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U.S. Edition • Vol. 1 • Issue 3/2011

# laser

## the international C.E. magazine of laser dentistry

3 2011


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From everyday dentistry to advanced photoacoustic endodontic applications

**_trends**
Diode lasers for periodontal treatment: The story continues

**_case report**
Technology-enhanced caries detection and treatment options

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Academy of General Dentistry PACE Program Approval for Continuing Education

# Expand your horizons with *laser*

**Torsten Oemus**, Publisher
Dental Tribune International

The amount of new information available in the dental field about new products, techniques and research data is astounding. Running a practice and seeing patients leaves little time for catching up on the latest clinical news and product information. Thus, we hope *laser* will not only be a welcome respite for those rare chunks of time you can devote to leisurely reading, but one that provides a practical return on your investment by providing information that you can actually put to immediate use.

For this issue of the U.S. edition of *laser*, we've assembled a collection of articles from some of the most respected names in laser dentistry. These expert clinicians are sharing their knowledge and expertise with you.

Within this issue you can read a report from Dr. Fay Goldstep and Dr. George Freedman on using diode lasers for periodontal treatment; an article by Dr. Michele Baffi Diniz, Dr. Jonas Almeida Rodrigues and Dr. Adrian Lussi on technology-enhanced caries detection and treatment options; a case report by Dr. Gabriele Schindler-Hultzsch on a laser-assisted frenectomy in pediatric dentistry; an article by Dr. Giuseppe Iaria, Dr. Rolando Crippa, Dr. Giovanni Olivi, Dr. Matteo Iaria and Dr. Stefano Benedicenti on the use of the Er,Cr:YSGG and Er:YAG lasers in restorative dentistry; and a case report by Dr. Georg Bach on a diode-laser-assisted combination therapy of a lip haemangioma.

But there's more. Every issue of *laser* magazine also contains a C.E. component. So, by reading the article on periodontal surgery by Dr. Elena Speranza Moll, and the article on the use of dual wavelength lasers by Dr. Lawrence Kotlow, Dr. Enrico DiVito and Dr. Giovanni Olivi, and then taking a short online quiz about these articles at *www.DTStudyClub.com*, you will gain one ADA CERP-certified C.E. credit.

Keep in mind that because *laser* is a quarterly magazine, you can actually chisel four C.E. credits per year out of your already busy life without the lost revenue and time away from your practice.

To learn more about how you can take advantage of this C.E. opportunity, visit *www.DTStudyClub.com.* Annual subscribers to the magazine ($50) need only register at the Dental Tribune Study Club website to access these C.E. materials free of charge. Non-subscribers may take the C.E. quiz after registering on the DT Study Club website and paying a nominal fee.

I know that taking time away from your practice to pursue C.E. credits is costly in terms of lost revenue and time, and that is another reason *laser* is such a valuable publication.

I hope you enjoy this issue of *laser* and that you get the most out of it.

Sincerely,

Torsten Oemus
Publisher

Technology 4 Medicine

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## C.E. articles



## trends



## case reports



## user report



## clinical technique



## events

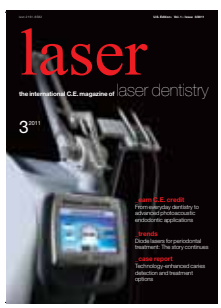


## industry



## about the publisher






## on the cover

*Cover image provided by Technology4Medicine*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# The Dual Wavelength waterlase iPlus™

## Advancing Laser Technology to Its Ultimate

### EASY TO USE GRAPHICAL USER INTERFACE

*For example, performing a Class I Cavity Prep the iPlus™ is as easy as 1,2,3...*

**Step 1** Select "Restorative" from the first screen

**Step 2** Choose "Class I" from the next screen that appears automatically

**Step 3** Specify any other concerns such as patient sensitivity or bond strength

*That's it! Step on the foot pedal, and start working with no shot, no drill!*

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- Adds dual wavelength versatility and convenience
- First totally wireless dental laser
- 5 Watts peak power with ComfortPulse™
- Battery operated with finger switch activation
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- Single use for NO cross contamination


powered

### BREAKS THE DENTAL SPEED BARRIER

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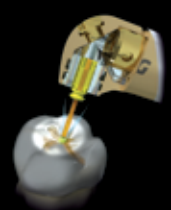
- Up to 100 pulses/sec. for superior soft-tissue cutting
- Enables multi-quadrant same-day procedures

*Roger P. Levin, DDS*
*Founder and CEO of Levin Group, Inc.*



### ENABLES PAINLESS BIOLOGICAL DENTISTRY

- Painless – no shot necessary
- No micro-fractures or thermal damage
- No cross contamination as with bur
- More precise, minimally invasive

### PROVIDES GREAT RETURN ON INVESTMENT

- "A fantastic tool to increase production!" – Roger Levin
- Increases treatment acceptance of day-to-day restorative cases
- Attracts new patients
- Increases productivity and enables new procedures

# Er,Cr:YSGG laser-assisted GTR in periodontal surgery

**Author**_ Elena Speranza Moll, DDS

**_c.e. credit part 1**

This article qualifies for C.E. credit. To take the C.E. quiz, log on to *www.dtstudyclub.com*.


## _Abstract

*Objectives:* This case report describes the application of an Er,C:YSGG laser in regenerative periodontal surgical therapy.

*Materials and methods:* A patient with extensive periodontal tissue breakdown is treated with an Er,Cr:YSGG laser for granulation tissue removal, bone decorticalization and root decontamination. In the regenerative procedure, demineralized bovine bone mineral and collagen membranes were used.

The following clinical parameters were recorded at baseline, three months, six months, one year, two years and five years: plaque index (PI), bleeding on probing (BOP), periodontal pocket probing depth (PPD), recession (REC), clinical attachment level (CAL).

*Results:* The operated sites demonstrated uneventful healing. Radiographically, remineralization was observed at six months. At a one year follow-up, significant probing pocket depth reductions and clinical attachment level gains were registered.

*Conclusion:* In this report, it may be acknowledged that the Er,Cr:YSGG laser could be applied for debridement and decontamination of both the root and the bone defect in guided tissue-regeneration procedures. Further investigation is needed to identify in which treatment protocol in periodontology the Er,Cr:YSGG laser can be integrated and with which benefits.


(Photos/Provided by Dr. Elena Speranza Moll)


Fig. 1


Fig. 2


Fig. 3


Fig. 4

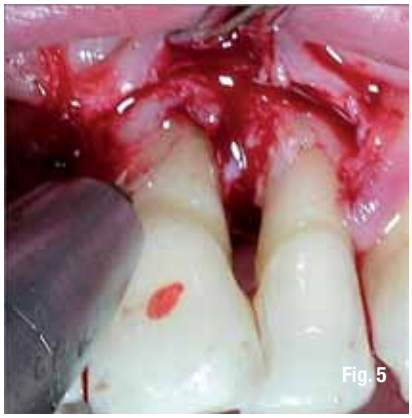


Fig. 5


Fig. 6


Fig. 7


Fig. 8


Fig. 9

## _Background

The application of laser in periodontology is widely discussed, especially as several laser systems with their specific wavelength have a different impact on periodontal tissues. Excellent knowledge of laser applications is essential, which requires the operator to endure a learning curve to avoid adverse effects.

During laser irradiation, the power settings play a significant role and must be regulated appropriately in order to avoid detrimental effects to the irradiated tissues (Ishikawa I. 2002).

Periodontal tissue destruction is treated according to the type of defect and the location, posterior or anterior, in the mouth.

Regenerative therapy is indicated in case of intraosseous defects of which the radiographic angle and number of walls determine which kind of procedure needs to be applied and which kind of materials need to be used. The difficulty of guided tissue regeneration and other treatments of the periodontium lies in the fact that we are dealing with roots, which have an avascular surface in which both the multiple specialized cell types and the microbial environment are involved in all healing processes of the periodontal ligament.

## _Materials and methods

The Er,Cr:YSGG laser (Biolase, Inc.; San Clemente, Calif.) with a 2,780 nm wavelength, in the far-infrared spectrum, is a class 4 laser, with a pulse repetition rate of 10 Hz to 50 Hz and power output from 0.25 to 8 watt, and pulse energy of 300 mJ. The flexible optical trunk fiber is connected to a straight or angled handpiece.

The laser beam is accompanied by a water and air spray. The water/air spray represents a hydrating and cooling agent reducing thermal effects. Both air and water settings can be modified from 0–100 percent. Radiation of the Er,Cr:YSGG laser is absorbed mainly by water and calcium hydroxyapatite.

With a pulse duration of 90 or 150 µsec, the Er,Cr:YSGG laser has a high ablation efficiency and low thermal impact on the surrounding tissues (Straßl, 2004) "Comparison of the emission characteristics of three erbium laser systems – a physicals case report." (JOLA 2004).

A 44-year-old female patient with incidental, severe adult periodontitis (Vd Velden U., 2005). Medical conditions and lifestyle: The patient was a non-smoker and she suffered from severe II grade obesity (BMI 35–39.9) and stress. Family history was positive for periodontitis.