

Chapter 4

T-Scan 10 Recording Dynamics, System Features, and Clinician User Skills Required for T-Scan Chairside Mastery

Robert Anselmi

McGill University, Canada

Robert B. Kerstein, DMD

*Tufts University School of Dental Medicine, USA & Private Dental Practice Limited to
Prosthodontics, USA*

ABSTRACT

The newly designed T-Scan 10 Computerized Occlusal Analysis system represents the state of the art in occlusal diagnosis. The reliability of the system's high definition recording sensors, the many occlusal analysis timing and force software features, and the modern-day computer hardware electronics that record occlusal function in 0.003 second real-time increments, affords a clinician unparalleled occlusal contact timing and force information, with which to predictably diagnose and treat many occlusal abnormalities. T-Scan 10 represents the culmination of 34 years of T-Scan technology innovation development. T-Scan 10 has revised desktop graphics with additional toolbar buttons that enhance T-Scan functionality and improve chairside T-Scan clinical implementation. The system's most recent important advancement, discussed in this chapter, is the melding of T-Scan digital occlusal force and timing data with digitally-scanned dental arches to overlay T-Scan data on a patient's virtual arch. This is a major system upgrade that inserts the T-Scan technology directly into the digital dentistry revolution presently arising in dental medicine. The chapter details the five useful diagnostic occlusal recordings employed when treating commonly observed occlusal problems, and lastly outlines the three learning levels of T-Scan mastery that must be accomplished for a clinician to become an effective and competent T-Scan user.

DOI: 10.4018/978-1-5225-9254-9.ch004

INTRODUCTION

Present day computerized occlusal analysis represents the State of the Art in occlusal diagnosis. T-Scan 10 (Tekscan, Inc., S. Boston, MA, USA) represents the culmination of thirty-four years of T-Scan technology innovation into the science of Dental Occlusion. T-Scan 10 has revised desktop graphics for simpler display, with less toolbar buttons and icons to minimize clinician complexity, which had made previous T-Scan versions somewhat difficult to readily learn and effectively implement clinically. The combination of the reliability of the High Definition (HD) T-Scan recording sensors, the occlusal timing and relative force analysis software features, and the modern-day computer hardware electronics, affords the clinician unparalleled occlusal force and timing information, with which to diagnose and treat a wide range of commonly observed occlusal problems. The T-Scan technology's studied abilities to measure time durations (Kerstein & Wright 1991; Hirano, Okuma, & Hayakawa, 2002), illustrate ordered tooth contact time-sequences (Kerstein, Chapman, & Klein, 1997; Koos, Holler, Schille, & Godt, 2012), reproduce relative occlusal force (Kerstein, Lowe, Harty, & Radke, 2006; Koos, Godt, Schille, & Göz, 2010), and locate excessively forceful occlusal contacts (Maness, 1988; Maness, 1991), is a vastly superior diagnostic method compared to the commonly utilized, non-digital occlusal indicators which dentists routinely employ to determine occlusal contact force levels (articulating paper markings, wax imprints, silicone imprints, and articulated stone dental casts (Kerstein, 2010). None of these dental materials have demonstrated any scientifically proven capability to record tooth contact time-sequences, or describe relative differences in contact occlusal force levels. Moreover, all of these non-digital occlusal indicators require the clinician to "Subjectively Interpret" their meaning and their supposed occlusal function representations (Kerstein & Radke, 2013).

T-Scan 10 has a similar user presentation as T-Scan 8, designed to shorten the learning curve for the clinician while standardizing the display and eliminating any significant clinician preferential software set up options present in prior T-Scan versions. Important desktop changes maintained from T-Scan 8 include the enlarged Force vs. Time Graph for easier visualization of all the color-coded force and timing lines, and a rotating 3-Dimensional ForceView window that improves the visualization of the moving individual force columns observed during movie playback. The rotating 3-D ForceView allows the clinician to orient the window in any view that during playback, to best eliminate the overlap of the rising and falling force columns (Figure 1a). With T-Scan 10, the main desktop Toolbar displays additional icons that activate important new software features that were recently added into the newest version of the program. Doctors can import and export patient data, generate reports, attach notes and photos, and create MP4 files of the scan, while also being able to import intraoral digitally- impressed .stl files of a patient's arch, which can then be overlaid with T-Scan force data (Figure 1b). Additional new tools include the Force Eraser that allows the clinician to remove from a scan sensor surface recording artifact, and the Implant Warning that detects occlusal force overload specifically present on dental implants, which informs the clinician as to the problem forces. These robust features give clinicians the ability to efficiently diagnose and treat patients occlusally, using objective and comprehensive force and timing data. T-Scan 10 with the Novus Handpiece hardware provides the clinician the ability to manage and view patient information seamlessly by evaluating occlusal forces across both arches, identify Force Outliers and problem occlusal contacts, and view the right-left arch half to assess occlusal balance and force distribution over time.

92 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/t-scan-10-recording-dynamics-system-features-and-clinician-user-skills-required-for-t-scan-chairside-mastery/233651

Related Content

Dental Tissue Engineering Research and Translational Approaches towards Clinical Application

Athina Bakopoulou, Gabriele Leyhausen, Werner Geurtsen and Petros Koidis (2017). *Oral Healthcare and Technologies: Breakthroughs in Research and Practice* (pp. 186-220).

www.irma-international.org/chapter/dental-tissue-engineering-research-and-translational-approaches-towards-clinical-application/178984

Complex Medical Diagnoses With an Underlying Dental Etiology: Case Reviews

Ben A. Sutter, DMD (2020). *Handbook of Research on Clinical Applications of Computerized Occlusal Analysis in Dental Medicine* (pp. 1243-1315).

www.irma-international.org/chapter/complex-medical-diagnoses-with-an-underlying-dental-etiology/233669

Study Plans and Programs Supporting Geriatric Dentistry Teaching in Cuba: An Update

Dachel Martínez Asanza, Isis Anastasia Rojas Herrera, Anuli U. Njoku, Ana Clara Reyes Puig, Farida Mouloudj, Indira Gómez Capote and Gerardo Maupome (2024). *Geriatric Dentistry in the Age of Digital Technology* (pp. 174-191).

www.irma-international.org/chapter/study-plans-and-programs-supporting-geriatric-dentistry-teaching-in-cuba/335315

Tooth Wear: Prevention, Treatment, and Monitoring Using the T-Scan/BioEMG Synchronization Module

Teresa Sierpiska, MD PhD (2020). *Handbook of Research on Clinical Applications of Computerized Occlusal Analysis in Dental Medicine* (pp. 879-943).

www.irma-international.org/chapter/tooth-wear/233661

Digital Occlusal Force Distribution Patterns (DOFDPs): Theory and Clinical Consequences

Robert C. Supple, DMD (2017). *Oral Healthcare and Technologies: Breakthroughs in Research and Practice* (pp. 1-74).

www.irma-international.org/chapter/digital-occlusal-force-distribution-patterns-dofdps/178981