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*Special Supplement to Dentaltown Magazine*

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# The LANAP Protocol: Laser-assisted New Attachment Procedure

by Robert H. Gregg II, DDS

## LANAP Protocol: What is it?

Although approximately 80 percent of Americans suffer from some form of gum disease, about 97 percent of those with moderate to severe periodontitis are not being treated.<sup>1</sup> These disturbing statistics need to be addressed. *The LANAP protocol is a patient-friendly, laser periodontitis surgery with consistent, reproducible and positive results.* Acceptance of the LANAP technique introduces a treatment option that more patients are willing to accept.

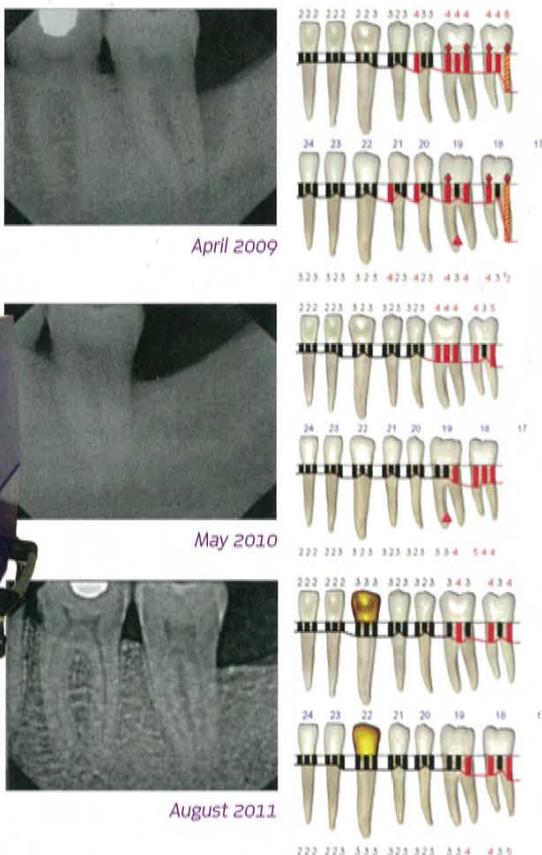
During the 1990s, Dr. Delwin McCarthy and I began doing research on the use of a laser for the treatment of periodontal disease. In 1998, we published our findings on periodontal bone regeneration.<sup>2,3</sup> In 2004, the U.S. Food and Drug Administration cleared the LANAP protocol<sup>4</sup> for the treatment of periodontal disease.<sup>4</sup> Later, in 2007, in conjunction with our work, histological proof of not only bone generation, but new cementum mediated connective tissue attachment was published by Dr. Raymond Yukna, DMD, MS (University of Colorado, formerly at Louisiana State University).<sup>5</sup>

A key component of the protocol is the PerioLase MVP-7 digital dental laser developed by Millennium Dental Technologies – a true pulsed Nd:YAG laser. The wavelength of this laser is 1064nm. It can be utilized to achieve peak powers in the thousands of watts and has the ability to vary the pulse duration (length of time of each laser pulse). This wavelength of laser light targets diseased or infected pocket tissue away from the underlying connective tissue. The necrotic epithelium is stripped from the connective tissue at the histologic level of the rete ridges. Since the laser energy is quite selective for diseased tissue, the underlying connective tissue is spared, thereby permitting healing and regeneration rather than formation of a pocket seal by long junctional epithelium.



## Clinical Case

Nick DeTure, DMD, performed a full-mouth LANAP protocol on May 19, 2009. The 54-year-old male patient suffered from 6mm to 12mm of pocketing in his molar areas with bleeding on probing in April 2009. The patient had already lost 15 teeth and was reluctant to lose any more. At his initial visit, the patient was on Norvasc, Simvastatin and penicillin with a history of periodontal surgeries – one full-mouth surgery and another on the right side. A clenching habit was exacerbating an already uncomfortable condition. His last perio maintenance was performed in February 2009, and plaque control was good: PI 20 percent, BP 135/84 and pulse 71. Fremitus was noted at #4, along with minor staining and a phase contrast bacterial slide sample remarkable for a high number of white blood cells, spirochetes and motile rods.



1. 7th Annual Conference on Periodontal Surgery on November 8-9, 1996. Michael Newman, DDS, PhD
2. Gregg RH and McCarthy D. Laser ENAP for periodontal bone regeneration. *Dentistry Today*, 1998; 17(5):88-91.
3. Gregg RH and McCarthy D. Laser ENAP for Periodontal Ligament (PDL) Regeneration. *Dentistry Today*, 1998;17(11)
4. 510(k) Number K030290, FDA Cleared July 2004
5. Yukna R, et al. Histologic evaluation of an Nd:YAG laser-assisted new attachment procedure in humans. *Int J Periodontics Restorative Dent* 2007;577-87.

## An Overview of the Procedure

There is no initial periodontal therapy started prior to the LANAP protocol. The LANAP procedure is generally completed in two visits, although it can be done in one.<sup>6</sup> On average, each of the two visits are two hours long. Patients are seen at a one-week post op for an evaluation and then at 30 days post op to have a supragingival prophylaxis.

Thereafter, supportive perio therapy is performed every three months. Patients are closely monitored during this time. At one year, a postoperative evaluation is done, which includes full periodontal probing and full-mouth radiography. At this time, phase two dentistry can be initiated once it has been confirmed that the periodontal condition is stable.<sup>6</sup>

Generally, during this first year, no restorative work that requires disturbing the periodontal tissue is done – only caries control and temporization. Subgingival cleaning and probing are discouraged. Since many of the patients that are indicated for LANAP treatment have avoided dentistry for years, they often require some restorative dentistry prior to the procedure, as they would not be able to wait a year before undertaking the needed restorative treatment. In this case, direct restorations are placed as needed and when indirect restorations are indicated, temporaries are placed with the understanding that the final restorations will be placed at a later date.<sup>6</sup>

## LANAP Training

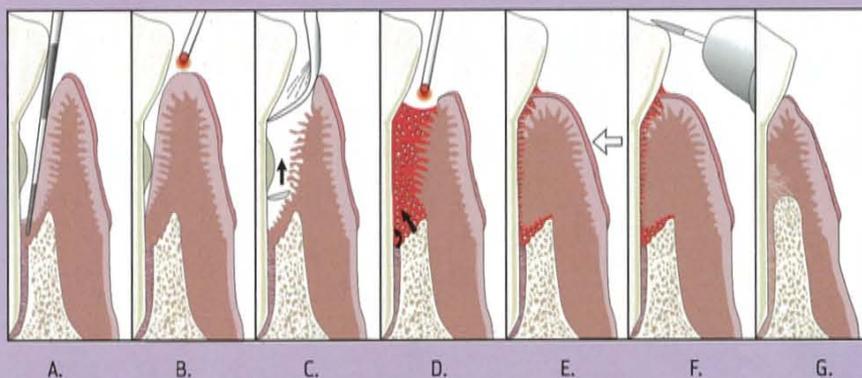
The LANAP Training Continuum is a year-long, comprehensive, live-patient, hands-on training program that dentists undergo to ensure that they are safe and effective in the LANAP technique. The first three days of training, Laser

BootCamp, focuses on safety and efficacy in the LANAP protocol. Upon completion, dentists are granted a conditional license to use the LANAP protocol and have been awarded a Standard Proficiency Certificate. Evolution 4 of the Training Continuum is designed to take place after six months of clinical LANAP practice and experience. During Evolution 4, the new LANAP “initiate” will return to gain more insights for successful, safe and optimal LANAP protocol techniques, methodology, and laser operating parameters, and realize improved LANAP outcomes and greater clinician and operator efficiencies. Upon completion of Evolution 4, dentists receive an Expanded Proficiency Certificate.

Evolution 5 of the LANAP Training Continuum is an integral part of the established Continuum of LANAP training that, upon successful completion, leads to a certificate in “LANAP Proficiency” and elects the LANAP-proficient clinician as a Fellow in the Institute for Advanced Laser Dentistry. Evolution 5 focuses on increasing energy density for even greater LANAP performance, versatility, adaptations, and increased capabilities, as well as improved clinical outcomes and management methods of clinically difficult LANAP case types. Only upon completion of Evolution 5 may the doctor use quartz fiber optics in different diameters, such as the 300 and 400micron fibers that have been custom manufactured with the ability to curve in the extreme bend-radius that LANAP often requires. Dentists who complete Evolution 5 have achieved one of

6. Harris DM, Gregg RH, McCarthy DK, Colby LE, and Tili, LV. Laser-assisted new attachment procedure in private practice. *General Dentistry*. 2004;52(5):396-403

## The LANAP Protocol



- A. Perio probe indicates excessive pocket depth
- B. Laser radiation vaporizes bacteria, diseased tissue, pathologic proteins and alerts the practitioner to the presence of tartar
- C. Ultrasonic scaler and special hand instruments are used to remove root surface accretions
- D. Laser is used to form a gel-clot containing stem cells from bone and PDL
- E. Reattachment of retentive ridges to clean root surface, with a stable fibrin clot at the gingival crest to create a “closed system”
- F. Occlusal trauma adjusted
- G. New attachment is regenerated

(This graphic is for illustrative purposes only and is not a technical representation of the LANAP protocol. Usage without permission is prohibited. © 2011 MDT, Inc. © 2011 IALD. All rights reserved.)

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the highest levels of clinical, live-patient, hands-on training in advanced laser dentistry available today.

### Patient Acceptance of the LANAP Protocol

Even patients who have traditionally avoided dental treatment or have experienced traditional surgery in the past accept LANAP treatment. They are seeking an alternative to traditional surgery and are familiar and comfortable with the use of lasers for LASIK treatment for their eyes. Thus, they consider laser treatment for periodontal disease a viable alternative. Clinically, what immediately becomes apparent is that post operatively there is minimal discomfort, shrinkage of swollen, puffy gums and reduction of bleeding.

After the procedure, the patient can see that the tissues feel and look healthier. Since LANAP treatment is not a cut-and-sew procedure, no native tissues are injured; the recession associated with traditional surgery is not present. Consequently, the patients do not have the root sensitivity or longer-appearing teeth.<sup>6</sup> ■

### Author's Bio

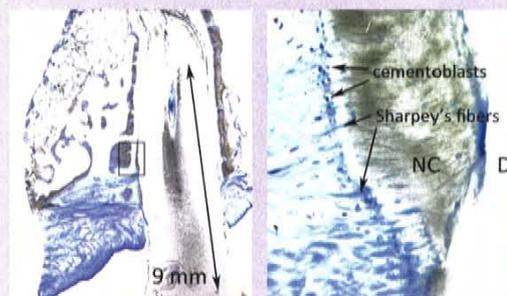
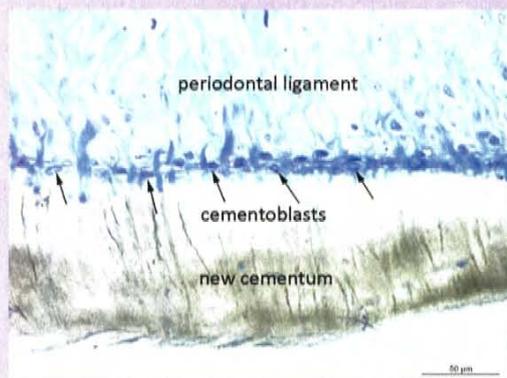


**Dr. Robert Gregg** is a former faculty member at UCLA School of Dentistry. He has been using lasers clinically since August 1990, including CO<sub>2</sub>, free-running pulsed (FRP) Nd:YAG, both single and variable pulsed; FRP Ho:YAG, surgical Argon, CW diodes and Er:YAG. He has given lectures nationally and internationally on the subject of clinical laser applications, and has conducted seminars for the UCLA Department of Continuing Education. Dr. Gregg along with Delwin K. McCarthy, DDS, formed the Institute for Advanced Laser Dentistry (IALD) in 2001.

**About the Institute for Advanced Laser Dentistry (IALD):** The Institute for Advanced Laser Dentistry is an internationally recognized non-profit educational and research center dedicated to providing evidence-based clinical training in advanced laser dentistry therapies. The IALD is both ADA CERP and AGD PACE accredited, and is committed to its continuing education (CE) programs. The IALD includes more than 20 certified instructors, who train dental professionals in laser dentistry techniques. In addition, the organization aims to reach more underserved patients with gum disease by offering free treatment to qualified patients in their training clinic – about \$750,000 in free dental services each year. The IALD's ultimate goal is for the percentage of patients seeking treatment for periodontitis to reach the percentage of patients seeking general dental care. For more information, please visit [www.theiald.com](http://www.theiald.com).

### More Research for the LANAP Protocol

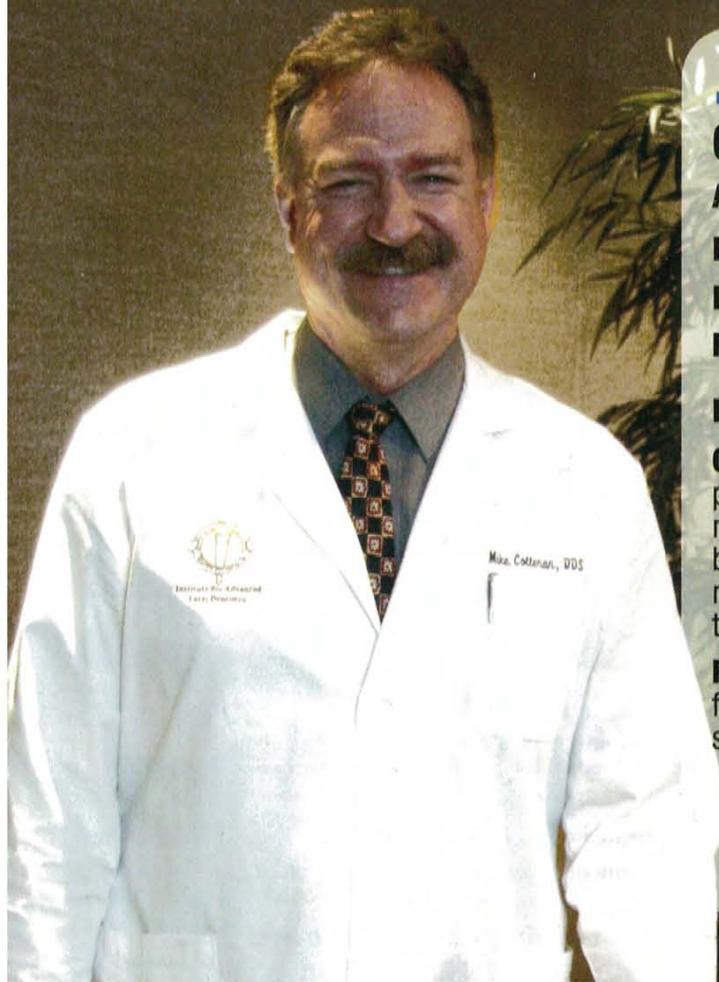
The preliminary report for the independent, nine-month *en-bloc* human-histological study by Marc Nevins, DMD, MMSc, positively supports the LANAP protocol for treating periodontitis.



#### Preliminary Research Details

- Twelve teeth designated as "hopeless" were identified as study teeth prior to treating all teeth with the LANAP protocol: Eight single and four multi-rooted.
- Pocket depths of 8 to 16mm pockets and up to 50 percent gingival recession.
- All teeth were Class III vertically mobile/compressible.
- All four molar teeth had Class III furcations.
- Twelve study teeth were removed *en bloc* after nine months.
- Two teeth were destroyed in the histological processing: one single root tooth and one multi-rooted tooth.
- Six additional teeth were used for calibration and proof of notch placement. All six teeth showed the notches placed in diseased calculus with calculus and bacteria extending apical to the notch.
- **All 12 "hopeless" teeth returned to clinical, radiological and histological health.**
- **Histologically, 10 teeth showed regeneration up to the bottom of the notch, with five teeth showing regeneration in and above the notch. A sixth tooth showed cementum-mediated new attachment.**

*Preliminary report was presented at the 2011 AAP Annual Meeting. Full analysis of clinical, radiologic and histologic findings are expected in 2012, with subsequent submission for peer-review and publication consideration.*



## LANAP® PROFILES

### CLETUS

**AKA:** Michael L. Colleran, DDS

**HOME:** San Luis Obispo, CA

**DENTAL SCHOOL:** University Of The Pacific

**PASSION:** Not my favorite fruit

**LIFE CHANGERS:** Dental School and The LANAP protocol

**QUOTE:** "Not only can the LANAP® protocol do something very cool for my patients, my custom painted blue flame PerioLase® MVP-7™ makes my office more cool and totally awesome."

**PERIO PROTOCOL:** LANAP'n from '06 (LANAP® protocol, since 2006)



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**21 Months Post-LANAP® protocol**

Radiographs courtesy of Michael Colleran, DDS – General Dentist

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