

**\*\*\*Handout\*\*\***  
**Faqs About CO2 Laser-Solea**  
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**Solea CO2 Dental Laser by Convergent Dental**

***Facts***

- ✓ First and only FDA approved CO2 laser for **hard and soft tissues**.
- ✓ Solea emits a 9.3  $\mu\text{m}$  wavelength, which nears the peak absorption of hydroxyapatite. Vaporizes enamel.
- ✓ Spot size diameter from .25mm to 1.25mm. Very precise.
- ✓ Variable speed foot pedal. The harder you press, the faster it cuts.



***Features***

- ✓ Quiet.
- ✓ No anesthetic required in most instances.\*
- ✓ Laser induces a **transient tooth analgesia**.
- ✓ Multiple quadrants can be treated in same appointment.
- ✓ Increased practice efficiency.
- ✓ No residual numbness or injection soreness.

**\*99.2% of 833 cavities and 132 soft tissue procedures treated successfully without local anesthesia in early use per early Convergent study.**

### ***Efficiency and Heat Production***

- ✓ The 9.3 $\mu$ m CO<sub>2</sub> laser has been shown to provide optimal enamel absorption with the least amount of reflection and transmission of the laser beam.
- ✓ NO adverse effects from heat have been noted in clinical and laboratory studies; heat effects are limited to 16 $\mu$ m in depth when used with water.
- ✓ Radiating enamel cracks were found to be greater with a dental handpiece than from the CO<sub>2</sub> laser.

### **References**

-Wigdor HA, Walsh JT. Histologic analysis of the effect on dental pulp of a 9.6 $\mu$ m CO<sub>2</sub> laser. *Lasers Surg Med* 2002; 30(4):261-266.

-Assa S. et al. Ablation of dental hard tissues with a microsecond pulsed CO<sub>2</sub> laser operating at 9.3 $\mu$ m with an integrated scanner. In: Reichman P, Editor, *Lasers in Dentistry XIV*. 2008; San Jose, CA.



### ***What About Tooth Analgesia and Desensitization?***

- ✓ The 9.3 $\mu$ m CO<sub>2</sub> laser has been shown to induce tooth analgesia lasting 10-15 minutes.
- ✓ The mechanism of action involves a transient depolarization of the nerve fibers (through interruption of the sodium/potassium pump/"Gate Theory").
- ✓ Laser stimulation induces synthesis of endorphins which can reduce nerve pain.
- ✓ Pashley theorizes that coagulation of plasma proteins in the dentinal tubules could result in tubular occlusion & dentin desensitization (coagulation "plugs" similar to the action of GLUMA but from heat).

### **References**

-Navratil L, Dylevsky I. Mechanisms of the analgesic effect of therapeutic lasers in vivo. *Laser Therapy*. 1997; 9:33-40.

-Asnaashari M, Moeini M. Effectiveness of Lasers in the Treatment of Dentin Hypersensitivity. *J Lasers Med Sci*. 2013; 4(1):1-7

### **Disclaimer**

Dr. Heymann has no financial interest or COI in regards to the Solea Dental Laser.