

## Computer-guided implantology and the era of collaborative accountability—Part 1

*Drs. Mandelaris and Rosenfeld are in private practice in Park Ridge and Oakbrook Terrace, Illinois. They have been using computed tomography (CT) scan technology in their practices for nearly 20 years and serve as consultants for Materialise Dental. Their articles on CT scan technology, the concept of collaborative accountability, and the use of computer-generated stereolithographic surgical drilling guides have been published in the International Journal of Periodontics and Restorative Dentistry. They are both Diplomates of the American Board of Periodontology and can be reached at:*



**Dr. George A. Mandelaris**  
1 South 224 Summit Avenue  
Oakbrook Terrace Medical Center  
Suite 205  
Oakbrook Terrace, IL 60181  
630/627-3930  
630/627-2148 (f)  
E-mail: [GMandelari@aol.com](mailto:GMandelari@aol.com)



**Dr. Alan L. Rosenfeld**  
Advocate Lutheran General Hospital  
Suite 250, Parkside Center  
1875 Dempster Street  
Park Ridge, IL 60068  
847/698-1180  
847/698-1185 (f)  
E-mail: [Implandds@aol.com](mailto:Implandds@aol.com)

What is the most consistent transgenerational principle uniting us professionally? It is the need to establish an accurate diagnosis and evidence-based treatment plan that will ultimately improve the quality of care we provide to our patients. Have advances in technology usurped the traditional decision-making process, creating an illusion of oversimplification? Implementing technology has helped move us forward, but it will not alter the above-mentioned principle. Is periodontology at a crossroads?

The introduction of computed tomography (CT) technology is not new to our profession, but its trendiness is. Our practice has been involved in CT technology, its development, and its implementation since 1987. CT scans and computer-guided implantology are not about placing implants without flaps, providing a prosthesis in a nanosecond, or creating an over-simplified mindset which disrupts the relationship between sound clinical judgment and the fundamental principles of wound healing. We believe we have a professional responsibility to honor and implement proven CT technology as an informational resource to better care for our patients.

In reality, computer-guided implantology is about one thing: information management. Two- and three-dimensional CT images have given us the ability to more accurately and objectively diagnose our patients' problems. More information improves the quality of care by helping us make more informed decisions. Perhaps the most under-appreciated value of a CT study is the opportunity it offers us to consult with our patients and referral colleagues in an atmosphere of complete disclosure. This allows for more effective human interaction where the objective clinical information drives the treatment planning process and establishes a level of accountability.

In our opinion, the concept of collaborative accountability represents the very highest level of interdisciplinary treatment. Using objective three-dimensional data during the treatment planning process, interdisciplinary team members (surgeon, restorative dentist,

laboratory technician, and patient) can be held accountable to a pretreatment prosthetically directed plan which focuses on patient treatment goals. Collaborative accountability has the potential to distinguish periodontists as "the specialists" to facilitate interdisciplinary treatment. We can provide sound leadership as we empower and advance our restorative colleagues unlike any other time in interdisciplinary dentistry.

Most often, traditional radiographs are analog in nature and exhibit wide variations in accuracy. They fail to determine prosthetic outcomes and do not allow for the transfer of prosthetically relevant information to guide the surgeon at the time of implant

*We believe we have a professional responsibility to honor and implement proven CT technology as an informational resource to better care for our patients.*

placement. While not all implant cases require CT scans for successful outcomes, more complex therapy benefits from cross-sectional and three-dimensional imaging information on multiple levels. It is our opinion that CT scans provide the most accurate assessment of patient anatomy. The advent of sophisticated scanning appliances, rapid prototyping via stereolithographic resin medical modeling, and the construction of computer-generated surgical drilling guides which accurately reflect the prosthetic outcome to sub-millimeter accuracy have given our profession tremendous opportunities.

However, with greater opportunity comes greater responsibility. The growing popularity of in-office cone beam CT technology, as well as stand-alone imaging centers, is revolutionizing radiographic imaging for all

of dentistry. Unfortunately, there appear to be no educational standards, programs, or resources to teach dentists how to interpret these unfamiliar images. In fact, images that appear on CT radiographs include anatomic structures that go beyond our daily familiarity. The interpretation of CT data may have to be supported by medical radiologists to satisfy a level of medico-legal responsibility which is in the best interests of our patients. These are real-life situations with potentially life-threatening consequences. Our practice has personally experienced incidental findings that might have gone undiagnosed if we had not received co-interpretive input.

Collaborative accountability has the potential to move our profession forward in an unprecedented collegial way. The incorporation of CT technology in private practice should not be clouded by an atmosphere where complex therapy is oversimplified by fashionable technology. In such an atmosphere, we run the risk of having the technology impair judgment and place the care of our patients at risk. In Part II we will look at CT technology as part of the culture in private periodontal practice. Its influence on managing complicated patient care and high patient expectations will also be addressed.

Part 2 of this article can be found in the Members section of the AAP Web site, located at [www.perio.org](http://www.perio.org) under "Practice Management Resources."

*References to products and services in this column do not represent an endorsement by the AAP. The AAP makes no representations about the suitability of these products and services for any purpose. Statements and opinions expressed in this column are to be used as a guide only, and do not reflect the views or policy of the Academy. Members are invited to submit materials on selected practice management topics for this column. Contact Clinical Affairs Manager Pamela Throw for more information (telephone 800/282-4867 ext. 3241 or 312/573-3241, fax 312/573-3234, e-mail [Pamela@perio.org](mailto:Pamela@perio.org)).*