AMD LiteTouchTraining
February 3, 2017
by Hugh Flax, DDS

Text
HughFlax
to 33444
then receive
a link via
e-mail to
download my
presentation

Catapult Education is an organization which consists of top clinicians and educators from throughout the United States and Canada. This group of like-minded yet diverse dentist's goal is to bring quality education to the dental community via multiple venues including; live lecture, participation, web based, and written formats.

Hugh Flax DDS, AAACD MICOI
Atlanta, GA
Flax Dental
Member of Catapult Education
h.flax@FlaxDental.com
As a Catapult Group member we participate in multiple product reviews each year in order to stay at the forefront of the latest materials, techniques and services available, ensuring that the message we are delivering is current and relevant to today’s continuing education needs.

Some of these products & services I will be sharing with you today.

Today I am supported in part by: AMD

DISCLAIMER

JOIN THE REVOLUTION OF NEW TECHNOLOGY

- Smarter
- Quicker
- More precise
- More comfortable for the patient
- Greater satisfaction
- Bottom line: You are “raising the standard of care”

AMD/ LITETOUCH TRAINING

Goals:
- Understanding how the unit works and how laser science impacts day to day treatment.
- Realize what it takes to use the laser safely and effectively with and without anesthesia.
- Be able to go back and apply all of these principles Monday morning.

Laser History and Physics

1916
Einstein took Bohr’s theory of spontaneous emission and came up with the stimulated emission theory that would be the basis of laser technology.

EVERYTHING YOU WANTED TO KNOW ABOUT LASERS—But were afraid to ask

LASER is an acronym for:

L = Light
A = Amplification by the
S = Stimulated
E = Emission of
R = Radiation
Spectrum of Medical Lasers

FIVE ESSENTIALS ABOUT LASERS

- There are several different lasers available—each has a unique wavelength.
- They all produce a thermal interaction in the tissue and different temperatures produce different interactions.
- The energy can be emitted continuously or in a pulsed mode.
- Different wavelengths interact with different tissue components.
- Laser safety is essential!
WHAT KIND OF LASER DO WE HAVE?

HARD TISSUE LASERS

- Fotona- Er Yag- 2940- Absorbed in water and Hydroxapatite
- AMD- LiteTouch- 2940- Absorbed in water and Hydroxyapatite
- Biolase- I Plus- 2780- Absorbed in water and Hydroxyapatite
- Solea- CO2- 9,300 Claims, at peak absorption of Hydroxapatite

Fiber based lasers

‼ Medium for laser energy delivery
- Optic fibers as,
  - Reduce the energy output in about a 30%
  - Typically costly
- Rigid glass in fiber- difficulty to perform treatments
  without causing limitation of movement to reach certain
  areas in the mouth.
- Non ergonomic use - often causes occupational health
  discomfort ; with symptoms such as common hand
  arthritis and shoulder pain.
- Inability to complete a planned procedure

Articulated Arms based lasers

‼ Medium for laser energy delivery - Bulky, articulated arms,
- Heavy device structures - difficulty to perform treatments without causing
  limitation of movement to reach certain areas in the mouth.
- Non ergonomic use - often causes occupational health discomfort ; with
  symptoms such as common hand arthritis and shoulder pain.
- Inability to complete a planned procedure

The LiteTouch Er:YAG laser

- Its entire laser delivery mechanism housed within
  the handpiece
- No loss of energy
- Avoids the heavy, rigid and bulky articulated arm
  and fragile fibers
- Ergonomic design and maneuverability

Direct Delivery Laser System

The designers of LiteTouch™ placed the laser chamber within the handpiece
doing away with the standard optical cable. In addition, they also did away with
fibers and articulated arms, which limit maneuverability and require the
replacement of costly cables.
<table>
<thead>
<tr>
<th>LASERS VS. HIGH SPEED</th>
<th>Ablation with an Er:YAG laser?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LiteTouch</strong></td>
<td><strong>Turbine Drill</strong></td>
</tr>
<tr>
<td>Almost no anesthesia</td>
<td>Anesthesia is required</td>
</tr>
<tr>
<td>No post-operative numbness &amp; sensitivity</td>
<td>Post-operative numbness &amp; sensitivity</td>
</tr>
<tr>
<td>Multiple quadrant treatment</td>
<td>Single quadrant treatment</td>
</tr>
<tr>
<td>No drilling noise &amp; vibrations</td>
<td>Drilling noise &amp; vibrations</td>
</tr>
<tr>
<td>Bactericidal effect</td>
<td>Threat of bacterial contamination</td>
</tr>
<tr>
<td>Coagulation: fast healing, not bloody</td>
<td>Scalpel: slow healing, scars, bloody</td>
</tr>
<tr>
<td>No micro-fracturing / no smear layer</td>
<td>Micro-fracturing and smear layer</td>
</tr>
<tr>
<td>Bond enhanced (etch still needed)</td>
<td>Need for etching</td>
</tr>
</tbody>
</table>

http://www.youtube.com/watch?v=-g81KfaElUw

Link to the fast camera movie

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**TERMINOLOGY**

**Units of measurement:**
- Hertz (Hz) measures Frequency
- Joule (J) measures Energy
- Watt (W) measures Power
- Second (sec) measures time

**Prefixes**
- Milli (m) = 1/1,000
- Micro (µ) = 1/1,000,000

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**HERTZ**

* Can be adjusted on the Unit.
  - Ideal cutting on tooth structure between 10-20 Hz.
  - Bone: 20-25 Hz
  - Soft tissue: 40-50 Hz
  - The higher the Hz, the smoother the cut.

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**ENERGY DELIVERY CONCEPTS**

![Energy Delivery Concepts Graph](image)

Average power is achieved by creating repeating pulses of energy at a steady frequency.
The Average Power (Watt) = \( \text{Pulse Energy (J)} \times \text{Frequency (Hz)} \)

1W=0.1Jx10 Hz=100 mJ x 10Hz
5W=0.1J x 50 Hz=100 mJ x 50Hz
8.4W=0.7J x 12 Hz=700 mJ x 12 Hz
A LiteTouch single pulse is roughly rectangular in shape, with a duration (width) measured in microseconds. The Peak Power is the maximal power of the pulse.

**Power density**

Amount of energy delivered by the laser to the area of the tissue being lased.

*Measured in watts/cm²*

**Power density is affected by**

- Amount of power delivered (watts).
- Distance of the tip (HP) from the tissue.
- Diameter of the tip.

**LASER SAFETY**

- While the unit is very safe there are certain protocol that you must understand and follow.
- For safety there is no compromise!

**SAFETY GLASSES**

- Technically safety glasses are to be worn, by patient, doctor and staff.
- Remember that every wavelength has specific safety glasses.
- When finished, patient’s glasses are the last to come off!
LASERS AND NITROUS OXIDE

• The Lite Touch can safely be used in conjunction with Nitrous oxide analgesia.

DOCUMENTATION AND SIGNS

• Laser warning signs and “Authorized Personnel Only” signs need to be out and in clear view for all to see.
• Chart documentation need to be clear and concise and must include laser type, tooth number, procedure, Watts used, Air, water settings, tip size and Hz and mode if applicable.

LASER SAFETY MECHANISMS

• The lasers are built with safety mechanisms to protect you in case of a problem.
• Examples of these are, Key, covered footswitch, disconnecting plug in back of unit, when powering on unit goes to lowest setting first, standby mode, E stop, etc
• In the event of an emergency,
  - Manage your patient, manage the laser, call manufacturer and/or FDA

LASER SAFETY OFFICER

• Designate someone in the office to be the LSO.
• Duties include, keeper of the key, sets up operating procedures, understands how the laser works, supervises staff education and training, posts warning signs, calibrates and sets up the laser before use, oversees all protective wear, reports and documents laser emergencies, and knows all regulations of OSHA.

WHAT CAN WE DO WITH OUR LASER?

• Operative Dentistry
• Crown and Bridge
• Periodontal Surgery
• Endodontic Disinfection and Apicoectomies
• Oral Surgery
• Treat Peri-implantitis
THE LEARNING CURVE OF HARD TISSUE

IN CONTACT
1-3 MM OUT OF CONTACT

THE LEARNING CURVE OF SOFT TISSUE

• IN CONTACT, MUCH LIKE USING A SCALPEL.
• WILL ALSO CUT SLOWLY AT HIGHER POWERS, 1 MM OUT OF CONTACT.
• ANGULATION AND POWER CRITICAL NOT TO DAMAGE UNDERLYING HARD TISSUE.

THE LEARNING CURVE

• WILL ALSO WORK OUT OF CONTACT ON HARD AND SOFT TISSUE TO EXERT LASER ENERGY IN REGARDS TO PROPAGATING A REACTION.
• DESENSITIZATION OF CLASS V LESIONS.
• REMOVING OF VENEERS, EMAX AND ZIRCONIA CROWNS ATRAUMATICALLY.
• APHTHOUS ULCERS.

MAGNIFICATION AND ILLUMINATION ARE CRITICAL IN WORKING WITH LASERS

Mastering the working distance

Angulation of the beam
Time of exposure
Focalisation
Defocalisation

Orascptic
**LASER ANALGESIA**

Proposed mechanism of action
Reducing the action of the sodium potassium pump at the cellular level thereby slowing or even stopping nerve conduction in the pulpal tissues long enough to “painless” ablate enamel and dentin without the use of anesthesia in most cases.

Lasers in Dentistry (Miserdino and Pick)
Quintessence Publishing 1995
Chapter 19 Modern optics and Dentistry page 287
“ For example, radiation scattered in enamel and dentin can be entrapped by these natural waveguides and transported to the pulp chamber”

**WHY LITETOUCH?**

Morphological changes in hard dental tissues prepared by Er:YAG laser (LiteTouch) and rotary instruments. A scanning electron microscopy evaluation.
Snejana T., Todorova, Georgi T. Tomov. Folia Medica 2010; 52(3): 46-55 Copyright © 2010 Medical University Plovdiv

Research Conclusion
All LiteTouch treated samples showed no evidence of thermal damage or signs of carbonization and melting. The SEM examination revealed characteristic microirregularities of the laser prepared dentin surface without any smear layer, and open dentinal tubules. Interlateral dentin is ablated more than peripherally dentin and that made the dentinal tubules appearance better exposed. The LiteTouch Er:YAG laser ablated enamel effectively leaving well exposed enamel prisms without debris. The surfaces are very retentive.

**PRINCIPLE OF LASER SETTINGS**

- Setting the Energy
  - Hard Tissue - Low energy/Higher energy
  - Soft Tissue - Low Energy

- Setting the Frequency
  - Hard Tissue - Operative/ Low frequency
  - Bone - Mid Frequency
  - Soft tissue - High Frequency

- Setting the Water
  - High on hard tissue
  - Low on soft tissue

**SUCTION PLACEMENT**

- As this laser relies on Air, Water and Laser energy to cut, location of suction and type of suction is critical for success.
- If using a HSS, place the suction 1-2 teeth mesial or distal from where you are working.
- If using a saliva ejector, place the saliva ejector adjacent to where you are working.
- “Listen to the crispness of the pop”

**TIPS**

- As burs come in various shapes and sizes, so do tips.
- While any tip can be used for any procedure you like, there are recommended tips for each procedure.
MAGNUM TIP
• Operative work horse
• Magnifies energy allowing you to cut effectively at low power.
• Recommended for restorative procedures.
• Use 1-3 mm out of contact.

BLADE TIPS - ideally for soft tissue. Do not use at powers greater than 2 watts. Use in contact with soft tissue

• 1mm wide 14 mm long tip.
• Operative Dentistry, Bone, Soft tissue.
• Use out of contact in hard tissue and in contact in soft tissue.

TIPS

CHISEL TIP -
• Universal for both hard and soft tissue.
• Excellent for cutting bone due to wider footprint of tip, also for creating C shape of gingiva in Gingival recontouring.

SIDE FIRING TIP -
• Energy come out of all sides.
• Typically used for endo at low power to photo-acoustically move liquid down the canal. Use out of contact.

LEARNING YOUR LASER
Low amount of water approx. 4
CLASS III

2 Watts/1 mm tip
No anesthesia

CLASS V—1 MM TIP / 2 WATTS

CLASS V /1MM TIP 2 WATTS—NO ANESTHESIA

DECAY REMOVAL
DECAY REMOVAL

Micro-FTIR spectra of the non- and lased dentin (CO\textsubscript{2} laser, 69.0 J/cm\textsuperscript{2}) revealed that the laser-irradiation eliminated the amide peak wavelengths (box) and increased the crystallinity of dentin (arrow).

Jpn J Conserv Dent 42(5): 860~877, 1999

Er:YAG was done at Hiroshima Univ. (former university for Morioki), CO\textsubscript{2} laser work was carried out in our department of Aich Gakuin University.

The characteristic changes of the superficial layer of lased dentin actually demonstrate the increase of the mechanical properties and acid-resistance. Unfortunately, laser-irradiation decreases resin-bond to dentin.

Information provided by Professors Akira Sendai and Fujitani Morioki
Aichi Gakuin University

SURGICAL SETTINGS

- Chisel Tip
- Pointed (scalpel) tip 0.4, 0.6 mm
- Max setting with pointed tip 2 watts total

CHISEL TIP (50 MJ WITH .04 TIP)

Water set to approx. 5-6
What are the differences?

- Bioactive surface
- Resorbable
- Complex anatomy

It seems that, unlike periodontitis, peri-implant lesions do not respond predictably to either nonsurgical or surgical treatments.

LASER irradiation on implants surfaces

- Appropriate conditions
- No visible change to titanium surface
- No temperature elevation
LASER non surgical treatment of peri-implantitis

Er:Yag is the most commonly use LASER for peri-implantitis

- Er:Yag remove calculus, degranulate and debride implant surface
- Limited effects of Er-Yag on control studies

Er-Yag LASER compare to conventional instruments: peri-implantitis exp. induced

- Better result for Er-Yag compare to conventional mechanical and chemical treatment.
- Better bone to implant contact on Er-Yag treated surfaces compare to curette on flap surgery.

PERI-IMPLANTITIS

Alteration of the implant microstructure


No or minimal alteration of the microstructure for machined sandblasted and acid etched implant surfaces after Er-Yag irradiation.

Scanning electron microscopy level

SUB-ABLATIVE LEVELS (1MM)

Treatment 9
Calculus Removal
100 mj / 10 MZ

LITE TOUCH (Er:Yag) Laser

Laser Assisted Calculus Removal
100mj
15Hz
Chisel Tip X 17mm Length

Water set to 6
FRENECTOMY

- The Higher the Hertz, the smoother the cut, the less bleeding there is.
- To further reduce bleeding keep water low (3-4)

POCKET DEBRIDEMENT
1MM/13MM LENGTH

- Water set to 5

SURGICAL TIP

- 50 mj . 40 HZ, water set to 4

FRENECTOMY---RULE OF THUMB

- Treatment 5: Operculectomy 100 mJ / 30 Hz
- Treatment 6: Frenectomy 50 mJ / 35 Hz
- Treatment 7: Blap 50 mJ / 35 Hz
- Treatment 8: Periodontal Pocket Debridment 50 mJ / 30 Hz
- Treatment 9: Gums Pigmentation Removal 100 mJ / 15 Hz
1MM TIP, LITTLE TO NO WATER

APHOUS ULCERS
1MM. TIP/ NO WATER

ENDO ACTIVATION
SIDE FIRING TIP OR .04 SURGICAL TIP, NO WATER

EMAX CROWN / VENEEER REMOVAL SETTING
- 150 mj, 20 Hz.
- 1 mm tip
- Keep tip 3-5 mm away.
- Be Persistent!
HOW DOES THIS PHENOMENA WORK?

BIOSTIMULATION

• When you cut soft tissue with Er:Yag laser, a cellular effect occurs that is beneficial to the healing process. Increase of mitochondrial activity, RNA, DNA production, improved blood flow and lymphatics.

Jan Turner and Lars Hode- LLLT Textbook

**文学审查**

Erbium Yag LASER: biologic effects

- Improvement of the healing process
- Reduction of post-op inflammation, action on pro-inflammation cytokines
- Stimulation of fibroblasts growth on surfaces treated by Er:Yag

Schwarz F, Arial A, Sauron A, Georg J, Schum W, Becker J: The biologic effects of Er:YAG on connective tissue showing good planning on the basis of data on biological and clinical studies of human tissue. Results used in surgery and medicine. 39: 74-75

**Biostimulation**


Completely unique aspect and different from conventional tools

**Still unclear**

Promotion of wound healing


Reduction of inflammation


**Pain relief**


**Soft Tissue Model**

*In vivo Study Using 600 Lab Mice*

Erbium:Yag on hard tissues is the best...

**Ernst et al.**

- Thermally affected layer of 5-10 microns under water cooling
- CO₂ and Air Yag is about 2 times more
- No carbonisation effects compare to others
**Reality Check**

"The Biologic Zone determines the cervical limitations of tooth preparations and will ensure the preservation of a healthy periodontal attachment."

John Kois

*Contemporary Esthetic Dentistry* Vol.2 No.1 1996

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**Based on a study of 100 healthy patients with unrestored teeth**

"The total dentogingival complex is more clinically significant to ensure predictable results."

John Kois

"Altering gingival levels: the restorative connection part 2: biologic variables"  
*J Esthet Dent* Vol 6 No1 1994

---

**In this study it was found that 85% - 90% of the time**

- Create an esthetically pleasing gingival architecture?
- Maintain biologic width by mimicking the osseous scallop?

**The Gingival-Esthetic Restorative Challenge**

**How to:**
- Create an esthetically pleasing gingival architecture?
- Maintain biologic width by mimicking the osseous scallop?

**THE ANSWER:**

Using a Erbium Hard/Soft Tissue Laser

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Using a Erbium Hard/Soft Tissue Laser
A WEDDING MAKEOVER - DISCOVERING THE FOUNTAIN OF YOUTH

34 yo working mother of 2 children
THANK YOU FOR YOUR TIME AND ATTENTION

ANY QUESTIONS ????

CONTACT INFORMATION

HUGH FLAX DDS
(404) 255-9080

Email: h.flax@FlaxDental.com

For lecture info on cosmetic dentistry, implants and lasers

http://www.cataul educat ion.com/educ at o rs/h ugh-flax

HANDS ON
THE BU$INESS OF MAKING YOUR LITE TOUCH PROFITABLE

Hugh Flax DDS MICOI
Accredited Member Aacd
Atlanta, GA

You Got A Problem With That??

GIVE PEOPLE A MESSAGE

MARKETING IS A TEAM SPORT

LET'S SEE HOW THE PROS DO IT

Before you begin marketing
- Be fluent in all aspects of laser treatment
- Make sure you can practice what you preach
- Training
- Move on to advanced procedures
Basic Laser Techniques
- Anesthesia
- Operative
- Routine soft tissue
- Endo

Advanced Techniques
- Crown and Bridge
- Perio
- Combination soft and hard tissue (i.e. cosmetic “gum lifts”)

REALITY
- People “buy” to feel good or solve a problem
- People love solutions that easy, quick, and painless

The Laser Dentistry Market
- Adults
- Children
- Apprehensive patients
- People who don’t like numbness
- People who have had bad dental experiences

Addressing Needs
- No pain
- No shots
- No numbness
- No sound of the drill
- Conservative
- Great for kids
- “Life changing dental visit”

LAW OF THE MIND
- It is better to be first in the mind than first in the marketplace
- If you have a laser and don’t advertise it and someone else comes along after you and does, it is impossible to convince the public that you were first or better
- You will always be remembered as “the first”
GIVE PEOPLE A MESSAGE

**Internal Marketing**
- Announcements to patients
- Brochures and articles
- Managing Expectations
- Asking
  - "Bun –Warmers"

**External Marketing**
- Website
- Print Media
- Press Releases
- Market to specialists
- **BRAG about the benefits**

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**BRAGGING KEYWORDS**
- Virtually painless
- No injections
- Extremely precise
- Microscopic fillings
- Extremely conservative
- Allows me to place tiny white fillings not the darks ones
- Popcorn popping sound
- Only 1 of X dentists that have made the substantial investment in technology

(WHY.....? “I’ll give you 60000 reasons why)
EDUCATING
You and your staff—make your investment payoff
In-office training-
  Graeme Milicich CD’s are the best(www.advanceddental-ltd.com)
Seminars –WCLI
User –groups
Join the World Congress of Microdentistry
Your patients
Utilize your marketing materials
Use Powerpoint
Display and/or give copies of articles
ALWAYS KEEP “THE PARACHUTE” OPEN

DO IT OFTEN!
IF YOU DON’T USE IT YOU LOSE IT!

Practice
Always try new things as you climb up the “learning curve”

Unconscious Competence
Conscious Competence
Conscious Incompetence
Unconscious Incompetence

THE LEARNING CURVE

MANAGING EXPECTATIONS

Case presentation-
  Diagnodent (www.kavousa.com)
Chairside-delegate
  Demo
What to say

IT IS NOT ONLY WHAT YOU SAY
BUT HOW YOU SAY IT

INSURANCE

Use the right codes to maximize benefits
Fully document claims
Charting –Periodontal; Diagnodent
Photographs
Supplement with research articles if needed
Let your patient know you are providing a higher level of service not only about their dental care but the “extra mile” you may be going to help with claims
Remember “The Rainmaker”
Medical reimbursement

DO IT RIGHT!
Use the Right Tools

KaVo DIAGNOdent®

SLAM DUNK SUCCESS
“Good-to –great organizations avoid technology fads and bandwagons, yet they become pioneers in the application of carefully selected technologies...used technology as an accelerator of momentum not the creator of it”

“A FINAL THOUGHT......

“We are not creatures of circumstance; we are creators of circumstance”
Benjamin Disraeli

THANK YOU FOR YOUR TIME AND ATTENTION

CONTACT INFORMATION
HUGH FLAX, DDS
(404) 255-9080
Email: h.flax@FlaxDental.com
For lecture info on cosmetic dentistry, implants and lasers
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