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How will new technology and techniques impact the future dentistry?"

BIOTECHNOLOGY WAYS TO ASSESS YOUR RESTORATIVE TREATMENT

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"The time is nearing, when dentist will acquire methods of restoring the function of chewing as accurately as opticians correct the old age defects of the eyes."
- Harvey Stallard, DDS

Biomedical technologic advances have been developed for the clinical dentist to see muscle responses come alive as they relate to mandibular positioning and occlusion. With these specifically designed measuring tools the dentist can visualize physiologic responses and better assess and monitor his/ her patient in a manner that is objective and measurable. It is now possible to see whether treatment is effective or not effective, when a bite relationship is optimal or not. Muscles have now come alive through electromyography and computerized mandibular scanning!

Computerized Mandibular Scanning (CMS) - measures jaw movements and locates mandibular position accurately in space giving the clinician new insights into the stomatognathic system that have been unseen by traditional occlusal approaches.

Surface Electromyography (sEMG)- measures the status of muscle giving new understanding to the importance of mandibular positioning and the health of the masticatory muscles.

Electrosonography (SONO) – measures high and low frequency joints sounds.

Ultra Low Frequency Transcutaneous Electroneural Stimulation Myomonitor (TENS) – physiologically relaxes the masticatory muscles via neural stimulation of the trigeminal (V) and facial (VII) cranial nerves synchronously and bilaterally.

Many of the leading aesthetic clinicians are now using this technology to not only document, but more importantly to "treat" their patients more effectively. The three main modalities that I have found to be clinically useful for patient treatment are:

1) **Physiologic Bite Recording** – Computerized Mandibular Scanning is a combined screen displaying to monitor both the quality of the physiologic vertical position with sagittal and frontal views of mandibular movement. A 6 oz. light weight sensor array is used to track mandibular movements in 3 dimensions.

Simultaneous mandibular positioning with EMG muscle activity monitored during bite registration assists in identifing a more optimal mandibular posture when recording a bite registration (Myotronics K7 Kineseograph, Scan 4/5, Tukwila, WA).

2) **Fine Tuning the Bite on Trajectory** – The specially designed electromyographic test records the status of mandibular torque as well as identifies first tooth contact during involuntary closure. The first tooth contact test is used to refine the patient's occlusion after TENS to a physiologically correct antero-posterior and vertical position. This recording is unique in that it helps the clinician refine the bite beyond observable articulating paper marks, taking occlusal refinement to a higher level. Fine premature first tooth contacts and inclines are identified via the high low EMG chart to eliminate mandibular torquing and forces which contribute to patient's complaints of mysterious tooth sensitivity and aches. This technology takes bite adjustments outside the realm of "tap on blue paper and grind" occlusal adjustments into the realm of physiologic on trajectory occlusal refinement.

3) **Chewing Cycle Diagnostics** – The quality of chewing patterns of the patient can now be monitored by both the doctor and clinical staff to assess precision of terminal centric occlusion, muscle balance and jaw positioning during habitual and physiologic functions. A dynamic mandibular tracking of jaw movements used in both the sagittal and frontal planes are simple to record with the CMS to better evaluate the precision of your dentistry.

The future of how to better assess our fixed and removable dentistry as well as assure patient happiness is certainly taking dentistry into era of physiologic science and objectivity for the clinical oriented dental practice. Bioinstrumentation is become the standard in diagnosis and treatment technologies for the restorative minded clinicians.

Brief Biography:

Clayton A. Chan, D.D.S. is a general dentist who practices neuromuscular dentistry in San Diego, California and Las Vegas, Nevada. He is the Director of the Neuromuscular Dental Center at the Las Vegas Institute for Advanced Dental Studies and lectures extensively in the United States and abroad. He has focused his care in the areas of complex occlusal, restorative problems, and orthodontics. He is a trained gnathologist. He is a Fellow of the International College of Craniomandibular Orthopedics and holds Diplomat status in many professional dental organizations.