespread T-Scan implementation. These authors are all experts in their own disciplines who have recognized that measured occlusion is a major diagnostic and treatment advance, which benefits both patients and clinicians in many, many ways.

This first Computerized Occlusal Analysis text is historic and compliments Dental Medicine’s need as a profession to place measurement of the occlusion into our general dental concepts. My hope is that within the coming decade, the T-Scan will become a fundamental technology used routinely in general dentistry worldwide.

To the reader of this book, please enjoy its detailed content and note and submit your questions, concerns, and ideas for future editions to continue to drive forward the study of this important occlusal measurement innovation, known as the T-Scan.

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Paul Mitsch received his DMD degree in 1977 from Washington University, St. Louis, Missouri. He purchased Augusta Family Dentistry in Augusta, Kansas, in 1979. In 2005, Dr. Mitsch created Dental Impact, a publication written by area dentists and distributed through Butler and Sedgwick counties. In 2008, Dr. Mitsch founded American Family Dentistry Training Center. AFD Training Center was established to aid in the training of those in the dental industry. It has been his mission to offer classes and seminars from skilled professionals in the dental field for those who wish to refine their skills and bring a higher level of care to their practices. Dr. Mitsch has lectured on the implementation of state-of-the-art technology in dentistry throughout the nation. He holds fellowships with the Academy of General Dentistry, the Academy of Dentistry International, and the International Congress of Oral Implantologists with a distinguished fellowship from the American Academy of Craniofacial Pain. Dr. Mitsch has also completed his Mastership from BioResearch, Inc.