**University of the Pacific Arthur A. Dugoni School of Dentistry**
**124th Annual Alumni Meeting – 2023 Alumni Weekend**
**37th Frederick T. West Orthodontics Lectureship**
**The Fairmont Hotel, San Francisco**

**Cherilyn Sheets, DDS**
Friday, February 24, 2023
9:00 am – 12:00 pm – 3 CE units

**Subject Area:** Quantitative Percussion Diagnostics

**Title:** "**Assessing Structural Integrity of Teeth & Implants Using AI and QPD"**

**Course Description:**
One of the more challenging diagnostic efforts in dentistry is the assessment of the structural integrity of teeth and dental implants.  Cracked teeth, deteriorating/fracturing restorations, loss of cement seal or loss of osseointegration are often hard to diagnose until the results are advanced or catastrophic.

Quantitative Percussion Diagnostics (QPD) has been shown in over 24 peer reviewed studies in engineering and dental journals to be an accurate and reliable test for determining the structural wellness of teeth or implants.  QPD is a mechanical test similar to evaluation methods used in engineering for assessing structural stability of objects, in contrast to visually based dental diagnostics such as radiographs and visual examination.  The mechanism that creates QPD data has been illustrated by Finite Element Analysis of novel models of uncracked and cracked teeth, as well as by fatigue cracking of replica teeth at UCI.

QPD, FEA modeling plus the addition of AI and Machine Learning are currently in development to create a future for dentistry of predictive diagnostics, where structural problems can be diagnosed early and rated as to type or severity.  Preventive or therapeutic steps can then be instituted earlier in the damage cycle prior to the occurrence of advanced or catastrophic results, providing dentists with a new diagnostic aid.

**Objectives:**
1) Understand how percussion can be a diagnostic risk assessment aid.
2) Know the scientific foundation of QPD
3) Envision the power of AI/ML combined with increasing amounts of QPD data
4) Determine the synergistic clinical possibilities of QPD/FEA/AI
5) Describe the steps necessary to move from concept discovery to research unit to useful clinical medical device.
6) Learn how the hygiene team is integral to monitoring the structural wellness of teeth and implants.

**Short Bio:**
Dr. Cherilyn Sheets maintains a full-time private practice in Newport Beach, California for esthetic rehabilitative dentistry. She is an international educator, clinician, author and researcher and received numerous awards including the 2002 Gordon Christensen Award for Excellence in Lecturing, the 2004 USC School of Dentistry Alumnus of the Year Award, the 2006 Section Honor Award from the California Section of the Pierre Fauchard International Honor Dental Academy, the 2012 Lucy Hobbs Taylor Award for Lifetime Achievement, the 2012 Honorary Membership in the American College of Prosthodontists and the 2012 Master of Innovative Research Award from the Academy of Microscope Enhanced Dentistry. Dr. Sheets is a Fellow of the Academy of General Dentistry, the American College of Dentists, the International College of Dentists, Pierre Fauchard Academy and the Academy of Dentistry International.

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